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DOOR SEAL CONSTRUCTION

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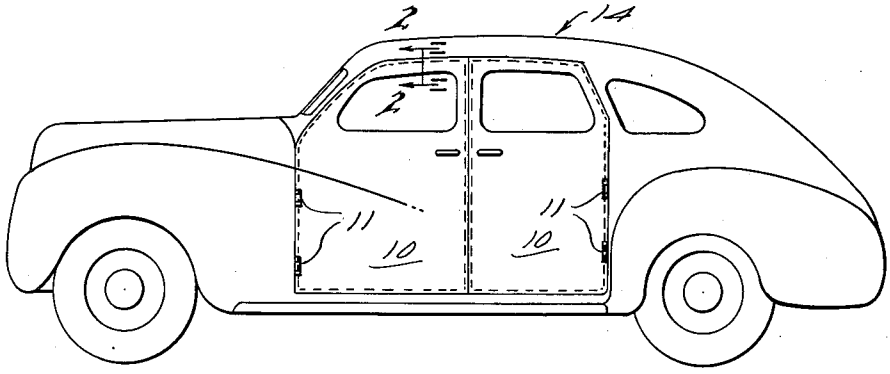


Fig. 1.

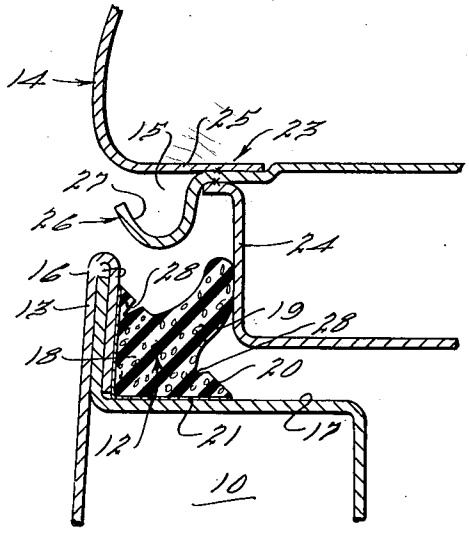


Fig. 2.

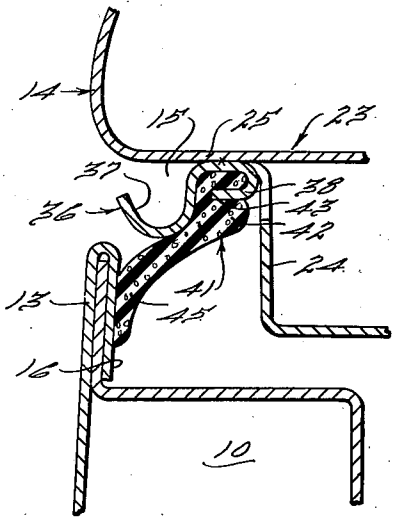


Fig. 3.

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DOOR SEAL CONSTRUCTION

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This invention relates to closure seals and has particular reference to motor vehicle door constructions wherein a combination door seal and drip molding assembly is mounted within the door jamb recess. The door seal and drip molding arrangement herein disclosed is designed so that it provides an efficient, durable seal that effectively cushions the closing of the door and eliminates the possibility of rattles between the door and its surrounding framework, insures a substantially airtight seal along the joint between the body and the door, prevents drainage of moisture into the sealing joint, improves the appearance of the door and the surrounding body structure by removing from view the unsightly conventional, outwardly projecting, drip molding, and eliminates the drip molding as a source of noise resulting from wind resistance as well as interference with the air flow about the door and the associated body structure.

In the past it has been common practice to mount the drip molding along portions of the joint between the door and its surrounding framework in such a manner that the molding projects outwardly from the body structure and forms a cupped roof over the sealing joint between the door and the surrounding door jamb. Due to the outwardly projecting position of the cupped drip molding it is the source of considerable noise due to wind resistance and interference with the air flow about the door. Furthermore, the outwardly projecting molding mars the appearance of the vehicle. The door jamb constructions herein disclosed are designed to remedy the disadvantages of the outwardly projecting drip molding and to improve door jamb constructions in general.

It is a primary object of this invention to provide a door jamb construction wherein the drip molding is arranged within the jamb recess to thereby improve the appearance of the sealing joint, prevent noise due to wind resistance, and eliminate a source of interference with the air flow about the door structure.

It is a further object of this invention to provide a recessed door jamb construction including a drip molding and a door seal wherein the molding prevents drainage into the sealing joint yet is not positioned so as to constitute a source of noise due to wind resistance or air flow interference.

It is an additional object of this invention to provide an improved door jamb construction of a simplified form which is economical to manufacture and install, highly efficient in operation,

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lends itself to improving the appearance of the door assembly on which it is mounted, and prevents the creation of objectionable noises due to wind resistance or interference with air flow around the door assembly.

It is a further object of this invention to provide an improved, simplified, economical type of combination sealing strip and drip molding.

Other objects and advantages of this invention will become apparent from the following description of my improved construction when considered in conjunction with the drawings in which:

Fig. 1 is a side view of an automobile equipped with a door cushioning and sealing means constructed in accordance with my invention;

Fig. 2 is an enlarged sectional elevational view taken along the line 2—2 of Fig. 1, indicating the position of the tensioned sealing strip and the recessed drip molding after closing of the door; and

Fig. 3 is an enlarged, sectional, elevational view of a modified form of recessed door sealing assembly wherein the drip molding supports the resilient, cantilever-type sealing strip.

Each door 10, supported on the usual hinges 11, is provided with resilient cushioning and sealing strip 12. The sealing strip 12 is mounted along certain of the side edges of the door adjacent the inside face of the door marginal flange 13. The vehicle body 14 is formed with a depressed door jamb 23 providing a continuous marginal recess 15 adapted to receive the door flange 13, the sealing strip 12 and the drip molding 26. This door jamb construction is designed so that the outside surface of the door will be flush with the outside surface of the vehicle body 14 when the door is closed. In the past it has been common practice to mount the drip molding outside the door jamb recess, above the upwardly facing edges of the door, to prevent drainage of moisture into the sealing joint. Such an arrangement caused the drip molding to project beyond the outside surface of the vehicle body and to thus constitute a possible source of noise due to wind resistance and interference with the air flow around the vehicle body. This invention provides means whereby the drip molding may be mounted within the door jamb recess so that it prevents drainage of moisture into the sealing joint but still does not project beyond the outside surface of the vehicle body so as to create noise or mar the apperance of the vehicle body.

The sealing strip 12 will ordinarily be provided around the entire periphery of the door, the con-

tinuity of the strip being indicated by the dashed lines in Fig. 1. The strip 12 is preferably of molded or extruded rubber or some similar resilient material and can be formed with an outer skin on its exposed surfaces to improve its wearing characteristics. The sealing strip 12 is cemented or otherwise suitably anchored to the inside wall 16 of the door flange 13 and to the side edge 17 of the door 10, the bonded connection in this instance being indicated by the numeral 21. The seal 12 is preferably formed in cross section so that it is symmetrically shaped and comprises a substantially right-angled base portion 18 and an outwardly projecting sealing finger 19. The base portion 18 is adapted to be seated in the corner between the door flange 13 and the door side edge 17. In cross section this base portion 18 is substantially of an isosceles right triangular configuration having the rear base side 20 extending at approximately forty-five degrees with both the door side wall 17 and the vertical door flange 13. This base portion 18 of the sealing strip 12 resembles in cross section an arrowhead and is adapted to have its head or vertex portion seated in the corner between the flange 13 and edge 17. Extending outwardly from the medial region of the rear side 20 of the symmetrically shaped base portion 18 of the sealing strip, along a line which bisects the angle between the sides of the base portion, is the long, symmetrically shaped, sealing finger 19. The dimensions and shape of the sealing finger 19 are such as to form an elongated projection with a relatively narrow throat portion which connects finger 19 to base portion 18 in such a manner as to provide the necessary hinging action between the sealing finger 19 and the base portion 18. The long sealing finger 19 insures a perfect seal, regardless of the variations in clearance between the door and the surrounding door frame. Due to the symmetrical design of the sealing strip 12, it is obvious that regardless of the way in which the base portion 18 of the sealing strip 12 is placed in the corner between the side edge 17 and the marginal flange 13 of the door, the sealing finger 19 will always project at the same angle and consequently will always function in the same manner. This symmetrical construction thereby eliminates the possibility of the sealing strip being installed in a reversed or backwards position so that the sealing finger 19 could extend at such an acute angle with the door edge 17 that it would be bent inwardly and compressed on door closing instead of being bent outwardly and tensioned against the depending, radially extending, vertical wall portion 24 of the door jamb 23. It has been found that by placing stress-relieving grooves or indentations 28 along the base portion 18 of the seal 12 adjacent the connection of the sealing finger 19 to the base portion 18, that the durability and sealing action of the seal 12 are materially improved. Symmetrically shaped, cantilever-type resilient door seals of this general design have been disclosed in the applications of Karl Pfeiffer, Serial No. 760,957, filed July 15, 1947, and John C. Dudley, Serial No. 24,289, filed April 30, 1948, which matured into U. S. Patent No. 2,513,789. The improved construction disclosed in this application relates to door constructions wherein the door seal 12 and the drip molding 26 are both positioned within the door jamb recess 15 to thereby provide a more finished and more efficient door seal construction.

The drip molding 26 is secured to the inwardly extending wall portion 25 of the door jamb 23 in

such a manner that the gutter portion 27 of the molding 26 is positioned completely within the recess 15 of the door jamb 23. While the molding 26 is completely within the recess 15, still it is so located that its gutter portion 27 extends along the outer edge of the door jamb recess so that it will catch all moisture draining into the door jamb recess from the outer body surfaces. Accordingly, the seal 12 is protected from draining rain, snow, ice, and the like. With the drip molding positioned within the door jamb recess as shown, the molding still performs its intended functions but it is so located that it will not be a possible source of noise or air flow interference, nor will it mar the smooth outer contour of the surrounding vehicle body. With the drip molding positioned within the door jamb recess a cheaper installation is possible for less care need be exercised in installing and painting the drip molding due to the fact that the molding is substantially hidden from view by the door flange 13 when the door is in a closed position. This feature is of importance when considering the mass production of motor vehicles requiring door seals and drip moldings of the type herein described.

Fig. 3 shows a modified form of the invention wherein a drip molding 36 is mounted within the door jamb recess 15. In this form of the invention the molding 36 comprises a gutter portion 37 and a depending flange portion 38 which is adapted to support the cantilever type, resilient, sealing strip 41. Seal 41 is preferably of molded or extruded rubber and is formed with an enlarged base portion 42 having an attaching slot 43 adapted to receive the molding flange 38. To connect the seal 41 to the molding 36 the flange 38 is inserted in the slot 43 of seal base portion 42 and then the flange 38 is bent about the contained base portion 42 to lock the seal 41 to the molding 36. Seal 41 includes a cantilever-type sealing finger 45 adapted to be engaged by and to seal against the inner wall 16 of the marginal flange 13 of the door 10. It will be noted that in this modified construction the sealing strip 41 and the drip molding 36 are both mounted on the door jamb. In the form of the invention shown in Fig. 3 the drip molding 36 is formed integrally with the flange portion extending from the wall portion 24 of the door jamb 23. With such a construction the drip molding and door jamb are integral and the cost of manufacture is considerably reduced. The depending seal connecting flange portions 38 are struck out of the wall portion 24 of the door jamb in this form of the invention. In the event the door jamb dies could not be economically altered to include the drip molding formation then the drip molding 36 could be formed as a separate S-shaped reversely bent strip that could be readily connected to the inwardly extending wall 25 of the door jamb. Such a construction would be essentially identical to that shown in Fig. 3 except for the fact that the drip molding and door jamb would be made separable instead of integral. With the separable construction the seal 41 could be connected to the separable drip molding strip 36 prior to the installation of the molding strip on the door jamb, and then the assembled molding and seal strip would be subsequently attached to the door jamb.

As the resilient seal shown in the Fig. 3 modified form of the invention is adapted to be formed by molding or extrusion and as it is

easily mounted on the door jamb, this form of the invention provides a sealing assembly that is economical to manufacture and install. Obviously, this form of the invention possesses all of the advantages pointed out with regard to the construction shown in Fig. 2, and furthermore, the combined seal and drip molding assembly herein disclosed is exceptionally cheap and easy to manufacture, handle, and install.

We claim:

1. In an automobile body, in combination a door frame member provided with a depressed jamb including an inwardly extending wall portion and a substantially vertically extending, exteriorly exposed wall portion, said wall portions defining a door jamb recess, a drip molding mounted on said door frame member and positioned within said recess so as to extend along the exterior edge thereof, a door member hingedly mounted on said frame member, said door member including a vertically extending, exteriorly exposed, marginal flange portion adapted to be positioned substantially across said recess when said door is in closed position, and a resilient seal mounted on said drip molding having a sealing finger arranged beneath said drip molding adapted to be moved into sealing engagement with the marginal flange of said door member when said door member is moved to closed position, the sealing portion of said seal being covered by said drip molding when the door is in closed position.

2. In an automobile body, a door frame defining a door opening and provided with a jamb portion including an inwardly extending wall and a radially extending, substantially vertical wall, said walls defining a door jamb recess, a drip molding mounted on said inwardly extending wall and positioned within said recess along the exterior edge thereof, a door hingedly mounted on said frame, said door including a substantially vertically extending, exterior, marginal flange portion adapted to be positioned so as to substantially cover said recess when said door is in closed position, and a resilient seal mounted on the side edge of said door adjacent the inner side of said marginal flange, said seal including a sealing finger adapted to engage and seal against the vertical wall of said jamb when said door is in closed position, the sealing portion of said sealing finger being arranged inwardly of and beneath said drip molding when said door is in closed position.

3. In an automobile body, a door frame having a jamb portion formed with an inwardly extending wall and a depending substantially vertical wall, said walls defining an outwardly opening door jamb recess, a drip molding including a gutter portion mounted on said inwardly extending wall and positioned so as to extend along the exterior edge of the recess and be completely within said recess, said gutter portion being located so as to collect the moisture draining into said recess from the outer surface of the automobile body, a door swingably mounted on said frame having a substantially vertically extending marginal flange portion adapted to be positioned substantially across said recess when said door is swung to closed position, and a resilient sealing strip mounted on said door and adapted to engage and seal against said vertically extending wall when said door is in closed position the sealing portion of said strip being located beneath said gutter portion when said door is in closed position.

4. In an automobile door construction comprising a door frame member formed with a depressed jamb portion including an exteriorly exposed wall and an outwardly opening door jamb recess, a drip molding mounted on said frame member and positioned within said recess, a door member hingedly mounted on said frame member and adapted to be swung into a closed position contiguous to said frame member, and a resilient cushioning and weather sealing strip mounted on said door member inwardly of and beneath said drip molding, said strip including a sealing portion adapted to engage and seal against the exteriorly exposed wall of said frame member when said door is in closed position, the sealing portion of said strip being located inwardly of the gutter portion of said drip molding when the door is in closed position.

5. In an automobile body, a door frame having a jamb portion including an inwardly extending wall and a substantially vertical wall, said walls defining an outwardly opening door jamb recess, a drip molding mounted within said recess including a gutter portion and a flange portion, said gutter portion being located along the exterior edge of said recess so as to collect the moisture draining into said recess from the outer surface of the automobile body, a door swingably mounted on said frame having a substantially vertical, exterior, marginal flange portion adapted to be positioned so as to extend substantially across said recess when said door is swung to closed position, and a resilient sealing strip supported by the flange on said drip molding adapted to engage and seal against the inner side of said door marginal flange when said door is in closed position, the sealing portion of said strip being located inwardly of the gutter portion of said drip molding when the door is in closed position.

6. In an automobile body construction, a door frame provided with a depressed jamb portion including an inwardly extending wall and a depending, exteriorly exposed wall, said walls defining a door jamb recess, a drip molding mounted on said inwardly extending wall and positioned within said recess, said molding including a gutter portion located beneath the outer edge of said inwardly extending wall and a flange portion positioned between said gutter portion and said depending exteriorly exposed wall, said flange portion supporting a resilient sealing strip, said sealing strip including a sealing portion adapted to engage and seal against the portions of a door moved into said recess, the sealing portion of said strip being located inwardly of the gutter portion of said drip molding when the door is in closed position.

7. A combination drip molding and door seal adapted to be mounted within a door jamb recess comprising a molding member formed with a gutter portion and a flexible flange portion beneath said gutter portion, and a resilient sealing member adapted to be fastened to said molding member by said flange portion, said sealing member including an outwardly projecting, cantilever-type, sealing finger.

8. A combination drip molding and sealing strip comprising an elongated reversely bent, supporting member provided with a cup-shaped gutter portion and a depending flange portion arranged inwardly of said gutter portion, and an elongated, resilient, sealing member formed with an enlarged base portion adapted to be supportingly engaged by the flange of said sup-

porting member and an elongated sealing finger projecting outwardly from said base portion.

9. In an automobile body construction comprising relatively hinged door and body portions, the body portion having a recessed door jamb provided thereon and the door portion having a projecting marginal flange extending along the edge thereof so as to be substantially in the plane of the outside of the door when said door is in closed position and movable in the closing of the door towards said jamb, a drip molding mounted in the jamb recess so as to extend along the outer edge of the joint between said door and body portions, and a resilient door cushioning and weather sealing strip mounted on one of said door and body portions inwardly of and beneath said drip molding so as to extend along the joint between said portions while being shielded against drainage from said body by said drip molding, said strip being adapted to be flexed into sealing engagement between the door flange and the door jamb in closing of the door, the entire door jamb being depressed relative to the plane of the outside of the body sufficiently to accommodate the drip molding, the sealing strip and the door flange so that the outside of the door is substantially flush with the outside of the surrounding body portion in the closed position of the door and said strip having the sealing portion thereof located inwardly of the drip molding when the door is in closed position.

10. In combination, two relatively movable members, one of which is provided with an outwardly opening recess within which is mounted a drip molding comprising a cup-shaped gutter portion and a depending flange portion, the gutter portion being positioned along the outer edge of said jamb recess, a cantilever-type, resilient, sealing strip supported from said depending flange, and provided with an outwardly extending sealing finger, the other member including an exteriorly exposed flange portion adapted to substantially cover the opening to said recess when said members are moved into contiguous relationship, the inner face of said flange being adapted to sealingly engage said sealing finger when said members are moved into contiguous relationship and the sealing finger of said strip being arranged so as to be covered by said gutter portion of the drip molding when the members are moved into contiguous relationship.

11. In combination, two relatively movable members adapted to be moved into contiguous relationship, one of said members being provided with an outwardly opening recess within which is mounted a drip molding arranged to extend longitudinally along the edge of the recess, said drip molding having supported therefrom a resilient, cantilever-type, sealing strip positioned inwardly of and beneath said molding so as to be shielded thereby, the other member including an exteriorly exposed flange portion adapted to substantially cover the opening to said recess when said members are moved into contiguous relationship, the inner face of said flange being adapted to be sealingly engaged with said strip when said members are moved into contiguous relationship, said sealing strip being arranged so as to be covered from above by said drip molding when the members are in contiguous relationship.

12. A combination drip molding and sealing strip adapted to be mounted in a recess or the like comprising a drip molding of substantially S-shaped cross-sectional configuration wherein the channel-like formation on one side of the molding provides a gutter portion extending longitudinally of the molding and the oppositely opening channel-like formation on the other side of the molding provides a supporting means for a resilient sealing strip, and a resilient, sealing strip mounted in said supporting means having a sealing finger extending beneath said gutter portion and lengthwise of said molding so as to be shielded thereby.

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