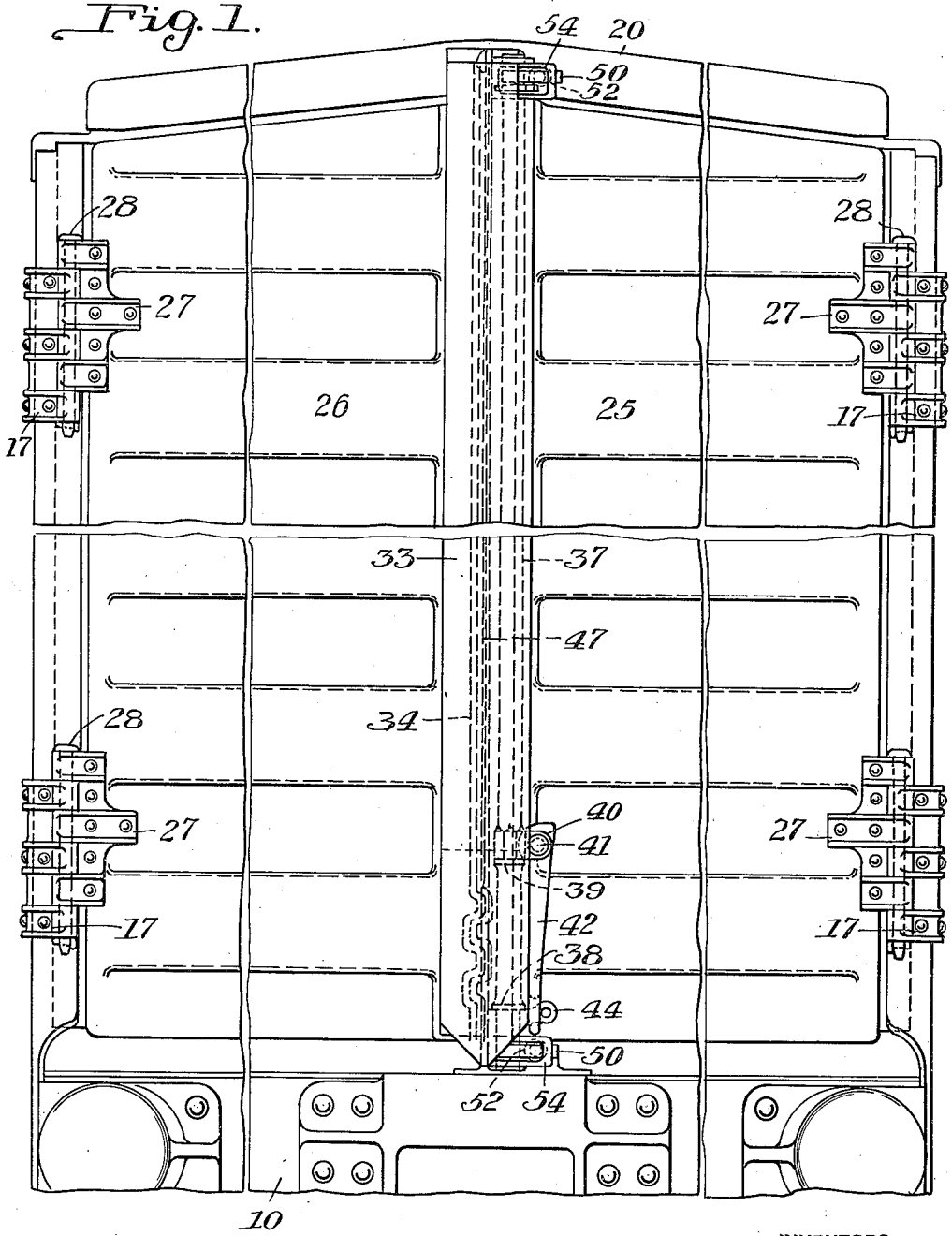
July 10, 1928. 1,676,426

A. CHRISTIANSON ET AL

CAR DOOR STRUCTURE

Filed Sept. 2, 1926 4 Sheets-Sheet 1

Fig. 1.



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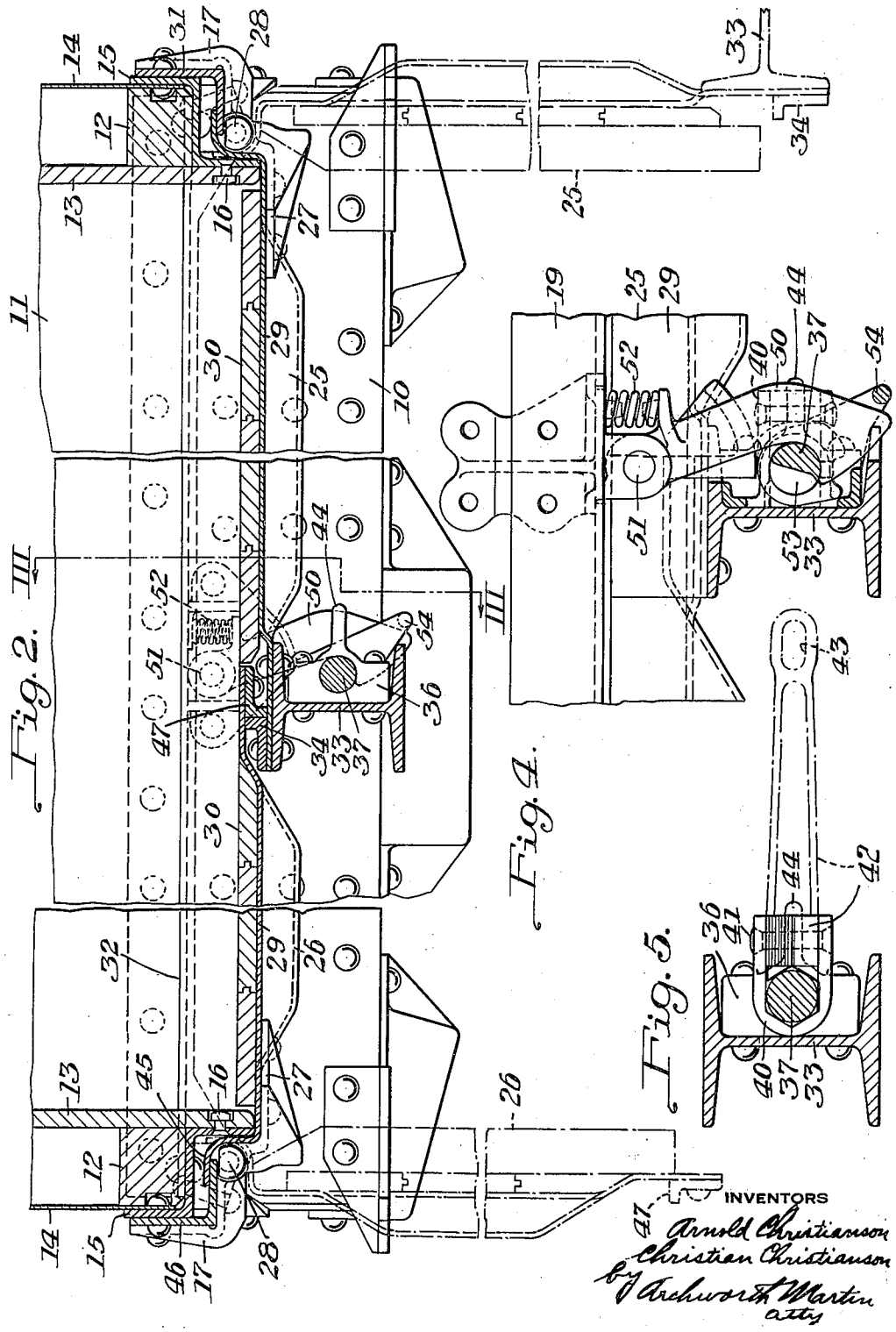


Fig. 2.

Fig. 4.

Fig. 5.

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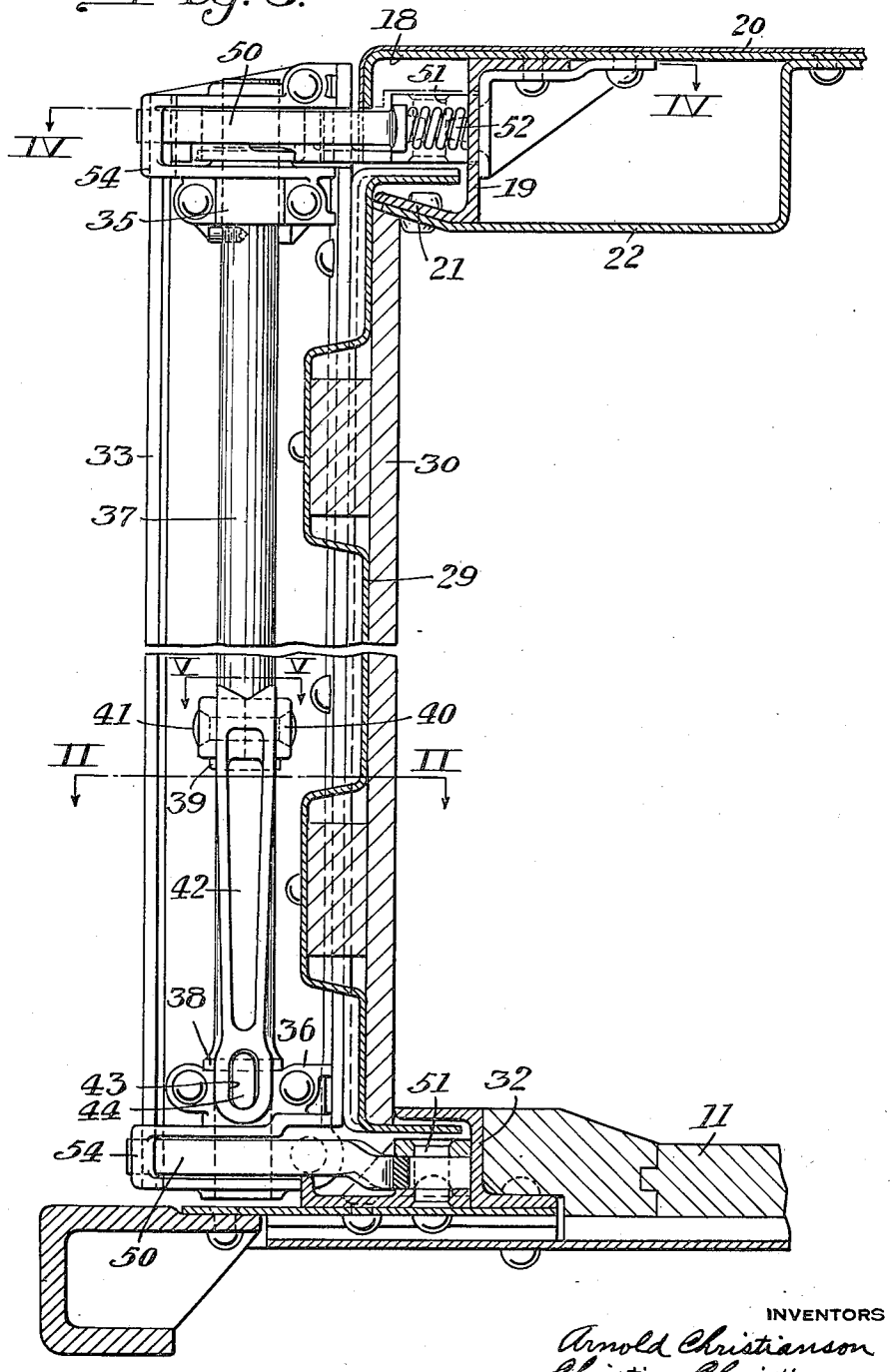
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Fig. 3.



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Fig. 7.

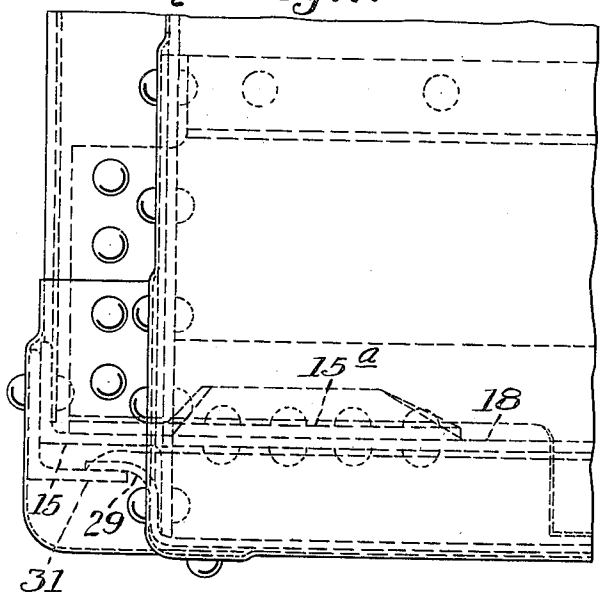


Fig. 6.

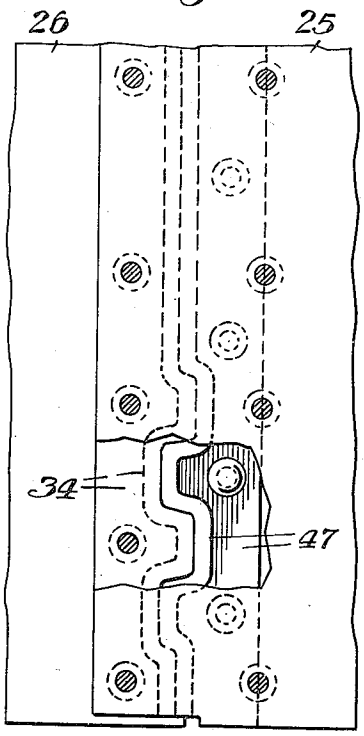
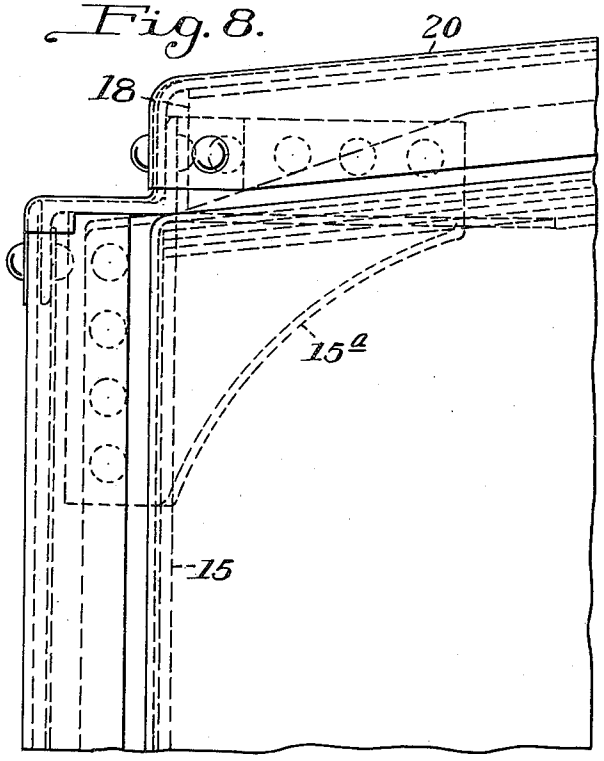


Fig. 8.



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UNITED STATES PATENT OFFICE.

ARNOLD CHRISTIANSON AND CHRISTIAN CHRISTIANSON, OF HAMMOND, INDIANA.

CAR-DOOR STRUCTURE.

Application filed September 2, 1926. Serial No. 133,147.

Our invention relates to car door structures and is particularly applicable to railway box cars wherein it is desired to provide end doors.

Heretofore, in the manufacture of box cars having end doors, it has been difficult to provide doors of sufficient size relative to the end of the car, without seriously detracting from the strength of the car body.

One object of our invention is to provide a door of such form that it may extend substantially the full width and height of the car body and will be of such form that it will serve to support the car body against diagonal strains, and also have sufficient resistance to thrusts imparted thereto in a direction longitudinally of the car.

Another object of our invention is to provide a car door structure of such form that the joints between the door and the car body are sealed against the entry of moisture.

Still another object of our invention is to provide a door having an improved form of fastening.

A further object of our invention is to simplify and improve generally the structure of car doors.

One form which our invention may take is shown in the accompanying drawing, wherein Figure 1 is an end elevational view of a portion of a railway car embodying our invention; Fig. 2 is a view taken on the line II—II of Fig. 3, but with the latch lever removed; Fig. 3 is a view taken on the line III—III of Fig. 2; Fig. 4 is a view taken on the line IV—IV of Fig. 3; Fig. 5 is a view taken on the line V—V of Fig. 3; Fig. 6 is an elevational view of a portion of the apparatus of Fig. 1, on an enlarged scale; Figs. 7 and 8 are plan and elevational views respectively, on an enlarged scale, of a portion of the structure of Fig. 1.

The car body is provided with an end sill 10 and a floor 11, the floor 11 being shown more clearly in Fig. 3. Corner posts 12 extend from the floor to the roof of the car and have inner walls 13 secured thereto. Outer walls 14 are held in place against the outer face of the corner posts 12 and are secured to Z bars 15 that are in turn fastened to the liner or wall members 13, by means of bolts 16. Hinge members 17 of angular form, as shown more clearly in Fig. 2, are riveted to the Z bars 15, and the side plates 14.

The upper ends of the Z bars 15 are riveted to the gusset plates 15^a, as shown more clearly in Figs. 7 and 8 and these gusset plates are in turn riveted to an angle plate 18 that forms the upper forward portion of the car body. A bar 19 of approximately Z form is secured to the car roof 20 and has its flange 21 extending substantially the full width of the car to catch and drain away moisture which may enter past the edges of the car doors, and prevent such moisture from entering the car. A strengthening plate 22 is riveted to the car roof and to the flange 21 and extends substantially the full width of the car.

Doors 25 and 26 are each provided with hinge members 27 that are pivotally connected to the hinge members 17 by means of pintles 28.

The door 25 is composed of a face plate 29 having a wooden lining 30, as shown more clearly in Figs. 2 and 3. The plate 29 is dished at intervals to provide increased strength. The plate 29 extends past the hinge members 27 and behind one flange of an angle bar 31 (Fig. 2) that extends from the top to the bottom of the door, so that moisture cannot readily enter the car past the outer edge of the door.

As shown more clearly in Fig. 3, the plate 29 has its upper edge inturned to overlap the flange 21 of the Z bar 19 and its lower edge is inturned beneath one flange of a Z bar 32 which extends across the car at its floor line. The overlapping effect thus produced at the top and bottom edges of the door prevents rain or snow from entering the car at such points.

An I-beam 33 is secured to the inner edge of the plate 29 and extends the full length of the door 25, and an angle bar 34 is riveted to the plate 29 and one flange of the I-beam 33. An upper bearing 35 and a lower bearing 36 are secured to the I-beam 33 by rivets or the like, as shown more clearly in Figs. 3 and 5. A shaft 37 is rotatably supported in the bearings 35 and 36 and is flanged at 38 (Fig. 3) so that it will be supported in proper vertical position by the bearing 36. The shaft 37 is of hexagonal form at an intermediate point, as shown in Fig. 5.

The shaft 37 is provided with a second flange or annular rib 39 (Fig. 1) which supports a yoke member 40 that partially surrounds the shaft 37 and carries a pin 41 that serves as a pivot for an operating lever 42. The outer end of the lever 42 is provided

with an opening 43 (Fig. 5) through which a perforated lug or eye 44 extends when the lever is in lower or locking position. The lug 44 is secured to the I-beam and the perforation therein serves to hold a seal that will prevent movement of the lever 42 to operative position without detection. The lever 42 is provided with a V notch that engages the angle of the hexagonal portion of the shaft 37 when the lever is in lowered position as shown in Fig. 1 to prevent rotation of the shaft 37 independently of the handle 40 and which will engage such angle of the shaft when the lever is moved to the position shown in dotted lines in Fig. 5, so that the shaft 37 can be rotated upon movement of the lever in a horizontal plane. The lever 42 is so formed that its V notch will not have operative engagement with the shaft 37 when the lever is in the intermediate position indicated by dotted lines in Fig. 5. This arrangement permits of the shaft 37 being given rotative movement for a given distance—corresponding to the horizontal range of movement of the lever 42—when the lever is in raised position, whereupon the outer end of the lever may be lowered slightly and swung backward in a horizontal direction preliminary to again raising the outer end thereof, and effecting further rotative movement of the shaft 37.

The door 26 is provided with an outer vertical flange 45 as shown more clearly in Fig. 2, which extends behind an angle bar 46 that is secured to the Z bar 15, for the purpose of producing a sealing effect as in the case of flange on door 29 that extends behind the angle 31. The door 26 is also provided with top and bottom flanges corresponding to the upper and lower sealing flanges of the plate 29 of door 25, which flanges overlap the adjacent flanges of Z bars 19 and 32 of Fig. 3.

A vertically disposed angle bar 47 is secured to the door 26 so that it has abutting relation to the angle 34 of door 25, when the doors are closed.

Latches 50 are pivotally connected to the roof of the car and the end sill, respectively, by rivets 51, and are normally yieldably moved in a clockwise direction, as viewed in Figs. 2 and 3, by means of compression springs 52. The hooked outer ends of the latches 50 normally engage the shaft 37 which has cut out portions 53 opposite the latches as shown in Fig. 4. When the shaft 37 is given a half turn from the position shown in Fig. 4, the cut out portions 53 will permit the shaft to pass the latches and the door 25 to swing open, somewhat after the manner shown in Patent 1,499,155, to Andrew Christianson. In order to prevent accidental disengagement of the latch 50 from the shaft 37 when the parts are in the position shown in Fig. 4, I provide castings 54 of yoke form, which are secured to the I-beam 33. When the shaft 37 has been so turned that its cut out portions 53 permit some outward movement of the door 25, and the door is moved slightly toward open position, the yokes 54 will be carried clear of the latches 50 and the door 25 thereby permitted to be moved to completely open position. When the door 25 has been opened, the door 26 may also be swung open.

As shown more clearly in Fig. 6, the angle bars 34 and 47 that are carried by the doors 25 and 26 respectively have inter-engaging offset portions adjacent to their lower ends, so as to provide an inter-locking effect, when the doors have been closed, which will resist diagonal thrusts imposed upon the car body, since the abutting edges of the doors will be thereby held against relative vertical movement. Also, the sides of the car body are held against spreading, when the doors are closed, as shown more clearly in Fig. 2, by engagement of the flanges of the door plates 29 with the outer flanges of the Z-bars 15, in planes disposed at right angles to the direction of lateral strain, the doors being held against relative spreading movement by their bars 34 and 47 that also engage in a vertical plane extending longitudinally of the car body.

We claim as our invention:

1. The combination with a car body having an opening in one end thereof, of a pair of doors hingedly connected at their outer edges, to said body, and having inter-engaging portions at their inner edges, arranged to prevent relative vertical movement thereof.

2. The combination with a car body having an opening in one end thereof, of a pair of doors hingedly connected at their outer edges to said body and each having a bar secured to its inner edge in position to lie in abutting relation with the other bar, and the bars having inter-engaging portions which prevent relative vertical movement of the doors.

3. The combination with a car body having an opening in one end thereof, of a pair of doors hingedly connected at their outer edges to said body, and inter-engaging members on said doors for preventing relative vertical movement thereof.

4. The combination with a car body having an opening in one end thereof, of a pair of doors, means for movably connecting edges of said doors to the car body, and means for holding the adjacent edges of the doors against movement relative to one another in a direction parallel to said edges.

5. The combination with a car body having an opening in one wall thereof, of a pair of doors whose remote edges are movably attached to adjacent edges of the car body, and inter-engaging means on the adjacent

edges of said doors arranged to hold said edges against movement in a direction parallel to said edges, when the doors are closed.

6. The combination with a car body having an opening in one wall thereof, of a door movably attached at its outer edge to an adjacent portion of the car body, a bar secured to the inner face of the door at the inner edge thereof, a second bar, means for connecting said second bar to the car body at a point opposite to that at which the said door is connected thereto, in a position to fit within the angle formed by the inner face of the door and the first-named bar when the door is closed, and inter-engaging portions on said bars for preventing movement of the door in a direction parallel to the last named edge, when the door is closed.

7. The combination with a car body provided with an opening in one end thereof, of a pair of doors hingedly connected at their outer edges to said car body and each of a width greater than one-half of the opening, a bar secured to the inner face of one of said doors and a bar secured to the outer face of the other one of said doors, along adjacent edges of the said doors, the bars being disposed parallel to said edges and positioned to lie in a common plane and to overlap one another, when the doors are closed.

8. The combination with a car body provided with an opening in one end thereof, of a pair of doors hingedly connected at their outer edges to said car body, a bar secured to the inner face of one of said doors and a bar secured to the outer face of the other one of said doors, along adjacent edges of the said doors, the bars being disposed in a common plane and parallel to said edges and positioned to overlap one another, when the doors are closed, the said bars being provided with laterally offset inter-engaging portions on their adjacent edges.

In testimony whereof we the said ARNOLD and CHRISTIAN CHRISTIANSON have hereunto set our hands.

ARNOLD CHRISTIANSON.
CHRISTIAN CHRISTIANSON.