

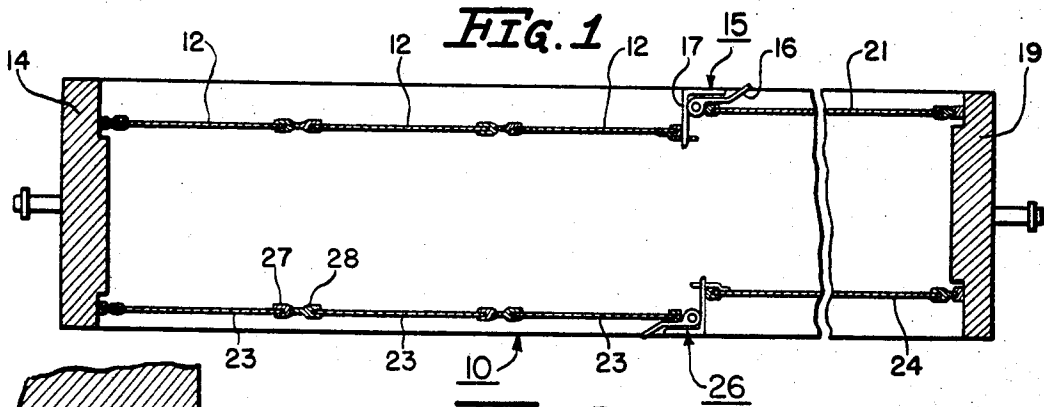
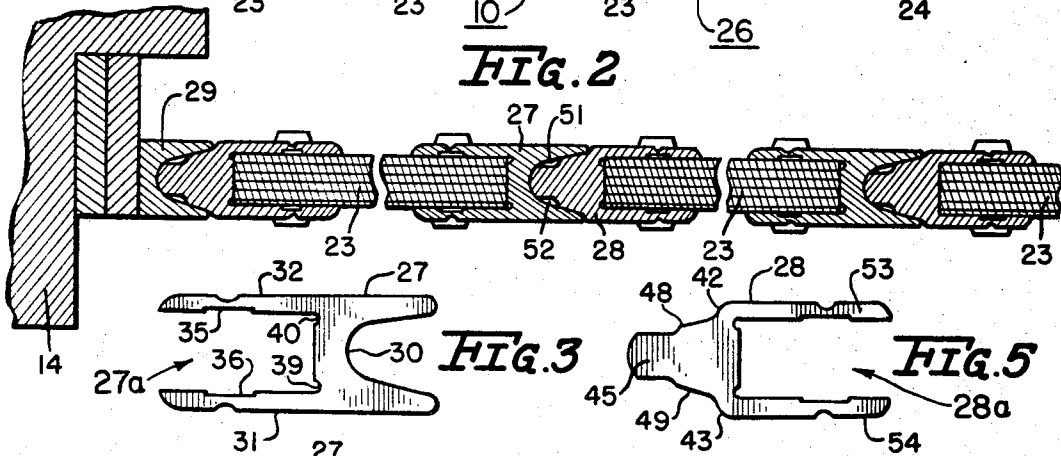
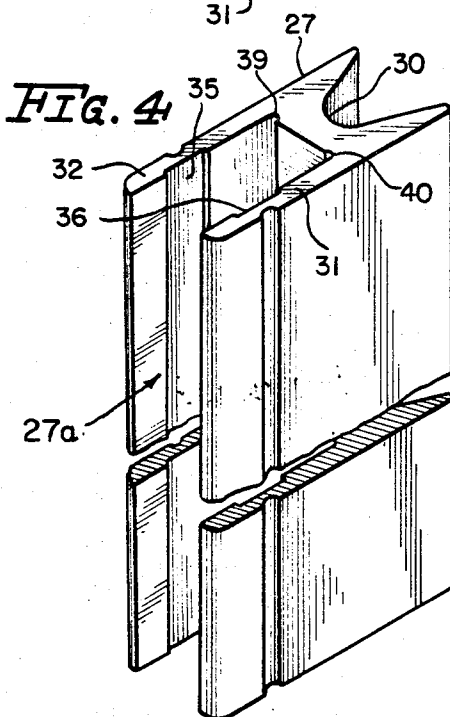
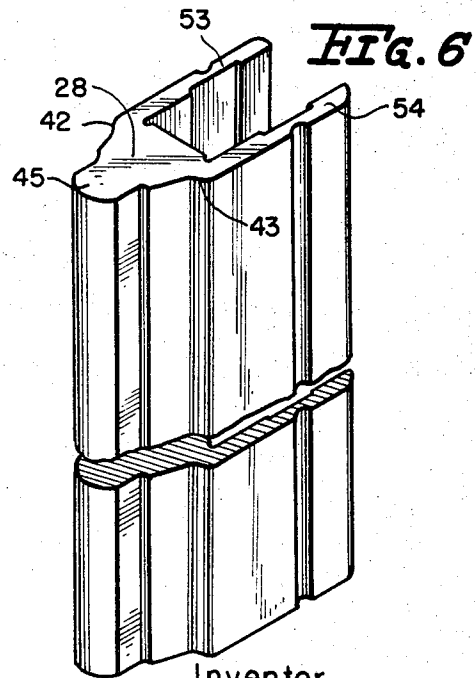
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DOOR CLOSURE

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DOOR CLOSURE

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ABSTRACT OF THE DISCLOSURE

A closure seal is provided between a pair of sliding doors of a railroad car or the like by mating male and female members affixed to respective abutting ends of the doors. The female member has a tapered receiving aperture and the male member has a pair of shoulder abutments separated by a narrowed, stepped nose portion which serves to initially align the two members without binding of the doors, etc. Bottoming of the nose portion in the base of the female member provides individual hermetic seals between the two members at three spaced points, namely, at the nose and the two shoulder abutments.

Introduction

The present invention relates to "all-door" railroad cars or the like in which sliding doors are to abut in a hermetically sealed relationship and, more particularly, to new and improved means for effecting such end closure seals.

Summary of the invention

It is therefore an object of the present invention to provide a new and improved end closure seal for adjacent sliding doors of a railroad car or the like.

It is another object of the present invention to provide a sliding door end closure seal in which a male and female member are initially guided into sealing relation by a narrow elongated nose of the male member and in which bottoming of the nose portion in the female member locates the members for sealing at three distinct points therebetween.

It is a more specific object of the present invention to provide a pair of sealing members as above described in which opposed tapered portions on the male member between the respective abutments and the stepped nose effect a secondary forced alignment of the closure members.

Accordingly, the present invention relates to railroad cars or the like wherein sliding doors are provided with closure seals between their abutting ends. Specifically, there is provided a female member affixed along an end of one of the doors and having a tapered receiving channel. A male member is affixed to an adjacent door and is provided with a pair of shoulder abutments spaced one from the other by a stepped intermediate nose portion which serves to initially guide the doors into sealing alignment and upon bottoming of the nose in the receiving aperture three distinct sealing points are established respectively at said shoulder portions and the leading edge of said nose portion.

Brief description of the drawings

The features of the present invention which are believed to be novel are set forth with particularity in the appended claims. The invention together with further objects and advantages thereof may best be understood, however, with reference to the following description taken in connection with the accompanying drawings in the several figures of which like reference numerals identify like elements and in which:

FIGURE 1 is a fragmentary plan view, in section,

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of an "all-door" railroad car embodying the door closure construction of the present invention;

FIGURE 2 is an exploded, fragmentary view of a portion of the railroad car doors of FIGURE 1 showing the closure construction in greater detail;

FIGURES 3 and 4 are respectively a plan view and a perspective view of the female closure member;

FIGURES 5 and 6 are respectively a plan view and a perspective view of the male closure member.

Description of the preferred embodiment

Referring now to FIGURE 1, there is shown an "all-door" railroad car generally designated by the reference numeral 10 and having a series of doors 12 defining a portion of one sidewall of the railroad car. Specifically, sliding doors 12 are mounted along a guide track (not shown) between a forward bulkhead 14 and a door locking mechanism generally designated by numeral 15. Locking mechanism 15 is provided with an opening handle 16 for releasing an L-shaped locking arm 17 to allow doors 12 to be slid, either individually or as a group, along their guide track toward rear bulkhead 19 to thereby open a selected large portion of the car for easy access in loading or unloading.

A second series of doors are slidably positioned in a guide track (not shown) outwardly but adjacent the guide track for doors 12. Only a fragmentary view of doors 21 is provided in the drawing but it is to be understood that the doors are similar in number and construction to doors 12 and are likewise slidably moveable towards opposite bulkhead 14 upon disengagement of locking mechanism 15.

The opposite side of railroad car 10 is also provided with two series of sliding doors, respectively designated by reference numerals 23 and 24, which are horizontally slidable along adjacent, parallel, guide tracks (not shown) upon release of an intermediate locking mechanism 26. On the other hand, closure of the respective locking mechanisms 15 and 26 applies horizontal axial forces to the respective doors of each series to forcibly interlock the doors in a hermetically sealed relationship as is required to protect the contents of the railroad car. One pair of closure members sealing adjacent vertical ends of a pair of doors 23 are designated by the numerals 27 and 28 in FIGURE 1. It is understood that all of the closures between adjacent railroad car doors as well as end seals between a door and an associated bulkhead are similar and, preferably, all of closure members 27 and 28 are formed of extruded aluminum.

An exploded view of FIGURE 2 depicts doors 23 with their end closure members disposed in sealed relation. Specifically, female member 27 there visible is provided with a tapered receiving aperture for accepting a male member 28 and, as will be discussed in more detail later herein, three separate sealing points exist there between with the portions of the members intermediate the sealing points being in spaced relation to one another. As also shown, both members 27 and 28 have rearwardly extending leg portions which define vertical receiving channels for respective end portions of doors 23, these channels serving, in conjunction with the rivets, screws or the like, to mount or affix the closure members to vertical ends of the doors. As is also more clearly visible in this figure, the closure members between others of doors 23 are indeed identical except that a female member 29 is mounted in abutted relation to bulkhead 14 rather than having a receiving channel.

Referring now additionally to FIGURES 3 and 4, it is seen that female member 27 has an elongated tapered receiving aperture which terminates in an arcuate base portion 30 joining the opposite legs of the tapered sidewalls. Rearwardly extending legs 31 and 32 of member 27 define

an elongated receiving channel 27a of a U-shaped cross-section for accepting the entire vertical end of one of doors 23. Shallow recesses defining lines running the length of the member are provided in the outer surfaces of each of its legs 31 and 32 for locating the bit of a pilot drill or point of a self-drilling, self-tapping sheet metal screw in fastening the legs to an associated door. On the inside surface of each leg and in registration with these elongated exterior recesses, there are provided surface depressions 35 and 36 which receive a caulking or sealing compound to preclude moisture from reaching the area adjacent the fastening screws. This prevents entrance of moisture in the metal faced wood doors at those points where the fasteners penetrate its protected or coated surface. Recesses 39 and 40, likewise running the length of the channel, are provided at the root of each of legs 31 and 32 in the web formed between these legs and the adjacent back wall of the channel. Recesses 39 and 40 receive a bead of adhesive sealant or similar waterproof caulking to protect against the adverse effects of moisture on the doors. To promote a clamping or gripping action of the door by spaced legs 31 and 32, the interior leg 32 is provided with a slight inward taper as it progresses outwardly toward its free end.

Male closure member 28 is also provided with a pair of rearwardly extending legs 53 and 54 which, like legs 31 and 32 of member 27, provide an elongated channel 28a for receiving the vertical end of an associated sliding door. Legs 53 and 54 are provided with exterior grooves for indexing fastening screws or the like in a position centrally disposed over internal depressions in the legs which receive a protective caulking or sealing compound. The construction of leg members 53 and 54 for mating with the railroad car door is identical to that previously described for legs 31 and 32 of member 27 and, in this regard, legs 53 and 54 are also provided with shallow elongated recesses in their webbed interior corners for receiving a bead of caulking compound for sealing and protecting the door.

As previously stated, female member 27 is adapted to mate with the male member 28 to effect a three-point hermetic seal between adjacent sliding doors of the car. It has been found that the three-point seal of the present invention provides a more positive and reliable closure seal than do the various arrangements of the prior art. To effect such a three-point seal, member 28 (FIGURES 5 and 6) is provided with a pair of abutment shoulders 42 and 43 respectively adjacent its inner and outermost surfaces. Intermediate these abutments there is provided a stepped nose portion 45 which is considerably narrower than the receiving aperture of member 27. Nose portion 45 serves to initially guide members 27 and 28 into a preliminary mated relationship without binding or mislocation of the doors. A secondary and forced alignment of the doors is provided by a pair of intermediate tapered sections 48 and 49 which join respective abutments 42 and 43 to stepped nose portion 45. Tapered portions 48 and 49 match the contour of the female receiving aperture and can be slightly larger than the aperture to forceably effect an axial alignment between the adjacent doors. Movement of male member 28 into the tapered receiving channel of the female member continues until the arcuate surface of nose portion 45 bottoms against the precisely complementary curvature of base 30 of the female receiving aperture. At this point, three independent seals are perfected between the surfaces of the female receiving aperture, respectively contiguous abutments 42 and 43 and the arcuate surface of nose portion 45. As seen in FIGURE 2, stepped nose portion 45 is spaced from the sidewalls of the receiving aperture along a wall area intermediate the three sealing points thereby defining a pair of gaps 51 and 52. Thus, the stepped construction not only provides a preliminary friction-free mating of the closure members but also defines a pair of separate drainage channels 51 and 52 for moisture in the vent

of a defective seal at the outer shoulder abutment or in the event water enters from the top edge of the closure.

While a particular embodiment of the present invention has been shown and described, it is apparent that various changes and modifications may be made, and it is therefore intended in the following claims to cover all such modifications and changes as may fall within the true spirit and scope of this invention.

I claim:

1. In a railroad car or the like having sliding doors moveable along a guide track, a closure seal construction for abutting ends of said doors comprising:

a female member affixed to one of said abutting door ends and having a tapered receiving channel;

a male member affixed to the other of said abutting door ends and having a pair of spaced shoulder abutments separated by an intermediate stepped, nose portion with said nose portion serving to initially guide said male member into said female member; said male member establishing, in conjunction with said female member, a three-point closure seal between said members respectively at said shoulder abutments and at a leading edge of said nose portion with said members between said sealed points being in a predetermined spaced relation;

said sealing being effected as said nose portion bottoms in said aperture of said female member.

2. The combination according to claim 1 in which both said male and female members have a pair of spaced unitary legs extending oppositely from the mating portions thereof and defining U-shaped receiving channels for respective ones of said door ends.

3. The combination according to claim 2 in which said shoulder abutments and said stepped nose portion are separated by respective intermediate portions having a taper corresponding to that of said female member for effecting a secondary forced alignment of said members subsequent to initial alignment thereof by said nose portion.

4. The combination according to claim 3 in which said tapered receiving channel of said female member has an arcuate base portion for joining the tapered walls thereof and in which said nose member has a like arcuate curvature for mating with said female base portion in a sealed relation.

5. The combination according to claim 4 in which said spaced portions of said male and female members intermediate said closure seals define two separate moisture drainage channels.

6. The combination according to claim 4 in which one of said elongated legs of each of said male and female members is tapered slightly toward its associated leg as said leg progresses outwardly toward its free end for providing a clamping action to securely grip said respective door ends.

7. The combination according to claim 6 in which each of said elongated legs of said male and female members is adapted to receive a series of fasteners on predetermined lines therealong for fixedly holding said members to said respective door ends and in which said leg members are each construed to have shallow recesses in their interior surfaces in registration with said predetermined lines for receiving a sealing compound to preclude penetration of moisture to the portions of said doors contiguous said fasteners.

8. The combination according to claim 7 in which a shallow, generally U-shaped recess is provided adjacent the fixed end of each of said elongated legs for receiving a moisture sealing compound.

9. The combination according to claim 8 in which said male and female members each consist of one piece extruded aluminum and said doors consist of metal bonded to wood.

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