It will be observed that it consists of a hood, shaped to fit over the saw, and made of three pieces of sheet iron rivetted together. It is supported at the back on a hinged connection from the table, in line with the saw, the support being a thin member, lighter in thickness than the saw, and fits in the saw cut in the board, so that the board does not interfere. It can be adjusted by a thumb screw for any thickness of wood to be cut.

## Ballast Trimmer for Intercolonial Railway.

The work of the ballast trimmer is to follow the ballast train, or in other words, as the ballast train is at work along the line it leaves the ballast in heaps and this has to be trimmed down to the standard, which is from the top of the tie to bottom of slope 18 ins., and from bottom of slope to centre of track 8 ft., making the standard for the main line 16 ft. overall. This is where the trimmer is of advantage and with one cut it will leave the slope with the exact contour of the standard road ballast template, which has a radius of 6 ft. 10¼ ins., and also bring the ballast up to within 1 in. of the top of the sleeper. The ballast trimmer can either be pushed or hauled by a locomotive, as it is fitted with two knives that will cut each way at the rate of 7 miles an hour.

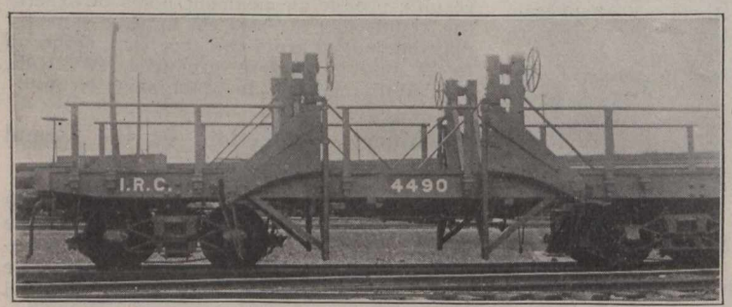


Fig 1. Ballast Trimmer with Knives Fastened up and Ready to go out on Line.

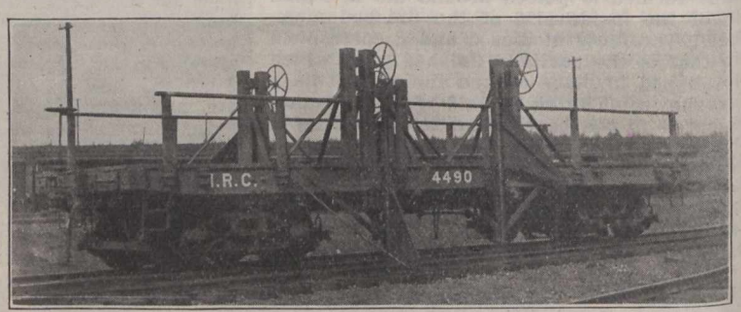


Fig. 2. Ballast Trimmer with Knives Dropped down but not in working position as the trimmer was in the yard.

The ballast trimmer illustrated herewith, which has been built at the I.R.C. shops at Moncton, can be operated by two men without any trouble, as the only time the knives have to be raised is when coming to railway crossings, etc., and the knives are hung so that when raised they will always swing in towards the car, and just as soon as they are lowered they cut right out to their proper place.

The ballast trimmer is applied to an old 20 ton flat car, which is obsolete as far as main line service is concerned, but is very easily fitted up with two uprights braced with a vertical shaft secured at top and bottom for the knife to work on and to raise and lower same. The knife can be raised and lowered by means of a chain from a pulley on uprights with shaft, pawl, pawl weight and brake wheel, which works on the same principle as applying the brake on a car.

After the first trial trip it was discovered that we would have to have additional weight on the knife when in operation, as it would not stay down in place when it struck a heavy cut of ballast. This was done by riveting two pieces of angle iron with a filler between and held in place with two brackets, one fastened on intermediate sill and other fastened on side sill, and a double coil spring placed on top of angle irons which takes a pressure of 1,000 lbs. to compress spring 1 in. This is worked by a lever on top of car deck and is applied when knife is in operation.

## A Permanent Railway Track Maintenance Force.

The employment of a permanent force for track maintenance work is an exceptional feature of the Long Island Railroad's maintenance of way department. In the early part of 1913, when there was a great demand for labor, contractors and others whose work was pressing in the summer were paying $2 per 8-hr. day. The railway was paying only $1.50 per 10-hr. day, and consequently got labor mainly of inferior quality. Many of the men obtained proved incompetent, and such good men as were obtained would not stay. To meet this condition, the railway established a permanent track force system in May, 1913. The sections average 5½ miles of main track and 4¼ miles of sidings, with an average force of five men (including subforemen). The sections are divided into five classes, the first class covering important terminals and yards and being allowed eight men. In each successive class the number is reduced by one man, the fifth class having only four men. Under this plan the force averages 15% less than under the old system. Rates were increased to 17½c. an hour for laborers and 18c. for subforemen (allowed on about 70% of the sections), while a material increase was made in the wages of the foremen.

Before putting the plan into effect, the foremen were fully instructed as to what was expected of them. They were to weed out gradually the inferior men and replace them with good men, giving preference to married men and those experienced in track work. The foremen were instructed to make each man understand that he would be given permanent employment if his work was satisfactory, and in case of dismissal by the foreman he would have the right to appeal to the supervisor. The foremen were made to understand that they would be held strictly accountable for the quality of their men, and must show no favoritism, this latter being a marked tendency among the Italians, who constitute the majority of the force. Further, it was impressed upon each foreman that he was being given great advantages and that the railway would demand the best results from him.

The Long Island Rd. has an extremely heavy traffic during June, July and August, averaging about 150,000 passengers daily. The greater part of the line has cinder ballast, with some fine gravel and sand, and only a small amount of stone. For the comfort of the passengers in hot, dry weather, the ballast is coated annually with heavy oil.

As early as practicable in the spring, the force on each section completes the main track tie renewal work left over from the previous year, and then levels up any rough spots. This work must be completed by June 10, at which time the main track roadbed is oiled. After the oiling the roadbed must not be disturbed except in emergency cases, and in such cases it must be promptly oiled by the section gangs, which are provided with oil and hand sprinklers for this purpose.

Throughout the three summer months, while traffic is heavy, work on the main track is practically suspended. During this period all necessary repairs are made on side tracks (including tie renewals), the right of way is mowed for the first time (the state law making it compulsory to mow twice a year, between June 20 and July 10, and during the latter part of August), the necessary frog, switch and guard rail renewals are made, and switch timbers installed. The period from Sept. 1 to about Oct. 15 is devoted to the improvement of the line and surface of main track, cleaning ditches, trimming ballast and preparing for the annual inspection, which takes place about the middle of October.

Immediately after the track inspection, the renewal of ties in main track is taken up and prosecuted vigorously until stopped by unfavorable weather. The renewal of ties in the autumn is a necessity to avoid heavy work in the spring. Experience has proved that where there is a sufficient quantity of clean ballast and the subsoil is of a nature that does not readily retain moisture, this work can be done safely in the fall, if care is taken to see that the ties are properly put in and securely tamped.

As soon as the ground freezes up, and throughout the winter, the time of the section gang is devoted to cleaning culvert and drain openings, repairing right of way fences, renewal of frogs, switches and guard rails, and such minor parts of switches as may be necessary; repairs and renewals of crossing plank and track signs; track gauging, placing tie plates, and distributing ties for spring renewals, practically in the order named. In addition to this, there are the usual snow and ice troubles, together with many incidental jobs that can be taken care of during the winter. It is aimed to have the work advanced so far when the weather moderates that spring work will not be delayed beyond the allotted time, always keeping in mind the limited force. Bolts are tightened, out of face, at the same time the track is surfaced in the spring and fall. Practically all relaying and new track construction is done by extra gangs.

As a result of this system, with the assurance of permanent employment at fair wages, the force has now 95% of the men who were employed at the time of the reorganization. At the inspection last autumn the track was found to be in far better condition than ever before. The conclusion is that the retention of men in service for long periods results in the acquirement of such experience and skill as to promote efficiency, and that there is a consequent reduction in expense. Such men may be classed as skilled labor rather than common labor. At each track inspection the com-