

Aug. 29, 1939.

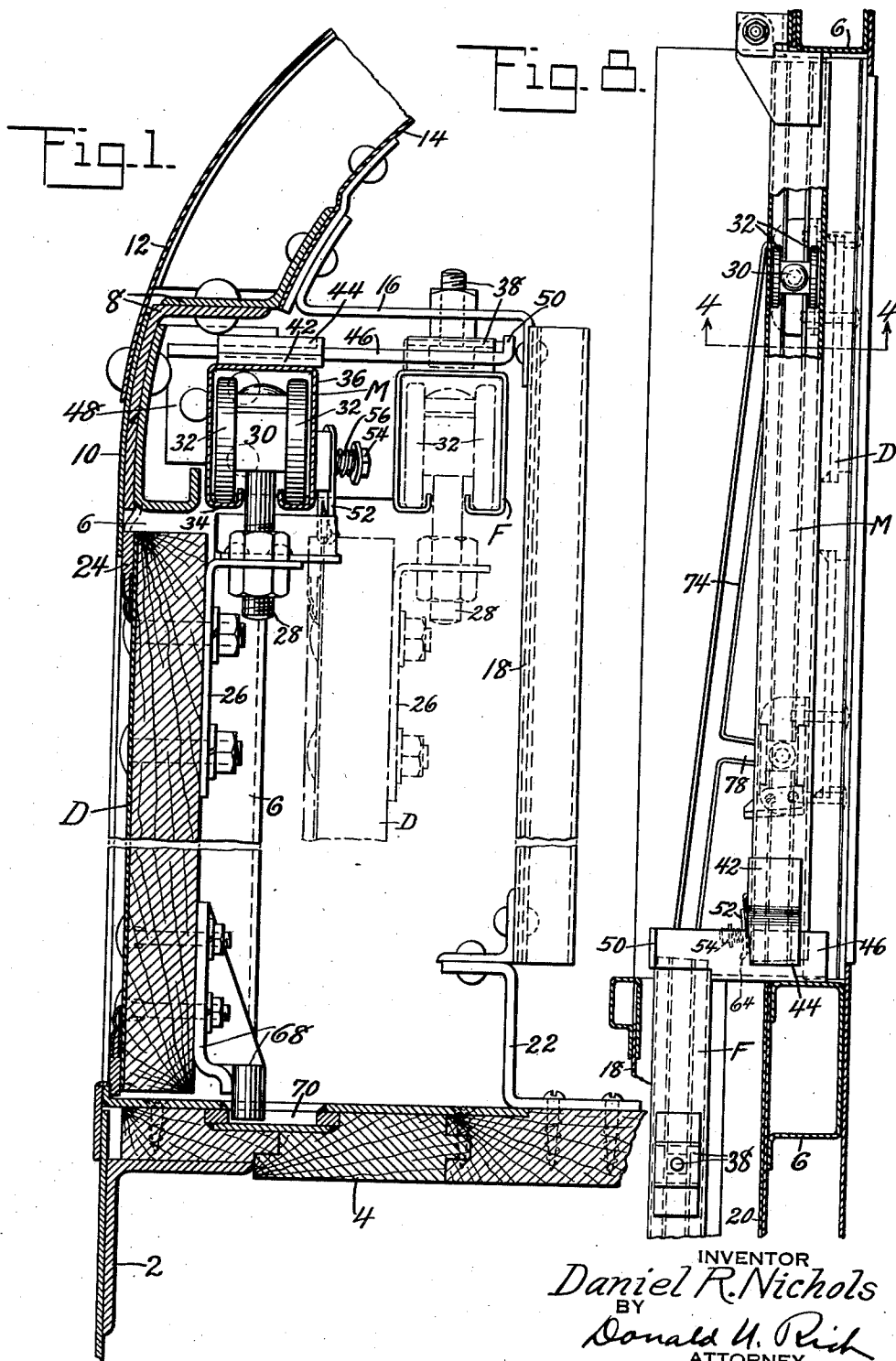
D. R. NICHOLS

2,170,870

SLIDING DOOR

Filed Sept. 17, 1937

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SLIDING DOOR

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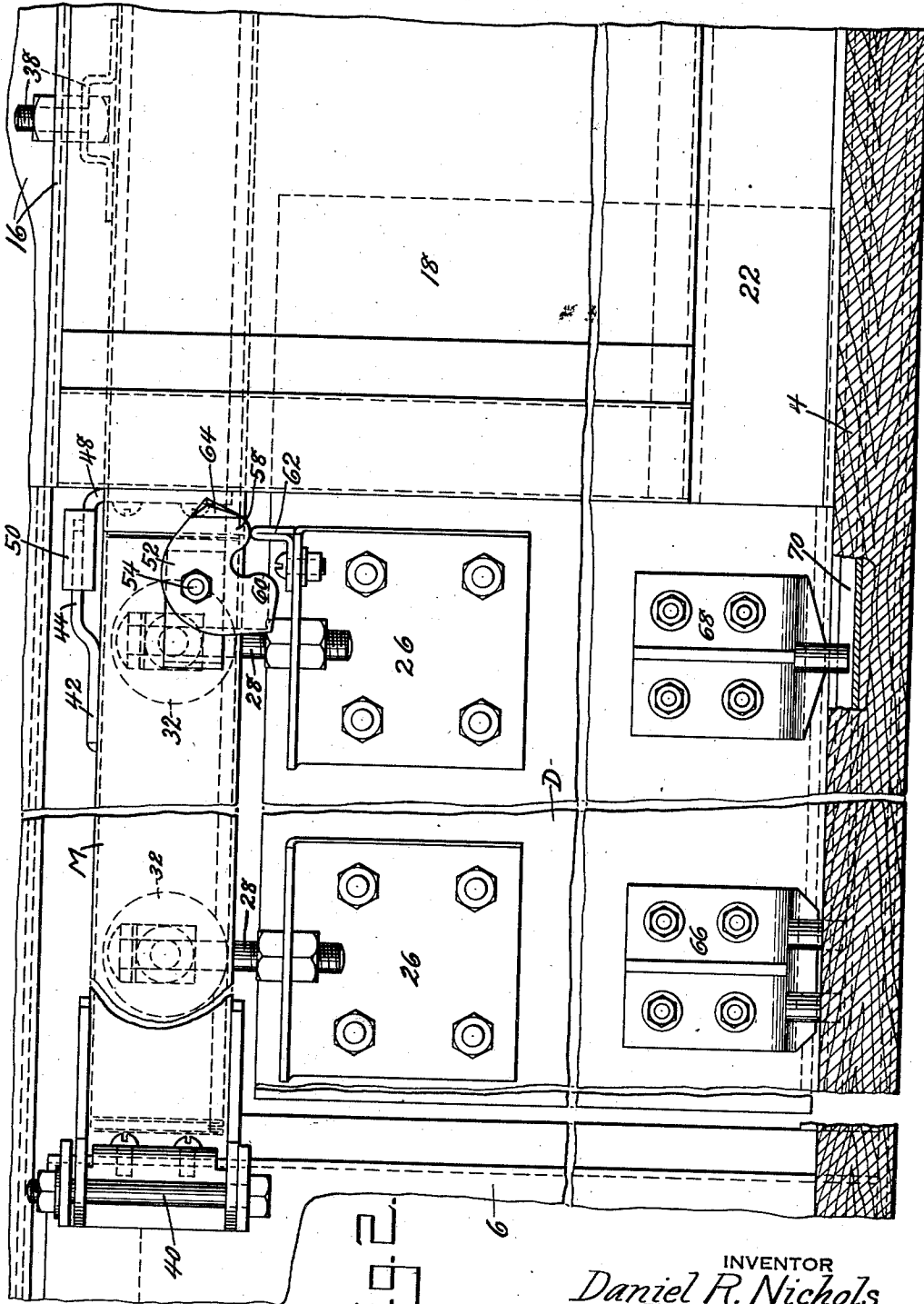


FIG. 2

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Fig. 5.

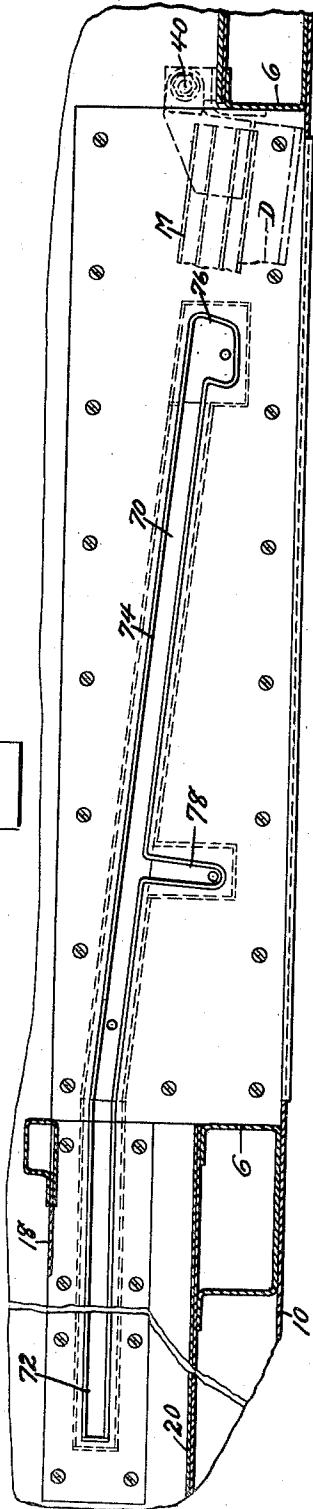
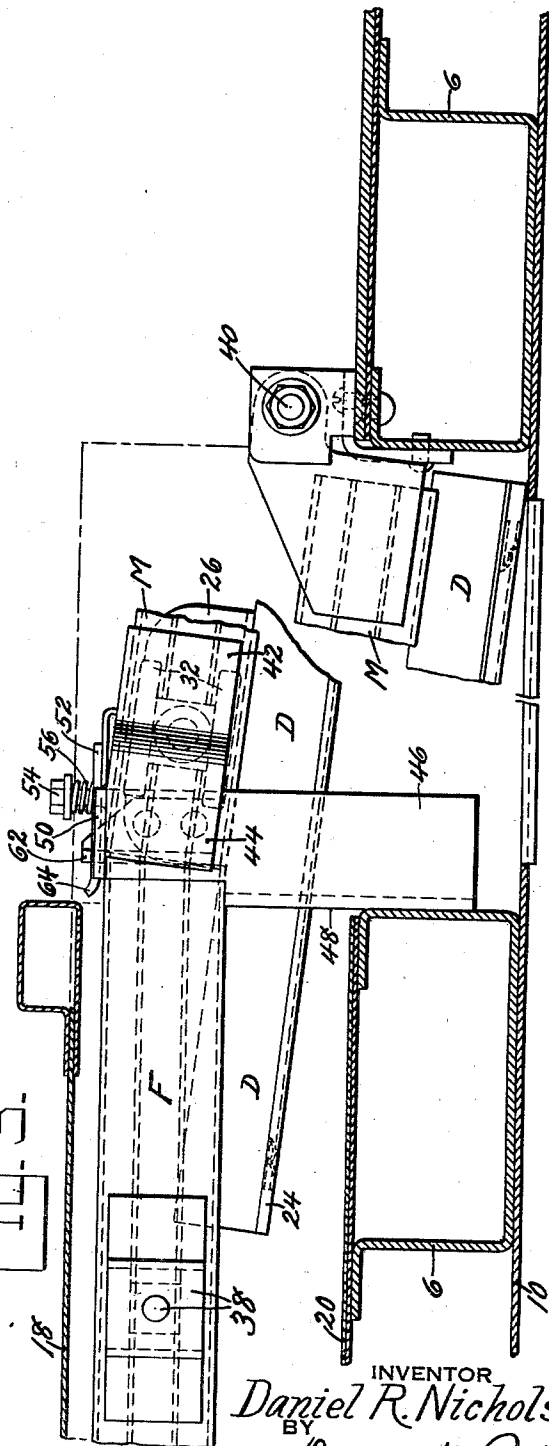


Fig. 3.



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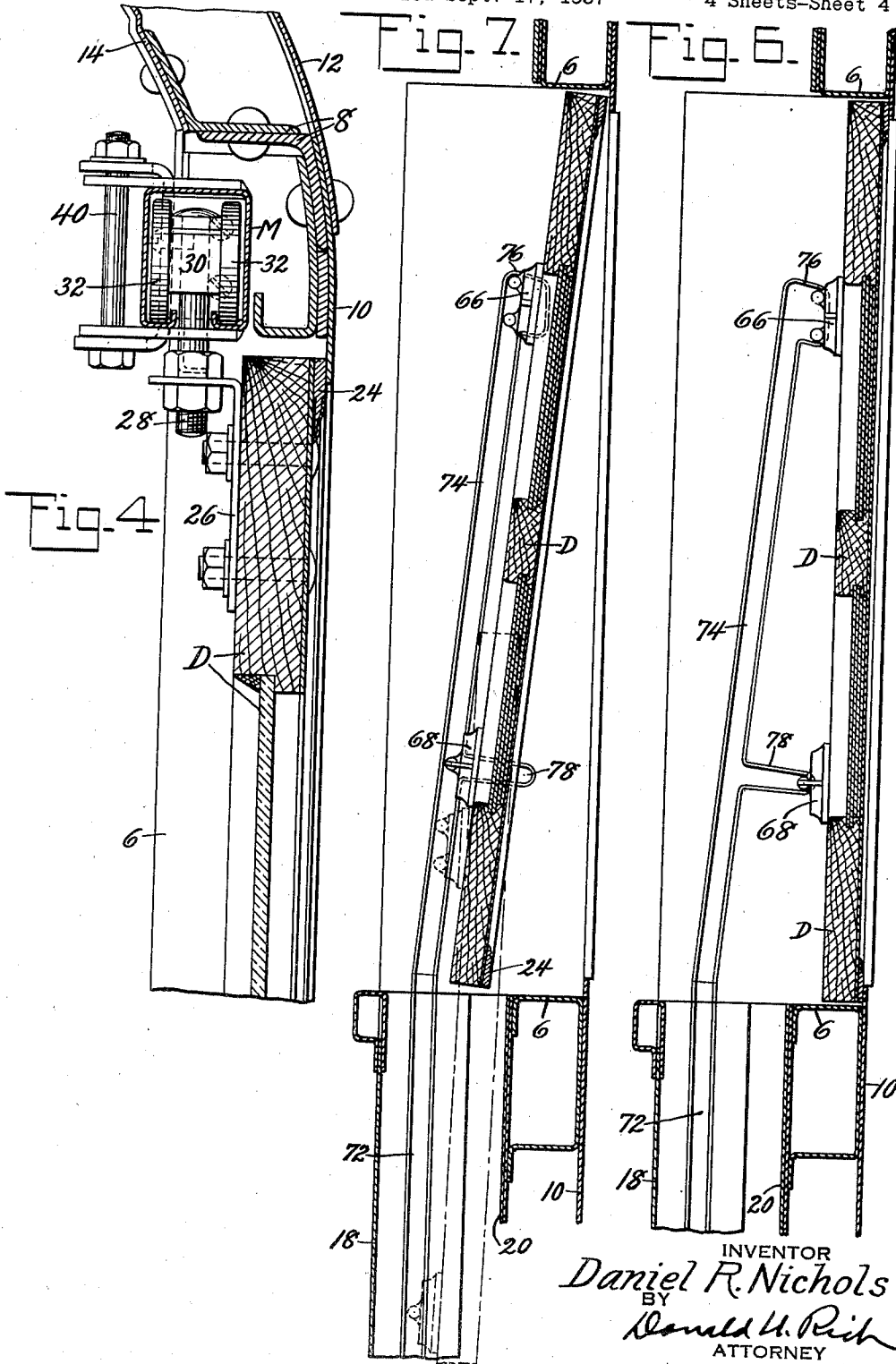
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4 Sheets-Sheet 4



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2,170,870

SLIDING DOOR

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9 Claims. (Cl. 20—19)

This invention relates to sliding doors in general and in particular to sliding doors for railway cars where a smooth exterior is desired.

One of the objects of this invention is the provision of a sliding door for railway cars in which the door will have a smooth sliding action from a closed position in the door opening to an open position parallel to but spaced from the car body wall.

Another object of the invention is the provision of a sliding door suspended from an overhead track formed in two parts, one of which is movable in order to permit a lateral swinging movement of the door to clear the door posts.

A further object of the invention is the provision of a sliding door having a two-part track, one part of which is swingable into alignment with the other part and in which locking means are provided positively retaining the track sections in alignment.

These and other objects of the invention will be apparent to persons skilled in the art from a study of the following description and accompanying drawings, in which:

Figure 1 is a sectional view taken through the door opening and showing the door in closed position by full lines and in open position by line and dash outline;

Fig. 2 is an inside elevational view of the door and its supporting and guiding structure;

Fig. 3 is a sectional view taken through the upper part of the car immediately above the supporting trackway;

Fig. 4 is a sectional view similar to that shown in Figure 1 but looking toward the forward edge of the car and is taken substantially on line 4—4 of Fig. 8;

Fig. 5 is a sectional view through the door opening and showing the lower guideway for the sliding door but with the door removed;

Fig. 6 is a sectional view similar to Fig. 5 but showing the door in its closed position;

Fig. 7 is a sectional view similar to Fig. 6 but showing the relation of the door and its guideway with the door in its preliminary open position, and

Fig. 8 is a plan view showing the door in closed position.

Referring now to the drawings in detail, it is seen that the improved door arrangement has been applied to a railway car having the customary side sills 2 forming part of the car underframe and supporting the floor 4 and having connected thereto the lower end of door posts 6, the upper ends of which are connected to the side

plate 8 of any suitable form. In the present instance the side plate is of substantially Z formation with one flange having the body side sheathing 19 and roof sheets 12 connected thereto, while the other flange carries the ceiling 14 and door pocket plate 16 which braces the upper edge of door pocket sheet 18 spaced inwardly from the car lining 20. The lower edge of the door pocket sheet is suitably connected to the floor structure by means of a Z or other suitably formed member 22 (Fig. 1). As clearly shown in the figures the side sheathing overlaps the door posts, side plate and side sill to define an opening therebetween against which the sliding door D abuts and is suitably sealed by means of gaskets 24.

The door may be of any suitable construction but in the present instance is shown as formed of wood sheathed on the outside with metal and having attached thereto at the inner side a plurality of brackets located substantially adjacent each corner thereof. Each of the upper brackets 26 have adjustably connected thereto a bolt 28 swivelly connected at its upper end to a roller unit 30 provided with spaced rollers 32. The rollers are adapted to engage the intumed flanges 34 of an inverted channel-shaped trackway 36. This trackway is formed in two sections, one of which is fixed and the other movable. The fixed section F of the trackway is carried by the door pocket plate 16 through suspension bolts and clips 38 and in a position substantially parallel to the car body wall and door pocket side. The movable trackway section M is of substantially the same length as the distance between the door posts and is pivotally connected at one end to the adjacent door post by means of bolt or other pivot means 40. The opposite or free end of the movable track section has a tongue or projection 42 secured to the web thereof and offset upwardly therefrom as at 44 in order to provide a space for reception of leg 46 of an angle member 48 secured to the door post and fixed track section (Figs. 1, 2 and 3). The offset projection 44 rests upon and is slidable along the upper surface of angle leg 46 from a position in which the door is closed to a position in which it strikes stop 50 at which time the movable track section is in alignment with the end of the fixed track section. In order that the movable track section will be held locked with respect to the fixed track section a locking member 52 is pivotally mounted upon the movable track section by means of bolt 54 and held in any position to which it is moved by means of compression spring 55

56. The locking member is provided with a locking projection 58 and an unlocking projection 60 separated by a suitable space permitting rotation of the locking member to its various positions under operation of a striking lug 62 secured to the supporting bracket adjacent the rear edge of the door. One edge of the locking member is deflected inwardly as at 64 in order to provide a camming surface engageable with a portion of the fixed track member, thus holding when in locked position the movable track section in perfect alignment with the fixed track section.

The door is held in a substantially vertical position by means of suitable brackets located adjacent the lower corners of the door. The guide bracket 66 adjacent the forward edge of the door is provided with two spaced lugs or projections extending below the lower edge of the door, while guide bracket 68 adjacent the rear edge of the door is provided with a single projection (Fig. 2). The projections of these guide brackets engage in an upwardly directed open channel-shaped guideway 70 formed in the car floor and provided with one straight portion 72 located vertically below the fixed track section and with another straight portion 74 located vertically below the movable track section when in its inwardly swung and locked position. Inward and outward movement of the door is permitted by forming recessed projections 76 and 78 respectively on the guideway portion 74 as clearly shown in Figs. 5 to 8. The front projection is relatively wide in order to receive the two projections of the front guide bracket, while the rear projection is narrower having only to receive the single projection of the rear guide bracket, but in either case the projections are so formed as to be substantially tangent at their centers to circles having their centers on the axis of the movable trackway pivot 40. If it becomes necessary to remove the door from its trackway this may be readily accomplished by manually releasing the locking cam while the door is in the open position and by rotating the swinging track section outwardly toward the car side wall. After the swinging of the movable track section the door may be withdrawn from the fixed track section for purposes of repair, replacement or inspection.

The operation of the door is as follows, assuming it to be in the closed position as shown in Figs. 1, 6 and 8: An inwardly and rearwardly directed force applied to the door will cause the rear edge to move inwardly under control of the projections 76 and 78 which prevent any rearward sliding motion of the door. During this inward swinging movement of the door the movable track section will swing inward about pivot 40 with projection 44 sliding along the leg of the supporting angle and into abutment with the stop lug 50. As soon as the movable track section has been stopped by the stop lugs 50 the lower guide projections will have assumed the position at the inner end of the guide projections and will be in such a position as to permit sliding of the door as shown in Fig. 7. Immediately upon the start of the rearward sliding motion of the door projection 62 on the door will strike locking projection 58 on the car thus rotating the locking member upwardly into engagement with the fixed track section and cooperating with the stop 50 to hold the movable section in alignment with the fixed track section as clearly shown in Figs. 2 and 3. The door may now complete its rearward motion into the door pocket and in substantial alignment with the car body wall. Upon

return of the door from open toward closed position the projection 62 will strike unlocking projection 60 and rotate the locking member in a clockwise direction, thus unlocking the movable section from the fixed section and permitting the inward swinging of the door to its closed position.

While the construction has been described more or less in detail, it is apparent that various modifications and rearrangements of parts will be obvious to persons skilled in the art and all such modifications and rearrangements of parts are contemplated as fall within the scope of the following claims.

What is claimed is:

1. A sliding door arrangement for railway cars having a car floor located between side walls with a door opening therein, said arrangement comprising a sliding and laterally movable door to close the door opening, fixed guides recessed in the floor to guide the lower edge of the door, an upper supporting trackway for the door consisting of a fixed and a movable section, said movable section being shiftable into and out of alignment with the fixed section to cause lateral movement of the door, projections on said fixed guides also recessed in the floor and permitting the lateral movement of the door, and locking means maintaining said fixed and movable sections in alignment for sliding movement of the door along the trackway and recessed guides.

2. A sliding door arrangement for railway cars comprising, a sliding and laterally movable door, a supporting trackway for the door consisting of a fixed and a movable section, said movable section being pivoted to the car and swingable to shift one end into and out of alignment with the fixed section to cause lateral swinging movement of the door, and automatic locking means operable by the sliding door for maintaining said fixed and movable sections in alignment during sliding movement of the door.

3. A sliding door arrangement for railway cars comprising, a sliding and laterally movable door, a supporting trackway for the door consisting of a fixed and a movable section, said movable section being pivoted to the car and swingable to shift one end into and out of alignment with the fixed section to cause lateral swinging movement of the door, and automatic locking means operable by the initial sliding movement of the door for maintaining said fixed and movable sections in alignment for the remainder of the sliding movement.

4. A sliding door arrangement for railway cars having a door opening defined on the sides by door posts, a sliding and laterally movable door normally closing the opening and occupying the space between the door posts, a supporting trackway for the door consisting of a fixed section located inwardly of the plane of the door posts and a movable section pivotally connected to a door post, said movable section being swingable from a position between the posts to an angular position with one end in alignment with the fixed section to cause inward angular movement of the door preliminary to a sliding movement thereof.

5. A sliding door arrangement for railway cars having a door opening defined on the sides by door posts, a sliding and laterally movable door normally closing the opening and occupying the space between the door posts, a supporting trackway for the door consisting of a fixed section located inwardly of the plane of the door posts and a movable section pivotally connected to a door

post, said movable section being swingable from a position between the posts to an angular position with one end in alignment with the fixed section to cause angular inward movement of the door preliminary to a sliding movement thereof, and locking means maintaining the sections in alignment during sliding movement of the door.

6. A sliding door arrangement for railway cars having a door opening defined on the sides by door posts, a sliding and laterally movable door normally closing the opening and occupying the space between the door posts, a supporting trackway for the door consisting of a fixed section located inwardly of the plane of the door posts and a movable section pivotally connected to a door post, said movable section being swingable from a position between the posts to an angular position with one end in alignment with the fixed section to cause inward angular movement of the door preliminary to a sliding movement thereof, and automatic locking means operable by the door for maintaining the sections in alignment during sliding movement of the door, said locking means being manually releasable for removal of the door from the trackway.

7. A sliding door arrangement for railway cars having a floor and a door opening defined on the sides by door posts, a sliding and laterally movable door normally closing the opening and occupying the space between the door posts, a supporting trackway for the door consisting of a fixed section located inwardly of the plane of the door posts and a movable section pivotally connected to a door post, said movable section being swingable from a position between the posts to an angular position with one end in alignment with the fixed section to cause inward angular movement of the door preliminary to a sliding

movement thereof, and a fixed guideway located adjacent the lower edge of the door for maintaining the door substantially vertical, said fixed guideway being recessed in the floor of the car to provide a smooth floor surface.

8. A sliding door arrangement for railway cars having a door opening defined on the sides by door posts, a sliding and laterally movable door normally closing the opening and occupying the space between the door posts, a supporting trackway for the door consisting of a fixed section located inwardly of the plane of the door posts and a movable section pivotally connected to a door post, said movable section being swingable from a position between the posts to an angular position with one end in alignment with the fixed section to cause inward angular movement of the door preliminary to a sliding movement thereof, and means secured to the car and slidably supporting the end of the movable section remote from the pivotal connection thereof to the door post.

9. A sliding door arrangement for railway cars having a body wall with a door opening therein, a sliding door for the opening, an inverted channel-shaped door supporting track formed in two sections, one of said sections being fixed and extending along the inner face of the body wall and the other of said sections being pivotally connected adjacent one end to the body wall and extending substantially across the door opening, spaced apart anti-friction means pivotally suspending the door from the track, and means slidably supporting the other end of the pivotally connected section for swinging movement into and out of alignment with the fixed track section.

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