

July 18, 1933.

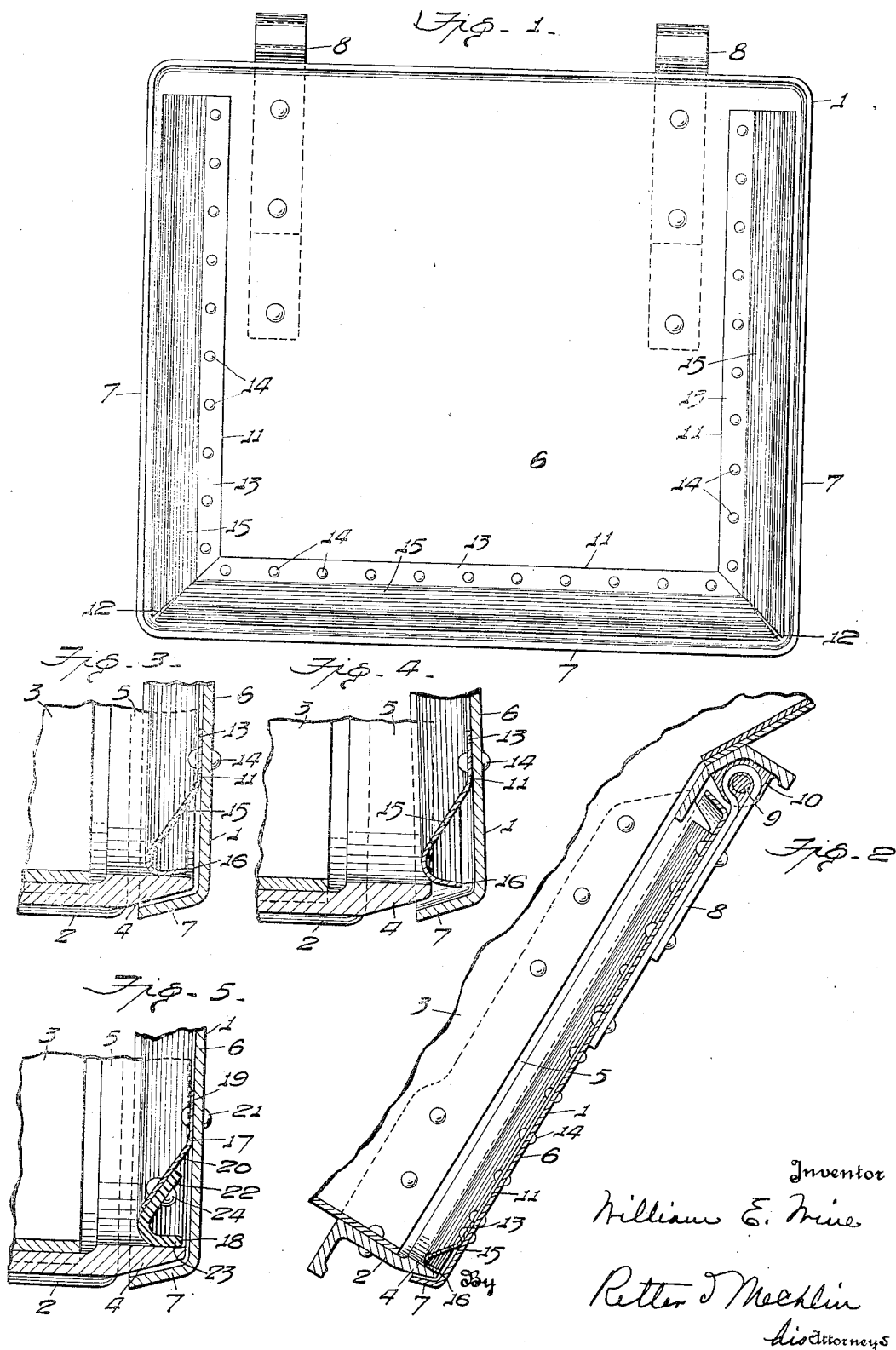
W. E. WINE

1,918,948

RAILWAY CAR

Filed March 18, 1931

2 Sheets-Sheet 1



July 18, 1933.

W. E. WINE

1,918,948

RAILWAY CAR

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2 Sheets-Sheet 2

Fig. 6.

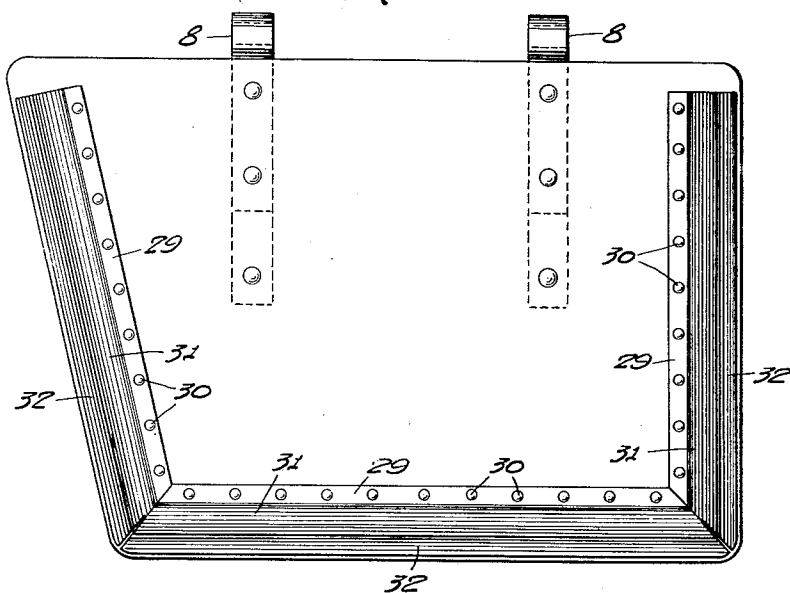


Fig. 7.

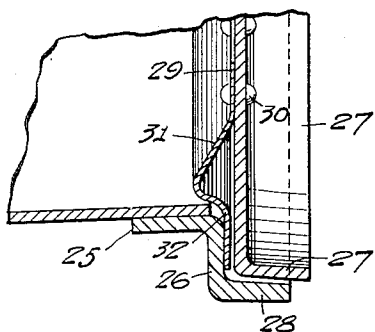


Fig. 9.

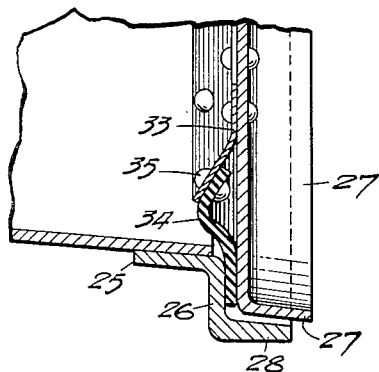


Fig. 8.

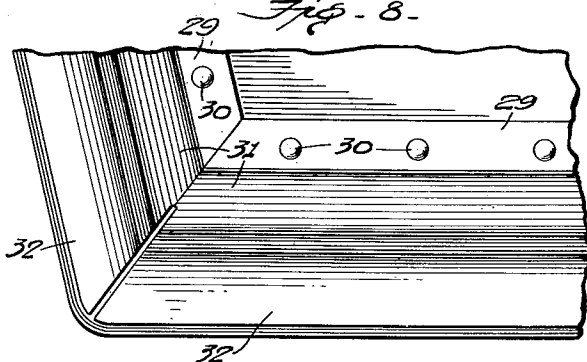
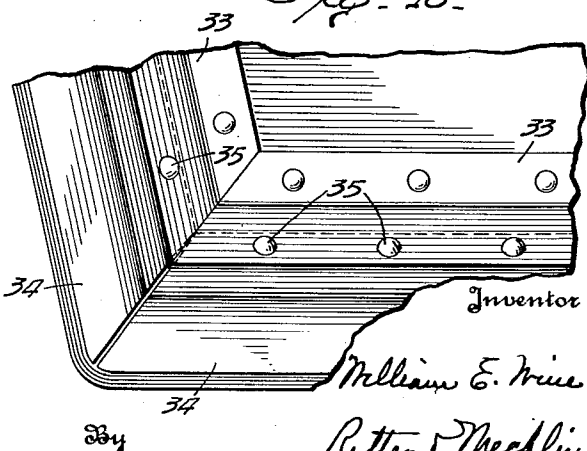


Fig. 10.



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UNITED STATES PATENT OFFICE

WILLIAM E. WINE, OF TOLEDO, OHIO

RAILWAY CAR

Application filed March 18, 1931. Serial No. 523,543.

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

Although cars of the hopper type are primarily designed for transporting granular lading it has been found, that as at present constructed, they are not suitable for shipping or transporting finely divided lading such as cement and the like. This is 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 thus leaving cracks or openings between the closed doors and portions of the hoppers bounding their lading discharge openings through which finely divided lading accidentally escapes from the car while in transit. It is the principal object of the invention to provide means forming a seal between the doors and adjacent portions of the hopper positively preventing the accidental escape of fine lading.

A primary feature of the invention consists in providing flexible means adapted to form a seal having a portion arranged so that it is subjected to the pressure of the lading within the hopper to maintain the means in sealing position.

Another feature of the invention consists in providing the hopper door with sealing means involving a flexible plate having a portion extending inwardly from the door adapted to be subjected to the pressure of the lading to maintain the means in sealing position.

A further feature of the invention consists in providing the sealing means with two longitudinally extending members, one of which is of greater rigidity than the other.

A still further feature of the invention consists in providing the door with sealing means involving two members one of which is secured to the door and the other of which is adapted to engage adjacent portions of hopper, the member secured to the door being of greater rigidity than the member engageable with the hopper.

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 a hopper door showing one form of my invention.

Figure 2 is a longitudinal vertical sectional view illustrating a portion of a hopper of a railway car and the co-acting door.

Figure 3 is an enlarged view of the lower portion of the construction shown in Figure 2.

Figure 4 is a view similar to Figure 3 showing the door in a position preparatory to assuming closed position.

Figure 5 is a view similar to Figure 3 illustrating a slightly modified form of the invention.

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

Figure 7 is an enlarged view similar to Figure 3 illustrating the modified form of the invention shown in Figure 6.

Figure 8 is an enlarged inside elevational view of the lower left-hand corner of the door shown in Figure 6.

Figure 9 is a view similar to Figure 7 illustrating another modification of the invention.

Figure 10 is a view similar to Figure 8 illustrating the modified form of the invention shown in Figure 9.

For the purpose of illustrating the form of the invention shown in Figures 1 to 5, inclusive, the door 1 is of a type adapted to be applied to a cast metal door frame 2 of the type disclosed in the patent to William E. Wine No. 1,705,147 dated March 12, 1929. This door frame is rigidly secured to adjacent portions of the hopper sheets 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. It may advantageously be hinged to the car by two

hinge straps 8 secured to the outer face of the door and formed to receive a pin 9 mounted in lugs 10 formed integrally with the upper portion of the door frame.

5 A plurality of flexible strips 11 are arranged on the door in overlapping relation to its inner face and adjacent its free edges. Each strip preferably extends continuously along the edge of the door to which it is adjacent and the adjoining ends of the strips are preferably mitred as at 12. In the principal form of the invention shown in Figures 1 to 4 inclusive, of the drawings each of the strips 11 is in the form of a flexible metallic plate and has a portion 13 rigidly secured to the inner face of the door by rivets 14. Extending inwardly from this portion of the strip is a plate portion 15 which is disposed at an acute angle to the inner face of the door and terminates in a portion 16 extending toward the door in spaced relation to the adjacent flange 7 of the latter. The portions 16 of the strips are so disposed that when the door is 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 that they will intimately and positively contact with the latter when the door is closed.

By arranging the portions 15 of the strips so that they extend inwardly from the door at an acute angle thereto it will be appreciated that they will be subjected to the pressure of the lading within the car. This pressure acting on the portions 15 tends at all times to maintain the portions 16 of the strips in sealing engagement with the hopper. It will thus be appreciated that effective means is provided forming a seal between adjacent portions of the hopper and door to prevent the escape of fine lading notwithstanding that the doors do not accurately fit the hoppers due to either improper mounting or deformation of the doors.

The form of the invention illustrated in Figure 5 is similar to that shown in Figures 1 to 4, inclusive, but the sealing strips instead of being formed of a single piece of metal are formed with two longitudinally extending members 17 and 18. The member 17 is formed of sheet metal and has portions 19 and 20 respectively corresponding to portions 13 and 15 of the strips 11 shown in the principal form of the invention. The portion 19 is secured to the door by rivets 21 while the portion 20 extends inwardly from the door at an acute angle thereto.

The member 18 is of greater flexibility than the member 17 and is preferably formed from non-metallic material such as rubber belting and the like. It is preferably pre-formed by any suitable means such as a die or the like so as to have angularly disposed portions 22 and 23. The portion 22 is

adapted to be secured to the portion 20 of the member 17 by rivets 24 while the portion 23 is adapted to extend inwardly toward the door and engage portions of the hopper bounding the lading discharge opening when the door is in closed position. It will, of course, be appreciated that the member 18 may be of such flexible material that it is not necessary to pre-form it before being secured to the member 17 but in this event such material will of its own accord assume the shape shown in Figure 5 of the drawings when the door is moved to closed position.

The strip shown in Figure 5 being of the same configuration as the strips shown in Figures 1 to 4, inclusive, will function in precisely the same manner as those strips, that is, the pressure of the lading acting on the strip will tend to force the portion 23 thereof into more intimate engagement with adjacent portions of the hopper. By providing the strip shown in Figure 5 with the member 18 which is of greater flexibility than the member 17 it will yield more readily than the member 17 and thereby more easily conform to the surfaces of the hopper which it is adapted to engage.

In Figures 6 to 8, inclusive, the invention is shown as applied to the door of a hopper of a different construction from that illustrated in Figures heretofore described. In this form the hopper instead of being provided with a door frame is formed with a Z-shaped reinforcing member 25 having a portion 26 disposed in a plane substantially parallel with that of the closed door forming a seat therefor. The door for closing the lading discharge of a hopper of this type is preferably formed with outwardly projecting marginal flanges 27 which are adapted to be disposed closely adjacent to similar flanges 28 on the hopper reinforcing member.

To provide efficient sealing means for this type of door and hopper the strips are provided with portions 29 secured by rivets 30 to the door, and portions 31 extending at acute angles to the inner face of the door which terminate in inwardly and laterally extending portions 32, the extremities of which are adapted to be interposed between the inner face of the door and the door seat portions 26 of the reinforcing member 25. The portions 31 of the strips being arranged so as to be subjected to the pressure of the lading within the car will tend to force or crowd the portions 32 of the strip into the space between the door and door seat portions and thereby form an effective seal against the escape of fine lading.

In Figures 9 and 10 sealing strips of the character illustrated in Figure 5 are shown as applied to the type of door and hopper shown in Figures 6 to 8, inclusive. These

strips are provided with two longitudinally extending members 33 and 34 respectively, the member 33 being of greater rigidity than the member 34 and being secured to the door.

5 The member 34 is secured by rivets 35 to the member 33 and being of a configuration similar to portions 32 of the members 31 has a portion adapted to be interposed between the door and door seat portions of the hopper. As the member 33 has a portion inclined with respect to the door it will be appreciated that this strip will function in precisely the same manner as that shown in Figures 6 to 8, inclusive.

15 From the foregoing it will be perceived that I have provided simple and efficient means for effectively sealing the lading discharge opening of railway hopper cars of various types 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 means forming a seal between adjacent portions of the door and hopper when the door is in closed position, said means involving a flexible metal plate having a portion extending inwardly from the inner face of the door and adapted to be subjected to the pressure of the lading for maintaining said means in sealing position.

2. A railway car having a hopper provided with a lading discharge opening, a hinged door for closing the opening, and means rigidly secured to the door forming a seal between adjacent portions of the door and hopper, said means involving a flexible metal plate having a portion extending inwardly from the inner face of the door at an acute angle thereto, said portion being adapted to be subjected to the pressure of the lading for maintaining said means in sealing position.

3. A railway car having a hopper provided with a lading discharge opening, a hinged door for closing the opening, and flexible means forming a seal between adjacent portions of the door and hopper, said means involving a plate portion rigidly secured to the inner face of the door and a plate portion extending inwardly therefrom, said last-named portion being arranged so as to be subjected to the pressure of the lading to maintain said means in sealing position.

4. A railway car having a hopper provided with a lading discharge opening, a hinged door for closing the opening, and flexible means adapted to form a seal between adjacent portions of the door and hopper, said means involving two longitudinally extending members, one of said members being of greater flexibility than the other of said members and one of said members having a portion extending at an angle to the inner

face of the door adapted to be subjected to the pressure of the lading for maintaining said means in sealing position.

5. A railway car having a portion provided with a lading discharge opening, a hinged door for closing the opening, and means forming a seal between adjacent portions of the door and hopper, said means involving two longitudinally extending members, one of said members being secured to the door and the other being engageable with adjacent portions of the hopper, the member secured to the door being of greater rigidity than the other of said members.

6. A railway car having a hopper provided with a lading discharge opening, a hinged door for closing the opening, and means forming a seal between adjacent portions of the door involving two longitudinally extending connected members, one of said members being secured to the inner face of the door and the other of said members being engageable with adjacent portions of the hopper, the member secured to the door being of greater rigidity than the other of said members and having a portion extending inwardly from the inner face of the door adapted to be subjected to the pressure of the lading for maintaining the other of said members in engagement with the hopper.

7. A railway car having a hopper provided with a lading discharge opening, a hinged door for closing the opening, and means forming a seal between adjacent portions of the door, said means comprising a flexible metallic member secured to the door and a flexible non-metallic member engageable with the hopper.

8. A railway car having a hopper provided with a lading discharge opening, a hinged door for closing the opening, and means adapted to form a seal between adjacent portions of the door and hopper, said means comprising a flexible metal plate secured to the door having a portion disposed at an acute angle thereto and an offset portion engageable with adjacent portions of the hopper.

9. A railway car having a hopper provided with a lading discharge opening, a hinged door for closing the opening, and means adapted to form a seal between adjacent portions of the door and hopper, said means comprising a flexible metal plate secured to the inner face of the door and having a plurality of offset portions, one of said portions extending inwardly from the door and the other of said portions extending toward the door and adapted to engage adjacent portions of the hopper, said first-named portion being arranged so as to be subjected to the pressure of the lading to maintain said second-named portion engageable with the hopper.

10. A railway car having a hopper pro-

vided with a lading discharge opening, a hinged door for closing the opening, and means adapted to form a seal between adjacent portions of the door and hopper, said means comprising two longitudinally extending members, one of said members being secured to the door and the other being engageable with adjacent portions of the hopper, the member secured to the door being of greater rigidity than the other of said members and being disposed at an acute angle to the door and the member engageable with the hopper extending in a direction toward the door.

11. A railway car having a hopper provided with a lading discharge opening, a hinged door for closing the opening, the hopper being provided with door seat portions disposed in a plane substantially parallel with the plane of the closed door, and means adapted to form a seal between adjacent portions of the door and hopper, said means comprising a flexible metal plate having a portion interposed between the door and the door seat portions of the hopper and a portion extending inwardly at an acute angle to the door.

12. A railway car having a hopper provided with a lading discharge opening, a hinged door for closing the opening, the hopper being provided with door seat portions disposed in a plane substantially parallel with the plane of the closed door, and means adapted to form a seal between adjacent portions of the door and hopper, said means involving a flexible metal plate having a portion extending inwardly from the door and a portion adapted to be interposed between the inner face of the door and the door seat portions of the hopper, said inwardly extending portion being adapted to

be subjected to the pressure of the lading to maintain said means in sealing position.

13. A railway car having a hopper provided with a lading discharge opening, a hinged door for closing the opening, the hopper being provided with door seat portions disposed in a plane substantially parallel with the plane of the closed door, and means adapted to form a seal between adjacent portions of the door and hopper, said means comprising two longitudinally extending members, one of said members being rigidly secured to the door and the other of said members having a portion adapted to be interposed between the inner face of the door and the door seat portions of the hopper, said first-named member being of greater rigidity than said second-named member.

14. A railway car having a hopper provided with a lading discharge opening, a hinged door for closing the opening, the hopper being provided with door seat portions disposed in a plane substantially parallel with the plane of the closed door, and means adapted to form a seal between adjacent portions of the door and hopper, said means comprising two longitudinally extending members, one of said members being rigidly secured to the door and the other of said members having a portion adapted to be interposed between the inner face of the door and the door seat portions of the hopper, said first-named member being of greater rigidity than said second-named member and having a portion extending inwardly from the door adapted to be subjected to the pressure of the lading to maintain said means in sealing position.

WILLIAM E. WINE.

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