WHICH PART OF THE TREE IS STRONGEST?

"It is by no means rare," says the proprietor of a large physical laboratory for builders and for prospective owners of buildings, "to have joists, plates, sills and other important pieces tested, in order that the size and kind for prospective uses may be determined." Why not? Is it not of much greater importance that the strength of materials entering into the construction of factory, store or dwelling be as accurately determined and well known as those out of which cars, bridges and cross ties are built? Proprietors of extensive car works, railroad and construction companies have the strength of materials known before a blow is struck, by which means enough and no more is used to sustain the strains to which the materials are to be subjected; but an architect and builder who makes a specialty of such knowledge is extremely difficult to find in this, and we presume, any other city, on the American continent.

This leads to the question, strength considered, of the relative merits of certain portions of a tree. It might be supposed, inasmuch as every layer from the central pith to the bark is in a different stage of prefection, the innermost, or earliest formed, being the most matured, would naturally be the strongest; but practical tests, made on the most modern and accurate testing machines, demonstrate that this is only true up to a certain period of growth. The greatest strength and toughness lies near the most recently formed heartwood, or that part the nearest to the sapwood. For this reason alone, to say nothing of many other peculiarities that will be enumerated at another time, it becomes a matter of the greatest importance in the selection of timber or lumber for special purposes requiring great strength and toughness, to have as little sapwood as possible, and as little pitch.

With practical tests already made this leads to the conclusion, timber or lumber for these special purposes, where the above properties are required, should be cut as near the sapwood as the timber will allow, for it should be remembered that the tree does not cease growing when it comes to maturity. As long as the tree is alive it continues to increase in bulk by the addition of the annual layer, but when maturity is once passed, each succeeding year produces a certain degree of deterioration. This decay appears in various stages, and generally exhibits in the first instance, either a white or yellowish color at the butt or root end of the stem. If white, the decay is very slight, and does not appear more than a few feet up at most, but if a yellowish red in color, it is not unfrequently of a most serious character. Again, if the affected parts have assumed a decidedly red tinge, the tree is said to be foxy, and scarcely fit for any purpose, as the decay will be found to permeate a greater portion of the entire tree.

A more advanced stage of deterioration is that which may be described as a drying up or wasting away of the wood layers surrounding the pith. This forms a hollow first at the butt, and then spreads upwards, gradually increasing in size as the tree gets older, while this defect may eventually reach into the very branches.

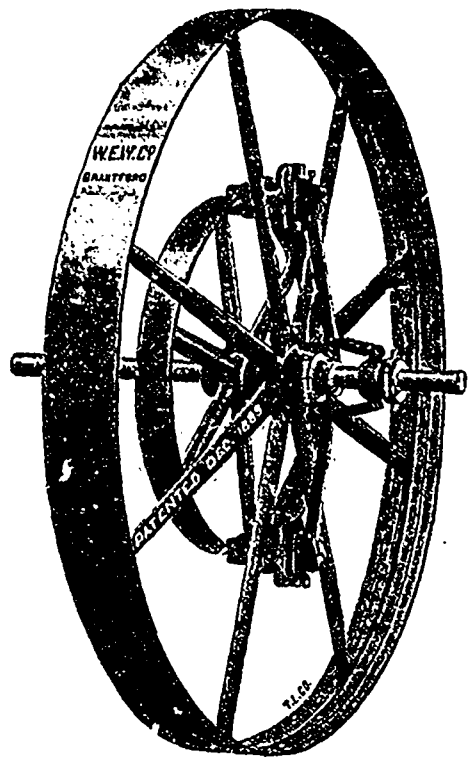
Trees are most valuable as yielding the largest amount of good timber just prior to their reaching maturity, which is indicated by the topmost branches and branchlets becoming stunted and presenting a scraggy appearance. If, therefore, we wish to select a prime healthy tree for felling, we must select one having an abundance of young shoots, and the topmost branches of which look vigorous, strong, pointed and healthy, this being the most certain evidence that the tree has not exhausted all the vegetable food within reach of its roots; in other words that the tree has not passed its maturity.

Whenever there is the unmistakeable evidences of permanent decay in a tree, the most economical thing to do is to cut it down, convert such parts as will answer the purpose into lumber, and use the balance for such purposes as do not require strength, durability, or staying properties. The size of any tree, cannot be taken as a criterion of the tree's maturity by any means, there being unlimited growth if the roots can find food to sustain and extend the formation fabric.

—Mr. A. W. Belding told the Penetanguishene *Herald* that the Katrine mill will cut 10,000,000 feet this season.

STEEL RIM FRICTION GRIP PULLEY.

The Waterous Engine Works Company, of Brantford, Ont., have just patented a Steel Rim Friction Grip Pulley, especially light and strong, which is claimed to be the most strong and effective made, and can be readily applied to old pulleys whose hub is large enough to bush. The cut represents 78x7 pulley built for elevator work, several having been finished for the Martin Elevator Company, of Manitoba. The friction rim is made fast to shaft and always revolves with it, and is simply a strong, narrow-face pulley. When idle the driving pulley and all the grip mechanism stands. To bring it into work the sliding sleeve is



forced with lever towards pulley and readily passes beyond the diametral centre of grip arms, thus closing the friction grips on friction rim and locking them there, and at the same time relieving sleeve of all strain. The friction grips are of hard maple, set end grain to the work in iron cases, and are readily replaced when worn. The end of grip arm is of cast steel and engages a small block of cast steel let into the under side of top grip arm, which is adjustable, being from the inner end, and can be adjusted with the set screw on top to put any strain desired on friction to take up wear. To apply this friction clutch to old pulleys it is required to know size and shape of arms; number, diameter and face of pulley; size of shaft, diameter and length of hub, and what pulley drives. Parties interested in the above can obtain all necessary information by addressing the Waterous Engine Works Co., Ltd., Brantford, Canada.

MAKING CLOTHESPINS.

"It takes ten men to make a pin, if not more," is a quotation from an ancient reader, descriptive of pin making. It takes exactly that number to make a clothespin, which are retailed at from three to five cents per dozen. It is only with the rapidity with which they are made that a profit is secured; and something of the speed may be judged when it is stated that a maple tree can be worked into clothespins in one hour at the new factory in Carthage, N. Y.

The logs come into the saw mill and are quartered, then sawed into blocks 27 inches long by a swinging saw; another saw cuts the blocks into boards ¾-inches thick; then a gang of smaller circular saws cut the boards into ¾-inch squares. The entire group of sticks as they come from the saws are taken and laid smoothly lengthwise on a large revolving drum which is divided into spaces about 20 inches each, by carrying slats. This drum feeds the sticks to another gang saw which cuts them into pin lengths (each one making five) whence they drop into an elevator and are carried into a hopper which delivers them on to a table in front of the turning machines. These machines have a head something like an iron nail cutter, with a motion very similar, and an iron tongue which darts out and catches the stick as a toad catches a fly. They stand in line with a wooden trough back of them through which runs an endless belt. These machines quickly do the turning and drop the pin on the endless belt, which in turn conveys them to another elevator which lands them on the slotting table. The slotting machines, two in number, have something the appearance of two old-style coffee mills set back to back. The pins being dropped into these machines are carried against a saw which makes the slot, and at the same time a knife, located on the saw arbor, cuts out the pin sufficiently to receive the line. It then drops into another elevator and is carried into a large drying vat, which is supplied by hot air blown through a large pipe from the boiler room.

After being dried the pins are again elevated to the tumbling-box, from which they come slick and smooth, and are then ready for boxing and shipping. The saws and turning machines are all handily grouped, and as they run rapidly it requires quick motioned folks to attend them. The machines for manufacturing clothespins are capable of turning out 250 pins per minute.

Ottawa Valley Output.

The output of square timber of the Ottawa Valley lumber firms for 1889-90 is estimated at eight million two hundred and eighty-five thousand cubic feet, being in excess of the cut of any previous season, due to a great extent to the brisk demand and high prices of last year. This calculated at the average current rate of 26 cents per cubic foot, represents a value of $2,154,100. Counting 50 cubic feet to a tree this amount represents in trees cut down, 165,700.

The cut per individual firm is as follows:

R. H. Klock & Co.	1,150,000
A. Fraser	600,000
Hurdman & Co.	550,000
Hale & Booth	500,000
Hawkesbury Lumber Co.	450,000
D. Moore (estate)	400,000
Gillies Bros	400,000
Thistle, Carswell	400,000
Caldwell	300,000
A. Lumsden	250,000
B. Booth	250,000
McCuaig & Moorehead	250,000
Carswell & Francis	250,000
Barnett & Mackie	250,000
A. Barnet	215,000
McLachlin Bros.	200,000
Rochester, Doherty & Co.	200,000
W. Mackay	175,000
J. & G. Bryson	150,000
J. Mackay	150,000
Emery Lumber Co.	150,000
E. S. Read	130,000
Rayside & MacMaster	125,000
R. Gorman	120,000
Perley & Pattee	120,000
Booth & Murtagh	100,000
O. Sills	100,000
J. R. Booth	80,000
O'Brien & Barry	80,000
J. K. Ward	80,000
Jas. Agert	60,000
Jas Bellisle	50,000
Total Cubic Feet	8,285,000

Building in the South.

[Southern Lumberman.]

The building fever has struck this country with the tenacity of la grippe, and seems to be contagious. Old cities that have been dead or dreaming for the last two decades have the fever and are building at a marvelous rate. Old houses that have stood duty for generations as honored landmarks, and which it seemed sacrilege to remove, are levelled to the ground, and costly structures taking their place. Entire blocks of business houses are built, new streets opened, and the suburbs, by the introduction of the electric, cable, and dummy cars, are dotted with handsome residences. Capital that has long been tied up in stocks and bonds finds a safe investment in houses. New towns are springing up daily, and are born with coats off. Building operations are not confined to any section, but are general throughout the entire land. The architects are crowded, and reports from every city are to the effect that "building will be more extensive this than last year," and the buildings are more substantial and costly. The agricultural districts are in better financial condition, and will build more extensively than ever before. More hardwood finish will be used, and quartered oak, ash, gum, sycamore, and yellow pine will be largely wanted. The South will lead in building, and will build more houses than in any past two years. The Building and Loan Associations enable the working man to build houses to an extent never before known. The demand for lumber will be great, and the dealer who does not make money this year will have no one to blame. The country is prosperous, and it is hardly possible for any calamity to retard building operations this year.