

THE DANGER OF CIRCULAR SAWS.

A DELIVERANCE BY THE INSPECTOR OF FACTORIES

THE Inspector of factories for Ontario in his report recently published deals at some length with the danger attending the use of circular saws. One-sixth of the accidents which occur are due, he says, to these dangerous tools. The subject is necessarily one of practical importance to lumbermen and saw mill men. The report says:—

"Saws in general are known as upright, band and circular. To these latter I more particularly refer. They have various names according to the work they are required to perform, or on the manner they are set up and operating in their frames, such as shingle, veneer or section, butting, edging, resaw, stave, equalizing, swing, railroad, angle, concave, cylindrical, grooving and others. These saws are supposed to be made of the best crucible or finest silver steel, and to be carefully and uniformly tempered throughout, requiring great skill and watchfulness on the part of the temperer. Great care is also required in hammering out these saws, as often the process forces the strain to one part, causing a slight bulge which may crack when some unusual strain is put upon the saw. The crack relieves the strain caused by the bulge, and on boring a small hole at the terminus of the fracture it will go no farther, and the saw, I have been informed by the maker of them, is safer than before the fracture.

"Shingle saws vary in diameter from 30 to 36 inches; are rather thin for their work, one would judge from their appearance, being about one-eighth of an inch in thickness, supported at the back by an iron flange to which the saw is made fast by proper screws. This flange will extend to within six or eight inches of the saw's circumference. These saws occasionally break as one did in Ottawa in October, the flying piece striking the workman near by in the side, causing his death 90 minutes later. Veneer saws are necessarily thin in order not to waste the valuable wood being cut into veneer. They are made in sections, fastened as a circumference to a steel blade or disc. Butting saws are in use in various works to square off the ends of lumber in saw mills and for cutting off butts of smaller sticks in other industries. Most of these saws I look upon as being very dangerous, as the saw overhangs the frame so that persons may accidentally walk or stumble against it.

"Edging saws are chiefly used in mills for cutting off the bark edge from the boards. I do not know that there is any special danger from these, except it be that in many saw mills the saw for cutting the logs and the butting and edging saws with their tables or frames are rather crowded together, so that the workers are sometimes jostled by the lumber being handled, and thereby thrown against the saw. In a resaw machine I do not consider there is any special danger. They are common in planing mills and in other wood-working industries, and no accidents have yet been reported to me from this machine. The stave or cylindrical saw is a tube of steel about two feet in diameter, about 36 inches in length, with the teeth on the outer end, and is used for cutting heavy staves such as are used for oil or liquor barrels. The cylinder is set up in a frame and is used horizontally, near the floor. The special danger of this saw is the liability of a person to run against it. It would be difficult to prevent this by a guard, as the wood can only be fed in from the end exposed. Equalizing saws are two cross-cut saws on the same mandril, at the extreme ends; each saw overhangs the frame in which it is set and projects a few inches in front of it. They are used for cutting off the staves or stave bolts to an equal length. In stave works they are set the length of the stave—32 inches apart; they are also used in factories making wagon or carriage wheels for equalizing the spokes. In some of these equalizing saw machines the wood to be cut is fed into the saws by being placed on a table swinging from above, and in others the feed tables rest on pivots below. I consider these saws to be very dangerous, and not easily guarded, but those with the table resting on pivots may be guarded with respect to the top and front of the saws by putting a suitable box across the table, covering the saws, allowing room at the end for the clearance

of pieces of wood cut off. But this does not prevent risk of injury from the lower part of the saws, which in this arrangement of feed table, it seems hard to guard against. On the other hand those equalizing saw machines, so arranged so to feed from the table swinging from above, cannot be guarded in the same way as the other, as the box covering the saws would be in the way of the feed table swinging through between the saws. So while the front and lower part of the saws in this arrangement can be guarded, I do not feel satisfied that the top of the saws can be. At best those saws are dangerous—more than ordinarily so.

"Swing saws are those attached to the frame, which is usually swung from the above floor. There is more than ordinary danger from these. The operator has to pull the saw up to its work, overcoming the resistance of a counterbalance weight, which is attached to the swing frame, generally by a rope, but occasionally by a chain. Sometimes the chain gives way and allows the revolving saw to come forward with sufficient force to reach the operator, often causing serious injury. As a check to this there ought to be a frame built down from the floor above in such a position that its cross-piece will arrest the forward motion of the swinging frame at a point which would prevent the operator from being touched with the saw. There is difficulty in putting a guard over the saw itself of this machine, and many have them. As to rip saws, several practical men have informed me that all of this kind could have a wedge set on the table behind the saw to keep open the cut, so as not to bind the saw, which causes the saw to be thrown forward and frequently injuring the sawyer. This year in Ottawa one young man was reported to me as meeting his death from this cause; also other injuries more or less serious were reported. The railroad saw is for a similar purpose to the swing saw, but usually for lighter work. It is of quite different construction, the saw being set in a sliding frame within the table, and by pressure of the foot on a lever is moved up to its work. I can see no special danger in this machine more than appertains to all saws; in fact I think that there is less than any other I have noticed without guards. The angle saw I consider very dangerous to the attendant, nor do I know of any way by which it can be made less so. The device consists of two saws set at right angles to each other, with their teeth just escaping contact. The saws operate on the top of the log to be cut, one cutting down and one cutting in, sawing out a square stick. They are used chiefly in chair, and handle work. Here about as many of the uses to which the saws are put all depends on the watchfulness of the attendant. Concave saws are used for various purposes, but there is no special danger from them, more than from a flat saw rigged up in the same way.

"Another dangerous use of the saw is the machine for making axe handles. In this machine the saw, a thick one about 12 inches in diameter, projects in front of the frame, about one half its diameter, and there is nothing to prevent the attendant or other person from coming in contact with it and receiving most serious injuries. This can be guarded, and I have asked to have it done wherever I have seen this machine in use.

The recommendation is made that wood-working fences be kept free from bits of stick and other refuse that may trip or cause a person to fall towards the saw. This in some instances is done; one case is cited where the Inspector had to walk altogether on sticks and refuse from the saw, and where the floor, it is behind, was two feet below the rubbish.

TREES THAT STING.

THOUGH the tropical shrubs of Queensland are very luxuriant and beautiful, they are not without their dangerous drawbacks, for there is one plant growing among them that is really deadly in its effects—that is to say, deadly in the same way that one would apply that term to fire, for if a certain proportion of one's body be burned by the stinging tree death will be the result.

They are found of all sizes, from three inches up to fifteen and twenty feet. In the old ones the stem is whitish, and the red berries usually grow in a cluster at

the top. It emits a peculiar and disagreeable smell, but it is best known by the leaf, which is nearly round, with a point at the top, and jagged all around the edges like a nettle. All the leaves are large, even on small plants—sometimes larger than a saucer.

The effects of the sting are curious, it leaves no mark, but the pain is said to be maddening, and for months after a jab from one of its numerous "stingers" the part stung remains very tender; especially is this true in rainy weather, and when the parts stung have been accidentally dampened, even if very slightly.

Hunters who have found themselves surrounded by small forests of "stinging trees" in the dusk of evening have been known to lie down and pass the night as comfortably as possible, fearing to make an effort to extricate themselves in the dim, uncertain light, lest they might get deeper into the besetting trouble.

"I have seen," said Shuman, "a man who would treat ordinary pain lightly roll on the ground in agony for hours after being stung. I had known a horse so completely mad, after getting into the thicket of these trees, that he rushed open-mouthed at everyone that approached him, and had to be shot to relieve his agony."

Dogs, when stung, will rush about, whining piteously, biting pieces of flesh from the affected parts.

The small "stinging trees," only a few inches high are even more dangerous than the large ones, being so small they are likely to brush one's ankles before they are seen.

One safeguard for the experienced hunter is the fact that they always grow in palm thickets, and no place else. The presence of palm trees is, therefore, sufficient to put the old settler on his guard.

SOME STATISTICS OF STEAM.

ACCORDING to a recent estimate, four-fifths of the engines now working in the world have been constructed during the last twenty five years. France owns 47,500 stationary engines, 7,000 locomotives and 1,850 steamboat engines. Germany has 10,000 locomotives of all kinds, 59,000 stationary engines and boilers and 1,700 ship and steamboat engines. Austria has 12,000 stationary engines and 2,800 locomotives. The force equivalent to the working power steam engines represent is in the United States 7,500,000 horse-power; in England, 7,000,000 horse-power, in France 3,000,000 horse power, in Austria 1,500,000 horse-power, and in Germany 4,500,000 horse-power. In these figures the motive power of locomotive engines is not included. Their number in all the world at the beginning of 1890 was 150,000, representing a total of between 5,000,000 and 7,000,000 horse-power, about 6,000,000 horse power, which, added to the other powers enumerated above, gives a total of 49,000,000 horse-power for the world. A steam "horse-power" is equal to three actual horse-power, and a living horse's strength is equal to that of seven men. Therefore, the steam engines of the world represent, approximately, the working-power of 1,000,000,000 men, or more than double the working population of the world, the total population of which is usually estimated at 1,455,923,000 inhabitants. Steam has accordingly enabled men to treble his working power, making it possible for him to economize his physical strength while attending to his intellectual development.

WHAT CUTTING A MAHOGANY TREE MEANS.

It is a full day's task for two men to fell a mahogany tree. On account of the spurs which project from the base of the trunk a scaffold has to be erected and the tree cut off above the spurs, leaving thus a stump of the very best wood from ten to fifteen feet high.

THE TREE THAT FURNISHES REAL LACE.

A remarkable tree is found in Jamaica, the inner bark of which is composed of many layers of fibers that interlace it in all directions. Caps, ruffles, and even complete suits of lace are made from it. It bears washing from common soap, and when bleached in the sun acquires a degree of whiteness equal to the best artificial lace, with which this surprising natural product compares quite favorably as to beauty.