Nov. 20, 1951 A. BUSH 2,575,793

WEATHERSTRIP MEANS

Filed May 27, 1947

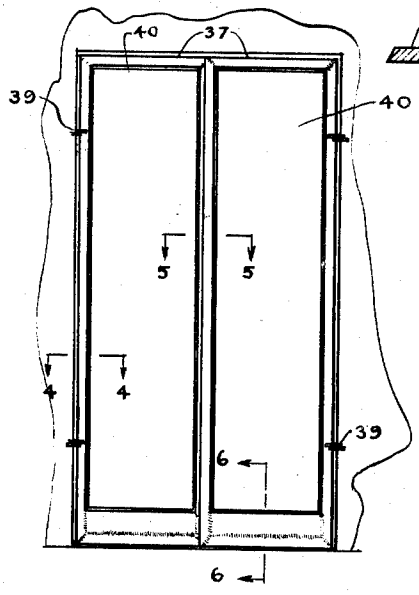


FIG. 3

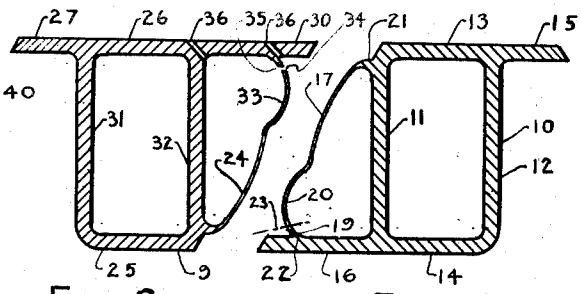


FIG. 2 FIG. 1

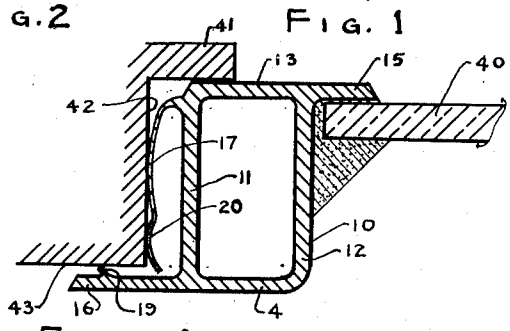


FIG. 4

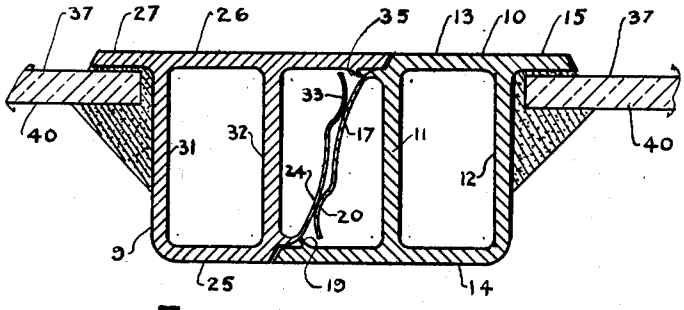


FIG. 5

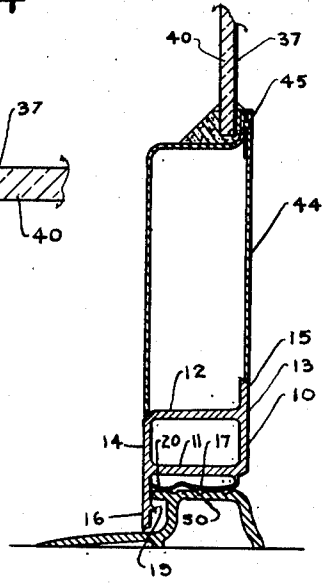


FIG. 6

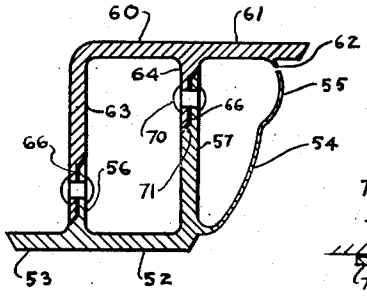


FIG. 7

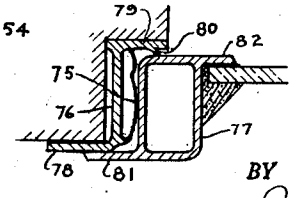


FIG. 8

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Patented Nov. 20, 1951

2,575,793

UNITED STATES PATENT OFFICE

2,575,793

WEATHERSTRIP MEANS

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Application May 27, 1947, Serial No. 750,725

2 Claims. (Cl. 29—148)

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This invention relates to improved weatherstripping means for doors, windows and other openings, and relates more particularly to a novel weatherstrip element which yieldingly engages the edges of the frame of the door or window when the latter is in closed position and which is formed integrally with the rails which form part of such door or window.

An important object of the present invention is to provide a novel weatherstrip structure wherein the several members forming the rails of a door or window are formed by an extrusion process or otherwise, and along the outer surface of each member there is formed a relatively thin wall attached on opposite sides thereof to the member which is preferably of hollow construction, which enhances its structural strength. After formation, the line of attachment on one side of the thin wall is broken. The inherent resiliency of the metal in this thin wall permits it to be retracted while employing a desired measure of pressure on a member, in this instance the frame of the window or door, which holds it in this retracted position.

By forming the rail with the thin wall initially attached along each edge thereof to such rail and then breaking or rupturing one such integral connection there is effected a considerable saving in cost of manufacture. In some instances, however, it may be desired to form each of the four members forming the rail in two pieces, an inner piece and an outer piece, with means for preventing transfer of heat by conduction therebetween. In such an arrangement the weatherstrip element will be formed with an integral connection along only one of its edges.

In an alternate form of the invention the weatherstrip element may be formed integrally with the frame and thus yieldingly engage the door or window.

In the drawing:

Fig. 1 is a transverse section taken through one of the rails having the integrally-formed weatherstrip element.

Fig. 2 is a section taken through a similar but oppositely-disposed rail, the view showing the relation of the parts after the weatherstrip element has been broken along one marginal edge thereof from its point of connection with the rail.

Fig. 3 is a front elevation of a double or French type of door embodying the present invention.

Fig. 4 is a section taken on line 4—4 of Fig. 3.

Fig. 5 is a section taken on line 5—5 of Fig. 3.

Fig. 6 is a section taken on line 6—6 of Fig. 3.

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Fig. 7 is a section taken through an assembled rail which has initially been formed in two separate parts.

Fig. 8 is a broken section showing the weatherstrip element associated with the window frame instead of the rail forming part of the window sash.

In Fig. 1 there is illustrated a section taken through a rail 10, a plurality of which, suitably mitred at the corners, are employed for a window or door, thus forming a rectangular frame which receives a pane of glass. If the glass is not required, as in the case of a door, the frame may receive and support an opaque panel.

The rail is of tubular construction and is formed with spaced, laterally-disposed walls 11 and 12, and spaced walls 13 and 14 disposed generally parallel with the plane of the window. Wall 13 may have an integrally-formed flange 15 which is arranged to receive and support an edge of the glass. Wall 14 is provided with a flange 16. A relatively thin, slightly-curved wall 17 forming the weatherstrip member is provided with a portion 20 having a slightly greater curvature. Thin wall 17 is integrally connected with the rail, as at 21, substantially at the junction between walls 11 and 13, and portion 20 of the weatherstrip member is initially integrally connected, as at 22, with flange 16.

A structure with such a cross-sectional contour where the thickness of wall 17 is critical is most expeditiously formed by extruding the metal. After forming, wall portion 20 is fractured along a line indicated by broken line 23. It will be noted that broken line 23 is spaced from wall 17, and when the weatherstrip member is so broken from its integral connection a residual fin 19 results. Thus, wall 17 has only one connection with the balance of the rail, and since there is a bending moment around point 21, the point of connection is somewhat tapered in order to distribute this bending stress.

Rail 9 shown in Fig. 2 is similar to that of Fig. 1, except that the relative position of the parts is, in general, reversed. That is, in rail 10 of Fig. 1, 13 may be considered as the inner wall of the rail and weatherstrip portion 17 is connected with this inner wall. In the rail 9 of Fig. 2, on the other hand, member 24 forming the weatherstrip portion is integrally connected with outer wall 25. This rail is further formed with inner wall 26, flange 27 for receiving the glass or the panel, flange 30, and lateral walls 31 and 32. Weatherstrip member 24 is further provided with a portion 33 corresponding to portion 20 in the struc-

ture 10 shown in Fig. 1. After this wall is formed it is broken, as at 34. This leaves a residual fin 35 running the full length of the rail. Flange 30 may have a number of holes 36 drilled therein to provide for drainage.

The reversal of the parts in the structure of Fig. 2 over that of Fig. 1 is required in cases wherein there is a double or French type of door and it is necessary to have the weatherstrip elements on the outer edges of the respective doors. In Fig. 3, doors 37 of this type are illustrated. Each of these doors is suitably hinged, as shown at 38, and is provided with glass 40. The relation between the fixed door frame and the adjoining rail of the door is shown in Fig. 4. This rail 10 is similar to that shown in Fig. 1 and is arranged to swing in the direction of the arrow when moved to open position.

Fig. 4, however, shows the door in closed position. The door frame 41 is provided with a transverse wall 42, and when the door is in such closed position, weatherstrip member 17 is yieldingly moved in the direction of wall 11 due to contact with surface 42. It will be appreciated that the weatherstrip member may have a continuous curved surface, when viewed in transverse section as in Fig. 4, although it is preferred to have the two curved sections 17—20 which provide two points of contact with surface 42. Residual fin 19 also contacts surface 43 of the door frame, thus providing an additional seal.

The relationship of the meeting edges of the two doors 37 is illustrated in Fig. 5. Since the left-hand rail is similar to rail 9 illustrated in Fig. 2, the parts are similarly numbered, and the right-hand rail is similar to rail 10 of Fig. 1. Here, again, the advantage of having the two curved sections in the weatherstrip member is amply illustrated. Residual fins 19 and 35 also provide additional weatherstrip or sealing means.

Fig. 6 shows the relation of the parts at the bottom of the door. Hollow kick plate 44 is provided with a flange 45 which receives the glass 40. At the lower end of the kick plate a rail similar to rail 10 of Fig. 1 is provided. The frame in this instance is provided with a threshold 50 against which the weatherstrip member is yieldingly held. The exact structure of this frame, of course, forms no part of the present invention.

The rail of Fig. 7 is substantially similar to the rails of Figs. 1 and 2, except that it is constructed in two portions. One portion comprises wall 52, flange 53, and weatherstrip member 54 provided with extension portion 55. It is further provided with laterally-extending portions 56 and 57. The other section is provided with wall 60, flange 61, fin 62, and lateral walls 63 and 64. These lateral walls have complemental cut-out portions 66 and are secured together by means of rivets 70. The surfaces of these cut-out portions may be provided with a facing of insulating material 71 which largely eliminates transfer of heat by conduction from one wall 60 to the other wall 52.

In Fig. 8 the weatherstrip member 75 is formed integrally with frame 76 rather than rail 77 of the window or door. The frame has a flange 78 on one side and a flange 79 on its other side. Residual fin 80 is formed when the weatherstrip member is broken from its connection with the fin. Rail 77 has flanges 81 and 82.

While three forms or embodiments of the invention have been shown and described herein for illustrative purposes, and the construction and arrangement incidental to three specific applications thereof have been disclosed and discussed in detail, it is to be understood that the invention is limited neither to the mere details or relative arrangement of parts, nor to its specific embodiments shown herein, but that extensive deviations from the illustrated forms or embodiments of the invention may be made without departing from the principles thereof.

What I claim is:

1. The method of forming the rails for a closure such as a window, door or the like with integrally formed weatherstrip elements arranged to yieldingly engage the inner surfaces of the frame in which such closure is mounted when the closure is in closed position, which method consists in extruding the material from which such rail is constructed with opposed edges of the weatherstrip element integrally joined to such rail and then fracturing the weatherstrip element along one edge thereof.

2. The method of forming tubular metal rails for a closure such as a window, door or the like with integrally formed thin weatherstrip members which are joined along one edge thereof to the rail and which is arranged to yieldingly engage the inner surfaces of the frame in which the closure is mounted when the closure is in closed position, which method consists in extruding the metal from which the rail is formed with the opposed edges of the weatherstrip member integrally joined to the inner and outer walls of the rail and then fracturing the member adjacent one of such walls.

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