Jan. 27, 1931. B. W. KADEL 1,790,307

CAR DOOR ARRANGEMENT

Filed Jan. 26, 1923 2 Sheets-Sheet 1

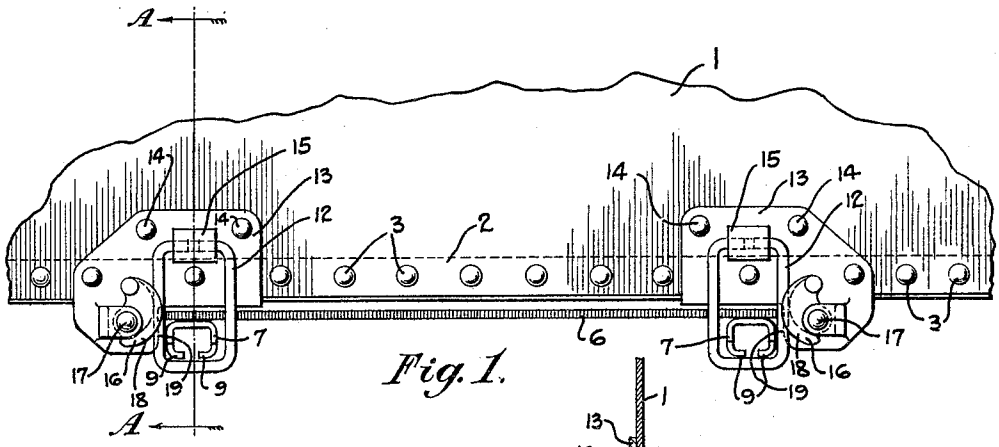


Fig. 1.

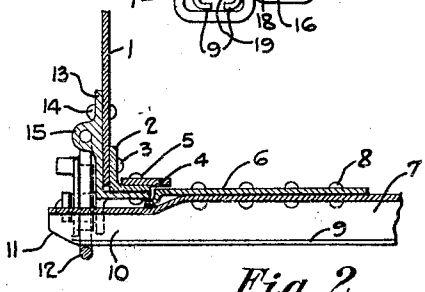


Fig. 2.

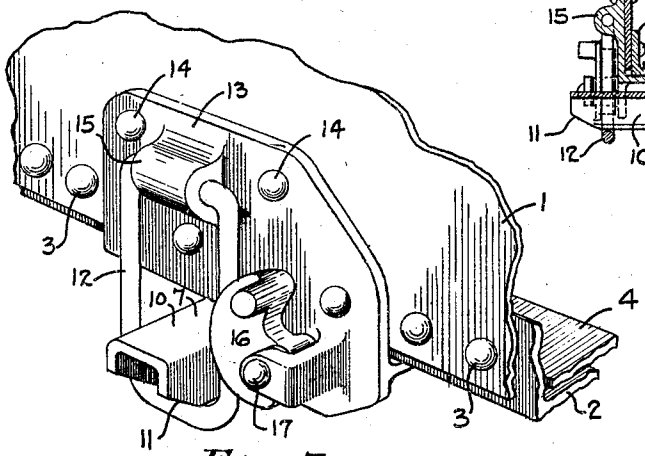


Fig. 3.

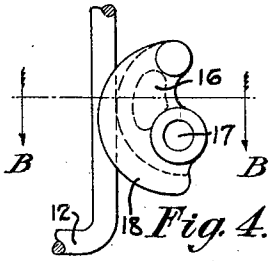


Fig. 4.

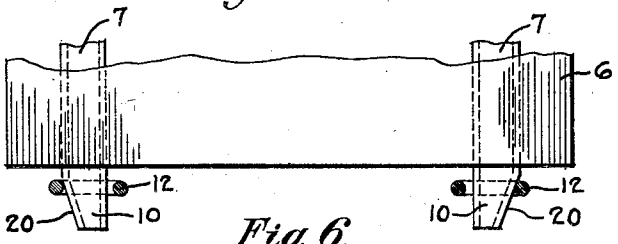


Fig. 6.

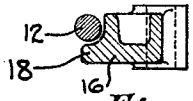


Fig. 5.

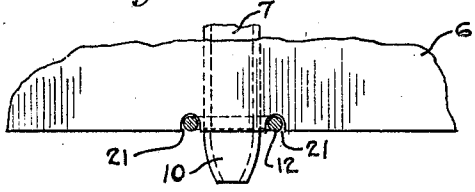


Fig. 7.

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CAR DOOR ARRANGEMENT

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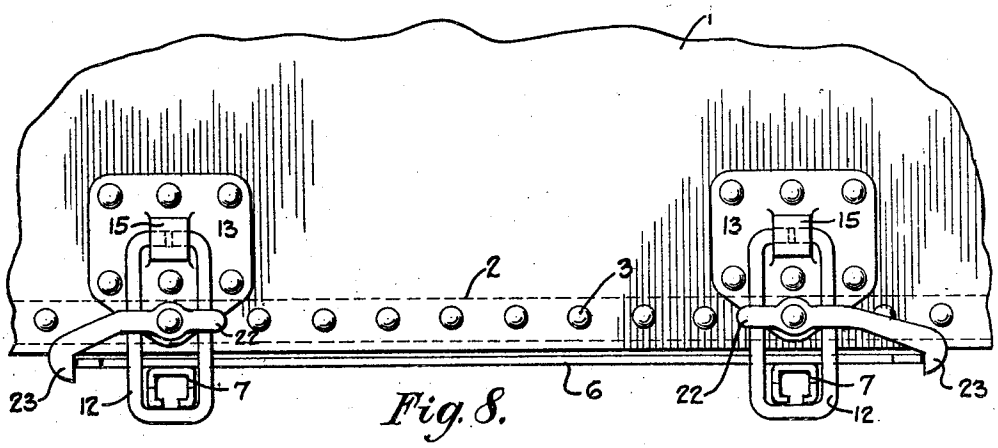


Fig. 8.

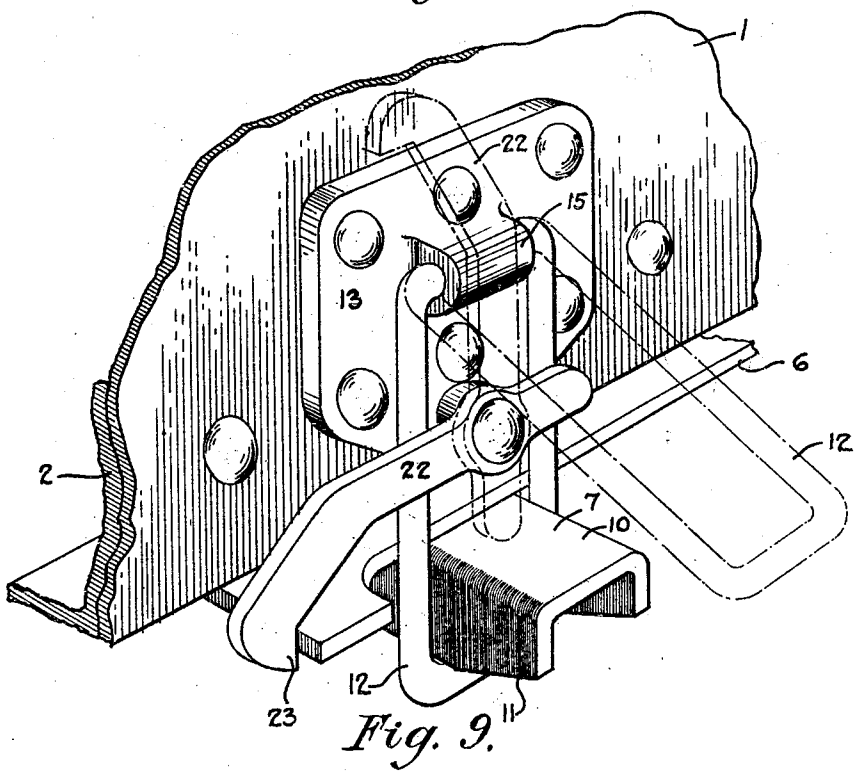


Fig. 9.

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UNITED STATES PATENT OFFICE

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CAR-DOOR ARRANGEMENT

Application filed January 26, 1923. Serial No. 615,154.

This invention relates to railway cars and has among its objects to provide improvements in door securing and supporting mechanisms. Another object is to provide a door supporting mechanism wherein the door supporting members will exert a wedging action upon the door. Another object is to provide a door supporting mechanism adapted to prevent shifting of the door within the plane thereof, when closed. Other more detailed objects will appear as the description is set forth. The invention consists of the construction, combination and arrangement of parts as will be herein described and claimed.

Referring to the accompanying drawings which show embodiments of the invention, Figure 1 is a fragmentary side elevational view of a portion of a car having applied thereto a door mechanism constructed in accordance with the principles of the present invention. Figure 2 is a transverse vertical sectional view substantially on the line A—A of Figure 1. Figure 3 is a perspective view of one of the door-supporting mechanisms. Figure 4 is an enlarged view of the eccentric or locking cam and a portion of one of the door supporting slings. Figure 5 is a horizontal sectional view through the cam and a portion of the sling, this view being taken substantially on the line B—B of Figure 4. Figure 6 is a fragmentary plan view of a door having a modified form of door-supporting arms. Figure 7 is a fragmentary plan view showing a portion of a door and sling for another modified arrangement of door arm. Figure 8 is a fragmentary side elevational view of a car to which is applied a modified form of the invention. Figure 9 is a perspective view of one of the door-supporting mechanisms used in the form of the invention shown in Figure 8.

The invention is particularly adapted for use with cars of the type having a door swinging upon hinge pintles arranged longitudinally of the car. When cars with such doors are subjected to heavy end impacts there is a tendency for the doors to slip or jump lengthwise of the car. The clearance at the hinges permits some slippage of this character and the free edge of the door may also have additional or magnified movement relative to adjacent portions of the car because of the yield of parts. The same action is present, although to a lesser degree, when the doors are hinged crosswise of the car. The embodiments shown in the drawings are in general of cars of the type having the longitudinally arranged hinge pintles.

Referring to the embodiment shown in Figures 1 to 5, the car is provided with a side plate 1 having a bottom flange angle 2 secured thereto by means of rivets 3. The car floor 4 is secured to the inwardly extending leg of the angle iron 2 by means of rivets 5. A discharge opening is provided in the floor of the car and this is normally closed by means of a door 6 which may be hinged in any conveninent manner to the car structure. The door is provided on its under face with stiffening members 7 which are secured in place by means of rivets 8. Each stiffening member is of channel section having bottom re-entrant flanges 9. Preferably two of these stiffening members are applied to each door and they are spaced somewhat from each other to better stay and support the door. The ends of the stiffening members extend outwardly beneath the car side to constitute arms 10 for supporting the door from the side wall of the car. The lower outer corners of the arms 10 are inclined or beveled as shown at 11 to permit of some wedging of the door to fully close the same.

The free edge of the door is supported from the car side by means of a pair of slings 12 which are pivotally attached to brackets 13 carried by the car. These slings are arranged to swing outwardly from the face of the car to release the door, or inwardly to supportingly engage the underfaces of the arms 10. The brackets 13 may be attached to the car side by means of rivets 14, some of the flange angle rivets 3 also being utilized for this purpose. The brackets 13 may also have portions which underlie the inturned flange of the angle 2 so as to utilize some of the rivets 5 for securing the brackets 13 to the car. Each bracket 13 is supplied with a suitable

boss 15 having a longitudinally arranged opening therein for the accommodation of the upper end of the sling 12.

Each bracket has pivoted upon it a locking cam 16 adapted for rotation about a pivot axis 17 which extends transversely of the car or normal to the axis of swing of the sling 12. When the slings 12 are in supporting engagement with the arms 10 the cams 16 are rotated to hold the slings in engaged relationship with the door arms and also to wedge the slings against the arms. These cams are arranged to be rotated from opposite directions into engagement with the two slings of a door and they thereby shift the slings longitudinally of the car and wedge one side of each sling tightly against its door arm. When the parts are so wedged from opposite directions, the door and the entire mechanism will be securely locked to the side of the car, thus preventing shifting of the door or accidental release of any of the mechanism. It will be understood that any impact which tends to shift any of the parts at one end of the door toward release position will at the same time more tightly wedge the engaged members at the other end of the door since the door supporting mechanisms are wedged against the door in opposite directions. The cams 16 are provided with flanges 18 which overlie portions of the slings to restrain the latter against swinging away from the car when the cams have been rotated into locked position. Each cam, therefore, performs a double function; namely, it prevents disengagement of the sling 12 from its door arm and also wedges the sling 12 endwise against the door arm to stay the door against movement within the plane of its closed position. One wall of the bracket 13 is preferably extended slightly below the bottom line of the car to form a pivot support for the cam 16 and this extended portion of the bracket may also serve as a limit stop for the door arm so that by no chane can movement of the door occur beyond the limits set by the shoulders 19 of these brackets.

In the modification shown in Figure 6 the ends of the stiffening members 7 which comprise the door arms are shown as formed with oppositely arranged bevels 20. When the slings 12 are swung into engagement with the door arms 10 having the bevels 20 the latter will wedge the slings in opposite directions in a manner similar to that effected by the use of the eccentric cams 16 employed in the embodiment. In the embodiment of the invention first described shown in Figure 7 the projecting ends 10 of the arms are shown as beveled from both sides so as more readily to permit the engagement of the slings therewith. The door plate in this construction is provided with notches 21 into which the two limbs of a sling may be forced in order to provide a positive interlock between the door and the sling.

The embodiment of the invention illustrated in Figures 8 and 9 is similar to that of Figures 1 to 5, except that instead of the eccentric cam a pivoted keeper 22 is provided for the sling 12. As shown in dotted lines in Figure 9, when these keepers are in an upright position the slings may be swung out to release the door. When the slings are swung into supporting engagement with the arms 10, the keepers 22 are rotated so as to overlie the arms of the slings. Each keeper is provided with a hooked end 23, said hook portions being respectively adapted to engage opposite edges of the door to hold the latter against slippage. The arrangement of these hooked ends is such that rotation of the keepers into locked position will effect a wedging action upon the door.

I have thus described several embodiments of my invention. Other embodiments are contemplated within the scope of the appended claims, without departing from the spirit thereof.

What is claimed is:

1. A railway car having a pivoted door provided with a supporting face, a door engaging member pivoted to the car and capable of movement in the direction of its pivotal axis and arranged for supporting cooperation with the supporting face, and a keeper movably carried by the car and arranged to retain the door-engaging member in supporting relationship with the supporting face of the door and to hold the door against slippage lengthwise of its pintles by preventing movement of said door engaging member in the direction of its pivotal axis.

2. A railway car having a pivoted door provided with a supporting face, a door-engaging member pivoted to the car and arranged for supporting cooperation with the supporting face, and means adapted for movement in a different plane from the door-engaging member for wedging the latter in a direction axially of its hinge pintles to hold the door against slippage lengthwise of its pintles.

3. A railway car having a door provided with a pair of supporting faces, door-engaging members pivoted to the car and arranged for supporting cooperation with the said faces, and means for shifting said supporting members parallel to their respective pivotal axes when in engagement with the supporting faces.

4. A railway car having a door provided with spaced supporting faces, and a plurality of door-engaging members pivoted to the car and arranged for supporting cooperation with the supporting faces, the door-engaging members being also respectively adapted to be shifted laterally of their swinging planes so as to contact portions of said door from opposite directions.

5. A railway car having a door provided with a supporting face, a door-engaging

member pivoted to the car and arranged for supporting cooperation with the said face, and means cooperable with said door-engaging member for wedging the same axially of its pivot when in engaged relationship with the supporting face to prevent the door from moving lengthwise of its hinge axis.

6. A railway car having a door provided with a pair of supporting faces, door-engaging members pivoted to the car and arranged for supporting cooperation with the said faces, and means cooperable with said door-engaging members for wedging the same axially of their pivots and in opposite directions when in engaged relationship with their supporting faces.

7. A railway car having a hinged door provided with a pair of arms extending outwardly from the free edge of the door, door-supporting slings pivoted to the car near the free edge of the door adapted to swing over said arms to supportingly engage the same, and means contacting opposite edges of the slings for holding the door against slippage along its hinge pintles.

8. A supporting and securing mechanism for the doors of railway cars embodying in combination with a hinged door, a pivoted door-supporting member adapted to swing into supporting engagement with a portion of the door, the pivotal axis of the member being substantially parallel with the hinge axis of the door, and a locking member arranged to swing in a different plane from the plane of swing of the door-supporting member and adapted to stay the door against slippage within the plane of the closed door.

9. A supporting and securing mechanism for the doors of railway cars embodying in combination with a hinged door, a pivoted door-supporting member adapted to swing into supporting engagement with a portion of the door, the hinge axis of the door being substantially parallel to the pivotal axis of the member, and a locking member arranged to swing in a different plane from the plane of swing of the door-supporting member and adapted to lock the door-supporting member in engaged relationship with the door and to stay the door against slippage within the plane of the closed door.

10. A supporting and locking mechanism for the doors of railway cars embodying two swinging members, one being adapted to support the door in closed position and to be shifted in the direction of the axis of its swinging movement and the other being adapted to stay the door against slippage when closed, and means carried by one of said members for locking the other member in operative position.

11. A supporting and locking mechanism for the doors of railway cars embodying two swinging members, one being adapted to support the door in closed position and to be shifted in the direction of the axis of its swinging movement and the other being adapted to stay the door against slippage when closed, and means carried by one of said members for locking the other member in operative position, the said members being arranged to swing in planes forming an angle with each other.

12. A railway car having a door with a supporting mechanism therefor, a bracket secured to the car near an edge of the door and embodying a portion forming a stop for limiting movement of the door and also embodying a pivotal support for the supporting mechanism, and a door-wedging member carried by the bracket.

13. A railway car having a door with a supporting mechanism therefor, a bracket secured to the car near an edge of the door and extending below the car side and embodying a pivotal support for the supporting mechanism and means pivoted upon the bracket below the lower edge of the car side for wedging the door.

14. A supporting and locking mechanism for the doors of railway cars, embodying, in combination with a swinging door, a door-supporting member adapted to swing into supporting engagement with a portion of the door, and a locking member for said supporting member, the said locking member being adapted to be moved against the supporting member substantially in the direction of the axis of swinging movement of the door to lock said supporting member in engaged relationship with the door and being further adapted to move said supporting member axially to hold the door against slippage lengthwise of its hinge axis.

15. A supporting mechanism for the doors of railway cars embodying the combination with a door arranged with its hinge pintles longitudinally of the car and with its free edge adapted to close near the car side, of members pivoted to the side of the car and arranged to swing transversely to the car into supporting engagement with portions of the door, rotatable means for retaining the supporting members in engagement with the door, each of said means being provided with an eccentric face cooperable with its associated supporting member for staying the free edge of the door against slippage longitudinally of the car.

16. A supporting mechanism for the doors of railway cars embodying the combination with a door arranged with its hinge pintles longitudinally of the car and with its free edge adapted to close near the car side, of members pivoted to the side of the car and arranged to swing transversely to the car into supporting engagement with portions of the door, and rotatable means respectively cooperable with said supporting members, each of said means having a plurality of faces, one

of which serves to retain its associated supporting member in engagement with the door and the other of which serves to stay the free edge of the door against slippage longitudinally of the car.

17. A railway car having a swinging door provided with a supporting face, a bracket secured to the car body, and a door engaging member movably mounted on said bracket and arranged for supporting cooperation with said supporting face, said bracket having a portion forming a stop for limiting movement of the door in the direction of its axis of swinging movement.

18. A railway car having a swinging door provided with a supporting face, pivotally mounted means arranged for supporting cooperation with said supporting face, said pivotally mounted means also being adjustable in the direction of its axis of pivotal movement to prevent slippage of the door longitudinally of its hinge axis, and means for locking said pivotal means in adjusted position.

19. A railway car having a swinging door provided with a supporting face, a pivotally mounted member arranged for supporting cooperation with said supporting face, a pivotally mounted member adapted to lock said first named pivotally mounted member in door supporting position, one of said pivotally mounted members being adjustable axially of its pivot to prevent slippage of the door longitudinally of its hinge axis, and means for locking said last named member in adjusted position.

20. A railway car having a swinging door and means for supporting said door in closed position, said means involving a pivotally mounted member which is adjustable in the direction of the axis of its pivotal movement to prevent slippage of the door longitudinally of its axis, and means for locking said member in adjusted position.

In testimony whereof I affix my signature.

BYERS W. KADEL.