Dec. 24, 1940. A. WASBERG 2,226,419

RAILWAY CAR DOOR

Filed March 10, 1939 3 Sheets-Sheet 1

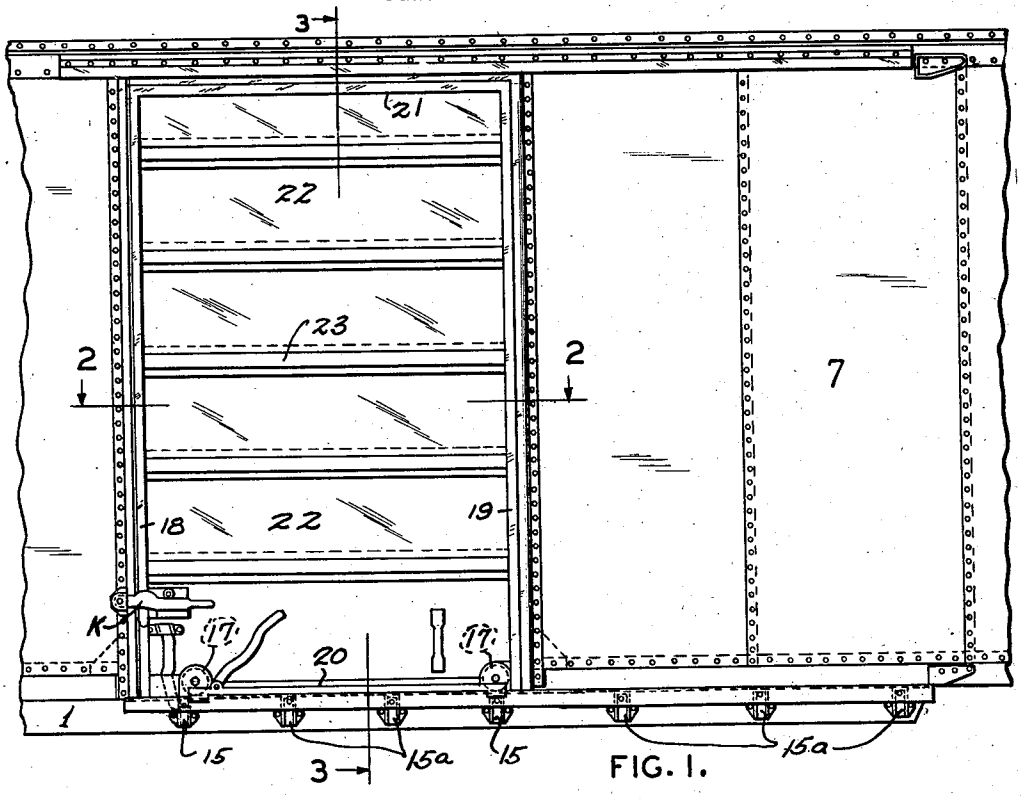


FIG. 1.

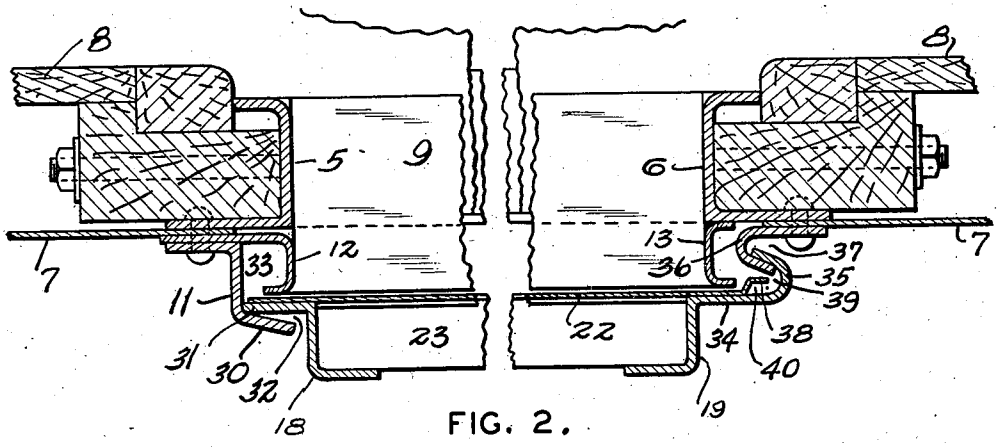


FIG. 2.

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RAILWAY CAR DOOR

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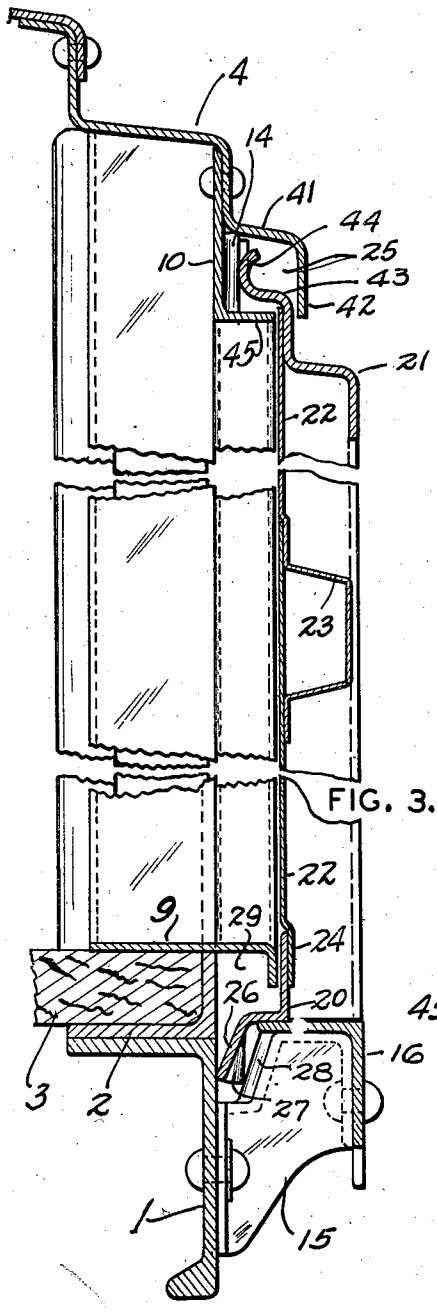


FIG. 3.

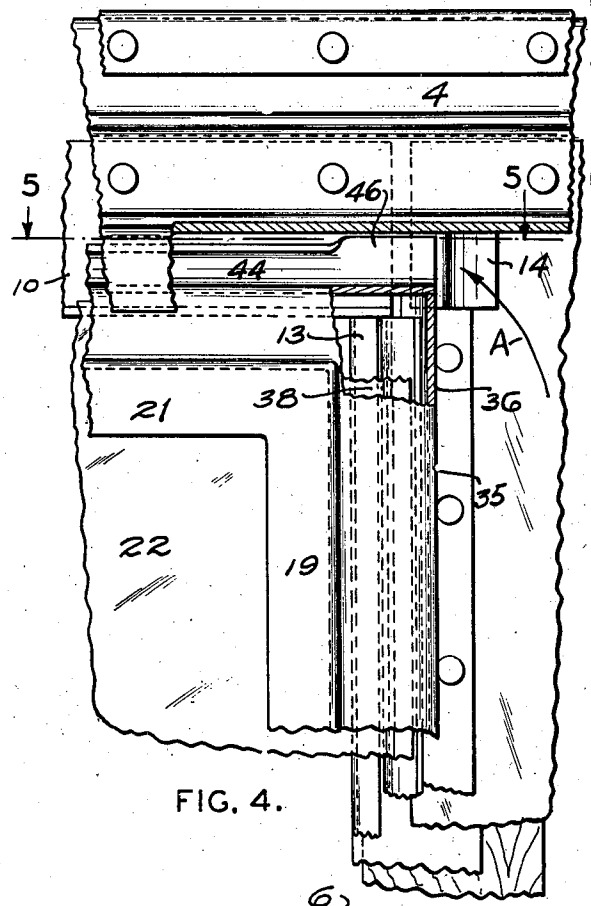


FIG. 4.

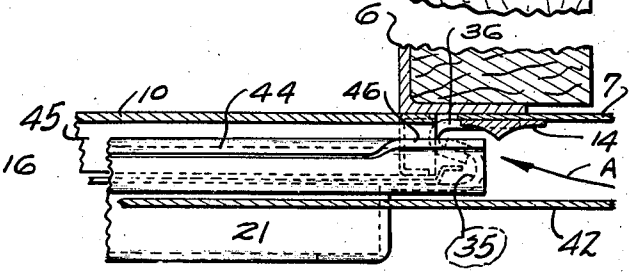


FIG. 5.

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RAILWAY CAR DOOR

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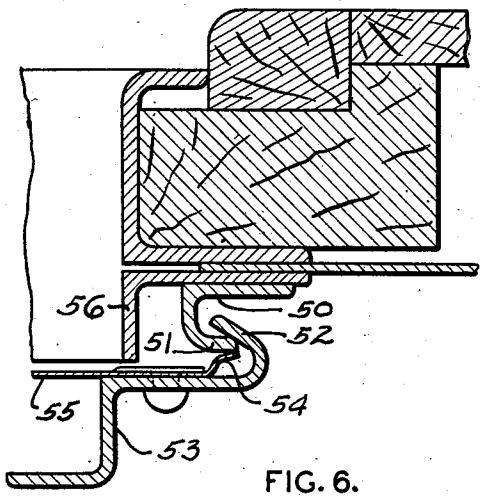


FIG. 6.

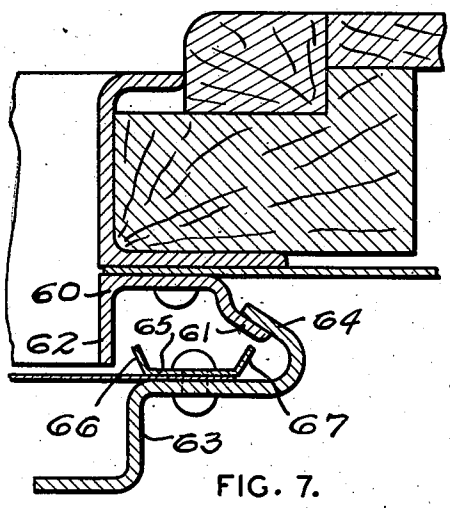


FIG. 7.

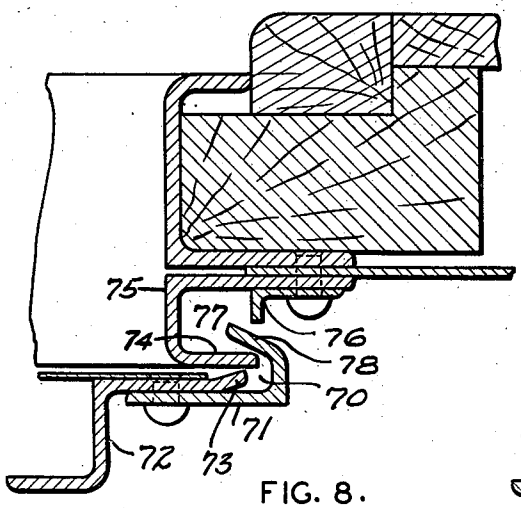


FIG. 8.

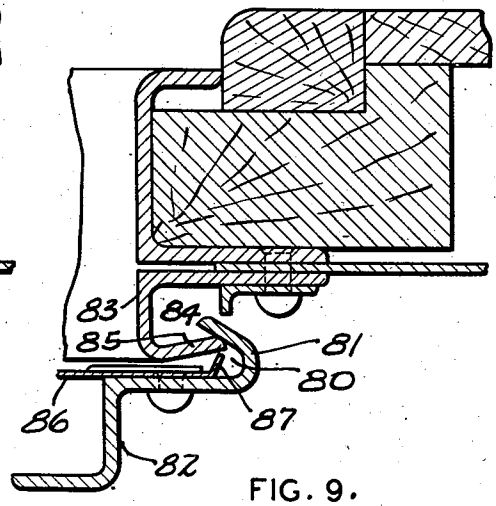


FIG. 9.

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Patented Dec. 24, 1940

2,226,419

UNITED STATES PATENT OFFICE

2,226,419

RAILWAY CAR DOOR

Axel Wasberg, Chicago, Ill., assignor to Chicago Railway Equipment Company, Chicago, Ill., a corporation of Illinois

Application March 10, 1939, Serial No. 260,921

17 Claims. (Cl. 20—26)

The invention relates to railway rolling stock and more particularly to the construction of sliding doors, as used on house cars, and the adjacent portions of the car body whereby an effective weather seal is provided around the door edge, when the door is closed, to prevent the passage of rain, snow, dust, cinders and other matter to the interior of the car.

As is well known in the art, the bleak exposure of the car exterior to winds from all directions and to air streams raised by the movement of the train and by the passage of trains on adjacent tracks sets up strong direct currents and eddy currents tending to enter the crevices between the car door and body and many "sealing" structures have been designed to prevent the passage of such air streams. The difficulty of the problem is increased when the involved parts are constructed of structural steel members, pressed panel forming plates and other steel parts, the surfaces of which are not true as they would be if machined and fitted individually. Even if the doors and wall members are accurately fitted when first assembled, subsequent deformations due to the weaving of the car, track irregularities and rough handling by train men, shippers, etc. would negative the permanence of the weather seal.

The main object of the present invention is to provide a more effective seal around the door than has been obtained heretofore and more particularly to provide such a seal by simple inexpensive and durable parts whereby the useful life of the seal will be prolonged. This and other detailed objects of the invention as appear in the following description are obtained by the structure illustrated in the accompanying drawings in which:

Figure 1 is a side elevation of a portion of a house car body and a sliding door mounted thereon.

Figure 2 is a horizontal section taken on line 2—2 of Figure 1 and drawn to an enlarged scale.

Figure 3 is a vertical section taken on line 3—3 of Figure 1 and drawn to an enlarged scale.

Figure 4 is an elevation of the upper right hand corner of the door shown in Figure 1 and drawn to an enlarged scale with parts broken away to more clearly illustrate the construction.

Figure 5 is a horizontal section taken on line 5—5 of Figure 4.

Figures 6, 7, 8 and 9 correspond to the right hand portion of Figure 2 but illustrate respectively different forms of the invention embodied in this part of the assembly.

The car body includes a side sill 1, a floor edging 2, flooring 3, a W-shaped side plate 4, body door posts 5 and 6, outer wall plates 7 and inner sheathing 8. At the door opening the body includes a threshold plate 9, a door header 10, a front door stop 11 and weather seal elements 12, 13 and 14 referred to in detail below. Brackets 15 and 15a on side wall 1 carry a door track 16 on which the bottom edging of a lift type door rests when the door is stationary. When the door is to be moved, it is raised and its weight transferred to rollers 17 as described in my copending application, Serial No. 231,141 filed September 22, 1938. However, the manner of mounting the door is immaterial to the present invention.

The door is shown as comprising a front edging 18, a rear edging 19, a bottom edging 20 and a top edging 21, all of relatively heavy rolled or pressed shapes, and a plurality of relatively light panels 22, the lower portion of each, (except the bottom panel) includes a U-shaped part 23 extending over the upper edge of the next lower panel and overlying the same to provide a box section reinforcement extending from edge to edge of the door. The lower edge portion 24 of the lower panel overlaps the bottom edging 20. Top edging 21 extends from the inside of the downwardly opening pocket 25, formed by side plate 4, downwardly and outwardly over the upper edge of the top panel 22. Hence there are no upwardly facing crevices from the car roof to the side plate in which water may gather to seep in between the joints and corrode the metal parts.

The door bottom edging 20 has a Z contour and the lower flange 26 thereof is inclined downwardly and inwardly so as to oppose and contact side sill 1. Restricted portions 27 of flange 26 are crimped outwardly to oppose the inner edge of the top flange of track 16 and the downwardly and inwardly inclined ribs 28 on brackets 15. Elements 27 and 28 cooperate to thrust the door inwardly towards the sill and hold the door against rattling and also to provide an air baffle between these parts. Upwardly of the joints between flange 26 and sill 1 is the downwardly facing pocket 29 formed by floor edging 2 and the downwardly flanged threshold plate 9. Any air, moisture or dirt tending to pass upwardly through the crevices between the sill and flange 26 is trapped in pocket 29 and there is little likelihood of the same passing upwardly from threshold plate 9 to the interior of the car. The door closing feature and air baffle feature of elements

27 and 28 do not depend upon the door being of the "lift" type but will be present in the usual roller mounted door in which the bottom edging is always spaced above the track.

Door stop 11 is Z-shaped and its outer flange 30 is inclined away from the body wall and towards the door opening to engage and guide flange 31 of the door front edging 18 and thereby cooperate with elements 27 and 28 to move the door inwardly towards the car body. Flange 30 and the adjacent portions of Z door-edging 18 form an outwardly opening pocket 32 for baffling air streams tending to enter the crevices between the door front edging and stop 11. The web of stop 11 and the J-shaped element 12 cooperate to form a secondary pocket 33 which traps any air, dirt and moisture passing inwardly from pocket 32 and same may be dropped to the bottom of the door and be discharged over track 16. When the door is closed elements 32 and 11 are wedged against each other by suitable locking mechanism K (detailed and described in an application filed by E. A. LeBeau on August 5, 1938, Serial No. 223,165.) The forward joint is more likely to be closed tightly and to remain closed than the other joints around the door and comparatively little difficulty is encountered in maintaining the forward seal. The structure forming the seal at the front edge of the door is not new and in itself does not constitute the present invention.

The door rear edging 19 preferably is of Z section and its flange 34 extends in the general plane of the door rearwardly of panels 22 and terminates in a return bend 35 at the inner side of the door and facing the door body with its edge portion opposing and adapted to contact the outer portion of a pocket forming member 36 mounted on the car wall and forming a pocket 37 facing away from the door opening.

Member 13 corresponds to member 12 and forms a secondary pocket facing away from the door opening. The rear edge portions 38 of door panels 22 are offset inwardly of the door and flange 34 and extend into pocket 39 formed by elements 34—35, being spaced from the wall of this pocket and partitioning the same and forming with element 34 an inner pocket 40 facing rearwardly of the door. The offset portion 38 and the opposing element of member 36 converge towards each other rearwardly of the door or, conversely, diverge in the direction of the door opening. Hence any air stream passing between elements 35 and 36 will have its velocity decelerated by pocket 38 and the diverging elements, and moisture, dirt etc. carried thereby will more likely be trapped by member 13 and dropped to the bottom of the door for discharge over track 16.

Obviously, tight joints are not likely to be maintained at the forward and rear ends of the door simultaneously. If the door front edging strikes stop 11 before members 35 and 36 have contacted then the opposing elements of the latter and elements 38 and 13 form a tortuous path well adapted to baffle the passage of air and foreign matter into the car. If members 36 and 35 should contact before the forward front edging strikes the door stop the contacting elements may spring somewhat to permit further forward movement of the door, but repeated contact of members 35 and 36 is likely to exhaust the springiness of these members and eventually the baffle structure must be relied upon rather than a tight contact between the members.

The door header 10 cooperates with the downwardly and outwardly inclined shoulder 41 and depending flange 42 of side plate 4 to form a nearly closed pocket 25. The Z shaped upper edging 21 on the door includes a projection 43 extending upwardly and inwardly through the opening in pocket 25 and terminates in a return bend 44 located above the flange 45 of header 10 and inwardly of door panel 22. Any air current tending to pass under side plate elements 41, 42 and over the top of the door is trapped more effectively in pocket 25 due to the curvature 44 and foreign matter carried by the air current will drop by gravity and may drain back from the exterior of top edging 21 instead of being carried into the car.

To prevent an air stream in the direction of arrows A (Figures 4 and 5) from passing around the opening above the tops of members 35 and 36 it will be desirable to straighten out the upper portion of element 44 as indicated at 46 and the rear end of this portion 46 will cooperate with member 14 to baffle such an air stream.

Fig. 6 illustrates another form of the weather seal at the rear end of the door in which the door body outer pocket forming member 50 has its outer element 51 paralleling the side wall and door panel to provide a line contact with the inclined element 52 of a door rear edging 53. The offset projection 54 on the door panel 55 is arranged to contact with the outer face of element 51 so that as the door is moved into closed position element 51 will be seized between elements 52 and 54, the latter of which may yield if necessary, to insure metal to metal contact at this point. The door body inner pocket forming member 56 consists of a standard angle and does not include the outer flange extending away from the door as embodied in member 13 previously described.

Fig. 7 illustrates a form of the weather seal provided at the rear end of the car in which a single body member 60 has an outwardly and rearwardly inclined flange 61 and an outwardly extending flange 62 perpendicular to the side wall. The door edging 63 includes a return bend flange 64 arranged to oppose and (if there is sufficient forward movement) to contact flange 61. A channel-like member 65 with inclined diverging flanges 66 and 67 is secured to the inner edge portion of the door and flanges 66 and 67 cooperate with the pocket structures formed by members 63 and 60 to baffle any air streams tending to pass between the door and door post to the interior of the car.

Fig. 8 illustrates another form of the invention in which the forwardly facing pocket 70 is formed by a J-shaped angle 71 applied over the inner flange of the door rear edging Z 72 and the rear portion of the latter is inclined inwardly of the door as at 73 to enter the pocket 70 and to cooperate with the sides of the pocket and with the flange 74 on the door body pocket forming member 75 to baffle any air stream tending to pass between the door and the door post to the interior of the car. A separate angular member 76 placed in the open end of pocket 77 cooperates with the flange 78 of door member 71 to baffle the air stream.

Fig. 9 illustrates a similar arrangement in which the main pocket 80 on the door structure is formed by an extension and return bend 81 on the door rear edging 82. A body member 83, which forms a pocket 84, includes a flange 85 arranged to oppose and contact, if there is suffi-

cient forward movement of the door, with flange 81. Door panel 86 terminates in an inclined portion 87 cooperating with elements 81 and 85 to form a double baffle inwardly of pocket 84.

In each of the weather seals at the rear end of the door, the door itself includes elements forming a pocket facing in the direction of the general plane of the door and towards the door opening, and a partition therein forming, in effect, a secondary pocket, irrespective of the relation of the door elements to the baffle structure on the car body.

All of the above described structures cooperate to prevent admission of the air and solid matter to the interior of the car and thereby protect the contents and avoid deterioration of the car parts. The door is thrust towards the car by the inclined flanges of members 11 and 36 and the downwardly and inwardly inclined portions of brackets 15. As to these features, the present application is a continuation in part of my copending application Ser. No. 231,141 filed September 22, 1938, the claims of which are now directed to different car door devices. The structures are simple and may be produced and assembled economically and are not unduly susceptible to injury from hard usage. The sealing structures may be united with each other and with the door or body parts by riveting or welding. The details may be varied in other ways than particularly pointed out herein and exclusive use of such modifications as come within the scope of the claims is contemplated.

What is claimed is:

1. A railway car door weather seal structure comprising a door panel, a door member forming a pocket at the edge of the door and facing inwardly of the door from said edge and parallel to the body of the door, and a door element offset inwardly of the inner face of said panel and projecting into said pocket and spaced from the inner face thereof.

2. A railway car door weather seal structure comprising a door panel, a rear edge reinforcing member thereon and including a U-section facing parallel to the general plane of the door and inwardly of the edge of the door, and an element offset inwardly from the inner face of said panel and extending between the sides of the U-section.

3. In a railway car door, a body panel having its rear edge portion offset inwardly of the door, a reinforcing member for said panel with a part spaced from said panel offset portion and extending rearwardly of the door beyond the edge of said offset portion and then bent around but clearing said offset portion and forming with the same a pair of air pockets facing in opposite directions.

4. In a railway car door, a body panel, a reinforcing member secured thereto and including a part spaced transversely of said panel and extending beyond the edge thereof and having a return bend towards the side corresponding to the inner face of said panel and arranged to oppose an outwardly facing sealing member of the car body, and a flange-like element offset inwardly from said panel and projecting into said return bend and arranged to cooperate with the sides of the same and with the car body member to form a plurality of air current baffles.

5. In a railway car door weather seal structure, a member mounted on the car body and forming a pocket facing away from the door opening, a member mounted on the car door and forming a pocket facing in the opposite direction, the outer side wall of each of said pockets being disposed to enter the other pocket, and an element on the car door overlapping said car body member transversely of the car and cooperating with the car door member to form another pocket facing the same general direction as the car body member pocket.

6. In combination in a railway house car, a body side sill and a door supporting track structure, a lift-type door having a body panel and an angular bottom framing member having a leg extending inwardly of the car from said panel and over said track structure with a part inclined downwardly towards said sill to form a baffle for an air stream tending to pass beneath the door into the car, restricted portions of said inwardly and downwardly inclined part being distorted outwardly to engage the inner edge of said track as the door is lowered and prevent the movement of said door outwardly transversely of said track structure.

7. In a sliding door for a railway house car, a body panel, an angular bottom framing member having a leg secured to said panel and a leg extending therefrom inwardly of the car and then inclined downwardly to oppose a car body member and form an air baffle, restricted portions of the inwardly and downwardly inclined part of said leg being crimped outwardly to provide a vertical shoulder for opposing the door track structure to prevent movement of the door outwardly transversely of the track structure.

8. A railway car door weather seal structure comprising a door top edging extending inwardly over the top of the door body and terminating at its upper end in an arcuate return bend forming an upwardly and outwardly facing concave baffle, and a door retainer member above said top edging and terminating in a substantially vertically disposed lip extending downwardly and overlapping said edging but spaced outwardly therefrom to arrest moisture and other matter discharged against it by said baffle and divert the same to the exterior of the door.

9. In a railway car door weather seal structure, a body member forming a door header with a depending portion extending exteriorly of the door and normally spaced therefrom, a door top edging extending inwardly of the car over the top of the door body and being curved upwardly and outwardly to face away from the car interior and to cooperate with said header portion to form a baffle for air currents and matter carried thereby, tending to pass between said door and header to the interior of the car, to direct the same outwardly and downwardly exteriorly of the door.

10. In a railway car door weather seal structure, a body member forming a door header, having a flange extending outwardly of the door opening, a door top edging extending inwardly over the top of the door body and said flange and then extending upwardly and outwardly and cooperating with said header to form a double baffle for air currents and matter carried thereby tending to pass between said door and header to the interior of the car.

11. A structure as described in claim 18 in which the upwardly and outwardly extending portion of the edging merges near the rear end of the door into an upright flange lying in the plane of the innermost part of the top edging, there being a cooperating body member at the rear end of said edging having a baffle surface

curving outwardly from the car body toward said upright flange.

12. In a railway car door weather seal structure, a body member forming a door header having a flange extending outwardly of the door opening, a body side plate including a part extending outwardly and downwardly above said flange and forming therewith a pocket having an opening adjacent the outer edges of said header and plate, and a door top edging extending through said opening into said pocket, and terminating in an outwardly and upwardly concaved baffle adjacent the inner end of said pocket.

13. In combination with a house car body having a door opening, a bracket beneath said door opening and including an inwardly facing part spaced from said body and inclined downwardly and inwardly, a track carried by said bracket and spaced from said body, and a lift-type door mounted on said track and including a part extending downwardly at the rear of said track and below the level thereof for a sufficient distance to engage said bracket part and be held thereby against movement away from the body and thrust the door inwardly of the car when it is lowered.

14. In combination with a house car body having a door opening, a bracket beneath said door opening, and including an inwardly facing part inclined upwardly and outwardly, a track carried by said bracket and spaced from said body, and a lift-type door mounted on said track and including a part extending downwardly at the rear of said track and below the level thereof and engaging said bracket part to direct said door inwardly towards the sides of the door opening as the door is lowered.

15. In a railway car door weather seal structure, a member mounted on the car body and forming a pocket facing away from the door opening, a member mounted on the car door and forming a pocket facing in the opposite direction, the outer side wall of each of said pockets being disposed to enter the other pocket, and an element on the car door converging towards the inner end of said car door member to form another pocket facing the same general direction as the car body member pocket.

16. In a railway car door weather seal structure, a member mounted on the car body and forming a pocket facing away from the door opening, a member mounted on the car door and forming a pocket facing in the opposite direction, the outer side wall of each of said pockets being disposed to enter the other pocket, and an air current baffle member on the door facing away from the door opening but positioned closer thereto than said car door member.

17. In a railway car door weather seal structure, a member mounted on the car body and forming a pocket facing away from the door opening, a member mounted on the car door and forming a pocket facing in the opposite direction, the outer side wall of each of said pockets being disposed to enter the other pocket, and a part carried on the door forming a pocket facing in the same direction as the pocket formed by said car body member but positioned closer to the door opening than the pocket formed by said car door member.

AXEL WASBERG.

CERTIFICATE OF CORRECTION.

Patent No. 2,226,419. December 24, 1940.

AXEL WASBERG.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, second column, line 69, claim 11, for the claim reference numeral "18" read --9--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 11th day of March, A. D. 1941.

Henry Van Arsdale,
Acting Commissioner of Patents.

(Seal)