Jan. 12, 1932. W. E. WINE 1,840,423

RAILWAY CAR

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Fig. 1.

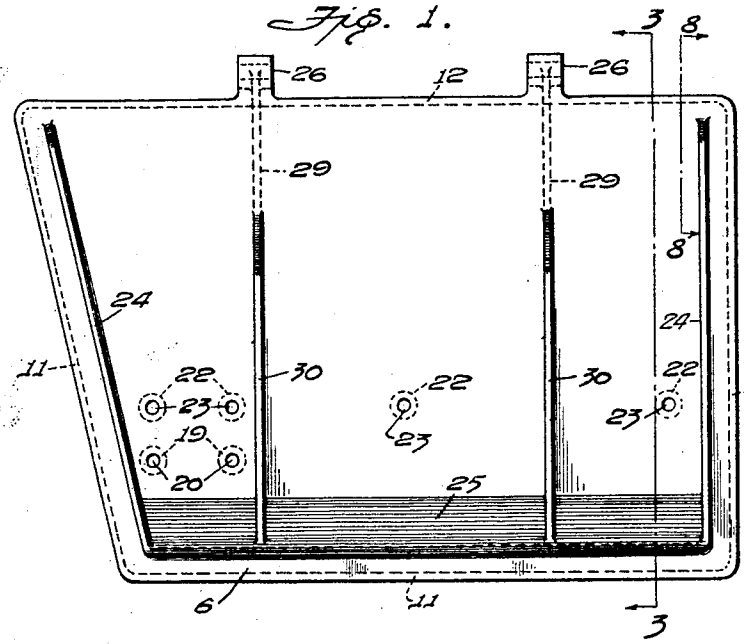


Fig. 3.

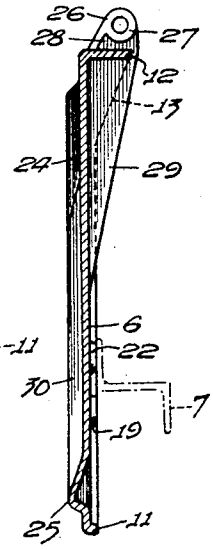


Fig. 2.

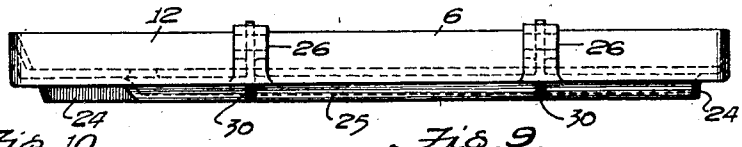


Fig. 8.

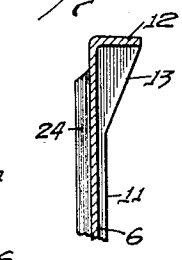


Fig. 10.

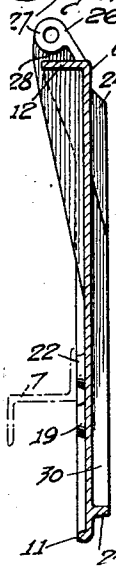
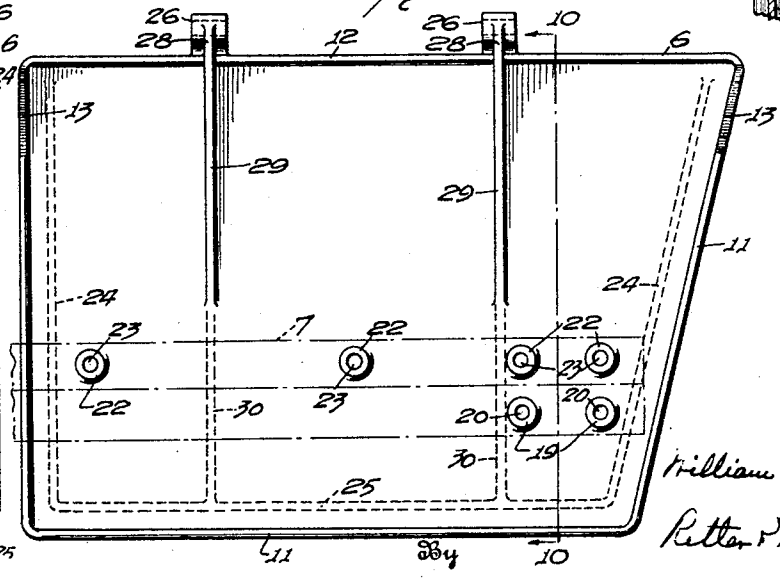


Fig. 9.



Inventor

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RAILWAY CAR

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Fig. 6.

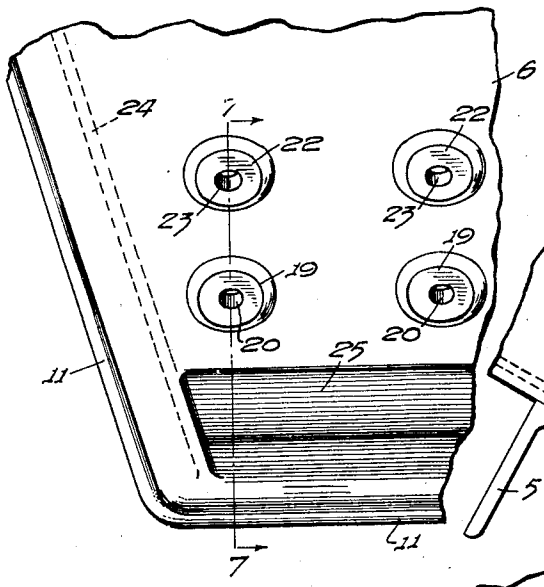


Fig. 4.

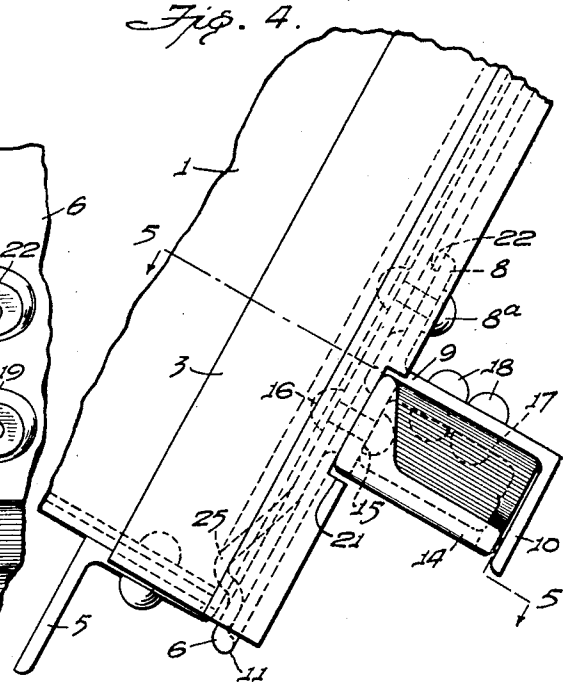
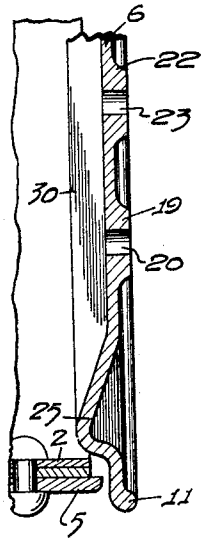


Fig. 7.



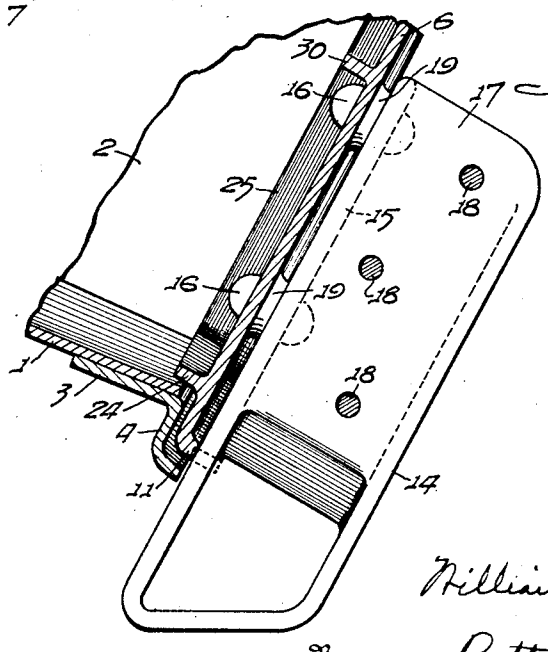


Fig. 5.

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Patented Jan. 12, 1932 1,840,423

UNITED STATES PATENT OFFICE

WILLIAM E. WINE, OF TOLEDO, OHIO

RAILWAY CAR

Application filed June 16, 1930. Serial No. 461,525.

My invention relates to railway cars and more particularly to lading discharge doors for cars of the hopper type.

A principal object of the invention is to provide the door with improved means adapted to cooperate with adjacent portions of the associated hopper to form a seal therewith for preventing the escape of lading from the hopper.

Another object of the invention is to integrally form the door with improved rigidifying means.

A primary feature of the invention is to integrally form the door with flanges projecting from its inner face adjacent its side marginal edges adapted when the door is in closed position to be disposed in overlapping relation to the inner face of the adjacent portions of the hopper to form a seal therewith for preventing the escape of lading from the hopper.

Another feature of the invention is to provide the door with an inwardly projecting corrugation connecting the lower ends of the flanges disposed adjacent its side marginal edges, the corrugation, as well as the flanges, being adapted to overlap the inner face of adjacent portions of the hopper.

A further feature of the invention is to integrally form the door with outwardly projecting flanges extending downwardly from adjacent the hinged edge thereof and with inwardly projecting flanges extending upwardly from adjacent the free edge thereof.

A still further feature of the invention resides in providing the door with an outwardly projecting flange along its hinged edge and with a plurality of outwardly projecting reinforcing flanges which extend downwardly from the marginal flange and terminate above the door spreader.

Other and more specific features of the invention residing in advantageous forms, combinations and relations of parts will hereinafter appear and be pointed out in the claims.

In the drawings illustrating preferred embodiments of the invention:

Figure 1 is an elevational view of the inside of the door.

Figure 2 is a plan view of the door.

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

Figure 4 is a side elevational view of the lower portion of the hopper and the adjacent portion of the coacting door.

Figure 5 is a sectional view taken on line 5—5, Figure 4.

Figure 6 is an enlarged elevational view of the lower outer corner of the door.

Figure 7 is a sectional view taken on line 7—7, Figure 6, a portion of the slope sheet of the hopper being also illustrated.

Figure 8 is a fragmentary sectional view taken on line 8—8, Figure 1.

Figure 9 is an elevational view of the outside of the door of a modified form of the invention.

Figure 10 is a sectional view taken on line 10—10, Figure 9.

The hopper car to which the door is shown as applied is of a well known type and therefore only a portion of one of the hoppers has been illustrated in the drawings. In cars of this type the doors are arranged on opposite sides of the car center sill and are rigidly connected by a door spreader or stiffening beam so as to operate together and, in effect, constitute a single door.

In the drawings 1 indicates the inclined side sheet or side wall of a car hopper and 2 designates the bottom or slope sheet of the hopper. If desired, the side sheet may be reinforced by a flanged member 3 having a portion 4 affording a door seat and the slope sheet of the hopper may be rigidified by an angle shaped member 5 which, as is well known, extends under the car center sill (not shown) and is secured to the hopper on the opposite side of the car.

The door, designated by the reference numeral 6, is hingedly associated with the hopper so as to swing to open position under the influence of gravity. The door spreader 7 which, as stated above is employed for connecting doors on opposite sides of the center sill, may be of any convenient shape, such as a Z-bar having a flange 8 secured by rivets 8^a to the outer face of the door, a web 9 projecting outwardly therefrom and a down-

wardly extending outwardly spaced flange 10.

The free or bottom edge of the door, as well as the side edges thereof, may advantageously be formed with an outwardly extending rigidifying bead 11. Along its hinged edge the door is preferably formed with an outwardly extending reinforcing flange 12 of considerable greater depth than the rigidifying bead 11. Although the rigidifying bead 11 along the side edges of the door may continue to the marginal flange 12 it is preferred to form the portions of the side edges adjoining the marginal flange with flanges 13 which preferably progressively decrease in depth from the flange 12 to the adjoining portions of the rigidifying beads.

Secured to the door and projecting beyond one of its side edges and the adjacent side sheet of the hopper is a door arm 14 for cooperating with mechanism of any suitable type (not shown) to support the door in closed position. The arm chosen for purposes of illustrating the invention is interposed between the flange 10 of the spreader and the door and is formed with a portion 15 rigidly secured to the door by rivets 16 and with a portion 17 rigidly secured to the web 9 of the spreader by rivets 18. To space the inner end of the arm from the main body portion of the door a distance substantially equal to the depth of the rigidifying bead 11, the door is formed, preferably integrally, with a plurality of outwardly projecting bosses 19 having apertures 20 through which the attaching rivets 16 extend. By thus forming the door the door arm may engage the adjacent portion of the rigidifying bead 11 and yet be firmly attached to the door without being offset. In order that the arm may extend beyond the adjacent side sheet of the hopper the side reinforcing member 3 is preferably cut away as at 21.

To obviate the necessity of offsetting the spreader adjacent the inner side edge of the door where it extends beyond the adjacent portion of the bead 11, the door is formed, preferably integrally, with additional outwardly extending bosses 22 for spacing the flange 8 of the spreader from the door a distance equal to the depth of the rigidifying bead. Each of these bosses may likewise be formed with apertures 23 for receiving the attaching rivets 8^a. In this manner the spreader may also be rigidly fastened to the doors without being offset.

To prevent the escape of fine lading from the hopper the door is integrally formed with inwardly projecting flanges 24 adapted to be disposed in overlapping relation with adjacent portions of the hopper when the door is in closed position. Each of these flanges is disposed inwardly of the adjacent side marginal edge of the door and extends substantially parallel therewith. The lower portions of the flanges 24 are connected by an inwardly projecting portion 25 which is also adapted to overlap the adjacent portion of the hopper when the door is in closed position to prevent the escape of fine lading. In Figures 9 and 10 this inwardly projecting portion is shown as a flange or rib while in the other figures of the drawings it is shown as a corrugation. In each form, however, the portion 25 efficiently functions to prevent the escape of lading and also acts to afford a stop limiting sagging movement of the door on its hinge pintles. The corrugation, however, is to be preferred as it more effectively rigidifies the lower or free edge of the door than the flange and it also possesses the additional merit, due to its shape, of being adapted to serve as means for cooperating with the adjacent portion of the hopper to wedge or force the door upwardly, in the event the latter sags on its hinge pintles.

The marginal flange 12 of the door is integrally formed with two upwardly projecting members or lugs 26 adapted to cooperate with means (not shown) for hingedly associating the door with the hopper. Each of the hinge lugs is formed with a hub portion 27 and a web portion 28, the latter being integrally joined to the flange 12.

To reinforce the upper portion of the door adjacent the hinge lugs 26 it is integrally formed with a plurality of outwardly projecting flanges 29. These flanges are disposed substantially normal to the axis of the door and constitute continuations of the web portions 28 of the respective hinge lugs 26. As the spreader 8 is secured to the outer face of the door the flanges 29 terminate slightly above that portion of the door overlapped by the spreader so as not to interfere with the attachment of the latter to the door.

Projecting from the inner face of that portion of the door to which the spreader is secured are flanges 30 which are in alinement with the flanges 29 and, although they are on the opposite side of the door, constitute continuations thereof. The flanges 30 extend upwardly from the inwardly projecting portion 25 adjacent the free edge of the door and terminate somewhat above the lower ends of the flanges 29. Thus the door is formed with reinforcing flanges disposed substantially normal to its hinge axis which extend, in effect, continuously from adjacent the free or lower edge thereof to its hinged or upper edge. In this manner it will be perceived that forces delivered to the door, incident to its connection with the hopper, will be distributed to a relatively large area thereof.

The foregoing construction results in a door which, in addition to being of a design such that it may be easily and conveniently manufactured, is of such a construction as

to adequately withstand the severe service conditions to which it is subjected and to prevent the escape of fine lading from the hopper.

I claim:

1. A railway car having a hopper provided with a lading discharge opening, a cast metal door hingedly associated with the hopper for closing said opening, said door being formed on its inner face with flanges disposed inwardly of and adjacent to its side marginal edges and with a corrugation disposed inwardly of and adjacent its free edge, said corrugation and each of said flanges extending parallel with the edge of the door adjacent thereto and being adapted when the door is in closed position to be disposed in overlapping relation to the inner face of the adjacent portion of the hopper to form a seal therewith for preventing the escape of lading from the hopper.

2. A railway car having a hopper provided with a lading discharge opening, a door for closing the opening provided with members for hingedly associating it with the hopper, said door being formed on its inner face with flanges disposed inwardly of and adjacent its side marginal edges and with reinforcing flanges intermediate said last-named flanges respectively extending from adjacent the free edge of the door toward said hinge members, each of the flanges adjacent the marginal edges of the door being adapted to be disposed in overlapping relation to the inner face of the adjacent portion of the hopper to form a seal therewith for preventing the escape of lading from the hopper.

3. A railway car having a hopper provided with a lading discharge member, a cast metal door for closing the opening integrally formed with members for hingedly associating it with the hopper, the lower portion of the door being formed with an inwardly projecting corrugation extending parallel with and adjacent to the free edge of the door, and a plurality of flanges projecting inwardly from the door and extending upwardly from said corrugation toward said hinge members, said corrugation being adapted when the door is in closed position to be disposed in overlapping relation to the inner face of the adjacent portion of the hopper to form a seal therewith for preventing the escape of lading from the car.

4. A railway car having a hopper provided with a lading discharge member, a cast metal door for closing the opening integrally formed with a plurality of members for hingedly associating it with the hopper, a plurality of flanges projecting from the outer face of the door and extending downwardly from said members, and a plurality of flanges projecting from the inner face of the door and extending upwardly toward the hinge members from adjacent the free edge of the door.

5. A railway car having a hopper provided with a lading discharge member, a cast metal door for closing the opening integrally formed with members for hingedly associating it with the hopper, a plurality of flanges projecting outwardly from the door and extending downwardly from said hinge members, and a plurality of flanges projecting inwardly from the door and extending upwardly toward said hinge members from adjacent the free edge of the door, said inwardly extending flanges terminating above the lower ends of said outwardly projecting flanges and all of said flanges being substantially normal to the hinge axis of the door.

6. A railway car having a hopper provided with a lading discharge opening, a cast metal door hingedly associated with the hopper for closing the opening thereof, said door being provided with an outwardly projecting flange along its hinged edge and with a plurality of inwardly projecting flanges adjacent its side edges, said outwardly projecting flange being integrally formed with upwardly extending hinge lugs and said inwardly projecting flanges extending parallel with and inwardly of the adjacent marginal edge of the door and being adapted when the door is in closed position to be disposed in overlapping relation to the inner face of the adjacent portion of the hopper to form a seal therewith for preventing the escape of lading from the latter.

7. A railway car having a hopper provided with a lading discharge opening, a hinged cast metal door for closing the opening provided with an outwardly extending marginal flange along its hinged edge, members formed integrally with said flange for hingedly associating the door with the hopper, flanges projecting from the outer face of the door and extending downwardly from said marginal flange, and flanges projecting from the inner face of the door and extending upwardly toward said hinge members from adjacent the free edge of the door.

8. A railway car having a hopper provided with a lading discharge opening, a cast metal door hingedly associated with the hopper for closing said opening, said door being provided with a marginal flange extending along its hinged edge and with an inwardly projecting portion extending parallel with and adjacent to its free edge, flanges extending downwardly from said marginal flange on the outer face of the door and flanges extending upwardly from said inwardly projecting portion on the inner face of the door, said

inner and outer flanges being substantially normal to the hinge axis of the door.

9. A railway car having a hopper provided with a lading discharge opening, a cast metal door hingedly associated with the hopper for closing the opening, said door being formed with an outwardly projecting marginal flange along its hinged edge and with an inwardly projecting corrugation extending parallel with and adjacent its free edge, flanges extending downwardly from the marginal flange on the outer face of the door and flanges extending upwardly from said corrugation on the inner face of the door, said upwardly extending flanges terminating above said downwardly extending flanges and each of said flanges being arranged substantially normal to the hinge axis of the door.

10. A railway car having a hopper provided with a lading discharge opening, a door hingedly associated with the hopper for closing said opening, and a door spreader rigidly secured to the outer face of the door, said door being integrally formed with inwardly projecting flanges adjacent the portion thereof to which the spreader is secured and being also integrally formed with outwardly projecting flanges extending downwardly from the hinged edge of the door and terminating above said spreader, said flanges being disposed inwardly of the side edges of the door and being substantially normal to the hinge axis thereof.

11. A railway car having a hopper provided with a lading discharge opening, a door hingedly associated with the hopper for closing said opening, said door being provided with an outwardly projecting marginal flange along its hinged edge, a door spreader rigidly secured to the upper face of said door, and reinforcing flanges formed integrally with the door and extending downwardly from said marginal flange inwardly of the side edges of the door, said reinforcing flanges terminating above the spreader and being substantially normal to the hinge axis of the door.

12. A railway car having a hopper provided with a lading discharge opening, a door hingedly associated with the hopper for closing said opening, a door spreader rigidly secured to the outer face of the door, and a plurality of flanges formed integrally with the door and respectively projecting from its outer face and from its inner face, said outwardly projecting flanges extending downwardly from the hinged edge of the door toward the door spreader and said inwardly projecting flanges extending upwardly from adjacent the free edge of the door and terminating above the lower edges of said outwardly projecting flanges.

13. In a railway car having a hopper provided with a lading discharge opening, a cast metal door hingedly associated with the hopper for closing the said opening, said door being integrally formed with an outwardly extending rigidifying bead along one of its side edges and with a plurality of outwardly projecting apertured bosses, and a door arm rigidly secured to said door in engagement with said bosses and said rigidifying bead.

14. A railway car having a hopper provided with a lading discharge opening, a door for closing the opening integrally formed with an outwardly projecting rigidifying bead along one of its side marginal edges, and a door spreader secured to the outer face of the door in engagement with said bead, the door being also integrally formed with means for spacing the spreader from the main body portion thereof.

In testimony whereof I affix my signature.

WILLIAM E. WINE.