

Oct. 11, 1932.

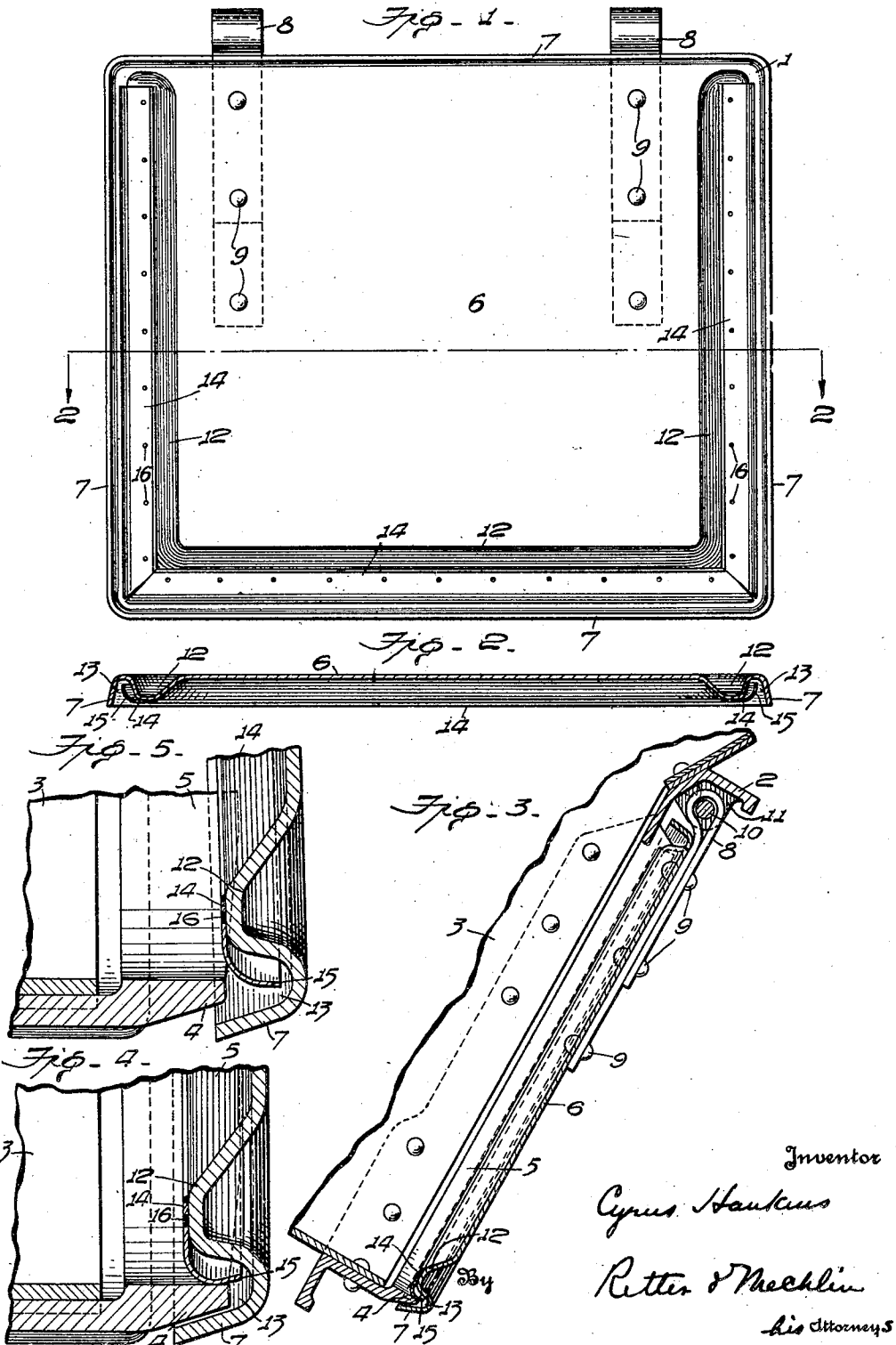
C. HANKINS

1,882,186

RAILWAY CAR

Filed Jan. 27, 1931

2 Sheets-Sheet 1



Inventor

Cyrus Hankins

Ritter & Macchlin

his Attorneys

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Fig. 6.

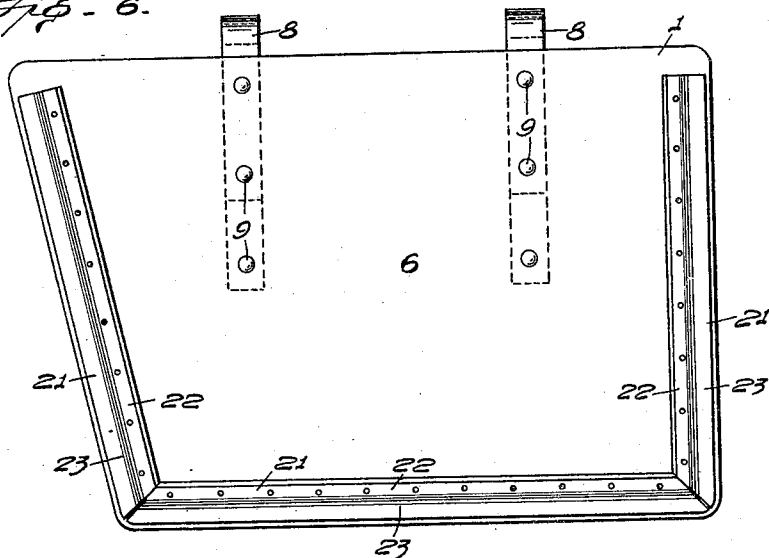


Fig. 8.

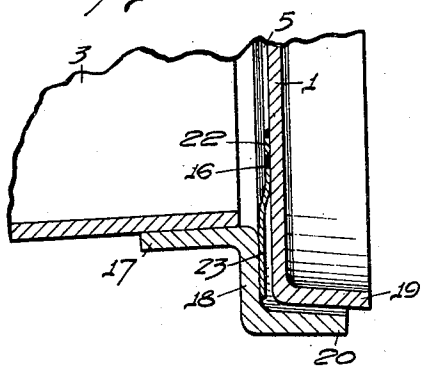


Fig. 7.

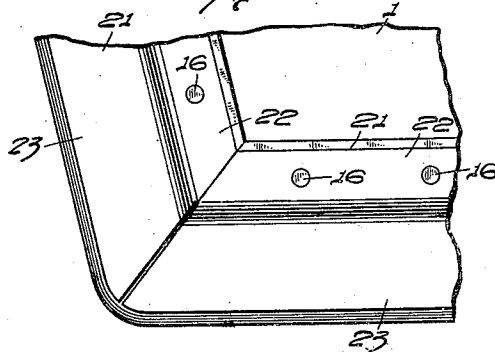


Fig. 10.

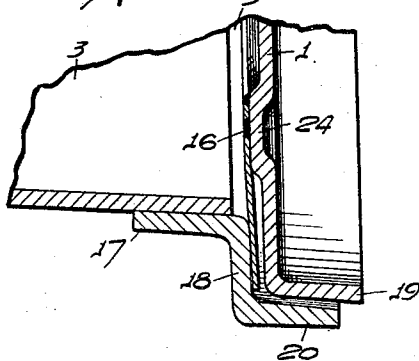
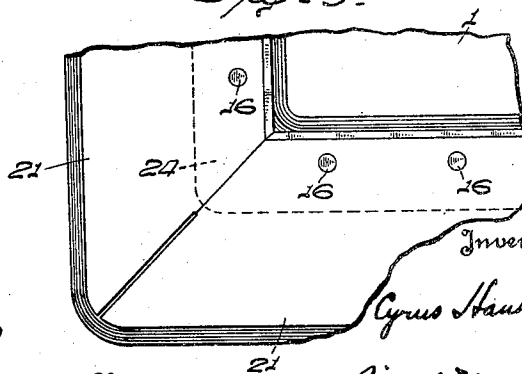


Fig. 9.



Inventor

Cyrus Hankins

Ritter & Macklin
his Attorneys

UNITED STATES PATENT OFFICE

CYRUS HANKINS, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR TO WINE RAILWAY APPLIANCE COMPANY, OF TOLEDO, OHIO, A CORPORATION OF OHIO

RAILWAY CAR

Application filed January 27, 1931. Serial No. 511,583.

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

It has been found desirable from an economical point of view to transport finely divided lading, such as cement and the like, in railway hopper cars which are usually provided with a protective covering or roof. However, due to the fact that hopper doors are not accurately fitted to the hoppers and become warped and distorted in the service to which they are customarily subjected, cracks or openings are usually left between the closed doors and portions of the hopper which bound the lading discharge opening and cooperate with the door through which finely divided lading may accidentally escape from the car while in transit. The principal object of the invention is, therefore, to provide the doors with means forming a seal positively preventing the accidental escape of the fine lading from the car hoppers.

A primary feature of the invention consists in providing the hinged door of a railway hopper car with flexible means adjacent one of the marginal edges thereof co-operable with portions of the hopper bounding its lading discharge opening for preventing the escape of fine lading from the hopper when the door is in closed position.

Another feature of the invention consists in providing the hopper door with a flexible metallic plate adjacent one of the marginal edges thereof and in overlapping relation to its inner face, the plate being adapted when the door is in closed position to engage portions of the hopper adjacent the discharge opening to prevent the escape of fine lading.

A still further feature of the invention consists in providing a door hingedly associated with the hopper of a railway car with flexible plates respectively adjacent the side edges thereof and adjacent the edge thereof remote from the hinge axis, said plates being engageable with portions of the hopper bounding the lading discharge opening when the door is in closed position for preventing the escape of fine lading from the hopper.

A still further feature of the invention consists in providing the hopper door with

an inwardly offset portion adjacent one of its marginal edges and in securing a flexible member to the offset portion adapted, when the door is in closed position, to engage a portion of the hopper to prevent the escape of fine lading therefrom.

A still further feature of the invention consists in providing the door with a portion adjacent one of its marginal edges affording a recess to receive an adjacent portion of the hopper when the door is in closed position, flexible means being disposed within the recess for cooperating with the adjacent portion of the hopper to prevent the escape of fine lading therefrom.

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 inside elevational view of the hopper door.

Figure 2 is a sectional view taken on line 2-2, Figure 1.

Figure 3 is a longitudinal vertical sectional view illustrating a portion of a hopper of a railway car and its co-acting door.

Figure 4 is an enlarged view of the lower portion of Figure 3.

Figure 5 is a view similar to Figure 4 showing the door partly open.

Figure 6 is a view similar to Figure 1 illustrating a modified form of the invention.

Figure 7 is an enlarged view of the left-hand lower corner of the door illustrated in Figure 6.

Figure 8 is a vertical sectional view similar to Figure 4 illustrating one type of hopper with which the door shown in Figure 6 may be associated.

Figure 9 is a view similar to Figure 7 illustrating still another modified form of the invention.

Figure 10 is a view similar to Figure 8 showing the door illustrated in Figure 9.

For the purpose of illustrating the form of the invention shown in Figures 1 to 5, inclusive, the door 1 has been shown as ap-

plied to a cast metal door frame 2 of the type disclosed in the patent to W. E. Wine, No. 1,705,147, dated March 12, 1929. This door frame is rigidly secured to adjacent portions of the hopper 3 and is formed with a plurality of outwardly projecting flanges 4 bounding the lading discharge opening 5. Although the door may be made of cast metal it is preferably formed from a single sheet of metal having a main body portion 6 and a plurality of inwardly extending marginal flanges 7. The door may be hingedly associated with the car in any suitable manner and for this purpose it may be conveniently provided with two hinge straps 8 secured to the outer face of the door by rivets 9. Each of the hinge straps is formed to receive a pin 10 removably mounted in lugs 11 which may be advantageously integrally formed with the upper portion of the door frame 2.

Adjacent its side edges and the edge thereof remote from its hinge axis the door is formed with a continuously extending inwardly projecting corrugation 12, the corrugation being spaced a sufficient distance inwardly of the marginal flanges 7 to afford a recess 13 for receiving the flanges 4 of the door frame. A plurality of flexible metal plates or strips 14 are arranged on the door in overlapping relation to its inner face and adjacent to its free edges, the plates being preferably secured to the innermost portion of the corrugation 12. Each plate or strip preferably extends continuously along the edge of the door to which it is adjacent and the adjoining ends of the plates are preferably mitered. The plates are each formed with a bent or offset portion 15 which extends into the recess 13 for engaging the adjacent flange 4 of the hopper. The offset portions 15 project into the recess 13 to such an extent that when the door is being moved to closed position they will be engaged and thereby deflected by the portions of the hopper bounding the lading discharge opening, such as the flanges 4 of the door frame, so they will intimately and positively contact with the latter when the door assumes closed position. In order that the plates may be deflected or flexed independently and without interfering with each other a slight space intervenes between the outer portions of the mitered ends of the plates. It will be appreciated, however, that this space will practically disappear when the plates are bent inwardly toward the door by engagement with adjacent portions of the hopper.

Although the plates may be made of any suitable or desirable metal they are preferably made of one of the well known rustless metals, such as Monel metal, and although they may be secured to the door in any convenient manner it has been found desirable to connect them thereto by welding. This may be accomplished by providing each of

the plates with a plurality of apertures or openings 16 in which is deposited welding material. Furthermore, welding material may be deposited in a continuous strip along the inner edges of the plates, which in addition to serving as means connecting the plates to the door, serves as a seal preventing moisture and the like from seeping between the plates and the door.

By providing the door with flexible strips adapted to positively engage portions of the hopper bounding the lading discharge opening it will be readily appreciated that the escape of fine lading from the hopper is effectively prevented notwithstanding that the doors do not accurately fit the hoppers, due to either improper mounting or to deformation of the door.

In Figures 6 to 8, inclusive, the invention is shown as applied to the door of a hopper of different construction from that illustrated in the principal figures. In this form the hopper instead of being provided with a door frame is formed with a Z-shaped reinforcing member 17 having a portion 18 disposed in a plane substantially parallel with that of the closed door. A door suitable for closing the lading discharge opening of a hopper of this type is preferably formed with outwardly projecting marginal flanges 19 which are disposed closely adjacent to similarly formed flanges 20 on the hopper reinforcing member 17.

In this form of the invention the flexible plates 21 are formed to engage and cooperate with the portions 18 of the hopper member 17 and for this purpose they are provided with relatively offset portions 22 and 23, respectively. The portions 23 of the plates engage the adjacent portions of the hopper while the portions 22 thereof are secured to the door in overlapping relation to its inner face in the same manner as the flexible plates illustrated in Figures 1 to 5, inclusive. The offset portions 23 are spaced a sufficient distance from the body portion of the door so that they will engage with the portions 18 of the hopper before the door assumes fully closed position whereby they will be firmly held in engagement with those portions of the hopper when the door assumes fully closed position.

Figures 9 and 10 depict another manner in which the flexible plates 21 may be associated with the door of the type illustrated in Figures 6 to 8, inclusive. In this form of the invention the door is formed with a continuously extending inwardly offset portion 24, to the inner face of which the flexible plates are secured. By forming the door in this fashion the plates may be flat instead of offset as in Figures 6 to 8, inclusive, because the portions of the plates adapted to engage the portions 18 of the hopper reinforcing member 17 are spaced a sufficient distance from the plane of

the body portion of the door that they will engage those portions of the hopper before the door assumes fully closed position whereby continued closing movement of the door slightly deforms or deflects the plates to insure intimate contact between them and the hopper. These flat plates may also be secured to the door in the same manner as are the plates illustrated in Figures 1 to 5, inclusive.

From the foregoing it will be perceived that I have provided simple and efficient means for effectively sealing the lading discharge openings of railway hopper cars for preventing the accidental escape of finely divided lading.

I claim:

1. A railway car having a hopper provided with a lading discharge opening, a hinged door for closing the opening, and flexible plates respectively secured to the door adjacent the side edges thereof and adjacent the edge thereof remote from its hinge axis, said plates being engageable with adjacent portions of the hopper when the door is in closed position to prevent the escape of fine lading from the hopper.

2. A railway car having a hopper provided with a lading discharge opening, a hinged door for closing the opening, and flexible metallic plates respectively secured to the door in overlapping relation to the inner face thereof, said plates being respectively disposed adjacent the side edges of the door and adjacent the edge thereof remote from its hinge axis, said plates being adapted when the door is in closed position to engage portions of the hopper adjacent its discharge opening to prevent the escape of fine lading.

3. A railway car having a hopper provided with a lading discharge opening, a hinged door for closing the opening, said door being provided adjacent one of its marginal edges with an inwardly offset portion, and a flexible member secured to said offset portion, said member being engageable with an adjacent portion of the hopper when the door is in closed position to prevent the escape of fine lading from the hopper.

4. A railway car having a hopper provided with a lading discharge opening, a hinged door for closing the opening, said door being provided adjacent its side edges and adjacent the edge thereof remote from its hinge axis with inwardly offset portions, and flexible plate members rigidly secured to said offset portions, said members being engageable with adjacent portions of the hopper when the door is in closed position to prevent the escape of fine lading from the hopper.

5. A railway car having a hopper provided with a lading discharge opening, a hinged door for closing the opening, said door having inwardly extending corrugations adjacent one of its marginal edges, and a flexible plate-like member rigidly secured to said cor-

rugation and adapted to engage a portion of the hopper adjacent the discharge opening thereof when the door is in closed position to prevent the escape of fine lading.

6. A railway car having a hopper provided with a lading discharge opening, a hinged door for closing the opening, said door being provided with a continuously extending and inwardly projecting corrugation adjacent its side edges and the edge thereof remote from its hinge axis, and flexible means rigid with said corrugation for cooperating with portions of the hopper adjacent the discharge opening when the door is in closed position to prevent the escape of fine lading from the hopper.

7. A railway car having a hopper provided with a lading discharge opening, a hinged door for closing the opening, said door being provided adjacent the edge thereof remote from the hinge axis with a portion adapted to project into the lading discharge opening, and flexible means rigidly secured to the door and having a portion adapted to be interposed between the said portion of the door and the adjacent portion of the hopper when the door is in closed position, said portion of the flexible means being engageable with the adjacent portion of the hopper to prevent the escape of fine lading from the car.

8. A railway car having a hopper provided with a lading discharge opening, a hinged door for closing the opening, the edge of the door remote from its hinge axis being provided with a portion affording a recess to receive an adjacent portion of the hopper when the door is in closed position, and flexible means disposed within said recess and cooperable with the adjacent portion of the hopper when the door is in closed position to prevent the escape of fine lading from the hopper.

9. A railway car having a hopper provided with a lading discharge opening, a hinged door for closing the opening, the lower portion of the door being provided with an inwardly extending marginal flange adapted to overlap the outer face of the adjacent portion of the hopper and being further provided with an inwardly extending corrugation adapted to overlap the inner face of the said portion of the hopper, and a flexible plate rigidly secured to said corrugation and being cooperable with the said portion of the hopper when the door is in closed position to prevent the escape of fine lading from the hopper.

10. A railway car having a hopper provided with a lading discharge opening, a hinged door for closing the opening, and a flexible plate rigidly secured to the inner face of the door adjacent one of its marginal edges, said plate being provided with an offset portion engageable with an adjacent portion of the hopper when the door is in closed

position to prevent the escape of fine lading from the hopper.

11. A railway car having a hopper provided with a lading discharge opening, a hinged door for closing the opening, said hopper being provided adjacent the opening with a portion disposed in a plane substantially parallel with the plane of the closed door, and a flexible metallic plate rigidly secured to the door in overlapping relation to its inner face and adjacent one of its marginal edges, said plate being engageable with the said portion of the hopper when the door is in closed position for preventing the escape of fine lading from the hopper.

12. A railway car having a hopper provided with a lading discharge opening, a door for closing the opening hingedly connected along one of its edges to the hopper, and a plurality of flexible members secured to the inner face of the door adjacent the free edges thereof, each of said members extending substantially parallel with the edge of the door to which it is adjacent and the adjoining ends of the said members being mitered, said members being engageable with portions of the hopper bounding the discharge opening when the door is in closed position to prevent the escape of fine lading.

13. A railway car having a hopper provided with a lading discharge opening, a hinged door for closing the opening, a flexible member overlapping the inner face of the door adjacent one of its marginal edges, said member being adapted to engage a portion of the hopper when the door is in closed position to prevent the escape of fine lading from the hopper, said member being welded along its inner edge to the door.

14. A railway car having a hopper provided with a lading discharge opening, a hinged door for closing the opening, a flexible member overlapping the inner face of the door adjacent one of the marginal edges thereof, said member being adapted to engage a portion of the hopper when the door is in closed position to prevent the escape of fine lading from the hopper, and welding material deposited along the inner edge of the member for connecting the latter to the door, the welding material forming a seal between the member and the contiguous portion of the door.

15. A railway car having a hopper provided with a lading discharge opening, a hinged door for closing the opening, a flexible member overlapping the inner face of the door adjacent one of its marginal edges, said member being adapted to engage a portion of the hopper when the door is in closed position to prevent the escape of fine lading from the hopper, said member being provided with a plurality of apertures intermediate its edges, and welding material deposited in the openings for connecting the member to the door.

16. A railway car having a hopper provided with a lading discharge opening, a hinged door for closing the opening, a flexible member overlapping the inner face of the door adjacent one of its marginal edges, said member being adapted to engage a portion of the hopper when the door is in closed position to prevent the escape of fine lading from the hopper, said member being provided with a plurality of apertures intermediate its side edges, and welding material deposited in said openings and along the inner edge of the member for connecting the latter to the door, the welding material along the inner edge of the member forming a seal between the latter and the door.

17. A railway car having a hopper provided with a lading discharge opening, a hinged door for closing said opening, said door being provided with an inwardly projecting flange adapted to overlap the outer side of a portion of the hopper, and flexible means secured to the door inwardly of said flange, said means being engageable with the inner side of the said portion of the hopper when the door is in closed position to prevent the escape of fine lading from the hopper.

18. A railway car having a hopper provided with a lading discharge opening, a hinged door for closing said opening, said door being provided with a rigid portion and with a flexible portion, said portions being adapted when the door is in closed position to overlap opposite sides of a portion of the hopper adjacent the discharge opening thereof and said flexible means being engageable with said portion of the hopper.

19. A railway car having a hopper provided with a lading discharge opening, a hinged door for closing said opening, said door being provided with a marginal flange extending toward the hopper and with flexible means disposed inwardly of said flange, said flange and means when the door is in closed position being disposed on opposite sides of a portion of the hopper adjacent the discharge opening thereof and said means being in engagement with said portion of the hopper to prevent the escape of fine lading from the hopper.

20. A railway car having a hopper provided with a lading discharge opening, a hinged door for closing said opening, said door having flexible means provided with an offset portion adapted to project into the hopper, said portion being engageable with a portion of the hopper bounding the discharge opening thereof when the door is in closed position for preventing the escape of fine lading from the hopper.

In testimony whereof I affix my signature.
CYRUS HANKINS.