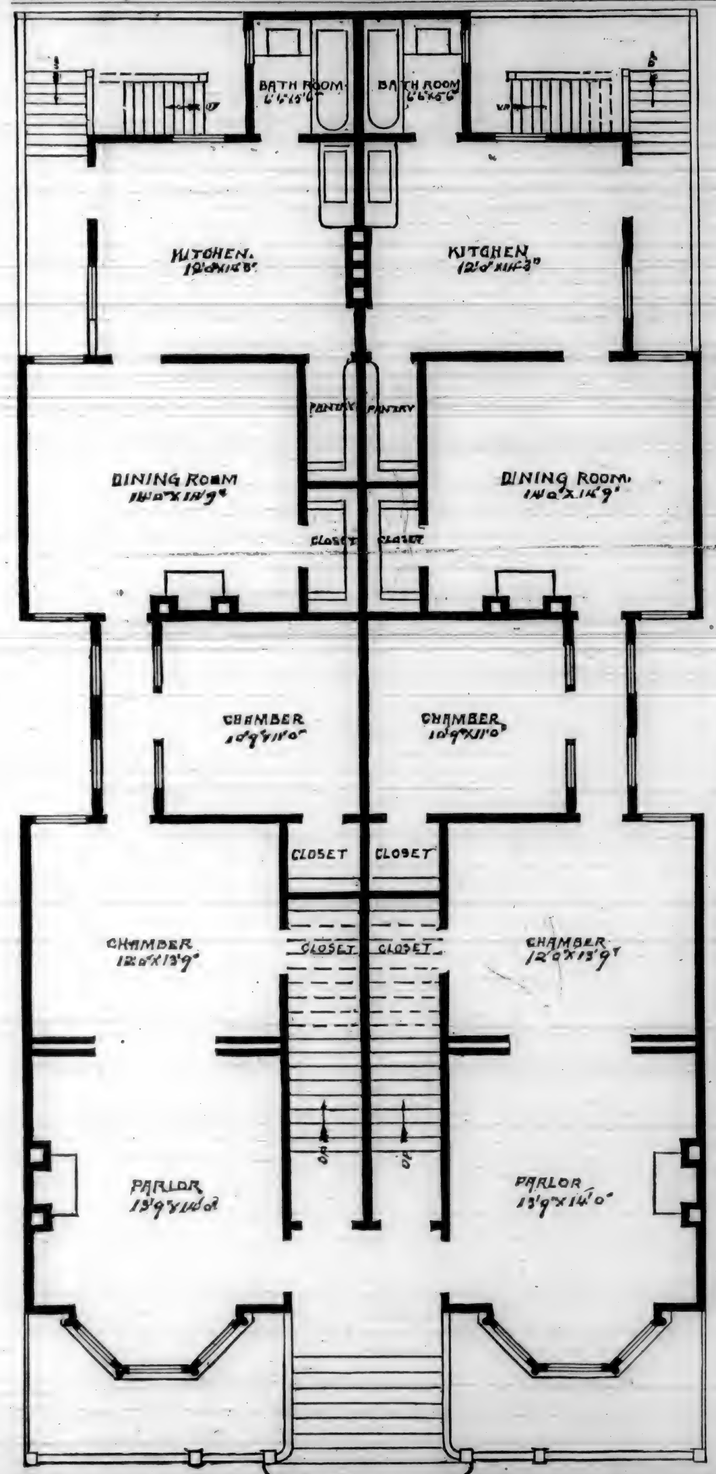


PLATE 2.—PLAN OF FIRST FLOOR 6-FLAT DWELLING. See "Our Illustrations."

Musty Smells in Untenanted Houses.

It is a cause of much wonder among those who do not study the subject, why a comparatively new house, after being in use a short time and then left vacant a few weeks, should be so impregnated with bad smells and foul atmosphere as not to be endurable for habitation until the house has been thoroughly ventilated.

A little study will lead one to soon arrive at the reason for such musty odors. The parties last inhabitating the house may have left it in perfect order according to their ideas of cleanliness; as far as outward appearance was concerned, nothing could be detected to lead any one to suppose that the *musty smell generator* would soon be in running order.

We can best illustrate the *modus operandi* of these *generators* by the following description as furnished us by the owner of the premises: "The house had only been built a little more than a year. At the expiration of that time it was to undergo a thorough change. A servant was left to sweep out and clean up generally. After a thorough (?) sweeping, the windows were washed and the almost muddy water dumped into the kitchen sink instead of being thrown into the yard hopper. The shelves in the pantry were washed, and the water also emptied in the sink. Instead of letting a bountiful supply of water run, that the trap might be thoroughly cleansed of filth, the girl simply used the cloth in brushing the water down the sink and forcing the thicker portions through the strainer.

The same thing was done up-stairs; windows and shelves washed and the dirty water dumped into the wash basin, a cloth used to wipe the basin clean, and all was right. We prefer not to put in print what took place in the bath-room. To all appearance the house looked clean. The servant went through the house, shut and locked every window and left the death-dealing *musty smell generators at work.* My advice to leave the windows open were not regarded, and as the time would not be up for several days for me to take possession of the premises to make the necessary alterations, I had no authority to leave the windows open.

Of course the gas fiend was soon at work The filth left in the traps, the dirt on the shelves, wet and but half washed, etc., soon began to putrefy; the absence completely of fresh air from the windows being closed, helped on the decaying mass, and a lively ferment took place. With such generators of musty and foul vapors, is it any wonder that in a short time the house was filled with a noxious atmosphere." We are sure, when we visited that house some days afterwards, even after sending a boy the day beforehand to open the windows all through the house, that we were met with, on opening the door, a smell that put us in mind of a certain story where a river had to be turned from its course in order to purify certain stables.

Landlords would be well paid after a tenant has left a house, to immediately give it a thorough sweeping; allow the water to run several minutes in all the sinks, basins, and water-closets; if there be a cellar, see that not a particle of vegetable matter is left around; leave a window in every room open; scatter a little chloride of lime in the cellar, and place some in a saucer in the bath-room and kitchen. It will take you but a few hours to follow these suggestions, and only a few dimes' worth of materials to carry them out. Your house, even if idle for quite a time, will be sweet and wholesome, and the little labor you have spent will be well rewarded by the praises of your new tenants upon the nice clean house they have secured.

It is estimated that there are about 6,000,000 feet of lumber used in the manufacture of toys in the United States yearly.

Interesting Information About Saws.

On few points connected with wood conversion is there more difference of opinion than the question of speeds. Commencing first with circular saws for ripping, for sawing soft and medium woods, a speed of 9,000 feet traverse per minute at the points of the teeth may be taken as a standard speed; if hard wood has to be sawn, this should be reduced to about 7,500 feet per minute, and with very hard wood 6,000 feet per minute will be found sufficient. The shape, number, pitch, and set of the saw teeth being modified to suit the nature of the wood.

In one experiment I put a circular saw, 30 inch diameter and 12 gauge, on a spindle and gradually increased the speed to between 12,000 feet and 13,000 feet per minute, when it became wavy and pliant and ran out of truth. It therefore follows that, not only is the extra speed entirely unnecessary, but it is positively detrimental, as more power is consumed, more heat engendered in the bearings, spindle, and saw-plate; extra lubrication is therefore required, and the belts deteriorate more rapidly. I should, however, prefer to err on the side of high speeds instead of low, as this necessitates perfect workmanship and finish not always found in these days of so-called "cheap" machinery.

The speed of circular saws for cross-cutting can be increased with advantage 1,000 feet beyond those used for ripping, say to 10,000 feet per minute. The difference in the cutting action of the two kinds of saw teeth will readily account for the necessity of this increase in speed. In the case of a ripping saw the action is chiefly a splitting one, the saw teeth acting like a series of small wedges, driven into and separating the longitudinal fibers of the wood, while the cross-cutting saws the fiber of the wood has to be severed across the grain, is comparatively unyielding, and the teeth of the saw meet with much more resistance. It is found necessary to make the teeth considerably more upright and more acute or lancet-shaped in their form than for cutting with the grain. Although the subject is one of great interest, time and space forbids extended remarks, and I pass to band-saws.

Owing to improvements in the manufacture of the blades and the machines themselves, the speeds of which it is safe to run band-saws has increased considerably of late years. On machines in which the saw-wheels are of small diameter, say below 36 inches, and where the arc of contact of the saw on the wheels is necessarily more acute, the speed of the saw-blade should not much exceed 4,500 feet per minute. With saw-wheels above 39 inch diameter this speed may be safely increased up to 6,000 feet per minute; this is, however, on the supposition that the saw-blades are of good quality, and that the top saw-wheel is mounted elastically, and that the machine generally is well designed and made. The proper construction and use of saws involves many important and scientific points that are unfortunately much neglected, resulting in an enormous waste of material and power.—*Mechanical World (English.)*

Any one who will call to mind the condition of the permanent way of our railways say ten or twelve years back cannot fail to be struck with the great improvement since introduced in the matter of the quality of the sleepers laid down. The waney sleepers have almost departed, and not only are the cubical contents of the modern sleepers greatly in excess of those which they superseded, but the number of them used in a mile of track has been enormously increased.

The demand for California redwood in the East is increasing. It takes a good finish, and presents a good effect.

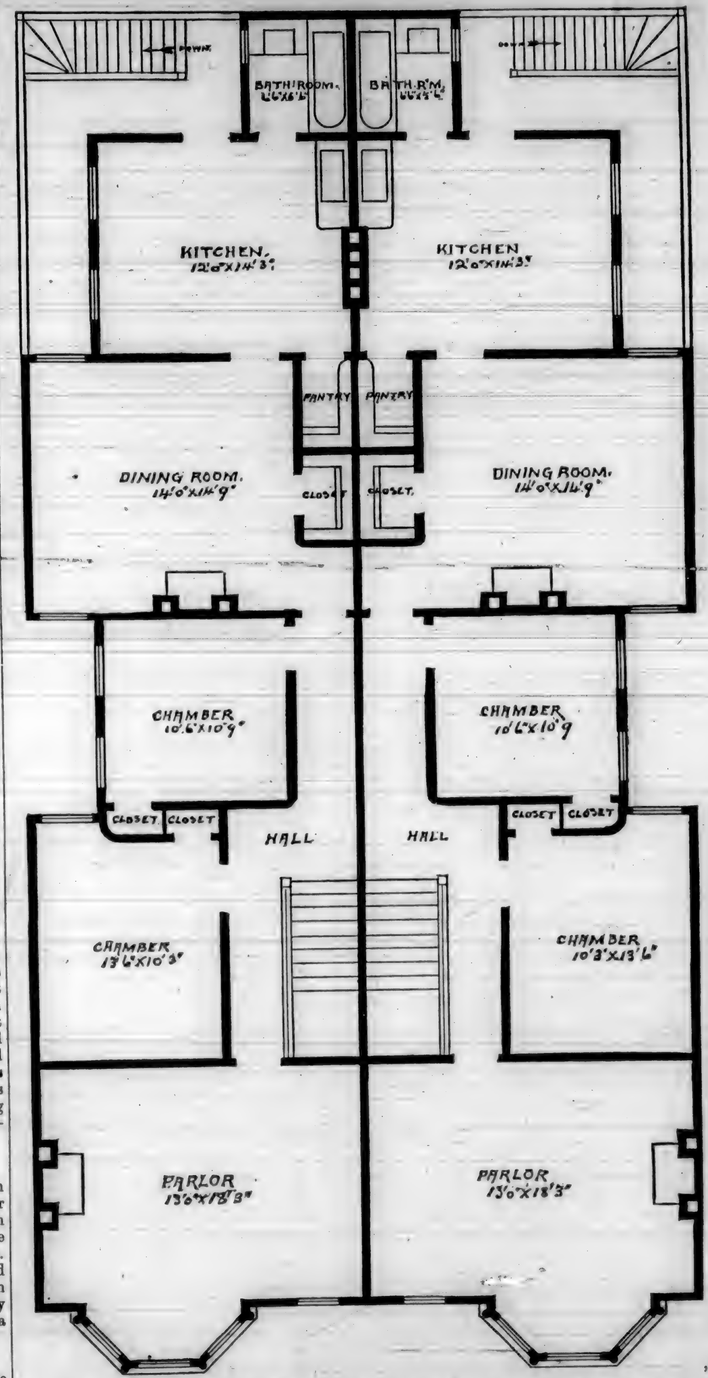


PLATE 3.—PLAN OF SECOND FLOOR, 6-FLAT DWELLING. See "Our Illustrations."

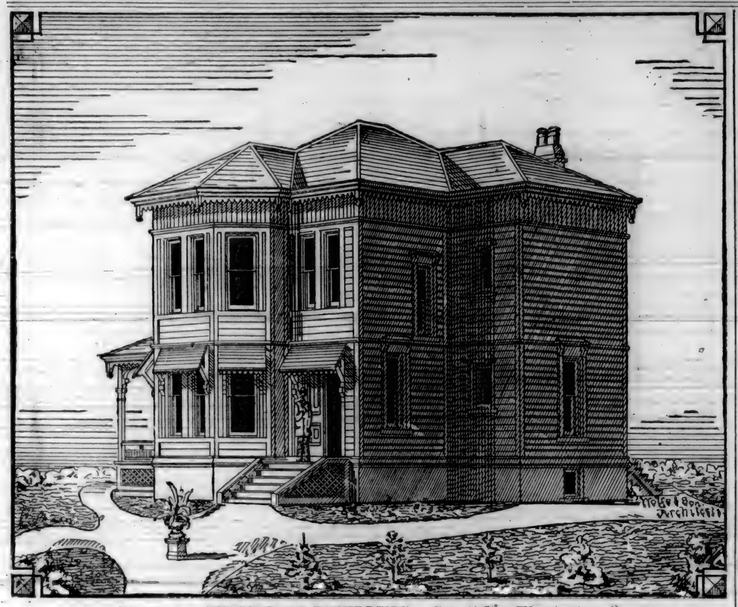


PLATE 4.—SUBURBAN DWELLING. See "Our Illustrations."

American Pyramids.

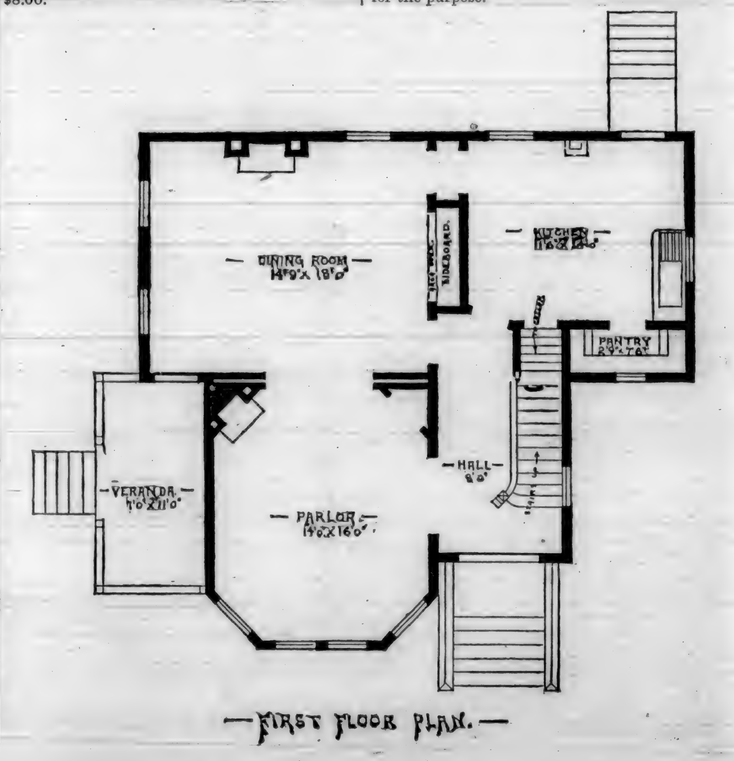
It is the generally accepted belief that the Egyptian pyramids are the only structures of the kind in the world that have any magnitude, and their existence in the Mediterranean region, that was for centuries the focus of civilization, has made them famous throughout the world. It is nevertheless true that the American continent contains at least one such monument of civilization probably as ancient as that of Egypt, and related to it ethnologically, which far surpasses the famous pyramids of that wonderful country. The great pyramid of Cholula, in Central America, is undoubtly one of the greatest constructions ever reared by human hands. Even in its present ruined condition, it is 160 feet high, 1,400 feet square at the base, and covers an area of 45 acres. The largest of the Egyptian pyramid—that of Cheops—is 461 feet high, and the length of its base 476 feet, and it covers 11 acres of ground. In comparison, some conception of the magnitude of the American structure may be formed.—*The Manufacturer and Builder.*

Miter-Boxes. $20 Competition.

In another column we publish a communication from Mr. George E. Turner, offering $10 for the best article on miter-boxes, and the use of the square in connection therewith. We will add $10 to the above, thus making a premium of $20. His offer is limited strictly to mechanics, and is open to them in every part of the country.

We sincerely thank Mr. Turner for his generous offer; he has been in the State but a short time, and has already shown himself as one well worthy of recognition by his fellow-mechanics. We trust that in the future the mechanics on this coast will emulate Mr. T.'s example, and send us articles of practical information for publication.

That all may have a chance to gain the above premium, the offer will remain open for three months.



—FIRST FLOOR PLAN.—

Steel Square and its Uses.

BY F. T. HODGSON.

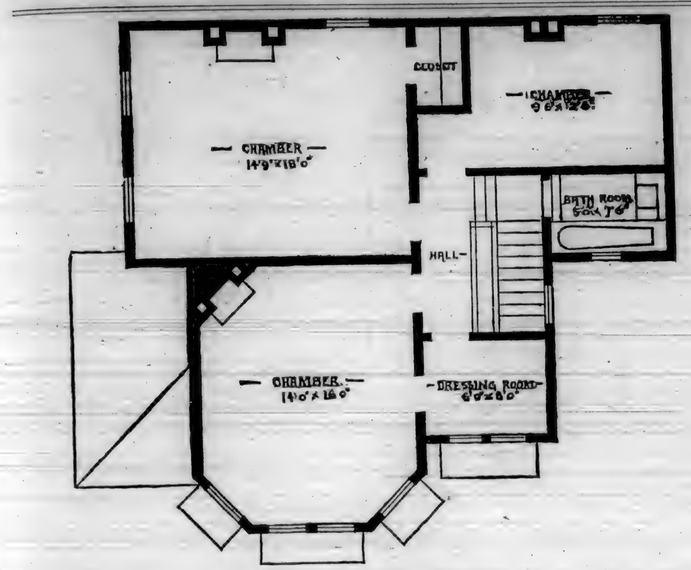
We have just received a large consignment of this valuable work by the above author. It has been enlarged, and now contains about 100 pages. Many new rules and methods are given that have not formerly appeared in print. The price is fixed at $1.00. The old edition is almost completely exhausted, and no more will be printed. We have only a few left of the smaller edition. Price 75 cents.

The author takes a just pride in desiring a copy to be in the hands of every mechanic in the United States. In order that all may possess themselves of this work we will send the CALIFORNIA ARCHITECT AND BUILDING NEWS for one year, and one copy of the enlarged edition of the STEEL SQUARE AND ITS USES, for the sum of $2.50.

The Value of Trees.

The Aztecs, before the conquest of Mexico by the Spaniards, recognized the value of trees to a country for the maintenance of moisture and the promotion of irrigation. Prescott, in his history, tells us that their law contained seven penalties against the destruction of the woods, which they deemed necessary to secure the means of maintaining irrigating canals.

An important alteration has been effected in respect to the selection of figured woods for pianoforte making. Italian walnut, once so universally used, has been to a great extent superseded by rosewood, and many other woods are now employed which were never before used for the purpose.



—SECOND FLOOR PLAN.—

American Architecture and Plumbing Seen Through English Eyes.

American architecture and plumbing were highly praised at a recent meeting of the Royal Institute of British Architects. The author of the paper, A. J. Gale, arrived in the country early last summer, and spent some time in the study of representative buildings in the principal cities. Mr. Gale came prepared to find American work much inferior to English; it is evident from his paper that he returned to England with a different impression. What was, perhaps, most surprising to him was the wonderful completeness of American houses and the elaborateness of their construction. He found American clients willing to pay for any comfort that could be procured.

In this city he devoted much attention to the work of the Board of Health and the improved tenement houses. The apartment houses were also a marked feature of the city. They were enormous blocks of buildings seven or eight stories high, and since 1879–80 had been strictly regulated by the New York Board of Health, some particulars of which organization were given. All classes of apartments houses were subject to the same regulations, and were constructed on much the same plans and lines, but in some a great amount of luxury was afforded the tenants. The entrance halls opened upon elevators with cushioned seats, and running very easily, and the buildings surrounded a court-yard, covered in the best examples. The walls were of brick, and the roofs of iron covered with slates, the staircases of iron, and the floors of iron bedded in concrete, and laid with two thicknesses of boords. The finishing of all woodwork was excellent, and the joinery was superb, and constructed in a great variety of woods. Some of these dwellings were erected by mutual associations, who thus preserved some power of choice of tenants, and in many cases the choice of apartments were put up to auction. During the past year the plumbing arrangements had been regulated by the Board of Health, and the rules were fairly representative of American public opinion on the matter. A curious feature was that the soil-pipe was usually of iron, coated inside and out with enamel or coal-tar pitch. The use of iron allowed the pipes to be suspended from the cellar roof. Lead was condemned as being less smooth, more liable to corrosion, and less easy of jointing. Indeed there was a general thoroughness about the use of iron pipes which was in advance of English practice.

The ventilation of buildings was, in many cases, very perfect, and he specially studied Dr. John Hall's Church (Fifth Avenue Presbyterian), New York, of which M. Carl Pfeiffer was the architect. The building measured 200 feet by 100 feet, and was 60 feet high, being seated for 2,000 persons. Two towers, each 100 feet high and 60 feet square, formed inlets and outlets for air. The incoming air was received in basement, and in cold weather passed over a set of steam pipes some 9,000 feet long suspended from the ceiling, the whole basement being thus converted into a heating chamber. The warmed air came up into the pews and could be regulated by the occupants. Twenty-four hours before the service the steam pipes were heated, and throughout the Sunday a powerful fan was rapidly rotated in the outlet tower, drawing off the vitiated and heated air. The windows were all double and the gas burners protected in glass niches. In summer time the incoming air was passed over ice. A steam pump and fire hydrant were provided to prevent accidents. Madison Square Theatre was ventilated and warmed, or covered, by somewhat similar apparatus.—*Sanitary Engineer.*

New Books Received.

From the house of John Wiley & Sons, 15 Astor Place, New York City, we have received copies of the following works:

The Materials of Engineering.

Steam Heating for Buildings.

Saw Filing by Grimshaw.

These works are new, and being *standard* publications, should be found in the library of every Engineer and Mechanic on the Coast.

The Antiquity of the Grindstone.

The quaint illustration shown with this article will be scanned with interest by all our mechanical readers. It represents a mechanical tool that has come down to our day, with little alteration, from the remotest antiquity, its origin dating far back to the times when men first learned the art of working in metals, comparing, in respect to age, with that other venerable heirloom of antiquity—the potter's wheel. Our illustration represents a grindstone of the sixteenth century, and is taken from an ancient work printed by H. Schopperum, at Frankfort-on-the Main, in the year 1548; and in connection with it, it will doubtless prove interesting to add some remarks respecting the history and uses of this indispensable mechanical agent.

For the use of the illustration we are indebted to Mr. J. E. Mitchell of Philadelphia, from whose admirable pamphlet on "The Grindstone" we obtain the material for the following historical and mechanical summary:

In the whole range of mechanics, with all modern developments and enlarged capabilities, there has been applied no mechanism nor process yet able to supersede the grindstone in its peculiar office. It is the one thing in mechanic arts that improvement has not added to or invention displaced; while the pruning hook and plow are of equal antiquity, the spirit of improvement has touched both, but left the grindstone unchanged. Its utility in the early ages was great, and science has not lessened its value any by its perfection of other means for like results. It has been found in use among uncivilized people, and yet has its place with nations most advanced. Writers of fiction knew it would not conflict with the appearance of truth to ascribe it a place among barbarians. It is among the few implements of handicraft mentioned in Scripture, though there only named for milling purposes; it is the same in form and in universal use—a round revolving stone. In a scriptural research for the articles of handicraft mentioned then, we can look through the "eye of a needle" and find the grindstone beyond, its origin lost in the darkness of antiquity. It is not meant to confound the millstone of antiquity with the grindstone of to-day, which the encyclopædia mentions as "a flattish circular stone of various diameters, employed in the cutting and sharpening of edged tools, precious stones, etc., and the grinding of steel, glass, pottery, and the like. They are made of sandstone, or sandstone grit." The grindstone now has scarcely a wider capability or greater usefulness than when we first hear of it. Although limited as its qualifications may be, it serves its purpose as nothing else can. Improvement has furnished us wheels of composition, which only to some extent serve some of its purposes, but the grindstone still remains unsupplanted. It is a tool of the utmost nicety in proper hands and properly understood, and is capable of performing with speed and precision its limited agency, beyond the powers of any modern tool. It is perhaps found best handled in its purpose of grinding dies for cut nails, where its proper use constitutes an occupation not to be attained very perfectly by a short apprenticeship with it. That known as the "bead stone," used by makers of cut nails, is a tool of the utmost perfection of workmanship, not to be meddled with by the inexperienced, however lightly, without the result being noticed by the eye of the experienced nailer. The milling machine, the planer, the file, the lathe, and the emery wheel do much of the work of the grindstone, but it still performs to perfection its needful though limited purposes. The importance and nicety of it, as a means to a purpose, is only known by those who know how to prepare and keep it in order.

Its utility or importance could not be guessed at were one to look at a crooked and badly kept grindstone; but in the hands of those who know its merit, with its even surface running as true as any turned wheel, it will perform work with a rapidity and precision attainable by no other means. In the hands of those who are learned in its use and keeping, it is capable of adaptation to intricate and fine work; but with those who do not understand it, it is rude, and the very opposite of what the educated craftsman would select for any purpose of fine employment.

An heirloom of antiquity, but used among us as we received it, and without any attachment or improvement; capable of its complete functions only when well kept and well applied, and this is only found with those whose craft education is solely to handle it. It alone can cut and shape expeditiously that which is prepared to cut and shape all other hard materials—cast-steel hardened. It is still employed to give the finest edge, the most even surface, the brightest polish, and is the quickest to accomplish it. The emery wheel does but a few of its purposes, and nothing that we have could supply its place. The file has its own peculiar uses, but in contact with the grindstone its thousand small-cutting edges would be reduced to polished plainness. It is found a necessary implement on the farm, and is still required where the finest instruments are made, or the hardest of metals are worked. It has come to us as we have it, and in all likelihood will pass on down to other ages the same—a simple circular stone, swiftly revolving on an axle.

It accompanies those who "go down to the sea in great ships," and moves along the frontier with the advance of civilization. All nations use it, and it is perhaps with all the one piece of mechanism that bears the same form and is the same in principle. More or less directly it takes part in the greatest modern material enterprises; it has no doubt assisted to fashion the implements of many of the lost arts, and is still needed in many of the requirements of arts of the present day.

As ages revolve and invention gives to the world new devises, may it be found more the agent in forming the plowshare and pruning hook than in sharpening the sword.—*The Manufacturer and Builder.*

Prof. Moos, of Heidelberg, has found good reasons for believing that many railway accidents have been due to defective hearing on the part of engineers, or others in charge of trains. Expert medical testimony shows that railway employees are especially liable to affections of the ear.

☞ **Subscription price of this journal is $2.00 in advance.**

Paper Rails.

Wooden rails are used on some tramways, but the latest device is the formation of wood into paper for rails to take the place of steel or iron. It will be hard for the skeptical reader to swallow all that is said about this new enterprise, of which the following is a summary:

It is well known that one of the best materials for car-wheels is paper. It is now stated that paper can be utilized for the manufacture of rails, in place of steel, which has almost displaced iron. It is said in favor of the new materials that the cost per mile will be less by one-third than that of steel, and it will last much longer, being almost indestructible. There is no expansion or contraction from heat and cold, consequently no loose or open joints; and, being so much lighter than steel or iron, the rails can be made longer and connections perfectly solid, making the road as smooth as one continuous rail. The adhesion of the drivers of the engine to this material will be greater than that of steel, consequently the same weight engine will haul a larger load. There will be a great saving of fuel, and the smoothness of the rail will lessen the wear and tear of rolling stock. The rails are made wholly and entirely of paper, and so solid that the sharpest spike cannot be driven into them. The action of the atmosphere has no effect on it, will neither rust nor rot, and, with paper wheels and rails of the same material, our palatial trains will glide over the prairies at the rate of 60 miles an hour with as little jolt and jar as on an ocean steamer.

The above is a sanguine view of the virtues of paper rails, but it is a tall story. The accomplishment is, to say the least, a trifle doubtful. In the first place, there is literally no such thing as a paper car-wheel; the office of paper is merely to furnish filling, the plates and bands being of iron. If the friction and pressure were applied to paper direct, it could never stand a fraction of the grief to be encountered. It is hardly more probable that a paper rail could do any more. If it is an iron or steel rail on the half shell, stuffed with *papier mache*, it may be different, but a chunk of paper that will turn the point of a spike must be in somebody's mind.—*Northwestern Lumberman.*

The *Journal of Decorative Art*, in discussing the evils of sewer gas, calls the attention of householders to the fact that it is easy to discover its presence by utilizing the fact that it acts upon the white lead paint in such a manner as to dissolve it; and remarks that the test can be rendered complete and effective, if a portion of the woodwork were painted with silicate paint the same shade; because, resisting as it does the action of the gas, it would serve to emphasize more strongly any discoloration that might take place. As an experiment we would suggest disks being made and painted pure white with white lead paint, and across the center a band of white, of silicate or "Charlton White" painted on them. These hung up in the bathroom, w. c., or cellars, or in such places as are suspected of being inlets for sewer gas, would soon discover if there was any such gas present, and disclose the danger at once.

Wall paper should not, in the opinion of Dr. Baker, who read a paper on the subject at the recent gathering of scientists at Montreal, be manufactured in a manner to be air tight. He says that, hygienically considered, the walls of a house should be porous like our clothing, having free intercourse with the open air. He thinks that waterproof paper causes increased dampness of the walls, as a stoppage of a circulation of air prevents their drying. This prolonged dampness of the walls he considers unhealthy, and productive of other evils. Dr. Baker advocates the old-fashioned white-washed walls instead of wall paper or their substitutes. —*American Artisan.*

Practical Mechanics.

THE SAW BENCH.

No repair shop can be complete without a saw bench, one that can be used for cutting up and splitting, rabbeting, and grooving, and with the aid of a few *traps*, be made to rough out and bring into shape almost any kind of a job in this department. I wish to write just a word about what can be done with just the saw alone, leaving the *traps* for some other time. I prefer, for my use, a saw bench made of hard wood, with the table projecting over the framework, to enable me to clamp on any arrangement I please, and by means of a screw to raise and lower the front end. This bench can be made, by almost any workman, in two days, and you will have no cast-iron table or framework to keep you from driving nails or screws, or making holes and slots, for whatever purpose you choose. The belting, too, should be from beneath. If we must belt from overhead, use a counter shaft, set so as to give the use of the table in every direction. The form or outline of the slot or groove made by the saw not only depends on its size and the position it occupies on the saw arbor, but on the direction the material being worked is also moving. If we take a block of wood and move it across the bench lengthwise, the saw will simply cut a slot in width equal to the *set*, and the depth depending on the height of the table. If we drive the block at right angles, or square across the table, a groove will be formed having a cross section in the shape of a segment of a circle. Any other direction will give us a similar part of an ellipse.

Fig. 2.

In Fig. 2 is seen a variety of work cut out on this principle. No. 1 is a block to be fitted up for lagging to a pulley. It is hollowed out by passing over the saw No. 7; it is then beveled, grooved, and the corners trimmed, and is all ready for the pulley, like either No. 2 or No. 3. The sections 5 and 6 simply show what may be done on the same saw. Nos. 8 and 9 are small, half-round, hollow blocks, which are used in many places in cotton mills, and can be finished entirely on the saw bench by taking three or four in one length at a time. Blocks like No. 10 are often required, and I have seen a workman work for days on them by hand, give it up, and then try the same job over again on the saw bench, roughing them out and fitting them up in a few hours with pleasing accuracy. When it is required to cut a circular groove of a given size at a saw bench, the table can be raised and the saw gauge set to the proper angle

Fig. 3.

by means of the diagram shown in Fig. 3. If it is required to groove out the block A to the line C A D, on the saw bench, using a twelve-inch saw, first draw the circle E M O, twelve inches in diameter, the same as the saw, then lay off on the radius E K, E F, equal to A B, and draw the line at right angles for the surface of the table. With F for a center, draw the circle T H V, equal in diameter to C D. Now the line passing through M, and touching the circle at T, will make the required angle with the line M I. From the point M, lay off at right angles to S M, M L, equal to D N; set the saw gauge at this point, with the angle already found, and the saw bench is ready for the work. The teeth of the saw, for this purpose, should be very coarse, and filed so as to cut the whole length of their sides as well as their points. If three or more of the teeth could be made shorter than the rest, and at the same time be given more set, it would improve its working qualities greatly. When the saw is fastened to the arbor by means of two wedge-shaped collars, we shall have what is called a "wobble" saw. This will cut a groove having parallel sides, but the bottom will be concave in

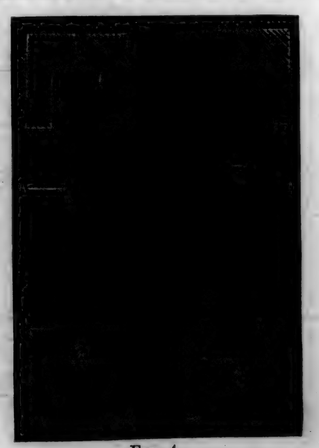


Fig. 4.

sections, as shown by No. 1, Fig. 4. This can be made to give us a groove having its sides straight, by simply jointing the saw, while in motion, with a file and a piece of emery. The work finished in this manner is shown by No. 2. By setting the saw off from the center, one corner of the groove will be deeper than the other, but the sides will still be parallel, and if the work be inclined, a dove-tail groove is produced, after passing over the saw the second time, end for end, as shown by No. 3. H R K G is the point taken by the saw in the first place, and H R I in the second. In this manner work can be easily fitted, like that shown in section by No. 4.

To enable us to use saws of all sizes, and cutters of every description, the saw bench should have a piece inlaid in the table where the saw comes through, and several pieces all fitted and ready whenever they are wanted. Fig. 5 shows just what I mean. In filing a saw for splitting, or sometimes called slitting purposes, I file the teeth as square across as possible, without taking it from the saw arbor, by standing at the front end of the bench. After setting the points a little, just slick up the corners with an oil stone, by resting it on the face of the saw, near the roots of the teeth, and bring the side in contact with the points; in this way the saw can be made to cut nice and smooth, and keep up to its work in all kinds of lumber. It is a good plan to have a good assortment of saws on hand—yes, all we can find. Old ones are just as good as new for many purposes, and if they here and need straightening, why straighten them. There is no one but can tell us how to do it, and if we never try we shall never learn.—Frank Clark, *in Cotton, Wool and Iron* (Boston).

Lumber in Mexico.—A New Departure.

The valuable timber resources of Mexico bid fair to see a merited development under the encouragement offered by the government. "Hitherto," says the Mexican Financier, "these have been almost entirely neglected, and Mexico has suffered the anomaly of drawing large supplies of lumber from American markets. Freights at sea and the cost of inland transportation have, of course, so increased the price of this lumber as to have prohibited its general use in the country. Experience has taught Mexico the importance of developing her own great resources of lumber supply. Hence, there is already an active movement to secure the rich timber lands of the Republic, either by government grants or by private purchase. In Sonora, Chihauhau, Conhuila, Durango, Sinama, Michoucan, Jalisco, Mexico, Hidalgo, and Vera Cruz there are vast quantities of fine wooda largely consumed in American markets, and the coast districts are covered with virgin forests of cedar, ebony, mahogany, and other rich woods, while in all the greater altitudes hickory and hard cedar, and pine, and larch, and oak, and sycamore and walnut flourish to perfection. The rapid advance of railroads is making these supplies more available, and for the encouragement of this industry the various State governments, as well as the general government, are offering liberal concessions to all who will utilize and further develop these great lumber resources of the land."

When it is not convenient to take locks apart in the event of keys being lost, stolen, or missing, and it is desired to fit a new key, take a lighted match or candle and smoke the new key in the flame, introduce it carefully into the keyhole, press it firmly against the opposing wards of the lock, withdraw it, and the indentations in the smoked part of the key will show exactly where to file.

A paper read before the San Francisco Chapter American Institute of Architects, on Friday evening, March 2, 1883, by P. H. Jackson, Esq.

Condemning the Use of Long Girders in one piece extending over two openings.

The subject of my remarks will be on a long cast-iron box girder, or lintel, extending over a length of two openings of Senator Fair's old building on Pine street, which, on uncovering, was found to be broken. Also on the general insecurity of long girders in buildings, when extending over two openings, be the material cast-iron, wrought-iron, or wood; and their further use should be discontinued when so applied. This girder, with another of the same dimensions, had been in the building for several years, supporting the wall on them; and the length of time it had been broken is not known, as its condition was only revealed on being uncovered. (Fig. 1.) It was 17 inches on the

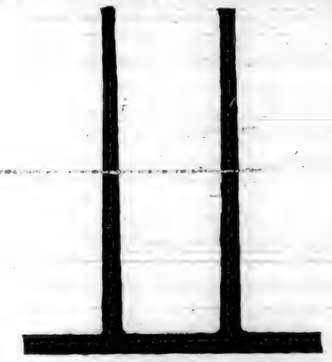


FIG 1.

bottom, by 1½ inches thick, making an area of 25½ inches, had two sides or flanges, as shown in diagram, each 19 inches up from bottom, the two top edges, each ¾ inch thick. See Fig. 1, page 49.

While the sectional area of the bottom flange subject to extension was 25½ inches, the area of the two top flanges subject to compression 1 inch down, equaled but 1½ inches ($2 \times \frac{3}{4} \times 1 = 1\frac{1}{2}$ inches), therefore the area of the bottom to that of the top was as 17 is to 1; while they should be so proportioned as to be duly balanced in resisting areas, when about to undergo rupture, in the ratio of 6⅛ to 1. For this reason, the top of the vertical rib should have had a compressive resistance in metal to meet that of the bottom of about 4 inches, in place of 1½ inches. Also, the resistance for the long length of girder on the top was insufficient to prevent lateral deflection. Therefore the metal in the bottom flange was in excess of the proportion named, and was so much waste of material, as the strength

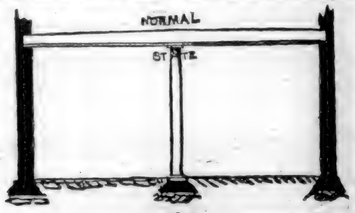


FIG. 2.

of any structure is that of its weakest part. I prefer that the top part in a cast-iron girder, subject to compression when employed for long lengths, should have even a greater amount of metal than usual, and be in the proportion of 1 to 5 instead of 1 to 6⅛. This girder was 34 feet long, and its end supports were the brick side walls—which extended upward. (Fig. 2.) The distance between these end supports was 32 feet 3 inches, and it had as an intermediate support a 14-inch-diameter round iron column.

I would give an approximate breaking weight of this girder, but its proportions are such, and the manner in which it was supported, renders it impossible by any formula. The unbroken girder, when released of its load, as Mr. Eisen, the architect of the Mission Street building where the uninjured girder and other iron work was afterward used informed me, raised off of the iron column one inch, evidencing that the the iron column had sunk that much more than the brick piers or walls on which the ends rested. Upon the hypothesis that this broken girder was similarly situated as the uninjured one, that is, that the column settled more than the brick wall on which the ends rested (which is just as likely not to be so), what were the strains and forces exerted? This will go to show the condition of all girders, when employed, be they wood, cast, or wrought iron, when made in long lengths in one piece, covering two spans, that is, having an intermediate support midway the ends.

The load on the girder caused its deflection, and the column foundation settled, as there can be no diminution in the length of the iron column, which is not the case with the end brick supports. (Fig. 3.) The strength of the girder to resist the load upon it was over its whole length, that is, the distance between the end supports with the assistance of the iron column, whatever that may have been in its resisting settlement.

When this girder broke, the old wall on it being in bond and solid as one piece of stone, most likely rested at points midway between the ends, and not following down the total deflection of the girder, thereby so relieving the load on the girder by its peculiar position, that it was not half as trying to it as it was before the girder broke; also it broke about over the column, and

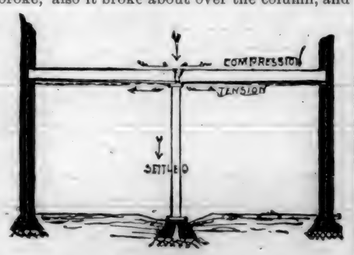


FIG. 3.

rested on it. Thereby making the girder in its broken state better able to sustain the load than before rupture took place. In my annual report to the Superintendent of buildings in New York city, on the 2nd of January, 1872, mention is made of a similar case. I will give the words of the report as follows: On the 24th of November preceding, my attention was directed to two buildings on First Avenue, between 40th and 41st streets, which had iron lintels supporting the brick front above them. These lintels were each in one piece, extending the entire width of the building, but intermediate supports were placed beneath, making the largest openings just under the length for the test as required by law. These were placed in the building previous to my connection with the department. Both of these lintels broke, one near the middle, and the other on one side, and in both the openings having the greatest span. On investigation it was found by their great length, and the unequal distribution of metal, they did not bear properly on the intermediate supports, but curved upward nearly one inch.

This is a similar case to the one in hand. In each case, when relieved of the load, taking the uninjured one as an example for the broken one, it raised up one inch from the top of the column. In the New York case, I remember well that the iron lintels were curved up in the casting, caused by the unequal distribution of the metal. The speculator who was erecting the buildings, finding they curved upward, filled in the inch space between the lintel and the head of the support with slate and cement, and when the load came on it, the lintel crushed them out; as we do not

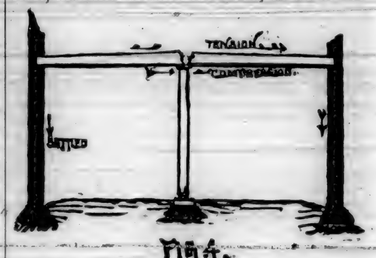


FIG. 4.

have such shoddy contractors in California such could not have been the case here. (Fig. 4.)

Suppose we take that the column remained firm, free from settlement, but the green mortar or cement of the brick piers or wall that supported the ends of the girder pressed out between the bricks, which is invariably the case in every green wall in the lower part when heavily loaded with the work above, and supporting the ends of the girders, and that the foundations for the walls settled. I measured a brick wall as it was being laid up on California street, and when it got to a height of about 17 feet, I made a level pencil line on it and on a board fence at its side, and after the wall was finished in its height, I found that the line on the green wall was ⅜ of an inch below that on the fence. The settlement of the green brick-work supporting the ends of the girder would reverse the forces and strains on the girder to that of previous mention. That is, the column, being the highest in the center, would be the fulcrum, and the girder the lever, and with not only the load on top of the girder, but we have the weight of the brick walls on each end above the girder support to break it. It is reversing the intention of the original supporting ends, they become loads instead of supports; consequently the point of fracture would be at the fulcrum column, and the girder would accommodate itself to the situation if it should break directly in the middle, as it should have been originally made.

The top of this girder, in this case presenting but an area of 1½ inches, would have to resist tension, and the bottom resist compression—just the reverse of what the girder was intended to do. The resistance to tension of cast-iron is usually computed at but 15,000 pounds to the square inch, and 1½ inches area, the part presented to resist this force, would equal but 22,500 pounds. So this practice of making long girders spanning two openings, which has been so much in vogue in San Francisco, should be discontinued. The advantage gained by the neutralizing of forces on each side of the central support is but small compensation to meet the danger in the practice. Architects have remarked to me that these double spanned girders are more to be relied on in case of earthquake oscillations or upheavals. The same reasons apply in settling of the end walls,

or the settling of the intermediate support, or the raising of either of them in an earthquake disturbance, as in the case of the broken girder. The using of cast-iron girders of long span to support heavy loads, when tensilely employed, should be condemned.

I will here quote from one of Professor Fairburn's works on the use of cast-iron beams and girders, in a case where the beams in a cotton factory broke in Oldham, England, in 1844—in which there were upwards of 20 persons buried in the ruins.

Nothwithstanding the increased security that has been gained in the form of cast-iron beams and girders, their use is nevertheless attended with danger, when either the design or construction is left to ignorant persons, and the numerous and fatal accidents which have occurred at various times, which have very naturally created in the public mind serious apprehensions of their security, and which have very naturally been traced to this cause.

In order to insure safety and attain success in their making, the following qualifications are necessary:

First, a knowledge of the properties and application of the material, when subject to three distinct strains, namely, torsion, compression, and tension, or separation or tearing the parts asunder.

Secondly, an exact knowledge of the proportion of the parts of a beam or girder so as to have the forces of extension and compression balanced when about to undergo rupture from transverse strain.

Thirdly, a knowledge of the laws which gives the expansion and contraction of metals, in order to insure sound castings and an equal degree of tension during the process of casting.

Many hold the impression because a girder beam or column, or any other support in a building or other structure, fills its *present* mission in sustaining function, it is safe for the future. We have in this case as an evidence what time does; but I do not refer to the application in this case particularly, as this was subject to vicissitudes in the manner in which it was held; but I refer to its general capacity to maintain the load for all time when employed beyond the measure of its elastic force. This distinctive point is, that the safe load should not exceed ½ of the breaking load. The strain just sufficient to balance the elasticity of common wrought-iron is computed to be 25 gross tons, or 56,000 pounds, while the measure of the elastic force of the material is computed to be 10 gross tons. Therefore, the ratio of the elastic force of the material is as 1 is to 2½, but this point of strain does not maintain recuperation when relieved of the load. With the human body, when the muscles are strained beyond the point of their elasticity, it is disabled for further use, until Dame Nature, in the fertility of her goodness, resuscitates through rest and care the disabled part in further renewed muscular development. So with us in our mechanical constructions: do not be blind that from present appearances of strength in our constructions it is indicative that it will remain so in the future, as all materials have standards of strength and possess elasticity to a greater or less degree.

I would like, before concluding, to refer to an impression that some have: if a girder is made of wrought-iron, it is much safer than made of other materials; this is not so: all materials used for supports have certain sustaining powers, and keep within the scope when employed of their elastic forces compressively and tensively under all circumstances; and all materials not subject to decay or deterioration, from excesses of temperature, will fulfill their functions, even be it of glass. A wrought-iron girder, loaded beyond the measure of its elastic force, is just as unsafe as if of other material, as there is an insidious distruction awaiting time for its complete ruin. In this I referred to the tensile resistance of common wrought-iron at 25 tons, or 56,000 pounds. In my printed article on the utilization of forces, or using cast-iron compressively, I mention the tensile limit of average wrought-iron at 60,000 pounds. It is a mistake which I desire to correct, as the rate of 60,000 pounds means refined iron—superior to the ordinary common iron—the difference being but slight in the two estimates, but I desired the correction made in the discrepancy.

Rights of Gas Companies.

A rather important case has been decided in Chicago, which concerns architects and builders perhaps as much as the parties directly involved. It seems that some years ago a house stood on a certain lot in that city, supplied with gas from a service-pipe from the main in the street. The house was pulled down, to make room for the erection of another on the same site, and the old service-pipe was capped, and left projecting slightly through the wall, another service-pipe being put in to supply the new house. By the arrangement of the new house a coal-bin was planned at the point were the old service-pipe came through the wall, and while the bin was being filled not long ago, a lump of coal struck the stump of the pipe and broke it off, allowing a great quantity of gas to escape into the cellar, where it exploded, severely injuring the mistress of the house, who brought an action for damages against the gas company. The company defended itself on the ground that all service-pipes belonged to its customers, instead of itself, and that its customers were alone accountable for injury to their property. This was the real point of the trial, the question as to the actual author of the injury not being called up at all. The suit was brought for fifty thousand dollars, as damages, and the jury awarded nine thousand, being apparently satisfied that the responsibility for the service-pipes lay in the company. It is so common to see, particularly in city buildings, the ends of abandoned gas and water pipes projecting through the cellar-walls, where they are liable to be broken at any time by settlements or accident, that the question of responsibility for their care, and for damage which may result from any injury to them, is a matter of considerable importance.—*American Architect.*

Builders' and Manufacturers' Mutual Aid Association.

We would call particular attention to the advertisement of this association in this issue. Although this association is young, it presents the same advantages possessed by its older competitors, without disadvantage to either. The objects of this association are to bring about a better acquaintance among the members of the building, manufacturing, and other trades, and the maintenance of such plans as shall tend to the mutual benefit and protection of its several members or their families; its prominent object is to pay a fund to the family or other legal representatives of its deceased members. This is done by an assessment upon each incoming member of two dollars per one thousand dollars, full benefit, and the same sum at each subsequent death, which provides a fund in the treasury which, upon satisfactory proof of death, will be paid to the legal representatives of the deceased member.

Full particulars in regard to any matters connected with this association will be given by the agent, whose office can be found (as per advertisement) at Room 11, 240 Montgomery St.

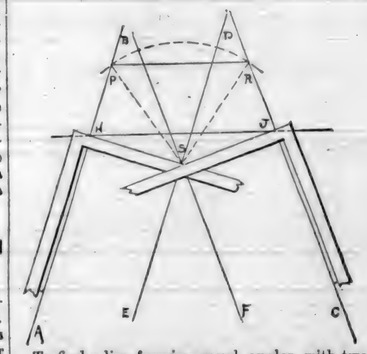
WHEELING, W. Va., February 17th, 1883.

To the Editor:

In using the word "stumpage," in referring to prices paid for timber lands, do you mean so much per thousand feet for the lumber taken off? or what is the true meaning, as understood by lumbermen? Please explain and oblige,

TWO DISPUTANTS.

The word "stumpage" is used by lumbermen to indicate standing timber. In quoting a sale of timber lands, at say "$2 per thousand stumpage," the meaning intended to be conveyed is that the purchaser pays that much upon an agreed estimate of the amount of timber standing upon the tract, the land being included in the transaction. If the actual cutting overruns the estimate, as is usually the case, the buyer is, of course, the gainer to that extent. The term stumpage may also be applied to a sale of standing timber, where the land is not included, in which it would mean the actual amount of timber cut off, log scale. The word is laid down in the latest edition of Webster as a Maine localism.—*Northwestern Lumberman.*



To find a line forming equal angles with two converging lines, A B and C D: draw E D and B F parallel, and equally distant from A B and C D, intersecting each other at the point S; from the point S as center, describe an arc, cutting the converging lines at the points P and R, which joined gives the line required.

The same can be found by the use of the square. Place, as shown, the square on the lines A B and C D; mark from the point of intersection S, cutting the lines A B and C D at the points H and J, which joined gives the line required.

L. D. GOULD.

British architects appear to concede that plumbing and other sanitary arrangements of American houses are far better than those of the English.

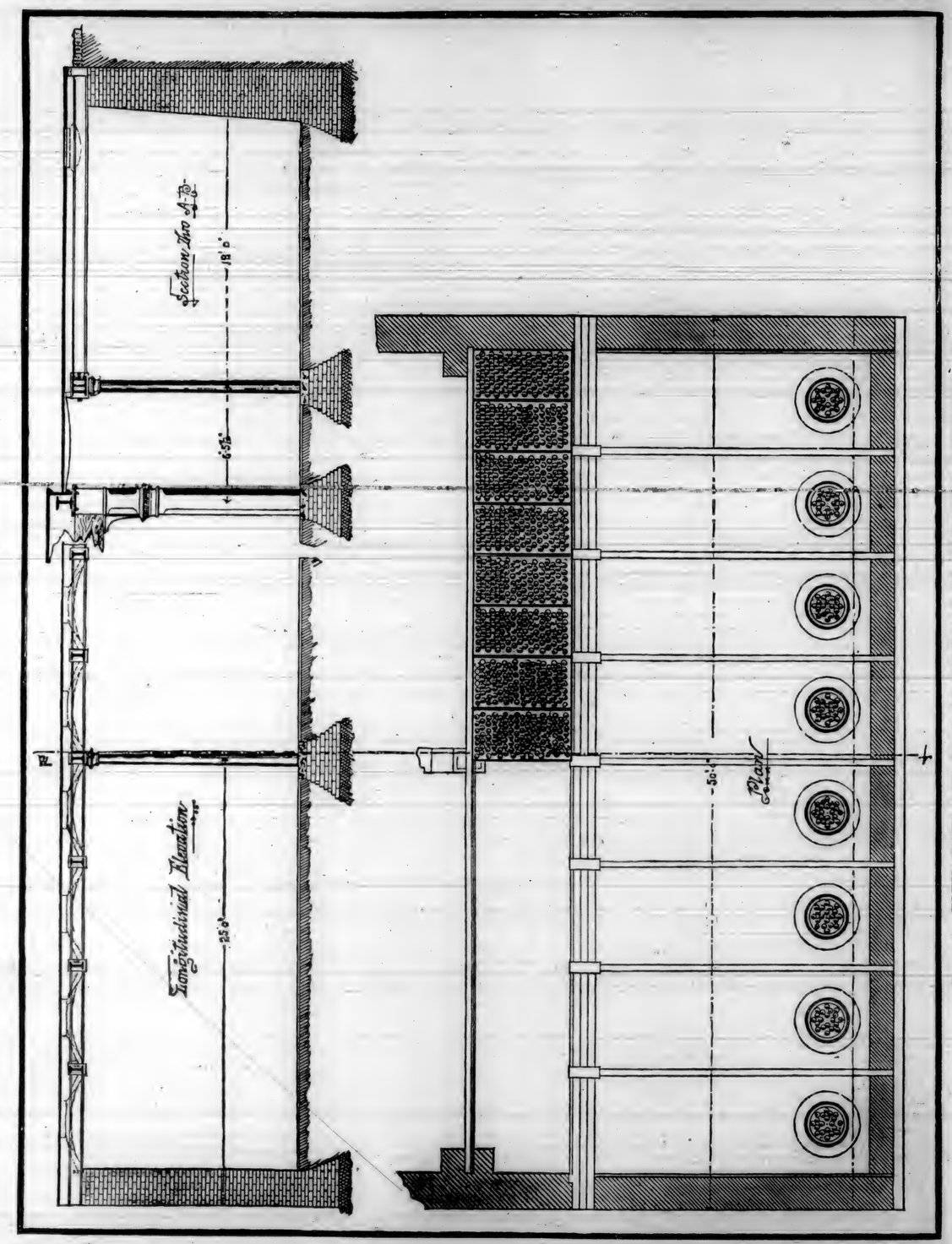


PLATE 1.—ELEVATIONS AND PLAN OF SIDEWALK OF BASEMENT EXTENSION. (See Page 50.)

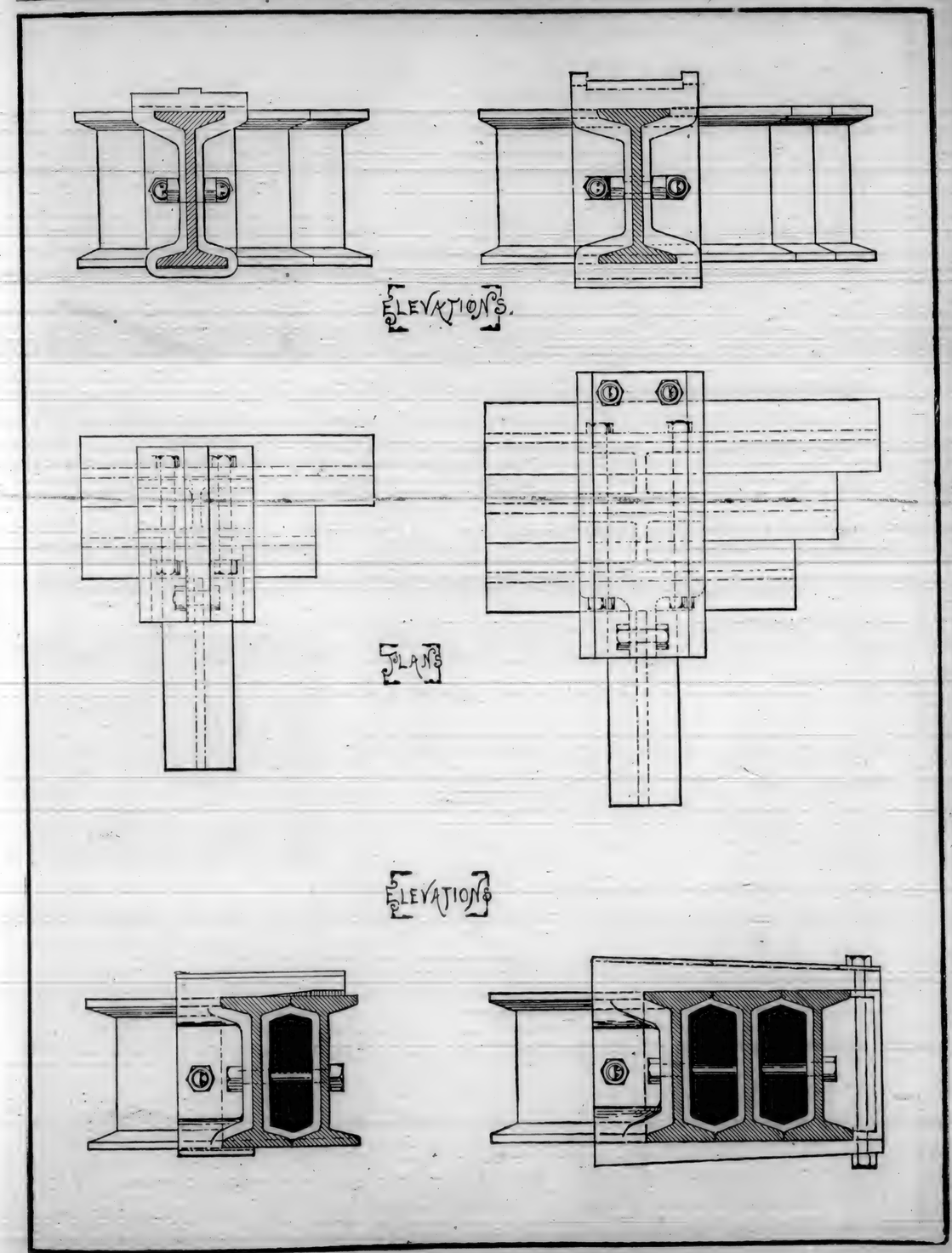


PLATE 2.—CONSTRUCTION OF GIRDERS. (See Page 50.)

Improved Building Construction.

BY THE ABSENCE OF THE USUAL ENCUMBERING PIERS AND COLUMNS IN THE BASEMENT AND FIRST STORY, AND A BETTER MEANS FOR LIGHTING TOWARDS THE REAR FROM THE FRONT OF THOSE APARTMENTS.

Plate 1, page 48, shows the longitudinal and sectional elevation of basement extension, also plan of sidewalk, beams, girders, and illuminating tile of Mr. Somer's new building, Nos. 741 to 745 Market Street, opposite Dupont Street, just finished, and occupied by F. S. Chadbourne, & Co. furniture dealers. W. P. Moore, Esq., architect.

Plate 2, page 49, shows the construction of the girders with vault-beam attached with three beams forming the girder for long lengths, and two beams forming girder for short lengths. The building extends back to the next street, is fifty feet front, and five stories in height including basement, which latter extends out under the sidewalk over twenty feet from the face of the building, making the basement and basement extension a continuous room without the usual obstructing piers and columns in basement and first story. The front has but a single central support of great strength in each basement and first story, with large show windows on the main floor, and the means for transmitting light received from the front to the rear of basement and first story of these deep buildings is a great desideratum, particularly for large retail stores. Besides, the cost is no greater, if as much, as in the usual obstructive construction which takes up valuable room, and divides the basement from the basement extension under the sidewalk. The only obstruction in this large basement room, which is the entire width of the building, is but a 11-inch face by 17-inch deep iron post, which supports one of like size above on the main floor, which in turn supports one end of each of two Franklin girders on a line of second story, each 25 feet long, spanning the 50 feet front. There is also in basement a thick 7-inch round iron column shown, that supports the ends of the two novel-constructed girders, each composed of three 10½-inch rolled wrought-iron beams, 25 feet long, making 50 feet for length of girder, with but one 7-inch diameter support. The iron cap-plate of this 7-inch column fits in the head of the column on the under-side, and on the top has two flanges on the outside, which project up on the outside of the girders, and hold them in place. In basement, the iron girder was not used, the inside ends of the vault beams would have to rest as usual on the ordinary brick piers, and would render the obstruction mentioned. In places of this kind, iron girders have been used composed of either one deep beam with several supporting columns close together, and in other places two beams form the girder, with cast-iron diaphragms between and bolted together, and with the vault-beams, resting on one side of the outside beam nearest the curb, and secured to it by wrought knee pieces; but in such a case the inside beam of girder cannot be employed to more than one-half its capacity to resist the load that rests on the side of the outside one, and transmitted indirectly by the inside diaphragm and bolts.

The strain upon both is sideways; and indirectly so, with the one away from the end of the abutting vault-beam, whose inclination is is to turn over toward the curb. The end of the vault-beam end at its bottom rests on an inclined plane, the lower flange of that part of the girder, hence the tendency of it is to slip off out toward the street, being held insecurely by the knees to the girder, the inclination is to turn over that way, hence, any calculation made as to the resistance of the two beams forming the girder to sustain the load on the side, by the formula which is computed as being loaded on the top, unless a large deduction was made for safety, would be deficient in proper result. The reason why these girders have sustained the loads is because the sidewalks have not as yet been loaded to what it is usually computed they should be. With the girder composed of three 10½-inch rolled beams, as shown and used in Mr. Somer's building, which construction is the, and not their, invention and held by P. H. Jackson & Co., Nos. 2 California and 231 First Streets, this city. The load of the end of the vault-beams on the outside is precisely as if they laid on top of the three beams composing the girder, and their weight diffused over the top, as the formula compute they should be.

The wide tongue which extends over the top of the three beams is as if integral of the vault-beam, and may be considered as a solid part of it as if rolled with the other part of the beam; or in other words, as if the vault-beam was cut away in every part but the top flange, and that extended over the top of the three beams forming the girder, and made stronger in that part to resist the load than in any other, by which means the girder is properly loaded in the manner calculated by our formulæ for beams, and not on the side, as in that of the single-beam girder, with the inclined slip off vault-beam, or the two beams tending to a circuit. The description is as follows: There are two cast-iron diaphragms which fill up the space between the three beams forming the girder, and the stress upon these diaphragms is compression, and as cast-iron's resistance to compression is 93,000 pounds to the square inch, these are held together by heavy bolts and nuts which pass first through the shoe of the connection that receives the end of the abutting vault-beam, then through the three webs of beams, and through the two diaphragms; they are to each other held in the most secure manner, as far as *internal* connections will make them.

On the outside on top is a heavy wide supporting tongue, which acts the part of the top flange of the vault-beam, extending over, as before explained. This is the great supporting power for each individual vault-beam, the lower tongue being but an assistant to it through the means of the bolts as shown, transmitting aid from the bottom to the top where three or four beams form the girder, but where two beams are the girder the lower tongue is dispensed with.

What are the forces and strains exerted on this patent connection by which any number of beams required for service may form a unit for strength to resist a side load on one of them, but transmitted as a load on top of all of them? The ends of the vault-beams are most securely held to the shoes. The top tongue is as a beam fastened at one end at the root where broken

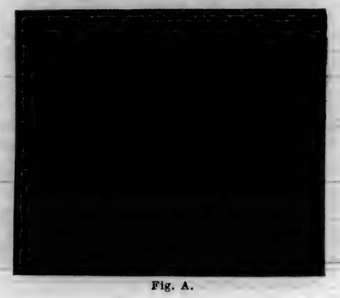


Fig. A.

off and lifted up at the other where the bolts are (see Fig. A), and the computation is to be made as to its resistance, providing the area of the bottom subject to extension in cross section is in the ratio of 6½ to 1 of the area of top subject to compression as in that of Hodgkinson's formula for beams fastened at one end and loaded at the other. (See Fig. B.)

The bottom tongue is more favorably exerted than the top one, while the force exerted on the top tongue is greatest at the root where it joins the shoe, the bottom one acts at its outer end on the bottom

Fig. B.

flange of the beam at *c*, which is the fulcrum, and the strain is mainly exerted between that and the bolts, which are immediately against *c*. This is the place where the strain mainly hinges. The strain to separate this tongue at its root by means of the long lever from there to the fulcrum *c*, and from there exerted on the adjoining resisting bolts, is comparatively light. Hence this bottom tongue is much stronger with the same quantity of metal than the top one. This construction of uniting beams forming girders when loaded on the side, equalizing the load as on the top, cannot on close investigation but commend itself to favor.

The public are respectfully invited to examine this light, airy and substantial building, so well adapted for a large retail business, where the large show windows permit such a fine display of goods on sale.

Terra Cotta Lumber.

One of the most interesting and useful inventions made within the past few years is the process of making terra cotta lumber. The making of fire-hardened clay materials, whether brick, tile, or vessels of any kind, carries us back to the dawn of history. While clay beds are to be found in vast quantities in almost all countries, the utilization of the material so lavishly bestowed by nature has been for the most part limited to brick and pottery. It is only recently that the idea has been suggested that a material might be produced from clay which would lack the brittleness of the articles so long known, and possess the exceptional and highly valuable quality of admitting of being cut and "dressed" into irregular shapes with edged tools.

Before our time anything constructed of clay had to be given its finished form while soft, and before the material had "set." Now we can make the material in large blocks, and afterward cut and shape it as we can lumber. This peculiarity, which is so valuable, is due to the same character of internal structure which wood possesses—that is, porousness. In proportion as wood is porous, within limits, of course, it is most useful for the vast varieties of building purposes to which it is applied. And so by making terra cotta porous we bring it more within the category of wood substances, and then properly name it "*terra cotta lumber.*"

It has similarities and dissimilarities of the utmost importance in contrast with wood and clay materials, and they seem to supplement each other. In other words, terra cotta lumber occupies an intermediate position between brick-like substances and lumber. It is, for instance, brittle and not fibrous; it lacks strength to resist the transverse strain which is possessed by wood, quantity for quantity; but it presents greater resistance to superimposed weight. It is fireproof, while wood is not, and it can be "dressed" by the plane and saw, which, generally speaking, clayey substances cannot be. In addition, it will receive and retain on its surface plastering or other surfacing without the application of lath. It must be borne in mind that, being at once an earthy substance, and of open or porous structure, it possesses all the qualities which appertain to those two characteristics in all substances; and it possesses the advantages not belonging to substances not having these both.

As an article of commerce and use it may be produced easily, the clay being found at hand in almost any part of the country. Hence its cheapness; hence its universal utility. Compared with other commodities it may be called home-made, like those articles of universal use produced in the farm houses everywhere. It may be applied to domestic purposes on a small scale, or to the largest public structures. Its uses, indeed, require no enumeration—they suggest themselves readily to the mind. Thus, invention in the useful arts is steadily bringing into utility the products of nature, which otherwise would lie like worthless material on the surface of the earth. If clay were valuable only for brick, piping, etc., but a small fraction of the clay would be utilized; but with this process a very large percentage of it becomes immediately useful. In this material, what New Jersey alone produces may be taken as an example.

The belt of country underlaid by these clays extends entirely across the State, and, as described by Prof. Cook, the State geologist, includes an area of 320 square miles; while the area within which these deposits have been worked up to the present time is only 68 square miles, the actual openings of the clay beds being only a fraction of this last area, so that, notwithstanding the hundreds of thousands of tons that are annually produced, the industry itself may still be regarded as in its infancy. The average depth of these clay deposits is about 400 feet, and their order of superposition is shown in the following table:

		Feet.
1.	Dark colered clay (with beds and laminæ of lignite)	50
2.	Sandy clay, with sand in alternate layers	40
3.	Stoneware clay bed	30
4.	Sand and sandy clay (with lignite)	50
5.	South Amboy fire clay bed	20
6.	Sandy clay, generally red or yellow	3
7.	Sand and kaolin	10
8.	Feldspar bed	5
9.	Micaceous sand bed	20
10.	Laminated clay and sand	30
11.	Pipe clay (top white)	10
12.	Sand clay, including leaf bed	5
13.	Woodbridge fire clay	20
14.	Fire sand bed	15
15.	Raritan clay beds: Fire clay	15
	Sandy clay	4
	Potter's clay	20

These clays form one of the most important elements of material wealth that the State possesses. Several hundred thousand tons of fire clay are dug annually and sent into maket for making fire-brick, fine pottery, sewer pipe, terra cotta ware, retorts, and crucibles, facing for wall paper, etc. The average price per ton is about $4, and the aggregate production of fire clay alone in its crude state exceeds $1,000,000. The stoneware clay from Perth Amboy is shipped to all parts of the United States, and supplies the material for most of the stoneware that is used in the country. Fine earthenware was formerly imported almost wholly from Europe, but within the last few years extensive potteries have been established at Trenton, which have been remarkably successful in the qualities of the wares made, and in finding a ready market for them. The Trenton potteries employ several thousand men, women, and boys, and produce several million dollars' worth of ware annually. Although the principal ware made is of the common white earthen and iron stone, the quality of which is fully equal to the best English ware of those grades, these works at Trenton also produce a much higher grade of decorated ware, that bids fair to supersede that which is now imported of this kind. The manufacture of pottery is rapidly increasing in quality and extent. The great abundance of the clay, its superior qualities, and its convenience to market have made it almost essential to the successful prosecution of some of the great industries of the country.

The terra cotta lumber is rendered porous by the simple device of mixing in resinous sawdust with the wet clay, and when the clay has dried burning out the saw dust, thus leaving interstices in the brick-like material. The fine clay, free from vitreous ingredients, is taken from the bed thoroughly mixed by means of small quantities of water with any desirable quantity of resinous sawdust, increased in proportion as it is desirable to make the product more porous. At Perth Amboy, where the works of the New York Terra Cotta Lumber Company are located, there are eight of these mixing mills in use, run by steam.

After a thorough mixing has been accomplished, the workmen shovel the mixture out of the mills and into a traveling trough, constructed of a wide leather belt and side walls, to the belt elevator, by means of which it is carried to the third floor. Here it is shoveled into a compressor, also worked by steam, through which it passes to the floor below, and is forced through a die into any requisite shape. Here, usually in the shape of large slabs, it is left to air dry. After partially drying here, it is carried to the first floor, and then dried on a brick flooring heated by flues running underneath it from grates. Here in a short period it is thoroughly dried and hardened.

It now goes, in the form of slabs, to the ovens, six in number, where it is piled up in layers, and, after all openings are closed, brought to an intense heat and all the sawdust burned out. This occupies forty-eight hours, and produces in that time about 180 tons of completed fireproof lumber.

It is now planed, tongued, grooved, sawed, etc., into any desirable shape, and this floor almost resembles a saw-mill or carpenter's shop. The dust of the sawing is carried off by means of a steam blower.

In conclusion, we may enumerate some uses to which it may be applied. It is light, bulk for bulk, and may be united like joiner work or nailed into place like so much wood. In the waterworks of the Holly system it has been used and pronounced admirable for filters. Saturated with petroleum, it becomes a valuable fire lighter or kindling wood, which may be used indefinitely. When immersed in boiling asphalt for a few moments, sufficient bituminous matter is absorbed to resist the action of water, for the asphalt becomes part and parcel of the material itself, and does not flake off when exposed to cold or dampness, as with common brick, solid terra cotta, or iron.

This fact and the splendid insulating qualities both of the material and the asphalt are now attracting the attention of electricians, and give reasonable hope that one of the problems of underground telegraphy has at last been solved.

The many future uses to which it may be put can be conjectured from the number of applications for patents being now made by Mr. Gilman, the inventor, for special purposes, to wit: Filters, underground electrical insulation, steam boiler and pipe sheathing, fire lighters, imperishable ground sills, waterproof brick, grain and elevator bins, refrigerators, safe and vault linings, fireproof jackets for iron columns, furnace linings, safety warehouses, etc.

Not the least noteworthy characteristic of this material is the fact that there is no waste in its manufacture, for the reason that all the remnants and edgings made by sawing, etc., find a market.—*Scientific American.*

The Art Amateur for March contains admirable full-sized working designs of clover, azaleas, and water-lilies for china painters; a South Kensington chair seat, and a chalice veil for embroiderers; a score of delicious cupids, and a page of fresh and excellent monograms, twenty-six in number, giving the letter A in successive combinations with the entire alphabet. The remaining letters are to be similarly given in future numbers. The leading article in this issue is a capital notice of the Water-Color Exhibition, by Edward Strahan, with illustrations of over thirty of the noteworthy pictures. Boughton's beautiful bainting, "Snow in Spring," is finely reproduced, and there is a good portrait of Doré, with some well-chosen examples of his work. Flower painters, fan painters, china painters, and photograph portraitists are remembered in the practical articles, and there is much pleasant and copiously illustrated talk about French furniture, Japanese art, new houses, old fashions, and a variety of other art topics. On the whole, the March number is an excellent specimen of this always attractive magazine. Price, 35 cents. $4 a year. Montague Marks, publisher, 23 Union Square, New York.

In 1851 the first saw-mill was built on Puget Sound, which was soon followed by others, until to-day there are 15 mills at work on the Sound. The largest mills cut 200,000 feet per day. It is calculated that since the first mill was built there 2,500,000,000 feet of lumber have been cut, principally fir, pine, oak and cedar.

SAN FRANCISCO.

Jackson x Webster & Fillmore. Two two-story frame.
O.—F. Wittram.
A.—W. P. Moore.
C.—A. Jackson.
$7,000.

Jackson, cor. Buchanan. Two-story frame.
O.—A. Wolters.
A.—Kenitzer & Raun.
C.—E. Farrell.
$6,000.

Geary, cor. Gough. Two-story frame.
O.—Dr. Stoddard.
A.—Schmidt & Havens.
C.—Terrill & Slaven.
$7,000.

Golden Gate Av., nr Fillmore. Alterations.
O.—G. Schutz.
A.—Behrens.
C.—L. D. Frichette.
$2,500.

Larkin, nr Bush. Improvements.
O.—G. Schroeder.
C.—B. Dryer.
$1,900.

Sacramento, nr Fillmore. Two-story frame.
O.—Wm. Patton.
C.—Cook & Johnston.
$5,000.

Bush, cor. Webster. Two two-story frame.
O.—J. O. Van Bergen.
A.—S. & J. C. Newsom.
Day's work.
$12,000.

Morton, cor. Dupont. Three-story and basement brick.
O.—F. Hellwig.
A.—Lueders.
C.—Mahoney Bros.
$20,000.

Cedar Av. x Polk & Larkin. Two-story frame.
O.—B. Fisher.
C.—J. H. McInnes.
$3,000.

Sutter, nr Jones. Alterations.
O.—R. H. McDonald.
C.—B. F. Ellis.
$8,000.

Fillmore x California & Sacramento. One story frame.
O.—J. McNulty.
Day's work.
$1,500.

Ellis x Polk & Van Ness Av. Three two-story frame.
O.—Capt. F. Gee.
A.—Schmidt & Havens.
C.—W. M. Fletcher.
$18,000.

Ridley x Guerrero & Market. Three-story frame.
O. & B.—S. D. Matthews.
$4,500.

Ridley, nr Valencia. Alterations.
O.—C. J. Holmes.
A.—Marquis.
C.—H. Sheldon.
$1,600.

Valencia, cor. 22nd. Two-story and basement frame.
O.—J. Schleff.
Day's work.
$9,000.

California, cor. Devisadero. One-story and basement frame.
O.—Jas. Keane.
A.—Kenitzer & Raun.
C.—Moore Bros.
$10,000.

Eddy, nr Jones. Four-story frame.
O.—J. Conolly.
C.—J. Oak.
$12,000.

Seventeenth & Dolores. One two-story frame. One one-story frame.
O.—J. Buss.
A.—G. E. Voelkel.
C.—F. Weineohl.
$4,500.

Howard, nr Twenty-Fifth. Two-story frame.
O.—Capt. Spear.
Day's work.
$3,200.

Treat Av. nr Twenty-fourth. Two-story frame.
O.—H. Ganther.
C.—T. F. Mitchell.
$1,800.

Bush x Sansome & Montgomery. Alterations to brick building.
O.—Bush & Schmidt.
A.—H. D Mitchell.
C.—Wilbur.
$10,000.

Fifth, cor. King. One-story brick building.
O.—Standard Oil Co.
C.—W. E. Stevens.
$10,000.

Seventeenth & Sanchez. Two-story frame.
O.—E. Dmane.
A.—W. Warren.
C.—L. Larravee.
$3,400.

Harrison, nr Main. Repairs.
O.—J. Moore.
C.—C. W. Kinsman.
$500.

Second x Folsom & Howard. Additions to building.
O.—J. Wieland.
C.—J. Haff.
$25,000.

Fourth & Berry. Two-story frame.
O.—Union Ice Co.
Day's work.
$7,000.

Octavia, cor. Ivy Av. Improvements.
O.—L. Gendotti.
A.—Eisen & Co.
Day's work.
$1,200.

Thirteenth, nr Valencia. Alterations.
O.—H. F. Sammi.
A.—G. E. Voelkel.
Day's work.

Polk, nr McAllister. One-story frame.
O.—J. J. Pfeister.
Day's work.
$500.

Ridley, nr Valencia. Three-story frame.
O.—C. J. Holmes.
A.—Marquis.
C.—Cummings & Rebman.
$8,000.

Henry, nr 14th. Additions.
O.—J. G. Wilkins.
C.—D. B. Sprangler.
$1,200.

Fifteenth, x Noe & Market. Two-story frame.
O.—Mrs. C. C. McQuade.
C.—R. M. Grant.
$2,400.

Harrison, x 24th and 25th. One-story frame.
O.—R. Ahern.
$900.

Natoma, x 6th and 7th. Additions.
O.—P. Connell.
Day's work.
$1,200.

Twentieth, nr Guerrero. Alterations.
O.—I. Thompson.
C.—T. F. Mitchell.
$800.

San Bruno Road, nr 15th Avenue. One-story frame.
O.—E. Sidel.
C.—I. T. Mitchell.
$800.

Taylor x Greenwich & Fillmore. Two-story and basement frame.
O.—G. Riedel.
A.—H. Geilfuss.
C.—J. C. Classen.
$4,800.

Castro x 19th & 20th. Two-story frame.
O.—Mrs. Banning.
A.—H. Geilfuss.
$2,500.

First x Mission & Howard. Two-story basement frame.
O.—Allyne & White.
A.—Kenitzer & Raun.
O.—Pluns.

Battery nr California. Additions.
O.—C. H. Hathaway.
A.—Marquis.
C.—Plummer.
$6,000.

Washington x Gough & Franklin. Two-story and basement frame.
O.—A. Bosquet.
A.—G. E. Voelkel.
C.—J. McKay.
$8,000.

Fair Oaks, nr Twenty-third. Two-story frame.
O.—Cleaveland.
A.—Geddes.
C.—S. E. Thompson.
$3,000.

Post x Powell & Mason. Two-story frame.
O.—Mrs. Adele Goodman.
A.—Schmidt & Havens.
C.—Haskell & White.
$8,000.

Taylor, cor. Turk. Alterations.
O.—L. Mejasson.
A.—Huerne & Everett.
C.—W. B. Kreger.
$2,200.

Jones & Lincoln. Two-story and basement frame.
O.—H. H. Bruns.
A.—Eisen & Co.
C.—J. Bruce.
$2,700.

Sutter, cor. Franklin. Two-story and attic frame.
O.—J. Spruance.
A.—Schmidt & Havens.
C.—Chisholm.
$18,000.

Geary, cor. Gough. Three two-story frame.
O.—D. S. Whitney.
A.—Schmidt & Havens.
C.—F. Klatt.
$14,000.

Fillmore x Jackson & Pacific. Two-story and attic frame.
O.—J. Washburn.
A.—Schmidt & Havens,
C.—A. Jackson.
$5,500.

Sixth & Mission. Fitting up stores.
O.—J. Moran.
A.—Eisen & Co.
C.—Waterbury & Maxwell.
$1,000.

1010 Post. Alterations.
O.—J. Eppinger.
A.—Wolfe & Son.
C.—Moore Bros.
$1,000.

1916 Sacramento. Alterations.
O.—H. W. Newbauer.
A.—Wolfe & Son.
C.—J. Furness.
$1,500.

Tyler, cor. Laguna. Additions.
A.—Wolfe & Son.
$1,800.

OAKLAND.

Franklin, nr 16th. Alterations.
O.—Mrs. E. Merrill.
C.—Henderson.

Filbert, nr Eighteenth. Two-story frame.
O. & B.—Ingerson & Gore.
A.—Taylor & Copeland.
$3,700.

Fourteenth, nr Filbert. One-story frame.
O.—G. M. Fisher.
C.—Knight & Littlefield.
$1,600.

Tenth and Kirkham. Three one-story frame.
O.—Apgar.
C.—W. A. Knowles.
$3,600.

Kirkham, nr Tenth. Two One-story frame.
O. Apgar.
C.—W. A. Knowles.
$2,400.

Seventh, nr Adeline. Two-story frame.
C. & B.—J. Kolb.
$3,500.

Eighteenth, x Curtis and Market. Two story frame.
O.—Mrs. Ainsworth.
C.—C. B. Kimball.
$3,200.

Linden, x Seventh and Eighteenth. One-story frame.
O.—Mrs. Hindermeyer.
C.—E. Child.
$800.

Union, x Eighth and Tenth. One-story frame.
O.—W. F. Kroll.
C.—Higgins & Armstrong
$1,600.

Eighth, nr Cypress. Two story frame.
O.—L. P. Burger.
C.—J. S. Tiffels.
$2,000.

Seventh and Campbell. Two-story frame.
O.—J. Wulff.
O.—J. F. Gleisner.
$3,500.

Eighth, nr Market. One-and-a-half-story frame.
O.—G. W. Scott.
C.—Knight & Littlefield.
$1,500.

SACRAMENTO.

O Street, x 16th and 17th. Two-story frame.
O.—E. F. Smith.
A.—Babson & Seadler.
C.—Carle & Croly.
$4,000.

4, x I and J.
O.—N. G. Curtis.
A.—N. D. Goodell.
C.—Carle & Croly.
$4,500.

8th & N. Two frame dwellings.
O.—C. N. Hartwell.
C.—J. Ough.
$4,500.

ALAMEDA.

San Antonio Avenue, x Park & Oak. One-story cottage.
O.—J. R. Patterson.
C.—Wasson & Pattiani.
$1,800.

Central Av. cor Third. Additions.
O.—C. Bahlheimer.
C.—A. Denke.
$1,000.

McPherson and Central Av. One-story and basement frame.
O.—S. Strevater.
C.—C. H. Fosse.
$1,000.

Morton, nr R. R. Av. One-story frame.
O. & B.—J. Sedgly.
$1,600.

LUMBER.

	Pine.
Common Rough, up to 40 feet, per M feet	$22 50
" 41 to 50 " "	23 50
" 51 to 60 " "	24 50
" 61 to 70 " "	26 50
" 71 to 80 " "	28 50
Refuse Rough	18 50
Common Rough, sized with planer $2 additional on above rates, per M feet.	
No. 1 Flooring, 6 inches and over, "	32 50
" 4 " and under, and 1¼x4 and 1¼x6	37 50
Flooring and Stepping	
Rough Clear for Flooring, $1 less than above rates.	
Second quality Flooring and Stepping....per M feet	27 50
Ship Plank, Rough "	28 50
" Planed 1 side "	32 50
" " 2 sides "	35 00
Deck Plank, Rough "	33 50
" Dressed "	37 50
Laths....per M	3 75
Wool Slats "	10 00
Shakes "	12 00
Redwood Posts....per piece	17½

	Redwood.
Rough Merchantable....per M feet	$22 50
" Refuse "	18 50
Surface No. 1 "	37 50
" 1 x 6 "	35 00
" No. 2 "	27 50
Rustic, No. 1, 1 x 8 "	35 00
" No. 1, 1 x 10 "	37 50
" No. 2 "	32 50
" Under 10 feet "	32 50
T. & G., 1¼ x 4 and 1¼ x 6 "	37 50
" 6 in. 12 ft. and over "	35 00
" " 7 to 11 feet "	32 50
" " under 7 feet "	30 00
" " No. 2 "	27 50
T. & G., Beaded, 12 feet and over "	35 00
" " 7 to 11 feet "	30 00
" " under 7 feet "	27 50
Half-inch Surface "	30 00
Pickets, Fancy "	27 50
" Rough, Pointed "	20 00
" " Square "	17 50
Siding, ½ inch "	25 00
Shingles....per M	2 50
Battens, ⅝ inch, lineal feet "	1c

NAILS.

10 to 60 pennies, are quoted at	$4 70
8 " "	5 02
6 " "	5 05
5 and 4 " "	5 87
4 and 5 pennies, brad heads, at	6 00
6 " "	6 25
8 " "	6 50
10 and upward	5 75
3 penny fines "	7 50

MERCED.

Two-story and basement brick.
O.—Ruffner & Dixon.
A.—H. D. Mitchell.
O.—Beck & Harrington.
$10,000.

MISCELLANEOUS.

Colusa. Two-story brick.
O.—Wm. Miller.
Day's work.
$10,000.

Near Town. Two-story frame.
O.—G. Molton.
A.—Matthews.
Day's work.
$5,000.

Two-story frame.
O.—E. Graham.
Day's work.
$2,500.

San Rafael. Fifth, x F. & G. Two-story and basement frame.
O.—Barstow.
A.—W. Wharff.
C—D. Ennis.
$4,000.

Additions to building, California Av.
O.—Mrs. J. Sims.
C.—W. Bar.
$1,000.

Petaluma. Corner B and Ninth. Frame dwelling.
O.—Blackburn.
C.—Sam. Bodd.

Riverside. Two-story brick building.
C.—F. W. Green.
$3,500.

Berkeley. Opposite Asylum. One-story frame.
O.—Mrs. Sedgwick.
C.—S. Child.
$2,000.

The California Architect and Building News.

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THE

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—AND—

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Building Activities and Prospects.

In previous issues of this journal during the current year, we have been enabled to present most encouraging and cheering accounts of the building prospects in San Francisco. But as the months roll round we find the increase in number of contracts let, and the amount of money expended in building operations, to be much greater than we anticipated at the commencement of the building season. The unpropitious state of the weather during the period from January 1st up to the commencement of the late rains caused a general feeling of dispondency, and the almost universal opinion prevailed that failure of crops and depression of all kinds of business were sure to follow—the building interest included. But the glorious rains which came with the closing days of March and the opening days of April, dispelled all doubts as to the crop results for 1883, and caused universal rejoicing and gladness throughout the entire State and coast.

The facts stated in another article in this issue illustrates the magnificent results reasonably to be anticipated for the current year; our building intelligence report the first quarter of 1883, exclusive of the report in present issue, being more than three times greater than that of 1882 up to the same period—a contrast which conclusively demonstrates that San Francisco is enjoying a splendid degree of prosperity, not merely in the isolated matter of building improvements, but generally; for it requires general business prosperities to enable or justify expenditures in the erection of buildings, the former always being the outgrowth of the latter.

Comparison of Building Operations.

A GOOD SHOWING ASSURED FOR 1883.

A few weeks ago, and one heard on all sides forbodings of dull times ahead for the balance of this year. Notwithstanding the discouraging rain prospects existing a few weeks ago, we felt confident that the building interest would be very brisk. This result was arrived at by almost weekly comparisons with the same dates in 1882.

We find in the previous year that the sum total of improvements—brick, frame, and alterations—reported for the first 3 months, amounted to

51 BUILDINGS OF THE VALUE OF $306,060.

For the first three months of the present year we find total improvements to be

142 BUILDINGS OF THE VALUE OF $1,013,197.

In the year 1882 we added 10 per cent. of the sum total for buildings that may have been overlooked, and for extras, etc., etc. In the amount given for this year we have added but 5 per cent. This is due to the fact that our force of reporters has been increased, and we feel confident that but few new jobs are started, upon which a call is not made by one of our reportorial staff.

Surely there is something suggestive in the above figures, which proves as correct the thoughts contained in another article in this issue, that "Capital will not remain idle."

This year promises to be one of the best in regard to building operations that this State has been blessed with for at least 10 or 12 years. Mechanics of all kinds are in demand at advanced wages. Prices of all kinds of materials are stiff, with a tendency upward. With a bountiful harvest assured, there can be but one drawback to the general prosperity, and that will be the lack of labor to move our immense grain and fruit crops.

Capital Will Not Remain Idle.

We predict a large increase of building operations this year, from the simple fact stated in the heading of this article. Money is very plentiful and will of necessity be used where it will bring in to its owner some recompense. If the wheat crop is short, and no opportunity for speculation be offered, then capitalists will invest their money in a *sure thing*; and what more favorable project offers than that of buying real estate and erecting suitable buildings for rent?

From careful inquiry we find that *rentable* houses are hard to obtain at present; and with the visit of the Knights a few months hence, there will be such a demand for accommodations that an empty house will be a very rare thing to find. Speculators are already at work trying to get up a corner in rooms.

A prominent capitalist visited our office during the month and inquired particular in reference to the cost of building FLATS. His idea is to buy lots in various parts of the city and erect apartment houses capable of accommodating four separate families. He assured us that two or three well-known gentlemen would cooperate with him in the idea he intends to carry out. His intention was to place part of his money in a flour mill, but thinks there is a much better field for investment in the erection of well built "FLATS." Property at the MISSION has been talked of as the probable location of the houses, wisely so we think, as the cable lines soon to be in operation will cause this beautiful part of our city to be eagerly sought after for comfortable homes.

Meanwhile, we are pleased to note the evident decay of the Pine Street excitement. One thing sure, if this were not so our bonanza kings would not put their millions into real estate. The withdrawal of the money from the Nevada Bank for the purpose of real estate investment is an event well calculated to make property owners all over the city feel confident in the value of their investments, and this confidence is strengthened by the fact, that the result of the bank's investment has been only obtained after a careful review of the market, and with the certain knowledge on the part of the investors that no surer, safer, or profitable way of getting a fair percentage on their money could be thought of than the one they adopted.

Surely it is well said that capital will not remain idle.

Another Proof of Prosperity.

The fact that nearly every architect's office in San Francisco is "full of work," and the entire draughtsmen's forces of the coast is fully employed, with vacancies in many of the offices for good draughtsmen, illustrates a degree of prosperity greater than has been enjoyed for many years. Nor is this confined to San Francisco; our advices from Portland, Oregon, Seattle, Los Angeles, and other points and places on the Pacific Coast, show the same state of facts, and illustrate the pleasing degree of prosperity prevailing throughout the entire western confines of our favored country.

The Gradual Decadence of the So-Called Eastlake Style of Architecture.

This style of Architecture when first introduced into California began at once to attract the attention of a certain class of property owners, who saw in the new style a chance to build fine-appearing and apparently well-constructed houses, erected in many cases to add to the value of their contiguous property.

Many scarcely gave a thought as to the manner of construction of the buildings, their sole aim being to present a showy house. This they accomplished by a liberal plastering on of "gingerbread" work, and by engaging the services of painters who were experts in the mixing of fancy colors. If Charles L. Eastlake could be brought suddenly to face with one of these imitation Chinese-colored houses (named after him), we can well imagine the looks of horror that would overspread his features, as he would gaze on the wooden foundation, painted so as to resemble moss-covered rock; hoods over windows of a chocolate color, relieved by brackets painted with a beautiful coleur de mouse; window sash of a red, the brilliancy of which could only be exceeded by that of pure vermilion; fantastically beautiful dragons with large eyes, and mouths open as if to devour the beauties of the surrounding scene; the upper sash of the windows divided into small squares, so that in case of necessity they can be taken out and used for checker-boards; a few dozen strips of wood, beautifully interlaced for a cornice, giving the birds a nice roosting place for their weary feet, etc.

How grandly kind the nature of the so-called Eastlake architects all over the State must be to thus provide for the wants of every one, birds as well as men! Tears come to the eyes of the beholders as they gaze on the emblems erected on the house-tops to the memory of the great and good demons and dragons who departed this life in the centuries B. C. May their memory ever be as green—as the ideas of some of these E. A.

We are well pleased to note the evident decay of the monstrosity ideas that have been too often of late introduced into the architecture of this coast. Many houses, built, a few years ago according to the ideas then in vogue, are now being changed into a style more in keeping with the climate of California. Wood will shrink, and California redwood will shrink endways as well as any other may. The frail but fancy work adopted in many of the dwellings under notice have become so warped and the joints so opened by shrinkage, that one would imagine the houses were twenty years old instead of but three. Another cause for the cracking, twisting, and shrinkage of the fancywork lies in the fact that from the intricacies of the different parts of the work, much of it does not receive a single touch of paint. That exposed to the gaze is well covered, but all the little nooks, corners, and parts that cannot be seen from the street, although readily accessible from a staging, fail to receive a single touch of that which is absolutely necessary to prevent lumber from cracking and shrinking, and so after a few years much of the "gingerbread" has to be removed, that the house may present a creditable appearance.

In our April number, 1882, we presented to our readers a letter from Mr. Eastlake, giving his views in regard to the style of Architecture named after him. The modesty of the gentleman mentioned forbade him saying anything more than to discountenance the use of his name to the style mentioned.

Briefly stated, his views are as follows: He "recommends good honest work, no dowels, no glue, no putty or paint, without any reference to the form of style of architecture, and his remarks and recommendations referred more particularly to furniture and inside than to outside decorations."

The grand principle of this style is contained in the two words—"honest work"; and when our architects and builders follow the true intent and meaning of those two words, they will lay the foundation for the coming new style of American Architecture.

San Francisco Chapter American Institute of Architects.

The regular monthly meeting of this Chapter was held in the rooms of San Francisco Art Association, on Friday evening, April 6th. President John Wright in the chair.

The minutes of preceding meeting were read and approved.

The Professors in charge of the various classes instituted by this Chapter reported as follows:

F. Marion Wells, in charge of the modeling class, reported that his class was well established, and the students took much interest in their study. He asked permission of the Chapter to procure casts from models in the Art Association for the benefit of the students. The Chapter acceded to his request, authorizing him to procure the necessary material, with the understanding that the bill for the same be presented at the next meeting.

Mr. Sanders, in charge of the class in drawing, reported very favorable progress of the pupils under his charge. It was the intention to have the pupils visit buildings in process of erection, and thus supplement office work by instruction in the practical part of the profession.

Mr. Pissis, in charge of the class in practical architecture, reported that he had given his class for a subject, the front entrance to the Mint. The first specimens were crude; he pointed out the defects and the remedy in each drawing, and a second trial by the students showed a vast improvement. He felt confident after another trial that their efforts would be worthy of insertion in the official organ of the Chapter.

Mr. Bryant, who is to have charge of the class in carving, was present, and expressed his willingness to give instruction as soon as a suitable place is procured. On motion, the Secretary was instructed to notify the Trustees of the Mechanics' Institute of the intention of this Chapter to establish a class in carving, and request them if possible to give a space in the fair building for the use of the students.

Proposition for membership as draughtsman was received from Mr. W. C. Jordan; Messrs Curlett, Moore, and Pissis were appointed a committee to report on same.

A work entitled "Charitable and Parochial Establishments," was received from H. Saxon Snell of London, England. It was examined with interest by all the members present. The Secretary was instructed to notify the donor of the acceptance of the work by the Chapter, and a unanimous vote of thanks was tendered the gentleman for his donation.

A portfolio of sketches was received from the Boston Architectural Association. (These sketches are published for the benefit of the profession at large, and complimentary copies are sent to the several Chapters of the A. I. A. for inspection.) Secretary was instructed to thank the Association for the kindness shown.

A committee of two—Wright and Curlett—were appointed to consider the feasibility of procuring a permanent room for the Association.

The picnic committee reported that arrangements were being made by which the Association, during the month, could visit the red woods in the neighborhood of Duncan's Mills. Report received, and the Association decided to go. The Secretary was instructed to visit the members and ascertain exactly how many could avail themselves of the opportunity.

Short Supply of Skilled Labor in San Francisco.

During the year 1882, there was at times a decided lack of skilled labor in all branches of mechanism in San Francisco, and at no time a surplus of good workmen; so much so, that signboards posted on buildings, "Carpenters Wanted," and on workshops, foundries, machine shops, etc., "Hands Wanted," were of common occurrence; and as an inducement, extra wages were in many cases offered. The brick-laying forces were also inadequate for the labor purposes of 1882, and but few jobs were carried through on time. With such a state of things prevailing during the past year, what may be expected for 1883, with the showing already made in these columns, of a threefold increase in the amount of building contracts let during the first quarter of 1883. We hope that among the thousands of new-comers to this State, there are a goodly number of first-class mechanics, all of whom will find ready employment. This shortness of labor supply is not confined to building mechanics, but extends to nearly if not quite all other classes of skilled labor. From inquiries among the machine shops, boiler makers, glass cutters, and others, we learn that the same condition of things exists, especially so as far as *competent* workmen are concerned.

Iron Girders over Store Fronts.

The cast-iron girder device used in the erection of Mr. Somer's building on Market Street was duly noticed in this journal, and recommended as possessing special, self-sustaining features, with no rests or bearings except at the ends—the centers being sustained by a perfect trap principle sufficient to carry ten times the weight placed upon them. We notice a similar modified girder construction in use in the building now in progress of erection on Mission Street between Fifth and Sixth Streets, which spans the respective openings without intervening supports between the ends. This is a desirable result in many cases, especially where open fronts are desired, while in any case, the girder referred to is unsurpassed for solidity and strength, and is less expensive than some of the other devices sometimes used. Mr. P. H. Jackson has devoted a very large amount of time and skill in working up this girder device, in which there is demonstrated a degree of mechanical science which should commend it to general favor. It is worthy the attention of architects and owners having in hand or contemplating the erection of brick buildings.

As Seen from the Railroad.

During the past month we visited the lower part of this State. But few new buildings are to be seen in progress of erection along the line of the railroad. The towns all seemed to be resting on improvements already completed. At Los Angeles, however, one sees on all sides evidences of prosperity. Numerous buildings are in process of erection on every side, some of them being fine four-story brick buildings. At Riverside and San Bernardino many building are in course of construction. Since the late rains everything has changed considerably, and every one seems to feel the effect of the welcome moisture. New buildings are talked of on every hand, and we hope next month to give a large report from this section. We have made arrangements by which hereafter we will receive the building intelligence from all the principal towns.

Uses of the Steel Square.

Although all the matter given below may not strictly come under the head of Steel Square and its Uses, it has been placed in this column at the request of the parties sending us the questions that are answered; several of them are regular contributors to this series of articles, and desire to have all matter and questions together. In a short time, Part No. 1 will be finished, and our articles will then be devoted to the consideration of the more advanced mechanics.

EDS. ARCHITECT: "A flask-maker in a foundry often has occasion to change a square flask into an octagon. I want to know a rule by which the length of the pieces nailed in across the corners is obtained."

An octagon is always as 5 to 12. Take a flask 6 feet across; multiply 5 by 6=30, and divide by 12=2 feet 6 inches. Cut the miter to suit the above measurement, nail the pieces in the corners of the square box, and you have the required shape. That is, to find the length of the diagonal pieces multiply the width of box by 5, and divide the amount by 12.

In answer to questions in our last:

The above cut shows at a glance how the diameter and center of a circle can be found. Place the square as shown at A B C. The line B C will be the diameter. Place the square so that the point of the square A will touch any other point of the circle as at D, draw E F. The point of intersection H will be the center of the circle.

An ellipse can be made with the square by using that instrument in place of a trammel. The tracer or rod should have pins in the required points, which can be pressed against the inner sides of the square, as the rod is moved to form the ellipse.

J. C. is informed that no regular rule can be laid down for the projection of cornices on buildings. Much depends on the style of architecture employed. To use a general rule, however, we might say that for a building 70 feet in height, the proper projection should be about 36 inches.

Too much time and space would be required to fully answer E. R. in regard to the method of ascertaining exactly the proper sizes that *trimmers* and *headers* should be framed in order to carry any certain weight. In this State it is the usual custom in dwelling houses to make the headers either one inch thicker than the common joists, or else nail two pieces of the latter together. In stores and warehouses, the headers are generally of double thickness, or same rule can be used as for dwellings. The only advantage of the latter method is that it saves the necessity of providing pieces of extra thickness just for headers, etc. Trimmers should be of same size as the headers.

L. R. suggests an improvement in the construction of a trammel. Instead of the sides of the grooves being square, they are beveled so as to resemble dove-tails. The advantage of thus doing, is to prevent the small blocks used to slide in the grooves from slipping while describing the elliptic curve.

The grinding of tools so that a perfect bevel can be formed without unnecessary loss of material, is an accomplishment only gained by close attention and much practice One of the most common errors, especially of a novice, is to continue the grinding until a feather edge is formed. This is removed by drawing the edge across a piece of wood; after trying on his thumb the sharpness of the instrument being operated upon, a few more touches are given upon the stone. The chances are that another feather edge will be produced, and the above operation be repeated probably three or four times. This simply means a loss of from 1-32 to 1-16 of an inch of metal unused. The proper method is to grind the tool so that the edge will be of uniform thickness, and carefully noticing the limit to which it can be brought without producing a feather edge. After the latter has been formed, the operator is left without a guide to determine the thickness of the edge. Bring the edge of your tool near perfect as possible without feathering, and then finish the operation on an oil-stone.

Steel Square Miters.

In the June number of this journal, 1882, we presented an ORIGINAL diagram, giving the figures on the square, which, if used as per directions accompanying the engraving, would enable the mechanic to readily make the miter necessary to form any given figure.

The figures as given were obtained only after much labor and study. They were verified by a practical mechanic, and we presented them to our readers as being the FIRST ATTEMPT to give the general public the information contained in the article referred to.

In a late number of the *Carpenters' and Builders' Journal* we find all our figures quoted as original matter. In the April number of the *Builder and Wood Worker* we find our figures again quoted, giving credit to the first-named journal. We have noticed the same figures in several others besides these named.

We do not object to our exchanges copying any article that may be deemed worthy of a place in their columns, but we trust, at least, that due credit will be given for articles original with the editors of this journal.

This series of articles on the square was commenced in the September number 1881. Back numbers can be supplied at 20 cents each.

To E. F.: There are a great many preparations to coat blackboards, but the following is one of the best:

Alcohol 95 per cent. (4 pints); shellac, 8 ounces; lamp-black, 12 drachms; ultramarine blue, 20 drachms; powdered rotten stone, 4 ounces; powdered pumice stone, 6 ounces; dissolve the shellac in the alcohol, then add the other ingredients, finely powdered, and shake well. Be sure the surface of the boards are perfectly smooth and free from grease or dirt.

R. S. will find an answer to his question in the following:

The fancy imitation inlaid work now being introduced in the city is made as follows: The wood is first grained in oil; when dry, grain the whole in distemper; have a paper with the design drawn thereon, the back of which has been rubbed with whiting, place it on the wood, and with a pointed stick trace the design, then with a brush and quick varnish trace the whole of the design. When the varnish is dry, with a sponge and water remove the distemper where the varnish has not touched. This, if well executed, presents a most beautiful imitation of inlaid wood.

Articles which have been formerly glued, but broken again at the old place, should be thoroughly cleansed of all dirt and old glue by being soaked in hot water, using a sponge for the purpose. Do not attempt to scrape off the old material, or the pieces will no longer fit together. Dry the pieces thoroughly; warm the joints, reglue them, and you can be sure they will stick.

5 pounds of 4d nails are required to lay 1,000 shingles.

5¾ pounds of 3d fine nails are required to put on 1,000 laths.

Studding over 2 inches in thickness should have the 2 edges chamfered so that the plastering will have more room for a perfect key.

Setting out Stairs.

After determining the height of the riser from the "storey rod," the right proportion of tread must be found. Sometimes steps are arranged so that it is easier for a man to go up "two at a time" than to walk up in the proper manner. The reason is, both tread and riser are made small. When a riser is reduced, the tread must be increased; and the contrary when the riser is increased, the tread must be reduced in width. Joiners do not often break this rule, but masons very often do, notably in steps leading to and from railway stations. A simple rule may be given for finding a suitable proportion.

Take any suitable step as a standard step, that is to say, if you know of a staircase which is comfortable and easy to walk up, take it as a standard to gauge others by. Suppose you have a riser given, and require the width of a suitable tread, make use of the following proportion:

As the given riser : standard riser :: standard tread : required tread.

If the tread is given and the riser required, then—

As the given tread : standard tread :: standard riser : required riser.

To work out an example: Suppose 10 inch tread and 7 inch riser be taken as a suitable step, let 6 inch be the given riser; then by substituting the value of treads and risers for the names, we have—as 6′ : 7′ :: 10′ : the required tread; this gives $\frac{70}{6}$ or $11\frac{2}{3}$ for the size of a tread. Nicholson gives as a staddard a tread of 12′ to a riser of $5\frac{1}{2}$′. Working out the example given by this proportion, we get 11′ instead of $11\frac{2}{3}$′; either of these sizes will be an agreeable step.

A rough and ready rule for the *usual* sizes of treads and risers is to make 2 risers and one tread equal to 24 inches.

(From a new work entitled Handrailing and Staircasing.)

Unbalanced Bids.

This article is so pertinent to several similar transactions which have occurred in this city, that it is with pleasure we quote it from the *Sanitary Engineer* of February 15th:

A case illustrating the chance for fraud which exists in the ordinary method of letting work by contract to the lowest bidder, is now pending in the Supreme Court in this city.

A small sewer was to be built in the Twenty-third ward. An estimate was made by the assistant engineer in charge of that division, giving the probable quantities of the several items on which proposals were to be based, and by which the bids made were to be compared. This estimate was approved in due course by the engineer in chief of the department of parks, and the contract was advertised by the department. Several bids were received. The one which footed up the least was made by the son of the assistant engineer, who made up the estimate of the quantities. This bid was an "unbalanced" or "gambling" bid evidently, for the prices bid for all the items were very low except for "rock excavations," which was placed at $50 per cubic yard, while other bidders only bid from $5 to $7 per cubic yard for the same, but the quantity of rock excavation being estimated at only 10 cubic yards, the $50 bid was easily balanced by the low prices on the larger items. The law requires that every contract shall be let to the lowest bidder, and the Comptroller and the Park Commissioners could do nothing but award the work to this suspicious bid. But when the sewer was built it was found that there were 297 cubic yards of rock excavation instead of 10, and the contractor's final estimate for that item only was $14,850 for work not worth more than $1,500 at the most. This made the work cost the city some $13,000 more than it would if the contract had been awarded to a higher bidder on the first estimate.

The presumption of fraud in this case was so strong, owing to the peculiar relations of the assistant engineer and the successful bidder, that the chief engineer very properly took measures, in conjunction with the Comptroller, to resist the payment of the final estimate due under the contract. The contractor applied to the Supreme Court for a mandamus to compel payment, and Justice Barrett has refused to grant it, which will oblige the contractor to have the whole matter ventilated if he attempts to push his claim.

Now there was nothing inherently wrong in the contractor making such a bid as this if he had reason to believe that the amount of rock as given in the preliminary estimate would be largely exceeded in the execution of the work, provided that he had not received the grounds for his belief from his own father, who made the preliminary estimate. Many a reputable contractor has made such bids, based on his own judgment, of the unseen parts of work as opposed to that of the engineer, and has made money at it. It is sharp practice, but it is a legitimate business transaction. It is not fair, however, to the city or corporation which has to pay for the work, and its allowance offers great opportunities for fraudulent collusion, as in this case and in the cases of the canal contracts which were ventilated by Governor Tilden a few years ago.

A remedy for the evil has been sought by engineers, but so far no efficient mode of guarding against it has been put into practice. A plan which seemed to promise efficient results was devised a few years ago by the engineer of one of the city departments, who had intended to try it in the next contracts he was to let, but it happened that his head fell into the waste basket while he was preparing the papers, and his successor was afraid to venture on any new experiments until he knew whether his own head was secure on his shoulders. The plan suggested was to enumerate the items and their quantities as usual, and to affix to each a fair price for that class of work, and foot up the total. Then require each bidder to make a proposition to do the work for a gross sum, with the proviso that he should receive as full compensation for each class of work a price bearing the same proportion to the engineer's figures that his gross bid bore to the engineer's total estimate. To illustrate: Suppose that the engineer's estimate of a piece of work was:

100,000 cu. yds. earth excavation	@	$0.15	$15,000
10,000 cu. yds. rock	"	1.50	15,000
5,000 cu. yds. cut stone masonry	@	22.00	110,000
3,000 cu. yds. rubble masonry	@	6.00	18,000
2,200 cu. yds. concrete	@	5.00	11,000
Total			$169,000

Bidders would be required to name a gross sum. If, for instance, a contractor was satisfied that he could do the work for five per cent. less than the estimated cost, he would bid $160,550. In drawing the contract, the prices of all the items would be scaled down 5 per cent. and would be inserted in the contract thus:

For earth excavation	$0.14¼
For rock "	1.42½
For cut stone	20.90
For rubble	5.70
For concrete	4.75

Now if this work were let in the ordinary way, a contractor who had reason to believe the rock excavation would turn out to be much greater than was estimated, and that the rubble masonry would be increased, and the cut stone masonry diminished, might bid as follows:

For earth excavation,	100,000 cu. yds.	@ $0.10	$10,000
For rock,	10,000 cu. yds.	@ 9.00	90,000
For cut stone,	5,000 cu yds.	@ 5.00	15,000
For rubble,	3,000 cu yds	@ 11.00	33,000
For concrete,	2,200 cu yds.	@ 4.50	9,900
Total			$157,900

which would make his proposal $2,650 lower than the other man who bid fair prices.

If his surmise was correct, and the quantities were varied as he supposed, the two bids would stand as follows on the final estimate:

	By the fair bid.			By the unbalanced bid.	
Earth,	80,000 @ $0.14¼	$11,400		@ $0.10	$8,000
Rock,	30,000 @ 1.42½	4 275		@ 9.00	270,000
Cut stone,	2,000 @ 20.90	41,800		@ 3.00	6,000
Rubble,	6,000 @ 5.70	34,200		@ 11.00	66,000
Concrete,	2,200 @ 4.75	10,450		@ 4.50	9,900
Total		$102,125			$359,900

That is to say, the unbalanced bid, which was apparently the lowest, would result in costing the corporation more than three times as much as the fair bid, and would yield the contractor about 280 per cent. clear profits instead of the fair profit of 25 per cent. This is a very fair specimen of what can be either lost by careless or tricky methods of letting contracts to the lowest bidder, or saved by judicious methods. A competent engineer is as well able to judge of the proportionate prices which should be paid for certain classes of work as a contractor is. In fact, most large contractors now employ engineers to make up their figures for them, and if the proposed plan were put into practice, no attempt at fraud of the kind produced by unbalanced prices attached to erroneous quantities, could be made without being sure of immediate detection by the public and all the bidders.

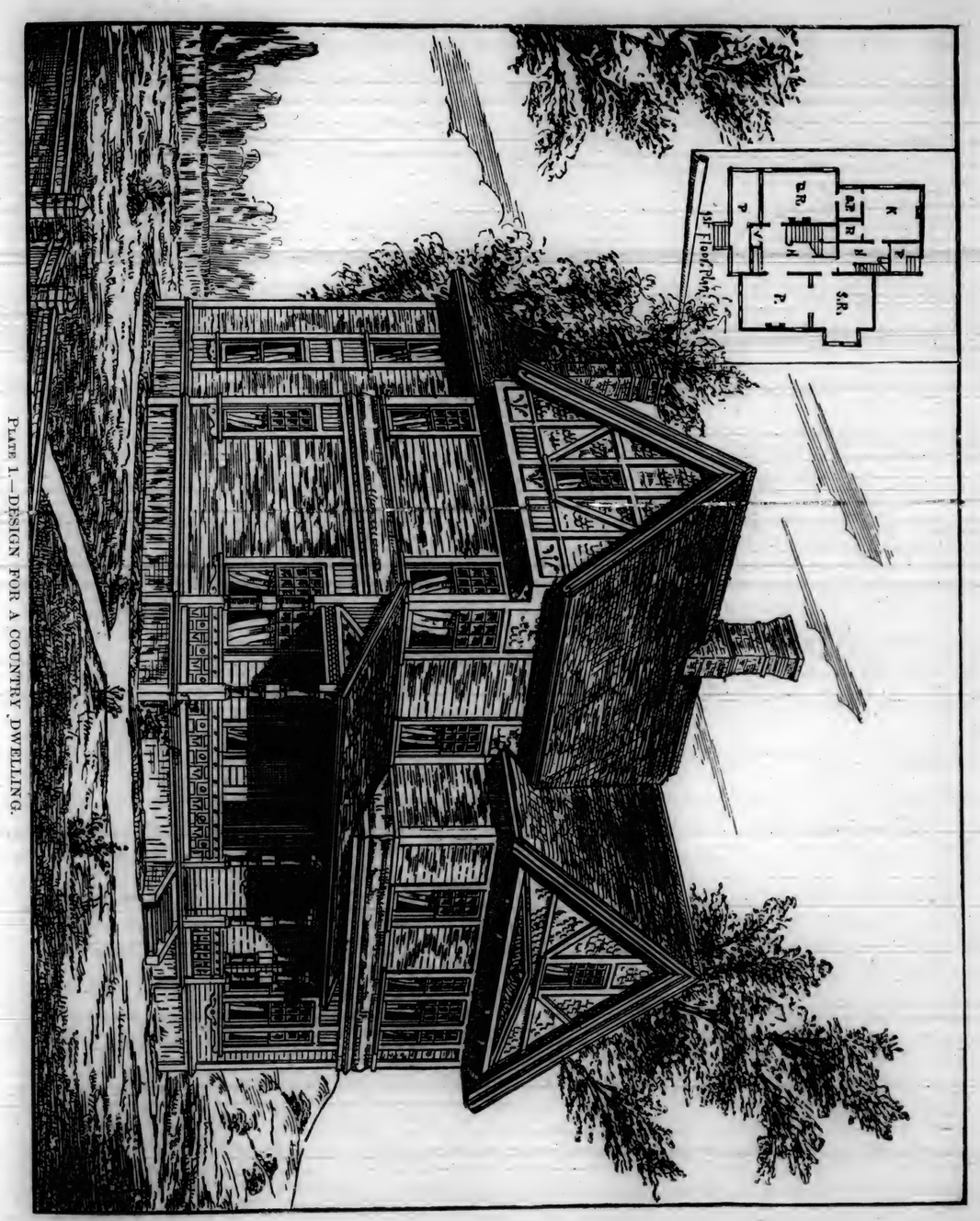

PLATE 1.—DESIGN FOR A COUNTRY DWELLING.

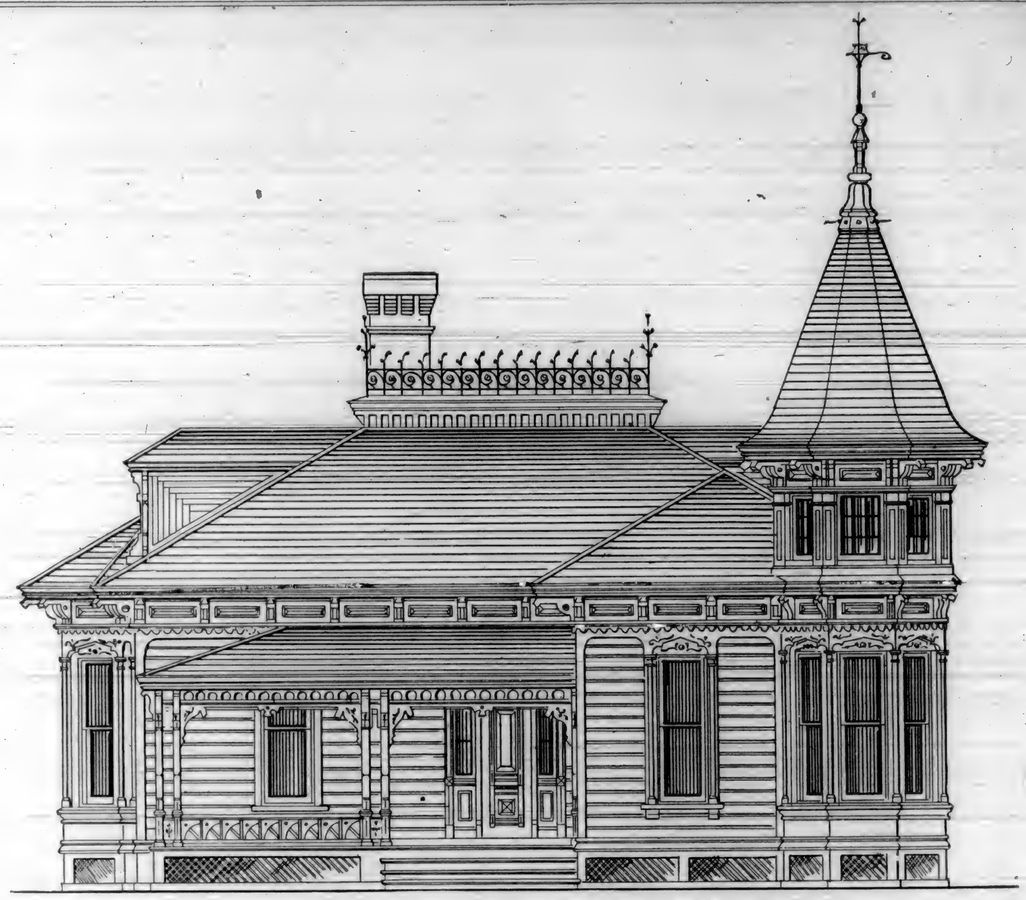

PLATE 2.—FRONT ELEVATION OF COUNTRY DWELLING COSTING ABOUT $3,500.

Our Illustrations.

Plate 1 represents a design for a commodious country dwelling. But little attempt has been made at ornamentation, the object being to present a showy house at as little cost as possible. The windows being placed in the corners is an innovation on the present popular style of bay-windows, and is certainly much less expensive. This building can be erected for from $4,500 to $6,000, depending altogether upon the styles and character of finishes used.

Plates 2, 3, and 4 show the plan, front and side elevations, of a beautiful country dwelling, costing about $3,500. This sum can be varied greatly, as almost double that amount could be used to advantage if extra nice finishes are employed. The amount quoted allows for as nice finish on the outside as is shown by the engraving and neat finishes inside. The arrangements of the rooms is such as to especially recommend the plan for a country dwelling. Stairs are shown leading to the attic. If desired, the elevation could be made 2½ ft. higher than shown, and the design thus changed into a 1½-story house. It will be noticed that the arrangement of the hall is such that in summer a perfect system of ventilation can be had, and in winter, by the use of the hall and other fireplaces, the home can be agreeably warmed in every part.

Plate 5 is an original design for a mantel.

English Wall Decoration.

There is one thing for which we cannot give the English too much praise, and that is their exquisite wall decorations. In this detail of house furnishing they are still a quarter of a century ahead of us. Some of the tile work is crude, and much of it is too sober in color; but there are public and private buildings in which the tile is employed with most exquisite taste. That there are very many gentlemen's mansions in America, where wall ornamentation is carried to a lofty, even an extravagant, pitch of splendor, I admit; but there is not one public restaurant or music hall or shop handsomely decorated in New York for every twenty in London and the minor English cities. In the theaters in England the decorating is lavish, but not tasteful. In the new Strand theater it is gaudy; and the Royalty, the Royal Comedy, the Novelty, and the other amusement halls are evidences of poor taste. But if one wishes to pay liberally he can have more comfort in any English than in an American theater. The decorations of the Savoy theater are lovely under the cool gleam of the electric light; there is nothing at once so original and pretty as this in Paris. The French seem to care but little for comfort in public places; fresh air is not one of their needs, and they hate innovations—literally hate them. Edward King, in *The Boston Journal*.

The California Redwood.

In Humboldt County, California, the whole area of the redwood forest has been mapped and platted. There are something over 500,000 acres of that timber in that county alone. Disinterested experts estimate 100,000 feet of lumber per acre as an average if not a small yield. At $18 per 1,000 feet the redwood of Humboldt County alone would just about pay the present national debt.—*Lumberman's Gazette.*

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.

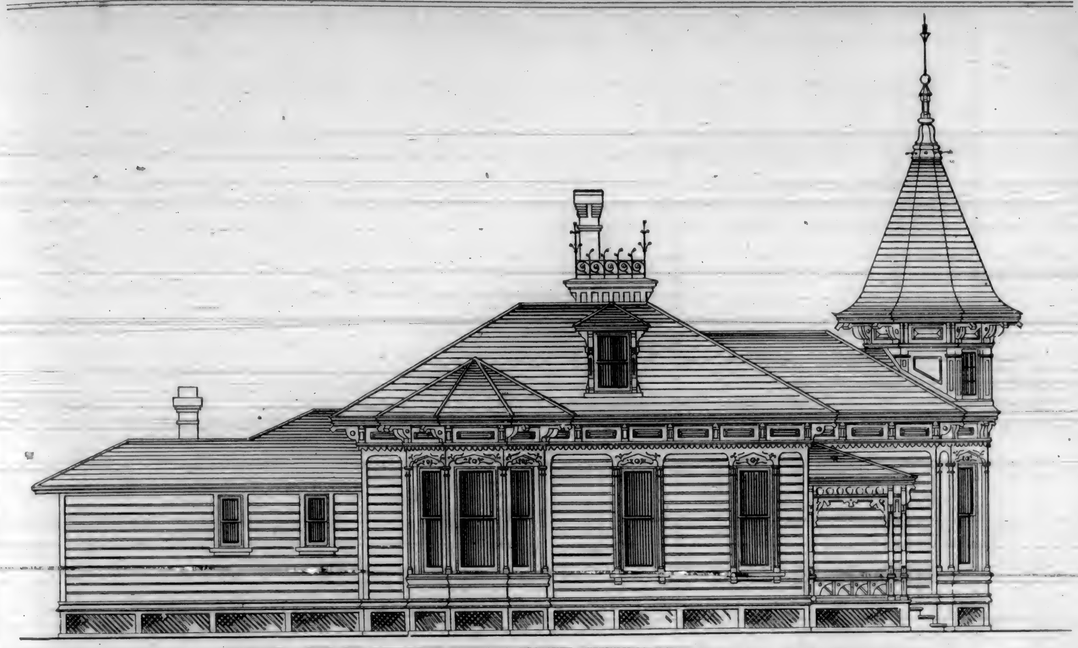

PLATE 3.—SIDE ELEVATION OF DWELLING COSTING ABOUT $3,500.

Tinting and Coloring.

There is a want felt by many when doing a little painting on their own account as to the mode of compounding the tints or colors they may wish to employ; and it is the purpose of this article to give a few hints which may prove useful to many readers of the ARCHITECT. There is a certain taste for fixing a tone to color which must necessarily come from a little practice and observation. For instance, some prime original colors, having more strength, will produce stronger effect when mixed in certain given proportions, but when of a weaker nature a larger proportion should be used to produce any given color. To make bright-toned colors, pure pigments should always be selected, and then the tone is clear and more decided. To make simple lead color, take white paint and add a little good black and a drop of blue, adding these carefully until the desired tint is obtained.

Light gray.—Is made with black and white.

Light buff.—Take yellow ochre and lighten with white.

Lemon color.—Lemon-yellow toned with white.

Stone color.—Take five parts of white lead, two of yellow, and one of burnt umber.

Straw color.—Add white to yellow of an orange tone.

Olive brown.—A little yellow added to burnt umber.

Oak color.—Lighten yellow ochre with white.

Tea green.—Mix raw umber, blue, and green to decide the shade.

Grass green.—Is made with yellow with a part of Prussian blue.

Pea green.—Lighten chrome green with white lead.

Bronze green.—Yellow deepened with black. Another shade is made by adding blue and umber.

Dove color.—Equal parts of white, blue, yellow, and red.

Fawn color.—Is made by mixing with white, yellow, red, and umber.

Snuff color.—Yellow with Van Dyke brown.

London smoke.—Van Dyke brown with yellow and white.

Chocolate color.—Indian red with black and yellow.

Claret color.—Vermilion and ultamarine blue.

Carnation red.—Carmine lake with white.

French red.—Indian red made light with English vermilion and tipped with carmine.

Copper color.—Yellow, vermilion, and black.

Maroon color.—Carmine with Naples yellow.

Rose color.—Carmine with flake white.

Drab color.—White lead with burnt umber.

French gray.—Light shade, white, yellow, and sienna. Deep, white, ochre, and Van Dyke brown.

The above formula applies to oil colors, but where color in water or distemper are used, for black use drop black, as that mixes freely. When colors are made, they should pass through a strainer, or they may be compressed with a muller or spatula on a marble slab. The latter method forms a smooth homogeneous paste paint, spreading evenly over any surface with a fine tone. J. E. W. C.

Salt and Sawdust.

The story is told in a Saginaw paper about a mill in that district that cut 18,000,000 feet of lumber annually, and the exhaust steam manufactured 20,000 bushels of salt. Thus the fuel for making the salt cost absolutely nothing. The slabs from the logs were sold for fuel at $1 per cord. That manufacturer made a fair thing on his logs, and if all could economize the product ike that, there would be but little need of bothlering aboutthe tariff question.

Preventing Water Pipes from Bursting in Frosty Weather.

A simple method of preventing the bursting of water pipes during frosty weather has recently been patented by Drs. Buxton and Ross, and was exhibited at the late Electrical Exhibition at the Crystal Palace. A valve of special construction, called by the inventors a ventilating valve, is screwed or soldered into the end of the house main service-pipe in the cistern, and a piece of string or wire conducted from it to any convenient spot, and fastened to a nail or hook. When frost is expected, all that is needful is to unhook the spring, when the valve falls upon its seat, and air being admitted through the small pipe, which rises above the surface of the water, the pipes can be emptied by simply turning on the tap at the lowest point in the house service, the water in the cistern being saved. To obviate forgetfulness on the part of servants, the inventors have called in electricity to their aid. A thermometer of special construction is so arranged that when the temperature falls below 33°, a current is sent through an electro-magnet, which releases a catch, causing the valve to fall upon its seat, and at the same time opening a small pet cock at the lowest point in the house service, and draining the pipe. The battery is cut out by the fall of the catch, and when the valve is raised again, that water may flow into the pipes, the connection is made good. The electrical part of the apparatus is by no means an *essential* feature, but simply saves trouble, and prevents the possibility of allowing the pipes to remain full during frost, as the contrivance is rendered automotic by its agency.—*The Building News.*

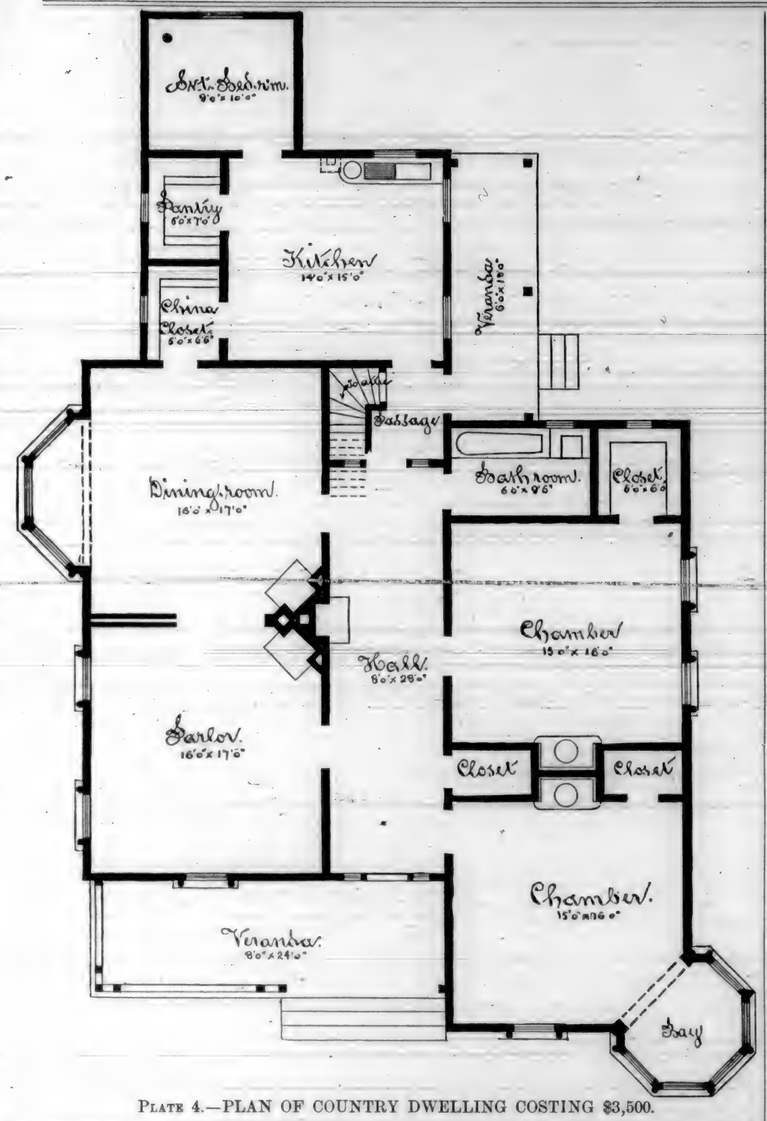

PLATE 4.—PLAN OF COUNTRY DWELLING COSTING $3,500.

Tin Roofs.

Tin roofing, to be good, must be put on with care, well turned up and over all angles, and flashed around all openings. As it is subject to expansion and contraction, leaks are always the result if proper allowances are not made. This is provided against by a raised standing joint, which costs a little more, but pays better by lasting longer; a flat joint is cheaper, but not durable. Tin should always be painted on the outer side of the sheets before using, as the sweating from condensation of vapor causes it to rust readily. Tin roofs should be painted thoroughly every two years, and in angles every fall. Tin sheets are 10x14 inches in size, and of different thickness; sized by X, XX, and XXX. XX is the best for general use, as the metal is thin, pliable, and less liable to crack under strain of contraction than thicker metal; anything thinner rusts through too easily. It is known among makers and dealers by different brands, which designate the quantity of tin actually used. Tin is bright, and of a silvery color; adheres in large, smooth flakes. Compositions of lead and tin, or zinc, are a dead smoky color, and last but a short time under the corrosive influences of salt air, smoke, and acids, these being principal causes of its decay.

It is stated that some kinds of woods, although of great durability in themselves, act upon each other to their mutual destruction. Experiments with cypress and walnut and cypress and cedar prove that they will rot each other when joined together, but on separation the decay will cease, and the timbers remain perfectly sound for a long period.

The Rights of Sanitation.

The time has arrived in this country for the stricter enforcement of a considerable body of miscellaneous sanitary law, and for the enactment and execution of new laws of the kind. This species of law, like all other law, has to struggle against ignorance, selfishness, perverseness, and wickedness. Underlying it will be found the well-defined principles of criminal law. If a man kills his neighbor, the criminal law inflicts the same penalty on him, whether he does the killing with poison, with a knife, with a club, or with a gun; but if he does the killing by means of beer poisoned with "multum," by means of a backhouse in the basement of a building let to a tenant, by means of milk containing germs of scarlet fever, by means of pork containing trichinæ, by means of tea containing a "bloom" of black lead, by means of wall-paper colored with arsenical pigments, by means of wine "doctored" to taste by admixture of plasterage," by means of a child sent to school bearing the contagion of deadly disease, by means of ships so crowded between decks with emigrants that each person has less than thirty cubic feet of air space, by means of a theater so constructed that even in case of *alarm* of fire a large percentage of the inmates are sure to be trampled to death, by means of a hospital built in defiance of every hygienic law as a monument to civic ignorance and pride, by means of a deadly drug administered by pretentious quackery—then the enactors of statutes consider their constituencies, and the elective magistrates look over their shoulders and out of the windows to observe the direction of the popular breeze. While it is very evident that public instruction must keep peace with law, it is also evident that malefactors who snap their fingers at preaching and teaching can be reached only by the infliction of dreaded penalties. The world can never be reformed by moral suasion alone.

Immanuel Kant, the most vigorous ethical soul in modern times, says: "When a man has made a worm of himself, he cannot complain if he is trampled under foot. If tenants, whose humble homes have been visited by the angel of death through the sanitary delinquency of a landlord, instead of passively submitting to their fate, would mob him and throw him into the stagnant pool under the building that he has refused to drain, or into the reeking cesspool that he has refused to clean, it would do more good than the best hygienic tract on sewer-gas ever written. If a thousand emigrants, after escaping from the foul dungeons of an ocean steamer, would turn around and abate the nuisance by burning it up—and there is some color of law for such a proceeding—it would do more public good than any act of Congress winked at by morally stupid officials. If the proprietor of an "Orange County Diary," known to be distributing milk from premises infected with small-pox, scarlatina, diphtheria, or typhoid fever, along a street where crape on many a door already indicates the sad fruits of his deadly trade, were set upon by an outraged community and hung on the nearest lamp-post, instead of being arraigned before a magistrate and "perhaps" fined ten dollars and costs, the summary proceeding would absolutely infuse a healthy ethical vigor into the makers and administrators of law." The public needs to be told again, in the trenchant language of Kant: "Let not your rights be trampled under foot by others unpunished." As long as we have a "stump tail" state of ethics on hygienic questions in the community, too rotten and feeble to beget sanitary indignation, we shall have plenty of interested men to trample uncomplaining worms under foot.—*O. W. Wight.*

☞ **Subscription price of this journal is $2.00 in advance.**

Waste of the California Redwood.

The wastefulness of this lumbering is one of the striking features of the scene. Only the largest trees are cut, those measuring less than two feet in diameter rarely being touched, and the ax is laid, not to the roots (though they are not thick and widely divergent, considering the height and weight they support), but some distance above, so that in very large specimens the massive stump, upon whose flat top you might build a comfortable house, stands ten or twelve feet above the ground, and contains hundreds of feet of sound lumber, which must be left to rot or burn. Then many trees are broken by their fall, so that large parts of them are useless; other parts may be knotty, or crooked, or inconvenient to drag out, and so only half of a great trunk will be utilized. Huge logs are consumed, also, in road-making and bridge-building in the hills, and dozens of small trees are crushed by the fall of their greater companions. Then, when a district is pretty well cleared of its best timber, fire is set in the brush and prostrate trunks. Feeding eagerly upon the resinous woods, half dried and broken, it gathers so much heat that the saplings are nearly all killed, and the flaky, tinder-like bark of the larger trees is singed in a way which must greatly injure and often destroy them. Moreover, these fires, fanned by the gusty breezes rushing in every afternoon from the ocean, often get beyond control, and sweeping through the oily tops and brittle trunks, spread blackened ruin over miles and miles of precious forest. Precious, however, it seems never to occur to the lumberman that these forests are; yet he is probably no more wasteful and careless here than elsewhere, and finds his match for heedless extravagance in nearly every pursuit that deals in what nature furnished us at the outset in abundance, but replaces only very slowly, giving abundant leisure for our repentance. The spendthrift lumberman is bad enough, but no worse than the wasteful oysterman or buffalo-hunters, reckless of the future. It is, or ought to be, a matter of rejoicing to everybody that the foresty people, under Mr. Sargeant's guidance, are paying especial attention to preserving, as far as possible, the magnificent forests of the Coast Range.—*Harper's Magazine.*

The Way It Strikes a Layman.

QUEEN ANNE HOUSES.

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.*

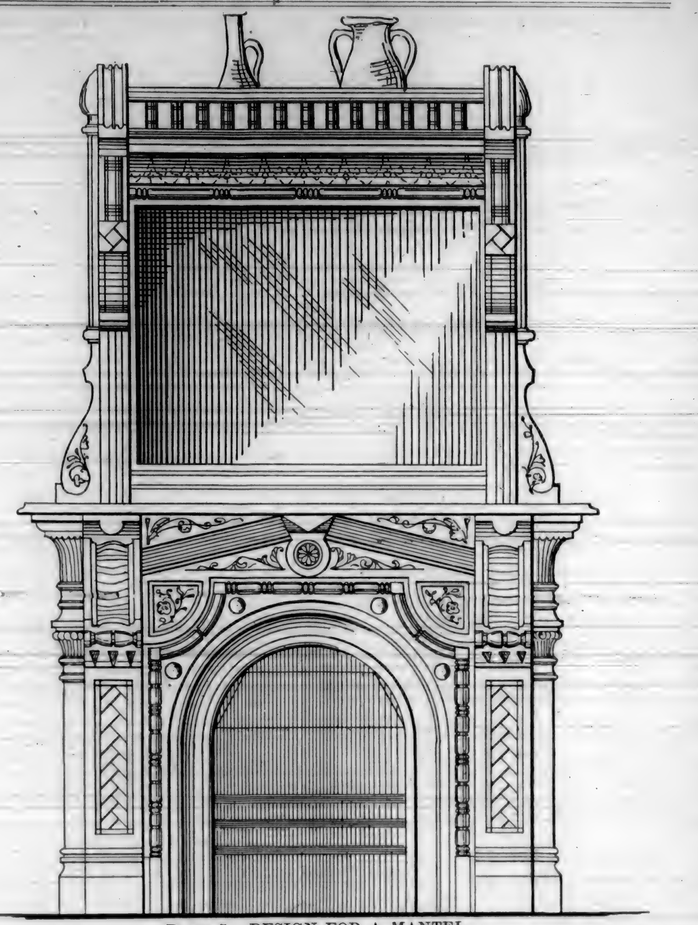

PLATE 5.—DESIGN FOR A MANTEL.

How Tacks are Made.

Described in a few words, the process of making tacks is as follows: The iron is received from the rolling mills in sheets from three inches to twelve inches wide, and from three feet to nine feet in length, the thickness varying, according to the kind of work into which it is to be made, from one-eighth to one-thirty-second of an inch. These sheets are all cut in about thirty-feet pieces, and by the immersion in acid cleaned of the hard outside flinty scale. They are then chopped into strips of a width corresponding to the length of the nail or tack required. Supposing the tack to be cut is an eight-ounce carpet-tack, the strip of iron, as chopped and ready for the machine, would be about eleven-sixteenths of an inch thick and three feet long. This piece is placed firmly in the feeding apparatus, and by this arrangement carried between the knives of the machine.

At each revolution of the balance-wheel the knives cut off a small piece from the end of this plate. The piece cut off is pointed at one end, and square for forming the head at the other. It is then carried between two dies by the action of the knives, and these dies, coming together, form the body of the tack under the head. Enough of the iron projects beyond the face of the dies to form the head, and while held firmly by them, a lever strikes this projecting piece into a round head. This, as we have said before, is all done during one revolution of the balance-wheel, and the knives, as soon as the tack drops from the machine, are ready to cut off another piece.

These machines are run at the rate of about two hundred and fifty revolutions per minute. The shoe-nail machines, for cutting headless shoe-nails, are run at about five hundred revolutions per minute, and cut from three to five nails at each revolution.

When we think of the number of machines now being run in the United States—about seventeen hundred—and of the quantity of tacks and nails they can produce, it is as much of a mystery where they go as it is what becomes of the pins.

The tack maker of fifty or sixty years ago worked as follows: He took a small rod of iron, and after heating it in a charcoal fire, hammered it down so as to make a point; then a piece was cut off, placed in a vise worked by foot power, and the head formed by a few blows of the hammer.—*The Artisan.*

Bird's-eye maple is used for firewood in Michigan, and sold for $160 a thousand in Liverpool.

The New Plumbing and Drainage Law.

The following act, entitled "An Act to grant to Boards of Health in cities and counties the power to regulate the plumbing and drainage of buildings," was passed at the late session of the Legislature of this State, and has received the signature of the Governor, and is therefore a law upon the statute books of California.

SECTION 1. On or before the first day of August, eighteen hundred and eighty-three, every master or journeyman plumber carrying on his trade shall, under such rules and regulations as the Board of Health of such [county] or city [and] county shall prescribe, register his name and address at the Health Office of such [county] or city and county; and, after the said date, it shall not be lawful for any person to carry on the trade of plumbing in any [county] or city and county, unless his name and address be registered as above provided.

SEC. 2. A list of the registered plumbers shall be published in the yearly report of the Health Office.

SEC. 3. The drainage and plumbing of all buildings, both public and private, hereafter erected in any [county], or city and county, shall be executed in accordance with plans previously approved, in writing, by the Board of Health of said [county], or city and county; suitable drawings and description of the said drainage and plumbing shall, in each case, be submitted and placed on file in the Health Office. The said Board of Health are also authorized to receive and place on file drawings and descriptions of the drainage and plumbing of buildings erected prior to the passage of this act.

SEC. 4. The Boards of Supervisors or other city or county officials, whose duty it is to make apportionments for the Board of Health of such [county or city] and county, shall make the necessary apportionment, and shall insert the same in the yearly tax levy, to provide for carrying out the provisions of this act.

SEC. 5. Any Court of record in said [county], or city and county, or any Judge or Justice thereof, shall have power to any time after the service of notice of the violation of any of the provisions of this act, and upon the affidavit of the Health Office or a member of the Board of Health of such [county], or city and county, to restrain by injunction order the further violation named in this act, or of any work upon or about the building or premises upon which the said violation exists, and no undertaking shall be required as a condition to the granting or issuing of such injunction, or by reason thereof.

SEC. 6. Any person violating any of the provisions of this act shall be deemed guilty of misdemeanor.

SEC. 7. This act shall take effect immediately.

The necessity of the enactment of a law which if enforced would limit and regulate the operations of that class of so-called plumbers who neither know nor care anything about sanitary sciences, and who are incompetent to fill places as competent journeyman plumbers, yet post themselves by sign-boards as practical sanitary plumbers, is an admitted fact among the competent plumbers and architects in San Francisco. Whether the bill just passed will accomplish the desired end, is a question yet to be solved. We have no questions as to the integrity and honesty of purpose on the part of those who secured the passage of the bill, and it may answer the purposes for which it was intended; but it might have been improved and made to cover the ground more clearly and thoroughly.

Section 1 calls for the registration of plumbers, which act of registration places all alike, good and bad, upon equal footing, securing no special advantage to the competent over the incompetent, but virtually acting as an indorsement of the very class of frauds who have created the necessity for the act. Section 2 simply authorizes the publication annually of all register plumbers, thereby helping the scaley class by placing their names before the public, among the names of good men, as practical plumbers. Section 3 makes the approval of plans by the Boards of Health obligatory, and creates the necessity of owners paying the extra cost and expense of preparing such plans, or of architects furnishing them gratuitously. Section 4 empowers Board of Supervisors to make the necessary apportionment for the carrying out of the provisions of the act; but the matter of costs and expenses are seemingly left to the discretion of the Boards of Health. Section 5 empowers any Court of competent jurisdiction to issue injunctions, etc. Section 6 defines all violations of the law as misdemeanors.

The act simply provides—more inferentially than positive—that Boards of Health shall have the power to define and regulate the means and methods "for carrying out the provisions of the act," and no limits are prescribed beyond which they shall not pass. It is presumable that such Boards will exercise all proper economies, and restrict expenditures within proper bounds; but as the law reads, extravagances and waste of public moneys are possible; and a strong public opposition is created by the fact, that under the law as it reads, Boards of Health may create places for one or several inspectors at liberal salaries, and use the power of appointment for political purposes. This is not likely to be the case in the first appointment, but hereafter such a course might be pursued. Another opposing argument is entertained in the suggestion that money in many cases may qualify merit, and scheming tinkers succeed in having their botchery passed for acceptable work. This is answered by the friends of the bill, by quoting in illustration the unimpeachableness of the gas inspector, who none will charge with the slightest irregularity. But there is a difference in the two positions. The gas inspector is exclusively under the control of the Gas Light Co., with no contingencies surrounding his appointment during good behavior; while the plumbing inspector will be liable to removal at every charge of the appointing power.

The law as passed is intended to serve a good purpose, and will so operate, so long as a qualified and honest man shall hold the position of inspector. There is also this other assurance that the spirit of the law will be enforced, viz.: Every worthy plumber will be interested in its proper enforcement, and should the appointee of the Board of Health—particularly in San Francisco—fail to discharge his duties correctly, there will always be some one to discover his irregularities and report them to headquarters, with a demand for his removal. The entire fraternity of competent plumbers will recognize the importance of watchfulness, and see that their individual interests are not tampered with by any one who shall receive the appointment of inspector, in allowing to pass any plumbing work not in accordance with the plans approved by he Board of Health. And as all such plans will be on file in the Health Office, they will be subject to inspection at all proper times, and any plumber or other person who may discover improper workmenship, or any trifling with the law, will have the right to investigate matters, and make such complaint as the nature of the case may warrant.

Since the foregoing was set in type, we have been handed a printed copy of "Rules for the Registration of Plumbers," as framed by the committee of plumbers appointed by the plumber association, which fully sets forth and defines the object of the law under notice, and develops the *modus operandi* by which the law is to be made both effectual and practical. Those rules have been prepared for submittal to the Board of Health, and if adopted by the board will qualify all seeming wants and omission in the law as past, and put at rest all the objections we have mentioned, and all that we have heard stated. With a strict enforcement of the "rules" before us, owners and tenants of buildings may rest assured that in the future a very different class of plumbing work will be done in this city, and the hitherto almost universal growl about sewer-gas and defective plumbing work will have ended. This one thing is a fixed fact—that the movement is in no way tinctured with politics, but is the outgrowth of positive necessity, and an effort on the part of the intelligent classes of practical plumbers, both masters and journeymen, to put an end to the mechanical demoralization which has in the past prevailed in the execution of plumbing work in San Francisco. As the rules referred to have not as yet been adopted by the Board of Health, and may be somewhat changed or modified before final adoption, we withhold their publication until perfected. But they are in harmony with the rules adopted by the New York Board of Health in connection with a similar plumbing law which has worked well in that city.

The Nine-Hour Movement.

The Carpenters' and Joiners' Union as an organization, representing as its name implies, the carpenters and joiners of this city, has made public the determination of its members to demand a lessening of the hours of labor from ten to nine hours per diem, without impairment of rates of wages. This conclusion has not been arrived at in haste, nor promulgated upon the spur of the moment, but is the result of prolonged deliberation and discussion; and from the standpoint occupied by those advocating the measure, the justice, fairness, and rightness of the movement is well sustained. But strong opposition will have to be encountered, and it will require more than the mere declaration of principles and rights on the part of mechanics to insure permanent success. We remember well the times—nearly fifty years ago—when the laboring classes of the country first unfolded the ten-hour banner, and resolved no longer to toil from the rising to the setting of the sun, nor to submit to that tyranny which made American freemen but little better than abject slaves, with the privileges and enjoyments of life limited to labor, eat, and sleep. The battle was fierce and protracted, but the right prevailed, and in due time the opposing elements calmed down to an acceptance of the situation.

Capital as a rule has always been arbitrary, exacting, and unyielding, demanding all that could be obtained from labor, with as small outlay as possible. "Grinding the poor" has been one of the curses inflicted upon humanity, and the source from whence has sprung the greater moral and social degeneracy of our race; and the great Author of all wisdom, truth, and love has pronounced in sacred history his utter and absolute condemnation of those who oppress the poor and make merchandise of the labors of human kind. The spirit of tyranny in some form more generally follows the acquisition of wealth. Yet we frequently read accounts of pleasing exceptions, in which the rich extend sympathy, relief, and comfort to the less fortunate, who live but little better than from hand to mouth, and of many good-hearted men who have acquired fortunes, doing noble things. But the underlying—the worm at the root—rule is, as far as labor is concerned, to utilize it to the advantage of capital, upon the most advantageous and economical terms. In manufacturing, building, and all other connections, the number of hours of labor and the pay of operatives become prominent factors. But few scruple at severe exactions to further their own interests, and the cry of "cheap labor" has been and is heard all over the world. And eyes eager for wealth have been and are turned in directions where the services of men and women can be had at least cost and with the shortest cessation from toil. The instances are few in which the financial and individual rights, interests, and comforts of the workers are first considered and fixed upon a broad and liberal basis. Long hours of labor and small pay to workers possess a fascination which blinds the minds of the larger number of employers of labor. Every one who expends money very naturally seeks to obtain the most that can be had for his outlay, but there is a rule of right and fairness, the going beyond which is neither just nor equitable.

We are well aware of the fact that the subject under discussion presents a thousand points of argument pro and con; and while we indorse and advocate all good and right movements calculated to advance the interests and better the conditions of the masses, especially those of the skilled labor classes, we advise caution, good judgment, and patience on the part of the Carpenters' and Joiners' Union, and mechanics generally. Too much haste and immature action have thwarted many a good purpose, and proved destructive to innumerable good causes.

The creation of a general sentiment in favor of any movement, and the pacification of adverse opinions, will prove far more powerful in any case than all the peremptory and arbitrary actions that can be resorted to; the former being conservative, convincing, and aggressive, while the latter tends to antagonisms and oppositions. The farmer who attempts to plant his fields without first removing the stubble and preparing the soil will have but poor return from his sowing.

In this view of the case, we presume that the carpenters and joiners have reviewed all the probabilities, and are prepared to meet the issues and responsibilities involved. The permanancy or failure of the movement is yet to be decided by practical experience. If, as all present conditions indicate, general prosperity is to continue in San Francisco, and the demand for skilled labor increased, the nine-hour rule will likely become a success, until a break-down in prosperities occurs; and even then the rule may be sustained, leaving the matter of wages to be regulated by any future stringency or reversal of building activities; for it may reasonably be anticipated that should the time arrive when again labor shall be in excess of demand, that either the nine hours or the rates of compensa- will be attacked.

The Nine-Hour Mass Meeting.

On the 30th of March, after the foregoing article had been written, the Carpenters' and Joiners' Union assembled in mass meeting, to the number of about three hundred. Speeches were made by several of those present, and the following resolution was adopted:

Resolved, That this meeting indorse the action of the Carpenters' and Joiners' Union in inaugurating the nine-hour system, and pledge ourselves to defend and sustain them in their endeavor to obtain the concession thus demanded.

A committee consisting of twelve members was then appointed to confer with the bosses, with the view of securing the consent and co-operation of the contractors in establishing the nine-hour rule as a day's labor. The moderation and manly fairness, and the absence of rash and hasty action on the part of the Union which has thus far characterized the movement, will do much toward furthering the object contemplated, and of placing it in its more favorable light before those who might otherwise be inclined to interpose opposition.

It is altogether likely that some employers will reject the proposition, and hurl anathemas at the proposed changes and those who have promoted it, with no fair or intelligent consideration of the arguments favoring the project. The contractedness and selfishness of some minds render them incapable of weighing facts and arguments not in accord with conclusions arrived at by them from premises exclusively one-sided and limited. It is a somewhat singular fact that oppositions to such movements as the one contemplated, and all others which seek to change long-established custom, are based upon *presumed and speculative effects*, with but little reference to the rights, comforts, or equities of those who ask concessions or relief. But we agree with no theory or doctrine which proposes to benefit certain classes at the sacrifice of the greater number, who perforce of circumstances are compelled to operate in dependent situations. For it must be admitted that every man and woman who lives by the product of personal toil is in that sense dependent, with the contingencies of life resting upon the more or less uncertain demand for such labor. But that fact does not sanctify the means and measures sometimes adopted to oppress labor and humiliate it at the feet of capital.

Bricklaying.

Bricklaying is the art of building with bricks, or by uniting them by cement or mortar into various forms.

The implements used by the bricklayer are a trowel, for spreading mortar and breaking bricks when a piece smaller than a whole brick is required; a hammer for making openings in the brickwork and for driving or dividing bricks, for which purposes one end is formed like a common hammer, and the other is broad and flattened, somewhat after the manner of an ax; the plumbrule, made generally of wood, having a longitudinal opening down its middle and a plummet suspended from its upper end, for carrying walls up perpendicularly; the level, consisting of a long horizontal arm, having a perpendicular branch carrying a vertical arm from which a plummet is suspended; a large square for laying out the sides of a building at right angles; a rod, usually five or ten feet long, for measuring lengths; compasses, for traversing arches and vaults; a line and line pins, for keeping the courses straight and level as the work progresses; and a hod, for carrying bricks and mortar to the workman.

Bricks are laid in courses so as to break joints, and their arrangement with regard to each other constitutes what is called the bond. There are two kinds of bond used in England and America—English, or old English, and Flemish—the former, however, being much more commonly employed than the latter.

The term "bond" generally means that part or those parts of a built structure which tie the other portions together.

In masonry it is a stone or brick which is laid with its length across a wall, or extends through the facing course into that behind, so as to bind the facing to the backing. Also known as binders, bond-stones, binding-stones, through-stones, perpend-stones, headers.

Perpend signifies that a heading stone passes through the whole thickness of a wall; binder, that it extends part of the distance across.

In what is known as heart-bond, in stone walling, there are no perpend stones, but two headers meet in the middle of the wall, and the joint between them is covered by another header.

Chain-bond is the building into the masonry of an iron chain or bar, or heavy scantling.

A cross-bond is a block-bond in which the joints of the second stretcher-course comes in the middle of the first; a course of headers and stretchers intervening.

In block and cross bond the extrados of the wall is put up in cross-bond; the intrados in block-bond.

In bricklaying, in English bond, the courses of headers alternate with the courses of stretchers. In the Flemish bond each course has headers and stretches alternately. It need hardly be remarked that the stretchers are those bricks which are placed lengthwise of the wall, and the headers are those laid endwise.—*Brick, Tile and Metal Review.*

We have received from Palliser & Co. plans and specifications of a modern 8-room cottage with tower, also showing how it can be built without tower, with only six rooms. These plans are finely finished, and give full details of mantels, stairs, doors and casings, cornices, etc. They also send us blank specifications for frame or brick buildings, costing $500 to $5,000, which include two of their new blank forms of building contract. These are perfect, have been drawn with great care and precision, and have been recently published. Architects and builders would do well to write to this office for information concerning these forms, which are in every way complete, convenient, and suitable for the purposes intended.

Dry Rot and Worm-Eaten Wood.

A question on this subject having been recently asked in the columns of our contemporary, the *Building News*, Mr. W. Stevenson, of Hull, has supplied the following answer, which will be read with interest by wood-workers in general: "Dry rot," he says, "is a term applied to damp wood under process of destruction by fungi, or low forms of vegetation. The albumen and the essential oils in the wood become the food of this secondary or parasitic vegetation; the woody tissue is broken up, and the walls of the cells destroyed, an earthy, powdery matter being left as the residue. This residue bears on its face a close resemblance to burnt or charred wood. Indeed, it is akin to burnt wood, for the albuminoid sand the essential oils, which escape under the influence and form the food of fires, have been consumed or absorbed by parasitic vegetation. The residue, an earthy, inflamable substance, is practically identical with that resulting from fire. Dry rot, or the destruction of wood by secondary forms of vegetation, is dependent upon two conditions—heat and moisture. To prevent dry rot, the wood is dried or seasoned, by which one of the elements is withdrawn. To guard against the return of this one element, the wood is painted or varnished, and hence the general application of paint or varnish. Where wood cannot be painted, preservatives are used, the object of which is to change the character of the wood, so far as its secretionary matter is concerned. In this direction, creosoting is the most common or customary, the object of which is to poison the albuminoids and the essential oils, and so render them unfit for food to low or secondary forms of vegetable life. Salts, sodas, and metallic injections have the same effect, but they are in large degree soluble in water, and in course of time become weak or disappear, and consequently they are not so largely or generally used as creosote oil. The amount of moisture necessary for the support of this secondary vegetation is very large. This is supplied by humid or stagnant air, or by damp walls or subsoils, and hence it follows that wood subject to passing air, or brought under the influence of vegetation, is free from this disease or dissolution.

"Worm-eaten wood is wood injured by mechanical action, i. e., by animal life. The same conditions are imperative to the support of this form of life as to the above, but the amount of moisture necessary in this case is very small campared with that required for the support of vegetation. Wood to be worm-eaten must be subject to damp, humid, or stagnant air, and it must be a sweet wood or the sap of a bitter or pungent wood. Ash, elm, walnut, birch, beech, and lime-tree are sweet woods, and very subject to worms. Oak and resinous wood are bitter, pungent, or unpalatable, and, except in the sap-wood, are fairly free or proof against the attack of worms. Under certain conditions, as in the roofs of churches covered down with lead, where condensation of the atmosphere ensues, and the wood absorbs the moisture, the heart-wood of even oak will fall a prey to the action of worms. In some cases the necessary moisture is supplied by the ends of the beams being inserted in walls, the materials of which are porous stone. Here the damp ends of the beams will be riddled with worms, and sponge-like, they will crumble away, and, if not supported, will fall clear off the walls. The heart-wood in this case seems to have lost its pungent qualities and to have become soft with long saturation; but, not having been seized upon by fungi, to still retain its albuminoids, and to be sufficiently endowed with them to form the food of worms.

"As to the worms themselves, they are the grubs or larvæ of the furniture beetle (*Anoblum striatum*), better known as the book-worm, an insect that will bore through volumes in search of the book-binders' paste, which is composed of flour or albumen. The beetle is subject to four stages of life—1st, the egg; 2nd, the grub or larvæ; 3rd, the pupa or chrysalis; 4th, the perfect or winged insect. The parent deposits the egg, which is provided with a supply of albumen, as in the eggs of birds where we recognize it as the 'white of the egg.' Moisture and food are thus supplied to the insect, and heat is supplied from the rarefied atmosphere of the summer season. The egg is hatched in the hole or crevice in which the parent deposited it, upon which the instinct of the animal teaches it to bore into the wood. At this stage it is small, and has exhausted its stock of food. Its boring operations are performed by powerful forceps or mandibles attached to the head, by which it detaches fragments of wood, not for the sake of forming a habitation, as some observers believe, but for the purpose of food, the object being to extract the albumen from the wood as the particles are passed through its intestines. The result is, that the grub-worm, or larvæ, increases in size as it bores in and along the wood. It will avoid touching or breaking into the neighboring chamber, and in its tunneling operations shows a remarkable instinct—one worthy of most careful study. When the grub or worm has attained its full size, it will be found to be possessed of a black head and a long, round, fatty body, at which stage it changes to the pupa. The insect is then enveloped in a case or cocoeon, from which, after absorbing the fatty store or albuminous compound secreted by and in the body of the grub, or larvæ, it emerges a perfect winged insect, in which state it has power to liberate itself from its prison of wood. I have known them in this stage, when propagated in limewood carvings, to bore for the painted surface, and to actually bore through sundry coats of paint to effect their escape. The parent insect will not bore through, or lay eggs in or upon the paint, but will reach the naked wood through some crevice or joints between the junction of two pieces of wood. In the mature insect effecting its escape, it will bore through foreign matter, like paint, that would be poisonous to the young grub or larvæ. This is owing to the fact that the perfect insect is not boring for food and sustenance, but merely to effect its escape from its prison home."

Reduction of Postage.

The Post-office Department will soon issue a circular in view of the reduction of letter-postage, which takes effect October 1st, calling the attention of postmasters and the public generally to the fact, and admonishing the former to cut down the stock of stamps kept on hand. No steps have yet been taken toward the issuing of a new stamp other than that the head of Washington, which now ornaments the three-cent stamp, will be printed upon the new two-cent issues. The color and design for the stamp have not yet been determined, but will erelong, so that in the intervening six months everything may be made ready for the change. The Canadian Government has decided not to follow the example of the United States in establishing two-cent postage.

Buying vs. Building.

The statement often made that it is cheaper to buy than to build, even when followed by the large qualification—if one can find what suits him—is erroneous. It is true, there are foreclosed mortgages, auction sales of household goods, and pawn-brokers' shops, by means of which real estate and personal property change hands with little regard for actual values, and chances to buy at low rates are often found. So there are men who build houses for themselves, which, proving unsatisfactory, their owners are willing to sell for less than their cost. There are others who, through change of residence or inability to pay their debts, are compelled to part with their homes at a pecuniary sacrifice; and speculative builders not infrequently push their enterprise so far during prosperous periods that when the real estate pendulum swings to the off-side they are compelled to unload at any price, even if such one-sided operations upset them into the slough of bankruptcy. All these things are common enough, more's the pity. Yet it is a mistake to suppose that on legitimate business grounds it is cheaper to buy than to build. Old homes cannot well be compared with new, for their relative values would be largely a matter of taste and opinion, affected more or less by change of position and the varying circumstances of different cases. It should be remembered, in favor of the new, that wooden houses as commonly built deteriorate rapidly, and the cost of improvements and repairs will increase with age—expenses that ought not to exist during the first five or ten years of the life of a new building.

As regards the houses built for sale and those built by their owners for their own occupation, there is no good reason why the latter should cost more than the former. For the common impression to that effect there are several reasons. It is assumed that the same principle applies in house-building as in some other kinds of business; and the more extensive the manufacture, the cheaper will be the product. This is true to a very limited extent only, because, as a rule, each house differs from every other in some degree, and because the best results in building require a large proportion of skilled, intelligent workmen. Another reason for this opinion seems to be based upon the most solid of all grounds—every-day experience. Men wishing to build for themselves are offered houses that are satisfactory in size and quality, at lower prices than any estimates they are able to get upon *what seems to them* the same thing, modified slightly to suit their special needs. But in the majority of cases they are not the same thing. When a man follows the building of his own house, either in the actual work or through minutely drawn plans and specifications, he expects and demands at every step, from the mouth of the drain to the top of the smoke flue, a perfection and thoroughness in all the materials and workmanship visible and invisible, that are not often found in houses built "for sale," but which he would not care for in his own if he had not seen it until it was completed. In brief, whether he intends it or not, he virtually expects the house he builds to be better than the one he would buy, not only better suited to his needs, but better in construction. For the same thing it would cost him no more to build than to buy, but he is never quite satisfied with the "same thing."—*The Builder.*

Carpenters should remember that fresh glue dries much more readily than that which has been once or twice melted. The finest ordinary glue, or that made from white bones, absorbs twelve times its weight of water in twenty-four hours; from dark bones the glue absorbs nine times its weight of water, while the ordinary glue, made from animal refuse, absorbs but three to five times its weight of water.

Building Prosperities of Portland, Oregon.

Building operations in this fair city of the North-west, are at present very lively, and from advices received from architects and builders, the present year will outrank any previous record in the number of new buildings erected.

From the columns of *The Commercial Herald*, a new aspirant for public favor, and from its appearance and the ability of its editorials, well worthy of support, we are enabled to present the following record of new buildings now in process of construction:

Brick building soon to be constructed on corner Fourth and Yamill streets. Size 100x100, 4 stories in height. Two story frame, corner East Park and D streets; owner, P. Taylor; contractor, J. C. Bennet; cost, $6,000.

J. Slavig is building a two-story frame residence, corner Sixth and Clay, to cost $3,800.

F. Opitz will construct a three-story brick block on the north-west corner of First and Pine at once.

Work has begun on the new Presbyterian church, corner of Fifth and J streets, East Portland.

Cleghorn & Bunting are rebuilding the old Eagle hotel, on Second street, between E and F, at a cost of $10,000.

H. H. Lone has under construction, on the south-east corner of Taylor and Ninth, a two-story residence costing $2,000.

The Long Island House, on the north-west corner of Front and C streets, will soon be replaced by a four-story brick.

Henry Weinhardt will soon commence construction of a four-story brick block, corner Second and Oak streets, 95x100.

Mrs. Vantine has a block of five residences under construction on Seventh, between Taylor and Yamhill, to cost $18,000.

Work on J. W. Cook's new brick block on Front street, between Ash and Pine, is progressing rapidly. It will cost about $35,000.

W. E. Robertson has commenced construction of two handsome residences on the south-east corner of Taylor and East Park streets.

A handsome residence is about to be constructed by Hon. H. W. Corbett, for his son, in the vicinity of Bishop Scott grammar school.

Captain Lewis Love will erect another large frame block on the south-west corner of Front and Clay, immediately back of his new hotel.

H. Fleckenstein has in course of erection a block of handsome residences on East Park, between Montgomery and Harrison, to cost about $25,000.

Work on the dock and warehouse of W. S. Ladd, at the foot of Taylor street, is being vigorously prosecuted. It will cost about $25,000 when completed.

H. E. Dosch, of Akin, Selling & Co., has a two-story dwelling-house in course of construction on Taylor, between West Park and Eighth, to cost about $3,000.

Foundation is being laid for Labbe Bros.' handsome four-story brick block on the north-east corner of Second and Washington. It will contain six stores.

J. A. Strowbridge's new three-story brick block on the north-east corner of Second and Yamhill will be 75x100 in size, and cost nearly $50,000 when completed.

Reconstruction of the J. C. Ainsworth building has been commenced, and a third story will be added to its previous height. Contractor, F. W. Lewis; cost, $20,000.

Goddard & Frazier have leased the property on the north-west corner of Sixth and C streets, and will commence the erection of a three-story livery stable at once.

Workmen are busily engaged tearing down the old stone foundation on the south-east corner of Front and Morrison streets, preparatory to the erection of a brick block.

A. H. Johnson will soon erect a four-story brick building to occupy the 100 feet square on the south-east corner of First and Taylor streets. It will cost about $100,000.

Workmen have moved the dwelling on the north-west corner of Fourth and Alder streets, and Mrs. Burk, owner of the property, will erect a building 25x60, for business purposes.

The excavation has been made and foundation commenced for Fred Bickel's new brick block, corner Front and C streets. The building will be 100x100, and cost about $50,000.

The two-story brick on the south-west corner of Front and Stark streets is to be torn down to make way for a handsome brick building three stories in height, to cost about $20,000.

The buildings on the lot adjoining the corner of First and Clay streets, east side, are being removed, and are to be replaced by a three-story brick. The property is owned by W. W. Spaulding.

Plans have been prepared by E. M. Burton for a row of three double residences for J. M. Kenworthy, of East Portland, to be erected on Seventh street near the Episcopal church. They will cost about $12,000.

A building will soon be erected by Messrs. D. P. Thompson and M. S. Burrell on the New Market block, north-east corner of Second and Ash streets. It will be 100x70 feet, and three or four stories high.

D. Goodsell has let the contract for a three-story frame block 50x70, on Third street near B. The building is to be completed by May 1st. The first floor will be occupied by stores, and the upper floors be fitted up for lodging rooms. Its cost will be about $10,000.

C. A. Malarkey has leased the quarter block on the north-west corner of Fourth and Morrison streets, and will remodel the present buildings into business houses, adding a new frame building to fill out the entire space leased.

Architect Sherwin is preparing plans for three handsome dwellings, to be erected by Hon. Geo. H. Williams on the half block immediately adjoining the fine residence he is erecting for himself near the Bishop Scott grammar school.

At a meeting of the board of trustees of the Odd Fellows' Orphans' Home, held last week, the plans and specifications of the building prepared by architect Krumbein were formally accepted. The cost of the building will approximate $10,000.

Construction of a $200,000 flouring mill, and $700,000 elevator in Albina, $250,000 iron works, $500,000 hotel, and $1,500,000 depot in Portland, and several hundred business blocks, stores, residences, etc., in Portland, East Portland, and Albina, during the coming season, will give to our city a building boom such as has never been witnessed in the North-west. It is likely that not less than $5,000,000 will be expended in new buildings alone during 1883.

The *Ledger* says the Episcopal college projected at New Tacoma is certain to be built. C. B. Wright, of Philadelphia, formerly President of the Northern Pacific Railroad Company, has pledged Bishop Paddock that if his friends would raise $50,000, he himself would add thereto $100,000. The Bishop, who is now in the East, announces that a large proportion of the $50,000 has been raised.

The old foundations on the ground immediately north of the National Hotel are being renovated by Canuto & Zanello. They have undertaken the contract to prepare them for a magnificent four-story brick to be erected thereon shortly. The material used for the foundation will be entirely of stone, and the extra work will probably amount to $20,000. The building will have a frontage on Front street of 100 feet.

The Willamette Iron Works have purchased the block bounded by Third, Fourth, G and H streets, paying $75,000 therefor, and will erect thereon a building for their new works. The entire plant, when completed, will have cost the comfortable sum of $250,000. The building will cover the entire block, and will be two and three stories in height, built of brick, stone, and iron, and will be completed by the last of September, but the company cannot move in before the first day of January, 1884. When finished, it will be the most complete and best arranged foundry west of Pennsylvania, and the largest on the North Pacific coast.

The authorities of the Taylor street M. E. church, have purchased of Mr. Skidmore for $14,500 a half block on the north side of Taylor street, between Tenth and Eleventh. It is proposed to erect on the new site a very fine tabernacle, costing from $35,000 to $40,000.

A commodious wharf will soon be built at Montesano.

Farmington, W. T., is to have a new steam flouring mill.

The Port Blakely saw-mill is cutting up logs as briskly as ever, at the rate of 180,000 feet a day.

A number of parties are looking at the Sinslaw country, with a view of building a saw-mill there.

The Oregon Improvement Company will soon begin building a fine wharf at Seattle, 240 feet long, running from Main to Washington street. The wharf will be built so as to leave a sixty-foot slip at the foot of Main street.

To Remove Clinkers From Stove Linings.

Once in a while we see in the papers directions for removing clinkers from the linings of stoves. Prevention being better than cure, I propose to show how they can be prevented. Three years ago I put a new lining in a No. 3 Magee heater, and no one would imagine, from examining it to-day, that it had been used more than a week. With a piece of iron about half an inch wide, bent to reach the whole lining, I scraped the surface of the lining, shake down lightly, and then put on coal. Kindlings will be required if the fire has been left to get too low, but it is better to do this earlier, as it keeps a steadier fire, and takes no more coal. I think I can explain it on correct principles. When the fire is the hottest, there are no ashes; but as the heat has decreased, the ashes have formed and settled down against the lining, and shaking does not wholly remove them. If more coal is added, the heat is sufficient to fuse the ashes on to the lining, and there they stay. Each time this is repeated more ashes adhere, and it does not take long to spoil the lining. I scraped these ashes off thoroughly the first thing, and none adhere, and it seems that the lining will never wear out.

There is another thing to be noticed. If one stirs a coal fire at the top, in the center, the fire generally goes out, because cold air goes up through the centre; but by scraping around the outside of the fire, and leaving the center undisturbed, the air going up around the fire slightly cools off the lining, and the coal in the center retains its heat sufficient to burn up again quickly without kindlings, if the replenishing has not been too long delayed. The grate must be let down often enough to prevent the accumulation of clinkers in the bottom. Once or twice a week I let down my great, replace it, and put in some wood, then some of the live coals on the top, when it burns up immediately. I then put on a hodful of coal and close the stove, and have a fire at once without the heat having gone down, and so keep a good fire all winter. This can be depended on: that scraping the ashes from the lining before replenishing a fire—*every time*—will effectually prevent clinkers from adhering.—*Ex.*

SAN FRANCISCO.

Octavia x Pine & California. Two-story and attic frame.
O.—S. Sussman.
A.—Schmidt & Havens.
C.—Thos. Moffat.
$15,000.

Mission & Bond. Frame-building, flats.
O.—Mrs. M. Brown.
A.—Schmidt & Havens.
C.—Terrill & Slaven.
$6,800.

Hyde x Post & Geary. Two two-story and basement frame.
O.—Mrs. C. Lauenstein.
A.—Schmidt & Havens.
C.—Haskell & White.
$5,500.

Buchanan & California. Alterations.
O.—A. Monpelier.
A.—Schmidt & Havens.
C.—F. Klatt.
$1,500.

Mission & Twelfth & Thirteenth. Three two-story frame.
O.—C. C. Vorrath.
A.—G. E. Voelkel.
C.—Thom Wohrden.
$12,000.

Natoma x Tenth & Eleventh. Two-story frame.
O.—C Dunker.
A.—Schmidt & Havens.
C.—T. C. Riddell.
$2 500.

Eddy x Polk & Larkin. Four two-story frame.
O.—E. & J. Dusenbury.
A. Schmidt & Havens.
C. Terrill & Slaven.
$16,000.

Franklin & Golden Gate Avenue. Alterations.
O.—K. Strauss.
A.—Schmidt & Havens.
C.—C. Chisholm.
$1,200.

Mission x Twelfth & Thirteenth. Two two-story frame.
O.—H. Sammi.
A.—G. E. Voelkel.
C.—Thom Wohrden.
$8,000.

California nr Montgomery. Alterations, Merchants' Exchange.
A.—Newsom & Gash.
C.—G. D. Nagle.
$4,400.

Post x Kearny & Dupont. Alterations.
O.—Hollis & Berts.
A.—H. D. Mitchell.
C.—Gonyeau.
$18,000.

Main nr Market. Two-story building.
O.—Schmidt Eng. Co.
A.—H. D. Mitchell.
C.—W. E. Stevens.
$1,800.

Excavations for proposed Dominican Church.
A.—T. J. Welsh.
C.—E. Kenney.
$3,485.

Octavia x McAllister & Golden Gate Av. Two-story and basement frame.
O.—Walker.
A.—W. Curlett.
C —Kincaid & Baldwin.
$5,000.

Golden Gate Av. x Laguna & Buchanan. Three-story frame.
O.—F. Grass.
A.—Schmidt & Havens.
C.—W. Langstaff.
$6,500.

O'Farrell x Taylor & Jones. Three-story frame.
O.—W. F. Robinson.
C.—Kincaid & Baldwin.
$7,000.

Leavenworth nr Sutter. Two-story and basement frame.
O.—Mrs. Jehus.
A.—Cleaveland & Swain.
C.—E. Watts.
$6,000.

Mission cor. Mary. Three-story and basement frame.
O.—Donahue.
A.—Smith.
C.—T. J. Welsh.
$8,000.

Ellis x Laguna & Buchanan. Two-story and basement frame.
O.—Blankbury.
A.—Kenitzer & Raun.
C.—E. Farrell.
$.

Ellis nr Buchanan. Two-story and basement frame.
O.—Porter.
A.—Kenitzer & Raun.
C.—E. Farrell.
$.

Van Ness nr Ellis. Alterations.
O.—H. Sadler.
A.—Schmidt & Havens.
C.—W. Fluns.
$4,000.

Bush nr Baker. Two-story frame.
O.—J. W. Wetmore.
A.—McDougall & Son.
C.—J. H. McKay.
$5,000.

Waller nr Steiner. One-story and basement frame.
O.—Strasser.
A.—Geo. Miller.
C.—J. Blake.
$1,300.

Bartlett nr Twenty-third. Two-story frame.
O.—Capt. Stockfleth.
A.—H. C. Macy.
C.—L. D. Frichett.
$3,200.

Capp x Twenty-third and Twenty-fourth. Two-story and basement frame.
O.—C. H. Evans.
A.—S. & J. C. Newsom.
C.—J. Doherty.
$5,500.

Ellis x Hyde & Leavenworth. Two-story frame.
O.—R. H. Lloyd.
A.—Kenitzer and Raun.
C.—Conrad & Miller.
$8,000.

Turk x Hyde & Leavenworth. Two-story basement frame.
O.—Mrs. Manning.
A.—Schmidt & Havens.
C.—Heald & Gillespie.
$5,000.

Dolores nr Twenty-third. Two-story frame,
O.—N. Stone.
B.—M. H. Colley.
$6,000.

Dolores x Twenty-third and Twenty-fourth. Two-story frame.
O.—F. Sandborn,
B.—M. H. Colley.
$6,000.

Fifth and Harrison. Additions.
O.—J. Martin.
Day's work.
$2,500.

Mission nr Eighteenth. Two-story frame.
O.—C. Herring.
A.—H. Geilfuss.
C.—P. Stecher.
$2,500.

Twenty-second nr Valencia. Two-story frame.
O.—Mrs. Lewis.
C.—W. Walsh.
$3,000.

Twenty-eighth x Dolores & Church. One-story and basement frame.
O.—Wm. Dodd.
Day's work.
$1,100.

Twenty-eighth & Guerrero. Two one-story frame.
O.—Mr. Klavensawl.
C.—Lanfian.
$1,000.

Guerrero & Fair Oaks. Two one-story and basement frame.
O.—J. Cronigal.
A.—R. Warren.
C.—L. Larivee.
$3,300.

Shotwell x Fourteenth & Fifteenth. Two-story basement frame.
O.—Mrs. C. Schreiber.
A.—H. Geilfuss.
C.—R. Doyle.
$3,900.

Stevenson nr Twentieth. Alterations.
O.—S. Moore.
Day's work.
$2,000.

Twenty-eighth nr Dolores. Two-story frame.
O.—J. Riper.
C.—R. Bergfeld.
$2,000.

Sanchez Av. x Twenty-seven & Twenty-eighth. Alterations.
O.—J. Lind.
C.—J. Cordano.
$500.

Shotwell x Nineteenth and Twentieth. One-story frame.
O. & B.—J. H. Patton.
$1,000.

Stevenson nr Ninth. Three-story and basement frame.
O.—J. Kirk.
A.—Geo. Miller.
C.—G. Hansbrough.
$7,000.

Washington cor Larkin. Two two-story and basement frame.
O.—Chas. Hinkle.
Day's work.
$6,500.

Washington cor Fillmore. One story frame.
O.—G. Uhl.
A.—C. Mau.
C.—Treadwell & Thompson.

Broderick nr Bush. Thirteen two-story frame.
O.—Chas. Hinkle.
Day's work.
$45,000.

California cor Devisadero. One-story and basement frame.
O.—J. A. Keene.
A.—Kenitzer & Raun.
C.—Moore Bros.
$10,000.

Washington x Polk & Van Ness. Additions.
O.—J. F. English.
C.—W. Wharff.

Pacific nr Van Ness Avenue. Two-story frame.
O.—W. F. Canham.
C.—T. Lasby.
$1,000.

Clay cor. Broderick. Two-story frame.
O.—Shortsline.
A.—Geilfuss.
C. Conrad & Miller.
$3,000.

Seaside Gardens. Presidio Pavilion.
O.—Hink & Burkhardt.
A.—C. Mau.
C.—B. Dryer.
$7,000.

Seventh x Folsom & Howard. Additions.
O.—H. Boyle.
A.—Eisen & Co.
C.—T. J. Hamilton.
$1,500.

Eighteenth nr Howard. Two-story and basement frame.
O.—James.
A.—G. A. Bordwell.
C.—Gray & Stover.
$3,000.

Front x Filbert & Union. One-story brick.
O.—American Sugar Refinery.
C.—C. Shoenmaker.
$20,000.

Laguna cor. Fell. Additions.
O.—C. Gienger.
C.—Thom. Wohrden.

Fillmore cor. California. Alterations.
O.—C. Nobmann.
A.—Voelkel.
C.—Cook & Johnson.

Ninth x Bryant & Harrison. Three story frame.
O.—Pacific Box Factory.
A.—Mooser & Depierre.
C.—D. Roy.
$7,000.

California x Broderick & Baker. Two-story frame.
O.—W. Martin.
A.—H. T. Bestor.
C.—Girvin & Munn.
$5,000.

Gough & Ivy Av. Two two-story frame.
O.—M. Cazelis.
A.—Huerne & Everett.
C.—Kreger.
$4,000.

Fair Oaks cor. Twenty-fourth. One-story frame.
O.—T. Le Huquet.
A.—Moore.
C.—Terrill & Slaven.

Washington nr Broderick. Two-story frame.
O.—J. Mellody.
A.—Moore.
C.—Langstaff.

OAKLAND.

Cor. Fifteenth & Brush. Two-story barn.
O.—E. B. Dean.
A.—Matthews & Son.
Day's work.
$2,500.

Madison x Fifteenth and Lake. Two-story frame.
O.—Merritt.
Day's work.
$7,500.

Filbert x Eighth & Tenth. Two-story frame.
O.—H. Althorp.
A.—C. Mau.
C.—W. Dahl.
$6,000.

Third and Market. Two-story frame.
O.—L. Marini.
A.—C. Mau.
C.—W. Dahl.
$3,000.

Centre & Eighth. Additions.
O.—J. Samm.
A.—C. Mau.
Day's work.
$800.

Broadway & Tenth. Two-story brick.
O.—F. Derger.
A.—Kenitzer & Raun.

Eighteenth nr San Pablo Av. Two-story frame.
O. & B.—W. F. Curtis.
$3,800.

Twenty-first nr San Pablo Av. One-story frame.
O.—H. Swail.
A.—Eisen & Co.
C.—Lockhart & Bentley.
$3,000.

West cor. Ninth. Two two-story frame.
O.—Col. Woods.
C.—Brown.
$4,800.

Brush cor. Ninth. Two two-story frame.
O.—Col. Woods.
C.—Brown.
$4,800.

Taylor cor. Wood. Two-story frame.
O.—J. Zieglemeyer.
Day's work.
$2,000.

Poplar nr Fourteenth. Two-story frame.
O.—B. C. Cavallier.
A.—McDougall & Son.
C.—W. P. Clark.
$2,000.

Seward nr Pine. One-story frame.
O.—A. S. Scofield.
C.—W. P. Kelley.
$650.

Oakland Avenue. Two-story frame.
O.—W. H. Rouse.
A.—Newsom & Gash.
C.—Knight & Littlefield.
$10,000.

Seward cor. Wood. Two-story frame.
O.—L. Hoffschmidt.
Day's work.
$2,000.

Seventh nr Union. Additions.
O. & B.—D. H. Matheson.
$800.

Fourteenth & Webster. Two-story frame.
O.—D. H. Ward.
A.—H. D. Mitchell.
O.—Hannah.
$5,000.

Brush & Thirteenth. Two-story frame.
O.—Thos. Smith.
A.—Matthews & Son.
Days' work.
$5,000.

ALAMEDA.

Alameda Av. x Willow & Chestnut. One-story frame.
O.—A. F. Cornell.
C.—A. Denke.
$2,500.

Union St. & Alameda Av. Two-story frame.
O.—Mrs. Rimrod.
A.—Babson & Seadler.
B.—Gilbert & Co.
$4,000.

Everett St. One-story cottage.
O.—Dr. Twichell.
B.—Gilbert & Co.
$1,600.

Santa Clara Av. nr Bay. Improvements.
O.—H. Dilling.
C.—Cutting.
$600.

Central Av. x Oak & Walnut. Three two-story frame.
O.—G. Zeh.
C.—Wassum & Pattiani.
$11 000.

San Jose Av. x Oak & Walnut. One-story frame.
O.—Brown.
C.—J. C. Jamieson.

Everett nr R. R. Av. One-story frame.
O.—Dr. Twichell.
B.—Gilbert & Co.
$1,800.

R. R. Av. x Oak & Walnut. Two story frame.
O.—Mrs. Brock.
C.—Christensen.
$7,000.

STOCKTON.

Four-story brick building.
O.—Masonic Hall Association.
A.—Percy & Hamilton.
C.—Confer Bros.
$60,000.

SACRAMENTO.

J x Second & Third. Two-story brick building.
O.—Heilbron.
A.—Babson & Seadler.
C.—D. & D. Falconer.
$5,300.

Seventh x J & K. Remodeling.
O.—Anderson & Johnson.
A.—Babson & Seadler.
C.—Thos. McCaffrey.
$1,400.

Fifteenth & M. One-story frame.
O.—Robertson.
C.—Falconer.
$2,500.

Tenth & N. Additions.
C.—Falconer.
Day's work.

SEATTLE.

Occidental Hotel.
O.—J. Collins.
A.—McKay.
$80,000.

Yesler Block.
A.—Boone.
$100,000.

Kenyon Block.
$5,000.

Public School Building.
$25,000.

Graves Building.
A.—W. E. Goodrich.
$8,000.

Frame dwelling.
O.—R. C. Farnsworth.
A.—Goodrich.
$20,000.

Frame dwelling.
O.—C. H. Harrison.
A.—W. E. Goodrich.
$20,000.

MISCELLANEOUS.

San Jose. First nr Hensly Av.
O.—T. S. Montgomery.
C.—G. Saph & Co.
$3,520.

Livermore. One-and-a-half-story frame.
O.—Mrs. M. Campbell.
C.—Chas. Bradshaw.
One-and-a-half-story frame.
O.—M. Dolan.
C.—N. McCabe.

St. Helena. One-story frame.
O.—C. A. Gardner.
C.—J. C. Mixon.
$1,250.

San Leandro. One-story frame.
O.—F. Bryant.
C.—Gilbert & Co.
$2,100.

Mt. Eden. Two-story frame.
O.—A. W. Schaffer.
A.—C. Mau.
C.—W. Dahl.
$8,000.

San Rafael. Tank house, &c.
O.—H. Boyle.
A.—T. J. Welsh.
C.—Benit.
$1,400.

Knight's Landing. Masonic and Odd Fellows' Hall.
Carpenter work. — H. White.
Brick work,—Craft.
$6,000.

Woodland. One-story frame.
O. & B.—S. Caldwell.
$3,000.

Additions.
O.—C. Thomas.
$600.

Additions.
O.—G. Freeman.
$500.

Tehama. Two-story frame.
O.—H. Mooney.
C.—A. J. Bryan.
$5,500.

Chico. Two-story frame.
O.—A. H. Cren.
C.—M. Miller.
$6,000.

Two-story frame.
O.— G M. Gray.
C.—L. Hansen.

Market Reports.

No change in the price of lumber or other materials from the reports published in our last three issues.

A very simple test to ascertain whether the air of any apartment contains sewer-gas is made by saturating unglazed paper with a solution of one ounce of pure lead acetate in half a pint of rain water; let it partially dry, then expose in the suspected air—the presence of sewer-gas in any considerable quantity soon darkens or blackens the test paper.

The California Architect and Building News.

VOLUME IV.
NUMBER 5.

SAN FRANCISCO, MAY, 1883.

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THE

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Bound Volumes of this Journal.

Bound volumes of 1879, 1880, 1881, and 1882 (in one book) complete, with all ads. and covers removed, will be sent to any address upon receipt of $8.00.

Bound volumes 1881 and 1882, each	$2.50
" " 1880 (only a few left)	$2 00

In 1880 the subscription price of this journal was only $1.50, and we have put the price of bound volumes accordingly.

Volumes of 1882 and those containing all the numbers from the first issue, bound in one volume, are supplied with a full index.

Any one failing to receive a complete index will be supplied by sending a postal card to this office with their address.

OUR NEW DRESS.

Substantial Evidence of the Success of This Journal.

No better nor stronger proof of the rapidly increasing prosperity of this journal can be offered, than that contained in its present issue. As will be noticed by scanning its pages, it appears in an entire new typographical dress, with four additional pages of reading matter and two pages of new advertisements added to former issues as a permanent thing. Occasionally we have been compelled to increase the number of pages temporarily, but hereafter there will be no less than appears in the present issue, with the probabilities of being required to add more to accommodate pressure in advertisements and specially interesting matter.

While gratifying to its management, thousands of warm and earnest patrons and friends will rejoice with us at this unmistakable evidence of the increasing prosperity of the only journal published upon the Pacific Coast, devoted to architectural, building, sanitary, and other sciences, and to mechanical pursuits and interests generally.

It has heretofore been promised that improvements, without regard to expense, should follow increased success, and such promises have been faithfully observed, as comparison of the past twelve months' issues with those of earlier dates will clearly demonstrate; and the present further improvement is but another step in the same direction, to be followed by others as rapidly as circumstances may favor.

With this feature of success, that of increase of subscription patronage is fully equal, requiring a permanent increase with this issue of 500 to meet the demand, and the cheering prospects that before another year shall expire its circulation will be almost if not quite double the present number.

TO OUR ADVERTISING PATRONS

this fact is very important. Many of those who have sought its columns have reaped handsome returns for the money expended in advertisements, and it is a further certain fact that its pages present superior advantages as an advertising medium to all parties dealing in building materials, house-furnishing goods, and things pertinent to and required in connection with the erection and fitting-up of buildings, and to all manufacturers, dealers, and others represented in its advertising columns.

Its management returns grateful acknowledgments for all the encouragements and favors received, and hope that their efforts in the future to make this journal one of superior excellence will be attended with even greater success than in the past.

The Trip to Duncan's Mill.

On the 26th ult., a delegation of architects —members of San Francisco chapter—accompanied by several draughtsmen and students, accepted an invitation to visit the red wood lumber regions of Marin County. The trip was made over the North Pacific Coast Railroad, and proved of great interest and pleasure to all who availed themselves of the opportunity. As all know who have ever enjoyed the pleasures of a ride over the road, it runs through one of the most picturesque and beautiful sections of California, and to those capable of appreciating the beauties of nature in its most enchanting forms—its hills and valleys, covered with verdure, trees, and growths of untold varieties—no more pleasing picture can be found upon the Pacific Coast; the stretch of road around the shores of Tomales Bay affording a beautiful water view, with hills rising grandly upon the opposite side, and the broad ocean appearing in the distance; beyond which the timber country lies in all its grandeur, with forests of trees still standing in their majesty, while the numerous immense stumps to be seen tell that the woodman's axe has felled most of the noblest monarchs of that region.

The company was handsomely received and entertained by Mr. Duncan, and every opportunity afforded to see the country surrounding the mills, including a ride on the logging train—on which cushioned seats were improvised by the generous-hearted host—to the logging camps four or five miles away; while the flowing waters of Russian River and its contributors added interest to the ride. We are unable in this issue to give all the interesting facts learned, and will therefore be compelled to reserve them until our next, by which time we hope to have many of the sketches made by our worthily ambitious young men who were present, reduced to cuts.

The more irregular the outline of your walls, the more unsatisfactory and expensive your roofs, and in this view, remember in planning, that next to a good foundation there is nothing of more importance than an efficient covering.

Master your trade, but do not let a pride in special or expert knowledge overmaster you, for the pedantry of the workshop or laboratory is as offensive as the pedantry of the school.

Shrinkage of Redwood Lumber.

"Shrinkage in lumber varies according to the tree from which it is made. Oak will shrink in drying a half inch to the foot, while the redwoods of California show no perceptible change, and the heavy eastern or South American woods lose but little."

WE have noticed the above "*clipping*" in several of our exchanges. and we are compelled to notice it on account of a decidedly wrong statement contained therein. "*Redwoods show no perceptible change*" in shrinking. Evidently the author of that statement is not acquainted with the wood he seeks to describe.

Redwood has the peculiar faculty of shrinking *endways* as well as in width. One needs to visit but very few of our dwellings to thoroughly convince him of this fact. It has been found (by actual experience) necessary to insert the following clause in the specifications under which the contractor is held. "*All the rustic and flooring to be stacked V shaped on the ground within ten days after the signing of the contract.*"

This precaution is absolutely necessary. The contractor seeks to pick out in the first place the driest lumber for all his finish work. It is then stacked on the ground and exposed to the weather for about 30 days. The joints in the rustic are made so well that they are hardly discernible a short distance away. Unless the lumber is extra dry, it will be but a short time before the joints begin to open; in many instances, so much so, that a liberal use of putty is necessary that the building may present a creditable appearance.

In wainscoting, when partly green lumber has been used, the shrinkage is often very noticeable. In fact red wood is like almost every other kind of lumber. If wet, it shrinks considerably end ways and side ways. If perfectly seasoned, it is one of the finest woods for general use. Where wide lumber is necessary, it takes the palm, as we can furnish perfectly clear lumber 10 ft. wide, and of any length from 10 to 30 feet. Of course 10 ft. is a great width and is only intended for fairs, exhibitions etc. But as a rule, redwood lumber is placed upon the market here, having a greater average width than any other class.

We make the above statement for the benefit of our eastern friends who are daily becoming more and more conversant with our splendid redwood lumber. It is statements like that at the head of this article that bring a great many truly good things in disrepute and we are not at all anxious that our grand California homogenous commodity should be in the least discountenanced by those who seek its use, and then condemn it because it shrinks, having been led to believe that no such results follow from its use.

San Francisco Chapter, American Institute of Architects.

THE regular meeting of the above chapter was held in the usual place Friday eve. May 4th, 1883. The President John Wright presided.

The committee on obtaining a permanent room for the association reported progress.

W. C. Jordan was elected a member as Draughtsman. The committee on classes reported as follows: Mr. Sanders remarked that the members of the classes were progressing finely. He thought it was a mistaken idea of the young students to favor the course of study in any one particular class. They should all receive attention and each class be regularly attended by each pupil. The members of the Chapter were requested to devise some method by which increased attendance could be secured. Mr. Pissis reported that much better progress had been made in his class over the preceeding month.

The Secretary was instructed to procure the sketches made by the Students during the late excursion to Duncan's Mills, and arrange them for publication in the June number of the *California Architect*.

An anonymous communication was received concerning the foundations of the Garfield Monument. The Chapter refused to consider the letter on account of no signature being attached.

A Mountain of Lime.

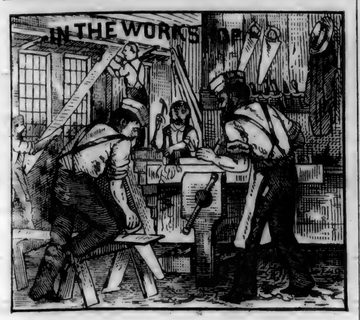
ONE of the most interesting objects pointed out to us while accompanying the late Press Excursion was a mountain of lime, situated near the town of Colton, in San Bernardino County. The mountain stands alone in a valley, and from its summit can be seen the Eden of the southern portion of our State, with its magnificent groves of oranges and lemons. Vineyards grace the landscape at every turn, and grand old San Bernardino mountain looks calmly on, carrying one's ideas back to the beginning of this world as so vividly portrayed in the GREAT BOOK.

We went over to the mountain, regretfully leaving our friends in Riverside, that we could be able to give our readers a description of the manner in which is fostered one of the great "to be" industries of the state.

Brother Holt, of the Riverside *Press*, succeeded in obtaining a complete description of the works. Our own time was too limited to obtain full information, and so we quote from our brother editor's notes.

"Two furnaces are now in operation, with a capacity of 175 barrels daily. The furnaces are 32 feet in height, one 4½ feet and the other 5½ feet in diameter; of slightly oval shape inside, lined with the best Scotch key fire-brick. The bottom is a square 12 feet high, each side 12 feet wide, braced within and without with heavy iron bars. From this rises a circle of ¼ inch boiler-iron, 16 feet high, separated from the brick circle by six inches of sifted wood-ashes, thus giving an elastic backing to withstand the expansion and contraction of the brick-work. A cast-iron ring, 1,900 pounds in weight, surmounts the circle, and above all stands a large wrought-iron hopper where all moisture is expelled from the rock before it enters the body of the furnace. Two arches on the north side of the square and two directly opposite hold four oil-burners, styled the Parsons & Northey hydrocarbon injectors. Crude petroleum stored in large tanks on the hillside above flows into iron tubes set under arches, where it is met by a jet of superheated steam, and forms with the accompanying air a hydrogen gas of tremendous heat-producing power. This flame is under perfect control, and is as easily regulated as an ordinary lamp. The calcining of limestone, which requires sixty to seventy hours in a kiln fired with wood is here accomplished in six hours. At regular intervals the draw-door is opened, and an iron car receives the red-hot lime, which is then dumped on the brick floor of the cooling room, 60 x 30 feet, where it is barreled after cooling. The barrels are then wheeled into the warehouse, 80 x 40 feet, which fronts on a siding of the S. P. R. R. From the time the rock is broken in the quarry it is on a descending grade until it is loaded into cars as marketable lime. The natural advantages of the location are great, and no pains has been spared to utilize them. In the quarry we observed the same character of solid, permanent work. High walls of stone and wood prevent the escape of rock while blasting, and a face of excellent limestone, 60 feet high, where one blast can throw down a hundred tons, allows a facility and cheapness in mining which we have never seen equaled. The rock lies in uniform layers, at an angle of 45°, and between these layers are found small veins of natural cement, gypsum, and alabaster. A judicious addition of these elements has given to this lime its high reputation for tenacity, hardness, purity, and hydraulic properties. Wherever it has been used, in brick-work, plastering, and finishing, cement-pipes, concrete-work, and whitewashing, the universal verdict has declared it superior to any lime hitherto used on this coast. It has been easily introduced into all parts of Southern California, and has even been shipped into Texas. The petroleum used is obtained at Newhall and is about 32° gravity, Oil from Puente has also been successfully used. Two large boilers, heated by oil-burners, furnish alternately the steam required. A neat and commodious boarding house has been built, where twelve employés are lodged and fed, a few rods below the works. A cooper shop will soon be added, and large contracts for staves are being filled by our lumbermen in the mountains.

The entire cost of the plant will not fall far short of $30,000. A royalty is paid to the Pacific Improvement Company, who have given a long lease of the property to the Colton Lime Company. Chas. N. Felton, President of the Pacific Coast Oil Company, is largely interested. Other prominent stockholders are J. E. Condict, President Central Gaslight Company, of San Francisco; Timothy Paige, Esq, and Dr. John Campbell, of San Francisco; E. A. Edwards, A. H. Miller, and D. W. C. Franklig, of Los Angeles, and L. F. Olmsted, of Colton, who is general manager of the company.



SETTING EDGE TOOLS.—In using the chisel for work that needs to be finely finished, the most common mistake made by beginners is to use it too long before resetting the edge on the oil-stone. Suppose that half an hour's work shortens the blade, as measured by the exact cutting edge, by 1-200th of an inch. To bring the edge once more to its original keenness requires a certain amount of rubbing on the stone, the amount corresponding to 1-200th of an inch on the flat face. In ten minutes' work the blade will be shortened by, say, about one third or 1-200th, or 1-600th of an inch, and the amount of rubbing to bring back the edge to the original sharpness after this amount of work, is not more than one-third of that needed in the first case. Thus, if in the half hour the edge be sharpened thrice instead of once, the total amount of rubbing required will be no greater than that needed at the end of the half hour, if no sharpening has been performed since the beginning of it; while, in the former case, the edge will at no time have become more than one third as blunt (*i. e.*, the edge no more than one third as thick) as it is at the end of the half hour in the latter case. Thus, by having the oil-stone always at hand, clean, and in good condition, and by having very frequent recourse to it to keep the chisel edge constantly sharp, a great deal of unnecessary labor is saved, and the work is done more nicely. Of course this rule cannot be followed unless the oil-stone is always ready to be used; otherwise much time would be lost in getting it ready so often. This rule also cannot be adopted to so great an extent with, for instance, plane-irons, with which a considerable amount of time is lost in taking the tool to pieces and putting it together again every time the edge is set. —*Cutting Tools.*

Do nothing in building by guess-work, and in its conduct trust not too much to memory, for a jotting or two at the proper time are worth a hundred jogs on the brain, for the purpose of safe recollection.

If you would set out good work, do it by practical geometry; if indifferent or bad, by the "rule of thumb."

A fair day's work for a fair day's wages should be estimated by its quality as well as its quantity.

IN planning stairs, think of your head-room from the lowest starting-point to the highest landing, or somewhere in ascending or descending stunning falls and broken limbs may accompany bruised foreheads and battered hats.

In making out building quantities do not overate them too much, for you may calculate too liberally for your own good, as well as estimate by guess-work too lowly to your own and others, loss.

Contrary to the old saying, "a carpenter is known by his shavings," he is known by the character of his work; and the state of his tools may be judged by the same standard.

The workman that makes the most noise will be often found doing the least work, and doing it badly.

Glaze your sashes with putty if you will, but make your mitres and other joints without it.

Hit the nail straight upon the head and you will save many crooked blows.

Sharpen your tools properly and you will husband your strength.

PLAN the attic story for bedrooms if you will, but do not stow the servants in a cock-loft between the ceiling joists and the slates, which will be a frying-pan in the summer and a refrigerator in the winter—a choke-room instead of an air-space.

A KITCHEN and its belongings should not be planned solely for the comfort or ease of the cook, but for the general health of the household, for the purer the air below the purer will that be which circulates above.

BUILD with seasoned timber or you will build to your own discredit and others' loss.

Modern Perspective.

THIS new work is a treatise upon the principles and Practice of Plane and Cylindrical Perspective. The author—William R. Ware—discusses the subject somewhat differently from that generally given, greater prominence being assigned to the phenomena of parallel planes, and use being made of the laws thus established to determine the perspective of lines of intersection and of shadows—subjects that seem hitherto to have received but little attention. The author has certainly succeeded admirably in producing a work that should be in the possession of every Architect, Draughtsman, and Student in the country. The latter two classes should feel grateful that such men as W. R. Ware and others so study their future welfare, as to lay before them the results of a life's labor. Few of our students recognize the value of such a work. They should at once secure a copy, and notice the skill with which they are gently led along under the guidance of the skillful Master to thoroughly understand the Principal Rules of Perspective. Accompanying the book is a portfolio of sketches containing 27 large plates of examples of perspective in all its different phases, viz.: Perspective of Planes; division by triangles; parallel perspective; three point perspective; perspective of shadows, reflections, circles etc., curvilinear perspective; shadows by artificial light; the perspective of converging lines and numerous others. These plates are eleven by fourteen inches in size.

We have received copies of this work and can supply any orders sent. The book contains over 300 pages. Portfolio and book go together, the one explaining the other—Price for the two together $6.00.

THE *Art Amateur* for May contains some excellent simple designs for wood carving, from the Cincinnati School of Design, together with the first of a series of articles on "Practical Wood Carving for Amateurs, by Calista Halsey Patchin. Other articles of special practical value are those on portrait drapery, flower painting in water-colors, mural decoration, and embroidery in gold and silver. The May number concludes the fourth year of *The Art Amateur*, and the index for the last twelve months gives a vivid picture of the surprising wealth of designs and instruction contained in this invaluable magazine.

BEWARE.—*The Sanitary Engineer* gives this valuable piece of advice to housekeepers: Beware of disused "conveniences," and don't trust to the memory of any one for filling the visible trap with water. Better remove the whole fixture and seal up its outlet if not wanted for frequent use. Moreover, don't you put such an antiquated device as a pan-closet in a first-class house anywhere. Even if its receiver be ventilated, the vent-pipe may work the wrong way and deceive you.

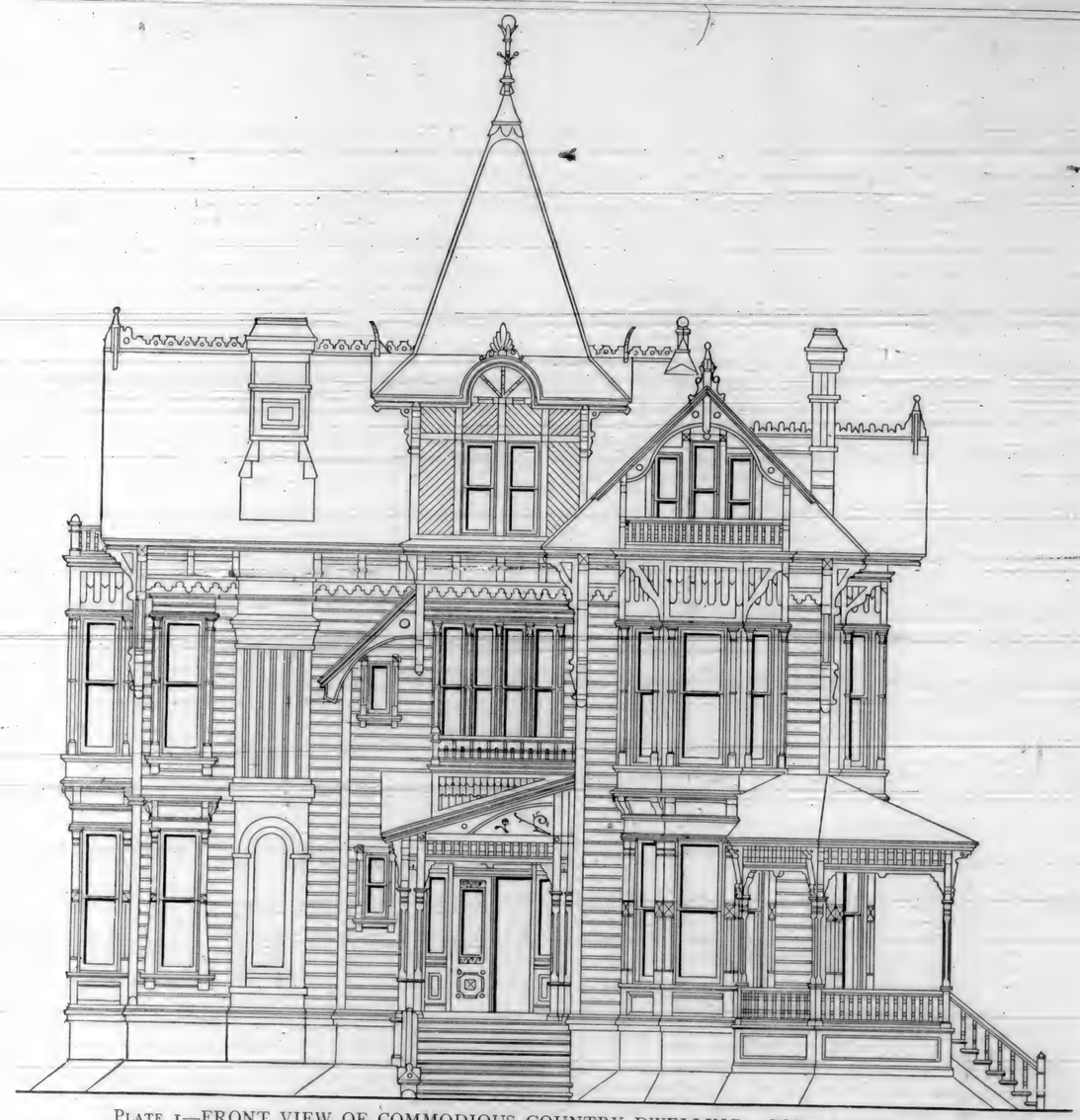


PLATE 1—FRONT VIEW OF COMMODIOUS COUNTRY DWELLING. COST, ABOUT $7,000.

Solid and Hollow Iron Columns.

A CONFUSION of ideas is sometimes found among practical men respecting the comparative strength of solid and hollow pillars. One hears it often said, for instance, that a hollow pillar is stronger than a solid one. Now this is, as one able authority has pointed out, not absolutely the case ; it is perfectly true, that comparing the strengths of two pillars of the same heighth and diameter, one solid and the other hollow, that the latter has the advantage of being economically stronger. The fact is, the solid column is stronger than the hollow of the same external diameter ; but the lesser area is more effective than the greater, because the central portions of the solid pillar are less useful in resisting the bending force than the metal in the circumference of the hollow pillar. But if the quantity of material in both the solid and hollow pillar of equal height is the same, the hollow pillar is by far the stronger. A simple geometrical construction will enable any one to understand this fact, by enabling us to proportion a hollow column of the same area as that of a solid one, by one of the diameters being given. It is shown, in fact, that hollow columns of the same area of metal as a solid one, may be made to any larger diameter, their strengths increasing proportionately till a limit is reached by the shell of the metal becoming too thin to insure a sound casting. Taking an example from Downing's work, a hollow pillar 9 inches in external diameter, having an internal diameter of 8.062 inches, and a thickness of metal of 4.7 inches, or about one half inch is five and one half times stronger than a solid pillar with the same quantity of metal. A thickness of one half inch may be regarded as a practical limit in manufacture.—*The Building News.*

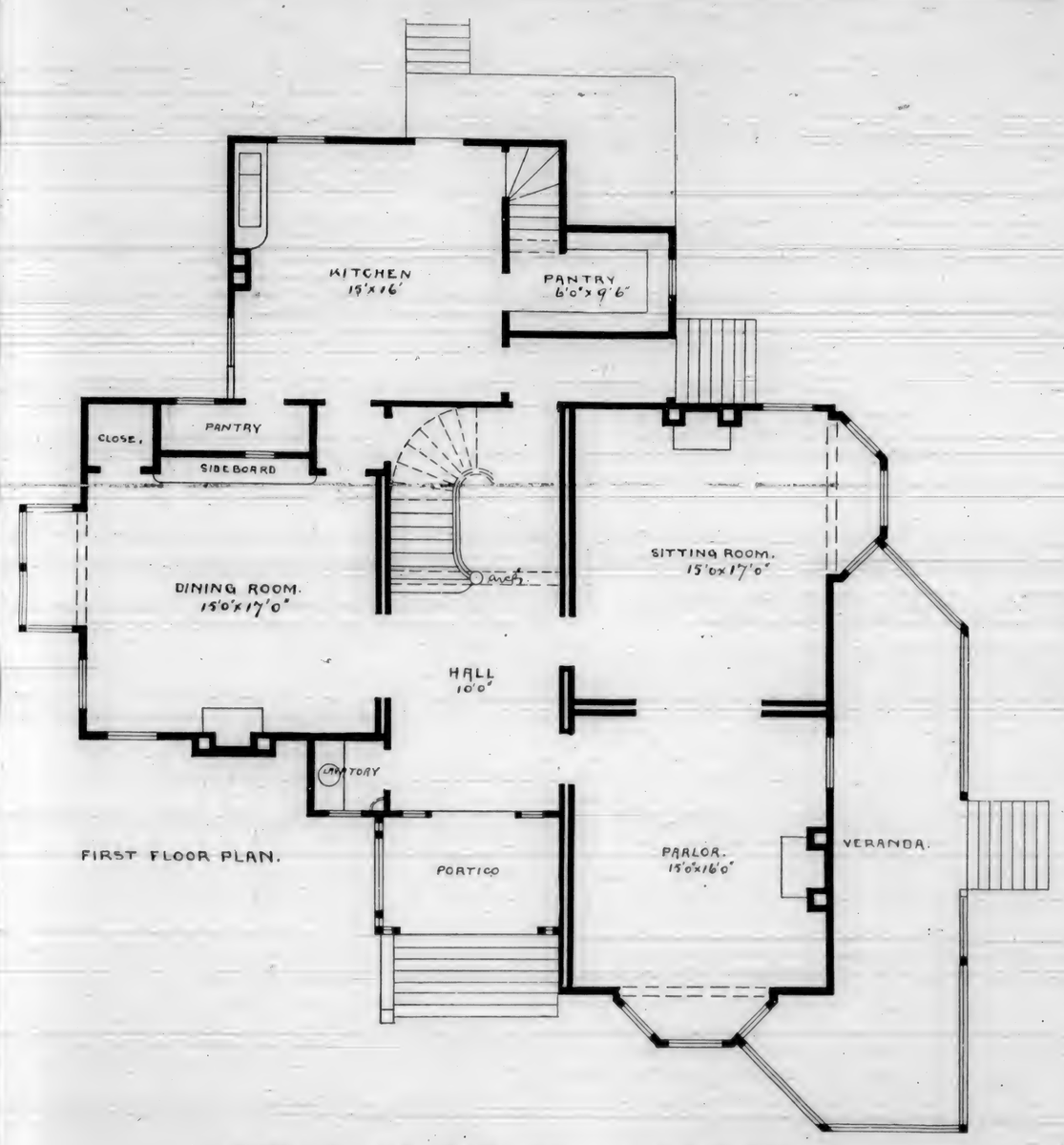


PLATE 2—FIRST FLOOR PLAN COMMODIOUS COUNTRY DWELLING.

GOOD workmanship needs no coat of paint to enhance the execution, for like sculptor's work, wood workmanship is best judged in the nude without drapery or color.

WET your bricks, wash your sand, slake your lime, but perish not your mortar with water, or your work will not be worth its bond.

LET no building workman be too proud to take a hint from the humblest laborer that attends him, for the experienced looker-on betimes sees more than the doer.

ARTIFICIAL, like natural drainage, is governed by gravitation, and the absence of a proper fall in either is as opposed to nature as a swamp is to health.

A HOUSE in danger, a family in peril.

THE builder that deceives the architect wrongs the client as well. and if he connives at bad workmanship he demoralizes the workman and constitutes himself a criminal.

Garden mold may be good for vegetables, but as a component of mortar it spells early ruin.

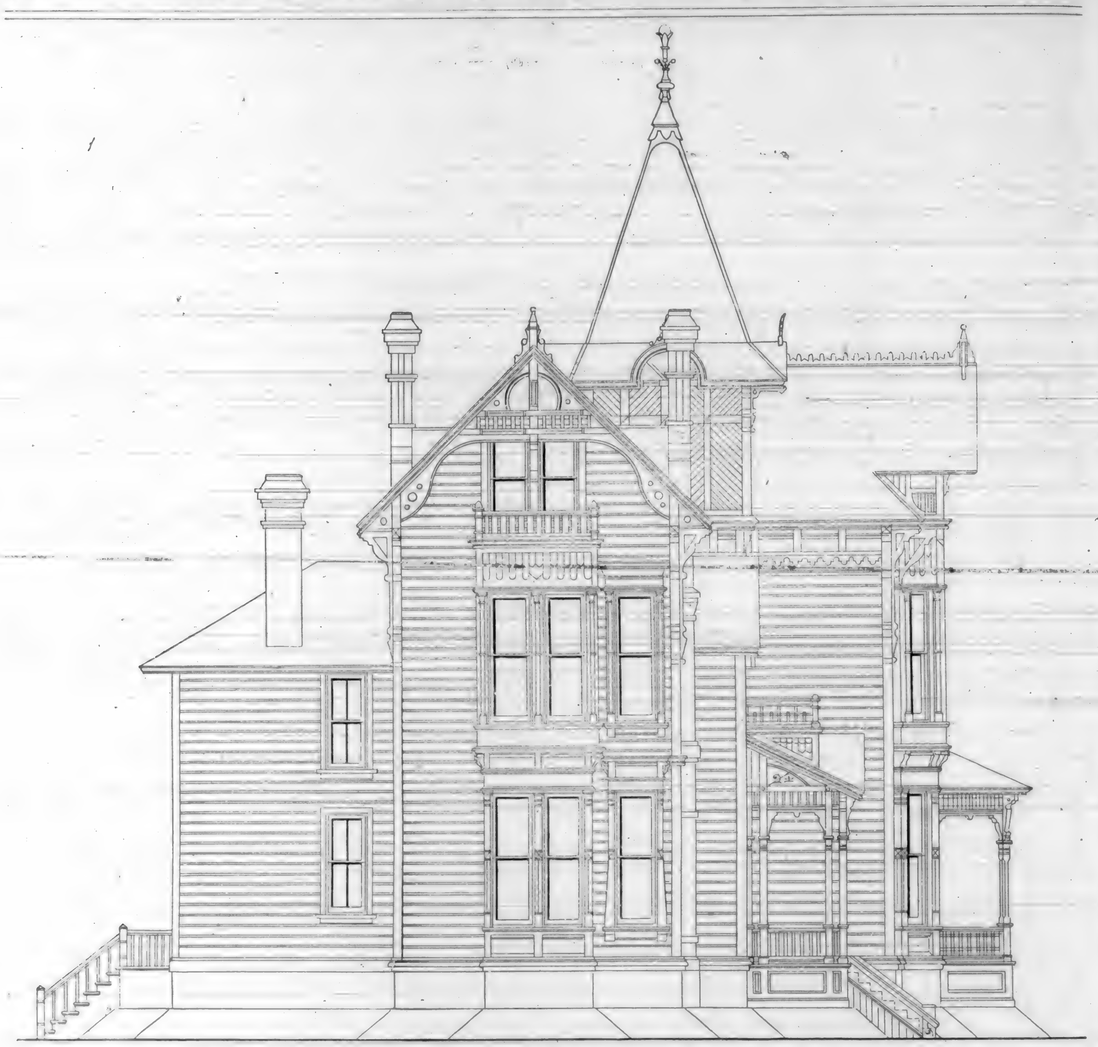


PLATE 3—SIDE VIEW OF COUNTRY DWELLING. COST, ABOUT $7000.

Our Illustrations.

PLATE 1 presents to our readers the elevation of a neat and commodious residence, suitable for a country or suburban dwelling, Plates 3, 5 and 6 being the same house, as seen from different points. Very little ornamentation on the outside has been adopted, the main idea being to show a handsome front with as little expense as possible.

In the arrangement of the rooms, as shown in Plates 2, 4, and 7, some new and striking features will be noticed. The kitchen is a little "snuggery" all to itself, and yet is in distinct connection with the yard, dining-room, and hall; an alarm at the front door can be attended to by the servant without passing through any room. The veranda is so situated that it can be used by the gentlemen for a smoking-room.

The bed-rooms on the second floor are all well supplied with closet-room. The bath-room is in the rear; two windows contained therein, so that perfect ventilation is secured. In the attic are the servant's room, children's play-room, and a billiard-room.

This house can be built for any amount from seven to ten thousand dollars, according to finishes used.

A Plethora of Money.

IN any city the amount of money loaned by savings banks on property is regarded by nearly every one as the thermometer by which the rise and fall in the values of real estate are determined

There is an immense amount of money lying idle in this city. In fact, simply to get it out of the way and that it may earn a little something for its owners, one of our principal savings banks last month invested quite a large sum in U. S. bonds. This one bank now holds nearly $10,000,000 in bonds of our own proud country.

One of the principal causes of this showing is the general prosperity among the working-men. There is no need whatever to run in debt. Consequently on the *pay-as-you-go-and-save-what-you-can* system, thousands of small depositors are placing their money in the banks; and it is these small amounts from a great number of people that is the cause of our savings institutions having a plethora of money.

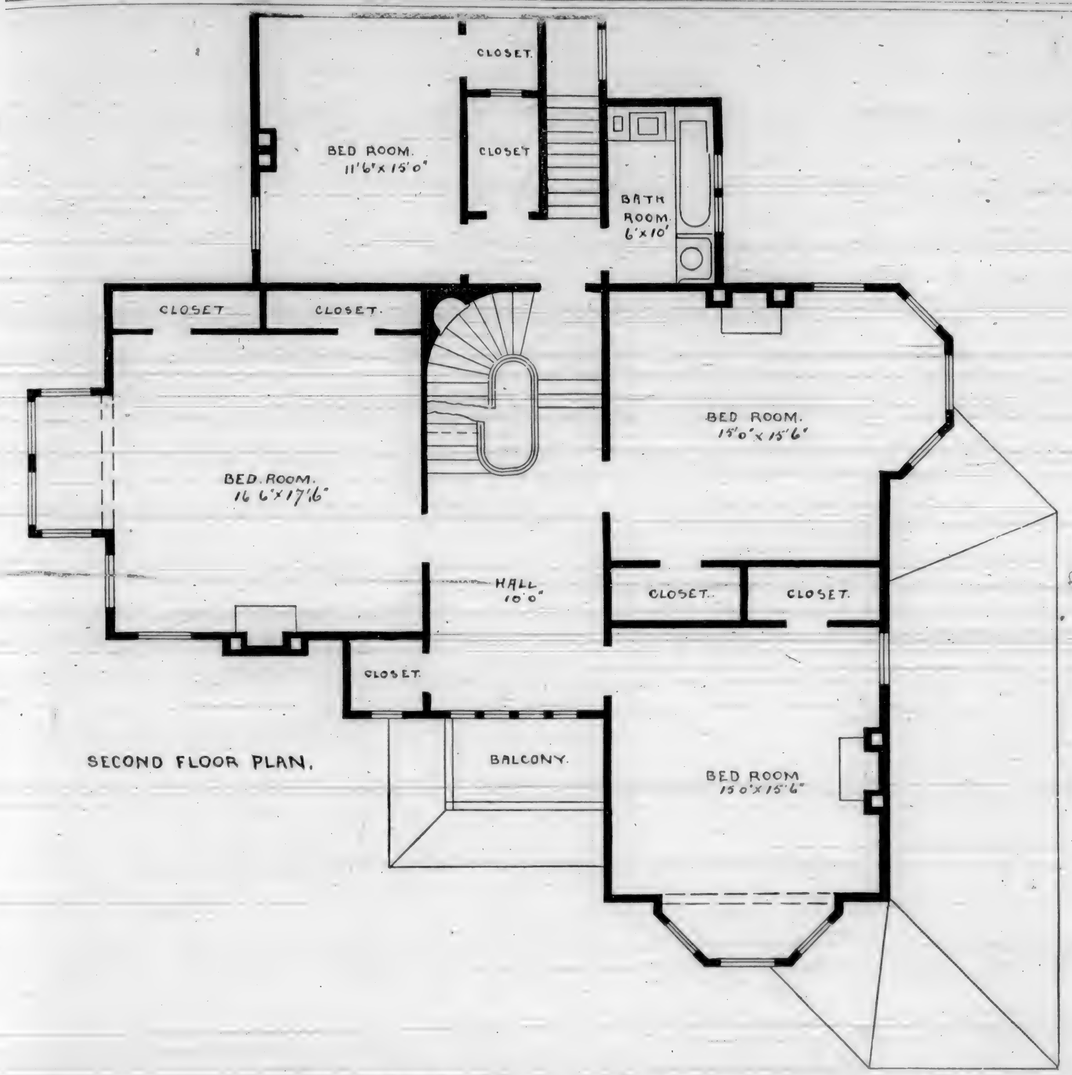


PLATE 4—SECOND FLOOR PLAN OF COUNTRY DWELLING.

Are Plastered Ceilings Obsolete?

MODERN architecture, says a correspondent, in its relation to modern discoveries of new material and the skill of artisans in the use of old material under improved conditions, both in a utilitarian and decorative view, seems to demand something of a departure from ancient methods of constructing and ornamenting buildings.

Weight of material where it does not serve to strengthen or elaborate a design, must certainly be considered obsolete in architecture. In this connection it might be well to consider the impropriety of using plaster ornaments for decorative purposes. In their representation of the vegetable kingdom they are not and can not be true to nature in any proportionate comparison, except it may be its facial outlines. In elaborating architectural beauty or engineering strength, the same may be said with the added detraction that the more we elaborate the more we weaken the structure. Consequently the application of plaster to ornamentation is by some designers but a lingering relic of unskilled artisans, and should, they think, have no place in architectural construction, except as a modeling convenience. They reason that with the skill now being applied in the use of metals and woods of various kinds, even plaster ceilings should be considered as but a temporary and imperfect method of inclosing rooms.—*The Inland Architect and Builder.*

Wheeler's Patent Wood Filler.

WE invite the attention of our patrons to an advertisement appearing in this journal, offering certain paints and "wood fillers," which are recommended as something superior, and warranted to surpass all others in that line. Being as go d as they are recommended to be, they are worth the attention of all architects, painters, wood polishers, and owners.

PERSPECTIVE is necessary in drawings; but do not carry its principles into practice in putting together workmans' ip.

HOUSES may not be built from the roof downwards, though they are often burned in that direction by plumbers' fires.