

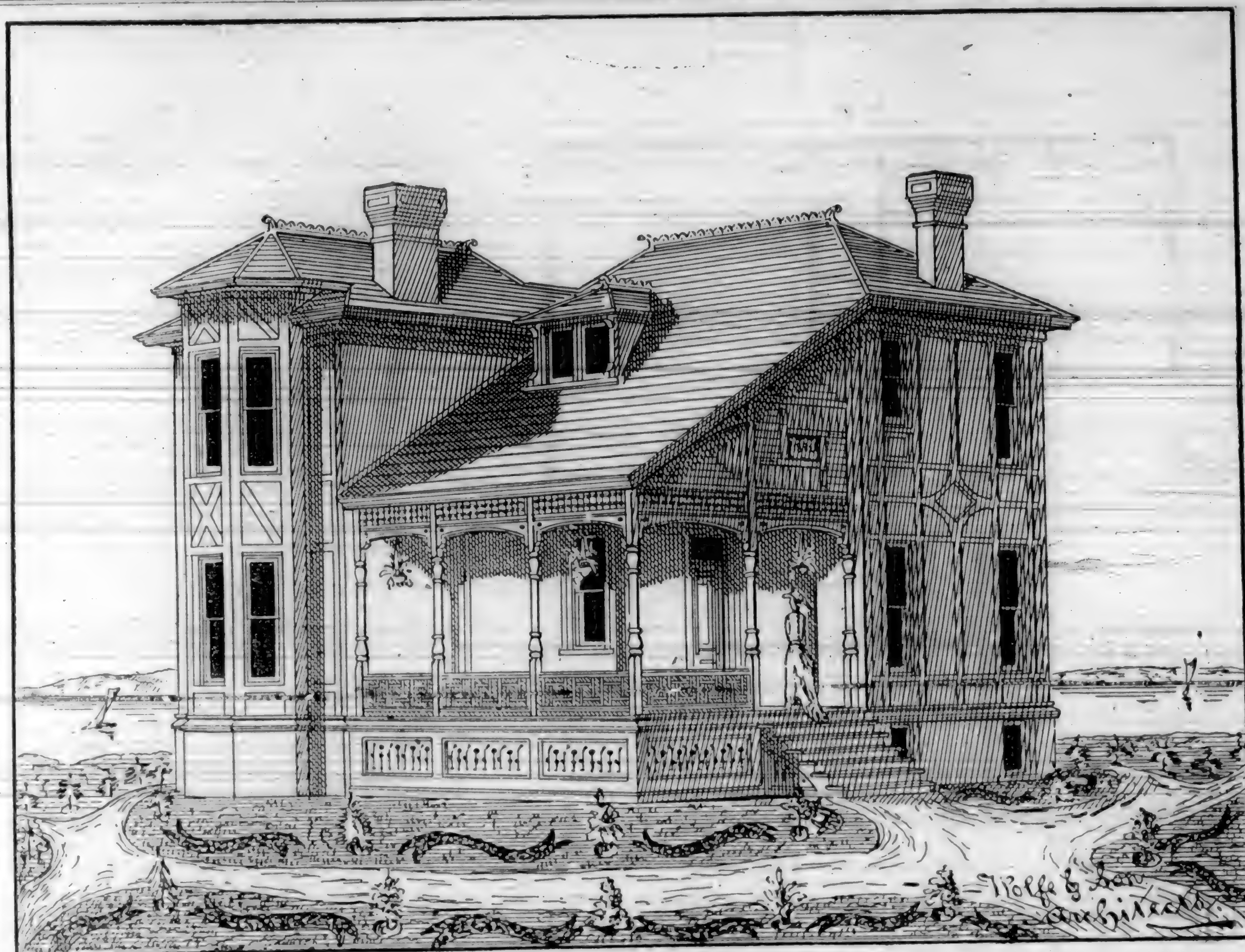


PLATE 4.—SUBURBAN DWELLING COSTING \$3,500.

Tar Roofs.

The London *Builder* says that the German government has on several occasions pointed out to farmers and others interested in agriculture that too great an expenditure of capital on buildings is a mistake. With a view of illustrating the application of this principle of economy to roofing, the *Cologne Gazette* points out that the system of using tar for roofing purposes is at the same time economical and suitable for agricultural buildings, and what is said may serve as an answer to a recent inquiry in our own pages. The framework of the roof can be of relatively slight construction on account of the nature of the covering it is intended to support, and the perpendicular height of the roof can be one-eighth to one-tenth of the entire depth of the building. The distance of the rafters is arranged according to the width of the covering material, the scale being that from the middle of one rafter to the middle of another. The distance should be 2½ inches less than the width of tar roofing sheets.

Immediately upon the rafters comes boards, and upon these (exactly in the center of the separate rafters) are placed strong laths, about 2 in. wide and 1½ in. thick, the upper edges being taken off. The roofing sheets are now placed so as to cover the spaces between the laths, and are nailed. Over the laths are placed strips of paper, 5 in. to 6 in. wide, fastened with nails at intervals of 2½ in.

In order to make the sheets lie smoothly upon the boarding, it is suggested, in case they are too dry, to soften them by immersion in water. It is recommended that the workmen should not wear heavy-nailed boots, and also, that if the

rain comes on, the roof should not be walked upon immediately after. When the entire surface of the roofs is covered with sheets, the strips of paper (or caps) already named, as well as the joints, are painted over with a hot mixture of coal tar and pulverized lime. Pure dry sand is at once sprinkled over this coating, and particular care must be taken that all the nail-heads are well covered. When the paint is dry the whole surface of the roof is once more coated with the same mixture, and is sanded.

The object of this careful method of overlaying the roof with several coatings of specially prepared solutions is to preserve in the tar those oleaginous and fatty properties which it soon loses if exposed to the air, and the retention of which is an indispensable condition of its resistance to water. Clay and sand do not afford sufficient protection, and they are removed by violent winds.

Reference is made to various systems of coating the tar roof with protective substances, for the purpose indicated. One of the most successful methods consists of a mixture of cow dung and thin white lime, which is spread over the entire surface of the roof. If such a coating is not applied the tar paint must, during the first four years, be annually renewed, which enhances the cost of the roof. If the last-named protective composition is used, and renewed every two years, the coating of tar and lime can be dispensed with. Particular mention is, however, made of a coating of tar mixed with Portland cement, the tar being well heated and used in the proportion of 111 pounds to 200 pounds of cement. The mixture should be kept well stirred during the preparation, and should be applied as soon as made. This particular

method has been tried in many cases in Germany, and, according to the journal quoted from, its satisfactory results have caused its adoption upon a scale of progressive importance.

Re-gumming Circular Saws.

It is estimated that three times re-gumming a non-perforated circular saw costs nearly the price of a new saw. Perforations in the line of the gullet lessen this cost. The metal in the track of the perforations is softer than the teeth, because the sawdust left in them when the plate is scoured, after tempering, burns when the plate is flattened, and draws the temper of the holes. —Grimshaw on Saws.

Breathe pure air, if you would have sound lungs. It is wicked for a young girl with weak lungs to sit on the anxious seat in a house of prayer, where the exhalations of a thousand bodies and the poison of carbonic oxide fill the closed room, even if the preacher seems to her like God's angel. Pure air in the house, pure air in the hall, pure air in the workshop, pure air in the church—this is the prime necessity, and without this, upholstery and painted glass, and labor-saving inventions, and the prayers of the man of God, are all mockery. The gospel of pure air is the saving gospel to those who mourn that so many are cut off in the morning of their days, and that consumption is the scourge of the race of man. —Herald of Health.

WE \$4.25. WE

We will send the "California Architect and Building News" for 1883, and one copy of "American Cottage Homes," for \$4.25.

EVERYBODY'S COLUMN.

"FAS EST AD HOTE DOCTUM."

"To find the inclination of roofs that the shingles may last the longest."

The shingles will last the longest (other things being equal) when the roof rises more quickly which will be the case when the water runs off as rapidly as possible.

We have not space to print the full algebraical solution, but the result shows that the height of the roof above the eaves should equal half the width of the house—that is, one half pitch. In practice, however, roofs are seldom made so steep in this part of the country.

FRIEND ARCHITECT: Please tell me how to compute the number of joists it takes in a building when spaced 16 inches from centers.

AMATEUR.

ANS.—Multiply the length of the building in feet by 3, and divide the product by 4. For instance: the building is 124 feet long— $124 \times 3 = 372 \div 4 = 93$, the number of joists required. This rule is applicable, no matter what the thickness of joists may be, as long as they are spaced 16 inches from centers. Allow one extra, except when the end sills are utilized in place of joist. Of course deduct when the latter is the case.

During a recent tornado in Brewer, Me., a plank was blown with such force against a cistern with wooden walls an inch and a half thick, that the board penetrated some distance through the wall into the water. It was found that the board was wedged in so closely that the water did not leak, and the owner simply sawed the plank off, leaving the wall in the cistern all right.

WE \$3.50. WE

We will send the "California Architect and Building News" for 1883, and one copy of "Palliser's Useful Details," for \$3.50.

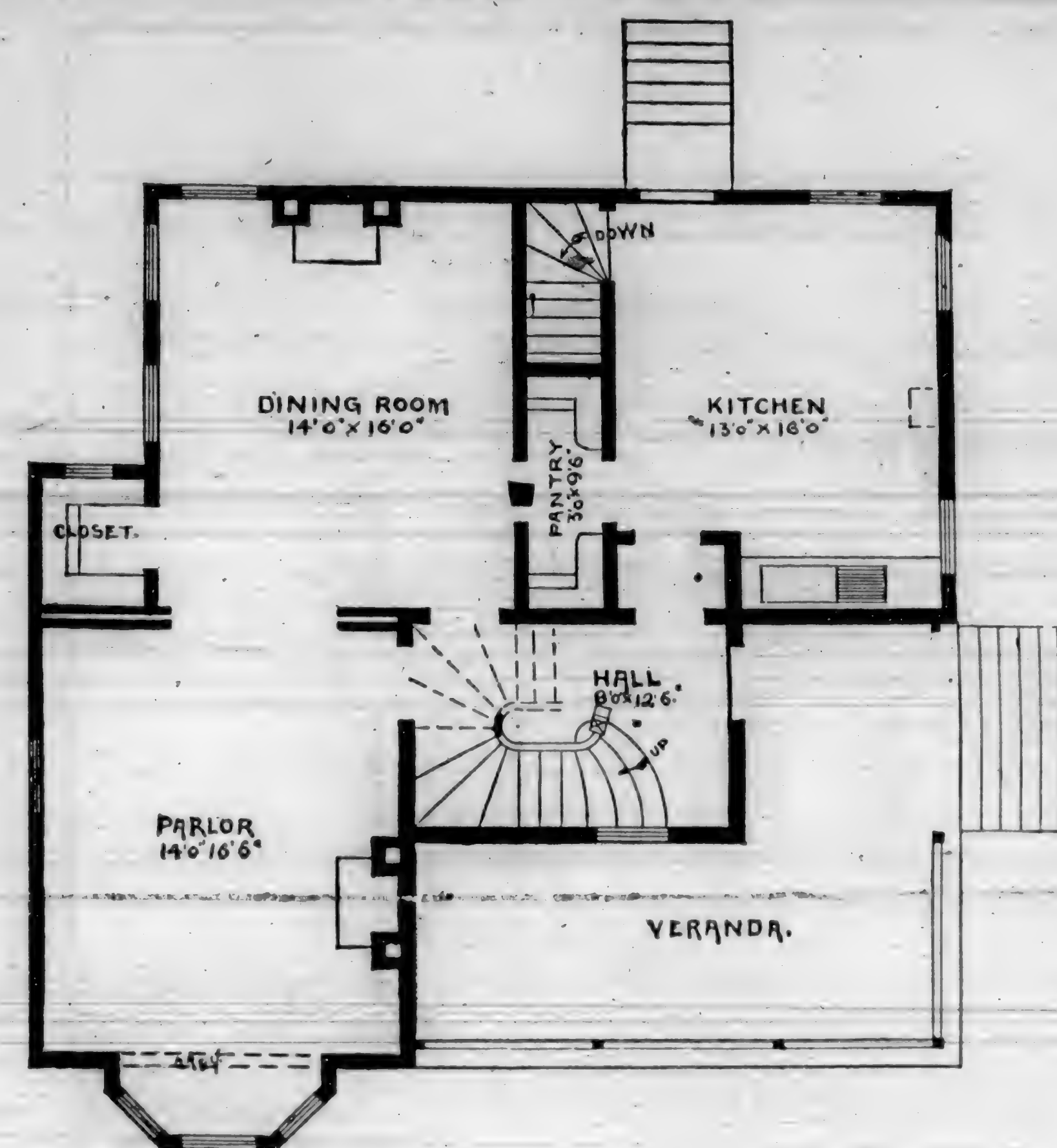


PLATE 5.—FIRST FLOOR PLAN OF SUBURBAN DWELLING.

The Gig Saw.

The spring strained saw, commonly known as the gig, jig, fret, or scroll saw, has a pull cut only; the return being effected by the same means that keep it strained. It is light running, and generally used for cutting out fine curved or scroll work, although of late years the band saw is superseding it for outside work.

Gig sawing really divides itself into two branches—sawing in irregular shapes on the outside of a piece of material, and the same process on the inside, known as fret work.

The short and readily detachable blades of the strained gig saw can be so quickly withdrawn from one cut and inserted in another starting hole, that the band saw has no chance to enter the field of fret work.

It may be said to have influenced American architecture, which seems largely to have been arranged so as to give every opportunity possible, from crest and barge board to porch and railing, for the display of scroll sawing.

Regarding the antiquity of the saw, it is instanced that a frame saw is shown in a painting of Heracleum. The sawyers are at each end, one standing and the other sitting. The bench to which the timber is secured by clamps is supported by four-legged stools. The saw blade is strained in the middle; the teeth stand perpendicularly to the plane of the frame. Frame saws were common in Egypt many centuries previous to this time.

WE \$5.50. WE

We will send the "Science of Carpentry Made Easy" and the "California Architect and Building News" for one year, for the sum of \$5.50.

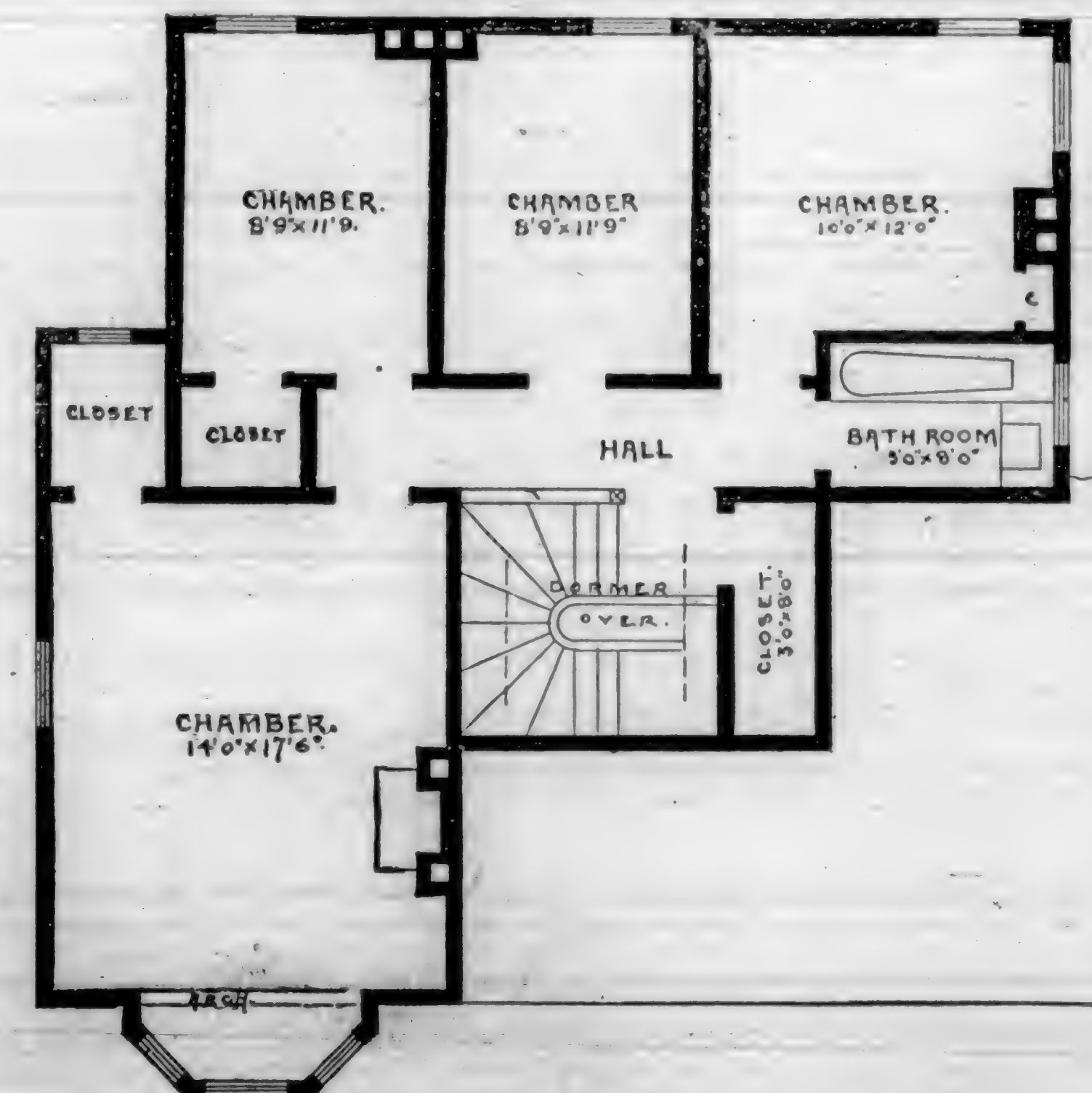


PLATE 6.—SECOND FLOOR PLAN OF SUBURBAN DWELLING.

Sixteenth Annual Session of the American Institute of Architects.

The Institute convened in annual session at Cincinnati, Oct. 26th, 1882. In the absence of President Walter, E. S. Littell of the New York Chapter presided, A. J. Bloor performing the duties of his office as Secretary. The annual address was delivered by Col. George Ward Nichols of the Cincinnati College of Music. The various reports of officers, trustees, and committees were received and duly acted upon; also the names of new members elected since the session of 1881 as Fellows of the Institute, among which are the following from San Francisco: Seth Babson, G. W. Sanders, James E. Wolfe, John Wright, William Curlett, Thomas J. Welsh, (Augustus A. Laver has also been a Fellow member for many years, and it is mainly through his influence that the union between the San Francisco organization and the parent institution was brought about. This representation of seven members in the grand body gives to California rather more than its quota, as the total membership of the Institute is restricted by its laws to seventy-five). Various subjects and matters of interest were introduced, discussed, and considered, bearing upon the numerous important features involved in the science and practice of architecture in its more intelligent and comprehensive senses. The matter of increasing the limit of membership to one hundred Fellows (without limitation to Associate membership) was discussed at length, together with other changes in the present rules and organic laws of the Institute.

At two o'clock the officers and members and invited guests of the Institute sat down to a sumptuous repast and enjoyed the hospitalities of Cincinnati Chapter. The remaining hours of the afternoon were spent in visiting the various more important buildings of the city; and, by special invitation of Mrs. George Ward Nichols, the Rockwood pottery. The citizens of Cincinnati seem to have vied with each other in extending invitations and hospitalities, and the Merchantile Library threw open their doors for the free use of the members of the Institute.

The evening session was called to order by the president *pro tem*. The nominating committee reported the following as officers for the ensuing year: For President, Thomas W. Walter of Philadelphia; Treasurer, O. P. Hatfield, New York; Secretary, William R. Ware, New York; Board of Trustees, H. M. Congdon, I. C. Cady, A. J. Bloor, Napoleon Le Brun, all of New York; Committee on Publication, A. J. Bloor, New York; H. H. Holly, New York; John McArthur, Jr., Philadelphia; Geo. C. Mason, Jr., Newport, Rhode Island; Committee on Education, Professor W. R. Ware, New York; Professor N. Clifford Ricker, Champaign, Illinois; H. Van Brunt, Boston, Massachusetts; Alfred Stone, Providence, Rhode Island; A. Potter, New York; Secretary of Foreign Correspondence, T. M. Clark, Boston; all of whom were unanimously elected. The thanks of the Institute were expressed by a rising vote to retiring Secretary Bloor, for his efficiency as Secretary during the term of his office.

The second day of the session was opened at 10 A. M. A salutary letter from San Francisco Chapter, and communications from other sources, were read.

The report of the Secretary for Foreign Correspondence was read, giving among other things an account of the discovery of the remains of an important Roman town near the City of Thomar in Portugal, made by the Chevalier de Silva, of Lisbon. It was known that Thomar was situated upon or near the site of the Roman town of Nabactia, but no important traces of the latter have been found until M. de

Silva, amusing himself during a morning walk in the fields by turning over a few sods with his cane, almost immediately exposed a fragment of mosaic pavement. The discovery was followed up, and it appears from his last letters that other pavements have been found, and the forms and situation of the principal buildings of the ancient city ascertained.

Mr. Clem Olhaber, smoke inspector of Cincinnati, made statements in reference to smoke consumers. He stated that there were 400 smoke consumers within the circuit of his duties, working well and satisfactory to all parties, and that he met with but little opposition to the enforcement of the smoke ordinance. (It is about time that smoke consumers were ordained into use in San Francisco. We see no good reason why persons or companies should enjoy rights and privileges in the erection of smoke stacks and chimneys, to the injury of large districts of valuable tenement property and residences. And as our cable-street railroads and others disregard the interests of the community in this respect, they should be compelled by imperative laws to comply with the laws of equitable rights, which recognize no privilege in any person or persons to enhance their own interests to the injury of others.)

Mr. A. C. Nash of Cincinnati read an able paper "in regard to the establishment of a valid test of professional ability," in which was urged the establishment of a board of examiners, composed of gentlemen eminent for their professional attainments, whose duty it should be to ascertain by rigid examination the qualifications of candidates for degrees, with vested rights to grant diplomas in accordance with the rank and standing of the applicants.

(There should be National and State boards of this character, established by Congress and State Legislatures, so as to prevent the assumption of the title of architects by those who arrogate to themselves the name of architect, while grossly ignorant of the grand principles and science upon which architecture rests. We shall revert to this subject hereafter.—Ed.)

An elaborate paper by Glenn Brown of Washington, D. C., in reference to "water-closets," was presented by Secretary Bloor. (It will be remembered that a series of articles written by Mr. Brown especially for this journal appeared in its columns during the past few months.)

On motion of Mr. Crapsey, the convention adjourned to meet at Providence and Newport, subject to the call of the Board of Trustees.

The session throughout appears to have been pleasant in a general sense to those attending, and especially profitable in the numerous valuable matters and subjects introduced. The Institute is certainly doing a good work by its organization, and the intelligent and educated of the profession should to a man, by their membership and attendance at its yearly gatherings, assist in the grand objects of the Institute, thereby, to some extent at least, helping to resist and hold back the tide of degeneracy which has to so large an extent flooded in upon the profession through the encroachments of unqualified pretenders and the indifference of the truly qualified to defend and sustain their high calling in life.

An old Hungarian miller is reported to have given this rule for telling a good millstone: "When about to select a stone, take a flask of gin and pour it upon the stone; if the stone absorbs the liquor so that the surface appears dry, it is a good one; but if the gin remains on the surface, the stone is good for nothing."

We would suggest that the same rule will not apply to the selection of a miller.

Subscription price of this journal is \$2.00 in advance.

More Railroad Inventions Wanted.

With the rapidly increasing traffic on American railroads there is a demand for greater facilities for loading and unloading freight. It would seem that an improvement in the construction of warehouses might be made that would render the rapid handling of heavy freight an easy matter, as compared to the present clumsy and inconvenient structures.

There is hardly any country station but has more or less heavy freight to handle, and frequently much trouble is experienced for the want of proper appliances for the work. Of course at terminal stations something has been done by way of cranes and derricks, hoisting machinery, etc., but even the best regulated warehouses are open to radical improvements in apparatus and appliances for moving heavy as well as light and bulky freight. This is worth the study of inventors.

There is also a chance for improving platforms, so that moving goods from the cars to the warehouses may be an easy matter, without the use of the ordinary trucks.

Another thing that interferes with the rapid handling of freight is the location of the doors of freight cars midway between the ends. Ordinarily, this is the proper place for the door, and is preferable for a single door. But if a car were so constructed that goods could be loaded in any part of its length, it would certainly be more convenient than with a central door. This might be accomplished by constructing the car with a system of slide doors the entire length of its sides, so that a car might be loaded in sections, and much sooner than if loaded from the middle. This would also facilitate unloading. Appliances for loading and unloading goods from platform cars are nearly satisfactory, but may be improved.

This is an inviting field for the inventor. But if any American inventor would reach the top of the ladder of fame at a single bound, let him produce a station indicator that will inform railway passengers where they are when they arrive at a station. How well the human machine fails to do this is well known by every railway traveler. For a brakeman to speak the name of a station so that any human being can understand it seems to be one of the lost arts, and it remains for the inventor to produce a substitute to perform this duty. This has already been accomplished so far as "braking" is concerned. Now let us have a reliable station indicator.

Then there is a want of a humane invention to prevent people being caught in frogs and switches, guard rails, etc. Hundreds of people are killed or maimed every year by being caught in the "boot-jack" portion of frogs and held fast, and run down by cars or locomotives. This trap is a peculiar one. A person slides his foot into the wedge-shaped opening, where it is held in horizontally, while the rail heads prevent his lifting his foot vertically, and before he can extricate himself he is a mangled corpse. Some devices have been tried to prevent these horrors, but none is effective. It will not do to fill this space with any rigid substance, for the wheel flanges must have room. Some yielding substance, as a spring, may be made to fill the space, so as to keep the feet out of the trap and yield to the pressure of wheel flanges. This is a serious evil, and there is no doubt that the railway community will reward the inventor who will produce an effective remedy.—W. S. H., in *Scientific American*.

A log was recently cut on Skagit waters, Puget Sound, which was nine feet in diameter at the stump. The first cut was 24 feet long, and the next log 32 feet in length, and 78 inches in diameter at the big end, while the third was 36 feet long, and measured 63 inches—in all 92 feet of logs, and an average diameter of over five feet.



ACME VENTILATOR

This is of double the usual power for producing a vacuum for the Exhaustion of Sewer Gas, Foul Air, or for increasing Chimney Draft, and the Principle is equally applicable for raising water as in that of a Steam Injector, and with increased power to those in general use.

By reference to the illustration it will be seen that the chamber C is for the exit of the contents of pipe or pipes D, which is in communication with the apartment or apartments below to be acted on. The chamber C is surrounded by the atmospheric current BB, passing by its mouth between the COWLS, and it also surrounds the atmospheric current passing through the center at A. By this means the inside and outside, (all around) the mouth of the exit chamber C is acted on to produce a partial vacuum by both atmospheric currents of double the usual power for exhausting the sewer gas, foul air, or increasing the smoke draft, or other gaseous substance to be drawn up and floated away in space. In some devices the mouth of exit pipe C is only surrounded by one passing atmospheric current BB, and in others it surrounds and receives only the influence of the atmospheric current at A passing through the center, neither combining but the single feature and acting on one edge only; while this device combines both features, acting on both edges to draw and drain the whole. In the devices mentioned having the influence of but one atmospheric current, may be likened in a degree to that of a stream of water quiet in one-half its width, and the other half, by an incoming stream, may be moving rapidly forward. The action of the water at rest where the moving current impinges on its side is not to move it forward as a whole, but to reverse the motion in part as it approaches the bank or shore, as the shore retains its hold in its quiet state, as that of the moving current opposite is to move it forward, hence reverse action takes place near the shore to that of the moving current which cause the eddies we see along the shores of our rivers. The point or line of inertia of a large body acted only upon at its rim or edge, instead of effecting to move its whole area, is likened to the instance mentioned. The atmospheric pressure at the earth's surface is fourteen and three-fourths pounds per square inch, or 2124 pounds per square foot. The passing through of the two atmospheric currents B and A, shown in the drawing, creates a partial vacuum by its operation on both sides of the mouth of the chamber C, and the atmospheric pressure at the lower end or connections of pipe D, being fourteen and three-fourths pounds to the inch, forces up the foul air, sewer gas, or whatever may be the contents of the apartments below to restore the equilibrium.

The principle of this device is equally applicable as an improved steam injector, the steam passing through the chambers B and A, which are of diminished size and enclosed at one end, creating a vacuum in chamber C, which will have great power for lifting liquids as well as gasses.

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The present dark, damp cellars, or coal vaults of old buildings made light, cheerful, and well ventilated business apartments. Ingall's Patent Refracting Ungula Lens, of great refracting power, and of a form difficult of breakage either by extremes of temperature, or by hard usage incident to travel over their surface. These, used in conjunction with mirrors, reflect the rays of light below the beams to the rear of dark basements. Refracting lens of any kind will not direct the light back where the illuminating tiling is above the ceiling; hence the use of reflectors requisite in such cases.

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Architects' Superintendence.

A case of considerable importance to architects and employers came before the Nottingham County Court recently, and is reported in the *Building News*. The simple facts of the case were these: An architect of the above town sued a local physician for the balance of an account owing for professional services. The defendant instructed the plaintiff to prepare plans for a house in the "Aesthetic style." A tender was accepted, and the plaintiff informed the defendant that it was necessary to appoint a clerk of works, as it was not expected that an architect could visit the building more than twice or three times a week, and it was the duty of the clerk of works to superintend the minor details. The defendant, however, thought a clerk of works unnecessary. The building was finished, and the plaintiff sent in his account; but the defendant paid only a portion of it, as he contended there were certain details not properly carried out, that the drains were defective, and the house consequently unhealthy. It was contended at the trial that these were details which could not properly come under the architect's notice; but that would have been obviated by the employment of a clerk of works. His honor took this side of the matter, and ultimately a verdict for the plaintiff was given for £25 and costs. The case has more than one point of interest for the architect and the employer: there is a certain amount of supervision expected from the architect, under the ordinary and customary usage of the profession. What does this consist in, and how many visits ought an architect to make a week to a building which he has undertaken to superintend? It so happens there is no written or traditional rule of the profession which defines such attention, and that in point of fact architects have to consult their own time and convenience in superintendence of works under their charge. It is a hard thing to say how much attention an architect ought to give to a work. The answer would necessarily depend on various considerations: the kind of contractor employed, his character for honesty and integrity, the class of building, whether it required more than usual care in details, the size and cost of the building, etc. It would be simply impossible to lay down a hard-and-fast rule: each case must be judged on its merits. Of course it is no excuse for an architect to plead a large practice, and that in consequence he could not make so many visits to a certain building; the cost of the building ought not also to have anything to do with the superintendence: for if an architect, in however an extensive a practice, takes a work, he is expected to carry out his engagement as much as any less busy practitioner. And men of large practices can well afford to leave small works to small men. An employer at least expects to receive from his architect such a fair amount of supervision as will guarantee to him that the work has been carried out in accordance with the design and intention of the specification; and yet it is possible to conceive such an amount of supervision inadequate to detect errors in workmanship or scamped work, such as bad drainage details. For example: no ordinary amount of supervision on the part of the architect can obviate such a blunder as giving a drain a deficient fall, of making a clumsy or imperfect junction with the sewer, of seeing that every pipe is sound and well jointed, or that the joints and workmanship of the interior sanitary arrangements are perfect in every detail. These are things likely to be neglected directly after the architect's back is turned. Nor, for the same reason, could an architect be charged for negligence in not detecting every bad brick or piece of timber introduced. It would be clearly out of reason to expect him to be always present on the works and watch everything done or every material

brought into the building; so that the superintendence of an architect can only be reasonably understood to mean a general inspection of the works, and this is the opinion the judge of the Nottingham County Court formed upon the evidence adduced. Referring to the details, he said "these were clearly the duties of a clerk of the work, and if the defendants did not choose to engage one, he must abide by the consequence, for an architect could not be expected to be present to superintend these details." The law affecting building contracts is not very explicit with regard to the question of the architect's duties in this respect. The law imposes on an architect, that he should be duly qualified to practice his profession, and that he should use a reasonable amount of care and skill in its practice. In ordinary contracts there is nothing said about what an architect's superintendence means. No case appears to have been decided, which defines the limits of the architect's authority in the general superintendence of works, and in the absence of such terms the duty has to be implied, and the law, indeed, dictates what any prudent man would consider fair. When an architect undertakes to superintend the erection of a building, he is supposed to exercise a reasonable amount of skill and attention, and the law would imply neither more nor less. The case we have quoted so far defines the limit of the architect's duties in respect of general superintendence, and, in the absence of an express agreement, the evidence of usage only is admissible. It is to be regretted that we have no decisions or legal authority which define the architect's duties with regard to superintendence, for them is ample evidence in the architect's practice to prove that much of the success of a contract work depends upon the attention given to details. Yet the case decided the other day shows what the legal mind would understand as reasonable in similar cases, and to this extent it will be useful as an authority.

Our readers may ask what is implied by reasonable superintendence. It is quite certain, as we have said, that an architect can only be required to exercise a general supervision over the works. The setting out of the building correctly, the construction of the walls and floors and roofs, so far at least as they relate to their proper thickness, materials, and strength to resist pressure or weight, are all matters which strictly come within the architect's duty to see properly executed, as these are all matters for which his skill as an architect has been retained. They are matters also which always upon the proper carrying out of the drawings and specifications, for it is very evident if a wall blew or fell down, or a floor gave way, it would imply a want of due skill in proportioning the thickness of the wall or the beams of the floor; and as these things are shown in drawings, the architect is reasonably expected to see that they are carried out. But it may be fairly surmised that he cannot be held responsible for the introduction of inferior materials, or even for the bad workmanship of any part of a building over which he can only give a general supervision. If a wall gives way or a floor breaks down from bad material introduced in the substance of it, or from an imperfect connection or detail, which could not reasonably have been inferred from the specification and intention of the architect, he is clearly not liable, but the builder is the responsible party. Of course, we are supposing no case of negligence on the part of the architect to be proved. By the French code both the architect and the builder are liable during ten years for negligent construction, and a similar code, we believe, is in force in Lower Canada. With regard to drains, they are generally left to circumstances, and the architect rarely does more than indicate their position on the plan. The levels, joints, and junctions, are points which, however important to be attended to, cannot

fairly be said to come within the architect's general superintendence, as usually implied in building contracts. The law, in fact, holds the architect responsible for all relating to design and construction, but cannot require him to exercise the same care as regards workmanship, as it would be unreasonable to suppose he could always be on the works. The question, indeed, is of such vital importance to architects, that it naturally brings to the front another of considerable moment; namely, the employment of a clerk of works. It seems to us that architects whose practice is extensive should require in all cases the employment of clerks of works. In country practice of a moderate kind it is usual to do without their services, yet the saving is dearly purchased, and the demands made on the architect become more onerous. It is to the interest of the architect that a clerk of works be employed, and it is certainly to the interest of the employer. In no building is it possible to see that all the materials and labor are of the nature described in the specification and shown in the drawings, without one; and we think it the duty of the profession to lay down some rule by which they may place themselves in a position of independence. When ought the clerk of works to be employed, and on what kind of work? are questions that might very well be left to an architect's discretion. In the case we have mentioned the plaintiff informed his employer that a clerk of works must be engaged, as an architect could not be expected to visit a building more than twice or three times a week. The defendant refused to have one, and the result was that the drains were defective. The judge observed, with much truth, that a clerk of works could not be considered merely as an ornamental appendage, for, as a matter of fact, the duties he was expected to perform were of a very important character. If architects desire to maintain their position as general supervisors of buildings, the sooner they come to a decision on these questions the better; and the employment of an efficient clerk of works ought to be considered almost as necessary a condition of good building as the employment of an architect.

Items of Interest.

A new form of window is being introduced in London, England, for preventing accidents in cleaning, and securing good ventilation. The two side-bars of each of a pair of ordinary sash frames are divided into two parts vertically, and the part carrying the glass is swiveled or pivoted in the side pieces, at a point central to its height. The frame with the glass is held in position by two small bolts in the top rail, which shoot into the side strips. When this latter fastening is effected, the two sashes may slide up and down in an ordinary way. It will be seen that to clean this kind of window there is no necessity for servants to go outside.

The placing of the plumbing business of New York under control of the Board of Health is working a much-needed reform in that city. Instances are constantly coming to light showing that unscrupulous plumbers have greatly hazarded the health of their customers by dishonest work. This fact appears as often in the dwellings of the better classes, where expense has not been spared, as in the residences of poor people. Suits for damages have been successfully prosecuted against plumbers, in a number of instances. This new law requiring scientific inspection of plumbing works admirably in New York, and it would be well if it were enforced in all large cities.

We will send the "California Architect and Building News" for 1883, and one copy of "Frankie's Celebrated Work on Monuments," for \$10.00. Every architect and marble-worker should have a copy of this work.

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FORMERLY THE CALIFORNIA ARCHITECT AND
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reports of this journal, both monthly (which it has done sometimes without giving us credit) and our yearly summary of Building Intelligence.

Holiday Slaughter of Trees.

At Christmas time even the humblest have their few pennies to spend in buying a Christmas tree. Churches are decked with evergreens; the fronts of stores are literally hidden by the large quantities of young trees before them; in nearly every dwelling, one or more of the young saplings may be found; and to furnish the immense number of wreaths and garlands required for ornamenting windows, etc., many of the infants of the forest are annually cut. The markets in San Francisco are principally supplied from the region around Guerneville, Sonoma County. How many have ever thought that this immense drain, year after year, will ultimately cause a large vacant space in the forests that by right ought to be filled with young trees? We hope that the Legislature now in session will pass a law forbidding the cutting of young trees for ornamental purposes. The *Northwestern Lumberman* has the following upon this subject:

"The spruce and fir forests of Maine are now suffering extensive inroads to supply Christmas trees and evergreen for the holidays. The business is particularly heavy along the line of the Knox & Lincoln road, having grown to an important extent year by year. The trees leave the State at the rate of many car loads a day while the holiday traffic lasts, and, as everybody knows, are used in a variety of ways for trimming stores, churches, public places, homes, etc., before the conventional Christmas eve arrives. The State of Maine is a main source of supply, though evergreen is obtained from various sections of the country. The supplies have been so drawn upon that the forests are showing it, and the sacrifice continues, and will so long as people cry for luxury, and handlers can coin money, as many do at present. If 100,000 young trees were swept away yearly, even in Maine alone, it would be only the conservative and sensible ones who would lament. The merry-makers rarely reflect that they are denuding more of nature's tree store for one item of general enjoyment than all the forestry societies in the country could replace in years. Warren is one of the great distributing points in Maine for the sale of evergreens for Christmas, and scattered through the State are several firms doing an immense business."

Articled Architectural Students.

One of the objects of San Francisco Chapter of Architects is to establish classes for architectural students, to be conducted by gentlemen of recognized abilities in teaching the art of sketching, drawing, mathematics, geometry, modeling, carving, etc.

All articled students engaged in the offices of practicing architects, members of the Chapter, may avail themselves of the advantages of the classes, without cost or charges of any kind, except that those who desire to unite with the Chapter as student members have an opportunity to do so at the nominal charges established by the By-Laws. This, however, is optional with students.

The term *Articled Students* is intended to include those only who are under written contract or agreement to serve a term of years in the offices where engaged. Lads and young men who are under no such engagements may, by entering into written agreements with their employers, become entitled to the privileges offered in this connection. All such are requested to hand their name to the Secretary of the Chapter, George H. Wolfe, without delay, so as to expedite the formation of classes.

San Francisco Chapter, A. I. A.

The regular monthly meeting of this Chapter was held on Friday evening, January 5th, 1883, President John Wright presiding. Minutes of the preceding meeting were adopted as read.

The committee on Articled Students presented a full report; the report was ordered to be printed in the form of a circular, that endeavors may be made to carry out the ideas suggested. The committee on incorporating the Chapter was granted further time.

A communication was received from H. Saxon Snell of London, England, presenting the Chapter with a volume of his work entitled, "Charitable and Parochial Establishments." On motion, the same was received, and the Secretary instructed to thank the donor.

G. H. Wolfe was appointed Librarian for the remainder of this year. On motion, a committee of three were appointed to draft laws in reference to the underpinning of buildings. Committee appointed, J. E. Wolfe, Macy, and Babson. The President was added to the committee.

Small Bed-Chambers.

There is reason to believe that more cases of dangerous and fatal disease are gradually engendered annually by the habit of sleeping in small, unventilated rooms than have occurred from a cholera atmosphere during any year since it made its appearance in this country. Very many persons sleep in eight-by-ten rooms, that is, in rooms the length and breadth of which multiplied together, and this multiplied again by ten for the height of the chamber, would make just eight hundred cubic feet, while the cubic space for each bed, according to the English apportionment for hospitals, is twenty-one hundred feet. But more, in order "to give the air of a room the highest degree of freshness," the French hospitals contract for a complete renewal of the air of a room every hour, while the English assert that double the amount, or over four thousand feet an hour, is required. Four thousand feet of air every hour! and yet there are multitudes in the city of New York who sleep with closed doors and windows in rooms which do not contain a thousand cubic feet of space, and that thousand feet is to last all night, at least eight hours, except such scanty supplies as may be obtained of any fresh air that may insinuate itself through little crevices by door or window, not an eighth of an inch in thickness. But when it is known that in many cases a man and wife and infant sleep habitually in thousand-foot rooms, it is no marvel that multitudes perish prematurely in cities; no wonder that infant children wilt away like flowers without water, and that five thousand of them are to die in the city of New York alone during the hundred days that shall include the fifteenth of July, eighteen hundred and ! Another fact is suggestive, that among the fifty thousand persons who sleep nightly in the lodging-houses of London, expressly arranged on the improved principles of space and ventilation already referred to, it has been proven that not one single case of fever has been engendered in two years! Let every intelligent reader improve the teachings of this article without an hour's delay.—*The Builder*.

"Hose Drainage and Sanitary Plumbing."

This is the title of a neat little handbook of 205 pages, edited by Mr. Paul Gerhard, and published by D. Van Nostrand, N. Y., containing many valuable suggestions upon the subject-matter indicated by its title. Every architect, plumber, and owner should possess a copy. Price, 50 cents; to be had at the office of this journal. Owing to the crowded state of our columns, we delay criticism till next issue.

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Detail Cottage and Constructive Architecture	10.00	11.00
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Science of Carpentry	5.00	5.50
Plasterers' Manual	.75	2.25
Artistic Homes	3.50	5.00
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Practical Lessons in Architectural Drawing	2.50	4.00
Gould's Carpentry	2.50	4.00
American Stair Builder	3.00	4.25
Modern House Carpenter's Companion	1.25	3.00
Art of Saw Filing	.75	2.25
Grimshaw on Saws	4.00	5.00
Carpenters' Pocket-Book	1.00	2.50
Foundations and Foundation Walls	1.50	3.00
Ames' Alphabets	1.50	3.00
Old Homes made New	1.50	3.00
Frank's Monuments and Tombstones	9.00	10.00
Wither's Church Architecture	10.00	11.00
Sewer Gas and its Dangers	1.25	2.75
Workshop Companion	.35	2.10
Reed's Houses for Everybody	1.50	3.00

Any one sending us the names of three new subscribers, with \$6, will receive a copy of the CALIFORNIA ARCHITECT AND BUILDING NEWS free.

Any one sending us the names of ten new subscribers, with \$20, will receive a copy of the CALIFORNIA ARCHITECT AND BUILDING NEWS free, and \$5 worth of books selected from the above list.

A club of twenty-five new subscribers entitles the sender to a copy of the CALIFORNIA ARCHITECT AND BUILDING NEWS, and \$20 worth of books selected from the above list.

Uses of the Steel Square.

The mechanic's success as a *foreman* depends greatly on his ability to keep the men employed under him busy all the time; not a minute must be allowed for men to wonder what is next to be done, and so that no delay may be made in the raising of the frame of the barn, it is necessary that men be set to work framing the various timbers required, while part of the gang are completing the foundations. The rafters being the part, for young men, the most difficult to frame, we will see how they are being prepared. The building is 40x60 feet. Size of rafters 2x6 inches. Roof $\frac{1}{2}$ pitch. The length being the first thing required, we will find it by several different ways, and see if they agree. First, the old way of obtaining the length of the hypotenuse of a right-angled triangle, two sides being given. In this case the two sides would be 20 and 10. Squaring 20 and 10 and adding the products together gives 500, the square root of which is 22.36 or 22 feet 4.32 inches—22 feet 4 $\frac{1}{2}$ inches. This is as near correct as is practical.

Or, let one inch on the square represent one foot. Then 10 inches on the tongue of the square and 20 inches on the blade will represent the two dimensions as above. Then place the point of your rule on the figure 20 on the blade of the square, allowing it to cross the tongue at the figure 10. You will notice that the length is 22 $\frac{1}{2}$ inches, or allowing one foot to the inch, 22 feet 4 $\frac{1}{2}$, the same as the previous method. This is the quickest and most practical way of getting the length of the rafters; by using a smaller scale as $\frac{1}{2}$ inch to the foot, $\frac{1}{4}$ inch to the foot, etc., you can easily get the length of rafter for any width of building.

A scale of 1 $\frac{1}{2}$ inches to the foot will also be found to be very convenient, as each $\frac{1}{4}$ th of an inch on the square will represent one inch on the rafter.

Still another way is by means of a "fence." We well remember when we were first shown this way of getting lengths of rafters and braces. Hodgson, in his work on the square, has fully described the process. As we used the "fence" long before his work appeared in print, we may be pardoned if our language partakes somewhat of the character of that author's writing. Our "fence" was made somewhat different from those in general use. One day, while sauntering around the foundry at Santa Rosa, we came across two pieces of iron three feet long, 1 $\frac{1}{2}$ inches wide, and $\frac{3}{4}$ of an inch thick. A row of holes $\frac{1}{4}$ inch diameter, and spaced one inch apart, went directly through the center of the two pieces from end to end. My com-

panion suggested that they were just the thing for making a "fence." The owner kindly gave us the two pieces, provided we would let him see the "fence" after it was made. A strip of wood 10 inches long, just the thickness of a common square, was procured, and fastened between the two iron pieces, so as to be in the middle. The holes gave us the means of securing the piece of wood. The square was then inserted in the openings caused by the wood, so that the tongue was one side and the blade on the other, a small bolt, with a thread for a nut on one end, was placed in one of the holes near each end of the square, and the nut put in so as to draw the two pieces of iron together, thus firmly securing the square. That was the kind of "fence" we first saw used. It was, however, too heavy to be carried around in a tool chest, and after a short time it was discarded. A much handier and lighter one can easily be made from wood, using screws to draw it together to hold the square.

Now let us apply our "fence." Select a straight piece of timber for a pattern. The roof is to be $\frac{1}{2}$ pitch; so place the square that the figures 12 on the blade, and 6 on the tongue are directly even with the top edge of your "fence." The two sides of the square and the edge of the fence will form a right-angle triangle, bearing the same proportions precisely as the triangle formed by half the width of the building, the height of the roof and the rafter. Now if the same proportions are found in one of such measurements, twenty times (or $\frac{1}{2}$ the width of the building), those figures would give us the exact length of the rafter.

Commence at one end of the piece you have selected for the pattern, and lay your fence against its edge. With a sharp-pointed awl mark on the pattern the exact shape of the square that is exposed outside of the fence, the long bevel of the square being towards the heel of the rafter. Then move the fence along, placing it so the long bevel will commence again precisely at the point of the short bevel, opposite the right angle of the square. Mark again as before; do this twenty times; the last mark will be the upper-end out of the rafter, and will show its exact length.

If the roof is $\frac{3}{4}$ pitch, take 12 on the blade and 9 on the tongue; if $\frac{1}{4}$ pitch, then 12 on blade and 12 on tongue. A general rule to be used, and one easily to be remembered, to mark the bevels for any pitch of roof, is to place the 12-inch mark on the blade even with the top edge of your fence, and that mark on tongue that corresponds with the rise of

the roof in feet even with the same edge, you will then have the exact angle for the rafter of one foot in length. Proceed as above. Thus, if the roof has 5 inches to the foot, place square at 12 and 5. If 11 inches, then at 12 and 11, and so on.

When the length of the rafter is equal to the width of the building, the pitch of the roof so formed is known as the gothic.

Several precautions must be observed in using a fence. See that the fence is held firmly against the edge of the pattern, and that the figures used are precisely even with the edge of the fence. A scratch awl sharply pointed should be used, and the aim should be to use exact measurements.

The way we have described is to be used when no projection of rafter is required. In the case the latter is necessary, gauge a line the width of the required projection the full length of the pattern. Gauge always from the crowning edge. Then proceed as before, using the gauge line instead of the edge of the pattern.

If a ridge board is used, deduct $\frac{1}{2}$ of its thickness from the length of the rafter, measuring the distance square from the end of the upper bevel.

If there is a fraction of a foot, proceed as follows: If the roof is quarter pitch, and there is a fraction of say 8 inches, place the square with the 4-inch mark on the blade, and the 2-inch mark on the tongue, in the same manner precisely as before, and the distance between these points will be the extra length necessary. No matter what the pitch may be, the same rule will apply.

We have just received two new works which should be in the possession of every mechanic:

THE MODERN HOUSE COMPANION AND BUILDER'S GUIDE. Price, \$1.25.

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\$5.50.



Something about the Saw.

Few people know the meaning of the figures which are stamped upon the heel of the hand-saw. Experts doubtless imagine it is to represent the number of teeth to the inch. However, this is not correct, for the figure is always one more than there is teeth to the inch. For instance, if a saw is marked "9," there will be just one tooth for each one-eighth of an inch. Consequently there will be only eight teeth to the inch.

Perhaps the best saw-set is a good vise; a vise that has straight and smooth jaws; jaws that will pinch thin paper their entire length.

By placing the saw in such a vise as this, with not more than one-half of the tooth projecting above the jaw, and using a nice punch and suitable-sized hammer, the saw can be set better, perhaps, than with any other saw-set ever invented. Of course, a wide saw cannot be set in a common-sized vise; but wide hand-saws or any other kind of wide saws do not work as well as narrow ones. A saw should only be of sufficient width to give it strength and stiffness, and all saws should be thinner on the back than on the edge. There is no economy in using a poor saw.

In filing "cut-off" hand-saws, always point the file upward, and towards the point of the saw. The more the file is inclined upward and forward, the better the saw will cut, provided the saw is filed by an expert. It must be borne in mind, that the more the file is inclined the more difficult is the filing.

"Rip saws" should be filed exactly the reverse of a "cut-off" saw, only the less inclination the better. A rip saw will do good work filed straight across, and is very much less work to keep it in running order.

Rip circular saws, as well as cut-off circular saws, should have a fly-wheel when they can be used without being in the way; and when saws of different sizes are used on the same shaft, there should be pulleys of different sizes that could be changed in an instant. As the verge of all saws require the same speed(?), which is, perhaps, about from 7,000 to 9,000 feet per minute, if the power is limited, 7,000 feet per minute will do very well.

Saw tables should be made to raise or lower in an instant to any desired point, not only for sawing rabbets, grooves, etc., but to place the table so the saw will just reach through the lumber. It requires only about one-half of the power to saw inch lumber with a 12 or 14 inch saw when the table is raised so the saw will only reach through the lumber than with the same saw when the table is down to its lowest. The saving of power is not the only advantage in having the saw just reach through the lumber, for lumber can be sawed much straighter, and far less liable to heat the saw.

SOMETHING ABOUT THE FENCE.

It is always better to have the fence the whole length of the table, but there should be an offset from the center of the saw to the farther end of the fence of not less than an eighth of an inch. There should also be a "relieving lever," to throw the fence out of line; as in case there is to be fine sawing done of thin pieces, for in-

stance, strips for lattice work, where a good many pieces are to be sawed from one piece of plank. In this case the fence should be thrown out of line so that the lumber will hug the fence, and saw each piece exactly the same thickness. But if rough sawing is to be done, the lever must be reversed, and the fence thrown out of line in the opposite direction, so that the lumber will pass along freely without binding between the saw and fence.

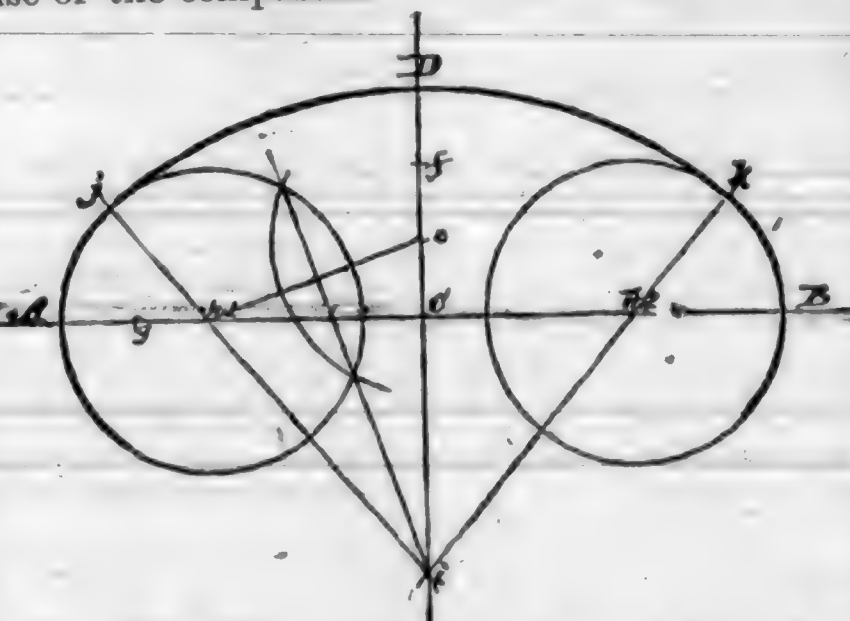
Rollers that are put on springs to press the lumber to the fence should have a slight inclination forward, which will make them have a tendency to climb the lumber, and keep it firm upon the table.

A cutting-off saw, either hand, band, or circular, should never be used in sawing obliquely across the grain, of more than 25 or 30°. All miterers should be sawed with a rip saw, either by hand or with power. A common-sized tooth circular rip saw, if properly filed and set, will make better miter joints than any cutting-off saw that ever was hung.

Santa Clara.

E. H. DAVIES.

We promised a correspondent to illustrate in this issue how an ellipse could be made by the use of the compasses.



Draw any line. Mark any two points as A B. Bisect the line between the points by perpendicular C, D, L. The distance C D is to be one-half the width of the required ellipse. Divide C D into 3 equal parts. Measure off from A and B the length of 2 of these parts as points, h and z. Join h and z. Bisect line g e, and continue the line until it intersects with the line D C L. At L is the center from which to describe the sides of the ellipse, and the points h and z are the centers from which to describe the ends.

TO BEND A GOOSENECK.—Fill the lead pipe full of sand, ram it in well, and plug up both ends, bend it carefully over your knee or around a barrel.

TO A. L., of Healdsburg: A good thing to use in patching small scars in plastering is plaster of Paris mixed with common flour paste. If the plaster is mixed with water it sets almost instantly; but when mixed with paste, it sets quite slowly, giving time to use it as may be desired.

A flour barrel is 28 to 30 inches high, and 20 or 21 inches in diameter at the largest part. This note may be of use in fitting up closets and pantries.

Mr. F. A. Rollo Russell, an English sanitary engineer, has come to the conclusion that the upper parts of buildings are by far the most healthy, and that even second stories possess decided advantages over ground floors. He finds that the climate undergoes less variation on hills and on the tops of lofty buildings, being cooler in the summer and warmer in the winter than on the surface of the earth. It has been observed that frost strikes the valleys first, and that in cold weather the thermometer on the hill-tops does not fall as low as in the valleys.

The Man-hole Scare.

The outcry against the system of open ventilation of the public sewers into the center of the carriage-ways, lately raised, has had a powerful effect in alarming the minds of the general public, whose confidence in such matters is based on the opinions of experts. Its example has caused medical officers of health to be so bold in their statements concerning the evils arising from the gases escaping from the man-holes, that the average member of the community half believes that the sewerage systems of our best towns, instead of being the means of carrying disease away from our homes, are actually the carriers of it to our very doors.

The Medical Officer of Health for the parish of Chiswick started his Board a few weeks ago by stating that he knew of no other cause for a case of enteric fever in the parish than the exhalations from the man-hole ventilator in the street where it occurred. The Board promptly ordered an inquiry into the case, with a view to knowing if their sewerage system, just completed at a cost of nearly 80,000l., was really a means of distributing disease and perhaps death. Dr. Corfield, Professor of Hygiene in University College, was called in, and has presented his report on the case. The man-hole ventilator alleged to be the cause was about 40 ft. from the house in which the case occurred. Inside the house he found that the scullery sink-stone was connected directly to the sewer, and that the only protection from the inrush of gas into the house from it was a small bell-trap with a water-seal of at most 1 in. When he removed the top of the trap, and held a lighted wax match over the mouth, the indraught was sufficiently powerful to cause the flame to flicker violently. He further found that the water service was intermittent, and that one cistern alone supplied the water-closet and the taps inside the house. He stated that, in his opinion, the disease was more probably caused by the sanitary defects inside the house than by the exhalations from the man-hole. In this moderate opinion, experts will join. In such a case comment is needless. We will only venture to say that it raises in the mind an uneasy suspicion that medical men look upon the man-holes as a cause to which they can refer every case presenting a difficulty of explanation, or in which they are too careless to make diligent search for the real cause.—Ex.

Specimens of Letters Received.

SEBASTOPOL, SONOMA Co., Dec. 14th, 1882.

Dear Sir—I wish to make my husband a Christmas present, and, as he has expressed a wish for the "Science of Carpentry," I cannot give him anything that will be more acceptable; so please send it as soon as you can, together with your excellent journal for 1883. I send you \$6 by express to-day. MRS. —

We received a gratifying number of similar missives during the holidays, from the wives and mothers of mechanics, and we hope to win the kind consideration of thousands more.

RIVERSIDE, SAN BERNARDINO Co., Cal., December 18th, 1882.

Dear Sir—Supplement No. 1 noted and appreciated, more especially the enterprise prompting same. Accompanying find \$2, in consideration of which please send the ARCHITECT AND BUILDING NEWS to S. & S.

We might add hundreds more of similar import from all parts of the Pacific coast and the Eastern States, but give the above as sufficient to illustrate the rapidly increasing interest felt in this journal. Let the good work go on, until every mechanic and owner of real estate in the land shall have his name entered upon our subscription list.



PLATE 1.—ELEVATION OF A COMMODIOUS DWELLING COSTING \$10,000.

A Proud Record.

PERMANENT ADS.

The success of a journal of this description depends greatly on the character of its advertisements; and when business men continue to keep their wares before the public by a judicious use of printers' ink, it follows that the parties inserting the "ads" are being greatly benefited. We present below a list of the firms who have advertised continuously with us since the first issue of this journal, in 1879.

Weed & Kingwell, California Brass Works. Bigelow & Morris, Western Iron Works. F. H. Rosenbaum & Co., plate-glass, etc. Turner, Kennedy & Shaw, lumber dealers. J. Kemp & Co., turning, sawing, carving, etc. Whittier & Fuller, Pioneer Lead Works. W. W. Montague & Co., mantles, tiles, etc. Pacific Rolling Mills. J. R. Sims & Son, iron doors, girders, etc. J. Mallon, Pacific Glass Works. W. Holst, Glass Works.

Commercial Insurance Company.

Lucas & Co., Golden Gate Plaster.

Kellett & McMurray, plaster decorations.

Renton, Holmes & Co., lumber dealers.

J. Marquis, standard hoppers.

C. H. & G. W. Burr, premium hoppers and weather strips.

W. E. Stevens, patent chimneys.

J. Brownell, patent chimneys.

Spaulding & Co., Pacific Saw Works.

Dunham, Carrigan & Co., bronze, hardware, iron, steel, and mechanics' tools generally.

In addition to the above, the principal plumbers in the city have kept their cards in permanently.

The plasterers have been well represented, as a glance at their column will show.

The carpenters have done nobly in sustaining their part of the good work in supporting a home journal. Many of them have been greatly benefited by their "ads," as we know of parties in the country who have obtained help through the aid of those advertising.

The principal stair builders in the city have the satisfaction of knowing that their business

has been increased by keeping their cards in the proper place.

In fact, brick layers, masons, metal roofers, asphaltum workers, etc., all testify to the great value of this journal as an advertising medium.

We sincerely thank our brother professionals for their cordial indorsement of the CALIFORNIA ARCHITECT, and their generous support, as shown by the large number of business cards.

Trusting that the future course of this journal will be such as to give entire satisfaction to those who have so worthily enabled us to build it up to its present standard, we present this initial number of a new volume with its many improvements to our readers, promising them that it will be our aim to make still further changes for the better in each successive issue until we can boast that we have no superior in all the broad range of journalism.

THE ARTIST'S ALBUM.

A large work, beautifully illustrated; will be forwarded to any address, upon receipt of price—\$8.00.

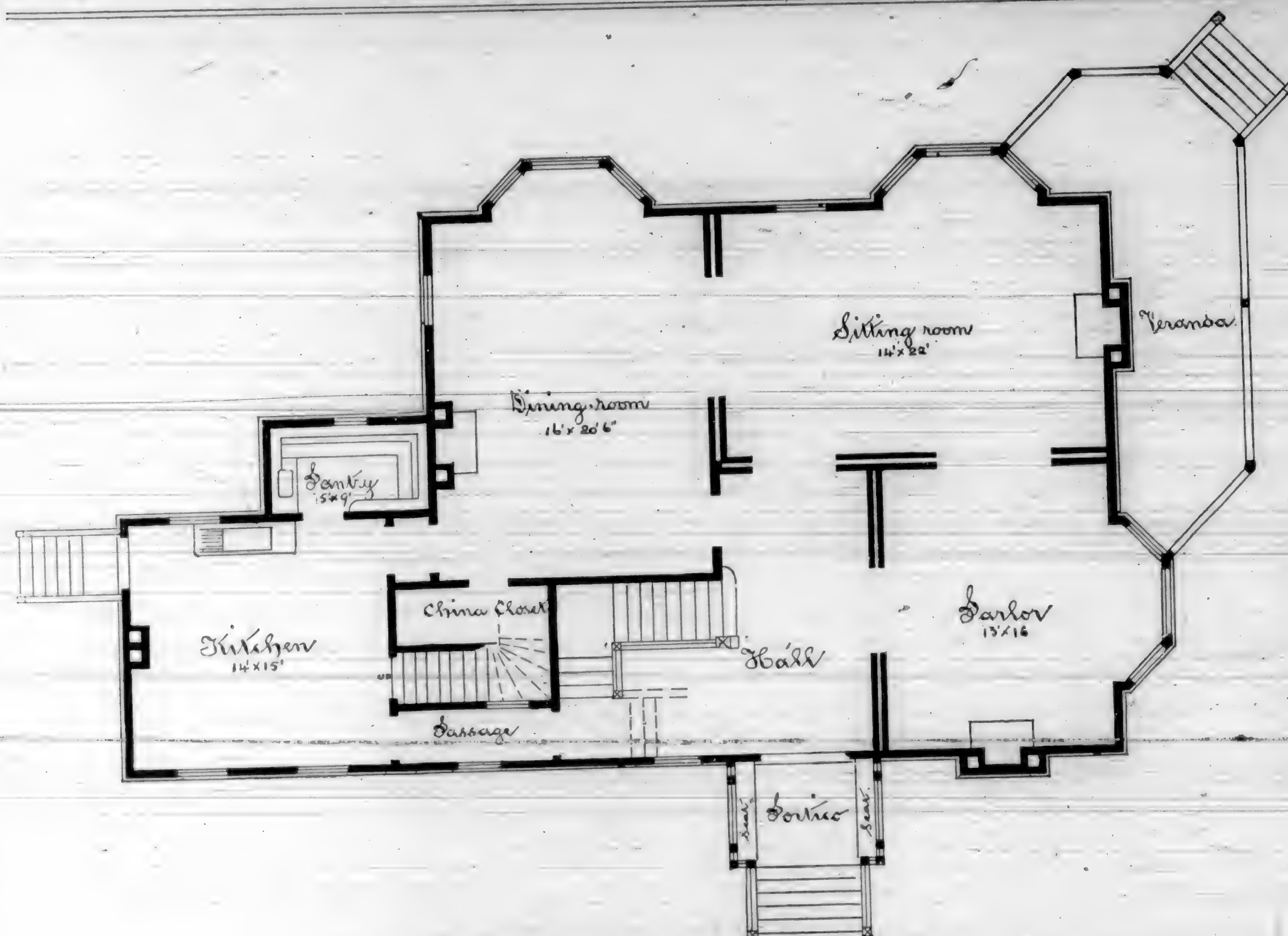


PLATE 2.—FIRST STORY PLAN OF \$10,000 DWELLING.

Some Facts About Bricks.

An average day's work for a bricklayer is 1,500 bricks on outside and inside walls; on facings and angles and finishing around wood or stone work, not more than half of this number can be laid. To find the number of bricks in a wall, first determine the number of square feet of surface, and then multiply by 7 for a 4-inch wall, by 14 for an 8-inch wall, by 21 for a 12-inch wall and by 28 for a 16-inch wall. For staining bricks red, melt one ounce of glue in one gallon of water; add a piece of alum the size of an egg, then one-half pound of Venetian red, and one pound of Spanish brown. Try the color on the bricks before using, and change to light or dark with the red or brown, using a yellow mineral for buff. For coloring black, heat asphaltum to a fluid state, and moderately heat true surface bricks and dip them. Or make a hot mixture of linseed oil and asphalt; heat the bricks and dip them. Tar and asphalt are also used for the same purpose. It is important that the bricks be sufficiently hot, and be held in the mixture to absorb the color to the depth of one-sixteenth of an inch.—*Railroad Journal.*

Hotel Plumbers.

Our attention was called to the following advertisement in a daily paper:

"A situation wanted by a young man as porter; understands plumbing and gas-fitting; a handy man around hotel, or as watchman."

It is just such handy men that in attempting to do plumbing sometimes cause a great deal of trouble. If this advertiser was a good plumber he could earn from three to three and a half dollars a day. A porter's wages are about two dollars; the advertisement, therefore, implies that he is a better porter than plumber.

The average hotel plumber is a dangerous man to have around, and if the registration provisions of the plumbing law were strictly enforced in this city, these men would be prevented from tampering with work that none but a skilled plumber should touch. If the plumbing societies want to perform a real service they should appoint a first-class committee, which should make it its business to look after men not registered, and see that the law is carried out. The medical societies are constantly hunting out the frauds and quacks, and they are vigilant in seeing that the law for such cases is enforced. This is what reputable plumbers should do.—*Sanitary Engineer.*

Substitutes for Lumber.

While on the one hand numerous practical men are setting forth the imminent danger of total exhaustion of the available timber supply of this country in the not very distant future, and are energetically striving to establish a correct public sentiment as to preserving and planting trees, on the other hand inventors appear to be bending their energies toward making wood entirely unnecessary for building, manufacturing, or fuel, or indeed for any purpose whatever. When the possibility of making lum-

ber out of straw, which should fill the place of that obtained by "slaying the monarchs of the wood," was first suggested, many were disposed to regard it as a canard, pure and simple, or at best, nothing more than an impracticable idea. To-day this is an accomplished fact. Not only this, but other materials are rapidly supplanting lumber in all directions. Wire is taking its place in fences; metal, slate, and felt are employed for roofing; machinery is constructed more of metal and less of wood, and wire laths, iron posts, joists, beams, and ceilings are coming into more general use. Among the latest inventions is a glass veneer, which, it is said, can be made in so close imitation of the ornamental woods as to defy the closest inspection. With the discovery that the glass can be so made as to lose its customary fragility, is revived the suggestion of the entire feasibility—even advisability—of constructing houses entirely from glass. All these facts indicate that when the predicted lumber famine comes, it will not affect building and manufacturing interests so seriously as one might suppose. Still, we should hardly advise the proprietors of saw and planing mills, and wood-working establishments in general, to make immediate preparations for changing their business. There is plenty of good timber in this country, and neither this generation nor the next will see it entirely supplanted by any of the would-be substitutes.—*The Lumber World.*

INDEXED ATLAS OF THE WORLD.
Beautifully bound in morocco; but one copy remains. Price, \$35.00.

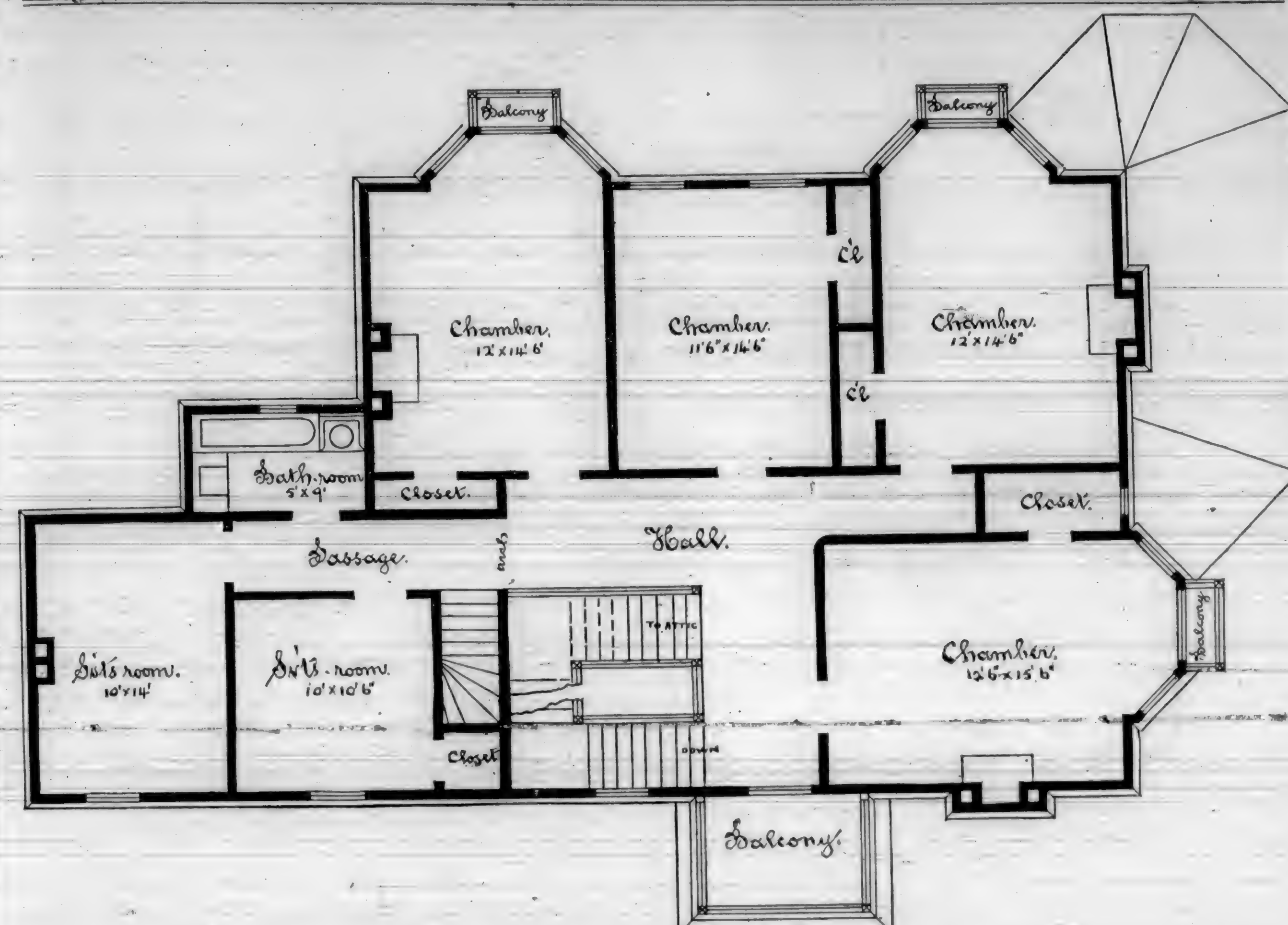


PLATE 3.—SECOND STORY PLAN OF \$10,000 DWELLING.

The Snow-Storm of New-Year's Eve, and its Effect upon Shingled Roofs.

We know of nothing that has happened in San Francisco within the past thirty-two years which caused such general excitement of a pleasing character as the mantle of snow which fell on the 31st of December, 1882. The day was ushered in with a low degree of temperature, and the remark, "It feels like snow," was expressed by thousands, yet perhaps but few anticipated that a snow-storm was really nigh at hand.

The usual number of worshippers wended their way to the various churches, prepared with mantles and wraps for the "cold snap" only, not anticipating the necessity for umbrellas on their return home; consequently, when the respective congregations were dismissed, there was great excitement at anticipated damages to fine dresses and Sunday outfits, mingled with laughter and delight at the sight of the falling snow-flakes, as they fell in rapid succession, until the white covering from the clouds spread itself over everything not under cover, to the depth of several inches. Conjecture places the total fall at from three to six inches—four to five probably being nearer the exact quantity; but as the ground was moistened by the dews and damps of preceding days, and remaining unfrozen, a large proportion of the snow melted away before the snowing ceased. To persons accustomed to the usual snow-falls of winter, in the mountains of California and other sections of the Pacific coast, and places where each returning season brings its regular snow-storms, that under notice

possessed less interest; but the thousands of children and young people who had never witnessed a fall of snow, and the older portions of the community who have but twice before within the history of California as a State seen the "ground covered," became jubilant, and snow-balling was the order of the day. At every corner along the prominent streets of the city, crowds of boys, young men, and older heads gathered to indulge in the sport of pelting passers-by, without respect to age or sex; while the drivers and conductors of cars, and those who held the reins in milk-wagons, hacks, and vehicles generally, became targets at every crossing of streets—the poor Chinaman receiving very special attention wherever he dared to venture beyond the threshold of his abode.

HOW ROOFS OF HOUSES WERE AFFECTED.

In the construction of roofs in San Francisco the only consideration has heretofore been to make them secure from leaks during rain-storms—snow being one of the overlooked possibilities. But the snow of New-Year's eve demonstrates that should snow fall to the depth of twelve inches, more or less, great damage would result, particularly to the class of dwellings where the roofs pitch from center to sides of buildings with tin gutters along the side walls, emptying through conductors at the rear ends of the buildings. As a general thing, this class of gutters are badly constructed, being put in with just sufficient grade to discharge the water, one-quarter inch to the foot, sometimes less, and in thousands of cases not more than three or four inches fall in fifty feet. In our practice

as architects, we have experienced great difficulty in enforcing a pitch of half-inch to each foot, contractors contending that any degree of slant will discharge water at the lower end, disregarding the material fact that the greater the pitch the more perfect will be the wash and durability of tin gutters, and less the liability of debris remaining in the waterways to absorb and retain the moisture from fogs, dews, and rains, and consequent corrosion and rust of the tin. Then again, the mean economy of restricting the width of the tin, so that the butts of the shingles lap but two or three inches over the edges of the metal, is a fruitful cause of leaks, and the fallacy of both flat and narrow gutters were fully demonstrated by the slight fall of snow of New-Year's eve; the snow filling the waterways, particularly where it was blown in drifts to an increased depth, and choking the small conductor outlets of two to four inches, thus preventing the escape of the rain which terminated the snow fall from running off; and, as a consequence in hundreds of cases, flooding up over edges of the gutters, and into the buildings. Thousands of tin pans, buckets, tubs, children's bath-tubs, etc., were brought into requisition, and some of our better circumstanced citizens were compelled to undergo muscular exercise in the manipulation of the water receivers, which produced soreness of limbs by no means pleasant, and blessing the reverse of piety fell from the lips of hundreds of angered heads of families.

Another suggestion is introduced in connection, to wit: 1882 ended with a snow fall of say five inches, with the above results. But as per-



PLATE 4.—PERSPECTIVE VIEW OF DWELLING COSTING \$3,000.

haps one-half the quantity thawed during the prevalence of the storm, its average depth was at no time more than two to three inches. We ask, had the thermometer ranged below zero, so that no thawing would have occurred, and the rains come as they did, to wet and add weight to the snow, would not some of the light constructions yielded to the unusual weight thrown upon them? Any number of roofs are constructed with rafters of 2x3 inch lumber, many of them without any collar beams or braces, and we doubt whether they would sustain the weight of six inches of wet snow. And we are very confident that if a fall of twelve inches should occur, there would be an extensive caving in of roofs in California. With the possibility of an old-fashioned snow fall before us, it will be well for architects and owners to see to it in the future that substantial roofs are placed on their buildings. The tin and composition and shingled hip-roofs were all right this time, but in cases of heavy snows, we question whether many of these would not suffer damage, for the reason that but few roofs are constructed on this coast for other purposes than simply strength to sustain them under ordinary conditions, with no provision for the contingency of heavy snows.

INDEXED ATLAS OF THE WORLD.

Beautifully bound, in morocco; but one copy remains. Price, \$35.00.

Improvement in Chimneys.

The best chimneys are made by inclosing hard-baked glazed pipe in a thin wall of bricks. Such chimneys will not only draw better than those made in the usual way, but there will be less danger from "defective flues." A four-inch wall of bricks between us and destruction by fire is a frail barrier, especially if the work is carelessly done or the mortar has crumbled from the joints. To build the chimneys with double or eight-inch walls makes them very large, more expensive, and still not as good as when they contain the smooth round flues. To leave an air chamber between them for ventilating is better than to open directly into the smoke flue, because it will not impair the draught for the fire, and there will be no danger of a sooty odor in the room when the circulation happens to be downward, as it will be occasionally. The outside chimney, if there is one, should have an extra air chamber between the very outer wall and the back of the fireplace to save heat, a precaution that removes to a great extent the common objection to such chimneys. A very large per cent. of fires comes from defective chimneys.—*Scientific American*.

Science of Carpentry Made Easy, \$5.00.

Our Illustrations.

Having perfected arrangements by which drawings can be reproduced in a superior manner, we present in this issue numerous plates by far surpassing in execution those we have hitherto published. It has been our aim from the first inception of this journal to secure a better process for producing cuts from drawings than could be found in San Francisco. Acting upon this worthy motive, we have, in turn, tried many of the different processes used in various parts of the United States, and we leave it to our readers to judge of our success in the selection of the best. We do not intend to halt in our efforts, and trust that each succeeding number will show that our efforts are continually pointing towards advancement.

Plate 1, is the elevation of a very convenient house. Plainness and neatness are its principal characteristics. Plates 2 and 3 are the plans. It will be noticed that every part of the house is easily accessible from the front hall; even the kitchen is in direct communication, by the aid of a well-lighted passage-way; there are doors at each end of the passage, so that with proper care no smell from the kitchen can enter any other part of the house. By opening the sliding doors, the lower part of the house can be made into a grand promenade. The windows facing the veranda run down to the floor, so that an easy exit is obtained. The veranda can be used for a smoking-room, being placed on the side of the house away from

the wind. The kitchen is large, well lighted, and easy of access from dining-room, hall, and yard.

The arrangement of the bedrooms, etc., in second story, cannot fail to meet the wants and taste of any one desiring comfort. They are all well lighted, of good size, and easy of access. The bath-room is placed where no danger need be feared from sewer-gas, and is handy to every room in the second story. Closets abound in every room save one, and in that, if needed, one could be placed in either of three corners. Stairs are shown to the attic, which can be laid off into several very comfortable rooms, if needed. From the attic a flight of stairs could be placed to a deck on the roof, from which a view of the country can be obtained. The cost of this plan—allowing San Francisco prices for everything—will be about \$10,000. This figure can be changed either way, according to styles of finishes.

Plates 4 to 8, are the elevations and plans of a picturesque country house. A glance at the plans show at once the convenient arrangement of the rooms. Its cost will be in the neighborhood of \$3,000.

Subscription price of this journal is \$2.00 in advance.

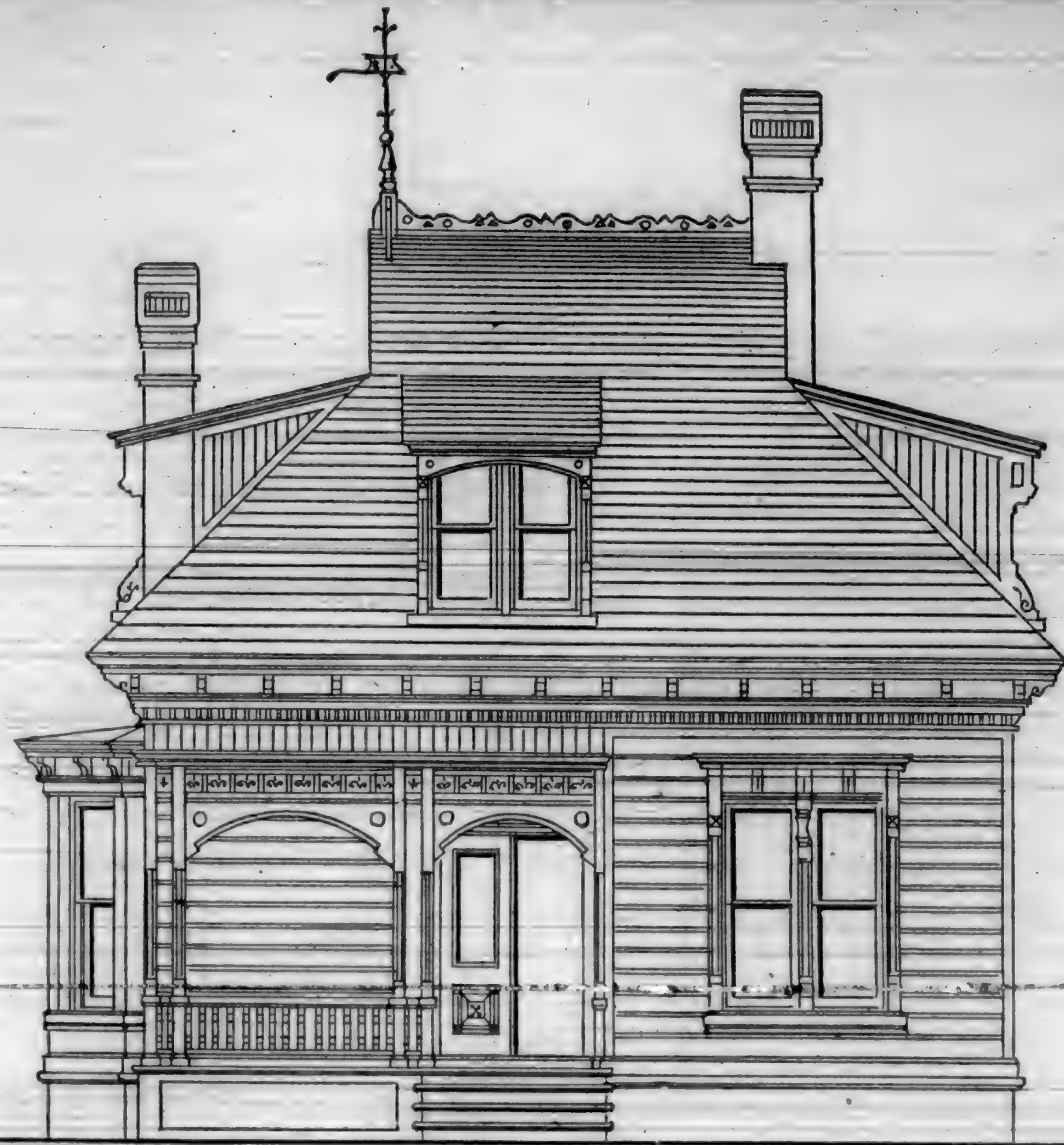


PLATE 5.—FRONT VIEW \$3,000 DWELLING.

Credit to Whom Credit is Due.

"Clippings" from standard journals and publications are absolutely necessary for the success of modern news distributors. One will soon get weary of perusing articles by the same author in repeated successive issues of any paper. The use of the clipping shears is an accomplishment apparently easily obtained, but none know better than an editor who truly endeavors to give proper credit for every article clipped, the difficulty in selecting proper articles, and the care necessary to give credit to the proper authors. One of our most esteemed contemporaries announces that every article after January first will be copyrighted. The editors of the journal are compelled to take this step on account of the pilfering of its articles by another paper published in the same interest. We have frequently seen in the two journals articles so nearly alike that if it was not for the high standard and integrity of the parties publishing the *North-western Lumberman*, we would be in doubt which party to give credit to. We are pleased to see one of our most esteemed exchanges take the step it has in this matter; and in future there will be no excuse for an editor not giving proper credit to whom it is due.

We are greatly amused at an English journal having quite an article on this subject in its preface. We quietly looked over its pages, and among its articles was one entitled "Laziness." The editor must have had a superabundance of that well-known quality at the time he inserted the "clipping," as the article was an original one with the senior editor of this journal, and appeared in the January number, 1881, some time before its publication in England.

Again: in our last issue we clipped an article and gave credit to the paper from which it was taken. After we received the proof, upon looking over later exchanges, we found precisely the same

article in three of them, and what is peculiar, they were all original, because no credit was given in any of the journals to the original author. An editor stands a good chance to "get in a pickle," as it were, in such a case. It would be manifestly wrong to give credit to any partic-

ular paper. The editor, however, has the remedy in his own hands. Just mark "Ex" after the article, and that will at least show that it is the work of some man's brain besides the one that presents it to his readers.

In the future it will be our aim to give credit for every article published except those that are original with the editors of this journal. By so doing, our readers can readily see the immense amount of work necessary to produce a journal of the character of the *CALIFORNIA ARCHITECT AND BUILDING NEWS*.

Straw Lumber—Suggestion to Farmers.

A few months ago we inserted an article in regard to straw lumber. Several of our exchanges saw fit to copy, and the result has been that numerous inquiries have reached us in regard to the manufacture of lumber from straw. That lumber can be so made is an indisputable fact. It can be used for all the purposes of ordinary lumber and as easily worked.

A gentleman from the East has requested us to draw attention to the matter, and ask farmers and those interested to forward us information in regard to the given amount of straw that can easily be delivered at any certain point, and the price thereof.

Convenient water privileges will be the great desideratum. Mills that manufacture the lumber in general use only require the sawdust and waste slabs and edgings for fuel. But with straw lumber it is intended that there shall be but little waste, and additional sources of supply for fuel will have to be looked for in case of the establishment of the new mill. We shall be pleased to hear from our farmers in regard to the matter.

Index to Vols. 1-4.

All parties who desire a copy of this index should at once send to this office. We have had a large number printed, and in the confusion attending the distribution of so many, doubtless some will be overlooked. A postal directed to this office, will be answered by the immediate forwarding of a copy.

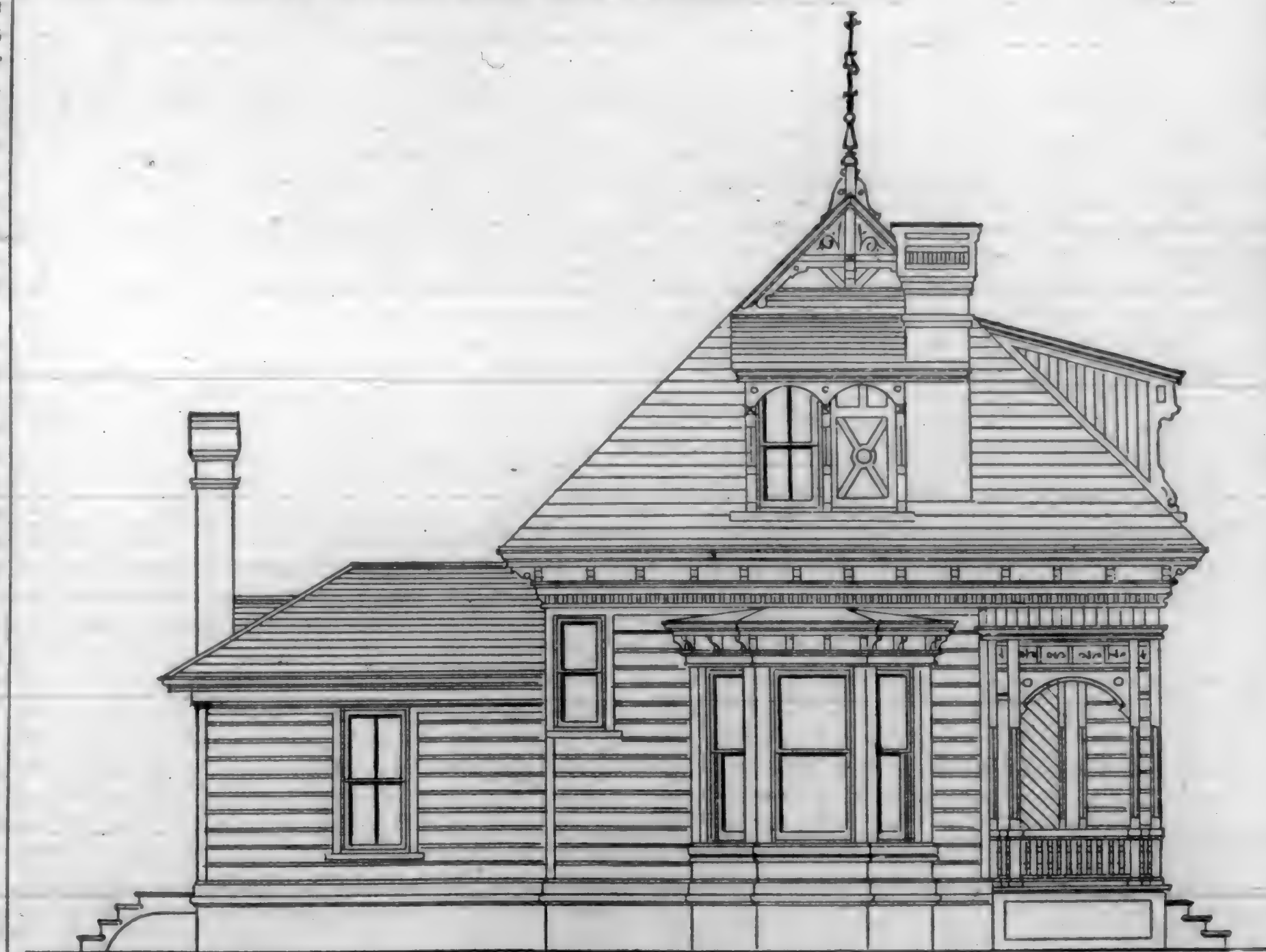


PLATE 6.—SIDE VIEW \$3,000 DWELLING.

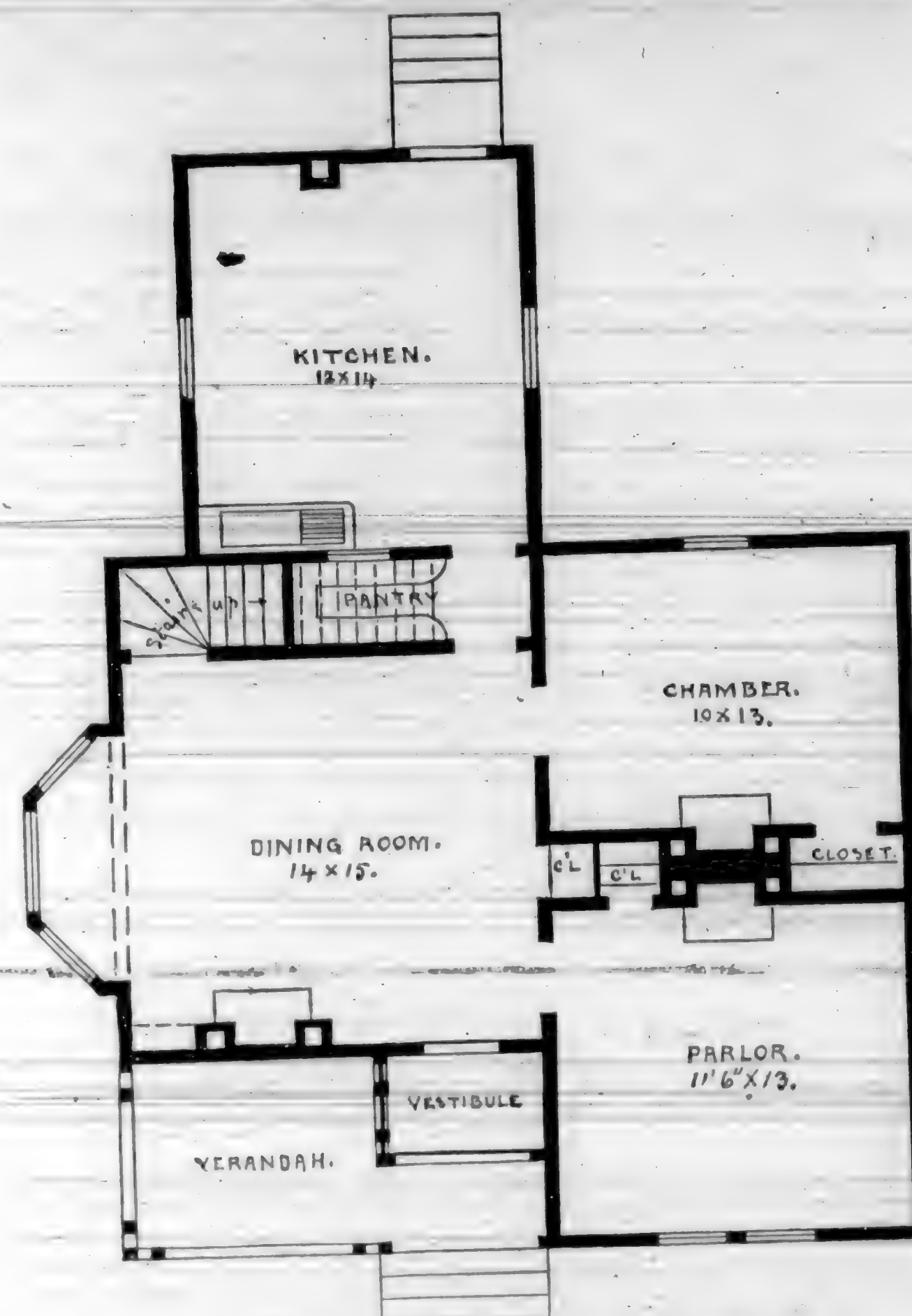


PLATE 7.—FIRST FLOOR PLAN \$3,000 DWELLING.

Veterans' Home Competition Plans.

On December 20th, the gentlemen appointed to examine the plans for the "Veterans' Home" met for that purpose, and found to their dismay no more than three attempts by architects to meet the unreasonable requests of the committee having the matter in hand. The refusal of the leading architects of the city to countenance the effort of the committee to secure a large amount of other people's time and labor without offer of compensation, deserved the contempt placed upon it by the members of the profession, and leads us to hope that the influence of this journal will at least in time work a reformation in the matter of competitive plan making, which will correct the base and absurd notion that architects as a class are ready and willing at all times to jump at any proposition that may be made, to use up time, paper and ink, with professional services and studies thrown in, without offered compensation. It has always been a matter of surprise and annoyance to qualified members of the profession, that men of intelligence and business integrity and abilities should so far lose sight of every principle of right and justice as even to suggest, much less to seriously propose to intelligent architects, the making of plans in competition without accompanying the proposition with adequate and reasonable offers of remuneration. And we hope the time will arrive when not a single man who is worthy the name of an architect, and who has any regard for the standing and reputation of the profession, will do

otherwise than scorn every attempt made by individuals, associations, committees, or commissions to procure plans for buildings of any character without proper and just recompense. The practice of obtaining plans upon the conditions offered in the case under notice, and many others of similar or worse character, has grown to be an injurious evil, amounting practically to this—the creation of a general idea that architects are a class of men whose time and professional skill possess but little value, and may be had upon the slightest inducements.

One thing is certain—that but few really qualified and competent architects will engage in these often-repeated, uncompensated, competitive contests, which are calculated in their effect to to demoralize and infringe the rules, principles, and practices which should govern and control in all cases, and create the sentiment in the public mind that the skill, experience, and services of architects have, in part at least, but circumstantial value, entitled only to such considerations as others may see fit to set upon them.

It is true that no one is compelled to enter into such contests; but that fact does not relieve the purposes and disposition of the parties making the proposal from the charge of seeking to obtain from others something which confessedly possesses value, without any assurance of payment for the services rendered. The fact that the successful party may secure compensation is but poor payment and satisfaction to those who may have earned equally as much by labors performed; and not unfrequently the intrinsically and practically more meritori-

ous are set aside, while the lesser succeed through skillful manipulations of advantages and showings on paper which deceive the unpracticed eyes of the novices who generally control such matters. Some of the worst things perpetrated in the erection of buildings have been in connection with competition plans; and as a rule, numerous changes are made in the plans adopted, and more generally the cost in execution is greatly increased over original calculations. And the man who enters into a competitive contest upon the square basis of following the lines made by those inviting the competition, will find himself defeated in nine out of ten cases. To be successful, every possible art and device must be resorted to, and all cavilings upon points of honest representations quieted. We have carefully watched these competitive frauds, and have long since been convinced of their gross injustice, with scarce a redeeming case in mind. And further: we have facts at command to satisfactorily substantiate the fact that in many instances success has been the result of purchase or special personal favoritism. It is a broad assertion for us to make, but we make it intelligently, that the unimpeachable competitive transactions are exceedingly limited. Sometimes committees are innocently, on their part, led to accept and approve unskillfully prepared plans, which in cases augment a large increase in outlay, because those "behind the throne are greater than the throne itself"; and it is only as the work progresses that innocent committeemen discover after the mistake is made. Nor is the objectionable features of such cases always attributed to the architects engaged in the contests, as there are but few cases in which unseen influences are not brought to bear for purposes by no means clearly apparent in the premises.

Our knowledge of the gentlemen having the "Home" matter in hand forbid the thought that they mean otherwise than exactly right; but the principle involved being absolutely wrong, less than wrong could not reasonably be expected in the consummation of the matter in hand.

Since preparing the foregoing for print, statements have appeared in the San Francisco Chronicle fully sustaining our position, and revealing the fact that the honorable committee have at least gathered about them a very disagreeable state of things, which might have been avoided by their selecting three competent and honorable architects to make plans, and giving to each fair pay for the services exacted; or rather selecting some one good architect, and allowing him singly to fulfill the requirements of the committee, as any member of the profession in San Francisco who has acquired by study and practice, an amount of architectural knowledge sufficient to entitle him to recognition as a qualified architect, could have accomplished all that was necessary in the case, and saved all the unpleasant issues which have grown out of an unrestricted invitation. Up to the present writing, Messrs. McDougall & Son's plans appear to be the more acceptable to the committee, and we have every confidence in the integrity and ability of the gentlemen named, and believe them to be as free from any intrigue in the matter as men can well be under such circumstances; but other of the contestants seem to measure the severity of their condemnation of the committee's act, by the depth of their disappointment, which seems to be without limit. The statements of the several gentlemen interviewed by the Chronicle reporter, questioning the results,—if the plans rejected had been approved, is perhaps justified; as under-valuation in such cases is the rule, and if a bond to complete according to said plans had been accepted, it would have amounted to nothing, as there are numerous methods of avoiding the responsi-

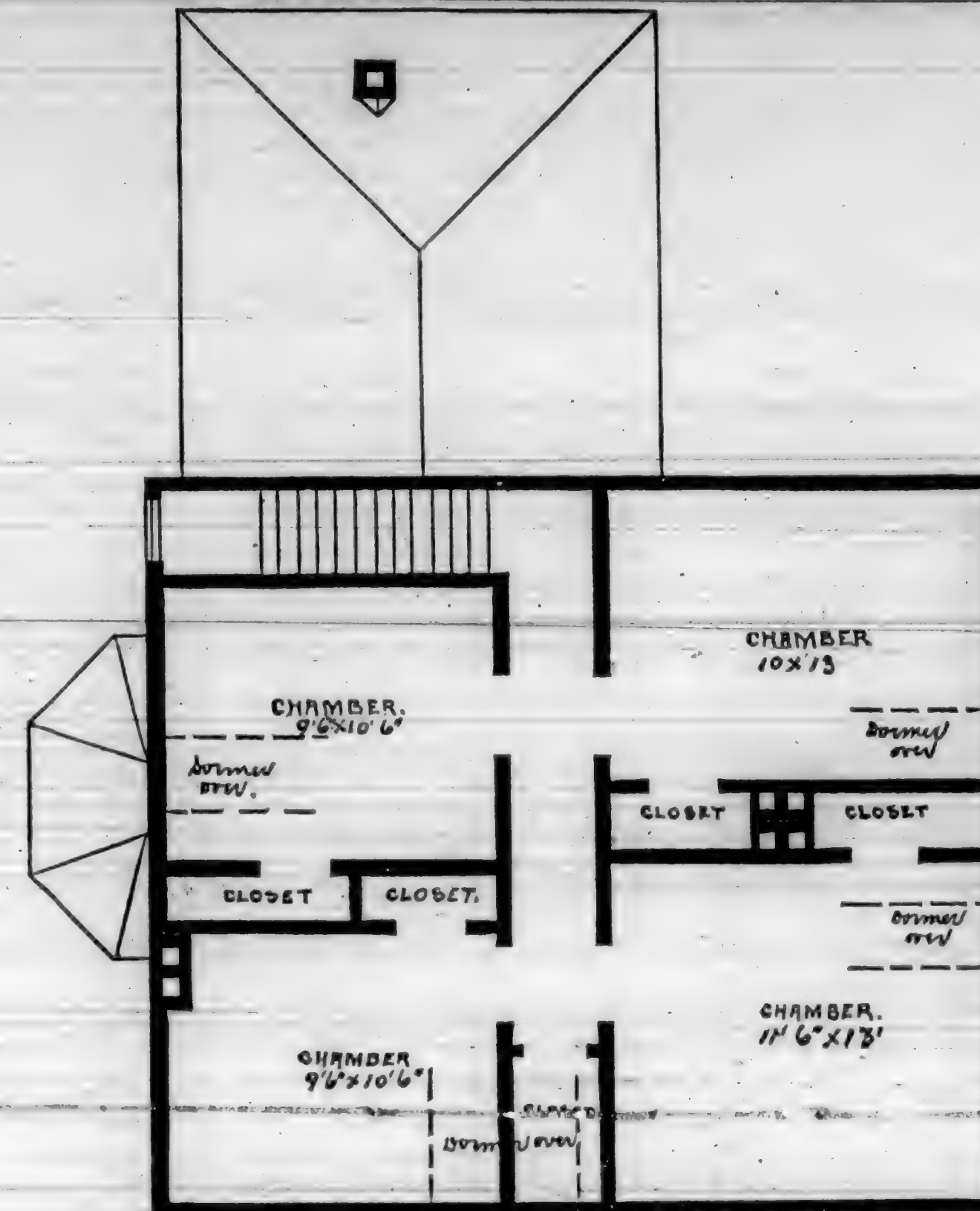


PLATE 8.—SECOND FLOOR PLAN \$3,000 DWELLING.

bilities of bonds of that character. And the "shoddiness of constructions" would doubtless have occurred, as a necessity to personal, financial safety on the part of the proposed bonding architects, who to secure the adoption of their plans, named an amount scarce sufficient for the erection of the merest shells, and not within twenty per cent. of the cost of a really good, substantial, well-constructed buildings. Personally, we should have been pleased had the committee accepted the plans of the angered architects, as in that case they would have learned by experience the folly of promiscuous, unresisted, competitive plan seeking, which throws open the doors of opportunity to every pretender, and practically reduces the skill, experience, and abilities of the educated architects, to a level with incompetents, or lifts the latter at once to a professional eminence which would never be gained by them through a lifetime of personal attempts at regular practice.

Final Action.

The gentlemen managing the Veterans' Home matter, met on Saturday, the 6th inst., and decided, by an unanimous vote, to adopt the McDougall & Son's plans. In substantiation of all that we have said in this and other connections of similar character, the following was developed, viz: that the invitations soliciting architects to complete upon the uncertain and unsatisfactory basis proposed in the invitation resulted in three sets of plans being submitted, although there are some sixty or more architects in San Francisco; that only two of these received special consideration; that the Newsom plans were at first favored by some of the Committee, upon the grounds of stated cost. To secure their adoption, their authors proposed a price at which the building could not be built, and if they had entered into a responsible bond

to carry out their plans at the cost proposed, they would have found themselves or their bondsmen involved in a loss of several thousand dollars. This we state upon our own practical knowledge of the cost of buildings, and in opposition to the expressed view of the Newsom Bros. They may consider themselves fortunate in escaping the difficulties which would have been realized by them had they been successful in having their plans adopted.

It was further developed, that some of the gentlemen of the Committee were incapable of intelligent decision as to the merits of the respective plans, as some of them confessed to the fact that they had had "competent outside parties" to pass their opinion upon the plans, and upon the result of the judgment of such parties conclusions had been reached by members of the Committee. This fact needs no comment, and clearly sustains our position as to the unqualified unjustness of competitive contests for plans.

Had the Committee selected the Messrs. McDougall, or any other competent architects, without contest, they would have secured, perhaps, precisely the same plans, or others equally meritorious, without any of the unpleasantnesses which have occurred, and saved all the annoyances which have grown out of this competition; for certainly the bandying back and forth of "they lie," between members of the Committee and the Committee as a whole and the defeated architects, cannot be pleasing to either parties. The Newsoms have insisted and persist in charging unfair and double dealing upon the Committee, and claiming that the whole transaction has been more or less permeated with falsehood on the part of the Committee, while the Committee in session personally gave the "lie" to the Newsom statements. As to the real merits of the contest we know nothing, beyond the sayings and bickerings of the respective parties; but the sum of the whole matter strongly sustains us in our condemnation

of competitive plan making, which in scarce a single instance is not surrounded with a state of facts similar in character to those appearing in the case under notice.

How to Select a File.

Most of our readers have more or less use for files, and a little information on how to select them cannot come amiss: On starting out to purchase a file, bear it well in mind that there are several qualities made by some file makers, as many as four qualities—first, second, third, and fourth. The first quality is, of course, the best, and represents about 75 per cent. of a file manufacturer's product, the other qualities taking up the remaining 25 per cent. Firm names are always stamped on files before they are tempered, and if, after they are finished, any of them are found to be poorly cut or badly tempered, the firm name is ground off, and one of several fancy names coined for all qualities below the first is stamped on each file belonging to a certain quality. Thus if a file maker should select the word "Jumbo" for his second quality files, all of his files which are too poor for the first quality and too good for the third have "Jumbo" stamped on them. First-quality files only bear the name of the maker, while fourth-quality ones generally bear no name at all, and are seldom seen and more seldom sold. When you have thought of all these things, ask the dealer for a first-quality file, bearing the name of some well and favorably known file maker—one that you have heard of yourself, if you ever heard of one. Select the heaviest file in the box (if there is any difference in the weight of them), for a heavy file is generally truer than a light one of nominally the same size, and is better for recutting—a recut file, by the way, being just as good as a new one. Take the file to the light and hold it in a horizontal position, the point of it toward you. The teeth of the file will now be pointing toward you, enabling you to detect easily any and all imperfections that a bad file is heir to. If the confirmation of the teeth is irregular or uneven, or if the color of the file is not uniform, let it severely alone. A spotted or mottled file denotes unevenness of temper. If, on the other hand, the file presents a clean, white color, it denotes that the temper of it is hard and even throughout; and if, besides this, it has regular and perfect teeth and bears the maker's name, you may rest assured that it is an excellent file. The best files are tempered at a low heat. Files of certain sizes and numbers made since the first of June are of uniform weight, the file manufacturers of the United States having agreed upon a standard of weights and sizes.—The Wood-Worker.

The Old Home of Henry Clay.

The house is built of brick and is quite modern in its architecture. It commands an extensive view of the surrounding country, and its front is handsomely decorated with growing flowers of almost every description. It is a rectangular structure with two wings, and appears to have been constructed for comfort rather than for show. The interior is nicely furnished and richly finished in white ash and butternut woods cut from the place. Ash formerly predominated here, and from this circumstance the place derived the name of Ashland.—The Builder.

IVES' PATENT DOOR BOLTS.



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ARCHITECTURAL PUBLICATIONS.

Modern Architectural Designs and Details.

The plan of this work is very comprehensive in its character. Numerous designs are given illustrating the Eastlake, Elizabethan, and Queen Anne styles of architecture. Complete plans of each, together with full and comprehensive details, are produced in a manner that will gratify the tastes of any architect or property owner. Price, \$10.00.

Lakey's Village and Country Homes.

This is a large work, and just suited to those parties in the country who live too far away from an architect to secure his services. Designs are given for all prices of village and country homes. Several pages of details are also introduced. Price, \$5.00.

American Cottage Homes.

This work has had an unprecedented sale in the United States since the reduction in price. The book is a large one, and contains many illustrations in the prominent later styles of architecture. Prices are given for which each design can be built. In California, however, the price in nearly every instance would have to be almost doubled to correspond to cost of work in this State. Being sole agents on this coast for the above work, we are prepared to make liberal terms to agents. Price, \$3.00.

Detail Cottage and Constructive Architecture.

To the general country mechanic, this work is invaluable. Every part of a building is thoroughly detailed, including store fixtures, counters, fences, etc. Price, \$10.00.

Model Homes.

A work containing a great many designs in the prevalent New England style. Price, \$1.00.

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This is the first work of its kind ever published in this country. The author justly remarks, "Ideas are as necessary as tools. Tools have no edge without them." These details furnish the mechanic with nearly eleven hundred ideas, and practical ideas that you want every day. 40 plates 20x26 inches in size, are given for the small amount of \$2.00. AGENTS CAN MAKE \$5.00 PER DAY STEADY, HANDLING THIS WORK. Being sole agents on this coast, we are prepared to make liberal terms to canvassers.

Artistic Homes.

A. W. Fuller, a well-known architect, has given to the general public, for a small price, a very neat work containing 44 plates in the Queen Anne style of Architecture. Price, \$3.50.

Interiors and Interior Details.

A large work, and as its name implies, contains details for every style of interior finish. The plates are all handsomely lithographed. Price, \$7.50.

Practical Lessons in Architectural Drawing.

There is not a draughtsman in this country but that will be benefited by the possession of this work. As its name implies, it is strictly a PRACTICAL WORK. Price, \$2.50.

Modern House Painting.

A new work of novel design, presenting numerous elevations of houses in colors precisely as they will appear when finished. Price, \$5.00.

MECHANICAL PUBLICATIONS.

Steel Square and its Uses.

Probably no work of modern times has met with so cordial a welcome from mechanics in every part of the country as the one under notice. Over 800 copies have been sold through our agency since its introduction on this coast. Every mechanic should possess a copy. Price, 75 cents.

Science of Carpentry made Easy.

The work, *par excellence*, for every mechanic to have in his possession. It is thoroughly practical in its character, and contains much information not to be found in any other publication. It excels in its methods of obtaining the length and bevels of every description of rafters, both common, hip, and valley. By special arrangements with the author we are enabled to give this work and the CALIFORNIA ARCHITECT AND BUILDING NEWS, for one year for the sum of \$5.50. Price of book alone, \$5.00.

Gould's Carpentry Combined with Steel Square Problems.

A work similar in character to the above. The author, being a practical mechanic, has endeavored to make his ideas so plain that any one by reading, with a little study, can thoroughly master all the problems incident to the use of the Steel Square. Price, \$2.50.

American Stair Builder's Guide.

By the same author as the above work. With the aid of the rules and illustrations given, the young mechanic can, in a very short time, be enabled to lay out any and all kinds of stair work. Price, \$3.00.

Builder's Guide and Estimator's Price Book.

This work is chiefly intended to assist the Builder and Contractor in making estimates of the cost of work they may be competing for. It is written by the author of the STEEL

SQUARE and its Uses, which fact is a guarantee that the book is practical in its character. Price, \$2.00.

Modern House Companion and Builder's Guide.

A handbook of carpentry for the coat pocket. Among the illustrations and descriptions of the various kinds of works are the following: Pitch, hip, valley, and mansard roofs, angle rafters on French roofs, interlocking circular moldings, stair work, etc. Every mechanic should possess a copy, and thereby fit himself to become a master of his trade. Price, \$1.25.

Our space is too limited to notice fully every book on our list. Besides those enumerated, we can send the following-named works to any address in the United States upon receipt of the price:

Grimshaw on Saws.....	\$4.00
Frank's Monuments.....	9.00
Plasterer's Manual.....	75
Foundations and Foundation Walls.....	1.50
Sewer Gas and its Dangers.....	1.25
Art of Saw Filing.....	75
Carpenter's Pocket Companion.....	50
Workshop Companion.....	85
Mechanics' Geometry.....	5.00
Fancy Alphabets.....	2.00
Standard Sign Writer.....	50
Street, Store, and Bank Fronts.....	4.00
Village Builder and Supplement.....	10.00
Artisan.....	5.00

Hods: Their Construction and Use.

Hods are of two kinds. One form of hod is devised for carrying bricks, and the other for the transportation of mortar. While differing somewhat in purpose and balance, the two species of hod are yet so closely allied as to be utterly indistinguishable when apart. Indeed, it is a matter of grave interest to men that during the whirl of centuries, when every other inanimate thing has, through the indomitable perseverance of invention, been forced through a process of evolution that has robbed it of almost every semblance of its pristine nature, the hod remains to-day in structure and design exactly as the hod originally was. At present hods are cheap. Eighty-four cents will purchase one. The craze for all that is aesthetic, early English, Japanese, Etruscan, or antique has passed by the hod unchallenged. The early Irish hod reigns supreme.

The dimensions of a mortar hod are as follows: Length of bowl, 22½ inches; mean depth of bowl, 9½ inches; greatest width of bowl, 9½ inches; height of back piece, 12½ inches; width of pieces forming lateral sections of bowl, 11½ inches. The dimensions of a brick hod, it will be seen, are different. They are as follows: Length of bowl, 23½ inches; mean depth of bowl, 8 inches; greatest width of bowl, 8½ inches; height of back piece, 10½ inches; width of pieces forming lateral sections of bowl, 8½ inches. It is generally conceded that the mortar hod is built larger than the brick hod, so as to make the weight when both are loaded as nearly equal as possible.

The shank or handle is 4 feet 2½ inches for each species of hod, and the shoulder rest is always 9 inches long, 3 inches wide, and 1½ inches thick. This shoulder rest is attached to the inverted ridge pole of the hod, and prevents the edge from cutting into the shoulder of the proprietor.

Touching the materials used in hod building, it may be said that the earliest ideas still obtain. Iron hods have been tried, but abandoned, because they were liable to rust and to become cracked when dropped six or seven stories by proprietors, who invariably and instantly relinquish all ideas and implements of labor at the stroke of 12 and of 6. The verdict of ages is that the bowl of the hod shall be of yellow pine, and the shank a hickory pole with the bark on. In constructing a hod, it is found necessary to use thirty-three nails for the brick species, and twenty-nine nails and four screws for the kind intended for mortar. The screws are used in the latter instance to fasten the two arms of the shank to the bowl, because screws do not leave holes, as do nails when they become loosened. Small holes allow mortar to escape, and are therefore open to objections. In making the bowl of a hod, eight-penny nails are used; four-

penny nails answer best for the shoulder rest, and shingle nails for securing a narrow slip of sheet iron that runs over the top of the back piece of the bowl for the purpose of imparting additional strength. All of the nails are machine made, with the exception of those used in fastening the shank to the bowl, which are hand made and highly malleable. The mortar hod, besides having four screws, is lined at the seams with white lead. It has been considered somewhat superior to the brick hod. The weight of hods one hour after completion is ascertained to be exactly as follows: Brick hod, 9 pounds 6 ounces; mortar hod, 10 pounds 3 ounces. Fifteen bricks are carried in the common hod.

There is a widespread impression that the shank of a hod is steamed after being split into the V-shape necessary to accommodate the bowl. This is erroneous. The shank, after being slit for a distance of 7½ inches, is violently forced asunder by pressure against the wedge-like base of the bowl, and is secured within that position.

Very many hods are owned privately, and many thousands more are owned by a large company up town, which makes hods and rents them to builders along with its patent hod elevators. The introduction of hod elevators, oddly enough, met with no opposition from individual proprietors of hods, but, on the contrary, was warmly welcomed by them. The elevators do the work of many men, but as building has increased in a satisfactory ratio, there has always been enough work for men who decided to adopt the hod as a means of advancement or sustenance. Indeed, so well have the individual hod proprietors in question adapted themselves to the existing state of things, that they absolutely refuse to climb higher than the second story now, and builders must, perforce, employ the elevators for stories of a loftier pitch.

At no time in the annals of the city has the hod industry been at a higher tide of prosperity. Thus the outlook for the hod is as bright as its history has been unvarying.—*New York Sun.*

Sawdust in the Upper Mississippi.

The statement was made some time ago on what seemed to be good authority, that the upper Mississippi was gradually becoming filled with sawdust, and that it was or soon would be detrimental to navigation. *Wood and Iron* says that a joint committee of prominent business men and steamboat men of St. Paul and Minneapolis have been making an investigation of this matter, and found no sawdust accumulating in the main channel, and think the accumulation in the eddies and shallows will prove an advantage, instead of, as was at one time feared, a serious impediment to navigation; that is, by lodging on the wing-bars and shallows, it serves the purpose of protecting them from the washing of the current, by which the sand was removed and deposited in the main channel.

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Shingling Seat or Jack on Steep Roofs.

The best and cheapest plan adopted for the purpose is made about in this manner: Take a bar of iron about 1½ inch by ½ inch, 15 or 16 inches long, flatten out to an edge, one end to a thin blade, then bend to a right angle 5 inches from the other end, drawing out a small point projecting out and down at or near the angle. The flattened end is pushed up under a course of shingles, until the sharp point at the angle rests upon the thick end of the shingle of the course upon which the iron rests; a slight stroke will set the point in the shingle and prevent any possibility of sliding out of place. One of the above irons every eight or ten feet with a 2x4 scantling laid from one to the other is all the help a person will need on any roof, however steep it may be.—*Builder and Wood-worker.*

Band Saws.

Band-sawing, an art or industry which from the advantages it possesses over other methods of dividing wood is growing so rapidly and steadily into public favor as to be by many considered the saw of the future, is essentially a modern invention. Probably the earliest known attempt to saw wood by this means was made in 1803, by Wm. Newberry; but, although his machine contained all the essential features of the modern machine, it failed as a practical tool, because at that time band saws could not be made of sufficient length, except by brazing a number of short pieces together, a process which was found very detrimental to the uniformity and tenacity so requisite in these saws. Although a band saw when at work appears a very simple thing, merely a narrow pliable band or belt of steel, with a notched or serrated edge, running over two pulleys, it has, in the process of its manufacture, offered a paradoxical problem. It must be soft and flexible enough to work rapidly round the pulleys, yet hard enough to retain a keen cutting edge; whilst stiff and tough, to resist firmly the pushing and straining tendency of a quick feed.

Many attempts were made to overcome these difficulties, but it was not until a young and beautiful empress led the fashion by wearing crinolines, and all-powerful fashion imperiously demanded the production of long lengths of thin, light, pliable, highly tempered steel, that saw makers, after many failures, hit upon the right method of producing their blades of sufficient length and uniformity of temper to render the band saw machine a success.

At the French Exhibition of 1855 was shown what was probably the first really practicable band-sawing machine, and the merits of the new system were at once recognized, a demand for such tools immediately arose, and, as is always the case, many competitors started to supply the demand, till at the present day few wood-working establishments are without one or more of these machines, chiefly, however, employed on the lighter kinds of work; for, although our clever American cousins have already adapted the band saw to the cutting up of large round timber—feeding the saw on the rack-bench principle, as described in a recent number of the *Timber Trades Journal*—it has not yet reached that wide application for heavy work to which its many merits entitle it.

To M. Perin, of Paris, undoubtedly belongs the honor of introducing the band saw as a practical tool to the public, and although it is a notorious and somewhat singular fact that French band saws are chiefly made from Sheffield steel, the trade has hitherto remained mainly in the hands of our neighbors across the Channel, but at least one English firm, that of Messrs. Moses Eadon & Sons, of President Works, Sheffield, has throughout competed steadily and successfully with their foreign rivals.

In 1856 Messrs. Eadon took out a patent—No. 1,628—for the manufacture of solid endless band or belt saws, and their system was for a time a great success; but experience and the continued march of improvements have shown that these saws can be made with one joint at much less cost, and with great uniformity of strength, temper, and substance, than by the other method; they have therefore abandoned their original plans, and, guided by long practical experience, have erected new and special machinery which, they claim, enables them to make band saws of a quality and price which must ultimately give them a monopoly of this now important trade. A full description of their processes of manufactures, from the crude iron to the finished saw, was given in the pages of this *Journal* on July 24th, 1880.

As the action of a saw is to sever the wood by cutting or tearing away the material, it is

obvious that the thinner it can be had the more economical it is, both of power and material—two most important considerations in these days of keen competition, and with the ever-increasing scarcity and dearness of timber. Herein lies one of the main claims of the band saw to popular favor, for not only is the blade itself thin in comparison, but it requires a comparatively small or narrow set; consequently it wastes less wood and requires less power to effect its passage through a log.

The band saw shares with the circular saw alone the great advantage of a continuous cut, there is no loss of time or power by a non-cutting back stroke, the sawdust also being constantly carried down; it requires no blower, as does it nearest rival, the jigger saw, to prevent clogging, and to enable the workman to see the line he is cutting to. Moreover, the length of the band saw gives it a great immunity from heating, there being but a very small proportion of its length (say 2 or 3 per cent.) in actual frictional contact, and this again cooled by the rapid passage of the saw through the air.

As the best band-sawing machines are now made with tables to cant to any angle, this saw is used extensively for cutting beveled or ship timber, for which purpose and for curves and bent timber it is probably unrivaled. The band saw is also rapidly growing into favor for sawing cold iron and steel, and as band knives they are much used for cutting skins, india-rubber, cloth, etc., etc.; but on account of these, however interesting, scarcely comes within the scope of a journal devoted to timber.

The band saw, however, like every other tool, possesses its disadvantages. Chief amongst these is its liability to "break," and although the fault is doubtless sometimes in the saw, a far more frequent cause will be found in careless or irregular setting and sharpening, it being plain that unless the greatest uniformity is maintained in both these important matters, the tension will be unequal and the saw drag.

In setting it should be remembered that soft wood requires a larger set than hard wood, and that small curves are better cut with more set than is necessary for larger curves. In sharpening care should be taken, not only to keep the teeth uniform in size, but to keep the bottom of the gullet nicely rounded, by which the chances of fracture are rendered much less than when the bottom of the tooth forms an acute angle. It is universally admitted that thick, round-edged files are the best for sharpening band saws. The blade being extremely thin, the tension is difficult to keep, changing instantly with the temperature, and the pulleys should be eased to prevent it breaking when cooling down after working.

Too coarse a feed will not only cause the saw to choke, but will cause the back to be crowded and get longer, like the edge of a leather belt that is constantly running against the strap guides.

It may be taken as a maxim that the larger the pulleys, and consequent curve of the saw, the less is the liability to fracture, and the pulleys should in all cases be covered with a ring of india-rubber, which is now made specially for this purpose, for not only are the teeth protected thereby, but the blade is given a greater "grip" when the pulleys are so covered.

In spite of these little disadvantages (and it is hoped that a perusal of the cause and effect will lead to a greater care being taken by removing the one to prevent the other), there can be doubt the band saw has a great future before it; and the sight of a band saw, well made, well set and sharpened, working on a good machine, under the hands of a man "as knows his business," is one to cause an old-fashioned sawyer to exclaim: "Of all the saws I ever saw saw, I never saw a saw saw as this saw saws!"

—ROBT. RENTON EADON, in the *Timber Trades Journal*.

Reckless Bidding.

Notwithstanding that a healthful and prosperous condition of things has ruled in San Francisco in building operations during the past year, as far as the number of contracts let are concerned, a singular recklessness and virtual disregard of results has prevailed among contractors in all the various branches of house construction, by which opportunities for profitable contracts have been largely sacrificed to the prevailing spirit of reckless bidding to secure contracts at all hazards. It is a matter of grave doubt whether contractors, as a whole, have gained five per cent. upon their financial standing during the past twelve months. That is to say, if after deducting the losses generally that have been made from the profits realized as a whole upon contracts, the contracting fraternity are financially five per cent. better off at the end than at the beginning of 1882. Some, of course, have done well, but the much larger number have gained nothing more than a living from the contract-money used during the progress of work executed by them, while scores have paid pro ratio, with debit accounts against them of greater or less magnitude, augmenting, perhaps, to as great a sum as the total of profits enjoyed by those who have been successful.

We refer to this state of facts because of its demoralizing influence upon the building business. Men who undertake work at less than fair recompense naturally seek to equalize the discrepancy by the avoidance of contract and specification obligations. Even those otherwise disposed to act honestly, when placed under the pressure of financial losses, are apt to practice the old maxim of self-preservation as the first law of nature, and to lessen or avoid disastrous financial results, seldom accept the situation and faithfully recognize and fulfill the obligation resting upon them, if there exist any possible means of escape. When losses and impaired credit are placed in the balances with honesty and integrity, the former more generally outweighs the latter, and for the time being, at least, moral ethics become valueless.

To the uninformed it may appear strange that such a state of facts should exist among so intelligent a class of men as the average of California contractors. But when the additional fact is considered that very many are pursuing the contracting business "on check"—i. e., men possessing no right knowledge of the science of construction or mechanical principles; men so utterly incapable to perform the duties of journeymen that they could not find engagements upon any works upon which mechanical skill and proficiency was a prerequisite to employment—the wonder ceases. We have seen contracts originating from offices in which all right architectural rules were ignored, signed with "his (X) mark," and that, too, in one instance, wherein the sum of contract was nearly \$10,000.

Is it, then, to be wondered at that with inability on the part of the contractor to even sign his own name, that irregularities should occur? If the evils resulting from this condition of affairs were confined to the degenerate characters causing them, decent men might laugh. But the pernicious effects are felt by the good and worthy, who must, to some extent at least, compete with the inferior element; for, unfortunately, the generality of owners, in ignorance of the underlying facts, are willing to risk engagement with the latter on the basis of low price, rather than pay better men more than an insignificant increased sum of money, if any. Good men, as contractors, are desired by owners, but as a rule actually preferred only when they consent to accept the profitless amount figured out, or more generally guessed at, by mechanical scallawags.

It is to be regretted that the responsible and reliable class of contractors submit to all this

Of Cincinnati. Its circulation is principally among the workers in mills and manufactories. 50 cents per year.

On the authority of the *Northwestern Lumber*.

The commission which has charge of the national monument to King Victor Emmanuel of Italy, finding none of the plans submitted in the last great competition quite satisfactory, has opened a new one, for which a year of preparation is given, the designs not being received until December 1st, 1883. Some modifications are made in the first programme, the site being now definitely fixed on the Capitoline Hill, upon the ground now occupied by the barracks of the municipal guards and the residence of the general of the Capuchins. The total height of the monument is restricted to twenty-nine metres, and an equestrian statue of the late king is to form the most important portion. Considering the magnificent dimensions contemplated in the most of the designs of the previous competition, these very modest requirements are a little surprising, and it certainly seems as if the Italians had concluded that sixteen hundred thousand dollars was too much to devote to a dead man's memory; but the new plan contemplates the extension of the Corso to the foot of the Capitoline Hill, and the construction of a grand staircase leading upward to the monument, so that the cost of the whole project will at least be very considerable. What, if any, may be stipulations as to the cost of the work and the premiums offered we do not learn, or whether the competition is to be confined to Italians, as was once proposed.—*American Architect*.

The furniture is light wood, and a lamp with rosy transparency stands on a five o'clock teatable of unvarnished wood, and throws a soft light over the room, which also contains books, shelves of pine, a couple of second-hand easy-chairs, and

Take six pounds of tallow and two pounds of bees-wax, and one ounce of finely pulverized sal ammoniac. Melt the tallow and bees-wax together, and then put in the sal ammoniac. Pour the mixture into a sheet-iron box, which, for convenience, should be two feet long, four inches wide, and four inches deep. A box of these dimensions will hold enough of the mixture for tempering any sized ax, hoe or other tool. When the ax is ready for tempering, heat it to a white red; then put it into the mixture deep enough to cover the steel all over. Let it remain from one to two minutes, then put in the water the same way. Then draw to a blue color and return to the mixture as before. Then hold it over the fire until it becomes dry, and then put it back into the water to cool. Never heat the steel more than to a light red when forged out.

told that a job is expected to be let before we go to print, and if we will call again information in regard to it will be cheerfully given. Of course, we become acquainted with many facts in regard to future improvements, every confidence being placed in us by our brother professionals, and it would be unkind—nay, it would be treacherous—on our part, if we gave a single hint in regard to the facts we learn from our monthly visits, which has not passed beyond all contingencies, and reached a point beyond reasonable probability of suspension, or the possibility of interferences from any source. By this intimation we mean this: that a very large number of cases might be cited in which, after the order to prepare plans have been given, other scheming and unprincipled men, calling themselves architects, but not so far as any of the more honorable, gentlemanly, and professional attributes are concerned, have brought personal and friendly influences to bear, and resorted to intrigues and misrepresentations by which they have dishonorably diverted engagements made with others to themselves. For this reason, principally, we refrain from publishing anything but what we know to be facts. Another reason is, that fully five per cent. of the jobs figured on do not go ahead, and it is not the purpose of this journal to litter its pages with accounts of things that may never be. What we want is simply plain, indisputable facts, and these we propose to give as true as close attention and careful inquiry will accomplish.

Gladly welcome will be the day when the cares and troubles of a professional career are over, and those of a journalistic character alone be assumed.

Proceedings S. F. Chapter of Architects.

The regular meeting of the Chapter was held Friday evening, 2nd inst., President John Wright presiding. The meeting was largely attended and interesting in character. The Committee on Articled Students' Class reported progress, and received instructions to proceed with the matter in hand, and to organize the respective classes. (The opening class in Modeling will be organized, under the instruction of Mr. F. Marion Wells, on the evening of February 13th.—Ed.) The motion to advertise the contemplated movement in this connection in the CALIFORNIA ARCHITECT AND BUILDING NEWS was unanimously adopted. The organization of classes in Drawing, Mathematics, and Carving will succeed that of Modeling as rapidly as circumstances will permit. It is hoped and requested that all students desiring to avail themselves of the valuable opportunities presented in the Chapter's efforts to benefit and perfect the young men in the profession will at once report to the Secretary, Mr. George H. Wolfe. There will be no charge to articled students; those who are not articled can also join the classes upon paying a nominal fee.

The articles appearing in the present issue, in relation to the appointment of "School Department Architect," and that in reference to this journal furnishing anticipatory reports of "contemplated improvements," were read and approved by vote of the Chapter.

The committee previously appointed to prepare amendments to sec. 832 of Civil Code, relating to the rights of coterminal owners, and the underpinning of buildings, reported that a bill, covering the ground, had been presented by Senator Cronan for action by the present Legislature, and is now pending.

Mr. Pissis read a very interesting address—subject, "Paris School of Designs"—which was ordered to be published in full in this journal. It will be found in another column. A vote of thanks was tendered him for his able effort.

A delegation from the Carpenters' Union appeared before the Chapter, specially in reference

to the practice permitted by some of the architects in San Francisco of allowing contractors to sublet the finishing of buildings, in part or as a whole, by "piece-work," instead of having the work done by day labor. The unfairness and injustice of the custom was fully argued by the delegation, setting forth its injurious effects and tendencies as against worthy and capable workmen, many of whom were frequently thrown out of employment by reason of piece-workers offering to "lump" work at prices which would yield current day wages only by slighting the work, crowding in all the working time possible, and rushing it through with but little regard to quality of workmanship, thus debasing and demoralizing the standard of mechanical science, and working a common injury upon competent men, and imposing inferior work upon owners.

While the Chapter cannot control and prevent or regulate the questionable practice, the expression of all present disfavored the piece-work system. Many of the members of the Chapter insert a clause in their specifications: "No piece-work will be allowed"; but this is harmless as against contractors who let piece-work when unaccompanied with a contract penalty. The agitation of the matter will, in time at least, induce all reputable architects to incorporate a penalty clause in contracts issued by them. The general sentiment of the members favored the adoption of some practical method calculated to favor the interests of the better class of mechanics. It was suggested to the delegation that the Union, from time to time, inform the Chapter of all cases of piece-work coming to its knowledge.

The meeting throughout was one of great interest, and members who failed to be present, and those architects who have not affiliated, missed the pleasures of one of the best meetings ever held by the architects of this city.

As Others See Us,

ESPECIALLY OUR ESTEEMED COUSIN, J. B.

Architecture has no status with Brother Jonathan, is not recognized as a profession, and is commonly reduced to the level of the signboard. The most highly educated men, therefore, do not become architects, and the result is plain. Whenever we find anything beyond the general run of indigenous wooden houses, it is usually of the most abject, commonplace kind, or a wonderfully ambitious failure. Whether in school-houses or in any other kind of structure, architecture in its highest aesthetic conditions is never found. Even the capitol at Washington, built of white marble, can, at best, be regarded only as a costly piece of architectural floundering. If, instead of parodying the styles of Europe, unsuitable both to the country and the people, American architects would as steadily set themselves to develop artistic buildings of their own (embodying, of course, the great fundamental truths which are present in all great architecture), in the same manner as American educationists have developed a school system, the result would perhaps be more respectable. Nor in the matter of scientific school-planning have they, as yet, done anything serious. Two rows of rooms with a corridor down the middle and a staircase at each end can scarcely be called planning. The German, in this respect, plodding heavily on, beats the quick American hollow, for in his school-houses every part of the fabric has its purpose as certainly as in any building of the thirteenth or fourteenth century. This is the more remarkable because school building is no longer with Americans any new subject, and because in other walks their science holds its own. Fertile of invention, and quick to seize new ideas, they are usually first in the field with useful inventions, such as the sewing-machine (to quote one only among a thousand), yet their workmanship is never equal to that of

England. America is striving to raise the quality of workmanship, and to manufacture within her own borders all kinds of things hitherto imported from Europe. To instance only one, carpets are now being largely made, and if English manufacturers do not yet know it, the fact will speedily be felt. In the struggle after science, good workmanship, and extended manufactures, one weak point has been keenly felt: America is profoundly ignorant of art. Further: she knows so much as to know her ignorance in this respect. Competition in all manufactures requiring artistic design (and what manufacture does not?) must result in failure if wanting in this initial necessity. Efforts are therefore now being made in the direction of art education with a purpose. This purpose is no other than the creation of a national school of designers who at all points shall be able to cope successfully with the artists of Vienna, Paris, and London. The movement has its beginning in Boston, where by good fortune one of the best English instructors in elementary art and design, Mr. Walter Smith, has been induced to settle. —English School Board Journal.

How It Works in New York.

The first case under the new plumbing law of New York came up in the Court of Special Sessions a few days ago. The defendant was John F. Crotty, of No. 232 East One Hundred and Twenty-First Street. The attorney who appeared in behalf of the Board of Health to urge the prosecution of Crotty stated that Crotty accepted the contract to do the plumbing for five houses at Alexander Avenue and One Hundred and Thirty-Fifth Street. The specifications approved by the Board of Health embraced basins properly trapped, house drains trapped at the sewer, and all traps ventilated by a pipe extending from the heel of this trap to the ventilating pipe running to and through the roof. Crotty, however, ran the pipe a short distance above the heel of one trap, and then terminated it, leaving the mouth open. He ran a branch waste-pipe into the room. The end of one of the large soil-pipes was left open in the cellar, the opening being concealed by a beam. There were also many other serious defects in the plumbing of the houses. The connections had been made with iron ferules instead of brass or copper. In one case Crotty had sawed off pieces of lead pipe and used these sections as ferules. Some of the joints were left open, the pipes being merely telescoped into each other. At some of the joints putty was used, and at others putty and lead. There was not a properly arranged and set-up trap or connection in the whole five houses. Crotty acknowledged that he had violated the law, but urged that it had been at the instigation of the owner, who had provided the material, and ordered him to proceed with the work just as he had done. He said that he had worked with all his might to rectify his bad work, and put the entire plumbing in the houses in first-class order. He declared that he would not violate the law again knowingly or willfully. Justice Bixby said that Crotty was guilty of an act that secretly threatened the health and lives of any persons who might occupy those houses. He had made up his mind to send Crotty to the penitentiary, and inflict the full penalty of the law in case of his conviction; but the sanitary inspector had supported Crotty's statement that he was doing all in his power to remedy the evil, and therefore he should impose a fine of fifty dollars. This leniency would not be shown to Crotty again if he engaged in any more "skin" work, and no other plumber need be encouraged to attempt deceit in the hope of avoiding severe punishment. Crotty paid his fine and was discharged from custody. An equally effective exposition of the methods of the Crottyes in every city would be a public benefit.—The Sanitary News.

Uses of the Steel Square.

EDITORS ARCHITECT: I was much interested in the article on finding the lengths and bevels of rafter, that was published in this column in the last number of your enterprising journal. As you have extended invitations several times to mechanics, asking them for communications in regard to improved methods of finding the length of rafters, I beg leave to submit to your approval the following method used by me in the Western States. Many of the mechanics in that section practice the rules given in all their roof work. While not giving the length with that same degree of exactness that would be found by the rule for finding the hypotenuse, two sides being given, still it is so near exact that the difference cannot be noticed, and I am sure it is a far quicker method than that old way.

I do not think that any simpler method can be given for finding the bevels at the heel and point of rafters than that explained in the issue of your journal referred to, so in this article I will deal with the length alone.

The most common width of buildings in California is 24 feet. And I propose to take that width for the practical test of my proposition. As you have given several ways by which the same result can be obtained, I will take up each of them and compare with mine.

Finding the length of the hypotenuse by the old rule, we obtain for a one-quarter pitch 13: 4.99, or, as near as it can be used on the square, 13 feet, 5 inches.

Allowing one inch to the foot and trying your second method, we find as the result 13 inches and 7-16 scant, or 13 feet, 5 inches. This is a very simple method, and when the rule is kept perfectly straight the results are very satisfactory.

By my way I simply multiply the width of the building by the decimal .56, $24 \times .56 = 13.44$, or as near as can be worked by the square 13 feet, 5 inches.

Let us try the same rule for a greater width—say 60 feet. By

finding the hypotenuse we find as near as can be used by the square, 33 feet, 6½ inches. By my method it would be $60 \times .56$, or 33.60, equal to 33 feet, 7 inches full. By this method the rafters in wide buildings are a little long. Thus, if the building is 52 feet wide, by the hypotenuse it would be 29 feet, 1 inch; my way it would be 29 feet, 1½ inches. I consider this an advantage, as it leaves the point of the rafter very slightly open.

For a one-third pitch I follow the same plan, only using the decimal .6. Unlike the decimal used for a quarter-pitch, the lengths obtained are a very small fraction short; as for instance: a rafter for a building 50 feet wide, by finding the hypotenuse, would be 36 feet, 1-16 of an inch. By my way, $50 \times .6 = 30$ feet. A slight difference, truly. If building is 48 feet wide, then by the first method we find 28 feet, 10 inches full; by my way, 28 feet, 9-8 inches. A little practice will enable the mechanic to allow just enough to make up for the slight difference, so that when rafters are put together the fit will be perfect.

The one-half pitch can be found in the same manner by using the decimal .71. Taking the 24-foot building, length of rafters by the hypotenuse we find 16 feet, 11½ inches; my way they would be 17 feet full. Again, building 60 feet wide, rafters by the first method would be 42 feet, 6½ inches; by my way $60 \times .71 = 42$ feet, 6 inches. By using this decimal, the length is so near practically correct that it may be used in all cases.

For a full pitch use the decimal 1.12, and as in the preceding mentioned pitch, and it will be found so near correct that it can be practically used in all cases.

It will be noticed that I have not made any allowance for projection of rafters over the plate. In this case gauge from the crowning side of your rafter the thickness of your projection; allow enough for the latter, and find the lower bevel according to the way you described in your last; measure the length of

your rafter from where this bevel crosses the gauge line.

A little practice will enable the mechanic to lay off a rafter in a very short time. I have used the above myself, and have no trouble whatever. If any of your readers will work out the lengths of rafters according to their own methods, and can show that the one I use has any defects, I will be pleased to hear from them through the columns of your journal. Trusting that the above will so meet with your appreciation that you will deem it worthy of your notice, I am, respectfully your well-wisher,

GEO. E. TURNER.

We thank our correspondent for the above communication, and trust to receive others from him. We have tried the several methods given, and as far as our limited time allowed, have found them practically correct. We will be pleased to receive communications from those who have time to demonstrate the propositions advanced upon their correctness. The columns of this journal are open to all, and we trust that more interest will be shown in the future by our mechanics in helping us build up the mechanical part of our journal.

Carpenters' Steel Square

AND ITS USES.

An Improved and Enlarged Edition of a Work of the same name, by Hodgson.

We are Agents, on the Pacific Coast, for the above work, and will send a copy to any address upon receipt of the publishers' price,

ONE DOLLAR.

Patent Paints.

The modern system of compounding paint has adapted itself to the mercenary spirit of the age, and patent mixtures are most exclusively of this class. The new invention of a mode of mixing a particular paint has its origin in the brains of some mediocre duffer in pigment, whose knowledge is so meager that when the compound is made (not being aware of its chemistry), regards it as an original mixture, and forthwith has it patented. A wise man in ancient times said there was "nothing new under the sun," but in these days, if there is nothing new, there is a plethora of evolution that makes new developments. These cheapened crude paints are manufactured for the market, and are sent in trade all over the country, with flaming color lists, which attract the eye of the uninitiated, who buy them because the colored cromo list represents a better paint, and on these proofs only are these patented paints sold everywhere.

The following is a sample of late patents for roofing paint issued August 29th, 1882:

Claim—"The herein described composition of matter to be used for painting roofs of houses and iron fences, consisting of benzine, sulphate of iron, oxide of iron, asphaltum varnish, oxid of lead, Japan, burnt umber, hard rubber, bisulphate of carbon and coal tar, in the proportion specified." Another issued May 16th, 1882: Claim—1. "The herein described paint for roofs, consisting of a mixture of coal tar, turpentine, sulphuric acid and a suitable pigment material, substantially as herein described. 2. A composition for painting roofs, consisting of a mixture of coal tar, turpentine, sulphuric acid and asphaltum, when mixed in the proportions as herein described." In the claim noted first, there is nothing really binding except the rubber and coal tar, which, when well diluted by the benzine, would render it a fleeting mixture. The pigments enumerated form a singular body-guard quite too too to need the superfluous support of asphalt varnish or Japan. It is very apparent that the vehicle to carry this heavy load of ingredients is too weak to bear the burden imposed, and when sublimated under a solar heat, the motor generated will cause the vehicle to travel like chaff, and even to fly before the wind from all metallic roofs, and be of little use on any other surface.

The latter claim quoted is even more vile, its binder consists of coal tar of no permanent value, and when attenuated with spirit of turpentine, will soon vanish under ordinary temperature. Another patentee claims to originate a coating mixture for all exterior surfaces, as the following will show: "I claim the improved process of covering exposed surfaces or walls, consisting in first coating said surfaces or walls with the described mixture of pulverized gypsum and glue, and then painting them substantially as described." All dope mixtures of this and similar nature have been in use for scores of years (without a patent), and many of them far superior to this one. And what is true of one is the virtue of all, they all need subsequent substantial painting. Their only use is to cheapen the work, and it generally does this effectually, for the painting that follows such primings is not homeogenous, and therefore they will not combine and form a solid permanent surface coating. There are no glue preparations for outside work that will stand like the oil, the pure linseed oil priming which dries firm, and is the foundation for all kind of work that needs to be honestly done. The cheap patent mixtures are generally for the use of contractors for doing work under price, and the work is patent, for it speaks for itself, it needs no advertising. The fictitious paste paints in vogue are made for the general public and country dealers. This class of goods are whole-

aled at figures that offer great inducement for buyers to stock their stores with them, being fully assured of much larger returns for their investment. Merchants who deal in these patent paints wink at the gullibility of the public buyer, and smile blandly over their profitable sales. Painters who have served an apprenticeship to their trade do not need these bogus paints for to do good, creditable work at painting. He needs only pure lead and oil, which forms the basis of all colors and shades needed in house-work. The modern chemist has not improved on these, and failing to do that, has often assisted and has made formulas of soluble mixtures and silicate pastes, as substitutes for reliable paints. There are wants it may in its purer silicate form serve to fill, but as a substitute for white lead it is a failure. It is claimed that the silicate combination with sulphate of baryta forms a fine white paint, yet the tendency to use water freely makes it unfit for wood, while it may answer for textile fabrics, card-board, etc. The sulphate of baryta is now very generally employed in the manufacture of cheap white paints ground in oil, and pass under a multitude of brands as pure white lead. As a white paint, it is inferior in every way as to body or covering quality, yet compounded with it makes a very serviceable paint, and may be used as a priming for all classes of cheap work. The so-called permanent white or artificial sulphate of baryta is one of the compounds of liquid glass, and under the name of blancfix, it is used by card-makers, paper stainers, and paper collar manufacturers to a very large extent. The advocates of these and other patent paints say with truth, that lead paints are more deleterious to health than the new compounds. Yet while we admit that, we do not concede any equality to liquid or soluble glass mixtures with the former. The artificial sulphate is obtained from native minerals, such as heavy spar, witherite or carbonate of baryta, and when manufactured produces a fine white pigment. This substitute, when mixed with dextrine, starch, or other binding material in connection with the liquid silicates of soda, offers a paint of a fire-proof nature, free from the odors of linseed oil, lead, or turpentine. A paint of this kind should be employed in painting the casings of elevator shafts and the wood-work of sleeping-cars; it would burn less rapidly if tinted with such a coat of fire-proof material, and thus give more time for the rescue of human life.

J. E. W. C.

A New Floor Covering.

A new and desirable papier maché process for covering floors is described as follows: The floor is thoroughly cleaned. The holes and cracks are then filled with paper putty, made by soaking newspapers in a paste made of wheat flour, water and ground alum, as follows: To one pound of flour add three quarts of water and a tablespoonful of ground alum, and mix thoroughly. The floor is then coated with this paste, and then a thickness of manilla or hardware paper is put on. If two layers are desired, a second covering of manilla paper is put on. This is allowed to dry thoroughly. The manilla paper is then covered with paste, and a layer of wall paper of any style or design desired is put on. After allowing this to thoroughly dry it is covered with two or more coats of sizing, made by dissolving one-half pound of white glue in two quarts of hot water. After this is allowed to dry, the surface is given one coat of "hard oil-finish varnish," which comes and is bought already prepared. This is allowed to dry thoroughly, when the floor is ready for use. The process is represented to be durable and cheap, and, besides taking the place of matting, carpet, oil-cloths or like covering, makes the floor air tight, and can be washed or scrubbed.

Prospects for the Season.

The inquiry, "What are the prospects for the season?" is repeated by thousands daily. All are anxious to learn the general condition of things at present concealed within the womb of the future, to be known only as brought forth and developed day after day. None are so wise as to be able to tell with certainty what is to be; but it is possible to judge of the future probabilities by the "signs of the times." Taking these as a guide, it is but reasonable to say that the future promises well, except so far as the general interests of the State may be adversely affected by insufficiency of rain. At present, the supply is unusually short, and unless, within the present or next succeeding months, increased quantities of rain descend, short crops and diminished expenditure in improvements are sure to follow.

Aside from this, all indications are favorable, and the general expression on all sides is, that a prosperous year is before us. As will be seen by our monthly reports, the number of building contracts let during the thirty days prior to January 15th far exceeded in number the report for the same period in 1882; and the report in present issue shows a large increase over our February report of the past year, and from all the facts within personal knowledge, and from information possessed, it is safe to predict, all things being square, an increase in building activities over the last past very prosperous year. In our November issue we expressed our fears of a "dry season," and regret that so far the rains, upon which the prosperity of the State so largely depends, have tallied with the indications upon which we based our surmises.

How Hinges and Other Articles are Polished.

Common articles of hardware, such as screw eyes, hinges, handles, etc., are polished by tumbling in a revolving barrel. The tumbler is charged about half full with the goods mixed with the material selected according to experience as best suited to do the work. Small scraps of iron, sand, and gravel with the attrition of the metal take away the roughness and put a moderately smooth surface to the work. Then charge the work into a tumbler partly filled with leather scrap or skivings cut fine, mixed with crocus or almost any fine polishing powder; after which it can be cleaned and brightened by an additional tumbling in sawdust and lime. The above is a general feature of this kind of work. Almost every manufacturer has some peculiar system of management suited to the special kind of work made. Some use oil or water, then boil the work in lime water, and again tumble in sawdust to dry and brighten. The black oxide of iron (anvil scales) is much used where it can be had. A little plumbago is sometimes thrown into the tumbler to give the work a shining black surface. A strong barrel or keg on trunnions, with a small door for charging, is most suitable for small, light work.

Much work that has a fine finish upon the surface is polished by boys, who handle the individual pieces against a large brush wheel with crocus or whiting. With a large wheel, the process is so quick that a boy will run through with many thousand pieces in a day.—*Scientific American*.

TWO ELEGANT RESIDENCES FOR SALE, located in prime localities. One with lot 137 feet 6 inches frontage, by 120 feet deep, \$75,000. The other, half 50 vara lot, with a fine residence in splendid order, \$18,000. The surroundings in both cases unexceptionable. Inquire at the office of this journal.

On House-Designing.—From an Old Work.

"No art without a genius will avail,
And parts without the help of art will fail."

"Rural architecture is not only one of the most pleasing of the useful sciences—termed the 'art of necessity,' in contradistinction to sculpture and painting—but it may be esteemed the most extensive in fancy and design, requiring great taste and good judgment to compose the parts of which it consists, either in respect to a regular, systematic uniformity, or a picturesque composition, and to harmonize and combine the different masses with the surrounding scenery, or local objects on the spot.

"To be successful in these, the architect must have a mind well stored with discrimination, and possess a fertile imagination as well as a playful fancy, to enable him to diversify the effect by light, shadow, and middle tints, and to preserve the analogy of design so as to produce a pleasing effect to the eye, either in its natural simplicity, or when more elegantly decked with ornaments.

"To design a country seat or suburban villa that will at all times attract attention and admiration, it is requisite that the architect should possess and exercise good taste as well as good judgment and inventive powers, which implies also a general perception of the whole design, the application of the several parts, and such as are the most fitting, beautiful, and appropriate. In order to accomplish this, the architect must possess a great knowledge of the various forms in architecture, and be enabled to bring them to his aid, as well as to diversify and have the art of applying and harmonizing these parts into pleasing effects. However simple a residence may be intended, it nevertheless admits of beauty as to form and proportion of parts; in fact, beauty becomes the grander when found in simpler forms, and is but seldom considered in connection with largeness and massiveness.

When we refer to the large and powerful horse, it is that he is a noble animal, although enjoying all the splendor of fine proportions and form, while the pony or lighter-framed roader become the object of special admiration for their special beauty. The eagle is spoken of as the majestic bird that soars above the howling storm, and floats upon tireless wings in mid-heaven, while the tiny songsters of the forest are admired and petted for the beauty of plumage and form, and the sweetness of their bird songs. The same applies to an edifice; we say that is a noble mansion, while this is a pretty cottage or a beautiful residence. In designing a dwelling, it does not depend upon or require a profusion of ornaments to constitute the beautiful, but often the reverse; for simplicity and taste, which are so difficult to obtain, are closely allied, and the most tasteless designs are generally the more expensive, from the great quantity and heavy mass of material required. In others, again, a redundancy of angles and grotesque forms, with which, in architectural phrase, some houses are overburdened, being crowded with inappropriate or unmeaning ornaments, is a sure indication of a low order of architectural imagination. Architects should bear in mind that whatever is ornamental should be useful. It is use alone that sanctifies expense."

Accepting the foregoing as the correct theory in house-designing—and such it is in fact—a large proportion of the habitations of mankind at the present time are architectural failures. One may stroll through the cities and towns of the present day, and find in the constructions of latter years as much to condemn as to admire in the display of architectural efforts; and in villages and country districts only here and there cottages and country residences entitled to consideration among the beautiful; and the question naturally arises, Why is it? Is the science

of architecture retrograding, and has time, experience, and the examples of ancient illustrations produced architectural degeneracy? Judging the matter by the manifest lack of architectural skill displayed by thousands who work their way into the practice of the profession, with but fractional and incidental parts of an architectural education, such a conclusion is not unreasonable; and it is in the fact that such men are liberally patronized by owners that the architecture of the present day is rendered the subject of so much adverse criticism; and it is to be regretted that the lesser class is so often preferred to those who so well and worthily fill the places made vacant by the passing away of the truly competent and qualified men of former years. That which, more than anything else, has stimulated and encouraged present seeming degeneracy, has been the penuriousness or false-economy notions of owners, in accepting the services of architectural pretenders at cheap rates, rather than pay trustworthy and competent men fair and just compensation for faithful and intelligent service.

One Reason why Plastering Cracks.

CHARGE THE FAULT WHERE IT BELONGS.

Often enough, without doubt, the masons are in fault, but far oftener plastering cracks and falls because the carpenter has failed in his duty. Even poor mortar will remain unbroken upon a rigid wall, but the best possible composition of lime, sand, and hair will quail and crumble before the shrinking of sills and floor joists, the warping and twisting of studs, and the failure of furrings to hold their place. As a coat of plastering is not absolutely inelastic, the slight bending of joists in upper floors is not sure to cause visible cracks in the ceiling below, but the settling of any part of a partition will certainly be followed by zigzag cracks that usually indicate by their course where the weak spot is to be found.

An almost universal cause of these ugly blemishes is the joining of the masonry and wood-work, as in the case of outer brick and stone walls inclosing partitions of wood, or where chimneys pass up through the frame around them. If properly constructed and resting upon solid foundations, the brick walls and chimneys are immovable. Saving a very slight settlement when they are carried up high and rapidly, they never change; but the wood that joins them, unless thoroughly seasoned—which happens "almost never"—keeps steadily changing its size and shape for a year or two at least, and possibly for a score of years.

A simple illustration of this incompatibility of wood with brick and stone work will suggest to thoughtful builders the difficulties and dangers from this source. By the ordinary modes of construction the outer ends of the joists and floor beams of a brick building rest in the walls and never move; the inner ends, if the building is too wide to be spanned by a single length, rest upon cross beams supported by posts and studs. Even if these cross sills and beams are partially seasoned when the walls are plastered, age and artificial heat will cause a considerable shrinkage in their depth, and this, of course, lets the inner ends of the partition walls, especially in the upper stories, down towards the cellar. It may be only by the smallest fraction of an inch, not enough to visibly affect the floors or wood finish, but it is easy to understand how much a settlement must affect the easily fractured sheet of mortar. The greater the number of stories—that is, the greater the aggregate depth of the horizontal timbers used for support—the greater will be the depression of the upper floors in the central parts of the building and the wider will the cracks yawn upon the walls. When the joists are laid upon

a beam passing wholly beneath them, the allowance for shrinkage must be proportionately greater.

As there is no appreciable shrinkage in the length of straight-grained timber, similar results follow from an unscientific combination of horizontal timbers with the vertical studs and posts. Thus, if the outside studding extends the entire height of the walls, resting perhaps on a thin sill lying flatly upon the stone underpinning, while the partition studs are cut off at each story, and stand upon deep joists or beams, it is also inevitable that the partitions shall settle and spring to such a degree as to tear the plastering, and afterwards wrinkle the paper that is put on to cover the cracks. As to chimneys, it is difficult to find a frame house, however carefully built, in which they are not surrounded by cracks running out like branches from a dead tree, and these cracks usually run in such directions that they would appear to have been caused by raising the chimney slightly after the house was built, which is precisely the case; relatively to the house the chimney does rise very slowly until all the joists, sills, and horizontal beams have shrunk to their smallest dimensions, and have finished sagging and bending around the hearths and fireplaces.—*The Builder*.

Light Basements or Cellars.

Accepting the invitation of Messrs. P. H. Jackson & Co., we made personal examination of Mr. Somer's new building, on Market street, opposite Dupont, and were not disappointed in finding a handsomely lighted cellar, in which, although its length is 165 feet, we found fully one-half of the entire space sufficiently illuminated during working hours for all mechanical purposes. This is attained by the omission of all obstructing brick piers at front wall, and the introduction of ample sidewalk lights, of Hyatt's patent, for which Messrs. Jackson & Co. are the agents, the structure being further sustained over the openings in front wall by the use of the Franklin girder, which, for strength and utility, will bear the severest criticism.

The building throughout reflects great credit upon the architect, Mr. Moore, who has displayed good architectural abilities in its arrangement, construction, and lighting. There is not a poorly lighted spot within the walls in either story, while in strength of construction it is faultless. The good judgment displayed in not overburdening the roof with unnecessarily heavy, clumsy timbers is commendable, and some of the older heads in the profession, who conceive the illogical notion that great bulk of material in the construction of roofs is a necessity, will find the illustration a sufficiently strong roof for all practical purposes, even that of sustaining four feet of snow, should that quantity ever happen to fall in San Francisco. It is old fogeyism exemplified to use more material than the purposes of use require for any purpose.

Saw-Mill Directory.

We have received from the N. W. Lumberman a copy of its Saw-mill edition. It contains 212 pages, giving a complete list of the saw-mills in operation throughout the United States. Pennsylvania heads the list with 1,291. Arizona has the least—8. In the United States there are a total of 15,020. Some idea of the amount of work done by N. W. Lumberman in its compilation of the above number of mills may be had by saying that it gives the number of mills in each county, in each State, with the name of the owner and the kind of wood sawed by the mill. We will take pleasure in showing this splendid edition to any one who calls. No extra price is asked. Subscribe for one year, and once during that time at least you get a copy such as the one on our table.

Ecole des Beaux Arts.*

Gentlemen—Since the interest of the Chapter has been aroused in reference to architectural education, and as we are all gradually awakening to the growing necessity of possessing in our midst a school for the purpose of educating our young men who desire to devote themselves to the study and practice of our profession, it will be useful and interesting to review and study carefully the methods of instruction pursued in different countries; to select from each what is conducive to improvement in architectural studies, as far as it can be applicable to our own limited means and numbers, and to discard that which we consider useless or injurious.

Among the art schools which are justly celebrated, the *Ecole des Beaux Arts* of Paris occupies a prominent place, and its architectural department will form the subject of my address.

The ultimate object of architecture is to erect buildings which are not only well and solidly put up, conveniently disposed for the objects for which they were intended, but they must also produce an agreeable impression upon the spectator, and conform with our ideas of the beautiful.

In order to attain these desiderata, the architect must be well acquainted with mathematical and natural sciences; he must possess a thorough knowledge of the properties of the materials employed—their qualities and cost; he must be quick in designing, skilled in the use of the pencil and the brush; he must also be conversant with the history and literature of the civilized world, in order to be acquainted with the styles of the different epochs and nations, and with the æsthetical and constructive reasons which led to the formation of such styles.

Therefore, a school of architecture, in order to be complete, must be so arranged as to afford the student facilities to obtain a knowledge in all the branches which I have just mentioned, and the Paris School of Fine Arts admirably fulfills these requirements.

Founded in the latter part of the seventeenth century, under the reign of Louis XIV., it has undergone several changes as the necessities of the times demanded. It has increased to such a degree, and its fame has become so great, that all the art schools in France have gradually become simply preparatory schools to this great institution, which numbers about twelve hundred students, four hundred of whom are architects.

Placed under the generous patronage of the Department of Fine Arts, it is liberally endowed with everything which can improve the artistic taste of the student, with large and spacious studios, handsome courtyards containing statuary, fragments of architecture, fountains, etc., museums of copies of the most celebrated works of art, both of painting and of sculpture, full-size columns and entablatures of the temples of Greece and Rome, entire fronts of the castles of the Renaissance—in fact, with everything calculated to inspire the youthful mind with noble examples of true art. It possesses a library second to none in artistic works, old etchings, photographs, coins, medals, etc.; and in the immediate neighborhood the student can avail himself of the vast collections of Louvre Museum.

Pupils are admitted to the Section of Architecture of the *Ecole des Beaux Arts* upon passing a successful examination in mathematics and history, and in ornamental or free-hand drawing; they must also be sufficiently well acquainted with the principles of architecture to enable them to make a finished sketch in twelve hours upon a given subject, such a sketch must bear evidence of a general knowledge of proportions, skillful drawing, and adaptability to the subject proposed. The school is free to all, Frenchmen and foreigners alike, without any fees for lec-

tures or examinations, or expenses of any kind. Once admitted, the student may take part in all the competitive designs and follow the different courses, which include Analytical Geometry, Surveying, Descriptive Geometry, Perspective, Stone-cutting, Chemistry, Physics, History, and lastly, strength of materials, theoretical and practical construction.

The pupils select their studios, at the head of which is a professor who comes two or three times a week to direct them in their work and advise them in reference to their productions. The studios are not divided in accordance with the advancement of the pupils in classes, but each contains among its members from the mere beginner to the skilled and already well-known student endeavoring to obtain that highest honor in the gift of the Academy of Fine Arts, namely, the Prize of Rome. This system of bringing together students in different degrees of advancement affords opportunities for considerable interchange of knowledge and ideas.

The students are divided into two classes—the first and second class. They enter the second class upon their passing the necessary examinations for admission. In order to become a member of the first class, the student must have passed all his examinations in the scientific courses upon all the subjects I have already mentioned, and he must have obtained six honorable mentions in the bi-monthly competitive designs, the minimum time that can be passed in the second class before promotion to the first class being two years. The first class devotes itself entirely to competitions of the most important character, and, necessarily, of more artistic value and merit.

The manner of conducting these competitions is, I believe, peculiar to this school, and it is to their fairness, and the emulation which they encourage among the students that this school owes its success. Once every two months the students assemble in a building adapted for that purpose, containing a large number of cells. Each student signs his name on a register, and receives in turn a copy of the subject of competition—the programme, as it is called. Then he retires to the cell bearing his number. There he has twelve hours to finish a sketch of the design answering the requirements of the programme. A tracing of the sketch is taken, and the original left in the hands of the secretary, by whom it is filed. The student has two months to study up his idea and to produce a finished design, in the production of which he is greatly aided by the hints and suggestions of his professor. Upon a certain day at the end of the two months, all the designs are taken to the exhibition hall and hung up for public inspection. The next day the jury, composed of all the professors and other leading architects of Paris, assembles. The original sketches having been attached to the respective designs, the jury begin by eliminating all the productions which have not retained the main features of the original idea, and rewards are given to the most meritorious of the remaining designs, the number of rewards not being limited except by the merit of the compositions.

In addition to the architectural competitions and examinations in the scientific department, numerous free-hand drawings from the cast are required from the student.

The greatest liberty is given to the pupils to enable them to advance with rapidity in their studies. There is no compulsion to attend the lectures, no roll-call at the studios, every one follows his own inclinations, and every opportunity is given to the bright and studious to push ahead without interfering with their less fortunate and talented school-mates; by such a system every one feels a certain responsibility and learns to take pride in his own achievements. The frequent competitions and examinations keep the young artists constantly on the alert, and al-

though the rapid advancement of some may discourage the indifferent or incapable ones, it presents a continual incentive to the ambitious and studious.

The most important of all the competitions and the only one to which foreigners are not admitted is the annual competition for the *Grand Prix de Rome*, which entitles the successful candidate to a pension for four years from the Government, with the condition of his studying his art abroad, mostly in Greece and Italy, and of sending every year the product and results of his work. Most of the eminent French architects, painters, and sculptors have obtained this prize.

The sections of painting and sculpture in the school are arranged on a similar basis as that of architecture.

The School of Fine Arts has been very much criticised for not even attempting to teach the young architect the actual practice of his profession. These criticisms are, in my opinion, unfounded. The real practice of architecture cannot be taught in schools, but must be acquired slowly by personal observation and experience, and this institution is so arranged that, without materially interfering with his studies, the student can readily accept positions from the government as sub-inspectors in public buildings, or situations as assistant to the numerous architects who are always glad to obtain the services of skillful draughtsmen understanding thoroughly the theory of construction and its necessary calculations.

I have endeavored to give as briefly as possible a general idea of the workings of the section of architecture of the *Ecole des Beaux Arts* of Paris, whose object has always been to give full scope to the individuality and originality of each of its members, to afford them every opportunity to acquire the knowledge of all that may interest the architect, and by a perfect system of examinations and competitions to reward the talented and industrious, and to encourage all in the desire of becoming worthy members of their profession.

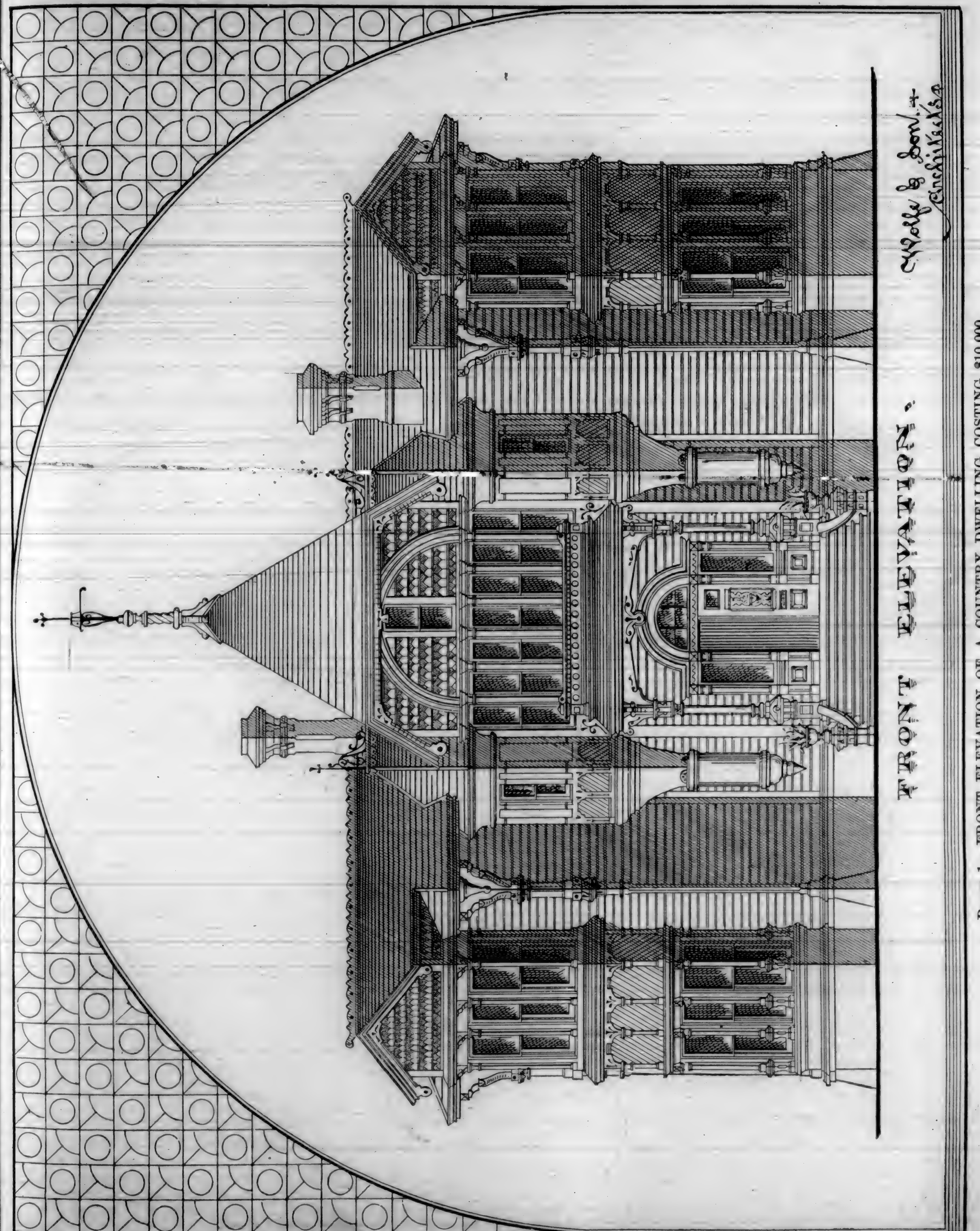
ALBERT PISSIS.

Finical Finish.

If mechanics generally realized how much labor is lost in the mere ornamentation of useful tools, they would discourage it in their own practice, and in their patronage of the manufacturers. There is a grateful sense of beauty in a well-finished tool, but to the mechanical eye this finish is more in good proportion and adaptability to use than in meretricious ornamentation.

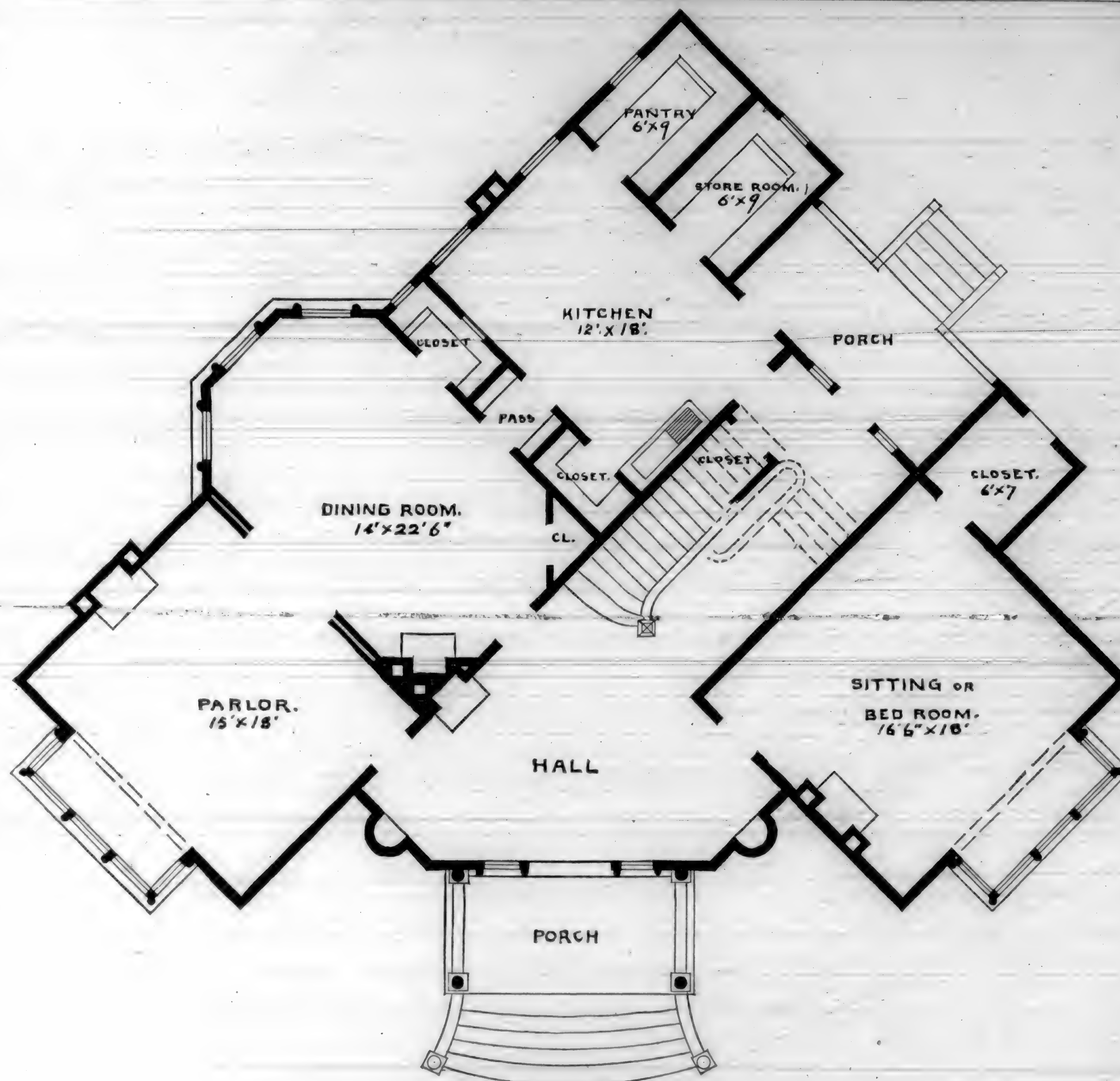
There is much time wasted in the shop by foolish experimenting to ascertain how much of fantastic "gigging" can be crowded in a small space on a bench implement. A simple scratch awl, that should be at best but a rod of quarter-inch octagon Stubbs' steel, tempered and sharpened, is sometimes so crowded with filed facets and clamp-turned beadings as to become a most unhandy tool.

Sometimes more glaring substitutions of finical finish for useful form are noticed. The employment of the knurled-headed screw, or the knurled nut, for a thumb screw, or "butterfly" head screw and nut, is very common. The knurled head or nut can be formed in the lathe, and presents an elegant appearance, and it may readily be turned off a bar or rod without the previous work of forging. But when done, its entire leverage depends upon the squeezing power of the thumb and forefinger, the corrugated edge of the nut or head bedded in the tender flesh of the balls of the finger and thumb. The butterfly thumb nut must be forged, but this is no objection when these nuts and screws may be bought by the gross, drop-forged, and in just the condition for final finish. These nuts and heads are elegant and easy to handle, and mechanically considered, are quite as ornamental as the knurled nuts.—*Scientific American*.



FRONT ELEVATION.
COUNTRY DWELLING COSTING \$10,000.

* Speech delivered before San Francisco Chapter of Architects, by Albert Pissis, Esq., member Ecole des Beaux Arts and S. F. C. A. I. A.



FIRST FLOOR PLAN

PLATE 2.—PLAN OF COUNTRY DWELLING COSTING \$10,000.

All Over and Around the Country.

In the issues of January 20th and 27th, the *American Machinist* has given two pages in each number, of letters from leading manufacturers of the country, embracing every article connected with the mechanical trades. From the letters we should judge that an unusual steady activity is manifested from every section of the country, in regard to the supply of orders on hand and those sure to come in the future. As a rule, prices are not as high as they might be, but every one seems to be satisfied. The plain, practical, common-sense, "to the point" style of writing of the editors of the *Machinist*, has evidently taught their correspondents to follow

their example, as all the communications are concise, and in as few words as possible explain the true state of the market. We would advise all our machinists to send after copies of the above dates, or better still, \$3.00 for a year's subscription.

For Fence Posts.

A writer in an exchange says: "I discovered many years ago that wood could be made to last longer than iron in the ground, but thought the process so simple that it was not well to make a stir about it. I would as soon have poplar, basswood, or ash as any other kind of timber for fence posts. I have taken out basswood posts

after having been set seven years that were as sound when taken out as when first put in the ground. Time and weather seemed to have no effect on them. The posts can be prepared for less than two cents apiece. This is the recipe: Take boiled linseed oil and stir in pulverized coal to the consistency of paint. Put a coat of this over the timber, and there is not a man that will live to see it rot."

Indexed Atlas of the World.

Beautifully bound in half morocco. This splendid work is only sold by subscription. The edition is now almost exhausted. But one copy remains. We will forward it to any address upon receipt of \$35.

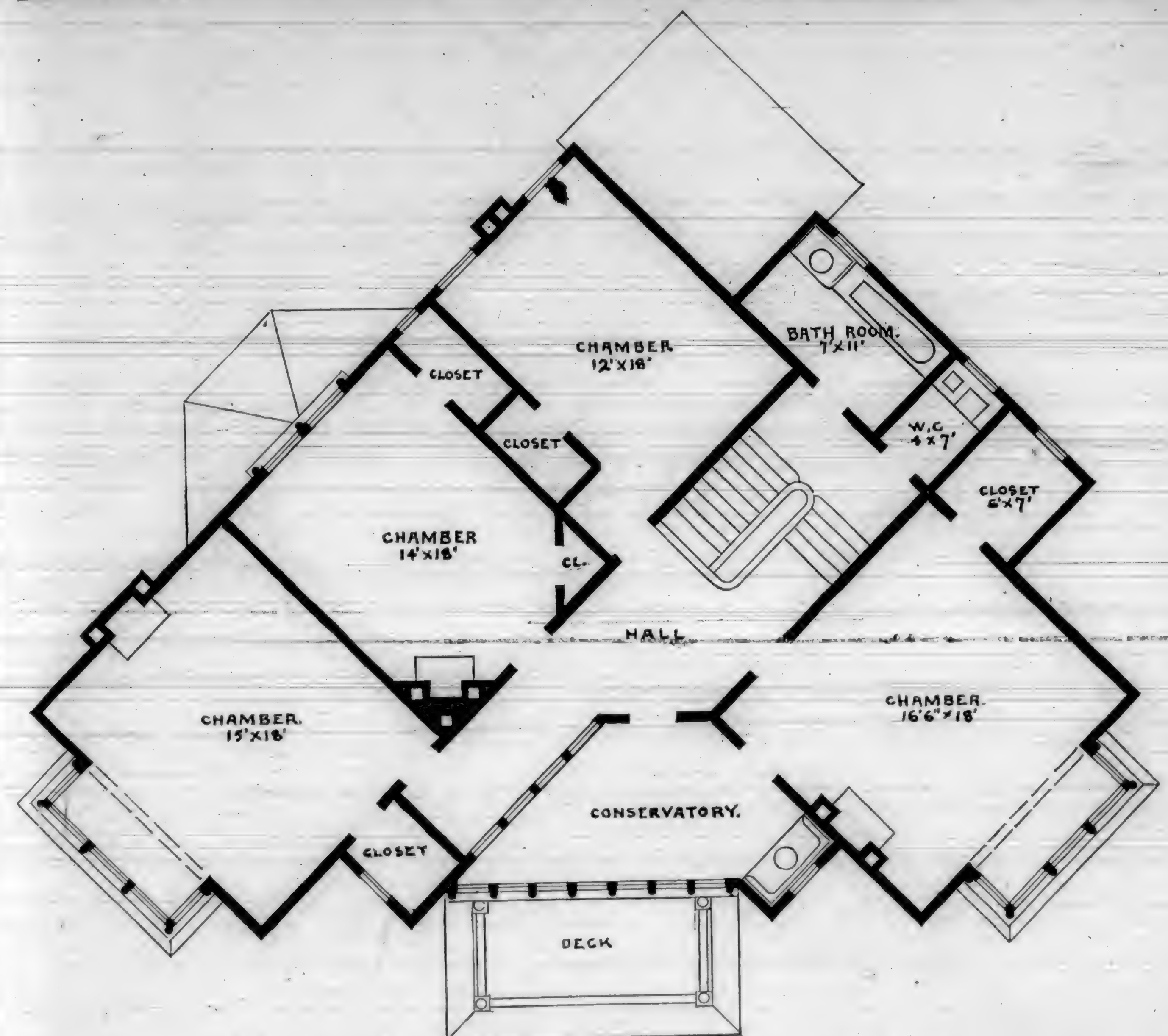


PLATE 3.—SECOND STORY PLAN OF COUNTRY DWELLING COSTING \$10,000.

Queen Anne Houses.

There is no distinct American architecture at present, but the country is fast approaching that development which will produce it. Our habits and ways of living are so much like those of the people of Europe that we have adopted their styles, and we show here every feature of the different houses of the old country mixed up together. All of these styles are now in a grinding state, and just as people from all of the nations of Europe are being ground up into characteristic Americans by our ideas and surroundings, so will in time these different styles, affected by our habits, ideas, and surroundings, grind out into something new, distinctively American. As it is, the American dwellings are modeled after the European villas. Abroad this style is used only by the wealthy, but we have modified it, and have adapted it to the residences of the poor as well. The architecture of a country or an age is the outgrowth of the

necessities and habits of the time. You must consider the surroundings before you build. A house that will look well on a hill surrounded by trees will not suit at all a location on a plain; and a villa in the country should be radically different from a structure located amid the bricks and mortar of a large city. The habits of the people demand different houses now than they did one hundred years ago; and of all the absurdities of modern house-building this attempt to push in the Queen Anne style of 1700 is the worst. The Queen Anne houses are not at all adapted to the times, and their absurdity has already begun to appear. In New York the style has fallen into discredit, and it will soon be as universally distasteful as it was a year ago universally popular. The Queen Anne houses will become a drug in the market, and they will depreciate the property on which they are located. They are not healthy. Their ceilings are low, and their interiors so constructed as to be ill ventilated and poisonously unhealthy.

The laws of hygiene were comparatively unknown when Queen Anne lived, and the economy of warming the houses was a great consideration. Their huge fireplaces acted as ventilators, and the homes of that day were not as badly ventilated as their aped counterparts of the present. Had they possessed furnaces, gas, and plate-glass, they would never have lived in such houses. The whole style is against the dictates of common sense. The houses are a disgrace to the intelligence and taste of the country, and their costly diamond-shaped windows are only a phase of the craze for the old and ugly which has swept over America. In two years hence the style will be discontinued in the smaller cities as it now is in the larger.—*Cleveland Leader*.

The new city hall in Philadelphia contains 57,000,000 bricks, and is the largest building in the country, occupying considerable more ground than the Capitol at Washington.