United States Patent

[11] **3,587,477**

[72] Inventors **Ray L. Ferris**
Thornton, Ill.;
William R. Shaver, Munster, Ind.; Jan W. Dohne, South Holland, Ill.

[21] Appl. No. **787,445**
[22] Filed **Dec. 30, 1968**
[45] Patented **June 28, 1971**
[73] Assignee **Pullman Incorporated**
Chicago, Ill.

---

[54] **RAILROAD CAR DOOR MEANS**
8 Claims, 9 Drawing Figs.

[52] **U.S. Cl.** **105/378,** 49/410, 49/474
[51] **Int. Cl.** **B61d 17/00**
[50] **Field of Search** 105/378, 366; 49/410, 411, 412, 472, 473, 474

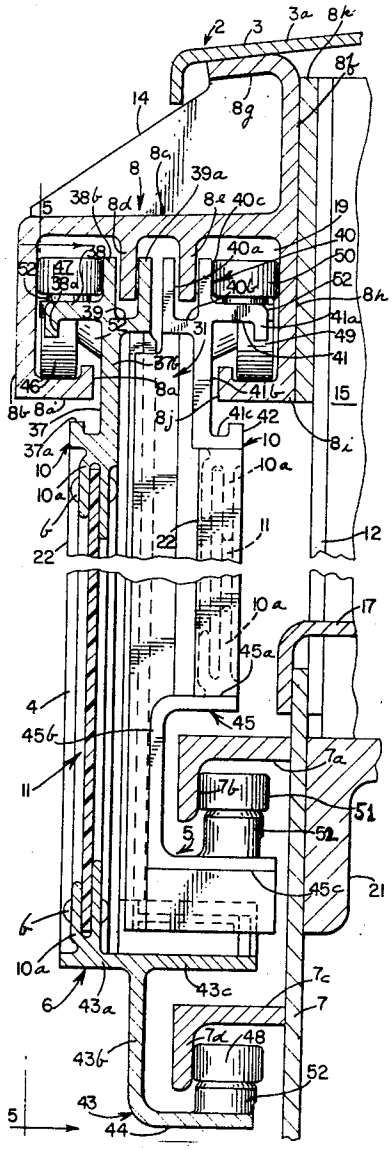
[56] **References Cited**

UNITED STATES PATENTS

1,921,422	8/1933	Mattern	49/412
2,201,915	5/1940	Oyen	49/473
2,397,335	3/1946	Christiansen	49/473
2,596,913	5/1952	Nystrom	49/474
2,756,694	7/1956	Wardein	105/378
2,780,180	2/1957	Rothfuchs	49/473
2,824,339	2/1958	Shaver	49/410
2,930,332	3/1960	Cook et al.	105/378
3,260,223	7/1966	Black et al	105/366

Primary Examiner—Drayton E. Hoffman
Attorneys—Hilmond O. Vogel and Wayne Morris Russell

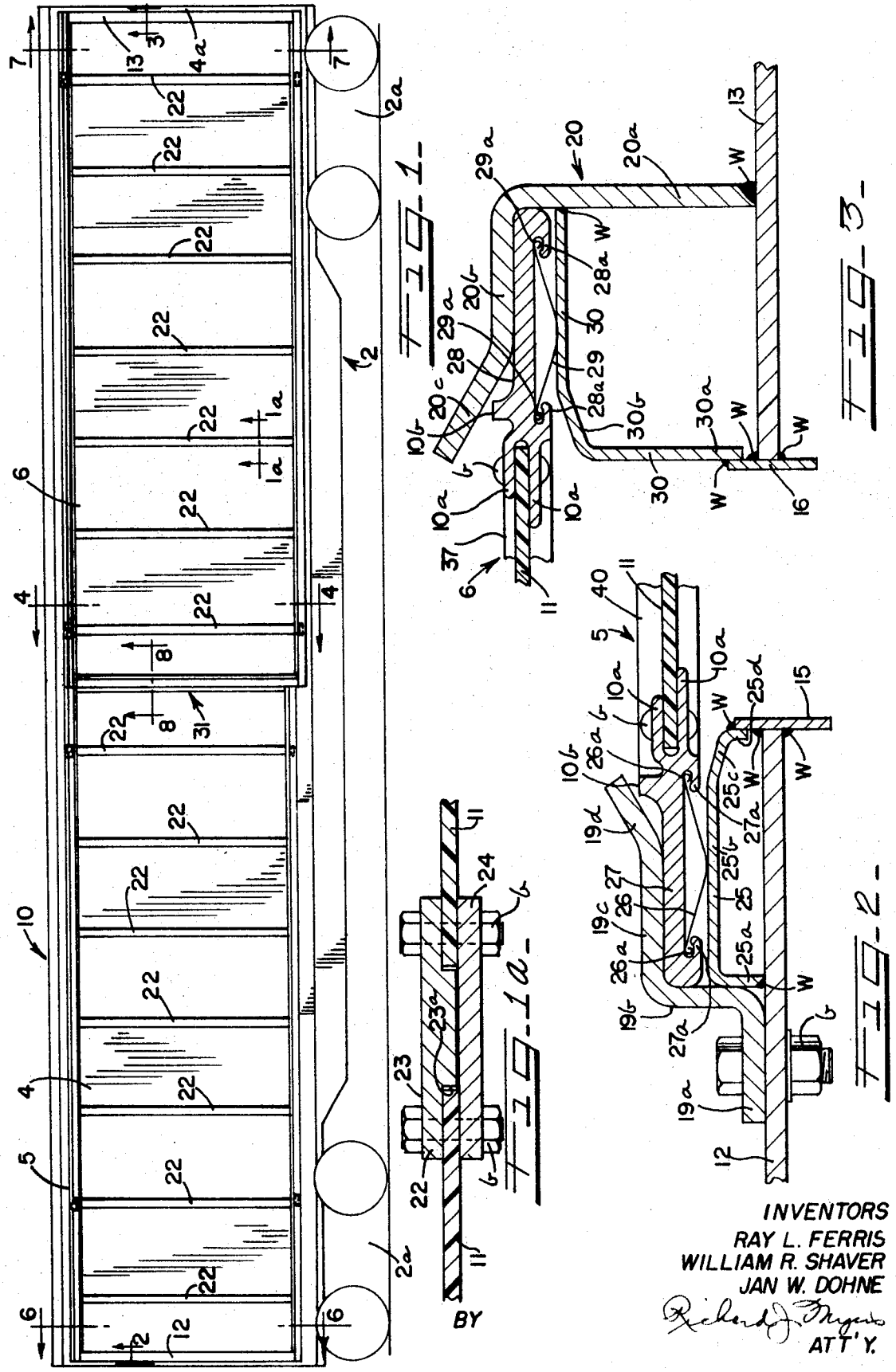
ABSTRACT: In a railroad box car, a pair of slidable doors extending the length of the car, the upper and lower door framing of each door providing a baffle seal arrangement with the upper side plate and lower side sill, the upper and lower framing carrying roller means mountable on track structure on the side plate and side sill to slidingly support the doors for movement toward and away from one another, the outer end of each door sealing with the respective outer post and the inner end of each door sealing with the other, the inner door sliding past the outer door to permit approximately one-half of the car side to be exposed.



PATENTED JUN 28 1971

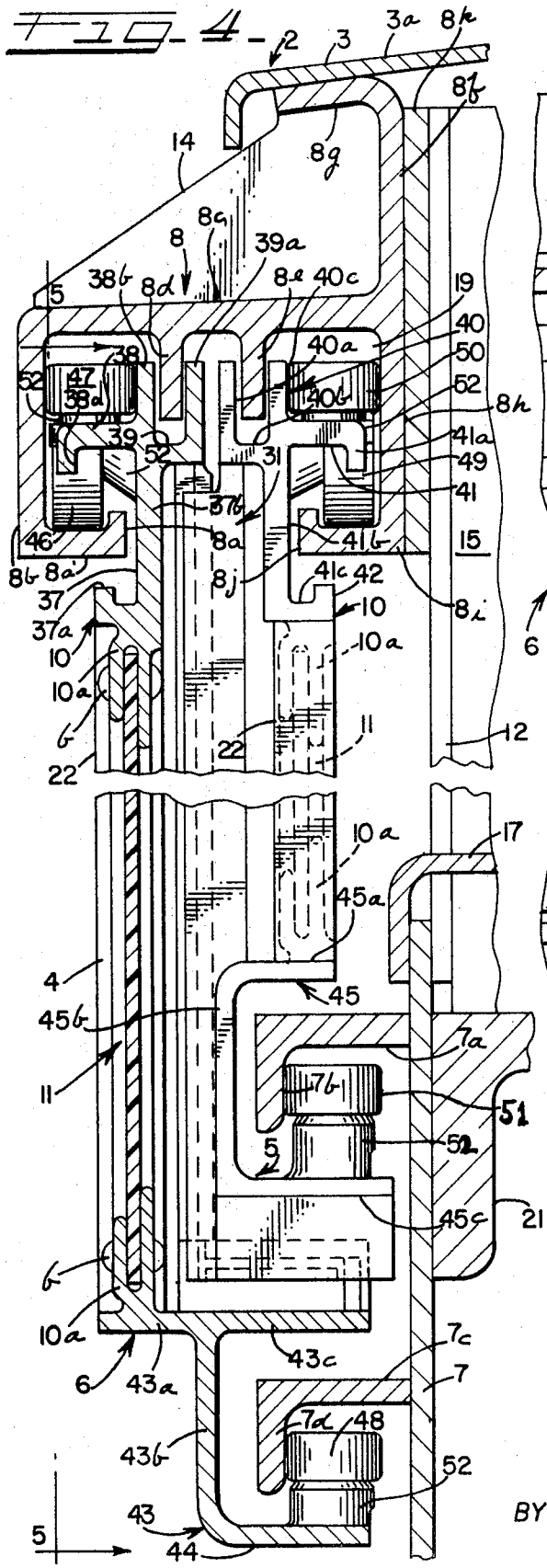
3,587,477

SHEET 1 OF 3



INVENTORS
RAY L. FERRIS
WILLIAM R. SHAVER
JAN W. DOHNE
BY Richard J. Myers
ATT'Y.

FIG. 4



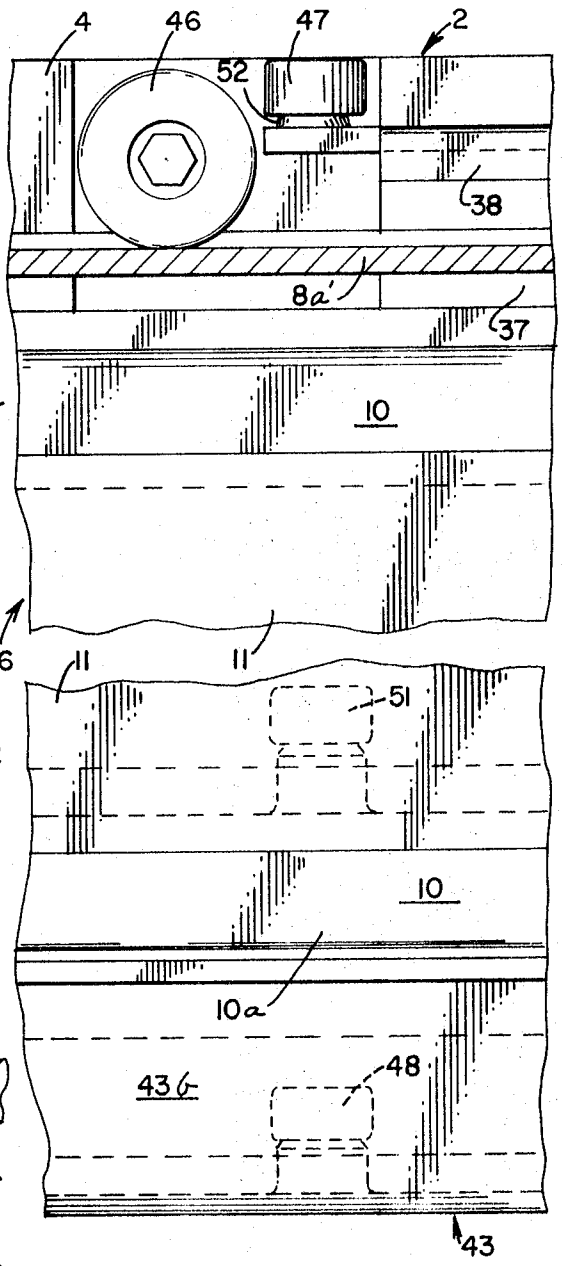


FIG. 5

INVENTORS
RAY L. FERRIS
WILLIAM R. SHAVER
JAN W. DOHNE

BY Richard J. Myers
ATT'Y.

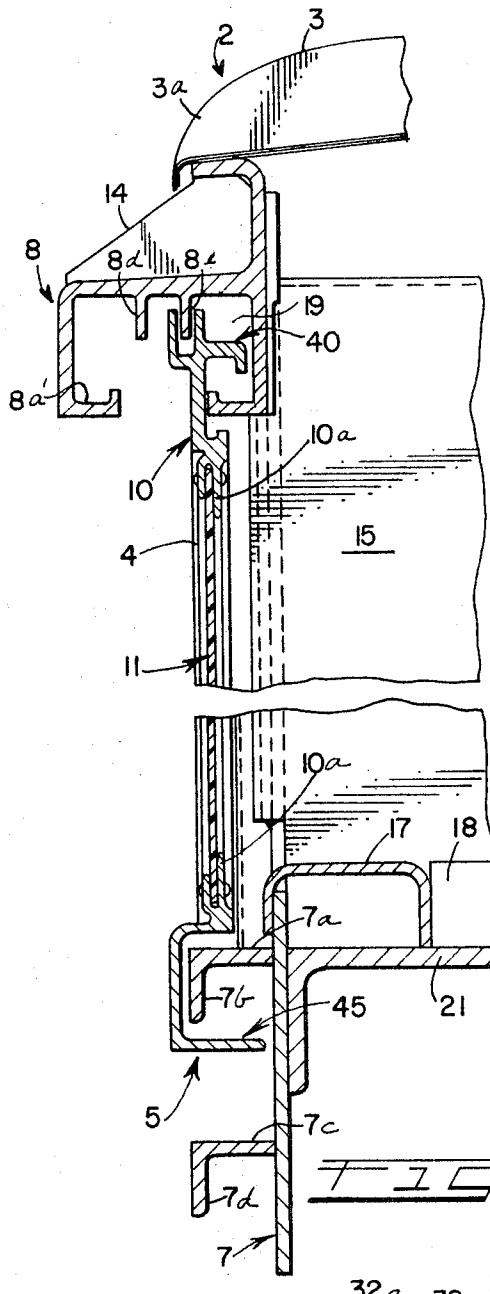


FIG. 6

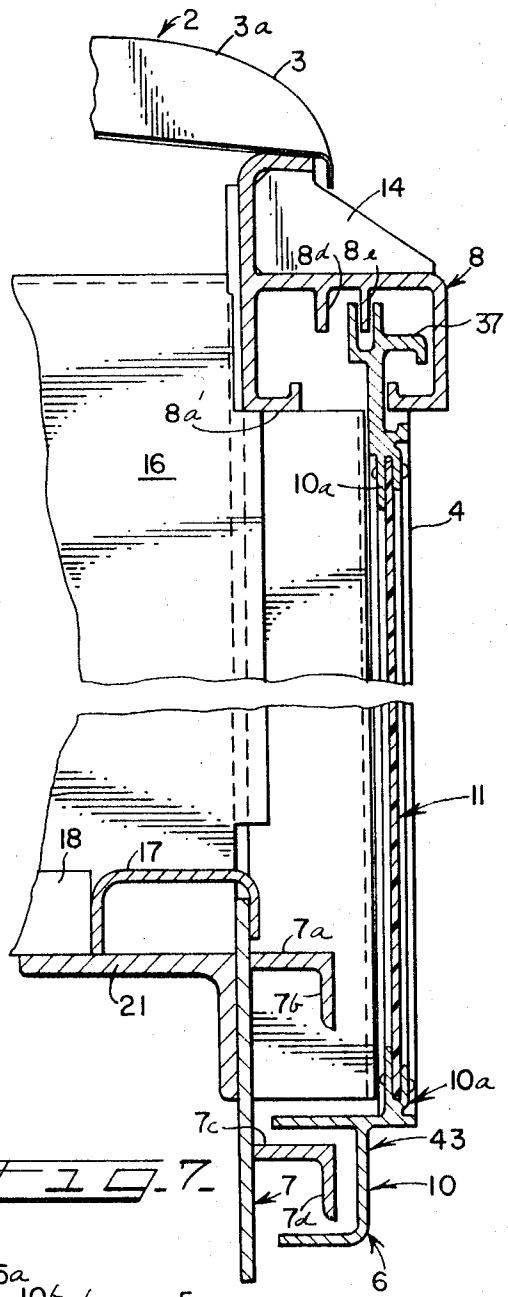


FIG. 7

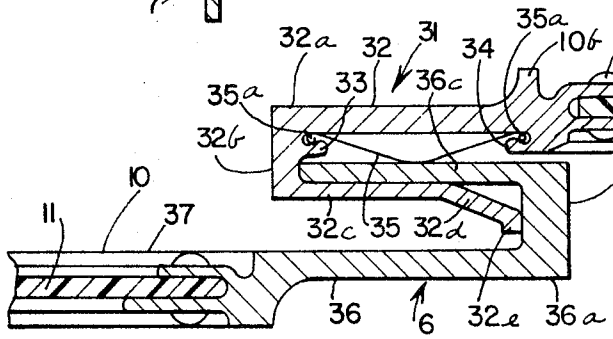


FIG. 8

INVENTORS
RAY L. FERRIS
WILLIAM R. SHAVER
JAN W. DOHNE

BY Richard J. Myers
ATT'Y.

RAILROAD CAR DOOR MEANS

SUMMARY OF THE INVENTION

It is a general object of this invention to provide for sliding doors for a railroad car wherein each door is hung on door moving means from upper sideplate structure, the upper and lower ends of each door overlapping with the upper and lower longitudinal structural side beam members of the car to provide a baffle seal relation at the top and bottom of a car. Another object of the invention is to provide for door end seal between each sliding door and between the respective end post means of the full door box car. Another object of the invention is to provide for a door suspension track integral with the extruded aluminum sideplate of the car and where the door is provided with rollers that move in the door roller guide track of the door suspension arrangement. The top plate member provides a closure member relation with the top portions of the door to provide suitable movable guide and sealing movable doors and the door opening portions of the box car. Multiple guide arrangements are also provided for at the lower side of the door opening portions to cooperate with the lower portions of the door and permitting relative sliding movement of the inner door relative to the outer door.

These and other objects will become apparent from reference to the following description and drawing, to wit:

FIG. 1 is a longitudinal side elevational view of a railroad box car employing the features of the novel invention;

FIG. 1*a* is a partial sectional view taken along line 1*a*–1*a* of FIG. 1;

FIG. 2 is a partial sectional view taken along line 2–2 of FIG. 1;

FIG. 3 is a partial sectional view taken along line 3–3 of FIG. 1;

FIG. 4 is a partial sectional view taken along line 4–4 of FIG. 1;

FIG. 5 is a partial sectional view taken along line 5–5 of FIG. 4;

FIG. 6 is a partial sectional view taken along line 6–6 of FIG. 1;

FIG. 7 is a partial sectional view taken along line 7–7 of FIG. 1; and

FIG. 8 is a partial sectional view taken along line 8–8 of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference now to the drawings and in particular with reference to FIG. 1 there is shown a box car 2 mounted on a pair of trucks 2*a* and having a roof 3 provided with roof sheeting 3*a* and having sides 4 and ends 4*a*. The box car is provided with a pair of relatively sliding doors, the inner door 5 being suspended by roller means from the top sideplate structure 8 of the car as is the outer or outside slidable door 6. Each of the doors 5 and 6 are guided at their bottoms by roller means engaging baffle structure attached to the bottom side sills 7, 7 of the car. Each door 5 or 6 is composed of an aluminum frame structure 10 of extruded aluminum and a central paneling 11 of fiber glass material. As viewed in FIG. 1, the left corner post or inner door post 12 sealingly receives the left vertical edge of the inner door 5 and the right corner post or outer door post 13 sealingly receives the right vertical edge of the outer door 6. As seen in FIGS. 4, 6 and 7 the top sideplate structure 8 is provided with a gusset plate 14 at each end of the car. A transverse or left end wall 15 as viewed in FIG. 1 joins with and forms the inner door post and a right end wall 16 joins with and forms the outer or outside door post 13. The entrance into the car doorway is provided with a threshold 17 that runs the length of the car after which is mounted the wood floor 18 mounted on longitudinal means 21. FIGS. 2 and 3 disclose the inner and outer door end frame sealing relationship with the respective end or corner post of the car respectively, the inner door post 12 being provided with a door seal structure 19 and the outer door post 13 being provided with an outer door seal structure 20.

As seen best in FIGS. 1 and 1*a* the door framing 10 includes the side mounted longitudinally spaced door frame elements 22 connecting with the upper and lower door framing portions and including an outside strip part 23 having a projection 23*a* lying against the inside strip 24 which is riveted or held by bolt means *b* to the outside strip 23. It is to be noted that the fiber glass panel 11 is held to the framing 10 through the intermediary of a pair of framing fingers, 10*a*, 10*a* the inner finger 10*a* being slightly longer than the outer finger 10*a* as shown, for instance, in FIGS. 2 and 3 and in other places throughout the drawings. It is also to be noted that various components are welded to each other as indicated by a weld symbol and the letter *w*. Also in most cases, as indicated throughout the drawings, the framing 10 has a framing flange 10*b* adjacent the attachment of the fingers 10*a* to the panel 11 to protect the attachment bolt means *b*. The flange 10*b* also acts as a structural strengthening element or stiffener.

With reference now to FIG. 2, the seal arrangement between the end post 12 and the end framing 10 of the inner door or inside door 5 is shown wherein 19 represents the door seal, which is generally S-shaped, having the attachment part 19*a* held to post 12 by bolt means *b* which seal member 19 may be easily removed for removing the both doors from the side of the car. The seal member 19, which is made of aluminum, further constitutes an outwardly projecting portion 19*b* connecting with a horizontal portion 19*c* and a slightly outwardly tapered or sloping portion 19*d*. The upright corner framing part 27 of the framing 10 of the inner door 5 is the elongated portion fitting in between the longitudinally extending arm 19*c* and the door post seal arm 25 against which is pressed the stainless steel plate seal and bearing member 26 which has its ends 26*a*, 26*a* retained in hook portions 27*a*, 27*a* of the framing element 27. The steel arm is generally U-shaped and has outwardly projecting short portion 25*a*, longitudinally extending elongated portion 25*b*, and inwardly short diagonally extending portion 25*c*, and end portions 25*d*. The portions 25*a* and 25*d* are welded to the post 12 and end wall 15 respectively, as indicated by *w*, and the post 12 is welded to the end wall 15. The spring steel seal 26 causes the projection or upright corner framing 27 of the inner door framing to press snugly in sealing engagement against the outer corner post seal element 19 as best seen in FIG. 2. The outer door sealing arrangement with its corner past 13, as shown in FIG. 3, has the corner door seal element 20 in sealing engagement with the elongated projection or upright corner framing 28 of the outer door framing 10 because of the V-shaped spring steel element 29 having its ends 29*a*, 29*a* in projections 28*a*, 28*a* of element 28 and pressing against both seal arm portions 30*c* of post seal arm 30 much as in the arrangement of the inner door end sealing design of FIG. 2. The seal element 20 does extend outwardly further from the post 13 relative to the seal element 19 but that is because the outer or outside door 6 is spaced outwardly of the inside door 5. Otherwise the framing 10 and stringers 10*a* and bolt means *b* as well as the seal element 20 and the arm 30 are similarly related to its post 13 and end wall 16 as is the seal element 19 and arm 25, its post 12, and end wall 15. The arm 30 is composed of an outwardly projecting elongated portion 30*a*, outwardly diagonally directed portion 30*b*, and elongate longitudinal portion 30*c* welded, as indicated by *w*, to the portion 20*a* of the member 20 which is provided also with a horizontal portion 20*b* and outwardly turned slightly diagonally extending portion 20*c*. Thus the frame projection 28 of the outer door has flush engagement in the sealing relation with the post mounted sealing element 20.

Now with reference to FIG. 8, the center seal arrangement 31 between the inner ends of the inner and outer doors is shown. The inner end framing portions or members 32 and 36 of the inner door and outer door respectively overlap and intercouple with one another in a sealing relation. The inner door inner end framing portion 32 is composed of thin portions 32*a*, 32*b*, 32*c*, 32*d* and 32*e* to define a generally C-shaped structure with the end portion 32*d* tapering

downwardly and inwardly toward the side of the car. The outer door inner end framing portion **36** is also C-shaped such that it couples or overlaps with inner framing **32**, the outer door inner end framing portion **36** having parts **36***a*, **36***b* and **36***c* defining the C-shaped member, the end part **36***c* lying flush against and intertwining with the part **32***c* of the inner door inner end framing portion **32** with the diagonal portion **32***e* intermediate projection portion **36***b* of the outer door inner end framing portion **36**. The V-shaped steel clip or seal member has its ends **35***a*, **35***a* in hook portions **33** and **34** of seal element **32** such as to press elongate projection **36***c* against the elongate projection **32***c* to ensure snug sealing relationship between the respective sliding doors when in the closed position. Framing construction **10** and panel construction **11** at the center door seal arrangement is the same as with the end seal arrangements of the doors with the post as discussed above.

The framing **10** of the outside door has an upper horizontal framing portion or part **37** and a lower horizontal framing part **43**, the upper and lower framing portions forming closed sealing closures with the upper and lower portions of the door opening at the sideplate and side sills. Similarly, the inside door framing has an upper horizontal framing portion **40** and a lower horizontal framing portion **45** which has complementary intercoupling or intersealing arrangement with the upper and lower door opening portions as defined by the sideplates and side sill. In addition, the outer and inner doors are hung on the sideplates and side sills by rollers mounted on the door framing portions of the doors to permit the doors to be extended and rolled past one another longitudinally of the car. The outer door upper horizontal framing structure has a lower horizontally extending flange portion **37***a* terminating in a slightly raised end and has an inner upwardly directed arm or flange portion **37***b*, a plurality of vertically mounted longitudinally spaced rollers **46** held by roller mounts **52** against the vertical faces of the upright arm **37***b*. A horizontal longitudinally extending flange or ledge **38** extends outwardly from the upright arm **37***b* and carries, on its horizontal surface a roller bracket **52** for carrying roller **47** which engages downwardly depending outer flange or wall **8***b* of the sideplate **8**. The outwardly projecting horizontal flange **38** has a downward depending outer end portion **38***a*, and other flange portion **39** extending longitudinally of the car is directed inwardly and somewhat opposite of the flange portion **38** and has an upright arm or baffle **39***a* which cooperates with the upper end extension **38***b* of the upright part **37** to also act as a baffle for reception of depending baffle finger or flange **8***d* depending from horizontally outwardly directing longitudinally extending arm or flange **8***c* of the sideplate **8**. The sideplate **8** has inwardly directed upwardly turned arm portion **8***a* connected to the horizontal portion **8***a'* which is in turn connected to the upwardly outwardly placed flange portion **18***b*, the roller **46** engaging the flange portion **8***a'*. Thus it is seen that the outwardly extending overhanging C-shaped portion of the sideplate **8** engagingly receives roller **47** against its vertical surface and roller **46** against its horizontal surface to thereby carryingly and rollingly support the outer door and yet to cooperate with horizontal baffle **38** and **38***a* and vertical baffle **8***b* to prevent entrance of rain, dust and other foreign material inside the car. The upper framing portion **40** of the inside door is a mirror image of the upper framing portion **37** of the outside door and is spaced adjacent to it but inwardly thereof, and is defined by the lower upright longitudinally extending flange or arm **41** which carries inwardly directed longitudinally extended arm or roller carrying extension or baffle **41** having a downwardly extending baffle portion **41***a* and an upwardly directed baffle portion **40***c* and an outwardly directed longitudinally extending closure portion or baffle portion **40***b* provided with an outer upright extending longitudinally extending baffle portion **40***a*. The lower end of the upright portion **41***b* has an outwardly projecting lower portion **41***c* and shortened end portion **42**. Roller **49** has a bracket **49***a* connected to the outward facing vertical face of the upright arm member **41***b* and the roller **49** and supportingly engages the lower inner end horizontal arm **8***i* of the plate **8** which is spaced below and overlapping inner frame plate arm portion **41** in baffling relation therewith. Roller **50** engages the vertical surface of the downwardly extending arm **8***h* of the sideplate **8** and is mounted by roller bracket **52** on the horizontal surface of the inwardly directed arm portion **41**. A downwardly directed baffle flange extending longitudinally of the car is extended down between upright arm **40***a* of the upper frame portion of the inner door and upright arm **40***c* of the upper portion of the framing of the inner door. Thus it is seen that the baffle fingers **40***a*, **40***c* and **40***d* of the framing portion receive the baffle **8***e* of the sideplate portion and the baffle plate portion **8***i* of the sideplate is received between the upper and lower baffle plates **41***c*.

The outside door lower horizontal framing **43** includes an outer horizontal flange **43***a* having a downwardly depending flange **43***b* and an inwardly directed horizontal flange **44** which carries roller support **52** and roller **48** which engages vertical inward side of side sill seal element **7***d* which depends from horizontal flange or baffle **7***c* connected to the side sill **7**. An inwardly directed horizontal baffle flange **43***c* connects with the flange **43***a* and the downward depending flange **43***b*. The flange or arm portions **43***c*, **43***b* and **44** form a downward depending C-shaped closure element about the seal element portion **7***c* and **7***d* attached to the side sill. The inner door framing **45** is similarly C-shaped and is provided with upper attaching portion **45***a*, downwardly extending portion **45***b*, and inwardly extending horizontal portion **45***c* to define said C-shaped closure portion **45** into which extends the sealing or baffle L-shaped element composed of parts **7***a* and **7***b*, the horizontal portion **7***a* being attached to the side sill **7** and the outer downwardly depending portion **7***b* being attached to the portion **7***a*. A roller **51** engages the vertical surface of the downward depending seal element portion **7***b* and is mounted by mount means **52** to the horizontally inwardly extending portion **45***c* of the inner frame portion of the inner door. The rollers for the lower portions of the inner and outer door engage vertical inwardly facing surfaces of the seal elements mounted to the side sills and the lower ends of the doors from moving laterally outwardly from the side of the car.

Thus, the invention provides for a box car arrangement having inner and outer relatively slidable doors having longitudinally extending upper framing portions complementary with the longitudinally extending extruded aluminum sideplate structure (on each side of the car) which acts as a door extending arrangement including longitudinally extending door roller guide track means which also acts as a top of door weather seal in conjunction with the upper framing portion of each of the doors. The lower framing portions of each door also cooperate with the lower portion or side sill construction of the car to longitudinally guide the rollers mounted on the lower door portions and also act as a weather seal. Further the vertical edges of the outer and inner ends of the doors cooperate with their respective end posts and with each other to provide further weather seal means.

The foregoing description and drawings are given merely to explain and illustrate the invention, and the invention is not to be limited thereto since those skilled in the art who have the disclosure before them will be able to make modifications and variations therein without departing from the scope of the invention.

We claim:

1. In a railroad box car having a full length door opening on each side of the car, each side of the car having:

sliding laterally spaced inner and outer doors each of which are substantially half the length of the door opening for closing same when spaced longitudinally of one another, each door having an upper baffle portion,

an upper sideplate structure having a downwardly extending sealing baffle structure,

said baffle structure including an outer baffle means for intertwining with the upper baffle portion of the outer box

car door and an inner baffle means for intertwining with the upper baffle portion of the inner box car door,

each baffle means having door support track means for movingly supporting its respective door,

each door upper baffle portion having antifriction support means mounted thereon movably engagingly received in the respective track means for movement of the respective door longitudinally therealong,

each door upper baffle portion having antifriction guide means mounted thereon and spacingly guiding its door longitudinally of the car,

the support track means of one door being in substantially lateral horizontal alignment with the support track means of the other door and each baffle means being in substantially horizontal lateral alignment with the other to provide for maximum vertical depth of door opening.

2. The invention according to claim **1**, and

said outer baffle means being a C-shaped construction and said inner baffle means being a reversed C-shaped construction facing the first mentioned C-shaped construction.

3. The invention according to claim **1**, and

a first end post having a weather seal arrangement,

said inner door having a vertically extending outwardly projecting baffle arrangement complementally registering with the seal arrangement of the first end post, and

a second end post having a baffle seal arrangement and said outer side door having a vertically extending baffle seal arrangement complementally registering with the second end post.

4. The invention according to claim **1**, and

center seal means defined by the overlapping and frictionally engaging sealing edges of each of the inner and outer doors.

5. The invention according to claim **1**, and

an end post for each door, each end post having an outwardly disposed and generally longitudinally extending seal element and an inner disposed longitudinally extending seal arm to define a door seal receiving space,

each door carrying an outer longitudinally extending seal element having sealing engagement with the post seal element when it is in the receiving space in the door closed position, and

seal spring means between the door seal element and the post seal arm in the door closed position urging the door seal element into tight sealing engagement with the post sealing element.

6. The invention according to claim **1**, and

said inner door having a lower baffle portion having antifriction guide means thereon and the outer door having a lower baffle portion spaced generally underneath the inner door lower baffle portion,

said outer door lower baffle portion having antifriction guide means,

a lower side sill below the door opening, and

upper and lower baffle weather seal plate means spaced in generally vertical alignment with one another and mounted on the outer side of the side sill and presenting respective guide engaging faces for the respective lower antifriction guide means cooperative with the respective upper guide means in guiding the door longitudinally of the car.

7. The invention according to claim **6**, and

said antifriction means being roller means.

8. The invention according to claim **6**, and

said lower baffle portion of the outer door being in overlapping baffling relation with the lower baffle portion of the inner door.