portion of the tie when the section hands are repairing the alignment of the tracks. The exposed hole must be plugged if the subsequent decay of the tie at that point is to be retarded as much as possible.

Fig. 1 outlines the shape of the plugs. They are constructed usually of soft pine although at times the harder woods are employed for that purpose. The body of the plug is 11-16 in. square, tapering on two sides at one end with a 60 deg. slope to a ¼ in. point. The customary length is from 4 to 5 ins.

The machine in two stages of operation is shown in figs. 2 and 3. Essentially, there are three sets of saws operating in three planes at right angles to each other. The gang of saws to the rear in fig. 2 is carried on a horizontal shaft operating in bearings on a carriage that can slide vertically on the post to the rear. This carriage is kept normally in its upper position on the guiding ways by a counterweight at the rear of the carriage post, and is lowered by the operator by the cross lever at the top, on which the operator in the illustration has his hands.

On a stationary shaft immediately in front of the near side of these last saws there is a further gang of four saws revolving in a horizontal plane. To the near side of this gang there is a single stationary saw revolving in a vertical plane at right angles to the first gang of saws, supported near the outer end of the cross frame of the machine. On this cross frame there is a carriage on which the wood stock to be operated upon is clamped with the quick-acting clamps shown. This carriage for carrying the stock is operated along its guides by means of the large hand wheel below the operator at the rear through gears engaging a rack on the lower face of the carriage.

The operation of the machine is as follows:—With the rear gang of saws in their highest position and the stock carriage at the rear of its travel, the stock piece is pushed under the clamps against a stop on the vertical carriage at the rear, which may be noticed below that carriage under the rear gang of saws in fig. 3. When the stock is located endwise against this stop, and against the rear face of the carriage, the clamps are brought down on it. With the stock carriage in this position, the upper gang of saws is brought down through the stock, the four saws slotting the end of the stock into five sections. In the separating washers between these four saws, there are projecting cutters to give the 60 deg. bevel to the ends of the plugs of the shape indicated in fig. 1. The vertical slotting completed, this saw carriage is raised to its highest position. The operator then moves the stock carriage along the ways, meeting first the gang of four saws revolving in the horizontal plane, which slots the stock at right angles to the previous cut. Continuing the forward movement of the stock carriage as in fig. 3, the single saw cuts off the finished plugs, thus completing them in batches of 25. The carriage is then drawn back, the stock loosened and pushed forward as before to the stop, and the operations repeated. The capacity of the machine is limited only by the speed and dexterity of the operator

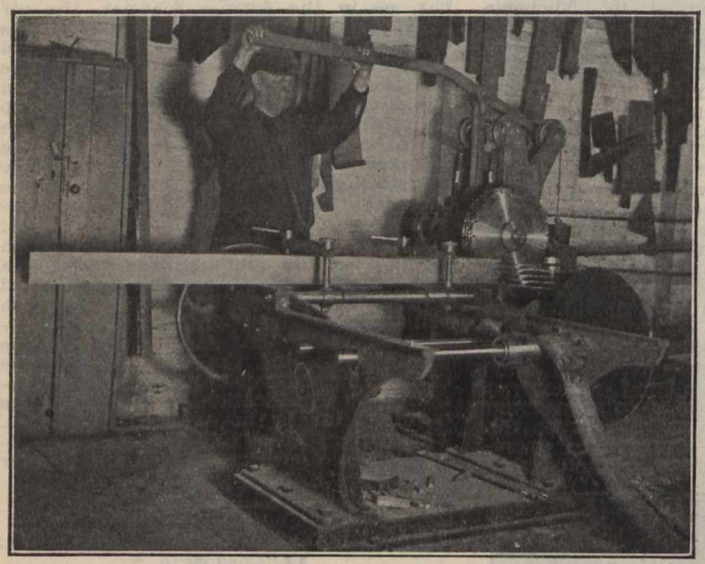


Fig. 2—Tie Plug Forming Machine Ready for First Cut.

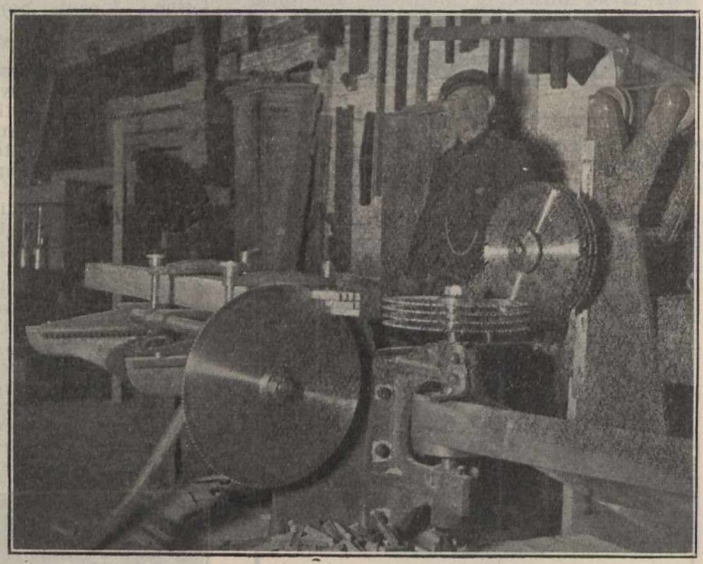


Fig. 3—Tie Plug Forming Machine Cutting off Finished Plugs.

The diameter of the saws of the upper gang is greater than the depth of the cut to the inner bevelling cutter requires, so that the saw cut enters into the next section of the stock end. The reason for this is obvious, making it possible to continue the sharpening of the saws to a considerably smaller diameter than they originally had, without in any way affecting their usefulness.

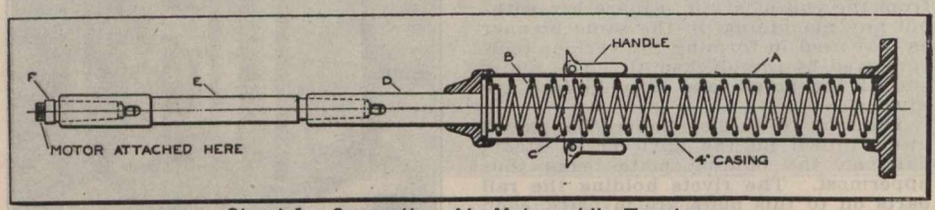
A further improvement to the machine is in contemplation. Pulling the vertically operating saw carriage at the rear up and down all day, as is being done in fig. 2, is fatiguing to the operator. To relieve him of this arduous part of the work, this carriage is to be power operated by means of cone clutches on one of the shafts when thrown into engagement revolving a vertical threaded lead screw for raising or lowering at will. Double cones will make it power operated in both directions.

J. J. McDonald, a G.T.R. conductor, was arrested in Toronto recently on charges of defrauding the company of fares, etc.

The Timiskaming and Northern Ontario Ry. commission has announced that it has adopted the ruling of the Geographical Board of Canada, as to the spelling of Timiskaming, and in future the name as referring to the railway will be so spelt, the folders, stationery and rolling stock being changed to correspond.

## Stand for Air Motor Used by Pere Marquette Railroad.

The Pere Marquette Rd.'s mechanical department has devised a neat little scheme for bearing the weight of the air motor while the latter is tapping holes vertically upwards, as, for example, when tapping staybolt holes in the firebox crown sheet. As the illustration shows, the body or main part of the stand consists of a piece of 4 in. pipe, A, about 2 ft. long, having two wrought iron caps screwed on the ends. The cap to the right serves as a stand, while that to the left is longer and bored out to act as a plunger guide. Inside the 4 in. pipe casing there are two springs, B and C, formed of ¼ in. steel, and coiled to give a free length a few inches in excess of the length of the casing. Resting on these springs is the plunger D, guided in the upper head as before mentioned. The plunger D has a No. 4 Morse taper holding the socket E, various lengths of which can be made to accommodate the different jobs that must be undertaken, or else the one average length may be blocked up to the job in an improvised way. These sockets E, are also given a Morse taper No. 4, to hold the head F, which is threaded on its outer end to fit the handle end of the motor. The motor, being screwed on to this head, forms a solid and rigid unit, guiding the tap accurately into the hole.




Stand for Supporting Air Motor while Tapping.

All who have had difficulty from imperfectly fitting staybolts, due to the hole being ovalled from incorrect tapping by the old method of having the workman support the motor, will appreciate the value of this idea. In addition, the spring being of medium strength, keeps the tap right up into the hole, materially reducing the tendency of the tap to strip the thread before gripping. Consequently, a more perfect thread, less liable to leak, is made possible.

The Central Railway and Engineering Club, Toronto, held its annual outing recently, to Erin, Ont.