

of accomplishing this, and the method of so doing is shown in the accompanying illustration, fig. 5. Clamped to the top of the drill table, there is a section of board covering the whole table top, and extending over the sides. The front of the board is lined up against the front edge of the table. On this board, there is a sliding wooden table, guided on the under part by a tongue fitting the groove of the latter, this tongue and groove being in line with the drill spindle. The separators are located on this movable platen up against the forward edge, located endwise against the pin shown. The drill spindle is located permanently in position, and the holes drilled by the operator forcing the upper carrying table towards the drill. Rapid operation is thus made possible, more so than if the drill spindle were moved up to the work.

Bevelling the edges is the next operation on the separating blocks, the rip saw being set up as in fig. 6 for this purpose. Parallel to the saw on the saw table, there is clamped a long board carrying a tongued upper surface, on which a carriage over top, with a grooved lower surface, is guided. In a recess on the upper surface of the carriage, the separator is located, and the carriage with contained separator run past the saw, trimming off the corner.

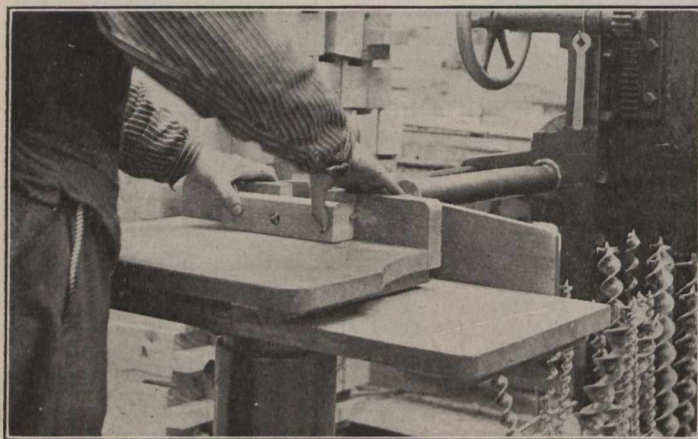


Fig. 5.—Drilling Bolt Holes in Separators.

Reversing the position of the separator on the carriage, the other end is trimmed down. On the near side, it will be noticed that there is a bevel strip, secured to the guide board to the rear, for deflecting the severed pieces from the saw and preventing injuries to the operator.

The wooden parts entering into the construction of the cattle guard being thus far completed in the machining, the parts are all taken to the assembling stand, as in fig. 7. Bolts from the screw department are piled conveniently under the assembling stand, and the separating blocks, in recesses in the upper surface. Against the edge to the right, which has a retaining shoulder, the first bar is located and three clamping bolts passed through. Then, alternately slipping separators and bars on to the projecting bolts, the guard is gradually built up. It will be noticed that there is a guiding surface under the points where the three bolts come, facilitating the rapid assembly of the component parts.

The cattle guards, assembled as in fig. 1, are removed and placed in piles outside the door in the background for shipment as required. Large numbers of these guards are in constant demand as already mentioned, so that nearly all the time there is some one or other of the operations outlined being performed in the shop.

Piece Work System at the Grand Trunk Railway Port Huron Shops.

Under the supervision of J. L. Hodgson, Master Car Builder, G.T.R. shops, Port Huron, Mich., a system of handling piece work has been developed that has proved a very valuable asset. In these shops, everybody but the office staff works on piece work, prices having been set for even the smallest operations, such for example as the painting of a couple of inches of stripping along the side of a passenger car, and similar small tasks. The management in this way knows exactly what the repair of a car will cost down to the last cent, and can therefore determine almost instantly whether it would be advisable to undertake the repairs at that particular time, or wait until they are more extensive, and require a more complete stripping of the car. Knowing the cost and the probable earnings of the workmen, the length of time required to put the repairs through is also known to within a very short space of time. The work can thus be scheduled through with a certainty of its being completed as promised.

A most important item is the fact that the workmen are more satisfied. Whereas

a certain amount of money in it for them, and in consequence, it is to their advantage to complete the task in the shortest possible time compatible with good workmanship. The popularity of the scheme is evidenced by the fact that some little difficulty has been experienced in obtaining foremen in certain of the departments, from the fact that the more dextrous workmen can make as much or more than the foreman in charge of the work. The incentive naturally is to remain where there is the most money.

In the freight car department, the work is handled by tracks. That is to say, a bunch of cripples is run in on one of the shop tracks, and none of the cars are removed until the whole lot are again in operating condition. To each track, there are a given number of workmen, about two per car, apart from the trucks, which are handled separately. These men operate in pairs, as that has been found to be the means of working the men to the best advantage. The numbers of the cars entered for repairs are each written on a separate piece of paper, these several pieces of paper being then rolled up separately and mixed

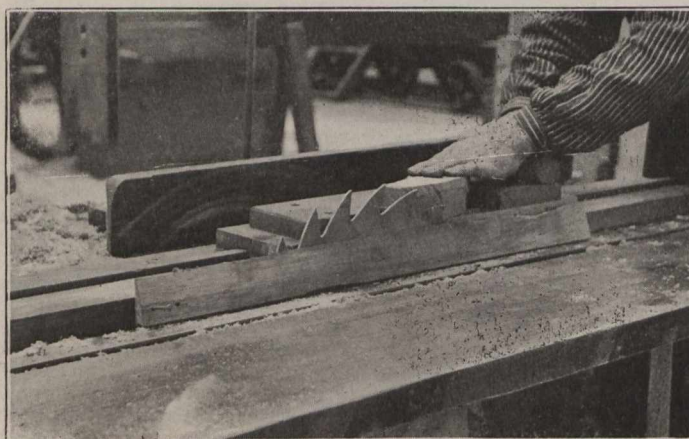


Fig. 6.—Bevelling Ends of Separators.

low wages are generally the rule where day work exists, from the general indifference shown by the workmen concerning the amount of time wasted on the task, under a piecework system the more the operator does, the bulkier is the pay envelope at the end of the week. This is probably one of the greatest incentives of a piecework system, if it is properly managed like the one under consideration, where the price is set permanently, and the workman has no fear hanging over his head that at some time if too great an amount is earned in a given interval, the price will be cut so as to reduce his earnings. Under such a scheme, the incentive to increase the output of the plant is removed, and the scheme is but slightly better than a day work system that is properly supervised. The greatest loss in such a case lies in the limited output from a given factory. The greater the output from a given factory, other things being equal, the less the standing charge per unit of production, and at the same time, the time when it will become necessary to extend the plant to handle increased business, will be pushed further into the future, involving the use of the capital that might otherwise be tied up, to other purposes. At these shops, no trouble has been experienced with the system, as no cutting exists. The men are given a fair price, and when they start in on a job, they know there is

together in a hat. The leader in each pair of men then draws one of these slips, representing the car on which that couple are to work. This method of distributing the work was made necessary by the fact that while the prices set for each of the different parts of the work have been set as fairly as is possible, some are found to be slightly better than others, and the more wily workmen would soon determine the best jobs, and on each occasion select that one, while probably the more plodding workman would have the poorer one shoved off on him.

As each track of cars is ready to be placed, an incoming inspector goes over each of the cars separately, noting all the repairs required on a special form provided for the purpose. For freight car bodies, this form is 13 x 14½ ins., divided into four main columns of items. At the top of the form, the schedule number, incoming inspector's name, road, class, number, and date commenced, and finally the date completed, are entered by this incoming inspector. In the four main columns of items, there are printed 178 parts, covering every kind of repair possible on the car. Opposite each item, there are three items giving number of pieces, rate and amount. In these columns, at the points required by the nature of the repairs that the inspector observes, the several amounts are filled in, duplicate forms being made out. The original goes