

April 24, 1934.

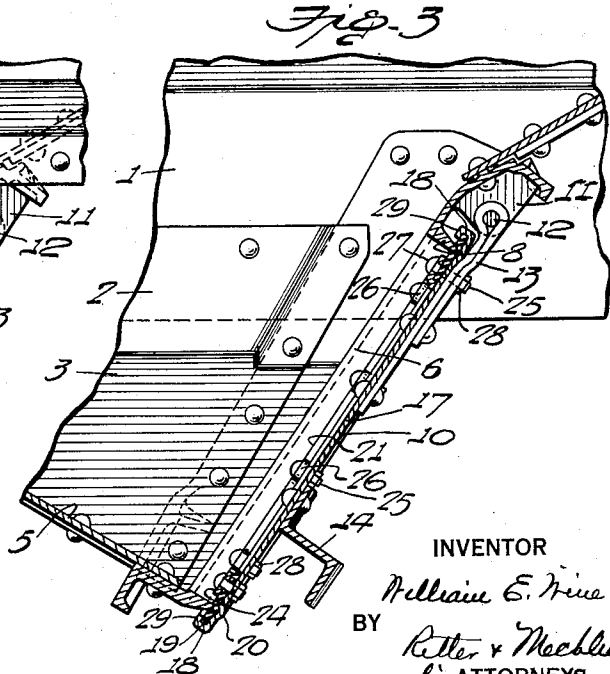
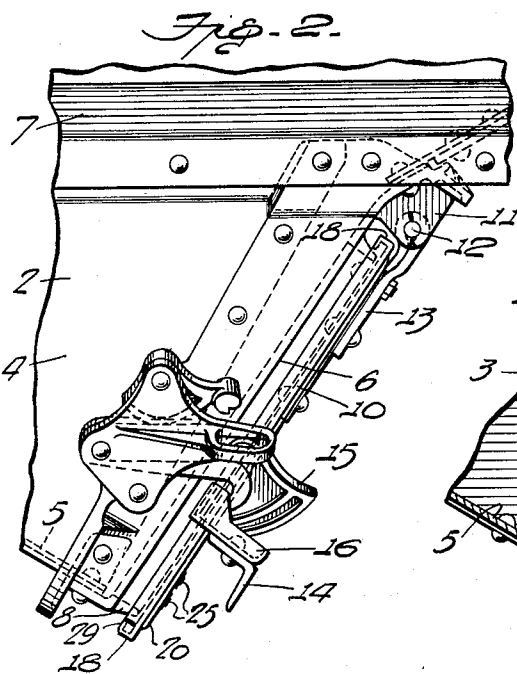
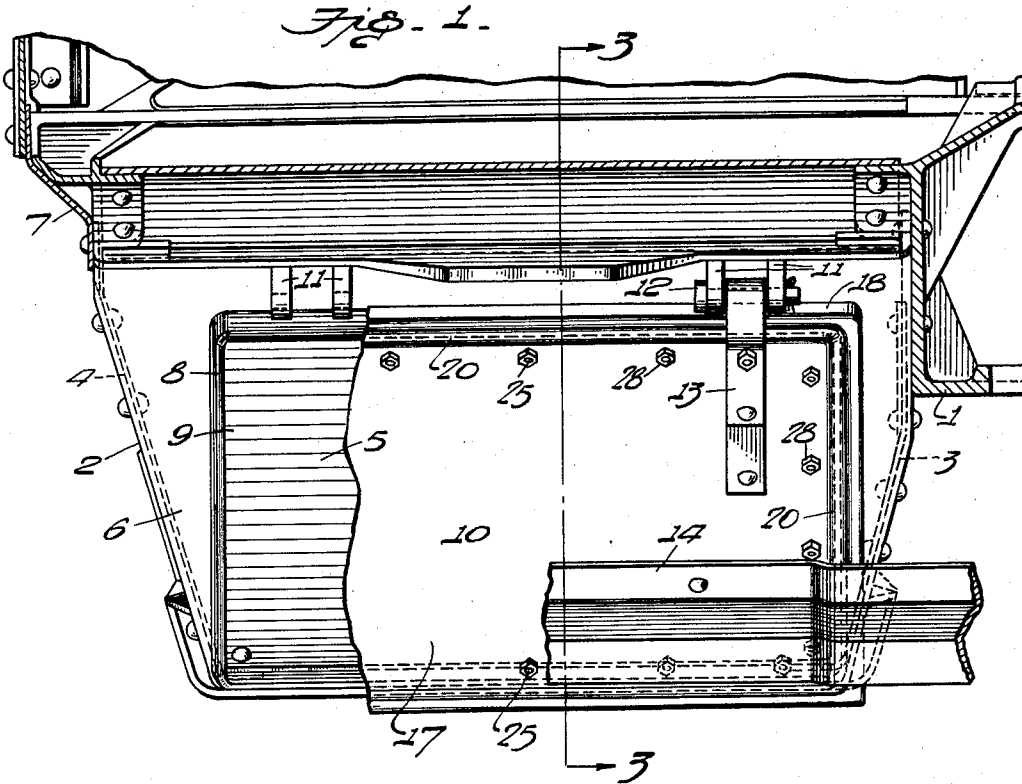
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1,955,868

DOOR FOR RAILWAY CARS

Filed June 29, 1932

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 4.

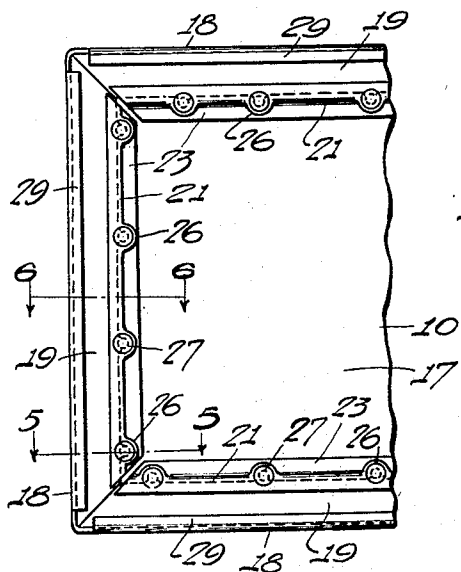


Fig. 5.

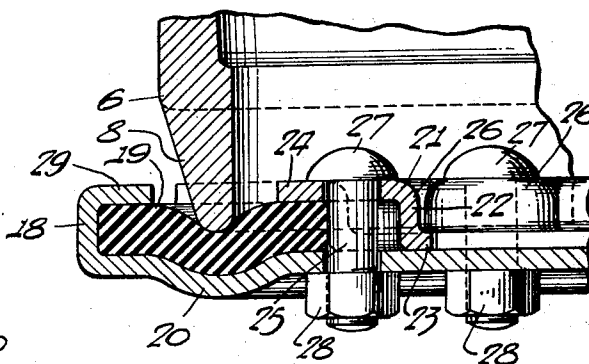


Fig. 6.

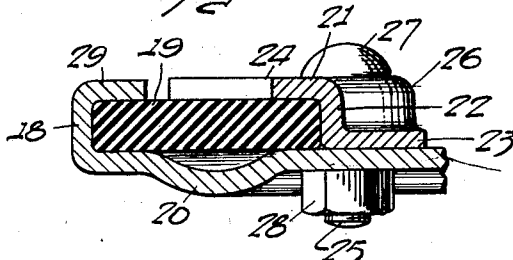


Fig. 7.

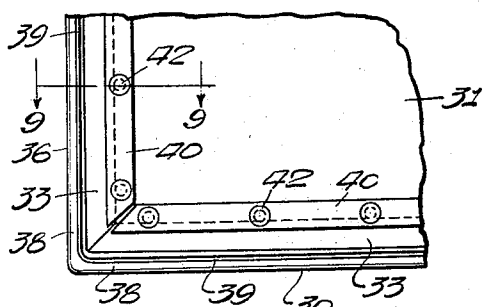


Fig. 9.

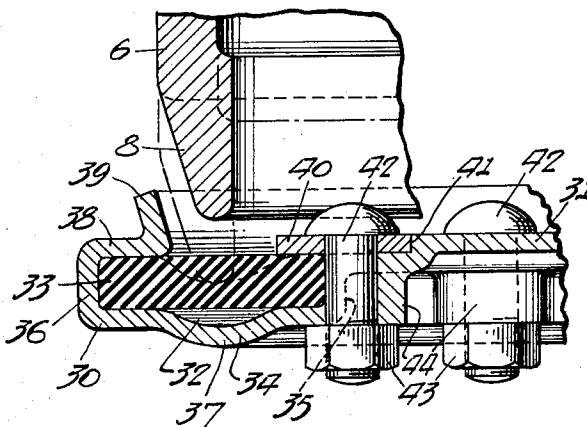
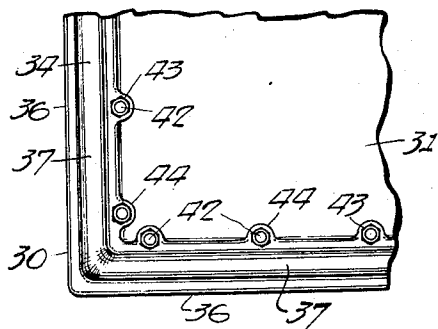


Fig. 8.



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DOOR FOR RAILWAY CARS

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Application June 29, 1932, Serial No. 620,020

17 Claims. (Cl. 105—280)

My invention relates to railway cars and more particularly to doors for closing the lading discharge openings thereof.

The principal object of the invention is to provide the door with means for sealing the lading discharge opening to prevent the escape of finely divided lading such as cement and other granular commodities which are shipped in bulk.

A principal feature of the invention consists in providing the door with a strip of molded elastic material which is adapted to engage a portion of the car adjacent the lading discharge opening and to be deformed by the latter when the door is in closed position.

Another feature of the invention consists in securing a strip of molded elastic material in overlapping relation to the inner face of a lading discharge door, the portion of the door overlapped by the elastic material being recessed to permit deformation of the material when the latter engages a portion of the car adjacent the lading discharge opening upon the door assuming closed position.

A further feature of the invention consists in providing the inner face of a lading discharge door with a channel portion and in disposing a strip of molded elastic material within the channel, the elastic material being engageable with a portion of the car adjacent the lading discharge opening.

Other and more specific features of the invention residing in the means employed for securing the strip of molded elastic material to the door will hereinafter appear and be pointed out in the claims.

In the drawings illustrating the invention, Figure 1 is a fragmentary transverse sectional view of a railway hopper car.

Figure 2 is a side elevational view of one of the hoppers of the car and its coacting door together with adjacent parts of the car construction.

Figure 3 is a vertical sectional view taken on line 3—3, Figure 1.

Figure 4 is a fragmentary elevational view of the inner face of the hopper door.

Figure 5 is an enlarged sectional view of the door taken on line 5—5, Figure 4, and of an adjacent portion of the hopper, the door being shown in fully closed position.

Figure 6 is an enlarged fragmentary sectional view of the door taken on line 6—6, Figure 4.

Figure 7 is a fragmentary elevational view of the inside of a hopper door disclosing a modified form of the invention.

Figure 8 is a fragmentary elevational view of the outer face of the door illustrated in Figure 7.

Figure 9 is an enlarged fragmentary sectional view of the door taken on line 9—9, Figure 7, and of an adjacent portion of the hopper, the door being shown in partly open position with respect to the hopper.

Although my invention relates to doors for closing the lading discharge opening of substantially all types of railway freight cars, for purposes of illustration, I have shown it applied to doors which are primarily suitable for closing the lading discharge openings of railway hopper cars.

The particular hopper car shown in the drawings is of the type wherein the hoppers extend longitudinally of the car and are arranged in pairs on opposite sides of the center sill 1 of the car. This type of car is well known and only one of the hoppers and its coacting door is shown. This hopper, which is designated by the reference numeral 2 is formed by inner and outer side sheets 3 and 4 respectively, and an inclined floor or slope sheet 5. At its discharge end the hopper may be provided with a door frame 6 which is secured at its inner upper edge to the center sill 1 and at its outer upper edge to the side sill 7. Although the door frame may be of any suitable construction it is preferably provided with an outwardly projecting flange 8 which extends continuously around the lading discharge opening 9 thereof. A door 10 for closing the lading discharge opening 9 is preferably hinged on the frame 6 so as to swing to open position under the influence of gravity. While the hinge mounting of the door may be of any suitable construction the frame 6 is preferably integrally formed with two pairs of hinge lugs 11 for respectively receiving hinge pins 12 which are adapted to extend through the upper ends of straps 13 rigidly secured to the outer face of the door. The lower portion of the door may be reinforced by a stiffener 14 which if desired may extend beneath the center sill 1 for attachment to the door of the adjacent hopper disposed on the opposite side of the center sill and thus serve as a door spreader. The door may be maintained in closed position by any suitable mechanism such as shown in Figure 2, which includes a hook 15 pivotally mounted on the hopper adapted to engage an arm 16 rigidly secured to the door stiffener 14. In the preferred form of the invention illustrated in Figures 1 to 6 inclusive, the door is preferably formed of sheet metal and it comprises a main body portion 17 and inwardly extending marginal portions 18. Overlapping the inner

face of the door adjacent its marginal edges are strips of molded elastic material 19 which, when the door is in closed position, are adapted to engage the flange 8 bordering the lading discharge opening of the door frame. The portions of the main body portion of the door overlapped by the elastic material 19 may advantageously be formed with recesses 20 which extend parallel with the adjacent edges of the door. By providing the door with recesses such as are indicated at 20, the elastic material 19 may be readily deformed when brought into engagement with the flange 8 of the door frame so that it will conform to the contour of the end portions of the flange and thereby compensate for inequalities in the latter. In this manner it will be observed that an extended area of the outer end of the flange 8 will be in engagement with the elastic material and the escape of finely divided lading from the hopper will thus be effectively prevented.

To secure the strips of elastic material 19 to the inner face of the door, removable members 21 are preferably employed. Each of these members is disposed adjacent the inner edge of the strip with which it cooperates and may be conveniently made of Z-shape having a web 22 and oppositely projecting flanges 23 and 24 respectively. The flange 23 overlappingly engages the inner face of the door while the flange 24 is disposed in overlapping relation to the outer face of the adjacent portion of the cooperating strip 19. The members 21 are secured to the door by a plurality of bolts 25. In order that the bolts may be disposed at one side of the adjacent strip 21 and not pass therethrough, the web 22 which is preferably contiguous to the inner side edge of the strip 21 is offset outwardly therefrom at spaced intervals as indicated at 26 and the flange 24 is enlarged at these points to provide seats for the heads 27 of the bolts. The bolts extend through the main body portion of the door and their outer ends are threaded to receive nuts 28.

To hold the outer end portions of the elastic strips 19 from movement with respect to the door, the marginal portions 18 of the door preferably terminate in inturned flanges 29 thus forming with the main body portion of the door, grooves in which the outer end portions of the elastic strips are disposed. By providing the door with the marginal portions 18 and 29 and the removable strip holding members 21, it will be observed that the inner face of the door is formed with inwardly opening channels for receiving the elastic strips. Moreover, the securing members 21 are of such construction that they may be readily disconnected from the door to permit replacement of the elastic material should this become necessary.

In Figures 7, 8, and 9 of the drawings, the invention is shown as applied to a cast metal door 30 having a main body portion 31 and a channelled or recessed portion 32 which extends continuously around the door adjacent its marginal edges. The channelled portion 32 is adapted to receive strips of molded elastic material 33 and is formed by a web portion 34 spaced outwardly from the main body portion 31 of the door and by inner and outer legs 35 and 36 respectively. As in the preferred form of the invention the portions of the door overlapped by the elastic strips 33, that is the web portions 34, are formed with recesses 37 to permit the elastic material to be readily deformed. Moreover, the outer end portions of the elastic strips are held immovable with respect to the door in the modified form of

the invention in substantially the same manner as they are in the preferred form of the invention. Thus the outer legs 36 of the channelled portions 32 of the door are provided with inturned portions 38 which overlap the outer faces of the elastic strips. If desired, the portions 38 of the door may terminate in offset flanges 39 which are adapted to overlap the outer surfaces of adjacent portions of the door frame when the door is in closed position. These flanges 39 are adapted to cooperate with the flanges 8 of the door frame when the door assumes closed position to properly position the latter with respect to the frame.

To secure the inner edge portions of the elastic strips to the door, plate members 40 may be conveniently employed. These plate members are disposed in recesses 41 formed on the inner face of the door and their outer ends overlies the outer faces of adjacent portions of the elastic strips. So that the plate members 40 may be readily removed from the door to permit replacement of the elastic strips they are preferably connected to the door by bolts 42. As in the preferred form of the invention, these bolts do not extend through the elastic material but are disposed at one side thereof. To provide seats for the nuts 43 which are threaded on the outer ends of the bolts, the door may be conveniently formed adjacent the channel portion 32 thereof with a plurality of bosses or projections 44.

By providing a lading discharge door with elastic material adapted to engage portions of the car adjacent the lading discharge opening, it will be readily appreciated that the escape of finely divided lading from the car is effectively prevented. Moreover, the means employed for securing the elastic material to the door is of simple construction and is of such character that it may be readily removed to enable replacement of the elastic material.

I claim:

1. A door for closing the lading discharge opening of a railway car, the inner face of said door being provided inwardly of one of its edges with a recess extending longitudinally of the latter, and a strip of molded elastic material overlapping said recess and extending on opposite sides thereof, said elastic material being adapted to engage a portion of the car adjacent the lading discharge opening and to be deformed by said portion when the door is in closed position.

2. A door for closing a lading discharge opening of a railway car, said door being provided with a strip of molded elastic material overlapping the inner face thereof, said elastic material being adapted to engage a portion of the car adjacent the lading discharge opening, the portion of the door overlapped by said material being provided intermediate the side edges of the latter with a recess extending longitudinally of the material, said recess being adapted to permit deformation of the material when the door is in closed position.

3. A door for closing a lading discharge opening of a railway car, the inner face of the door being provided with a channel portion, and a strip of molded elastic material disposed in said channel adapted to engage a portion of the car adjacent the lading discharge opening when the door is in closed position.

4. A door for closing a lading discharge opening of a railway car, the inner face of the door being provided with a channel portion, the web of said channel portion being provided with a longitudinally extending recess, and a strip of

molded elastic material disposed within said recess adapted to engage a portion of the car adjacent the lading discharge opening when the door is in closed position.

5 5. A door for closing a lading discharge opening of a railway car, said door being provided adjacent an edge thereof with an inwardly extending portion, and a strip of molded elastic material overlapping the inner face of the door and
10 abutting said inwardly extending portion, said elastic material being adapted to engage a portion of the car adjacent the lading discharge opening when the door is in closed position.

15 6. A door for closing a lading discharge opening of a railway car, said door being provided adjacent an edge thereof with angularly disposed portions defining a groove, and a strip of molded elastic material overlapping the inner face of the door and having its outer edge portion disposed within said groove, said elastic material
20 being adapted to engage a portion of the car adjacent the lading discharge opening when the door is in closed position.

25 7. A door for closing a lading discharge opening of a railway car, a strip of molded elastic material overlapping the inner face of the door adapted to engage a portion of the car adjacent the lading discharge opening when the door is in closed position, and means integral with the
30 door having a portion overlapping the outer face of said strip.

35 8. A door for closing a lading discharge opening of a railway car, said door being provided with a strip of molded elastic material overlapping the inner face thereof, said elastic material being adapted to engage a portion of the car adjacent the lading discharge opening when the door is in closed position, and means rigid with the door adjacent the side edges of said strip for
40 securing the latter to the door, said means having portions disposed in overlapping relation to the outer face of the strip.

45 9. A door for closing a lading discharge opening of a railway car, said door being provided with angularly disposed portions defining a groove, a strip of molded elastic material overlapping the inner face of the door, the outer edge of said strip being disposed within said groove, and a member detachably secured to the door
50 adjacent the inner edge of said strip having a portion overlapping the outer face of the strip.

55 10. A door for closing the lading discharge opening of a railway car, said door being provided with angularly disposed portions defining a groove, a strip of molded elastic material overlapping the inner face of the door, the outer edge of said strip being disposed within said groove, a member disposed adjacent the inner edge of said strip having a portion overlapping the outer
60 face thereof, and means for securing said member to the door disposed at one side of said strip.

65 11. A door for closing a lading discharge opening of a railway car, a strip of molded elastic material overlapping the inner face of the door, and a substantially Z-shaped member adjacent one edge of the strip for securing the latter to the door, said member comprising a flange overlapping the outer face of the strip and a flange overlapping the inner face of the door.

70 12. A door for closing a lading discharge open-

ing of a railway car, a strip of molded elastic material overlapping the inner face of the door, a substantially Z-shaped member adjacent one edge of the strip for securing the latter to the door, said member including a web and oppositely projecting flanges, one of said flanges overlapping the outer face of said strip and the other of said flanges overlapping the inner face of the door, and means passing through the flange of the member overlapping the strip for securing the member to the door. 80 85

13. A door for closing a lading discharge opening of a railway car, a strip of molded elastic material overlapping the inner face of the door, a substantially Z-shaped member adjacent one edge of the strip for securing the latter to the door, said member including a web portion and oppositely projecting flanges, one of said flanges overlapping the outer face of said strip and the other of said flanges overlapping the inner face of the door, portions of said web being disposed adjacent the inner edge of said strip and portions thereof being offset therefrom, and means respectively extending between said offset portions of the web and the adjacent edge of the strip for securing said member to the door. 90 95 100

14. A door for closing a lading discharge opening of a railway car, said door being provided with an inwardly opening recess having a wall portion spaced outwardly from and substantially parallel with the outer face of the door, a strip of molded elastic material disposed in said portion, and means rigid with the door overlapping the outer face of said strip for securing the latter to the door. 105 110

15. A door for closing a lading discharge opening of a railway car, said door being provided with an inwardly opening recess having a wall portion spaced outwardly from the outer face of the door, said wall portion being provided with a longitudinally extending depressed portion, a strip of molded elastic material disposed in said recess, a plate member having a portion overlapping the outer face of said strip, and means passing through said member at one side of said strip for securing the member to the door. 115 120 125

16. A door for closing a lading discharge opening of a railway car, said door being provided with an inwardly opening recess, and a strip of molded elastic material disposed within said recess, said door being integrally provided with a portion overlapping the outer face of said strip adjacent the outer edge of the latter, said portion terminating in an angularly disposed flange adapted to be disposed in overlapping relation with a portion of the car adjacent the lading discharge opening when the door is in closed position. 130 135 140

17. A cast metal door for a railway car having a lading discharge opening, said door being provided with an inwardly opening recessed portion, a strip of molded elastic material disposed in said recess, means integral with the door having a portion overlapping the outer face of said strip adjacent the outer edge thereof, and a plate member rigidly secured to the door adjacent the inner edge of said strip, said plate member having a portion overlapping the outer face of said strip. 145

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