

Canadian Railway and Marine World

April, 1919

Broad Gauge Steel Coal Hopper Cars Built in Canada for Bengal-Nagpur Railway.

The accompanying illustrations show one of 70 steel coal hopper cars for the Bengal-Nagpur Railway, India, which have the following general dimensions:

Length over buffers.....	41 ft. 3 in.
Length over end sill.....	37 ft. 1 in.
Length of body inside.....	35 ft. 0 in.
Truck centers.....	27 ft. 8 in.
Width over side sill.....	9 ft. 10½ in.
Height from rail to top of sides.....	9 ft. 9 in.
Size of hopper door openings.....	6 ft. 2¼ in. x 3 ft. 3 in.
Buffer height (unloaded).....	3 ft. 7½ in.
Wheelbase of truck.....	5 ft. 8 in.
Journals.....	5½ ft. x 10 in.
Capacity.....	100,000 lb.

The center sills are 21 in. deep, and built up of plates and angles, to shape approximating a girder of uniform strength, commonly known as the fish belly type of car center sill. There are

web stiffeners as shown in the accompanying illustrations. Heavy cast steel center fillers are placed between these center sills, and bolster, and are riveted thereto through the draft sill and bolster flanges. A heavy bottom cover plate is applied under the bolster extending from side sill to side sill of car.

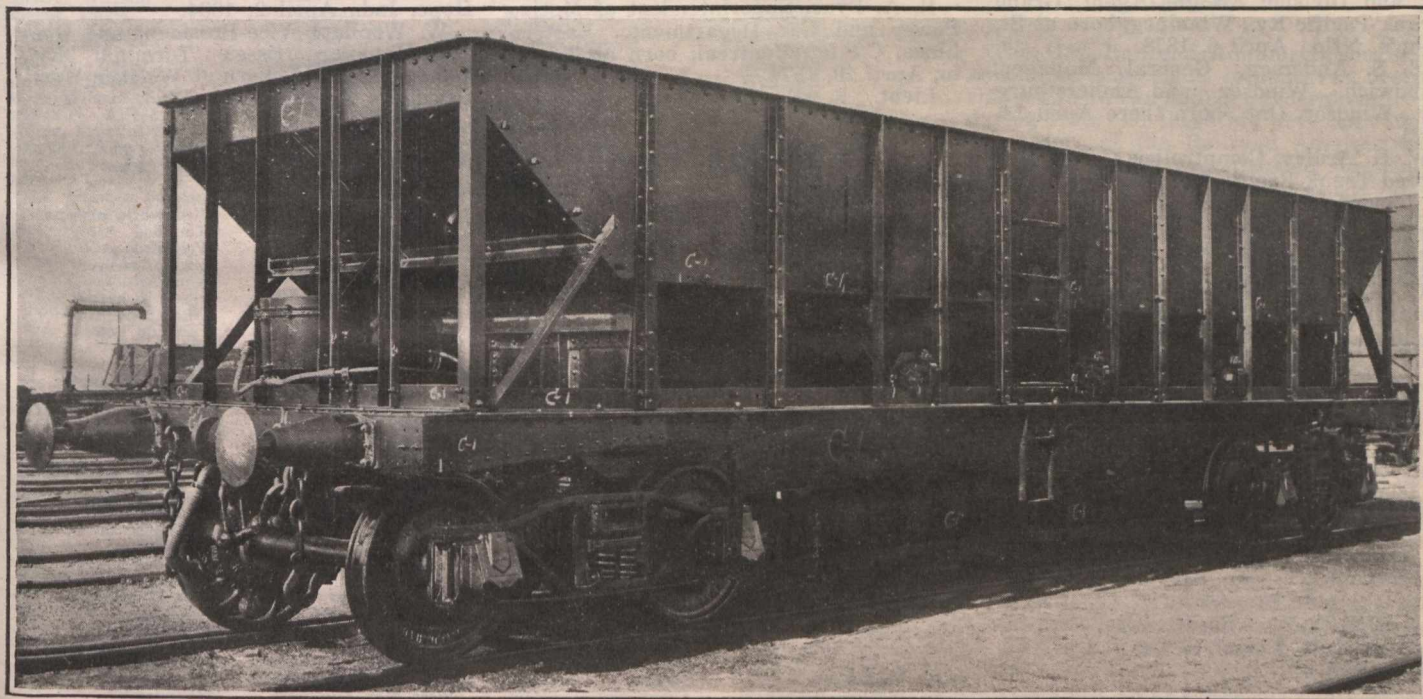
The sides are ¼ in. steel plate, built up into sections, and reinforced by 3 x 3 in. angle side stakes. Sections are spliced together with narrow plates, or bars, on inside of car, and in addition the side stake angle outstanding legs are riveted together as shown in the illustration. This building up into sections is done to facilitate knocking down into convenient sizes for ocean shipment. Side sheets or

The cross ridges are built up of ¼ in. plates, spaced apart and sloped and riveted together at the top by upstanding flanges. The space between the cross ridge plates contains the device for operating the hopper doors.

Transverse bracing and side slope sheet supports are built up with 5 x 3 and 3 x 3 in. rolled steel angles, spaced apart and secured to center and side sills, and side stakes, by structural knees and gussets, all as shown in photograph.

The inside cross diaphragms or girders are located midway between the cross ridges and are built up of plates and angles.

The hopper doors are built up of plates and angles and are operated with



Steel coal hopper car for Bengal-Nagpur Railway.

two center sills per car, extending the length of car between bolsters, each center sill consisting of ¾ in. web plate, with single flange angles, 4 x 3½ x ½ in.

The draft sills are 15 in. standard rolled steel channels, extending from inside of bolster to end sill. The draft sills are securely attached to the bolster and end sill.

The end sills are 10 in. standard rolled steel channel, secured to draft sills, side sills and buffer diagonal brace, or structural knees and gussets. The end sills are reinforced on top for the side buffers by ¾ in. thick cover plates, and 5 x 3 x ¾ in. standard rolled steel flange angles.

The buffer diagonal braces are 8 in. rolled steel ship channel, extending from behind the buffers to the bolster and center sill construction.

The body bolsters are built up of heavy flanged plates, reinforced by angles and

girder webs are reinforced at the top with 3½ x 3½ in. angles, and at the bottom by the flanged side slope sheet for as much as can be gathered in by rivets spaced as shown in the illustration. Side sills are 5 x 3½ in. angles. Sub side sills are built up of plates and angles, and extend from end sill to bolster, and are connected thereto.

The end construction consists of corner posts of 3½ x 3½ in. angles and end posts of 3 x 3 in. angles, all securely riveted to end of car and end sill construction.

The flooring is built up of ¼ in. plates, and slopes towards the center hoppers at an angle of about 40° from the horizontal. Side slope sheets are inclined from the top of the center hoppers to a point about half way the height of the sides, at an inclination of about 35° from horizontal.

the ordinary chain lifting device.

The side bearings are the latest rocker type.

The forged draw hooks have the shank drawn out to extend beyond bolsters, through railway standard draw bar volute spring, and are secured thereto with 2 in. standard nut and split cotter.

The buffers are the Bengal-Nagpur Ry.'s standard.

The safety chains are of the usual European type.

The screw couplings are made from nickel chrome steel, with an ultimate strength from 145,600 to 168,000 lb. per square inch, and with an elongation in 2 in. of 15% minimum to 23% maximum.

The brake equipment consists of the usual vacuum brake quite common with cars on the continent. The system includes two 21 in. detached cylinders, with suitable reservoirs and all necessary fit-