the eight segments which were bolted to the faces of the center casting. These segments follow the curved form of a scoop wheel and have at the outer edges 6 in. diameter hinge pins. The segments are bolted to the center casting with 2¼ in. diameter bolts. The adjacent segments are bolted together through flanges at their rear edges.

Fig. 38 shows the wheel assembled before the cutting knives are attached. This view shows the 1¼ in. thick by 10 in. wide band bolted to the segments, and which helps hold them in place. The band is increased in thickness to compensate for the hinge pin and bolt holes. This band is made in section with L shaped lugs on each end which fit into grooves in the segments.

Fig. 39 shows the inside of one of the massive cast steel knife blades. Figs. 40 and 41 are other views of these blades and show how they are heavily ribbed. These blades are ⅝ in. thick at the cutting edge.

Fig. 42 shows the nose piece for the center of the wheel. Fig. 43 shows the completed wheel, without the nose piece, being balanced. As shown in this view, the wheel weighed 24,000 lb. and as it was designed to run at 400 revolutions per minute it was necessary to balance it accurately.

Fig. 44 shows the finished wheel in place on the plough.

Figs. 45 and 46 show the arrangement of engine and plough. The casing is made of ¾ in. plate and tapered to eliminate any flat surfaces on which snow or ice might accumulate. The bottom of the casing is reinforced by an additional ¾ in. plate. The back of the casing consists of steel castings with flanges for attachment to supporting gusset plates. This view also shows the boiler and engines in place, as well as the taper wheel fit on the front end of the main shaft. The main shaft is 11⅛ in. in diameter and 12 ft. 2 in. long. The front bearing is 11⅛ in. in diameter by 28 in. long. Behind the front bearing is a marine type thrust bearing with 10 collars. There is a rear bearing 10 in. in diameter by 16½ in. long. The thrust bearing, which is peculiar to this plough, is intended to take up the thrust ordinarily received by the back wall of the wheel casing. It has proved of decided benefit in service. The engines are of the marine type and have cylinders 20 in. in diameter and 24 in. stroke. The steam chests are cast integral with the cylinders. The supporting columns are cast steel. As head room was limited, the connecting rods are short in proportion to the stroke, and the area of the crosshead bearing surfaces was increased accordingly. The crank pin of the engine was connected to a crank disc on the rear of the wheel shaft by means of a drag link coupling. This was used in case there should be any variation in alignment of the wheel shaft and engine crank shaft and to prevent any bending strains from being transmitted from one to the other. Duplicate reverse lever and throttle are provided so that the engine can be operated from either side.

Fig. 47 shows the main frames and gusset plates which support the casing. The frames are box girders 36 in. deep at the front end. The outside plate of the girder is ⅜ in. thick and the inner ½ in. thick. The top and bottom members are 13 in. ship channels. The boiler applied to these ploughs is similar to those of the Canadian Pacific class M-4 consolidation type locomotives. It has 2,108 sq. ft. of heating surface and 44 sq. ft. of grate surface, and is of greater capacity than any boilers that have been used for snow plough service. The trucks are of the 6-wheel type specially designed for the purpose, and have cast steel frames. The axles have 7 x 12 in. journals, and the steel tired wheels are 34 in. in diameter.

In working order, these ploughs weigh 260,000 lb. The weight is practically equal on the two trucks. The tender has a water capacity of 7,000 Imperial gallons and holds 16 tons of coal. The tender was made 32 ft. long over end frames, as, on account of bridge limitations, it was necessary to separate the weight of the plough from the weight of the pushing locomotives. The tender trucks are of the 4-wheel, equalizer pedestal type, using standard engine truck wheels and axles. An officer who has used them

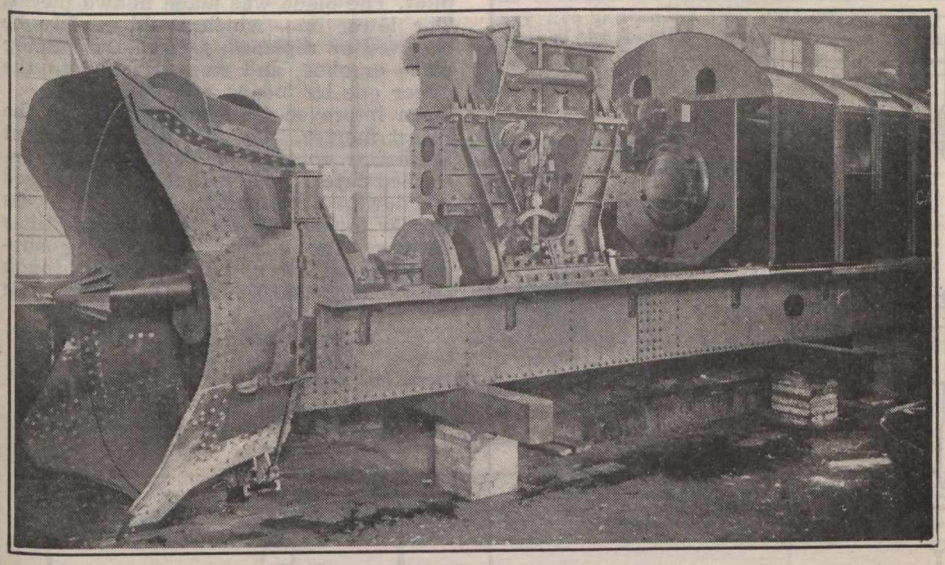

Fig. 45. Arrangement of Engine and Wheel, C.P.R. Heavy Rotary Snow Plough.

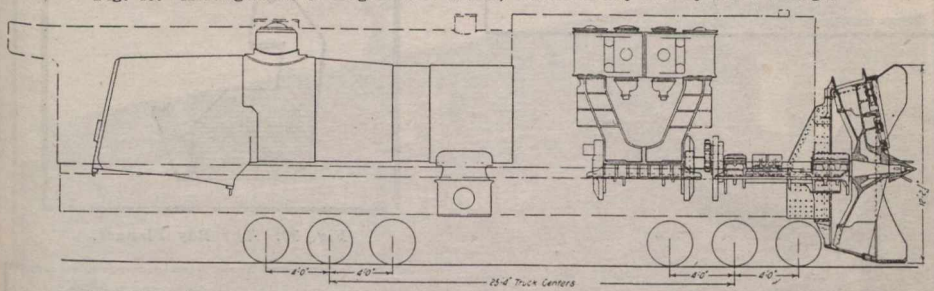

Fig. 46. Arrangement of Engine and Wheel, C.P.R. Heavy Rotary Snow Plough.

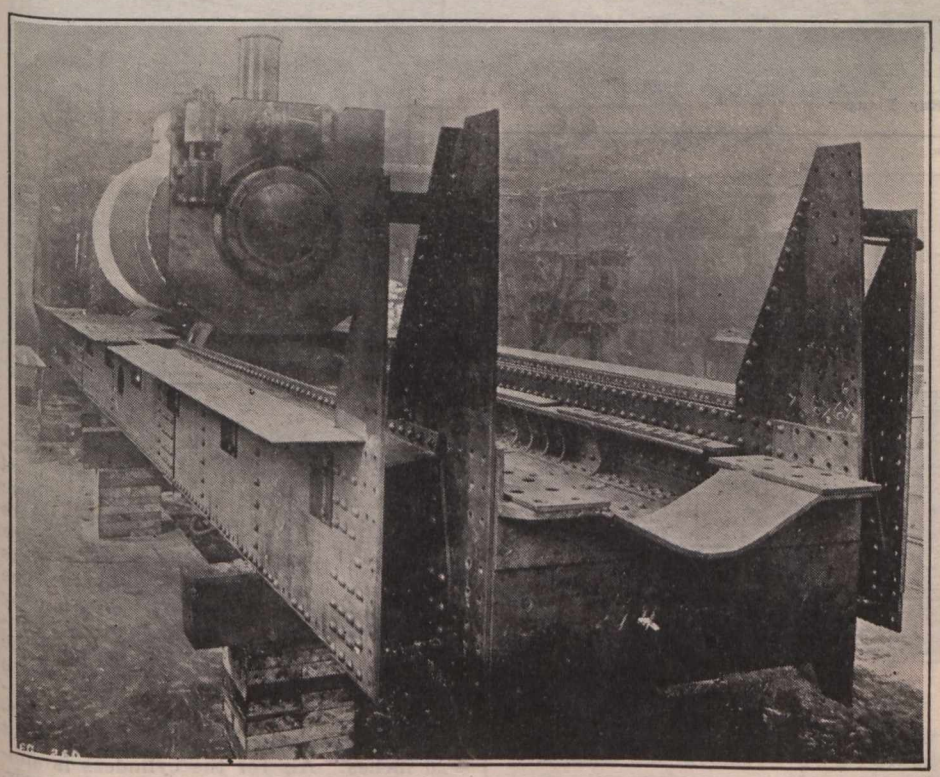

Fig. 47. Main Frames, with Gusset Plates in Position, C.P.R. Heavy Rotary Snow Plough.