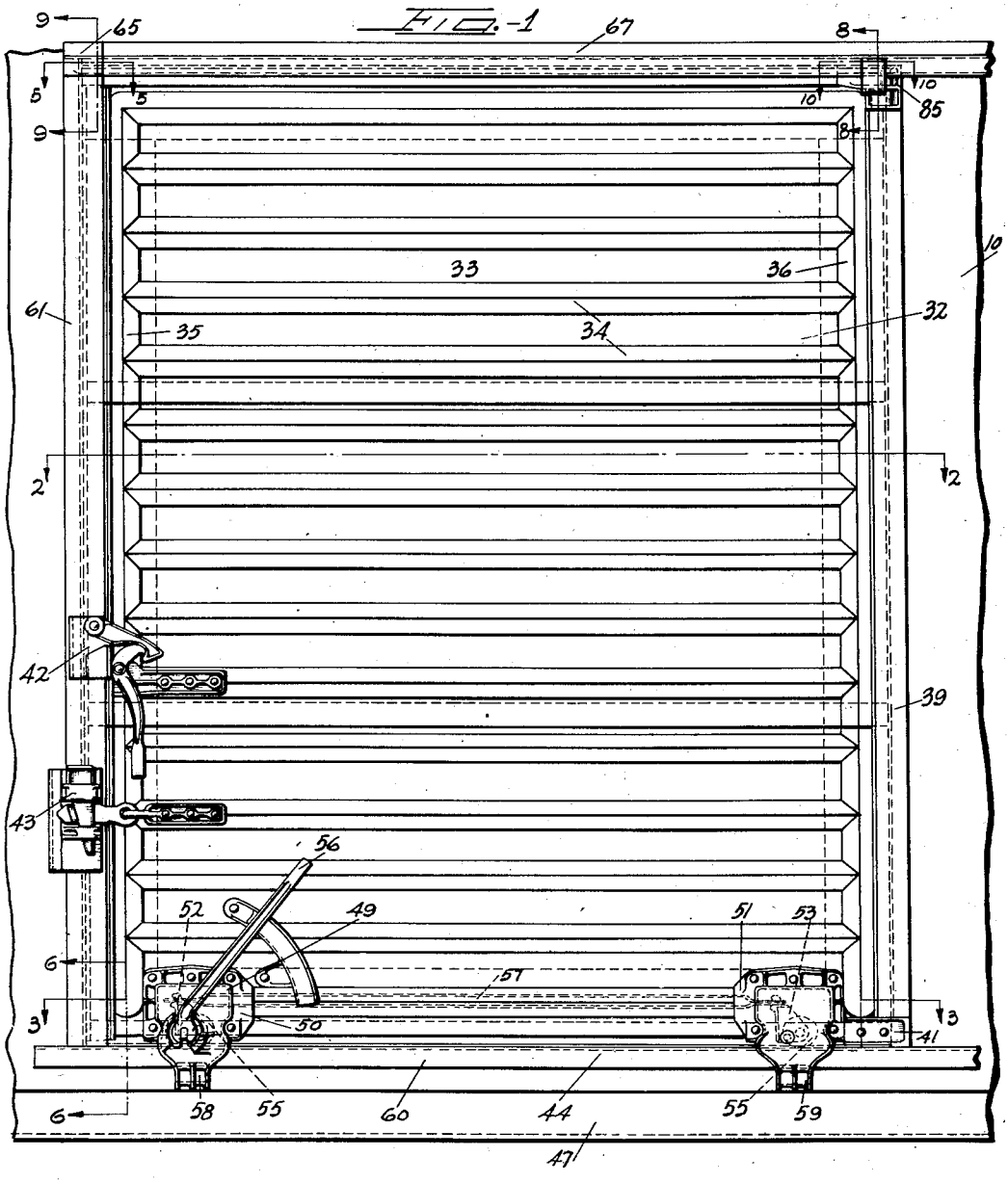
May 19, 1936. T. MADLAND 2,041,007

CAR DOOR

Filed May 28, 1934 3 Sheets-Sheet 1

FIG. -1



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CAR DOOR

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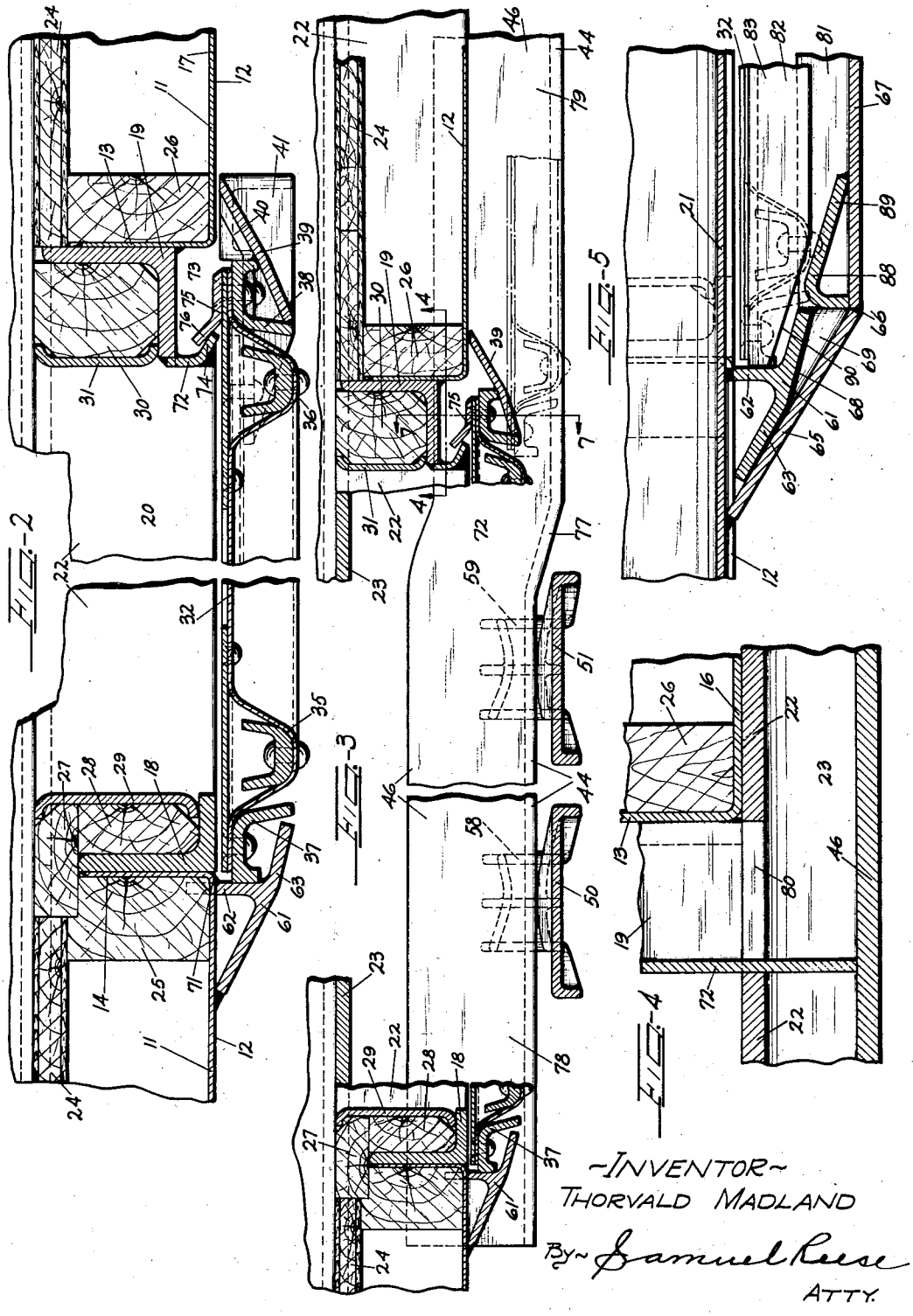


FIG. 2

FIG. 3

FIG. 4

FIG. 5

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CAR DOOR

Filed May 28, 1934 3 Sheets-Sheet 3

FIG.-6

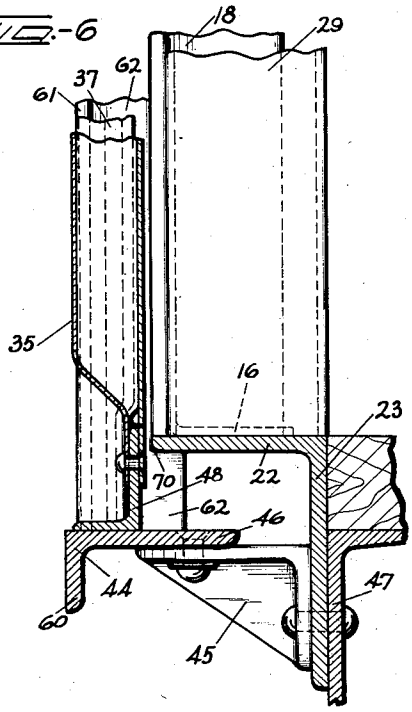


FIG.-7

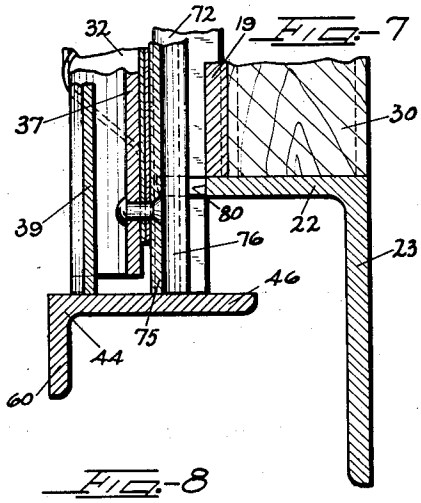


FIG.-8

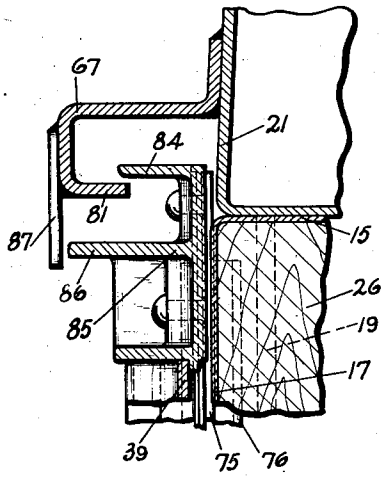


FIG.-9

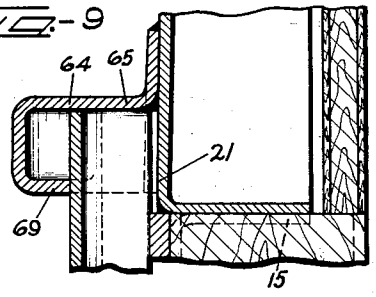


FIG.-11

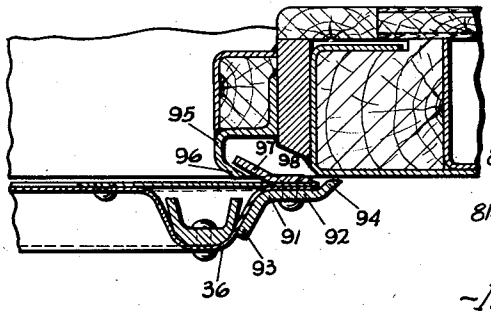
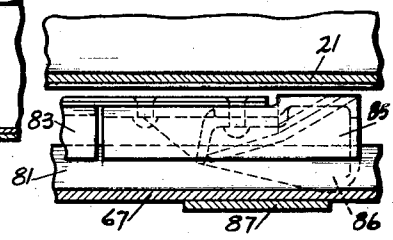


FIG.-10



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Patented May 19, 1936 2,041,007

UNITED STATES PATENT OFFICE

2,041,007

CAR DOOR

Thorvald Madland, Chicago, Ill., assignor, by mesne assignments, to The Youngstown Steel Door Company, Cleveland, Ohio, a corporation of Ohio

Application May 28, 1934, Serial No. 727,922

13 Claims. (Cl. 20—22)

This invention relates to sliding railway car doors.

It is an object of this invention to provide sliding car doors constructed and associated with cooperating car parts so as to effect a substantial reduction in wind resistance.

A further object is to provide a sliding door for railway house cars, the rear margin of which shall move toward the car side in the final longitudinal sliding movement of the door to closed position, such movement toward the car establishing effective weather proofing relationship between sealing means provided on the car and the rear margin of the door, the extension of the car sealing means being limited substantially by the outer plane of the car side.

A further object is to provide a sliding door for railway house cars having a sealing strip on its rear margin capable of movement toward the car side in the final longitudinal sliding movement of the door to closed position, such movement toward the car side establishing effective weatherproofing relationship between said sealing strip and means provided on the car, the lateral projection of said means being limited substantially by the outer plane of the car side.

A further object is to provide a novel front stop member for sliding doors.

Other objects will become clear as the description of the invention proceeds.

In the drawings forming part of this specification

Figure 1 is a partial elevation of a railway house car embodying the invention;

Figure 2 is a fragmentary horizontal section taken on line 2—2 of Figure 1;

Figure 3 is a fragmentary horizontal section taken on line 3—3 of Figure 1, part of the section line coinciding with the tread of the track, a portion of the door being shown in open position in dot and dash lines;

Figure 4 is a horizontal section taken on line 4—4 of Figure 3;

Figure 5 is a horizontal section taken on line 5—5 of Figure 1;

Figure 6 is a vertical section taken on line 6—6 of Figure 1;

Figure 7 is a horizontal section taken on line 7—7 of Figure 3;

Figure 8 is a vertical section taken on line 8—8 of Figure 1;

Figure 9 is a vertical section taken on line 9—9 of Figure 1;

Figure 10 is a horizontal section taken on line 10—10 of Figure 1; and

Figure 11 is a partial horizontal section showing a modified form of construction.

Referring to the drawings the numeral 10 designates a railway house car, a portion of which is illustrated in elevation in Figure 1 of the drawings. The side wall of the house car, designated in its entirety by the numeral 11, embodies outer metallic sheathing 12 comprising generally a plurality of substantially pan-shaped units having vertical inturned flanges 13 and 14 and upper and lower inturned flanges 15 and 16, the main body portion of said units 17 defining the outer plane of each of the side walls of the car. The flange 14 of one of said pan-shaped units is adapted to be secured as by means of welding to an angle member 18 which serves as a front door post. The inwardly directed flange 13 of another of said units is adapted to be secured as by means of welding to an angle member 19 which serves as a rear door post. The posts 18 and 19 define the vertical boundaries of a door opening 20, customarily provided in each side of a railway house car. The upper boundary of the door opening 20 is defined by the lintel 21 to which the upper inwardly directed flanges 15 of the pan-shaped units are secured while the lower boundary of the door opening is defined by the outwardly directed flange 22 of the sill member 23. To the flange 22 the lower inwardly directed flanges 16 of the pan-shaped units are secured as shown in Figure 6 of the drawings.

A lining 24 disposed in spaced relation to the metallic sheathing 12 defines the inner portion of the side wall 11 of the car. Wooden spacing members 25 and 26 may be disposed between the metallic sheathing and the inner lining of the side wall. Nailing strips 27 and 28 may be utilized in connection with the front door post 18, the latter strip being seated within the angle formed by the legs of the door post. These nailing strips may be protected by means of a metallic plate 29. Similarly, a nailing strip 30 may be seated in the angle formed by the legs of the rear door post 19 and the exposed face of said nailing strip may be protected by the wear plate 31.

A door 32 is adapted to be supported for sliding movement upon the side wall 11 of the car. The door 32 may comprise a metallic panel 33 formed to present spaced horizontal corrugations 34 which merge at their ends with vertical corrugations 35 and 36 formed adjacent the vertical edges of the metallic panel. A front edge weather strip 37 is secured to the front margin of the door

while a similar weather strip 38 oppositely disposed is secured to the rear margin of the door. A plate member 39 which, as clearly shown in Figure 2 of the drawings is inclined rearwardly and inwardly toward the car side, is secured preferably by means of welding to the member 38. The positioning of the plate member 39 is aided by a flange 40 provided on a strike casting 41 secured to the lower right hand corner of the door. In the disposition of the plate member 39 it is abutted against the flange 40. An opening and closing arrangement, designated as a whole by the numeral 42, may be utilized in connection with the door. A locking device, designated in its entirety by the numeral 43 may be utilized in order to fasten the door in its closed position.

The door illustrated is of the lift type whereby in its lowered position it is adapted to be frictionally received upon a supporting track 44 supported in the desired position in spaced relation to the outwardly extending flange 22 of the sill member 23 by means of a plurality of brackets 45 to which the flange 46 of the track is secured. The brackets 45 are in turn fastened to the sill member 23 and the sill member 47. The frictional engagement between the door and the track is preferably obtained by an angle reinforcing member 48 secured to the lower margin of the door. The door may be disposed upon antifriction means when it is desired to move it toward open or closed position and to this end lift mechanism, indicated as a whole by the reference numeral 49, may be employed. Briefly, the lift mechanism embodies cover plates 50 and 51 secured adjacent the lower corners of the door. Roller housings 52 and 53 are journaled between the cover plates and the door. The roller housings carry rollers 55 which are disposed in engagement with the track 44. An operating lever 56 is engaged with the roller housing 52 in order to impart movement of rotation to said roller housing, which movement of rotation is also imparted to the roller housing 53 by virtue of the connecting bar 57. This movement of rotation of the roller housings imparts a lifting movement to the door about the rollers 55 as fulcrums, the weight of the door being then disposed upon the rollers and being free of the track the door may readily be moved in the desired direction. The brief description of the lifting mechanism is believed to be sufficient inasmuch as it constitutes no particular part of the instant invention except that the members 50 and 51 are provided with hook portions 58 and 59 which, as hereinafter explained, are adapted to coact with the downwardly directed flange 60 of the track 44 for a reason which will become apparent.

The closing movement of the door is limited by means of a front stop member 61. This member preferably takes the form of a deformed T-bar, the stem 62 of which extends substantially at right angles to the side wall of the car. The head flange 63 of the front stop member 61 is inclined to the side wall and, as clearly shown in Figure 2 of the drawings, is directed forwardly and inwardly toward the side wall to which it is preferably secured by means of welding. The head flange 63 is extended rearwardly so as to overlap the front margin of the door. It will be clear from Figure 2 of the drawings that by virtue of the construction and relationship between the head flange 63 of the front stop member and the front margin of the door and the relationship between the plate member 39 and the rear margin of the door, a construction is presented which at these margins are similar in form. It will be apparent, additionally, that the inclination of the plate member 39 and the head flange 63 will effectively decrease the wind resistance normally offered by car doors.

The front stop member 61 extends downwardly from the web 64 of a member 65 secured to the lintel 21 of the car and disposed in inclined relationship to said lintel as best shown in Figure 5 of the drawings. The member 65 at its inner end is secured as by welding, as indicated at 66 to a top retaining member 67, thereby providing in effect a prolongation of said member. The front stop member 61 is preferably welded as indicated at 68 to an inwardly directed flange 69 provided on the member 65. From the member 65 the front stop member 61 extends downwardly to the inwardly directed flange 46 of the track. The stem 62 of the front stop member is coped as indicated at 70 from its upper end to a point adjacent the outwardly directed flange 22 of the sill member 23. As a consequence of this construction the stem 62 extends toward the car side and is disposed between the flange 22 and the inwardly directed flange 46 of the track. This disposition of the stem of the front stop member at the point indicated effectively precludes the entrance of the weather around the forward edge of the door. The stem 62 is preferably welded as indicated at 71 to the metallic sheathing 12.

An effective weatherproof condition is provided as well for the rear margin of the door. The construction utilized to this end has in view a reduction in the extension of the door outwardly beyond the side wall so as to reduce the wind resistance. In the accomplishment of this purpose the rear door post 19 is disposed inwardly of the metallic sheathing 12, as clearly shown in Figure 2 of the drawings. A guard strip 72 is secured as by means of welding to the rear door post 19 in spaced relation to the inwardly directed flange 13 of the pan-shaped unit lying adjacent the rear door post. It will be apparent from this construction that the inwardly directed flange 13, the door post and the guard strip define a recess 73. The guard strip 72 extends outwardly from its connection with the door post 19, this outward extent being limited substantially by the plane of the metallic sheathing 12. All projections, consequently, beyond the sheathing 12 adjacent the rear door post are eliminated. The guard strip 72 is preferably provided with a rearwardly and outwardly directed flange 74.

A sealing strip 75 is secured to the rear margin of the door. The sealing strip is preferably provided with a forwardly and inwardly directed flange 76 adapted to cooperate with the flange 74 provided on the guard strip 75 in order to effectively exclude entry of the elements into the car.

It will be apparent from the foregoing description as well as the showing of Figure 2 of the drawings that the rear margin of the door must be moved toward the car side in the closing movement of the door in order to obtain the desired cooperation between the guard and sealing strips 72 and 75, and that the rear margin of the door must move outwardly from the car side in the opening movement of the door so that the sealing strip 75 may move out of the recess 73 and be disposed in spaced relationship with the metallic sheathing 12. These movements of the rear margin of the door are obtained by the cooperation between the hook shaped portions 58 and 59 of the cover plates 50 and 51 secured to the

door and the track 44 upon which the door is supported.

With reference to Figure 3 of the drawings which, in full and dotted lines, denotes the position of the hook shaped portions 58 and 59 in the full closed position of the door it will be apparent that these portions substantially embrace the depending flange 60 of the track whereby to guide the door in its movements and to prevent disengagement of the lower portion of the door from the track. The track 44 adjacent the rear door post 19 is inclined outwardly and rearwardly as indicated at 77. As a result of this inclination of the track there is provided, in addition to the inclined portion 77, the horizontal portions 78 and 79 which lie parallel to the car side. The horizontal portion 79 of the track is disposed at a greater distance from the car side than the portion 78 of the track.

It will be apparent from the foregoing construction that in the movement of the door toward open position the hook shaped portion 59 of the cover member 51 will engage the inclined portion 77 of the track so as to force the rear margin of the door outwardly away from the car side. This cooperation between the hook shaped portion 59 and the inclined portion 77 of the track results in movement of the sealing strip 75 out of the recess 73 and disposes said sealing strip in spaced relation to the metallic sheathing 12 so as to prevent engagement between the sealing strip and the sheathing in the movement of the door. The hook shaped portion 58, as the door is moved to open position, will in turn engage the inclined portion 77 of the track and move the front portion of the door outwardly so that the door in its full open position will lie in spaced parallel relationship to the car side.

In the return movement of the door to its closed position the engagement between the hook shaped portion 58 and the inclined portion 77 of the track will force the forward part of the door inwardly toward the car side so as to insure engagement of the front edge thereof with the front stop member. The hook shaped portion 59 similarly, by virtue of its engagement with the inclined portion 77 with the track when the sealing strip 75 is opposite the recess 73 provided in the wall of the car, will urge the sealing strip into said recess so as to insure engagement of the flange 76 of said sealing strip with the flange 74 of the guard strip, thereby effectively sealing the rear margin of the door.

Sealing engagement between the spark strip 72 and sealing strip 75 is carried down to the lower edge of the door, as clearly shown in Figure 7 of the drawings. For this purpose the outwardly extending flange 22 of the sill member 23 is coped as indicated at 80 to permit the extension of the guard strip 72 and the sealing strip 75 to the track 44.

The upper margin of the door is guided during the sliding movement of the door and retained against disengagement upon the car side by means of the cooperation between an inwardly extending flange 81 provided on the retaining member 67, an outwardly directed flange 82 provided on an angular reinforcing member 83 secured to the upper margin of the door and an outwardly directed flange 84 adjacent the upper right hand corner of the door formed upon the casting 85 which carries, additionally, an outwardly directed flange 86. The flange 86 tapers forwardly from the rear edge of the door, as clearly shown in Figure 10 of the drawings, and is adapted to coact with a plate 87 secured to and depending from the retaining member 67 in order to force the upper portion of the door inwardly in the final sliding movement of the door to closed position. The forward portion of the door in the final closing movement thereof is forced toward the car side by the engagement of the member 37 secured to the forward margin of the door with the inclined head flange 63 of the front stop member 61. To insure this movement of the upper left hand portion of the door an angular member 88 provided with a forwardly and inwardly inclined flange 89 is secured as by means of welding to the retaining member 67. The outwardly directed flange 82 of the angular reinforcing member 83 is coped as indicated at 90 so as to provide a portion inclined similarly to the inclined flange 89 whereby the flange 82 in the final closing movement of the door will engage the inclined flange 89 and so urge the upper portion of the forward margin of the door toward the car side.

Figure 11 illustrates a modified construction of the rear margin of the door. In this modified construction the member 38 shown in Figure 2 of the drawings is dispensed with and in its stead an angular member 91 is utilized. The member 91 embodies a flange 92 by means of which said member is secured to the rear margin of the door. The flange 92 is extended from the flange 93 into engagement with one side of the vertical corrugation 36. A flange 94 extends rearwardly and toward the car side from the flange 92, the free edge of said flange 94 lying in proximate relationship with the car side. A guard strip 95 is secured to the wall of the car. The guard strip is provided with a rearwardly inclined flange 96 adapted to coact in weatherproofing relationship with a forwardly inclined flange 97 provided on a sealing strip 98 secured to the rear margin of the door.

It will be apparent that numerous changes and modifications in the details of the invention will be clear to those skilled in the art. It is intended, therefore, that all such modifications and changes be comprehended within this invention, which is to be limited only by the scope of the claims appended hereto.

I claim:

1. In a railway house car, a wall, a sliding door, a member secured to said car adapted to be engaged by the forward edge of said door to limit movement thereof, said member comprising a flange overlapping the forward margin of said door and inclined forwardly and inwardly to proximate relation with said car wall and a plate member secured to said door in overlapping relationship with the rear margin thereof, said plate member being inclined rearwardly and inwardly to proximate relation with said wall.

2. In a railway house car, a wall, a sliding door, a member secured to said car adapted to be engaged by the forward edge of said door to limit movement thereof, said member comprising an inclined flange extending from substantially the outer plane of said door forwardly and inwardly to proximate relation with said wall and an inclined plate member secured to the rear margin of said door and extending rearwardly and inwardly from substantially the outer plane of said door to proximate relation with said wall.

3. In a railway house car, a wall, a side sill having an outwardly extending flange, said wall being secured to said sill, a track secured to said sill below said sill flange, a front stop member

secured to said wall, a door slidably supported upon said track, the forward edge of said door engaging said front stop member in the closed position of said door, said front stop member extending downwardly to said track and having a flange directed inwardly toward said car beyond the inner plane of said door, said flange lying between said sill and said track.

4. A front stop member for sliding car doors comprising a vertical flange and a cross flange at one vertical edge of said vertical flange, said cross flange being related to said vertical flange at other than a right angle, one end of said cross flange terminating substantially in the plane of the opposite end of said vertical flange.

5. A front stop member for sliding car doors comprising a deformed T-bar having a stem and a head flange, said head flange being related to said stem at other than a right angle, one end of said head flange terminating substantially in the plane of the free end of said stem.

6. In a railway house car, a wall provided with a door opening, the outer face of said wall being formed of sheathing, an outwardly extending guard strip secured to said car adjacent the rear of said opening, the outward extent of said strip being limited substantially by the plane of said sheathing, a track secured to said car, a door supported for sliding movement upon said track in proximate relation to the outer face of said wall, a sealing strip on the rear margin of said door and means cooperable with said door during the final sliding movement thereof to closed position for forcing the rear margin of said door toward said wall to establish weatherproofing relationship between said guard and sealing strips.

7. In a railway house car, a wall provided with a door opening, the outer face of said wall being formed of sheathing, an outwardly extending guard strip secured to said car adjacent the rear of said opening, the outward extent of said strip being limited substantially by the plane of said sheathing, a track secured to said car, a door supported for sliding movement upon said track in proximate relation to the outer face of said wall, a sealing strip on the rear margin of said door and means effective during the final sliding movement of the door to closed position for moving said sealing strip toward said guard strip to establish overlapping weatherproof relationship of said sealing strip with said guard strip.

8. In a railway house car, a wall provided with a door opening the outer face of said wall being formed of sheathing, an outwardly extending guard strip secured to said car adjacent the rear of said opening, the outward extent of said strip being limited substantially by the plane of said sheathing, a track secured to said car, a door supported for sliding movement upon said track in proximate relation to the outer face of said wall, a sealing strip on the rear margin of said door, said track adjacent the rear of said opening being inclined outwardly and rearwardly, and means provided on said door engageable with said inclined portion of the track during the final sliding movement of the door to closed position for forcing the rear margin of said door toward said wall to establish weatherproofing relationship between said guard and sealing strips.

9. In a railway house car having a wall provided with a door opening, a door post defining the rear of said opening, said post being offset inwardly relative to the outer plane of said wall, a guard strip secured to said post in horizontally spaced relationship to the adjacent portion of said wall whereby to provide with said wall portion and said post a recess, said guard strip extending from said post to substantially the outer plane of said wall, a track secured to said car, a door slidably supported upon said track, a sealing strip on the rear margin of said door and means carried by said car effective during the final sliding movement of said door to closed position for moving a portion of said sealing strip into said recess and into weatherproofing relationship with said guard strip.

10. In a railway house car having a wall provided with a door opening, an inwardly directed offset formed in said wall adjacent the rear of said opening, a guard strip secured to said wall at the forward margin of said offset and cooperating therewith to provide a recess, the outward extension of said guard strip being limited substantially by the outer plane of said wall, a track secured to said car, a door slidably supported upon said track, a sealing strip on the rear margin of said door, and means cooperable with said door during the final sliding movement thereof to closed position for forcing the rear margin of said door toward said wall, a portion of said sealing strip entering said recess to establish weatherproofing relationship with said guard strip.

11. In a railway house car having a wall provided with a door opening, a side sill to which said wall is secured, an outwardly extending flange provided on said side sill, a recess formed in said wall adjacent the rear of said opening, said sill flange being coped to conform to said recess, a guard strip secured to said wall at the forward margin of said recess, said guard strip being disposed substantially within the outer plane of said wall, a track secured to said car below said sill flange, a door slidably supported upon said track, a sealing strip on the rear margin of said door, a portion of said sealing strip lying in said recess in overlapping relationship with said guard strip, said guard and sealing strips extending through the cope in said sill flange to said track.

12. In a railway house car, a wall provided with a door opening, the outer face of said wall being formed of sheathing, a door post defining the rear of said door opening, said post being offset inwardly relative to the outer face of said wall, a guard strip secured to said post in horizontally spaced relationship to the adjacent portion of said sheathing, said guard strip, post and sheathing defining a recess, said guard strip extending from said post to substantially the plane of said sheathing, a track secured to said car, a door slidably supported upon said track in proximate relation to said sheathing, a sealing strip on the rear margin of said door, said track adjacent the rear of said opening being inclined outwardly and rearwardly and means provided on said door engageable with said inclined portion of the track during the final sliding movement of said door to closed position for forcing the rear margin of said door toward said wall to establish weatherproofing relationship between said guard and sealing strips.

13. In a railway house car, a wall provided with a door opening, the outer face of said wall being formed of sheathing, said wall adjacent the rear of said opening being offset inwardly relative to the plane of the outer face of said wall, a guard strip secured to said wall, said guard strip cooperating with said offset portion

to provide a substantially channel shaped recess, said guard strip extending from said post to substantially the plane of said sheathing, a track secured to said car, a door slidably supported upon said track in proximate relation to said sheathing, a sealing strip on the rear margin of said door, said track adjacent the rear of said opening being inclined outwardly and rearwardly and means provided on said door engageable with said inclined portion of the track during the final sliding movement of said door to closed position for forcing the rear margin of said door toward said wall to establish weatherproofing relationship between said guard and sealing strips.

THORVALD MADLAND.