Improved Design of Canadian Northern Railway Locomotive Parts.

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One of the earliest policies adopted by S. J. Hungerford, on his appointment as Superintendent of Motive Power on the Canadian Northern Ry., was that of standardization of rolling stock wherever possible. In this connection, the motive power received particular attention, many parts being from time to time standardized when such improvements have been introduced as would make such a course advisable. This progressive policy has been carried even further; the standards as adopted have not been considered as perfect, but when possible, still further requirements have been introduced without losing sight of the interchangeable feature so essential to standard practice.

From time to time the locomotive parts have been undergoing this standardization, and at the same time, the design has in several instances been entirely changed from conventional practice, as instanced in several of the parts to be herein described.

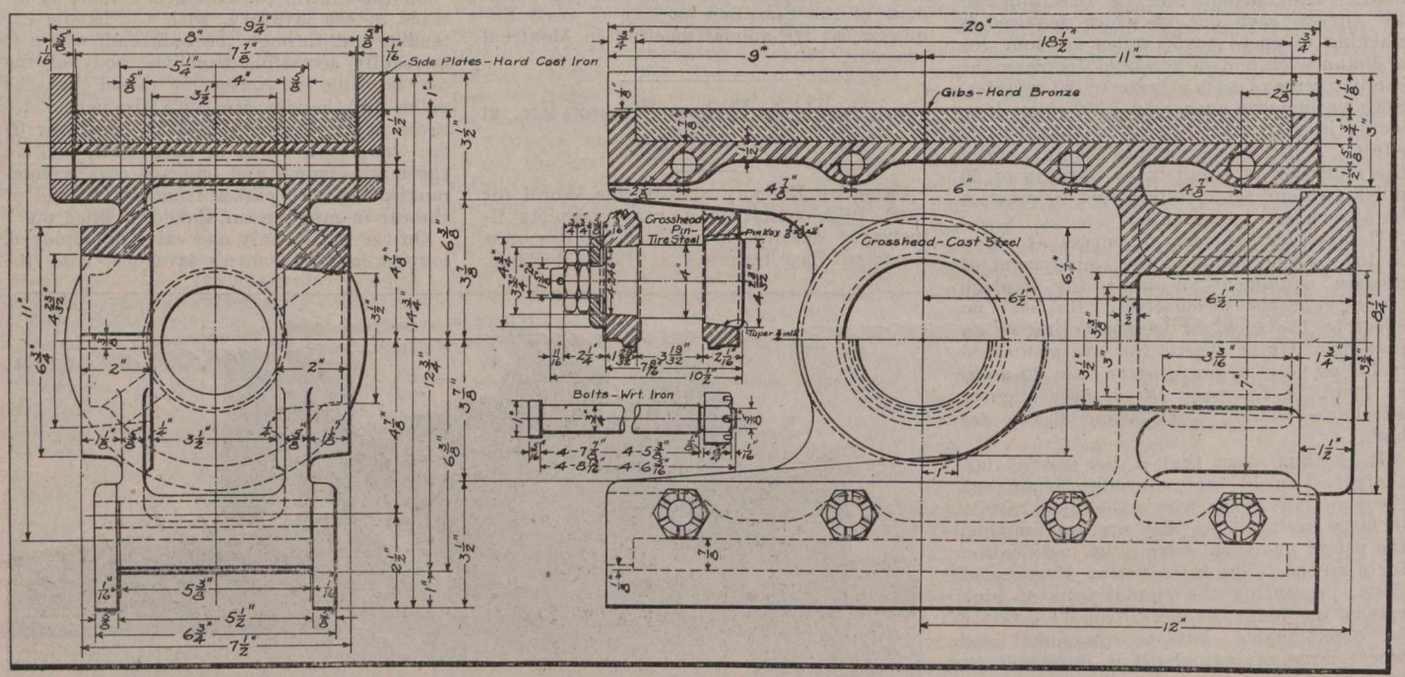

Fig. 1.—Canadian Northern Railway Standard Design of Crosshead.

CROSSHEAD.—A simplified design of crosshead, of which fig. 1 is a typical example, has been developed. In general appearance, it closely resembles one of the commoner conventional designs, but it is in the factor of simplicity of repair and renewal of worn parts that this new design is worthy of comment.

The body is of cast steel, carrying a tapered wrist pin in the usual manner, and with the piston rod held in tapered opening in the rear end, with the usual diagonal flat pin. The novel feature of the design is in the manner in which the gibs are attached top and bottom. The sides and top of the crosshead are planed. The gibs are hard bronze slabs let into the face of the crosshead, projecting slightly above the end lugs of the crosshead body to allow for considerable wear. These end lugs take care of end movement, and side movement is prevented by hard cast iron side plates, held in place by 4 cross bolts through the crosshead casting.

In the upper guide of the crosshead, the width of the crosshead casting is 8 in., below the bolts; the gib width is the same, but above the lower edge of the bolt holes, the width of the crosshead casting is cut down to 7⅞ ins., or a cut out of 1-16 in. on each side. Thus, the side plate partakes of the nature of a clamp, bearing on the lower face of the crosshead side, and on the gib, securely holding the latter in place.

The only parts of a crosshead subjected to any appreciable wear are the bearing parts on the guides, and these require frequent renewing. In this design of crosshead, the renewal of the worn parts is simple in the extreme. Without removing the crosshead from the guides, the side plates can be removed, the gibs drawn out, and new ones inserted. This is not always necessary, as the wear on the gibs, being more or less uniform, leaves a smooth surface, which is still serviceable by packing the gib up from beneath in the recess in which it fits in the crosshead casting. The side plates are subjected to wear only on the upper inner face. All that is necessary is to take the plates to a shaper and plane over the worn face to a surface, and then replace.

It is thus apparent that the wear is confined on each guide to three simple flat pieces, on which there is no work that cannot be handled with the greatest expedition equally well at roundhouse or back shop. This crosshead is standard for a large range of locomotives; for other ranges there are crossheads of similar design. Thus the crosshead repair stock at the various divisional shops is reduced to a minimum, consisting of the different sizes of side plates and gibs, and wrist pins and their parts.

TENDER TANKS.—About two years ago, it was decided to standardize the tender tanks of C.N.R. locomotives, and use two sizes only, to hold 5,000 and 6,000 imp. gals. respectively. It was decided that these two sizes would meet all the demands of the motive power contemplated for the future. To avoid complications with too many designs, consideration was given to making the two sizes so nearly alike as to have the general design the same, making the use in both cases of identical parts. This was accomplished satisfactorily by making the forward end and cross sectional construction in both instances the same, the increased capacity of the 6,000 gal. tank being obtained by lengthening the tank to the rear.

The tanks are constructed of ¼ in. plate throughout, using 2 x 2 x 5-16 in. angles for the most part. They are 9½ ft. wide, and the 6,000 gal. tank is 25½ ft. long. In all other particulars, the two sizes of tanks are the same. The coal space in the forward end is 13½ ft. long, the full width of the tender at top, tapering forward and inward to a space 6½ by 3½ ft. at the forward end. Below the coal floor is a 19 in. water space, while the water depth at the sides of the coal bunkers is 5 ft. 10 ins. On top of these coal sides is a flashing 20 ins. high. The rear section of the tender is 4 ft. 10 ins. deep.

A baffle extends down the centre of the tank, with 5 cross baffles at intervals down the length of the tender. The 5,000 gal. tender is made from the design of the larger size, by eliminating the rear end compartments. In addition to various standard auxiliary appliances fitted to the tender, there are coal doors, 18 ins. back from the forward end of the coal space. These doors have a clear space beneath of 16⅛ ins. The fittings, such as ladders, steps, grab irons, water intake and outlet, tool boxes, and flag stands are all standard as well.

GRATES.—The design and arrangement of the grates and firebox fitting have also been improved on usual practice, and standardized, so that for all the locomotives on the system there are but two sizes of grates required, of the general design shown in fig. 2, which is of the larger size. The side and end grates are shown in fig. 3.

They are of the box shaker type and have been reduced to two standard sizes, 28 and 36½ ins. over shoulders, covering all C.N.R. locomotives. There is nothing unusual about the grate body, which is a conven-