

placing them in their former positions, tamping them well. When this is done, repeat the process until the spot is completely dug out. Wherever this is done, there will be no more heaving and the company will be amply paid for the trouble and expense of removing the clay from the road-bed.

**Placing Snow Fence.**—As the greater portion of railways in the northern countries run in one general direction, which is east and west, and are exposed to severe and repeated snow storms, there should be some protection against drifting snow. This protection is best provided in the form of fences. Their efficiency will depend upon the strength, height, position and distance from the track. The fence should be placed at such a distance from the track that when drifted full the snow will not reach closer than 25 ft. from the track. The fence should be set up from track 12 ft. out for each foot in height of fence, thus if the fence is 10 ft. high it should be 120 ft. from the track, and so on, according to height of fence. As the general direction of the railways is east and west, the greater portion of the fence will be required on the north side of track, as the severest snow storms come from the north and west. It is a good plan to have the fence extend parallel with the track for the entire length of the cut, until nearing the ends of the cut, when the fence should be gradually drawn in, so as to be about 50 ft. from the track. This is to prevent snow from filling up the ends of the cut. I have found that snow walls properly built are of great value, and are often used in place of fences, where there is not too heavy drifting and the expense of permanent fences is not warranted. Snow fences should be set up in plenty of time, so as to avoid being caught with an early fall of snow, which may drift the cuts full and cause serious delays and unnecessary expense.

**Clearing Switches, Interlocking Plants and Road Crossings.**—During snow storms switches and interlocking plants must be kept cleared of snow, so as to be in working order at all times, especially interlockings, as it requires but very little snow to render them useless. There should be a sufficient amount of maintenance force on hand to keep them cleared of snow, either night or day, during storms, and as soon as the storm is over, the switches must be thoroughly cleaned out and station platforms and public road crossings cleaned off, and the flange way picked out. When clearing switches and interlocking plants of snow, it will be found a good plan to remove the snow from between the rails over the entire turnouts. If this is done it will prevent them from filling up with ice, and also keep the spikes clear, which will greatly aid the section force in holding track to gauge in turnouts.

**Preparing Track for Snow Plow.**—As soon as the condition of the track has been reported after a severe snow storm, the section foreman should take his force and put his section in shape for the snow plow. In cuts where the snow is drifted to a depth of 3 or 4 ft. the track in both ends of the cut should be cleared of snow and flanged out to where the snow has a depth of 2 ft. Snow is most apt to cause derailments where it is of slight depth and frozen to the rail, and this most frequently occurs at the ends of cuts, and by clearing the cuts in the above manner the danger of derailments is avoided.

**Snow Reports.**—Immediately after a heavy snow storm the section foreman should ascertain the condition of his track, noting which cuts are drifted full and which are clear. These facts should be

reported immediately to the roadmaster, in order that preparations may be made to clear the track. If the section is clear, it should be so reported.

**Snow and Its Effects and Handling Snow Plow to Open Line.**—All roads in the northern countries are obliged to contend with snow, and in the northwest especially. The keeping of the track clear constitutes one of the main items of cost of track maintenance. Snow must be contended with in many forms, the most common of which is drifted snow, but it is almost equally as difficult to contend with it when it fills the flanges of rails with ice, or when in melting and freezing it fills the track ditches, and flows over the track, covering the rails with ice and threatening derailment to the first passing train. The clearing of the track of snow belongs to the roadmaster's department, and is of vital importance to a railway. A man should be thoroughly competent and familiar with the best methods of "bucking" snow, before taking charge of an outfit to open up the track for traffic after a blockade. Before starting out on the road he should be thoroughly informed as to the condition of the amount of snow in cuts, especially the length and depth of the worst drifts. Locomotives in first class shape should be furnished for this work, and locomotive men that are familiar with the road should be furnished. The snow plow, if not a rotary, should be one of the best make and able to deliver the snow out of a 10 ft. cut. I have found that a snow plow that is independent of the locomotive, is best. It should have wings that can be let out or taken in as the conditions require. Snow plows differ a great deal as to make and design, but I would suggest one of the above mentioned style. A snow plow of this type should be carried directly ahead of the locomotive where heavy drifts are expected, and it is probable that one locomotive will not be able to handle the plow successfully. The second locomotive should follow close behind the first locomotive and plow, so as to be in readiness to assist when needed. No car or caboose should ever be placed between the two locomotives. When conditions of the above nature are known to exist, the second locomotive should carry a car of coal and a water car in the train. It is also a good plan to carry a bunk car of some kind, for sleeping quarters for laborers, especially when it is not known how long it may take to open the line. When the snow is reported hard, each drift should be carefully examined and its height and length noted. If the drift has not been faced by the section men (that is, shovelled out from the end of the drift to where its depth is about 2 ft.), it should be done before a run is made with the plow, for if this is not done it may cause derailment. Wherever the second locomotive is used in "bucking" snow, it should be uncoupled from the cars that it is handling. A run for a drift should never be made while locomotives are handling anything other than the snow plow. If it is not absolutely necessary to use both locomotives, it is a great deal safer and better to use but one. If snow is not too hard, a drift from 3 to 6 ft. deep and 600 to 800 ft. long can be cleared in one run. There is comparatively no danger in "bucking" soft deep snow at top speed.

The locomotives with a snow plow outfit should take fuel and water to their full capacity, at every point where it can be obtained, as unforeseen delays may be encountered. Each locomotive in the outfit should be equipped so as to be able to syphon water from the emergency tank that is carried. I have also found it a good plan

to have a steam hose attached to the locomotive, as it can be used to thaw the ice and snow from the machinery and the track rails. When "bucking" snow, the speed of the locomotive should always be regulated by the length and depth of the drifts. An experienced locomotive man will regulate the speed so as to leave very little work for the shovellers; therefore the necessity of an experienced locomotive man. The locomotive's whistle should always be sounded before entering a cut, so as to give warning to those who may be working there. When it is necessary to make the second run for a cut the whistle must be sounded and make sure that all hands are out, as it is almost impossible to climb out of a snow cut when first opened up.

When the snow is both deep and hard, the rotary plow should be brought into use, if one is available, if not the crust should be shovelled out before any attempt is made with the plow, as "bucking" deep, hard, crusty snow without having the crust broken is very severe work for a locomotive and is dangerous for trainmen. It is better to have a little delay and be on the safe side; however, it is not advisable to start clearing the track of snow during the storm, especially a heavy storm, but be in readiness to start at the first signs of the storm abating. Cuts, where road crossings are located in them, must be dug out and the flangeway cleaned out before making a run with the plow. If a pilot flanger is attached to some locomotive which is making daily runs over the line, it will be found a great help in keeping the rail clear and the flange open. A local passenger locomotive, or local freight locomotive, should answer this purpose, and the running of the snow plow should not be confined entirely to the opening of the line, but it should be run occasionally during open weather. When being used on these trips it is not necessary to have a special locomotive for this purpose, as I have quite frequently seen the plow attached to a local freight. The benefit derived from running a plow in this manner is that the wings of the plow can be opened, and any snow that is drifted in near the track levelled down, and the line thoroughly flanged out, which will greatly benefit the line and make the handling of traffic much easier, besides it will take much heavier snow to block traffic than if it was left piled up close to the track.

**The Intercolonial Ry. Efficiency Association** held its regular monthly meeting at Sydney, N.S., Nov. 1, when the recently inaugurated merit and demerit system was discussed and adjourned to the December meeting. It was announced that about 200 of the I.R.C. employees had gone to Europe with the Canadian contingent for war service, and that their pay would be continued, each man filling up a form indicating the person to whom his pay cheque was to be made payable.

**Railways in the United Kingdom** give names to their passenger locomotives, and since the war, several of these names have fallen into disfavor. To keep up with the popular taste, the London and North Western Ry. has changed the name of its locomotive *Germanic*, to *Belgic*, and the Great Western Ry. has changed its *Knight of the Black Eagle*, to *Knight of Liege*.

**With drop forge dies**, a very good practice after the impressions have been sunk and completed in the die block, and before the dies are tempered, is to try them by pouring a lead casting, which will form a lead proof, showing any slight changes that may be required.