

July 23, 1946.

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2,404,554

RAILWAY CAR DOOR AND POST STRUCTURE

Filed Sept. 5, 1942

2 Sheets-Sheet 1

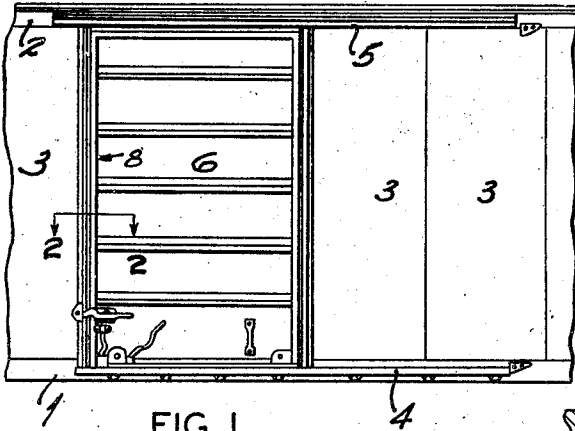


FIG. 1.

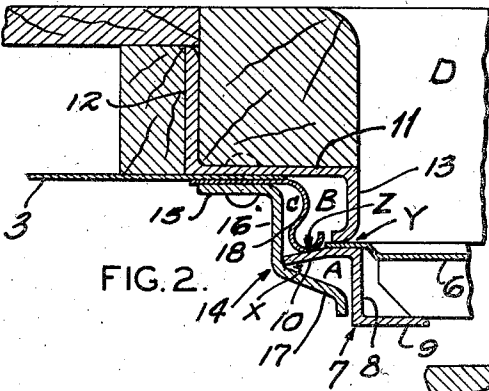


FIG. 2.

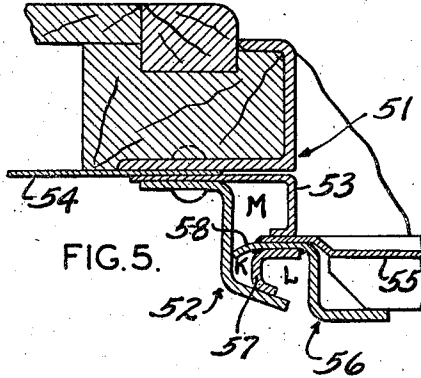


FIG. 5.

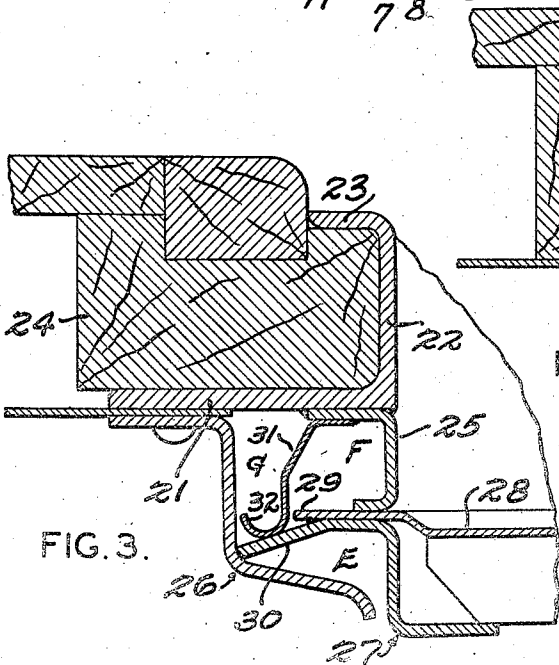


FIG. 3.

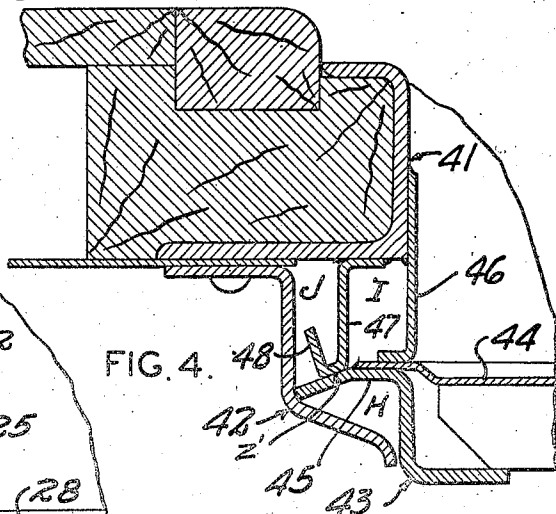


FIG. 4.

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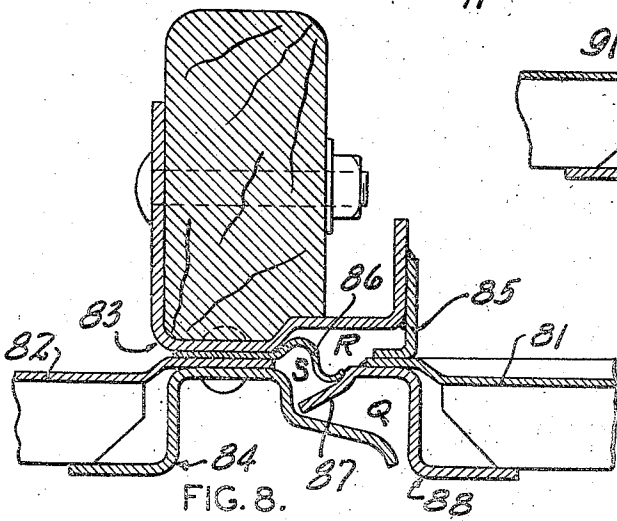
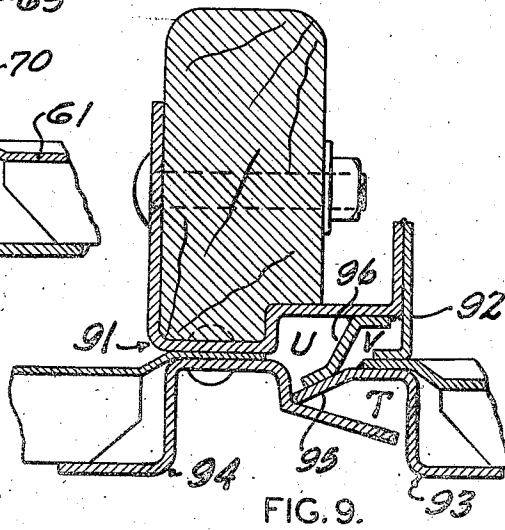
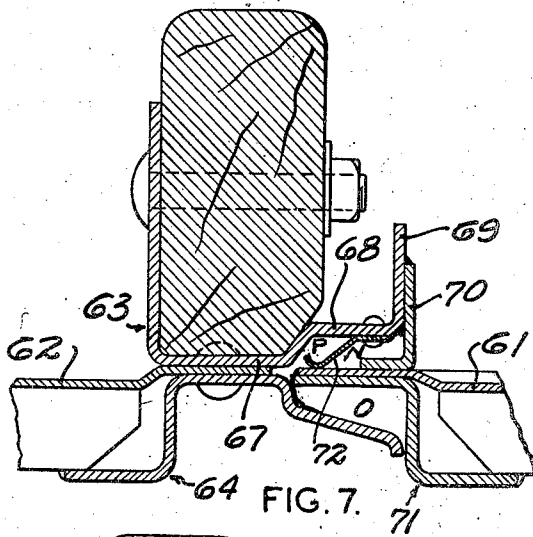
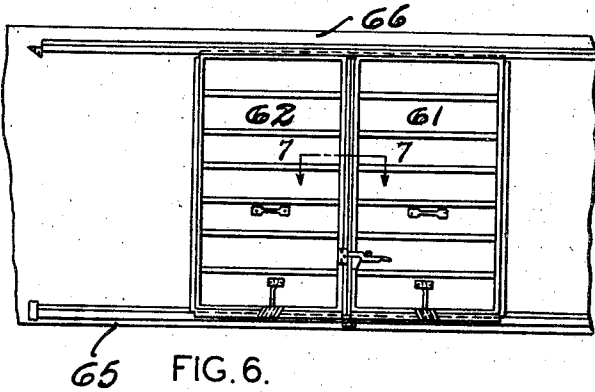
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RAILWAY CAR DOOR AND POST STRUCTURE

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2 Sheets-Sheet 2



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2,404,554

RAILWAY CAR DOOR AND POST STRUCTURE

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Application September 5, 1942, Serial No. 457,405

9 Claims. (Cl. 20—26)

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The invention relates to the formation of a weather excluding seal at the forward edge of a sliding door, when the door is closed, such as is adapted to be used effectively on railway box or house type freight cars where the exposure to winds and currents of air set up by the movement of the car tend to drive rain, snow, dust, cinders and other foreign matter to the interior of the car with likely damage to the lading.

In Patent No. 2,226,419, issued to the present applicant December 24, 1940, the front edge of the door and the adjacent post cooperate to form a pair of successive weather pockets opening towards the exterior of the door and serving to baffle inwardly moving currents of air and trap dirt, water, etc., carried thereby.

The general object of the present invention is to provide a more effective weather seal at the front edge than that disclosed in the above-mentioned patent. One way of obtaining this object is by utilizing a flexible weather-strip element in association with rigid elements on the door and post to cooperate therewith in forming the weather excluding pocket. Another way of obtaining this general object is to have spaced metal elements of the post and door structure provide a third pocket facing outwardly of the car cooperating with successive pockets as previously disclosed. This general object may be obtained by combining the flexible weather-strip element and the third pocket forming structure.

Other detail objects will be apparent from the following description, reference being had to the accompanying drawings illustrating selective embodiments of the invention in which—

Figure 1 is a side elevation of a railway box car provided with a side door mounted to slide longitudinally of the car wall to open and close the doorway.

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

Figures 3-5 are similar sections each illustrating a different form of the invention.

Figure 6 corresponds to Figure 1 but illustrates a box car having a main door and an auxiliary door arranged to slide to and from each other to open and close the doorway.

Figure 7 is a horizontal section through the joint formed by the two doors when in closed position and is taken on the line 7—7 of Figure 6 and is drawn to an enlarged scale.

Figures 8 and 9 correspond to Figure 7 but illustrate other forms of the invention.

The car body indicated in Figure 1 may include

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the usual side sill 1, side plate 2, sheathing 3 and tracks 4 and 5 upon which will be slidably mounted the door comprising panels 6 and framing including an upright angular forward member 7 here shown as a Z bar with its web 8 disposed transversely of the plane of the door and with one flange 9 extending longitudinally of the door and rearwardly from the edge of the door and with its other flange 10 extending in the opposite direction and forming the door front edge.

The body includes a door front post structure comprising a Z bar with its web 11 disposed longitudinally of the car and with one flange 12 extending inwardly of the car body and the other flange 13 extending outwardly of the car body and forming one side of the door opening and terminating adjacent to the inner face of the door Z bar flange 10. An angular member 14 on the body post has an inner flange 15 riveted through the sheathing and post web 11 and has a web 16 extending transversely of the car and forming a stop against which the door front edge abuts when the door is closed. Post member 14 also has an outer flange 17 extending longitudinally of the car outwardly of the flange 10 on door member 7 and towards web 8 of the door member.

Members 8, 10 and 17 form an outer pocket A opening outwardly of the car and with its inner end closed. Elements 10, 13 and 11 form an inner pocket B facing away from the door opening and closed at its inner end. Preferably a weather-strip element 18 of flexible material is secured to the body member extending transversely of the car between and spaced from elements 13 and 16 and positioned so as to be engaged and distorted by element 10 when the door is closed to form with element 10 and element 16 an intermediate pocket C facing away from the door opening and of substantial area and closed at its inner end.

With this arrangement of parts the movement of the door across the door opening D into closed position in which it engages the front stop 14 automatically forms a plurality of successive pockets which will baffle the admission of air currents and foreign matter carried thereby into the interior of the car. The contact at X will result in the outer pocket being closed at its inner end.

The inclination of post element 17 tends to force the door inwardly towards element 13 so as to narrow or close the gap between them at Y resulting in the inner pocket being substantially closed at its inner end. In the event the rigid elements are deformed or inaccurate the

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resilient element 18 is certain to be engaged by the door front edge so as to produce contact at Z, thus assuring a plurality of successive pockets each opening outwardly of the car and being closed at its inner end. The rigid elements of the post structure form a deep channel-like housing into which the door front edge may project and in which the flexible element 18 is so spaced from the rigid elements and the outer end of the pocket formed by them that it is not exposed to freight or other exterior objects moving past or through the doorway and it is therefore unlikely to be distorted, when the door is open, so that it would not fulfill its intended purpose when the door is closed.

Figure 3 illustrates another arrangement of the body door post and door front edge parts cooperating to form a triple pocket weather seal. The body post comprises a structural angle with one flange 21 disposed longitudinally of the car and the other flange 22 disposed transversely of the car with its edge portion 23 bent inwardly to receive the wooden post member 24. Both this post and the post illustrated in Figure 2 are recognized standards in railway house car construction. A channel-like pressing 25 is attached to post flange 21 and cooperates with post flange 22 in forming one side of the door opening. The door stop 26 corresponds generally to stop 14 previously described. The door includes a front edge member 27 corresponding to door edge member 7 previously described, although shown as a pressing instead of a rolled section. The door panel 28 is assembled with the door front edge member 27 similarly to the arrangement shown in Figure 2, but the edge portion of the panel forms a lip 29 projecting beyond the inner end of the inclined portion 30 of the front edge member.

Elements 26, 27 and 30 form an outer pocket E corresponding to the pocket A previously described. Elements 25 and 28 form an inner pocket F corresponding to the pocket B previously described.

A flexible weather-strip member 31 is secured to the body post at a point nearer to the door opening than the attachment of the flexible member in Figure 2, and its outer edge forms a lip 32 projecting into the intermediate pocket G corresponding to pocket C previously described. Lips 29 and 32 cooperate with the pocket wall forming elements to baffle the passage of air and matter carried thereby to the interior of the car. This structure functions substantially the same as that previously described.

Figure 4 illustrates another arrangement in which the body door post 41, door stop 42 and door front edge member 43 are substantially identical with the corresponding parts of Figure 3. The door panel 44 terminates abreast of the parallel portion 45 of the flange of the door edging to which it is attached and the cooperating element 46 on the body post has an angular section with a long leg attached to the inner face of the body post. The parts mentioned form an outer pocket H and an inner pocket I corresponding to the outer and inner pockets previously described. An intermediate pocket J is formed by a member 47 corresponding generally to member 31 in Figure 3 but differing therefrom in being substantially rigid instead of flexible. Its outer edge forms a re-bent flange 48 serving as a baffle for currents of air tending to pass inwardly of the door irre-

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spective of actual contact between elements 45 and 47 as indicated at Z'.

In the arrangement shown in Figure 5 the post main member 51 and the door stop member 52 are substantially the same as illustrated in Figures 3 and 4, and the post inner pocket-forming member 53 corresponds to that shown in Figure 3 but it is secured between door stop 52 and the body sheathing 54 instead of being attached directly to post 51. The door panel 55 and the door front edge member 56 are substantially identical with the corresponding parts shown in Figure 4.

The triple pocket arrangement is attained by the use of a small angle or clip 57 secured to the forward flange 58 of the door front edge member. The portion of element 57 extending transversely of the plane of the door is spaced from the edge of the flange so as to form with the flange and with the web of stop 52 a secondary pocket K at the rear of the initial pocket L. Elements 52, 53 and 58 form an inner pocket M at the rear of pocket K. With this arrangement, the closing of the door forms three successive pockets facing outwardly of the door opening and the first two pockets encountered by a current of air tending to enter the car are positioned outwardly of the inner flange of the door front edge member.

In each of the above described arrangements the invention is shown embodied in the joint between the front edge member of a sliding door and a post forming a part of the car body structure. The invention may be embodied in the joint between the main door and auxiliary doors of a car having a double door arrangement and commonly termed an "automobile car." In such a joint the major difference lies in arranging the parts so that the panels of the two doors may be in the same general longitudinal plane.

One such arrangement is shown in Figures 6 and 7 in which the panel 61 of the main door and panel 62 of the auxiliary door are in alignment. The auxiliary door includes an auxiliary main post member 63 and a framing member 64 which also forms the stop for the main door. The post may be provided with any one of different known types of latching structure (not shown) for securing the post to the car side sill 65 and side plate 66 when the doors are closed. The outer flange 67 of post member 63 is offset inwardly as indicated at 68 and terminates in an inwardly turned flange 69 to which one flange of the angular member 70 is secured, the other flange of member 70 extending in the same plane as the post flange 67 and forming with the offset portion 68 the inner pocket N. The front edge member 71 of the main door abuts the door stop member and forms therewith an outer pocket O corresponding to those previously described. A flexible weather-strip element 72 is attached to the inwardly offset portion of the post main member and has its outer end disposed to be engaged by the inner face of the marginal portion of panel 61, as the main door is moved into closed position, to form an intermediate pocket P. This arrangement corresponds to that shown, described and claimed in an earlier application filed by applicant June 28, 1941, Serial No. 400,234, now Patent 2,313,106, issued March 9, 1943, of which the present application is a continuation in part.

Figure 8 illustrates a door seal arrangement resembling in some details that shown in Figure 2 but modified for application to a main door and auxiliary door combination, as set forth in con-

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nection with Figures 6 and 7. The door panels 81 and 82, auxiliary door post 83, auxiliary door edging and main door stop 84 and angular member 85 are substantially identical with the corresponding parts shown in Figure 7. The flexible weather-strip member 86 is secured between members 83, 82 and 84 and has a reverse curve projecting portion arranged to be engaged by the offset and outwardly bent forward flange 87 of the door front edge member 88. This arrangement provides an outer pocket Q, an inner pocket R and an intermediate pocket S functioning as do the triple pocket arrangements previously described.

Figure 9 corresponds generally to the arrangement of Figure 4 but shows the parts embodied in the main door and auxiliary door joint of a double door structure. The post main member 91, the inner rigid angular member 92, the door front edge member 93 and the door stop member 94 are substantially the same as the corresponding members shown in Figures 7 and 8 except that the inclined forward flange 95 of the door edge member is straight. The intermediate member 96 is rigid and is shaped to provide extended contact with flange 95. Insofar as the member 96 is rigid the structure corresponds to that shown in Figure 4. As in the other forms of the invention, three successive pockets T, U and V are formed to block incoming currents of air and trap dirt and moisture carried thereby which will be drained downwardly to the bottom of the door and post.

Each form of the invention attains the general object described in the introductory portion of the specification in different specific embodiments, and it is to be understood that, so far as the present invention is involved, it is immaterial whether the post cooperating with the front edge member of the door is a post forming a fixed part of the car body or is a post mounted on an auxiliary door. The different arrangements shown in the drawings are intended to be illustrative and specific features of the body post and associated door may be embodied in the auxiliary door post and associated door and vice versa, as may be deemed expedient. Some of the elements may be omitted, leaving two pockets embodying novel features of the construction. Other variations in details of construction may be made by those skilled in the art without departing from the spirit of the invention, and the exclusive use of such modifications as come within the scope of the claims is contemplated.

What is claimed is:

1. In a railway car sliding door weather seal construction, a door, a door post, the door including an upright angular member with a web extending transversely of the plane of the door and with a flange extending longitudinally of the door and forming the door front edge, the post including an upright angular member having a web extending transversely of the plane of the door and forming a stop for the door front edge, when the door is closed, and having a flange extending outwardly of said door member flange and towards the door member web, and an element on the door member cooperating with said door member web and said post member flange, when the door is closed, to form a pocket opening towards the exterior of the door and closed at its inner end, said element cooperating with said door member flange and post member web and flange to form a second pocket behind said

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first-mentioned pocket and opening towards the exterior of the door and closed at its inner end.

2. Structure as described in claim 1 which includes an element on the post member inwardly of the door member and element and cooperating with the post member web and the door member flange to form a third pocket opening outwardly of the car and closed at its inner end.

3. In combination, a pair of sliding doors movable into closed position with their adjacent edges abutting each other, each of said doors comprising a body panel and framing members at the margins thereof, the framing members on the adjacent margins of the two doors including overlapping elements forming successive pockets closed from the space at the inner side of the doors, each having a relatively small opening directed outwardly from said space whereby air and matter carried thereby tending to pass from the space at the outer side of the doors to the space at the inner side of the doors is trapped, one of the pocket-forming elements having a yielding portion extending into the path of movement of an element on the other door, said yielding portion forming an inturned lip adjacent one side edge of the corresponding pocket.

4. Structure as described in claim 3 in which the yielding portion normally projects from an inner wall of the pocket with which it is associated and between the spaced edges at the open end of the pocket to contact with the other door when the doors are in closed relation.

5. In combination, a pair of sliding doors movable into closed position with their adjacent edges abutting each other, each of said doors comprising a body panel and framing members at the margins thereof, the framing on the adjacent margins of the two doors including overlapping elements forming successive pockets closed from the space at the inner side of the doors, each pocket having a relatively small opening adjacent the joint between the doors and directed outwardly from said space when the doors are closed, whereby air and matter carried thereby tending to pass from the space at the outer side of the doors to the space at the inner side of the doors is trapped, one of the pocket-forming elements having a yielding portion extending into the path of movement of an element on the other door, said yielding portion forming an inturned lip adjacent but spaced from the sides of the corresponding pocket.

6. In structure for excluding weather from passing inwardly of the door opening in a railway car having a sliding door, a post forming a stop for the door, when the door is closed, spaced elements on said post forming a plurality of pockets, irrespective of the position of the door, and each having a relatively narrow opening past which the door will move as it approaches said stop, and each having a relatively wide inner portion permanently closed except for said narrow opening and adapted to trap matter which may enter the pocket opening.

7. In a railway car sliding door weather seal construction, a door, a door post, the post including an upright web extending longitudinally of the car, and flanges spaced apart longitudinally of the car and extending outwardly from said web, there being an element of flexible material extending outwardly from said web and positioned intermediate said flanges and having a return bend portion at its outer edge and forming with said flanges a pair of pockets with closed inner ends and open outer ends, the door including a

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front edge part extending longitudinally of the door and positioned, when the door is closed, to overlie said pocket open ends and to contact said flexible element at a point spaced from its outer edge to increase the baffling effect of the element. 5

8. In a railway car sliding door weather seal construction, post structure, a door front edge structure slidable across the door opening towards said post structure into closing position, said structures each including spaced elements as permanent parts thereof, said elements, when the door is closed, forming a series of three pockets arranged one after the other and each having a relatively narrow outer open end and having an inner portion opposite to the open end and disposed to baffle the passage of air and foreign matter inwardly of the car through the joint between the post and door, at least one pocket having an

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element projecting inwardly from a side of the pocket between its open end and its inner portion to interrupt movement of air through the pocket.

9. In a railway car sliding door weather seal construction, a post, a door front edge structure slidable across the door opening in the car wall towards said post into closing position, there being substantially rigid elements on said post and structure movable past each other and cooperating when the door is closed to form a series of three successive pockets each having a relatively wide inner portion and sides converging towards a relatively narrow entrance from the outside of the car, said pockets being arranged to check successively the passage of air and foreign matter inwardly of the car through the joint between the post and the door.

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