July 16, 1929. K. J. TOBIN ET AL 1,720,933

FLUSH CAR DOOR

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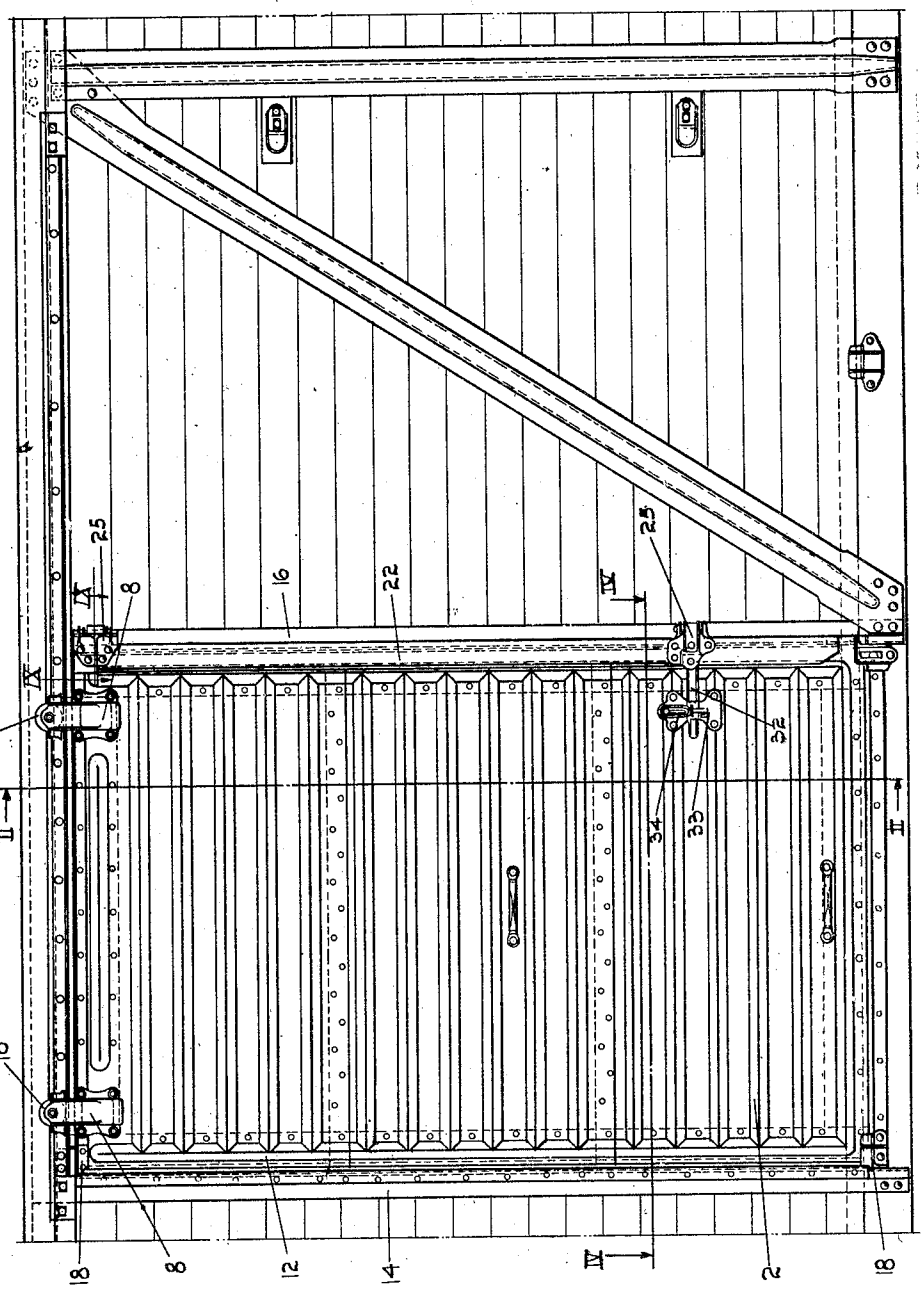


Fig-1

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FLUSH CAR DOOR

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Fig-2

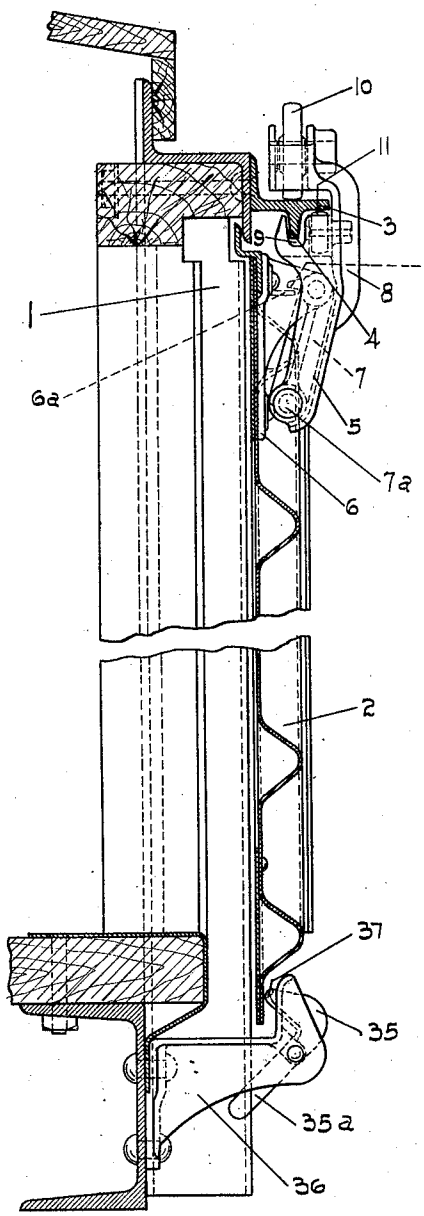
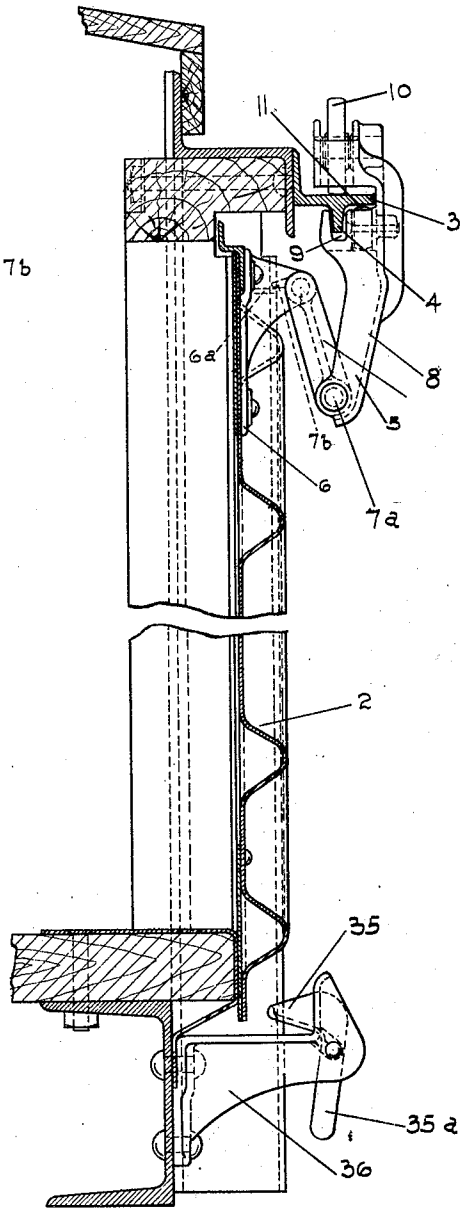


Fig-3



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July 16, 1929. K. J. TOBIN ET AL 1,720,933

FLUSH CAR DOOR

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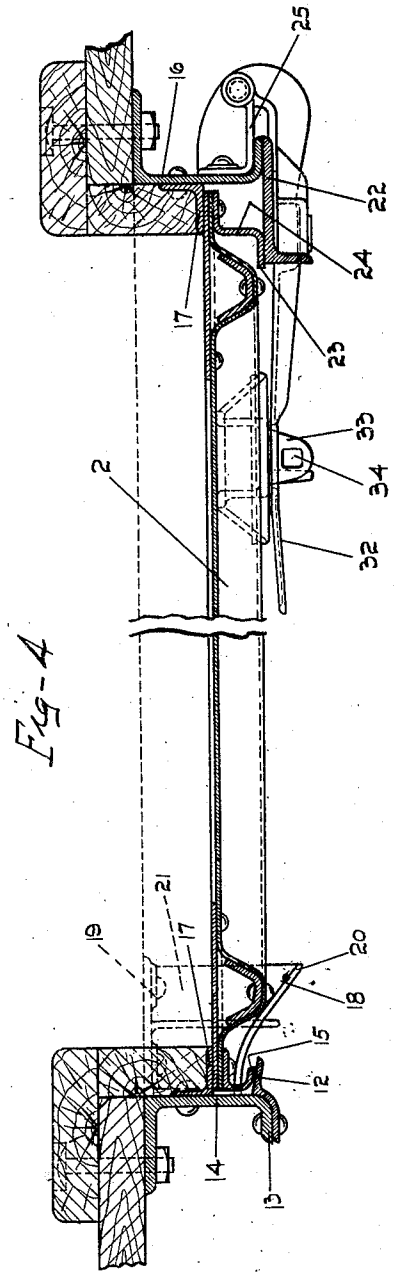


Fig-4

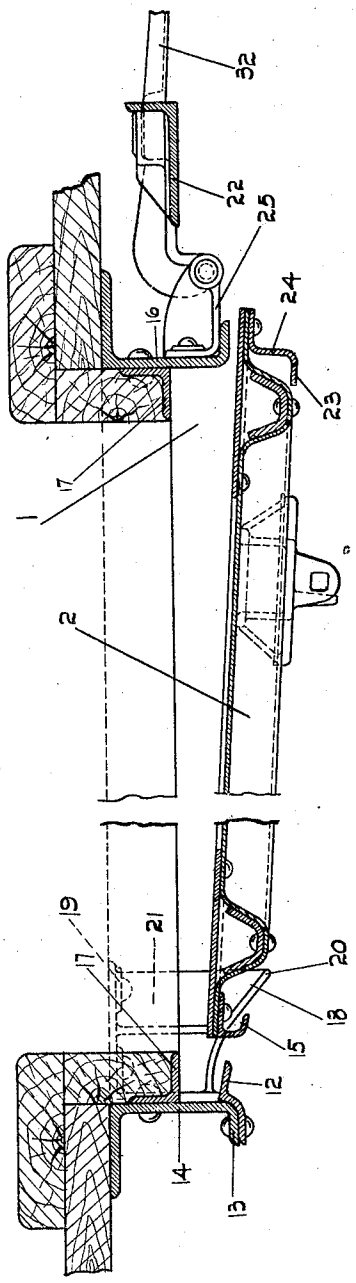


Fig-5

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FLUSH CAR DOOR

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Fig-6

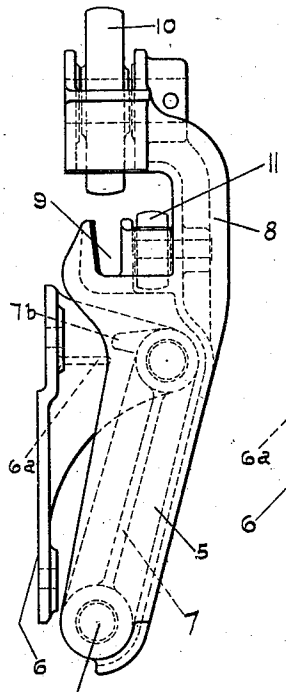


Fig-9

Fig-7

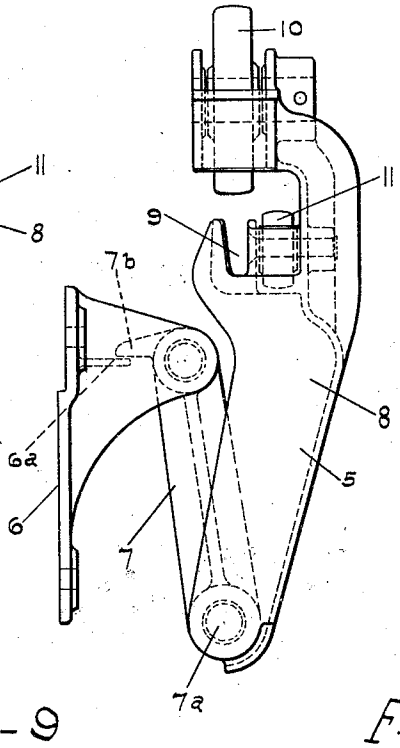


Fig-8

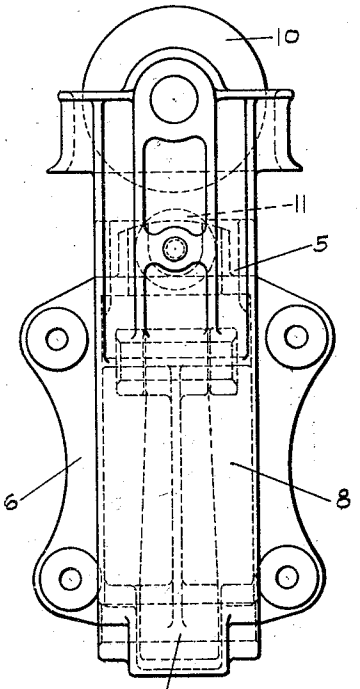


Fig-10

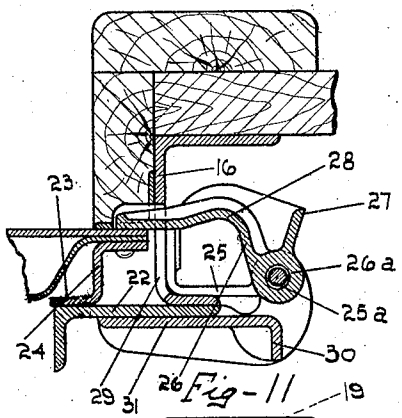


Fig-11

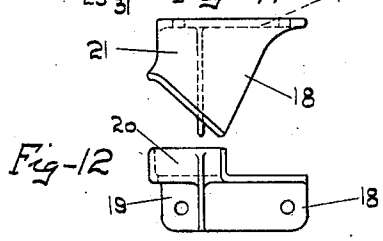
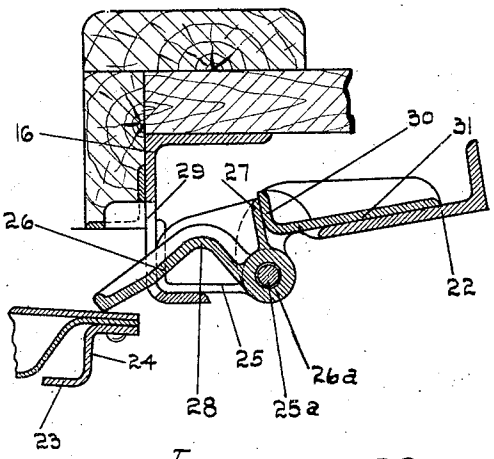


Fig-12



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Patented July 16, 1929. 1,720,933

UNITED STATES PATENT OFFICE.

KENNETH J. TOBIN AND AXEL WASBERG, OF CHICAGO, ILLINOIS, ASSIGNORS TO CAMEL CO., OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

FLUSH CAR DOOR.

Application filed May 2, 1927. Serial No. 188,141.

This invention relates to a flush door for railway cars and it is among the objects of this invention to provide a structure in which the door is metal bound when in closed position, in which a straight supporting track for the door may be used, and in which the door is guided to its flush position.

With these and other objects in view which will become more apparent in the following description and disclosures, this invention comprises the novel structure and combination of parts hereinafter described and more particularly pointed out and defined in the appended claims.

In the accompanying drawings which illustrate a preferred embodiment of this invention and in which similar reference numerals refer to similar features in the different views:

Figure 1 is a side elevational view of a portion of a house car closed by a flush door involving this invention.

Figure 2 is an enlarged and broken sectional view taken substantially upon the line II—II of Figure 1 showing the door in its out position.

Figure 3 is a view similar to Figure 2 showing the door in its in position.

Figure 4 is an enlarged and broken sectional view taken upon the line IV—IV of Figure 1 showing the door in its in position.

Figure 5 is a sectional view similar to Figure 4 showing the door in substantially its out position.

Figure 6 is an enlarged side elevational view of the door hanger showing the parts in one position.

Figure 7 is a view similar to Figure 6 showing the parts in a different position.

Figure 8 is an enlarged front elevational view of the hanger.

Figure 9 is an enlarged sectional view taken upon the line IX—IX of Figure 1 showing the parts in closed position.

Figure 10 is a view similar to Figure 9 showing the parts in open position.

Figure 11 is a top plan view of the lower front closing guide for the door.

Figure 12 is a side elevational view of the closing guide.

As shown on the drawings:

In order to fully set forth this invention, there is shown a portion of the side of a house car having an inset doorway or opening 1 which is adapted to be closed by a metal door 2 which may be suitably corrugated. It will be understood that by inset doorway is meant a doorway which is inwardly offset with respect to the supporting track for the door, and which requires a transverse movement of the door. Adjacent one margin of the doorway, there is a door supporting track 3 which in the present instance is shown above the doorway. This track is straight and parallel throughout its length with the side of the car, and its lower surface is provided with a guide rib or flange 4 as shown in Figures 2 and 3.

The door 2 is supported upon the track 3 by a plurality of supports or hangers 5. In the illustrated form of the invention two such hangers are shown and each consists of an attaching plate 6 which is designed to be bolted to the side of the door, an arm or link 7 which is pivoted to the plate 6 as indicated at 7^a and depends therefrom, and the main hanger member 8 which is pivoted at its lower end to the arm or link 7. The main hanger member 8 is provided with a guideway 9 for receiving the rib 4 on the track 3. Each main hanger member 8 overhangs the track 3 and supports a roller 10 which is adapted to travel on the track 3, and a roller 11 which engages the bottom of the track on the outside of the rib 4. The plate 6 and link 7 have cooperating lugs 6^a and 7^b for maintaining member 8 in outward alignment in out position as shown in Fig. 7. It will be noted that the plate 6 has an outwardly extending bearing and that the lug 6^a is located in a pocket or groove having side walls between which the lug 7^b on the link 7 may pass. This structure prevents undue relative lateral movement of the plate 6 and link 7. It will be further evident that the main hanger is substantially channel shape below the guide roller 11. In other words, the shank portion of the hanger 8 has a groove into which the link 7 and bearing on plate 6 can pass when the door is in open position, as shown in Figures 2 and 6. Consequently, there is no appreciable lateral movement between the plate 6 and hanger 8

when the door is open and moved on its track.

With reference to Figure 3, it will be noted that when the car door is in closed or in position, that is when it is completely in the inset doorway, the link 7 is inclined inwardly with respect to a vertical plane passing through the axis of the pivot 7ª. In other words, it is beyond dead center. Consequently the thrust transmitted to the link 7 due to the weight of the door will be partially effective for maintaining the door in its closed position. For it will be apparent that the weight of the door on the links 7 will tend to cause them to swing further inwardly and exert an inward thrust against the door so that the same will always be held in a tightly closed position.

With reference to Figure 2, it will be apparent that when the car door is in its out position with respect to the inset doorway, the links 7 are inclined outwardly with respect to the aforementioned vertical plane through the axis of pivot 7ª. In other words, the links are inclined outwardly beyond dead center and the thrust thereof tends to hold the door in its out position.

At the front edge of the doorway, there is a weather strip 12 (Figures 4 and 5) which is outwardly and rearwardly inclined to allow the front edge of the door to pass thereunder. This weather strip 12 is attached to a forwardly flanged end 13 of an angle member 14 which is secured to the side of the car and forms the forward end of the doorway. The forward edge of the door 2 is provided with a co-operating metal weather strip 15 which has a flange that is outwardly and rearwardly inclined for engaging under the metal weather strip 12, whereby the front edge of the door becomes metal bound when the door is in its closed position.

At the rear edge of the doorway there is a rearwardly flanged angle member 16. The angle members 14 and 16 support vertical angle members 17 against which the door 2 abuts when the same is in its in position.

The front edge of the door 2 is guided to its in position by means of upper and lower guides 18. These guides are substantially similar, the lower guide only being fully illustrated. The form of guide 18 is clearly shown in Figures 4, 5, 11 and 12 and in referring to these figures, it will be noted that each guide 18 has an attaching flange or portion 19 secured to a part of the car, and an outwardly and rearwardly inclined guiding flange on portion 20 which is integrally connected to the attaching flange by a web 21.

When the door is in its closed or in position, its rear edge is adapted to be metal bound by a swingable hinged metal strip 22 which engages against the outstanding flange 23 of a vertical Z bar 24 secured to the rear edge of the door. The metal strip 22 is connected to the rear angle member 16 by means of a plurality of hinges 25. Upon the hinge pintle 25ª of the upper hinge 25, there is mounted a door actuator 26 shown more clearly in Figures 9 and 10. This door actuator comprises a hub 26ª rotatably mounted upon the hinge pintle 25ª and having a stop lug 27 and a bowed arm 28 that extends through a suitable slot 29 in the web of the rear angle 16 and to a point behind the door 2 as shown in Figure 9.

The rear hinge strip 22 is provided with a shoulder 30 in alinement with the stop lug. The shoulder 30 is formed on a transverse metal strip 31 secured to the hinge strip 22. The bowed arm 28 of the door actuator normally lies in the position shown in Figure 9. However when the hinge strip 22 is swung rearwardly as shown in Figure 10, to free the rear margin of the door, the shoulder 30 will engage the stop lug 27 and rotate the actuator for moving the door outwardly as shown in Figure 10.

In order to easily swing the hinge strip 22 outwardly, the same is preferably provided with a handle 32 which may be normally latched to the door by a suitable latching mechanism such as a hasp 33 and bolt 34.

In the switching of cars, it frequently happens that sliding doors are open, and a sudden jerk will cause the doors to swiftly slide on their tracks. If the thrust tends to slide the doors toward the front edge strip 12 and the angle member 14, such parts may be distorted and badly damaged. To avoid such an objection, there is provided at the rear of the door opening, a gravity controlled dog 35 which is pivoted upon one of the lower door guides 36. This dog has a nose 37 that normally rides against the side of the door adjacent its lower margin. The dog 35 has a depending weighted arm 35ª that overbalances the part above the pivot with the result that when the door has been completely opened, the nose of the dog will automatically be moved into the path of the door and behind the same. In such position, the dog will obviously prevent any sliding movement of the door through switching or the like.

It will be appreciated that the foregoing described structure provides a car door which is metal bound by the front strip 12 and angles 14 and the rear angle 16 and hinge strip 22 when the same is in its closed position. It will also be apparent that the hangers or supports for the door tend to maintain the door in either its in or out position and thus facilitates the in and outward movements thereof since it is only necessary to move the door beyond the dead center of the links 7, when the door will of its own weight continue such movement.

We are aware that many changes may be made and numerous details of construction may be varied through a wide range without departing from the principles of this inven-

tion and we, therefore, do not purpose limiting the patent granted hereon, otherwise than necessitated by the prior art.

We claim as our invention:

1. The combination with a supporting track, of a sliding door, rollers upon said track, hangers attached to said rollers, said hangers having grooves, a link pivoted to each hanger and having a stop lug, bearing plates upon said door having pockets with stop lugs, said first-mentioned stop lugs entering said pockets and coacting with said second mentioned stop lugs when said door is swung outwardly, and said links entering said grooves when said door is swung inwardly whereby relative lateral movement of the parts is decreased.

2. A hanger for a flush car door comprising a door attaching plate having an outwardly projecting bearing provided with a pocket having a stop lug therein, a link pivoted to said bearing and having a stop lug adapted for entering said pocket for coaction with said first stop lug, and a roller carrying member pivoted to said link and having a channel-shaped groove for receiving said link and bearing.

3. A hanger for a flush car door comprising a door attaching plate having an outwardly projecting bearing, a link pivoted to said bearing, said link and bearing having interfitting parts, and a roller bracket pivoted to said link, said link and bracket having interfitting parts for preventing relative lateral movement.

4. A hanger for a flush car door comprising a door attaching plate having a bearing, a link pivoted to said bearing, and a roller bracket having a channel-shaped recess for receiving said link and bearing.

In testimony whereof we have hereunto subscribed our names at Chicago, Cook County, Illinois.

KENNETH J. TOBIN.
AXEL WASBERG.