

precipitated to the bottom of the dust collector. From this bottom there is a 1/4 in. pipe connection, leading to a T, with a branch pipe leading to each side of the locomotive.

The bottom cap of the dust collector has four 1-32 holes drilled in it, through which the oil escapes through the T connection to the flanges, with just enough steam passing through the holes to carry the oil to where it is needed. The ends of the pipes leading to the outside of the locomotive are bent around, so that the tip is radial to the flange corner, the tip being about 1/2 in. back from the corner.

We are informed by W. Black, General Foreman, by whom these flange lubricators have been applied, that the results obtained have been excellent, and that even in the very severe winter weather to which this line, situated far north and in a comparatively high altitude, is subjected, no trouble has been experienced from the apparatus freezing, enough steam passing through to keep the parts free. Nearly all the road locomotives have been equipped, but it has only been found necessary to pipe them to lubricate the flanges of the front driving wheels, as it is only there that excessive flange wear has been experienced. The flange wear has been materially minimized, as no trouble has been experienced with the oil running on the tread of the tire reducing the adhesion.

Interesting Shop Kinks.

Among my jobs as machinist once was one of repairing a leaky boiler, in which there were about 700 copper flues of 1/2 in. diameter. After having spent four successful hours in order to get out one of the flues that had to be replaced with a new one, I got the idea of threading one end of the flue with a tap, large enough to make sufficient hold for a bolt or screw, but not so large as to cut through the copper flue. When I had the bolt or screw in the one end of the flue, I unloosened the other end of the flue, put a steel rod through the flue, hit the rod with a hammer, and it took only about a minute to get each of the other faulty flues out of the boiler in my new way of doing it.

Once I was reaming out a new wristpin lining for an air compressor. The reamer was 2 1/2 ins. in diameter, but it was just a trifle too small for making the bore in the lining large enough, so I took a strip of thin copper, such as are used as fuses connected with cables or bars, transmitting electric currents. First I used a strip of the copper, wide enough to cover three of the teeth of the reamer, and let it follow the reamer through the bore, but still the hole was too small. After using another copper strip, covering four of the reamer's teeth, I got a perfect fit for the wristpin.—G. H. Ander, New York.

Diaphragm Between Cab and Tender on Intercolonial Locomotives.

The Intercolonial Ry. is equipping part of its passenger motive power with a diaphragm between the cab and tender, to protect the enginemen more thoroughly against inclement weather. The arrangement is identical with that in use on some of the C. P. R. locomotives, which was described in detail in Canadian Railway and Marine World for June, 1912.

The rear wall of the cab has a large square opening, around the contour of which there is a diaphragm ring as between vestibuled passenger cars. A corresponding

diaphragm ring on the tender is held in contact with the former by means of four spring plungers in the forward end of the tender. The tender diaphragm has hinged to it another bearing plate, at right angles thereto, which bears against a passage wall from the cab, the hinged plates being kept apart by four intermediate coiled springs on each side. This hinged arrangement permits of free movement of the locomotive with regard to the tender, as in passing around curves, the pressure of the connecting plates being always maintained by the springs, so that the cab is at all times closed to the weather in a more effective manner than by the usual canvas curtain method. Coal passes into the cab floor through the usual coal doors.

The sides of the cab are equipped with doors, and entrance is made through them by way of a ladder embodied in the cab structure, and which is slightly forward of its usual position, and of a different design. We are indebted to G. R. Joughins, Superintendent of Rolling Stock, Canadian Government Railways, for this information.

Tool List on Canadian Northern Quebec Railway.

T. C. Hudson, Division Master Mechanic, C. N. Q. R., Joliette, Que., writes Canadian Railway and Marine World:—"I note your interesting publication frequently publishes methods used to facilitate mechanical work. I am, therefore, sending you a tool list which is used on the C. N. Q. R. lines, which has been found very convenient when transferring locomotives from one division to another, also when locomotives are allotted to contractors.

CANADIAN NORTHERN QUEBEC RAILWAY	
Eng No	Assigned to
<input type="checkbox"/> Water Gauge Lamp	<input type="checkbox"/> Packing Hook
<input type="checkbox"/> Steam Gauge Lamp	<input type="checkbox"/> Packing Iron
<input type="checkbox"/> Lamp Burners	<input type="checkbox"/> Engineer's Torch
<input type="checkbox"/> Fire Irons	<input type="checkbox"/> Bell Rope
<input type="checkbox"/> Coal Pick	<input type="checkbox"/> Water Bucket
<input type="checkbox"/> Cold Chisel	<input type="checkbox"/> Broom
<input type="checkbox"/> Hand Hammer	<input type="checkbox"/> Coal Sprinkler
<input type="checkbox"/> Monkey Wrench	<input type="checkbox"/> Crosshead Blocks
<input type="checkbox"/> Pipe Wrench	<input type="checkbox"/> Crank Pin Blocks
<input type="checkbox"/> Classification Lamp	<input type="checkbox"/> Scoop Shovel
<input type="checkbox"/> Marker Lamp	<input type="checkbox"/> Green Flags
<input type="checkbox"/> 1 Gal Oil Can	<input type="checkbox"/> Red Flags
<input type="checkbox"/> 2 Gal Oil Can	<input type="checkbox"/> White Flags
<input type="checkbox"/> 1/2 Gal Oil Can	<input type="checkbox"/> Car Replacers
<input type="checkbox"/> Tallow Pot	<input type="checkbox"/> Valve Stem Packing
<input type="checkbox"/> Oil Feeder	<input type="checkbox"/> Piston Rod Packing
<input type="checkbox"/> Torpedoes	<input type="checkbox"/> 3/4" S Wrench
<input type="checkbox"/> Fuses	<input type="checkbox"/> 1/2" S Wrench
<input type="checkbox"/> Pump Packing	<input type="checkbox"/> 1 1/4" S Wrench
<input type="checkbox"/> Padlocks & Keys	<input type="checkbox"/> 1 1/2" S Wrench
<input type="checkbox"/> Tool Box	<input type="checkbox"/> Socket Wrench
<input type="checkbox"/> Pump Wrench	<input type="checkbox"/> for Mud Plugs
<input type="checkbox"/> Oil in Cans <input type="checkbox"/> Engine Valve <input type="checkbox"/> Coal <input type="checkbox"/> Signal <input type="checkbox"/> Coal on Tender <input type="checkbox"/> Tons <input type="checkbox"/> Other Material shipped with Engine <input type="checkbox"/> Engine disconnected and following parts put on Engine	
Boiler washed out Boiler tested Tools and Material on Engine as per above list Messenger in Charge of Engine Engine and Material received in good condition except as mentioned below	

"With the adoption of this list there need be no difference of opinion between the sender and receiver regarding material and tools furnished and returned. The messenger in charge of locomotive is furnished with copies in duplicate of material on it prior to its departure for another divisional point or contractor. On arriving at destination the messenger has the tools checked by the foreman or person authorized to receive them. The list having been checked and signed, one copy is retained and the other returned by the messenger to the headquarters station, thus completing a record which can be referred to any time if needed."

Track Section Prize Competition on Eastern Lines, Canadian Pacific Ry.

For the past two years an annual track section prize competition has been carried out on the eastern lines, C.P.R., which has aroused a healthy spirit of rivalry and keen competition among the officers and section force of the different divisions and districts. Sixty-two prizes are awarded in the competition, as follows:

A general manager's prize to the foreman having done the best season's work on eastern lines.

Four general superintendent's prizes, to the foreman on each division who has done the best season's work, exclusive of the winner of the general manager's prize.

Fourteen district superintendent's prizes, to the foreman on each district who has done the best season's work, exclusive of winners of higher prizes.

Forty-three roadmaster's prizes, to the foreman on each roadmaster's territory who has done the best season's work, exclusive of winners of higher prizes.

Under this system no man can win more than one prize, and all foremen have an equal chance, as the quality of the work done throughout the season is the deciding factor, and not the actual physical condition of the section at the end of the season. The basis on which the sections are judged is entirely efficiency and careful consideration is given throughout the season to the condition of, and work done on, ditches, gauge, spiking, line, surface, bolts, rail wear, so far as it can be controlled by the section forces, switches, sidings, right of way and station grounds, track signs, cattle guards and fences. The amount of work done and the hours of labor put in, both by regular force and extra gang, are also carefully considered, and the foreman accomplishing the best work with the least amount of labor—the physical condition of the section, as to grades, alignment, drainage, and character of roadbed being taken into consideration—wins the first prize.

The number of hours of regular labor and the number of hours of extra labor on the section are figured against the number of ties renewed, tie plates installed or changed, rails changed over on curves and ditching done. The amount of track handled, right of way, spikes and bolts is fairly uniform on all sections, so that the condition with respect to these items at the end of the season is usually a criterion of the amount and quality of the work done thereon throughout the season. Where special conditions affect such work they are taken into consideration. Track gauge testing machines are run over each roadmaster's territory periodically during the season and records are kept of the condition of gauge found.

Towards the end of the season each roadmaster, after careful consideration of each section, as above outlined, reports to his superintendent the prize winner on his territory. The superintendent and resident engineer then carefully inspect each roadmaster's prize section, and decide on the winner of the superintendent's prize, reporting same to the general superintendent, who, together with the division engineer, decides which superintendent's prize section is entitled to the general superintendent's prize. Finally the best section on each division is inspected in detail by the General Manager and the Engineer of Maintenance of Way, together with division officers, gauge and surface are checked throughout, bolts, spikes, and every detail of track maintenance examined, and on these observations, taking into account physical, labor and other conditions, the General Manager's prize is awarded.