

the working of pine or other soft woods, and these items alone entail extra cost. Where hardwoods are to be finished in a natural state great care should be taken to prevent lime stains, consequently it is better in all cases to put no finish until the plasterers have fully completed their work, for a lime stain on cherry or birch can never be taken out or completely covered without staining. In the absence of birch or cherry red beech makes a very handsome finish—in fact, beech has some beauties no other wood has, and when quartered and properly finished has a metallic sheen that is charming and unique.

Wood, particularly hardwood, that has not been properly sawn, is almost sure to warp or twist to some extent in the seasoning, and this is a matter that every contractor should see to when getting in a stock of lumber to be worked up. A board cut from the side of a log has the grain rings of the wood lying in circles having a greater length on one side of the board than on the other, and it is quite natural that these rings will endeavor to close as their circumferences get shorter by seasoning, and in closing they bend the board over, or, in other words, warp it. If the rings at one end of a board are out of line with the rings at the other end, which is frequently the case where the log was originally crooked, then the board will both warp and twist, as the rings do not shrink uniformly. Much can be done to prevent warping and twisting, in the piling of the stuff. The boards should be laid on their flat side with the side down that shows the concave or hollow curve of the rings; battens or weather strips should be laid across the pile at regular intervals, and always directly over the corresponding battens below; then another tier of boards on these again, and so on, until the pile is completed. The pile should have an inclination to carry off the rain, and should be topped off with rough boards enough to keep the pile dry. It is not best to pile the lumber where it will get too much sun or drying winds, as lumber seasoned too rapidly is apt to crack and check. Of course the best boards, boards that will not warp or twist, are "quarter sawn." It makes no difference what the lumber may be, whether it is pine, oak or ash, if it is quarter sawn it will not warp in drying nor yield so readily to changes of the weather. It has the disadvantage of being more expensive, as in sawing each quarter a narrow board is first taken, then one a little wider, and so on until the whole quarter is cut. Quartered oak, of which we hear so much now-a-days, never changes its shape after it is worked, "it stays where it is put," as the carpenters say, a quality that is very valuable. Another advantage of "quartering" is that you get all the beauties of the grain shown up to better advantage than if the boards were just "sliced" from the round log.

THE practice of cutting rafters so that their points in the plumb cut are close, while the lower part of the joints are left open, is bad, and not in accordance with good construction. When the points come together at the top and a small gap is left at the bottom, the roof is sure to drop as the weight of boards, shingles or slates is laid on it, and it will continue to drop until the joint in the rafter finds a solid bearing; this causes the ridge to sag in the centre and throw an uneven outward thrust on the walls. The gables support the ridge at each

end and thus prevent the roof from settling uniformly along its length. In framing rafters it is always better to have the plumb cut at its point, proud at the lower part of the joint just a trifle, for no matter how true a roof may be framed, there will always be a small percentage of settlement, and when this takes place the rafters, if cut as suggested, adapt themselves to the changed conditions, and the bearing at their points becomes equalized. The fact of using a ridge pole makes no difference, as the sag will take place if the rafters are cut open at the bottom, just the same; in fact, if the ridge pole is formed of unseasonable stuff it will increase the sag to some small extent, owing to shrinkage. Rafters should be of sufficient section to sustain the regular load, including wet snow and rain, to which should be added 100 pounds to the square foot for cyclonic wind pressure. Light rafters may be very much strengthened by a generous supply of collar beams and braces. It is a prevailing fault with Canadian builders to frame their roofs with too light materials, and this is the cause of many a leaky and saggy roof in country places. There is quite a difference between the roofs of America and those of Europe. Here a few light timbers and a few pounds of spikes with a minimum of labor are about all that are employed on most of our domestic roofs. There, heavy timbers framed together with mortise and tenon, bolted with heavy iron bolts and tied with iron straps, is the manner which obtains. Their roofs last a half dozen centuries, here they are old and weary at 25 years, but if proper attention was given, and honest construction prevailed, there is no reason why roofs built on our present methods should not live twice the years they do now.

Figuring on a Contract.

OMISSION of items in figuring contracts is probably the most common cause of disaster prevalent in building contracting, and many a man who has intended well enough has been brought to grief because of having left out some things in his bill of estimates that ought to have been figured on. As we have before stated in these columns, every man who intends to become a contractor should prepare a minute schedule of all the items that could possibly be included in any manner of building construction. These should be classified and arranged under sub-headings, according to the different building industries or trades, and prices, when possible, should be added. It may take some time before a schedule of this kind can be completed; in fact, it may never be completed, for the continual changes that take place in styles and character of work, hardware and colors, will make it necessary to always keep the columns of the schedule open for additions. By having a schedule as suggested, and consulting it closely when making an estimate, the possibility of an omission will be reduced to a minimum. All successful contractors follow some such system as this in estimating, but the careless and unsuccessful contractor fails to see just where it would be to his interest to follow a rule of this sort, as the loss of time in preparing and consulting a schedule for every little thing would be a waste of time and loss greater than any benefits that would be derived. Every time a contract is taken below its actual worth every contractor in the neighborhood is injured thereby, as well as the man who does the work. If a man gets a house built for \$5,000 that is actually worth \$6,000 to erect, every man in the neighborhood will expect his work to be executed in the