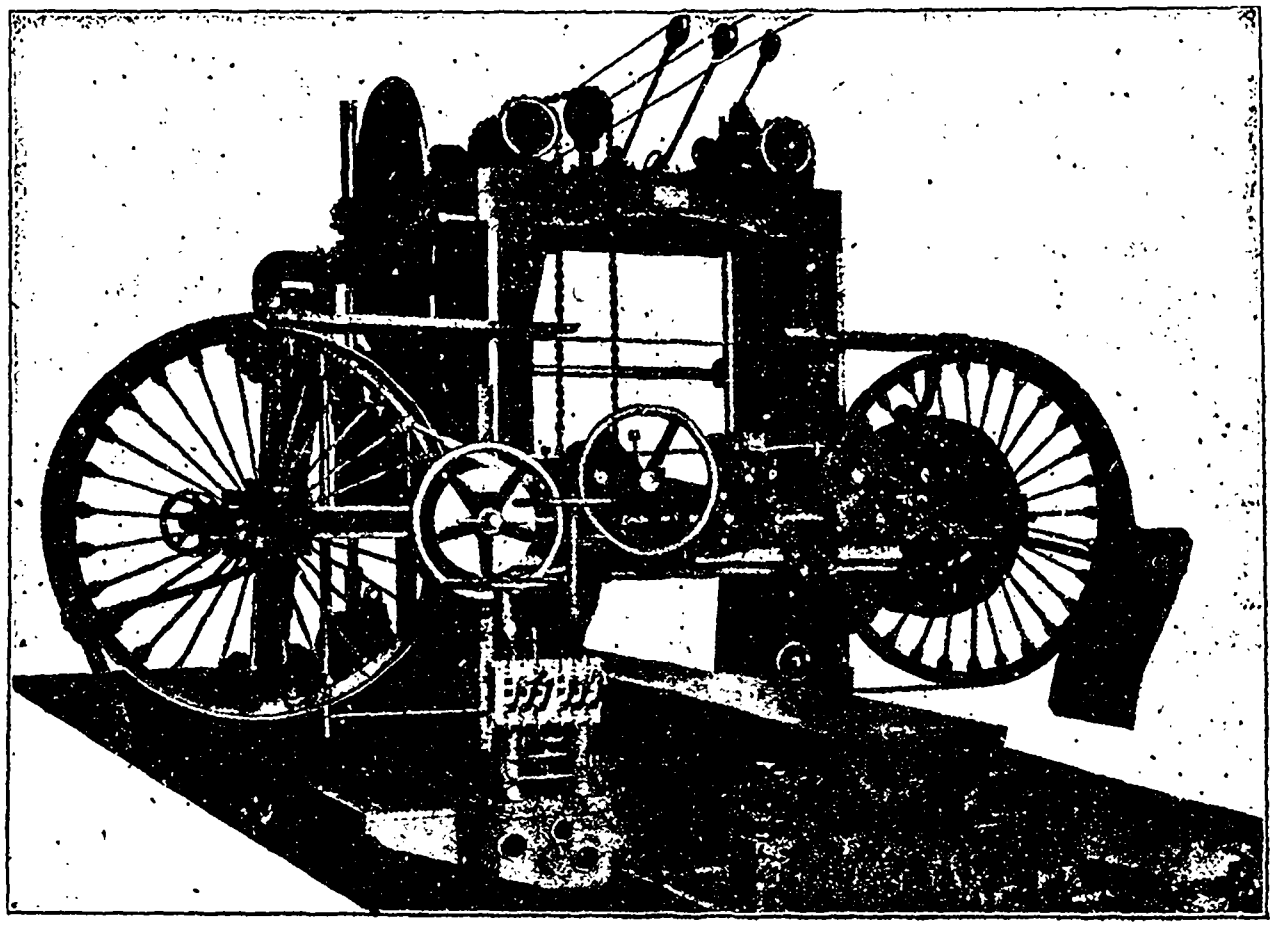
THE CANADA LUMBERMAN

VOLUME XVIII. NUMBER 3. | TORONTO, ONT., MARCH, 1897 | TERMS, $1.00 PER YEAR. Single Copies, 10 Cents.

AN ELECTRICALLY-DRIVEN BAND-SAW.

THE application of electricity for saw mill purposes is rapidly coming to the *front*. At a recent exhibition at Geneva one of the interesting features was a horizontal travelling band-saw at work, as shown in the accompanying illustration. This saw was designed for sawing logs of timber of any length. The frame is made to travel, while the log is fixed on the foundation floor. This kind of saw requires more space than the ordinary one, but works without interruption, as, owing to the length of travel, while the machine is working on one log another one can be prepared and set at the other end of track. The machine is driven by two independent three-phase motors; one of them of 6 h.p., running at 810 revolutions, is set on the platform of the travelling frame, and provides for forward and backward movement. From the motor pulley the movement is transmitted by a belt to a larger pulley, and then by a worm and wheel gear to a friction wheel fixed on a vertical spindle, that can be moved radially on a large disc, thus permitting the operator to vary the rate of travel of the frame, as the movement is transmitted from this shaft to the driving wheels by means of a vertical spindle and two conical gears. The return movement is very rapid, attaining a maximum speed of 47 ft. per minute. The reversal is obtained by a double conical friction gear. The forward movement can be regulated at will; the minimum speed is 3½in. per minute. The other three-phase motor of 16 h.p. is direct-coupled on to the spindle of one of the band-saw pulleys, and drives it at a speed of 480 revolutions a minute, the band saw attaining a linear velocity of about 125 ft. per second. To allow of a vertical movement of the saw frame, and of a lateral shifting of the pulleys for tightening the band-saw, the connections of the motor to the pulleys are made by means of three flexible cables. The vertical downward movement of the saw is regulated by a dividing disc, so that the boards can be cut of equal thickness. Every movement of the saw can be directed from the frame platform by hand wheels.



AN ELECTRICALLY-DRIVEN BAND-SAW.

POWER LOST IN SHAFTING.

SOME interesting experiments were conducted recently by C. H. Benjamin, Professor of Mechanical Engineering at the Case School of Applied Science at Cleveland, to determine by actual observation in factories of various kinds just what loss occurred through friction in transmitting power by belts and shafting from the engines to the driven machines. The figures of loss must prove startling to factory owners, and they will also serve as a guide to engineers.

The observations were made in sixteen factories, each engaged in a different kind of work. The method of making observations was as follows: During the day-time, when the works were in operation and the machines were running, indicator cards showing the work being done by the engines were taken each hour. Then during the noon hour or at night, when the engines were driving only the shafting, similar cards were taken, and when these and the first ones had been averaged, the difference between the power required to drive the shafting alone and that required to drive the whole shop was found, and this reduced again to a percentage. The most startling loss was found in a bridge material factory, where the shops were spread over a lot of ground. Eighty per cent. of the engine's power was lost in the shafting there. In a planing mill the loss was 73 per cent.; in a sewing machine factory it was nearly 70 per cent. It was 77 per cent. in a stamping mill and 65 per cent. in a boiler and machine works. The average loss for heavy machine shops was found to be 62.3 per cent. The average for light machine work was 55.1 per cent., and in but one instance did the loss fall below 47.3 per cent.

In this one case the percentage of loss was so small that it must serve as a serious commentary upon the character of the work generally done in putting up shafting. This was in a steel screw works, and the loss was only 14.5 per cent. In this factory the machinery is all of the automatic type, very compactly arranged, and the shafting had been put up in the most careful manner. The shafting was in perfect alignment, and ran in hard cast-iron boxes without babbitt metal. It is supported by very rigid hangers, and was oiled by hand instead of wick oilers.

The results of these observations were presented to the American Society of Mechanical Engineers, at its recent meeting, in a paper by Prof. Benjamin, and tables were given which showed the number of feet of shafting run in each of the factories under observation and other features of the test.

One explanation of this immense loss of power, Prof. Benjamin says, is economy in either the quantity or the quality of the oil used. This cuts down the apparent size of the bills for shop expenses while the coal and water bills go piling up. A saving could probably be made by using electricity for transmitting the power.