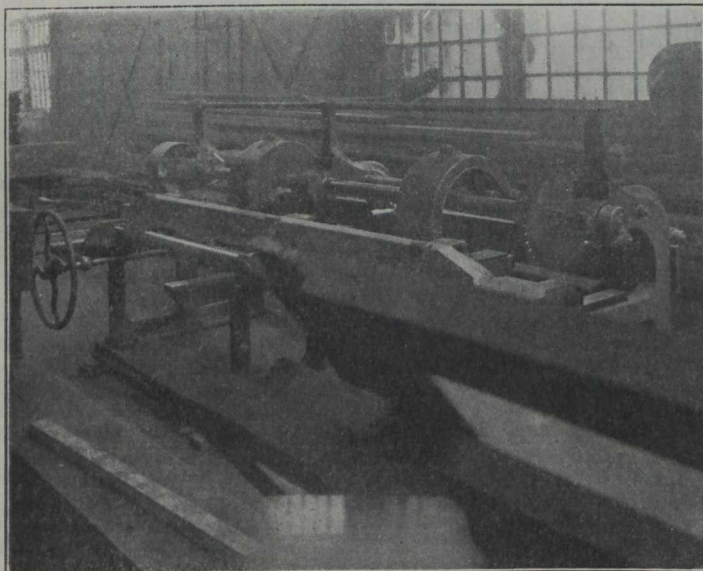


# Railway Mechanical Methods and Devices.

## Cattle Guard Machine in Grand Trunk Railway Car Shops.

In Canadian Railway and Marine World for Oct., 1912, a full description of the then existing practice of making cattle guards at the G.T.R. car shops, at London, Ont., was given. This practice, while better than that to be found in the majority of shops, is being superseded by a more nearly automatic system of handling the parts, made possible by the construction of a special machine by A. Leclair, millwright in the G.T.R. Montreal shops. Several years ago, he devised a machine for sundry kinds of duplicate work in the Montreal shops, and it was found that it was useful in making the parts of a cattle guard, by adopting special fixtures to it. Since then, the machine has been used entirely for these guards, and so useful has it proved, that it has been decided to equip other shops of the system with the same kind of machine, only the latest development is a considerable improvement on the last production, specialized exclusively for the cattle guard slats.



Machine for Trimming, End Bevelling and Drilling Cattle Guard Slats.

The machine which has been made in the Montreal shops for London, Ont., is shown in one of the accompanying illustrations, ready for shipment, but is unfortunately marred by the presence of an obstruction in the foreground which does not belong to the machine. The machine consists of a light cast iron frame construction, similar frames at each end and the centre forming the whole under structure. Carried in three bushings, one in each of the frames, there is a shaft extending the length of the machine, on which in any desired position may be secured saws or knife heads. These heads are protected by sheet iron hoods, attached to a shaft in the rear, and which may be shifted when it is necessary to get at the knife or saw.

Across the top of each of the three under frame sections, there is a carriage way, on each of which is mounted a carriage, an arrangement similar to the cross slide of a lathe carriage. These three carriages are operated in unison by the large handwheel shown in front, which connects, through a shaft and bevel gears, with a shaft under the cross carriages, spurs on this shaft meshing with racks on the under surface of the carriages.

The original machine of this type was

made up for general work. This machine, being specially designed for cattle guard slats, is arranged with a special clamping jig. On the top of each of the three cross carriages, there is a stop block, the three lined up correctly. These stop blocks hold a wooden jig member, of a section to receive one side of a cattle guard slat. There is a corresponding jig section to the rear, which is adjustable on the carriage, by cams actuated by the vertical lever on the far end of the machine, clamping the member to be machined, in place in these vise jaws.

The details of the clamping mechanism are shown in the other illustration. The lever in the background is on the end of the cam shaft. Pulling the lever over towards the operator, locks the cams in position. On the cam shaft, there is a notched wheel, engaging with which is a knife edged lever, fulcrumed on the end frame. On the near end of the frame, there is a small dog, pivotted on the frame, and which holds the end of the lever down, retaining the jaws in their clamped position. By raising this dog, and giving the clamping lever a releasing pull, the jaws are loosened, so that the

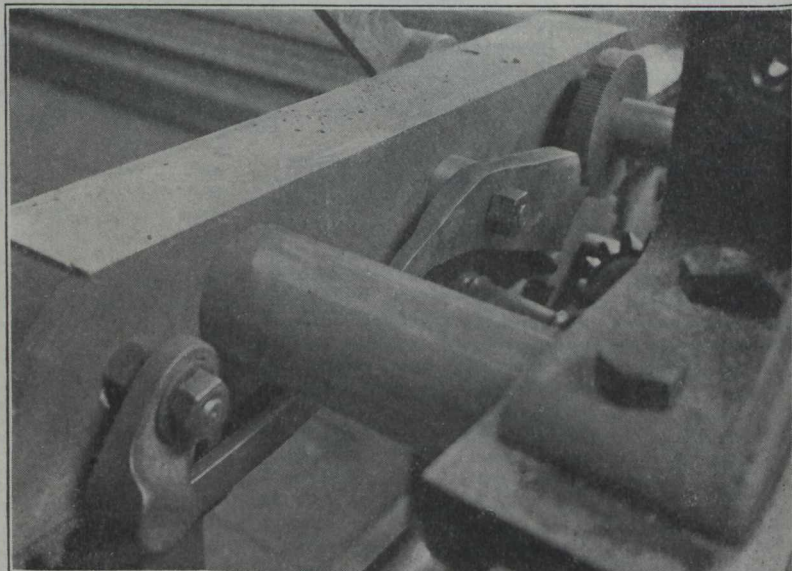
operation. This machine is almost identically the same as the slat machine, only shorter.

The initial operation on the slats, that of bevelling the tops, is performed on the buzz planer. The slat stock is twice the depth of the completed slats. This stock is passed through the planer on the flat, with revolving knives above and below, spaced one before the other, so that as the stock passes through, channels are planed top and bottom, turning out two completed slats at the other end.

The final assembling of the slats to form the cattle guards is done in a vertical jig, fitting them on one at a time.

## Crank Pin Turning Device at Quebec Central Railway Shops.

Considering the amount of machine work to be performed on the part, the work involved in putting a crank pin in shape, is considerable. As usually practised, the locomotive driving wheels are placed in a large hydraulic press, and the pin first of all



Clamping Mechanism of Cattle Guard Machine.

slat can be taken out quickly. Then, after inserting a new piece, the lever is pulled forward, and by the dropping down of the dog on the knife lever, the slat is clamped for operating.

The cutter head carries two saws, for trimming the slat to length, and also carries a double cutter head adjoining each of the saws. The initial construction had a single cutter head, but it was found that by making the cutter head in two parts, with knife blades of each set in an opposite direction, the cut was divided, and a better balance obtained. These double headed cutters shave off the end bevel of the cattle guard in the one pass across the machine.

Back of the cutter and saw shaft, there is a secondary revolving shaft, with heads that are adjustable along its length, in which there are drill heads, operating from this shaft through bevel gears. As the cutters and saws are performing their operations, the drills, properly spaced, drill the tie rod holes, so that the slat on coming from the machine is completed.

A somewhat similar machine has been made up for machining the separating blocks, which are bevelled at both ends like the slats, and have one tie rod hole in the centre. All this is performed in the one

pressed out. This generally requires the removal of the wheels to another point in the shop, which, in the case of a small shop, without adequate crane facilities, is a considerable task. In consequence, any device that is capable of being used directly on the crank pin when in place in the driving wheel, makes for a considerable saving in time, even if the actual time of machining by an applied device is not as short as when removed to a lathe.

In the Quebec Central Ry. shops, at Sherbrooke, Que. (G. M. Robins is Master Mechanic, and E. M. Green, General Foreman Machine Shop), such an applied device for turning crank pins is in use, and is illustrated herewith. The device depends initially on the fact that the threading for the crank pin nut is concentric and uniform with regard to the body of the crank pin. The body of the tool consists of two parts. An inner stem is threaded as a nut at one end, this end screwing on over the crank pin threading aligning the tool with the crank pin. This extending pin carries a long sleeve as shown. This sleeve carries on its inner end an offset arm, which extends over the crank pin surface, and in its extremity it has a small adjustable cutting tool. The inside guiding pin is stationary,