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RAILWAY HOPPER CAR CONSTRUCTION

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3 Sheets-Sheet 1

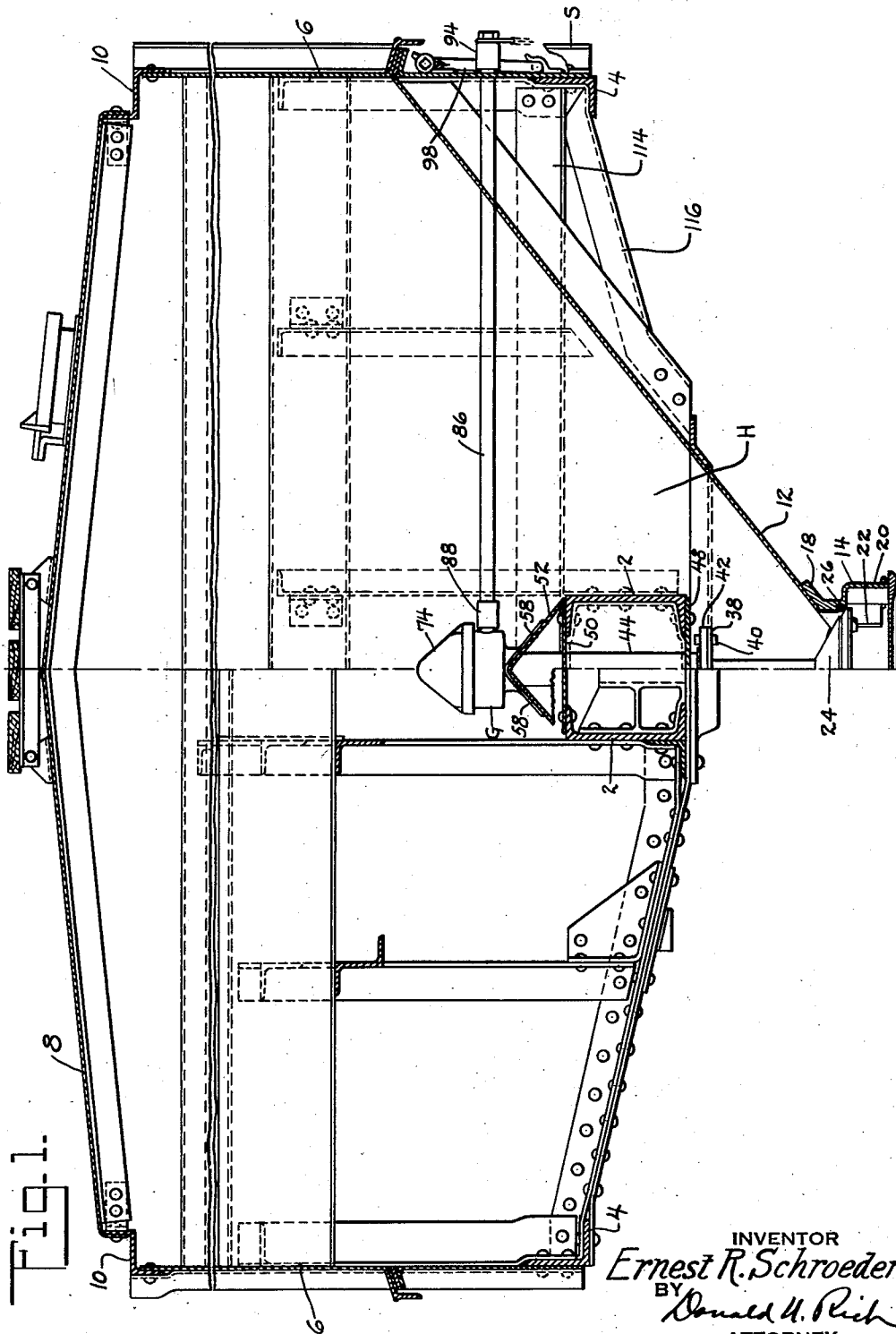


Fig. 1.

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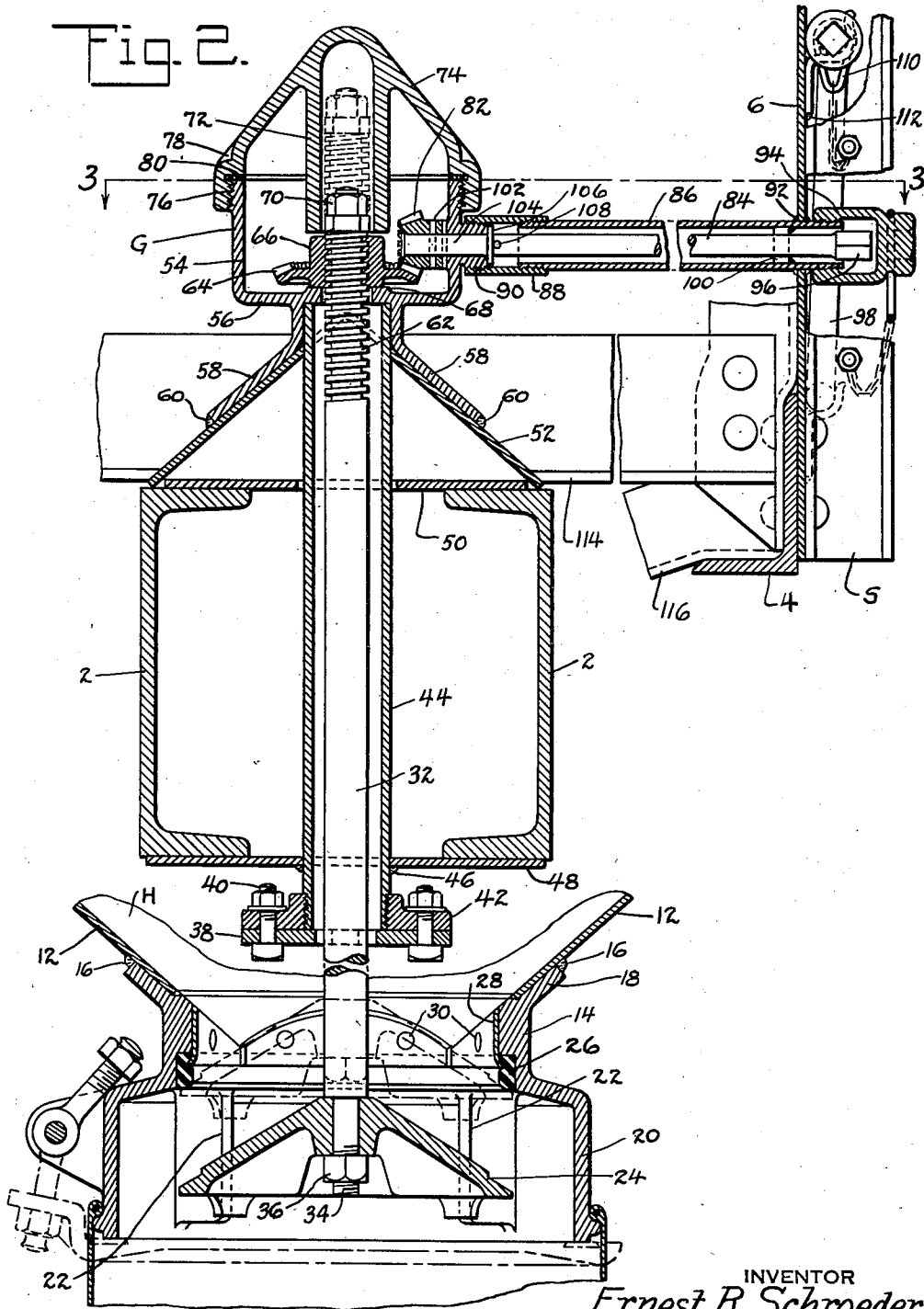
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3 Sheets-Sheet 2



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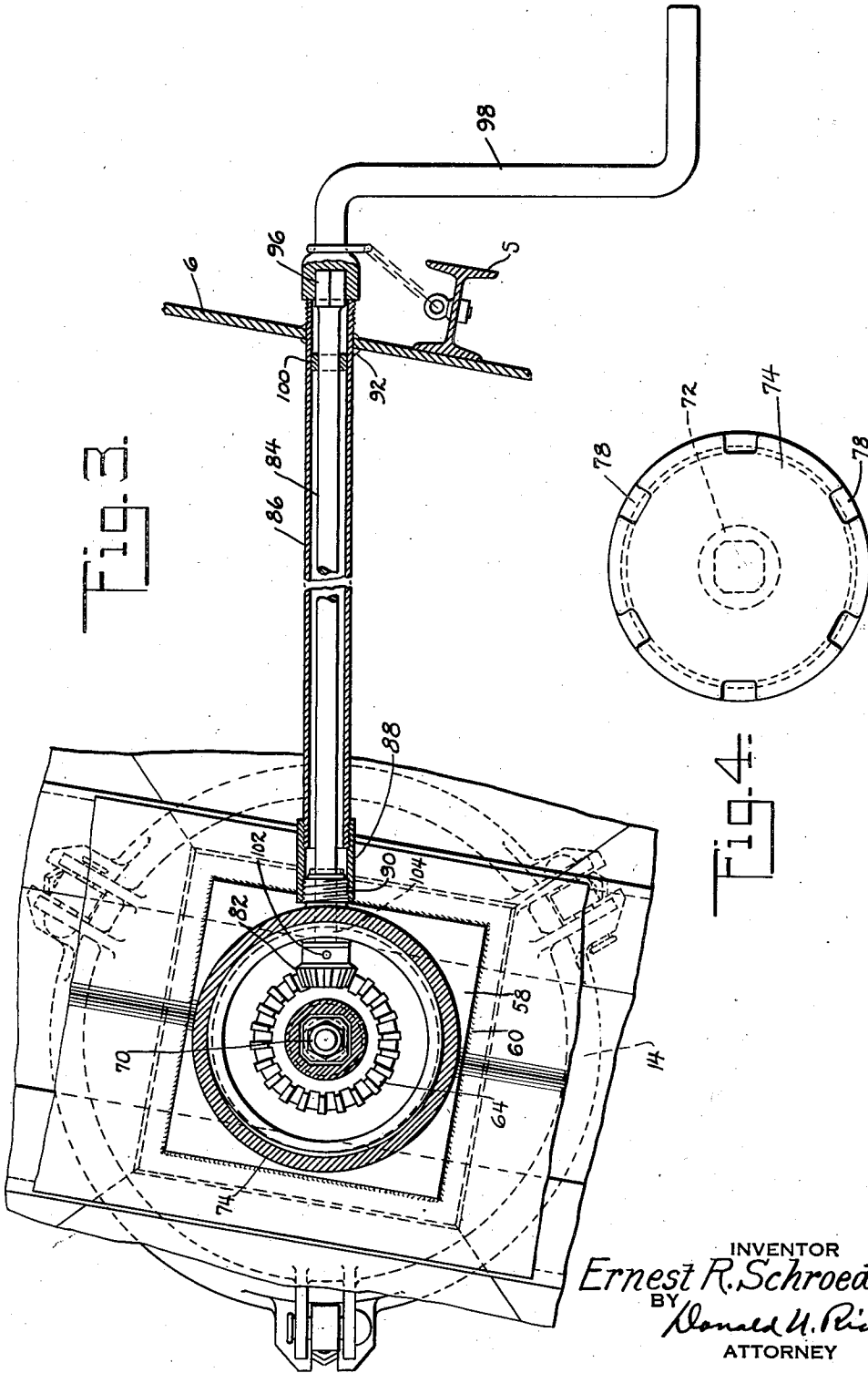
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RAILWAY HOPPER CAR CONSTRUCTION

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3 Sheets-Sheet 3



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RAILWAY HOPPER CAR CONSTRUCTION

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Application February 19, 1937, Serial No. 126,533

9 Claims. (Cl. 105—307)

This invention relates generally to railway hopper car constructions and has particular reference to means for controlling discharge of lading.

5 The present invention contemplates certain improvements in the construction shown in co-pending application of William F. Dietrichson and Victor Willoughby, Serial No. 721,674, filed April 21, 1934, and now Patent No. 2,073,513, 10 issued March 9, 1937, particularly with regard to the operating mechanism for the discharge valve of the hopper.

One object of the present invention is the provision of a railway hopper car having a hopper outlet controlled by a valve movable vertically with relation to the outlet in combination with valve operating means supported by car parts.

Another object of this invention is the provision of a railway hopper car having a hopper outlet controlled by a valve movable vertically with relation to the outlet, together with means for operating said valve in such a manner that the degree of outlet opening may be regulated as desired to accurately and nicely control the discharge of lading from the hopper.

Another object of the invention is the provision of a railway hopper car having a discharge outlet which is normally closed by a valve, said valve being movable in substantially vertical direction to open and close the hopper, together with valve rod means which extends upwardly through the ridge sheet of the hopper into engagement with a gear mechanism supported by the ridge sheet and operable from the side of the car to regulate or control movement of the valve rod, and hence the valve.

A further object of the invention is to provide, in a railway hopper car having a discharge outlet and a valve normally closing the latter, a valve operating means which is substantially wholly concealed yet arranged within the interior of the car body and, being substantially wholly concealed, is practically dust-proof.

45 Other objects and advantages of this invention will be apparent from the following description taken in conjunction with the accompanying drawings, in which:

50 Figure 1 is a broken sectional view through a hopper car embodying the present invention, the left hand portion of the figure being taken adjacent the car bolster while the right hand portion of the figure is taken through the hopper.

55 Fig. 2 is a broken sectional view of a portion of a car showing a portion of the hopper

with the valve, and the operating means for the valve; the view also showing certain required parts of a railway car.

Fig. 3 is a sectional view on the line 3—3, Fig. 2, and

Fig. 4 is a top plan view of the gear casing cap.

Referring now more particularly to the drawings, the present invention is shown as applied to a railway car having an underframe including center sills 2, side sills 4, side walls 6 and a roof 8 supported by side plates 10. The car body is provided with a plurality of hoppers, only one of which is shown in the drawings, the same being indicated at H, having slope sheets 12, to the lower edge portion of which is secured a discharge casting or housing 14 similar in construction to the housing shown in the beforementioned Dietrichson and Willoughby application. As shown, the housing 14 is preferably attached to the slope sheets 12 by being welded to the latter as shown at 16, but obviously the housing may be riveted or otherwise secured if desired. The housing comprises a one-piece casting having a reduced upper end portion formed with the flange 18 and a lower enlarged portion 20 having guide ribs 22 projecting radially inwardly of said housing and so arranged as to be contacted by the marginal edge portion of valve body 24. The valve body 24 is adapted to close the discharge outlet and seal the same against leakage and is adapted to engage a valve seat 25 formed in the body 20. In the instance shown in the drawings, the valve seat 26 is of resilient material retained in place by a keeper 28 secured by suitable fasteners 30 to the reduced portion 14 of housing 20 but obviously the valve seat may be formed of the material forming the housing, if desired.

The valve body 24 is carried by a valve stem 32 extending upwardly from said valve body and having its lower end portion 34 extended through the valve body 24 at substantially the center thereof and retained by a securing nut 36. The valve stem or rod 32 extends upwardly through an adjustable guide 38 secured as by fasteners 40 to a flange member 42 secured to the lower end portion of a tube or pipe 44 welded as at 46 to the bottom center sill cover plate 48. The pipe 44 extends upwardly through center sill top cover plate 50 and also through the upper portion of the ridge sheet 52 secured to the center sills 2 in any suitable or desired manner. As shown clearly in Fig. 2, the valve rod 32 extends beyond the upper end of the tube 44 and into a gear 55

housing G comprising an annular side wall 54, a bottom wall 56 with diverging attaching flanges 58 depending from said bottom wall 56 and resting upon the ridge sheets 52 and secured to the latter in any suitable or desired manner as by being welded at 60. The bottom wall 56 of the gear housing G is apertured so that the upper end portion of the rod 32 may project into said housing and, as clearly shown, the upper end portion of said rod 32 is threaded at 62 and has a gear 64 engaged therewith. Gear 64 is provided with a hub 66 which rests upon a thickened portion 68 of the bottom wall 56, said thickened portion constituting a gear support. The upper end portion of the rod 32 is reduced in diameter and is threaded to receive a holding nut 70; the upper end portion of said rod 32 projecting into a guide 72 formed on the interior of and depending from a gear housing cap 74 threadedly secured to the gear housing body portion, as shown at 76. As shown in Fig. 4, the cap 74 is provided with a plurality of recesses or indentations 78 adapted to receive a wrench or other suitable tool whereby the car may be secured or released from the body portion of the gear housing G. For sealing purposes a gasket 80 is interposed between the cap 74 and the upper edge portion of the wall 54.

The gear 64 is engaged by a pinion 82 secured to the end of a pinion shaft 84 which is arranged within a sleeve 86, the inner end portion of which is secured to a coupling 88 attached to a tubular boss 90 projecting laterally from the side wall 54 of the gear housing; all as clearly shown in Fig. 2. The outer end of the sleeve 86 extends to and through the side wall 54 of the car body and is preferably welded to the latter as shown at 92. The projecting end portion of sleeve 86 is threaded to secure a cap 94 which is removable to expose the squared end 96 of the rod 84 for the attachment of a crank or operating handle 98. Arranged within the sleeve 86 adjacent the wall is a bearing 100 which supports the outer end portion of the shaft 84, as clearly shown in Figs. 2 and 3. The pinion 82 bears against the inner surface of the side wall 54 of the gear housing (see Fig. 2) and is preferably keyed as at 102 to the reduced end portion 104 of the shaft 84. To prevent shifting of the shaft 84 a collar 106 is arranged thereon and secured against displacement by a pin 108; the collar 106 having bearing against the boss 90.

When not in use the handle 98 may be secured in a keeper or holder 110 secured to the side wall 54, as shown at 112.

The car body is provided with outside stakes indicated generally at S and with suitable internal cross braces 114 and with hopper braces 116, all as shown in Fig. 1.

In operation, to discharge lading, the cap 94 is removed and the handle 98 is attached to the squared end 96 of shaft 84. Rotation of shaft 84 will obviously rotate the gear 64 to actuate the valve rod 32 to lower the valve body 24 to permit discharge of lading. During the movement of the valve 24 it is guided by the ribs 22 and further by the guide 72 which depends from the cap 74 of the gear housing G. Reversal of rotation of the shaft 84 will obviously return the valve 24 to seated position.

The drawings herein illustrate one embodiment of the invention but obviously they are merely by way of example and various changes in the form and proportions of the device may be made within the scope of the appended claims with-

out departing from the spirit of the invention.

What is claimed is:

1. In a railway hopper car including side walls, center sills and a ridge sheet over said center sills, a hopper outlet arrangement comprising a valve body normally closing the hopper against discharge of lading, a valve rod extending upwardly through and beyond the ridge sheet, a gear housing supported on the ridge sheet into which the valve rod projects, gearing in said housing and connected to the valve rod to shift the latter in upward and downward directions to shift the valve body relative to the hopper outlet, gear actuating means extending through the side wall of the car, and means within the gear housing to restrain the valve rod against rotation upon operation of the gearing.

2. In a railway hopper car having side walls, center sills and a ridge sheet mounted on the center sills, a hopper outlet arrangement comprising a valve body normally closing the hopper against discharge of lading, a valve rod extending upwardly from the valve body and projecting beyond the ridge sheet, means enclosing a substantial part of the valve rod and having valve rod guiding means at its lower end portion, a gear housing supported on the ridge sheet, gearing in said housing for operating said valve rod to shift the valve body relative to the hopper outlet, valve rod guiding means in the gear housing so formed as to restrain the valve rod against rotation during operation of the gearing, and actuating means for said gearing extending through and supported by the side wall of the car.

3. In a railway hopper car, a hopper outlet arrangement comprising a frame secured to the hopper at its outlet portion and provided with guide means therein, a valve body in said frame and guided in its movements by said guide means, said frame having a valve seat with which the valve body normally cooperates to close the hopper against discharge of lading, a valve rod extending upwardly from the valve body and having a threaded upper end portion, a substantially closed gear housing supported within the lading zone of the body and having gearing enclosed therein engaged with the threaded portion of the valve rod, said housing including a cap having guide means formed therewith and with which the upper end portion of said valve rod is engaged in such a manner as to be restrained against rotation, and gear actuating means extending from the gear housing through and beyond the side wall of the car.

4. In a railway hopper car including side walls, center sills and a ridge sheet, a hopper outlet arrangement comprising a valve body normally closing the hopper against discharge of lading, means for guiding said valve body in its movements, a valve rod extending upwardly from the valve body beyond the ridge sheet, enclosing means for a substantial part of the valve rod supported by the center sills, a gear housing mounted on the ridge sheet and having a bearing on the upper end portion of the enclosing means, said valve rod having its upper end portion threaded, an actuated gear in the gear housing engaged with the threaded portion of the valve rod, a pinion engaged with said gear, a pinion shaft extending through and beyond the side wall of the car, enclosing means for said pinion shaft, and guide means within the gear housing into which the upper end portion of the valve rod extends in such a manner as to be re-

strained against rotation upon actuation of the gearing.

5 5. In a railway hopper car including side walls, center sills and a ridge sheet supported on the center sills, a hopper outlet arrangement comprising a valve body normally closing the outlet, guide means for the valve body arranged below the outlet, a valve rod extending upwardly from the valve body through and beyond the 10 ridge sheet, the upper end portion of said valve rod being threaded, a gear housing supported on the ridge sheet and having gearing therein engaged with the threaded portion of the valve rod, a housing detachably secured to the gear housing and provided with a depending guide member into which the upper end portion of the valve is arranged in such a manner as to be restrained against rotation during operation of the gearing, gear actuating means extending 15 through the side wall of the car, and means enclosing the gear actuating means and at least a substantial portion of the valve rod.

20 6. In a railway hopper car having a center sill ridge sheet and side walls, the combination with a valve body normally closing said hopper, of actuating means for said valve body comprising a valve rod extending upwardly through and beyond the ridge sheet and having a threaded upper end portion, a gear housing mounted on the 25 ridge sheet and having gearing therein cooperating with the valve rod, gear actuating means supported by the gear housing and by the side wall of the car, and guide means within the gear housing with which the valve rod is engaged in such a manner as to be restrained against rotation during operation of said gearing.

30 7. In a railway hopper car having center sills and a ridge sheet supported thereon, the combination with a valve body normally closing the hopper, of actuating means for said valve body comprising a valve rod extending upwardly 35

through and beyond said ridge sheet and having a threaded upper end portion, a gear housing mounted on the ridge sheet and having gearing therein cooperating with the threaded portion of said valve rod to operate said valve body, actuating means for said gearing, said gear housing 5 being provided with a cap having means depending therefrom in engagement with the valve rod and being so formed as to restrain said valve rod against rotation during actuation of said gearing. 10

8. In a railway hopper car having side walls and center sills, a ridge sheet supported on said center sills, a valve body normally closing said hopper, valve actuating means comprising a valve rod extending upwardly from said valve 15 body through and beyond the ridge sheet and being threaded at its upper end portion, a gear housing mounted on the ridge sheet, gearing cooperating with said valve rod concealed within said housing, gear actuating means supported by 20 said housing and a side wall of the car, said gear housing including a cap formed with guide means depending therefrom with which the upper end portion of said valve rod is engaged in such a manner as to be restrained against rotation 25 during operation of said gearing.

9. In a railway hopper car having center sills and a hopper outlet, a valve body normally closing said outlet, a valve rod extending upwardly 30 from said valve body through and beyond said center sills and being threaded at its upper end portion, means for shifting said valve rod to operate said valve body including gearing cooperating with said valve rod, and a housing substantially enclosing said gearing supported on said 35 center sills, said housing being provided with a cap formed with guide means depending therefrom and with which the valve rod is associated in such a manner as to be restrained against rotation during actuation of said gearing. 40

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