Dec. 10, 1935. F. V. DE HAVEN 2,023,873

RAILWAY CAR DOOR TRACK

Filed May 19, 1930 2 Sheets-Sheet 1

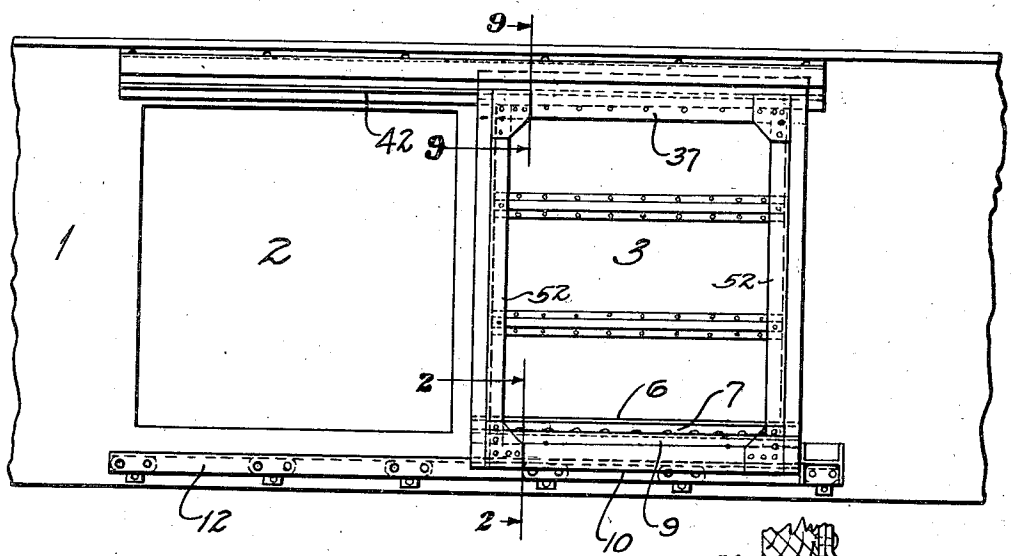


Fig. 1.

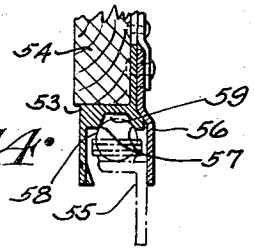


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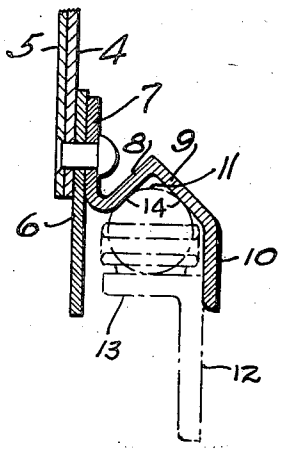


Fig. 2.

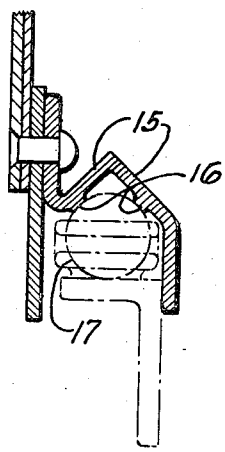


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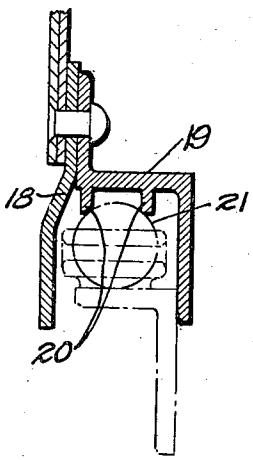


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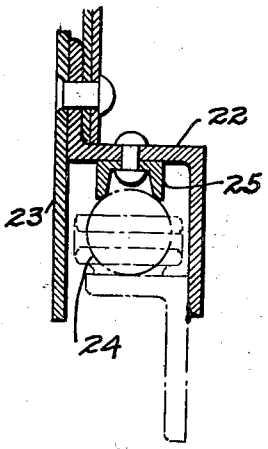


Fig. 5.

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Dec. 10, 1935. F. V. DE HAVEN 2,023,873

RAILWAY CAR DOOR TRACK

Filed May 19, 1930 2 Sheets-Sheet 2

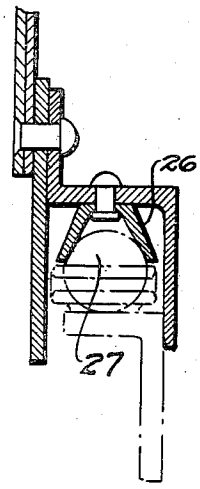


Fig. 6.

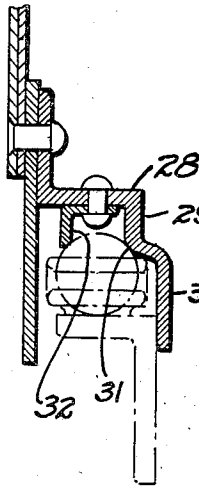


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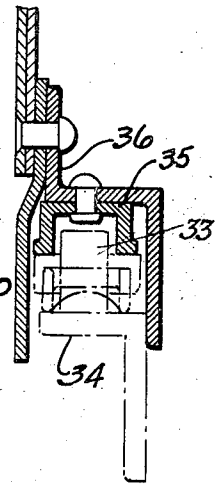


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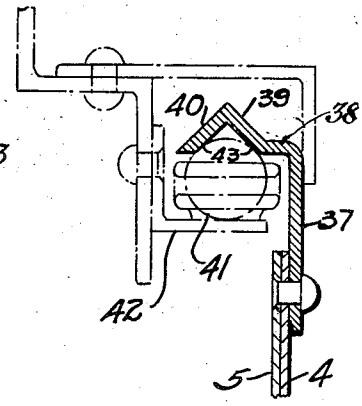
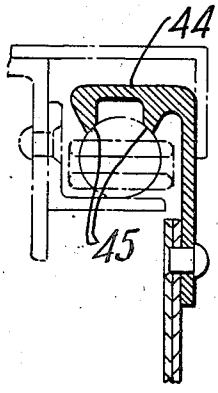
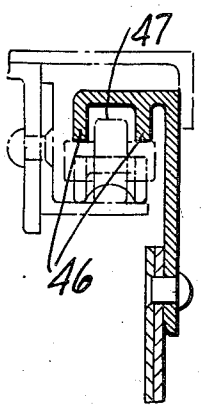


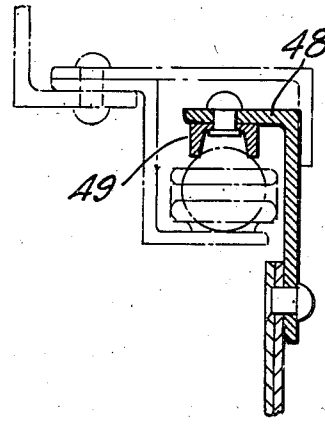
Fig. 9.

Fig. 10.

Fig. 11.







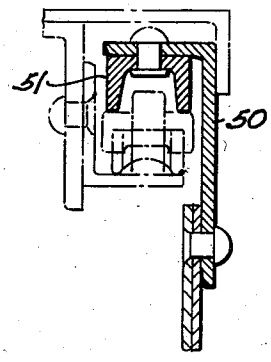
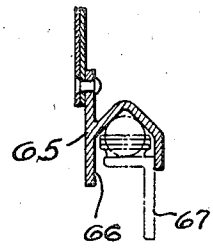


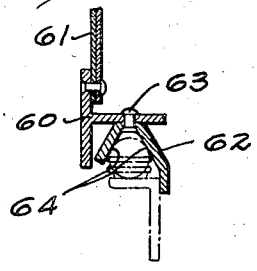
Fig. 16.

Fig. 15.

Fig. 12.

Fig. 13.





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UNITED STATES PATENT OFFICE

2,023,873

RAILWAY CAR DOOR TRACK

Floyd V. De Haven, Chicago, Ill., assignor to Chicago Railway Equipment Company, Chicago, Ill., a corporation of Illinois

Application May 19, 1930, Serial No. 453,693

4 Claims. (Cl. 16—96)

My invention relates to railway car doors and particularly to doors of the type mounted on roller or ball bearings.

The main object of my invention is to provide a door having a horizontal reinforcing or bracing or framing device extending from end to end of the door and providing spaced track-ways for engaging the anti-friction bearing which supports the door through the horizontal framing device. It is also desired to protect the anti-friction element and its carrier track from the weather and from dirt and from injury by contact with external objects.

These and other detailed objects of my invention are attained by the structures illustrated in the accompanying drawings in which—

Figure 1 is a partial side view of a railway box car having a sliding door including my invention.

Figure 2 is a vertical transverse section taken on the line 2—2 of Figure 1.

Figures 3 to 8, and 14 to 16, inclusive, are similar sections illustrating modifications of my invention.

Figure 9 is a vertical transverse section taken on the line 9—9 of Figure 1.

Figures 10 to 13, inclusive, are similar sections illustrating modifications.

The box car side wall 1 may be of any usual construction, steel or wood or composite, and is provided with the usual door opening 2. The sliding door 3 may be of any desired construction, steel or wood or composite. In the detail sections I show a door having its upper and lower portions comprising steel sheets 4 which may or may not have reinforcing elements 5 extending along their edges.

In Figure 2 I illustrate a two part framing, housing and track-way device overlapping and secured to the lower edge of the door. One of the members of the device is a vertically disposed flat plate 6, the upper portion of which overlaps the lower edge of the door sheet 4 and the lower portion of which extends downwardly below the door sheet 4 forming an extension thereof.

The other member of the device has a flange 7 overlapping the upper portion of plate 6 and the lower edge of the door and extending outwardly and upwardly, as indicated at 8, and then outwardly and downwardly, as indicated at 9, and then downwardly, as indicated at 10. This member has a general Z like shape with one of the flanges secured to the door and the other flange paralleling plate 6 and the web being distorted to form an inverted V. The assembled device has a general inverted U shape and is secured to the vertical frame members 52 of the door and constitutes a rigid bottom frame member. It also forms a housing for receiving the anti-friction element 11 and upper portion of an angle 12, the horizontal leg 13 of which forms a carrier track for the ball-bearing which supports the door.

The inverted V portion 8—9 provides spaced track-ways 14 for engaging spaced bearing circles, on the ball, of smaller radius than the radius of the ball whereby, when the door is opened or closed, the movement of the ball along its carrier track will be greater than the relative movement of the ball and door. This avoids the ball reaching the end of its trackway on the door before the door has reached the limit of its movement, which would result in sliding movement of the ball on the elements engaged thereby, and this arrangement also avoids teetering of the door on one of the balls due to the failure of the balls to move to points sufficiently close to the ends of the door. It will be understood that these undesirable results are likely to attend the ordinary bearing arrangement where the radius of the supported portion of the anti-friction element is the same as the radius of its supporting portion.

Figure 3 illustrates a very similar structure except that the inclined elements 15 have ribs 16 provided on their lower surfaces forming raised track-ways for engaging the ball 17. This structure has the advantage of maintaining a desired spacing of interengaging surfaces on the ball and track-ways, irrespective of wear on the latter, and also has the advantage of providing a restricted track-way which is readily defined for inspection or machining purposes. The ribs 16 are so arranged that the shape may be rolled in the usual manner whereby this main portion of the device may be produced in the most desirable form.

In the modification illustrated in Figure 4, the inner plate element 18 is offset inwardly of the door and the outer Z member of the device does not have its web 19 deformed to form an inverted V. It is provided with spaced track-ways by means of the depending ribs 20.

In the construction illustrated in Figure 5, I use a standard rolled Z shape 22 which cooperates with the flat vertical plate 23 to form an inverted U shape housing. Preferably, spaced track-ways for ball 24 are provided by securing an inverted channel shape 25 to the lower face of the Z web.

The structure shown in Figure 6 is very similar to that illustrated in Figure 5 but it utilizes a differently shaped channel 26 with inclined flanges, the sides of which engage the ball 27 whereas channel 25 in Figure 5 shows the ends of the flanges engaging the ball 24.

In the construction illustrated in Figure 7, the Z member 28 has its outer flange 29 offset in part, as indicated at 30, to provide one track-way 31. The other track-way is provided by a separately formed angle 32 secured to the web of the Z.

In the construction shown in Figure 8, I illus-

trate a form of my invention which utilizes a roller bearing element 33 in place of the ball-bearing elements previously described. The middle portion of the roller rides on the carrier track 34 and the end portions of the roller are reduced in diameter and support the door device through spaced track-ways provided by the flanges of the channel 35 secured to the web of the Z 36.

All of the above described details are designed particularly for application to the bottom of the car door but my invention is also adapted for application to the top of the door.

In Figure 9 I show a framing and track-way forming device having a main vertical leg 37 overlapping and secured to the upper portion of the door. This device has an inwardly extending flange portion 38—39—40 which extends over the ball 41 and its supporting carrier track 42 and provides track-ways 43 very similar to the track-ways indicated in Figure 2.

Figure 10 illustrates a modification in which the upper portion of the framing device 44 is horizontal and two depending ribs 45 form the track-ways for engaging the supporting ball.

Figure 11 illustrates a similar structure in which the ribs 46 are arranged to ride on the reduced ends of rollers 47.

In Figure 12 the framing device consists of a standard angle iron 48 and the track-ways are provided by a channel 49 secured to the horizontal leg of the angle. This is similar to the arrangement shown as applied to the bottom of the door in Figure 5.

Figure 13 illustrates a similar arrangement of an angle 50 and a channel 51 arranged for a roller bearing instead of a ball-bearing.

Figure 14 illustrates a modification of the lower track member in which I show a Z bar framing member 53 having an upright flange applied to the outer face of the wooden door panel 54 and having a depending flange forming the inner guide for engaging the track 55. A separate plate 56 is secured to the upstanding flange of the Z and engages the outer face of the track 55. The spaced track-ways 57 for engaging the anti-friction supporting element 58 are provided by forming a depression 59 in the relatively thick horizontal web of the Z.

In Figure 15 I illustrate a T bar 60 applied to the lower edge of the door body panel 61 with its leg extending horizontally outwardly from the door. A separate angular member 62 is rivetted to the leg of the T at 63 and forms the spaced track-ways 64 for riding on the anti-friction bearing element.

Figure 16 illustrates a modification in which the reinforcing member 65 resembles in part the structure shown in Figure 2 and also resembles the structure shown in Figure 15 in that it has a depending element 66 on the inside of the track 67. In this form of my invention the entire framing device consists of a single element which can be rolled or otherwise formed to the shape shown.

In all of these forms of my invention, the lower edging or framing structures described in detail will, preferably, be directly connected to and cooperate with other framing members such as vertical Z bars, as indicated at 52, (see Figure 1) to provide a rigid door structure.

In this connection, I here direct attention to my copending applications, Serial Nos. 453,694 and 453,695 filed herewith, and illustrating various other arrangements of door framing and track forming devices embodying some of the features described and illustrated in this specification.

While I consider the use of the plate members 6, 18, and 23, etc. in combination with the Z shape members as the preferred construction forming a housing for enclosing the carrier track and anti-friction element, it will be understood that this complete structure is not essential to the embodiment of all of the elements of my invention and some of the desirable features may be retained without the use of these plates. Attention is directed also to the fact that the reinforcing members may be formed by casting, forging or bending, or machining from a solid bar, as well as by rolling although the latter is preferable and usually would be the most economical for my purpose.

Various other modifications in the details of my invention may be made without departing from the spirit thereof and I contemplate the exclusive use of such variations as come within the scope of my claims.

I claim:

1. In a railway car door, a door panel, a flat substantially vertically disposed plate with its upper portion overlapping and secured to said panel and with its lower portion extending downwardly from said panel, another member having a vertical flange overlapping said plate upper portion and extending from the lower edge of said flange outwardly and upwardly and then outwardly and downwardly to form an inverted V, then downwardly, substantially parallel with said plate member, whereby a housing is formed having generally an inverted U shape and serving to reinforce the door across its lower edge, said housing also providing an angular upper portion forming spaced track-ways for an anti-friction supporting element.

2. A structure as set forth in claim 1 in which said track-ways are in the form of integral ribs on said angular portion.

3. In a railway car door, a downwardly projecting flat element, a member having a vertical flange overlapping and secured to the door but spaced above the lower portion of said element, said member extending from the lower edge of said flange outwardly away from the side of the door and then downwardly substantially parallel with said portion, said member being of substantially uniform section throughout its length and extending from front to back of the door to reinforce the same and also to form with said element a housing having an inverted U shape, the outwardly extending portion of said member being shaped to form spaced trackways substantially throughout its length for an anti-friction supporting element.

4. A sliding door framing member of rolled structure having a uniform section from end to end comprising a general Z-shape, the web of the Z consisting of relatively inclined portions forming a downwardly facing recess between them with rolled longitudinal ribs extending downwardly from the sides of the recess, one of the flanges of the Z extending vertically upwardly at one side of said web and having a flat exterior to engage a door plate to which the member is applied, and the other flange of the Z extending vertically downwardly at the other side of said web to form the side of a support housing, the opposite lateral edges of said member terminating respectively in the planes of said flanges.

FLOYD V. DE HAVEN.