

TALKS WITH WOOD-WORKERS.

IN these occasional talks with wood-workers reference has been made before to the subject of wood bending. About this there are many features of special interest. I have come across a familiar talk on the question by Mr. W. J. Shepard, in the Wood Worker. He tells us that wood is subjected to but little longitudinal shrinkage, the minimum occurring in the direction of its length, a larger amount taking place transversely through the growth grain, and the maximum following the direction of the concentric rings. There being, then, but little longitudinal shrinkage, as long as the grain lies straight and regular there is but little tendency for a stick to crook from this cause; but when the grain is turned aside from its straight course, to any great extent, by a knot or knarl, everyone knows the deflection, the twisting and crooking of the stick, that will be likely to occur in drying. When a stick is bent under end pressure, great changes occur in its substance along the inner side of the bend. The grain layers lie no longer straight and regular. Under the powerful compression of the bending process, the substance of the wood at or near the point of bending, goes together wherever the density is least, each particular fibre writhing its way into every adjoining pore and cell, and twining itself about and interlacing itself with its neighbors, until the whole becomes a closely interwoven mass of fibre, much resembling a skein of tangled yarn.

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Anyone not intimately acquainted with the characteristics of wood bent in this way, will be astonished, upon investigation, at the extent of the change thus made in the nature and condition of the fibre. Little or no indications of it are to be discovered on the surface, if the bender has done his work well; but as soon as an attempt is made to break or split a piece so treated, its changed nature becomes at once apparent. To split or break it is almost impossible. It will be found to have become literally tougher than whalebone. The compressed portion may be wrung and twisted and bent, in a cold condition after being taken from the form, but it will exhibit a marvellous tenacity, and will hang together and resist any attempt at splitting or breaking. Of course the fibre may be torn asunder by the application of sufficient force, but it will not come with a clean cleavage, as wood splits, but will shred and tear, and show a very ragged edge, not unlike that which would be presented by a piece of heavy woven cloth, showing very clearly the interwoven character of the compressed fibre.

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It might naturally be supposed that the forcible disturbance of the substance of the wood by compression, would leave it in a broken and ruptured, and consequently a weakened, condition. But the exact opposite is the case. There is no wood that grows, which in its natural condition can for a moment equal, in point of toughness, a brashy piece of western ash as it may become under the skilful manipulation of the wood-bender. This may seem to many like a rash and unwarranted statement, but should the fact be doubted the writer stands ready to submit to the editor of this journal such specimens of toughened western ash, or of any one of a half-dozen other kinds of wood, as would, without doubt, convince the most skeptical of the needlessness of a comparative test. Another cause besides the interweaving of the fibres goes to produce this marvellous toughness of the compressed wood. In nearly all woods adapted to bending purposes, there is a starchy, glutinous substance in the grain cells which under the action of steam cooks up to a glue-like consistency and condition, and when the fibre is pressed into the cells by the compression of bending, this natural glue cements the whole very firmly together. Thus it will be seen that the fibres of the wood are not closely interwoven with each other, but they are virtually glued together in this tangled condition. The result of these two causes operating together, is such a toughening of the wood as would seem quite impossible to one having no acquaintance with the compressed fibre.

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Now to follow out the result of shrinkage on this altered condition of the wood. It should be borne in mind that along the strap side of the bent piece there is no

compression, that the layers of grain there lie straight and undisturbed, the compression beginning more or less near the surface, according to the circumstances, and increasing progressively, its greatest amount being at the inner surface of the bend. There, will be, then, no perceptible longitudinal shrinkage on the strap side of the bent piece; but on the form side, where the compressed fibre lies in an irregular, wavy, tangled mass, no longer parallel with the longitudinal surface of the stick, there will occur a contraction of the length of that surface as this mass of fibre shrinks together through drying, and as the inner surface contracts in length while the outer one does not, it necessarily results in curling up the bend to an increased acuteness. A Vienna chair seat, for instance, may be so bent, on a fourteen inch circle, that by mere drying, if left to itself, it will decrease in diameter to eleven or twelve inches. Thus it will be seen that this, at first sight, puzzling phenomenon, is of easy explanation, and but the natural result of shrinkage due to the changed condition of the compressed fibre.

CARELESSNESS AND WASTE OF LUMBER.

TO make good lumber simply to throw it away is folly so egregious as to be almost beyond belief. It would be entirely so, says the St. Louis Lumberman, were it not for the abundant evidence that such practice obtains among saw mill men to an extent that, could it be accurately known and stated, would be appalling. Millions of as good timber as ever grew in a tree is wasted annually in getting it from the saw to the user, involving losses to producers, that saved would speedily make them rich with good facilities for manufacture, a thorough knowledge of all its processes and abundant skill in manipulating them. Many fail of success because they do not understand how to handle stock after it is made. They are good loggers and saw-mill men to the point of being able to turn out lumber of excellent quality and in satisfactory quantity; but they are not good lumbermen, because they fail to properly care for the product of their mills after getting it into merchantable shape.

At too many mills, especially small ones, lumber is still treated from the moment it leaves the saw. It is often improperly piled, imperfectly seasoned, and so carelessly and unskillfully handled as to be injured by many per cent, before it is even ready to ship, and in that operation it is not unlikely that a further injury is done, so that when the stock finally gets to the buyer, its value is only a fraction of what it ought to be, or what it actually was as it came from the mill. Even the most painstaking care will not save it from damage, unless it follows it from the moment of cutting to its delivery at destination and into the hands of the buyer. A case illustrating this came to notice a few days ago. A car load of clear yellow pine, dressed and sized, was recently unloaded that inspected more than two-thirds culls, merely because the shipper had put the stock, not fully dry, into a closed car and sealed it up. The heat with the absence of any ventilation, caused the sap in the lumber to ferment, and when the stock was taken out a large portion of it was so badly stained as to be worthless. Otherwise it was splendid lumber in every way. Perfectly sawed and dressed, every piece of even width, it was lumber to excite the admiration of everyone who saw it; yet it was nothing but culls, worth probably several dollars a thousand less than the producer paid for putting it on the car. No doubt the report the receiver made on this lumber brought a vigorous remonstrance from the shipper, who no doubt found it hard to believe that the splendid stock which he put into the car could be nothing but worthless rubbish when it came out. Yet no judge of lumber who saw it unloaded could deny the justice and fairness of the inspection which made most of it cull. The damage would have been less had the stock been rough, as most of the stain would dress out, but it was ruinous to dress lumber, and for a dealer simply destroy its value entirely.

The fault here was improperly caring for the lumber in shipping, after it had been well handled up to the point of loading. Knowing that it would be some time on the road, the shipper should have either made sure that the stock was thoroughly dry or seen to it that it was so loaded as to provide for proper ventilation. If

it had been suggested to him that he take the same stock and dead-pile it as it came from the planer, and allow it to remain so for two or three weeks, the party who sent this lumber to market would no doubt have been indignant, that anybody should assume that he could be so careless, yet he put the stuff without a second thought into a position far more hazardous, as much as in the car, closely confined, there was no chance for a circulation of air or for the escape of moisture. It was simply a case of carelessness.

No lumbermen need be told that the possible profits of the lumber business are not sufficient to cover losses arising from such a needless waste as this. Every saw-mill operation is figured upon the assumption that the good lumber, and indeed all the lumber, that can be produced from the timber is to reach the market and to be worth the full market price. Allowance is made only for the legitimate cost of production, not for the loss that comes from the needless waste through carelessness and lack of skill. This is one reason why the preliminary calculations of their timber buyers are so seldom realized when they come to operate their saw-mill. A small percentage of stock reduced in grade through imperfect manufacture, imperfect methods of handling, or by sheer carelessness, will easily use up all the expected profit, leaving to the unlucky owners only the barren satisfaction of getting back what their timber and sawing cost, and often not even that. The frequency of failure in the mill business is familiar; may it not be that carelessness in handling and shipping the lumber is one of its prime causes?

THE DANGERS OF CHEAP BOILER INSURANCE.

THE danger of employing unqualified boiler inspectors was recently well exemplified in a small English town by a boiler explosion which did considerable damage to property in the immediate neighborhood of the scene of action. The boiler in question, it would seem, had gone the way that many boilers unfortunately do, go, after having served nearly the full period of their usefulness, from its last place of fairly safe operation, the paint shop of a second-hand dealer, from whence it emerged spick and span, ready to be sold again to some one unacquainted with its history and eager for a bargain. Paint has a wonderful rejuvenating power over houses as well as some other things, and with the help of an unprincipled inspector's certificate, soon had this boiler again at work with the result, before long, of a wrecked boiler house, damaged buildings adjoining, though happily no loss of life, and a bill for the owner for the costs of the usual investigation by the local authorities. The payment of the costs was exacted "as a warning" to other steam users who rely upon unqualified, incompetent inspection, because it is cheap, and afterward plead ignorance as an excuse for their conduct."

This episode pointedly directs attention once more to the subject of cheap boiler inspection and insurance, which off and on has been condemned for many years, though evidently not with sufficient vigor to have brought about its suppression. Cheap inspection and insurance rates, in fact, seems to possess an allurements to many boiler owners which is surprising, when even slight consideration will show that cheap service of any kind in connection with boilers is simply not worth having. It cannot be profitable, but certainly will prove dangerous. England, more than any other country, has suffered from a multiplicity of boiler inspection and insurance companies, and with growing competition among these and failure on the part of steam users to properly appreciate the value of thorough and conscientious examination of the boilers, decrease in price and corresponding decrease in the reliability of the service rendered have become natural and unavoidable results. There is a price, as has often been argued, below which a guarantee of faithful inspection cannot possibly be extended without seriously affecting the financial stability of any insurance company. A close approximation of what this price is could probably be made in most cases without much difficulty, and any offer of insurance at inspection at a much lower rate should be regarded with suspicion. -Cassier's Magazine.