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The Handling of Snow and Care of Track in Winter.

The Canadian Northern management offered a prize recently to the roadmasters on its lines in Quebec and Ontario, for the best paper on the handling of snow and care of track in winter. The offer elicited a very satisfactory response, six papers being contributed. They were submitted to two judges, C. H. N. Connell, Engineer, Maintenance of Way, Montreal, and R. A. Baldwin, Engineer, Maintenance of Way, Toronto, who awarded the first prize to R. J. Monroe, Roadmaster, Joliette, Que. W. M. Jocklin, Track Inspector, Port Arthur, also submitted a paper which received very high commendation from the judges, but it could not be considered in the competition, which, as above stated, was confined to roadmasters. We are indebted to L. C. Fritch, Assistant to President, C.N.R., for copies of the two papers referred to, which are reproduced herewith.

First Prize Paper by R. J. Monroe, Roadmaster, C.N.R., Joliette, Que.

In dealing with this subject I will endeavor to put in a concise form the methods, which, in my opinion, should be employed in order to obtain the most economical, safe and efficient results. Trackmen's work in winter consists practically of but two units, the clearing or removal of snow and the maintaining of track.

The handling of snow in the province of Quebec, due to its geographical location, is a difficult problem, requiring thorough organization and the co-operation of all those engaged in the operating department.

With the approach of winter a portion of the ballast should be removed from between the ties around all moveable parts of interlocking plants, switches, etc. This is essential in order to facilitate the removal of snow and ice from these parts during the winter. The ends of all crossing planks that remain intact during the winter should be tapered off, in order to minimize as much as possible the damage that would result from flangers catching them while in operation.

The roadmaster, after personally inspecting all snow plows and flangers assigned to him, and having them equipped and made ready for service in good season, should consult with the superintendent and arrange for the proper distribution and assignment of this equipment. An experienced and competent foreman, thoroughly familiar with the district to which he is assigned, should be placed in charge of each snow plow. He should also be familiar with adjoining districts, so as to be in a position to operate over same in case of emergency.

Each snow plow foreman should make several trips over the division every autumn, in order to become familiar with the location of sidings, interlocking plants, etc., which is essential in the successful operation of snow plows. He should also take particular notice of any changes that have been made since the previous winter, such as the installation of new side tracks, or the lengthening of old ones, etc.

At the beginning of the winter the track should be kept clear of snow as long as

possible, by the operation of wing flangers on freight or mixed trains, thus avoiding the extra expense of running plow extras. As the season advances and the snow becomes heavy and cuttings get filled, necessitating the operation of snow plow extras, the roadmaster and supervisor of track must keep in touch with the superintendent and chief dispatcher, keeping them well posted as to the condition of the road, and arrange for plow extras when required, and in this respect it is imperative that snow plow extras be run promptly when ordered, and that the best available power be supplied for them. Experience has taught us that failure to promptly operate snow plows during heavy snow storms has resulted in serious blockades, with the ensuing result of congestion of traffic and extra expense all round.

On the return trip of snow plow extras from their operation over the division, or immediately after snow storms, plow extras should be used in winging out and widening the bad cuttings and for plowing out all passing tracks and other through sidings. The prompt and proper handling of snow in passing tracks and sidings, by the use of snow plows, reduces the cost of hand labor, and in addition permits the more prompt handling of traffic after each snow storm, as trains can meet without delay, and cars can be promptly set out or picked up from business tracks.

In heavy cuttings, as well as in certain places in the open country, snow very often accumulates from continual drifting, and in this respect section foremen must thoroughly familiarize themselves with their sections. It is important that they watch closely all such places and give timely advice to the train dispatcher's office, as well as to the roadmaster and supervisor of track, as soon as snow accumulates in such places, so that trains, especially heavily loaded freight trains, may not be permitted to run into such places and become stalled, thereby seriously delaying traffic. They should keep the snow in all such cuttings well shovelled back, so that snow plows during snow storms may successfully operate through them with wings in full operation.

The handling of snow at the larger terminals forms a heavy item of the snow expense, and while no adequate means have been devised for doing this work, except by hand labor, still a great deal can be accomplished by the use of flangers. Foremen in charge of terminals must watch snow expenses very closely and not employ more men than is absolutely necessary. This is particularly so at the beginning of the winter, when the first falls can be handled with a small gang of men and with very little inconvenience to traffic, as the flange is generally clear of ice and hard snow and yard engines can operate with greater ease than later on in the season. Tracks and switches around locomotive houses, water tanks and shops demand very close attention on the part of section foremen. Ice quickly accumulates at such places and unless watched very closely, becomes a cause of derailments. Section foremen in charge of important terminals should keep in touch with the unemployed

labor, so as to be in a position to secure extra men on short notice.

Shimming is another problem which trackmen have to contend with. The extent to which track heaves varies according to the nature of the soil in the subgrade, the amount of ballast underneath the track and the drainage. With a liberal supply of ballast shimming can be reduced to a minimum. It is my experience that the results obtained from shimming do not depend so much on the number of shims applied each day, as the applying of them in the most needed places. When track heaves badly the section foreman should select the worst spots on his section and do the necessary shimming promptly, in order to keep the track in a safe condition for the passage of trains. Some foremen, especially the inexperienced, find it rather difficult to select the worst places and very often spend valuable time and material doing unnecessary work. In order to avoid this the supervisor of track, when travelling over the division, should keep a sharp lookout for rough track and note the extremely bad places on each section and promptly advise the foremen, giving them the exact location of each spot. By doing this regularly all unnecessary shimming will be avoided and the track will show a marked improvement each day.

Spread track, except on sharp curves, is invariably caused by defective surface and line. When track shows signs of spreading, trackmen should at once set to work to remove the actual cause, instead of driving a few extra spikes and leaving the track in bad line and surface, with the result that the track will again spread from the same cause in a day or two.

When leaving for work in the morning the section foreman should always have in mind the places to be shimmed on that day and see that he has the necessary material with him.

When shims exceed half an inch in thickness spikes should be pulled and driven through them. When shims exceed 1½ ins., sufficient long spikes and braces must be used to ensure safety. When shims exceed 3 ins., long shims must be used and an occasional one spiked to the ties.

The most critical time is in midwinter, when snow storms are frequent and of long duration. At such times trackmen find it very difficult to do any shimming and track will continue to heave badly. Bad spots will develop that will become dangerous within a very short time if not attended to. Supervisors of track must watch this even more closely in such weather and keep a sharp lookout for such bad spots and insist on having them attended to at once.

As soon as the snow has disappeared from around the rail, section foremen should go over their section and spike all short kinks into line and shim up all spots which are liable to cause spreading.

We now arrive at the season when the frost will show signs of coming out and shims will "show high." A great deal of rough track at this season can be attributed to two causes, the principal one is that of allowing shims to remain "high" for a certain length of time in order that they may be all taken out at one "pull-