

May 3, 1960

G. B. HASBROUCK ET AL
PANEL SECURING STRUCTURE

2,934,800

Filed May 12, 1958

2 Sheets-Sheet 1

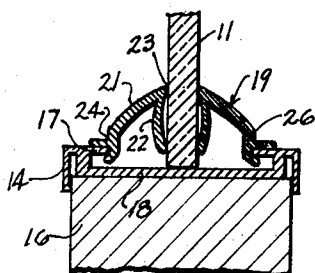
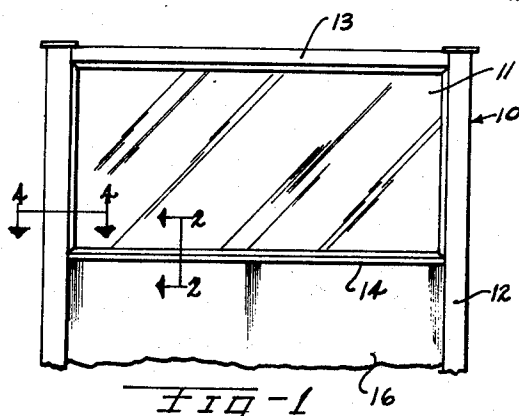


FIG - 2

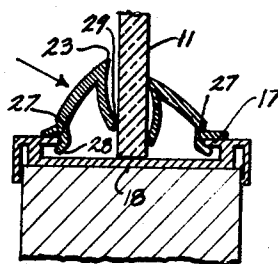


FIG - 3

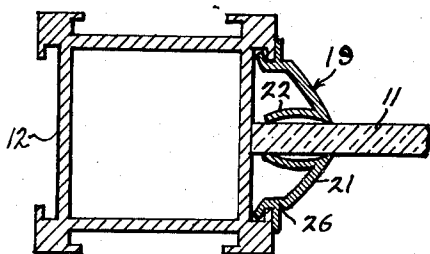


FIG - 4

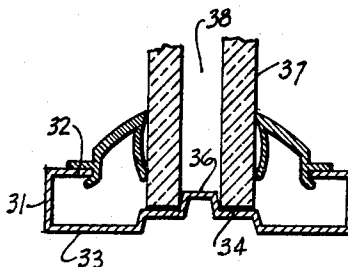


FIG - 5

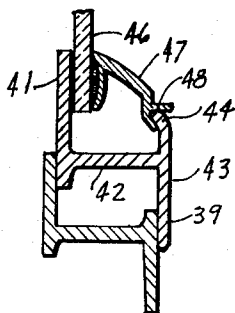


FIG - 6

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2 Sheets-Sheet 2

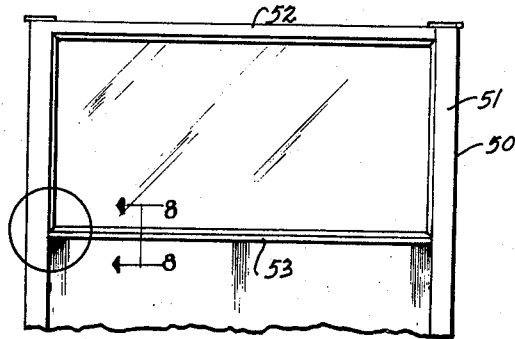


FIG. 7

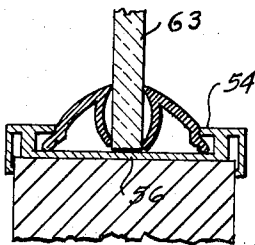


FIG. 8

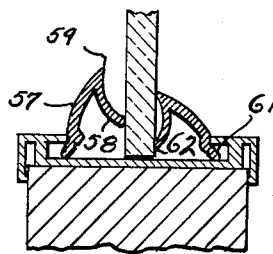


FIG. 9

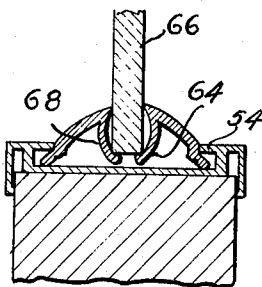


FIG. 10

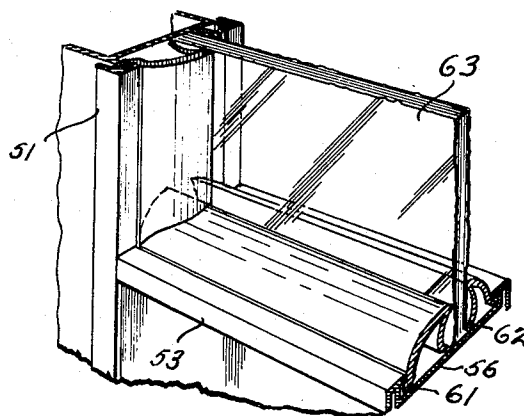


FIG. 11

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PANEL SECURING STRUCTURE

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Application May 12, 1958, Serial No. 734,773

7 Claims. (Cl. 20—56.4)

This invention relates to an improved structure for securing glass or similar panels in a frame. More particularly, the invention is directed to structure for securing panels in frames without the use of conventional glazing points, mastic or other similar old and well known means.

It is well known that metal strips of various cross sectional shapes have heretofore been used to create a finished or dressed appearance in the framing of a glass panel and that in some instances these strips, when secured by screws or clips, have also actually served as the panel retaining means. It is recognized that metal clips and spring wire, in one form or another, have been fastened to a frame in a manner to secure a glass panel and that such clips, at times, have also provided anchorage for finish or trim strips. Almost without regard for the many—and in some cases, ingenious—devices employed to secure glass or other relatively thin panels in a frame, such as found in a window, door, ventilator, partition, etc., it would seem that little attention has been directed to producing some securing means that would combine the advantageous features of these various devices into a single structure and, at the same time, eliminate those features found to be undesirable for one reason or another.

The present invention is directed to and has for one of its objects the provision of means, in strip form, for securing glass or similar panels in a framed opening.

It is also an object of the invention to provide glazing strips that will secure a panel in a frame without the aid of spring clips, wires, or any means other than the strips themselves.

It is another object of the invention to provide a molded glazing strip that may be installed to secure a panel in a framed opening without the aid of any additional fastening means or the need of tools of one kind or another for installation.

It is also found to be an important object of the invention to provide a glazing strip that has positive engagement with a portion of the frame in which the panel is mounted and spring-like engagement with a marginal portion of the panel it secures.

It is also an important advantage and object of the invention to provide a strip that is adaptable for use in both outdoor and indoor glazing.

It is considered of importance in the invention to provide a strip that can be used to engage and seal the marginal edges of either or both faces of a panel in a frame.

Other objects and advantages of the invention will be more fully apparent from a consideration of the following specification, taken in conjunction with the accompanying drawing, in which—

Fig. 1 is a fragmentary front elevational view of a framed glass panel, the panel being secured by strips embodying one form of the invention;

Fig. 2 is a greatly enlarged vertical transverse sec-

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tional view, taken substantially on the line 2—2 of Fig. 1, and shows the manner in which two strips serve as the sole means of securing the edge of a panel to a frame rail;

Fig. 3 is a view similar to Fig. 2, showing one of the strips in place and serving as a locating abutment for the marginal portion of the panel and the other strip in partially engaged position.

Fig. 4 is an enlarged horizontal sectional view, taken substantially on the line 4—4 of Fig. 1 and shows one method of utilizing the strips to secure a panel to the vertical wall of a post;

Fig. 5 is an enlarged fragmentary transverse sectional view showing a pair of strips utilized to secure spaced apart thermo-type panels;

Fig. 6 is an enlarged fragmentary transverse sectional view showing the invention utilized to secure a panel in a casement window frame;

Fig. 7 is a fragmentary front elevational view of a framed panel, the panel being secured by strips embodying another form of the invention;

Fig. 8 is a greatly enlarged vertical transverse sectional view taken substantially on the line 8—8 of Fig. 7;

Fig. 9 is a view similar to Fig. 8 showing one of the modified strips in place as a locating abutment for a panel and the other strip in partially engaged position;

Fig. 10 is an enlarged transverse sectional view of a frame rail and shows the manner in which a panel may both be seated and secured in a frame; and

Fig. 11 is a fragmentary enlarged perspective view of a typical corner as indicated by the circle in Fig. 7 and shows the connecting strips to be lapped instead of mitered.

Referring more particularly to the drawing, the reference numeral 10 is employed to generally designate one form of a frame with which the invention may be used to secure a panel 11 in the opening thereof. Purely for purposes of illustration, the frame 10 may be considered one section of a partition in which both opaque and transparent panels are mounted. The frame 10 includes spaced uprights 12, connected by top and bottom horizontal rails 13 and 14. The rail 14 may be secured at its ends to the post 12 in any conventional manner, and if the lower panel is of the nature of a sound-deadening or solid wall, the rail 14 will rest on such a lower panel 16, substantially as shown in Fig. 2 of the drawing. It will, of course, be appreciated that the particular contour or structure of the under surface of the rail 14 may be varied as required to seat it upon another panel or wall therebeneath. However, the upper surface of the rail 14, in its adaptation for accommodating the present invention, will include generally marginal inwardly extending flanges 17 which extend the length of the rail and are located slightly above the base wall 18, thereof. Although the panel securing strips embodying the invention are shown mounted on metal rails or posts, it will be evident that the strips may be equally satisfactorily employed to secure panels to wooden rails provided, of course, that the rails include a flange or inwardly extending marginal rib of the nature of the flange 17. As indicated in the modification of Fig. 6, the rail flange may be more of the nature of an inwardly inclined rib or bead.

Reference is now had particularly to the panel securing strip indicated at 19. This strip consists of a pair of divergent flanges 21 and 22 that are integral along a line or bend indicated at 23. Flange 21, in cross section, is convex and, near its free edge, inclines downwardly as at 24 and terminates in a thickened portion 26 in which a channel 27 is formed, the channel being defined by slightly divergent legs 28. The other flange 22 of the strip, from

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its line of jointure 23 with flange 21 to its free edge 29, is concave in cross section. Thus, the flanges 21 and 22, although divergent, are curved in the same general direction.

Attention is now particularly directed to Figs. 2 and 3 wherein two of the strips 19 are utilized to engage and secure one edge of the panel 11. To install the panel, one of the strips is first applied to the rail and assumes a position such that the edge 29 rests on the base 18 of the rail when the channel 27 and flange 17 are interfitted. This strip now serves as a locator and abutment for the panel edge. In other words, it assures the panel being positioned substantially centrally of the rail. The second of the two strips required to hold the panel in place is mounted on the rail, the channel 27 thereof being engaged with the rail flange 17. In this position, the free edge 29 of flange 22 contacts the panel 11 quite a distance upwardly of the rail base 18, and the line 23 of the flanges 21 and 22 is well removed laterally from the panel 11. Pressure is now applied in the direction of the arrow (see Fig. 3), and this application of pressure causes the flanges 21 and 22 to compress, allowing the edge 29 to move downwardly of the panel and the meeting line 23 to move laterally inwardly toward the panel. Continued application of pressure causes the flange 22 to have double-line contact with the panel; namely, along the edges 23 and 29. In the process of assembling this second strip, sufficient pressure was necessarily applied to place the previously installed strip under approximately the same tension. Thus, an equal squeezing pressure along upper and lower lines 23 and 29 is applied to both faces of the panel. It will be noted that when the strips are in place their exterior contour resembles quarter-round molding and thus gives a finished and trim appearance at the place of meeting of the panel and the rail. Due to the angularity of the flanges of each strip, the panel 11 is so gripped along its edges that the application of a force less than enough to break a glass panel or damage a fiber or similar panel, will be insufficient to disturb or displace either of the strips.

From the foregoing it will be evident that by the use of the resilient strips 19, it is possible to eliminate clips, wire fasteners, glazing points, putty, etc., in the mounting of a panel in a frame. It is apparent that when the panel is secured in the frame, the securing means of itself serves as ornamental finishing strips. Further, a suitable waterproof mastic could be applied to the channels 27 and to the marginal edge of the panel 11, and possibly to the recessed area formed in the flange 22; and, by so doing, it is considered practical to use the present strips for outdoor weather-tight glazing of window panels. Should the panel 11, due to accidental marring, or the desire to change from a clear to translucent glass, or possibly to a completely opaque panel, require removal, it is a simple matter to insert a thin tool between one surface of the panel and the adjacent contacting edge 23, and by lifting upwardly and outwardly, upset the strip, permitting its manual removal. And, of course, once one strip has been removed, the panel may be moved laterally and disengaged from the frame. No inconvenience or difficulty is anticipated in the use of the strips 19 as the sole means of anchoring all four edges of the panel. The strips would be mitered at their ends and would be separately installable and removable in the manner above stated.

In order that the advantages of the invention may be more fully appreciated, attention is now directed to Fig. 5 of the drawing wherein a rail 31 is shown. The margins of this rail have inwardly directed flanges 32 similar to the flanges 17 above described. However, the base 33 of this rail has a central, upstanding, full length area that provides two ledges 34 which are spaced apart by an upstanding rib 36. A rail of this configuration is intended for use when it is desired to spacedly mount a pair of panels to reduce the extent of heat exchange. Herein, panels 37 are seated on the ledges 34 against the rib 36.

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Strips 19 are now engaged with the rail flanges 32 and pressed into place substantially as shown in the drawing. It will be readily understood that by coating the ledges 34 with waterproof mastic, the panels 37, when installed, will create a dead air space 38. Unlike some of the currently available twin thickness windows, the present invention makes it possible to replace one panel, should it become broken, without removing the frame from its installed position.

Attention is now directed to a further application of the invention as suggested in Fig. 6 of the drawing. Here is shown a section of a conventional rail 39 that forms one of the four rails of a casement window. This rail includes the usual inwardly extending flange 41, web 42, and outer flange 43. The usual continuation of the flange 43 inwardly beyond the web 42 is modified to the extent that this portion 44 is curved laterally inwardly of the rail and thus constitutes a modified equivalent of the flanges 17 or 32 of rails 14 and 31, respectively. It may be seen in this modification that a glass or other panel 46 is mounted against the flange 41 and a strip 47, similar to the strip 19, is utilized to secure the panel in place. It is probable that the channel 48 in the strip will be of somewhat larger proportions in order to engage the portion 44 of the casement rail. However, in all other respects, the mounting strip 47 is identical with the strips previously described and functions to hold the panel 46 in place under pressure.

In keeping with the above described use of resilient strips as means for securing and trim finishing panels, the structure of Figs. 7 to 11, inclusive, is now to be considered. Insofar as the application of the invention to a framed opening is concerned, the presently considered modification may be applied to a frame of the nature of frame 10, presently described as frame 50. The frame 50, of course, includes spaced uprights 51 of one form or another and these uprights are connected by top and bottom horizontal rails 52 and 53, respectively. As with at least one of the previously described modifications, the inwardly opening structure of one of the rails that comprise a frame is considered. Each of these rails, as shown in Figs. 8, 9, and 10, includes generally, marginally located, inwardly extending flanges 54 which extend the length of the rail and are located a predetermined distance above the rail base wall 56.

This strip is similar to the strip 19 to the extent that it consists of a pair of divergent flanges 57 and 58 that are integral along a line or bend indicated at 59. Flange 57, in cross section and throughout a substantial portion of its cross sectional length, is convex. However, near its free end this flange inclines in an opposite direction and terminates in a laterally extending marginal portion 61. The other flange 58, from its point of jointure 59 with flange 57 to its free edge 62, is concave in cross section. Here again, although flanges 57 and 58 are divergent, they are nevertheless curved in the same direction.

Examination of Figs. 8 and 9, wherein two of these strips are shown to engage and secure one edge portion of a panel 63, reveals that the free edges 61 of the strips have a leverage-like bearing on the rail, the extreme edge contacting the base wall 56 and the curved portion, adjacent thereto, contacting the edge of the flange 54. Thus, it may be stated that, due to the bowing of flange 57, the points of contact 59 and 62 of the strip are under considerable tension with respect to the panel 63 and, of course, when, as shown in Fig. 8, two of these strips are provided, sufficient pressure on both surfaces of the panel, adjacent its margins, is exerted to prevent panel displacement even though only one pair of strips be used for this purpose. In other words, when the strips are pressed into place and assume the position shown in Fig. 8, their anchored engagement with the rail is such as to preclude any movement in the direction of displacement. As shown in Fig. 9, as clearly

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as is possible in a drawing of this nature, the free edge 61 of each strip first tucks into the channel-like space between the flange 54 and base wall 56 and, as pressure in the proper direction is exerted, the flanges of the strips 57 and 58 are squeezed toward each other, the edge 61 sliding along the base wall 56 and the flange 57 being constrained to bow or bend around the edge of the rail flange 54. The tension thus created, as already expressed, is more than adequate to hold the panel 63 against another previously installed strip, or the equivalent thereof in the form of a permanent or fixed abutment constituting a part of the rail.

The modification of the strip shown in Fig. 8 is capable of being further altered to the extent that a pair of these strips are not only capable of holding a glass or other panel in place within a frame, but can be made, when used in pairs, to serve as a seat or base for the panel margin in lieu of the base 56. This modification enables inserting a rectangular panel of given dimensions into a framed opening wherein the marginal edges of the frame may at least on one face reduce the proportions of the framed opening. For example, if all four rails of a panel frame included inwardly offset flanges such as the flanges 17, 32 or 54, it would be impossible to insert a panel of such dimensions that all four margins thereof would seat against the base wall 18 or 56. This same condition, of course, would prevail with respect to the modifications shown in Fig. 6. However, if the inner, concave flanges 58, shown in Fig. 8, are formed with marginal or free edge-beads 64, it will be noted (see Fig. 10) that a pair of strips having these beads cooperate to provide a seat for the marginal edge of a panel 66. Furthermore, the marginal edge of panel 66, being within the innermost limits of flanges 54, or, in fact, any part of the rail that makes up the panel frame, thus enables insertion or removal of a panel without vertical or lateral sliding or without cutting the panel to some predetermined accurate dimensions that would enable its insertion in any of the frames previously described. The innermost flanges 68 of this modification actually contact the marginal edges of the glass as well as projecting part way across the marginal surfaces. In so doing, these strips not only pressure engage the two surfaces of the panel but provide a more or less sling seat for the panel edge.

The enlarged structure shown in Fig. 11 discloses a practical method of cutting the panel securing strips in order that they may be individually inserted or removed in a manner other than by means of the accurately mitered strips suggested for the installation considered in Figs. 1 to 6, inclusive.

Although applicant has shown and described only two forms of strips for use in securing the marginal edges of glass or other panels in place and has disclosed several different applications of use of these strips, it will be understood that installation requirements, outdoor use, size of panels, and material from which the strips are made may necessitate some slight modification of the present disclosures and that such modification is contemplated as being within the spirit and scope of the invention insofar as it is set out in the annexed claims.

Having thus set forth our invention, what we claim as new and for which we desire protection by Letters Patent is:

1. In a frame for mounting a panel wherein at least one of the rails thereof includes a marginal inwardly directed flange, a strip for securing a panel in said frame comprising a pair of diverging flanges integral along their meeting edges, a first flange of said strip terminating along its free edge in a pair of legs that define a channel, the body of said flange, in cross section, being generally convex, the second flange of said strip, in cross section, being generally concave and having a relatively thin edge adapted to contact said panel.

2. In a frame for mounting a panel, at least one mar-

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ginal edge of said frame being defined by an inwardly directed flange and a spaced parallel abutment, a strip for securing a panel within said frame, said strip consisting of a pair of resilient integral flanges that diverge from their jointure, the free edge of one of said flanges defining a channel for receiving the flange of said frame, the other of said flanges being concave and adapted to have line contact with a panel seated against said abutment when said strip is engaged with the flange of said frame.

3. In a frame for mounting a panel, at least one marginal edge of said frame being defined by an inwardly directed flange and a spaced parallel abutment, a strip for securing a panel within said frame, said strip consisting of a pair of integrally joined diverging flanges, one of said flanges being of greater cross sectional thickness than the other and terminating along its free edge in an outwardly opening channel defined by a pair of slightly divergent legs, the other of said flanges being curved and terminating in a generally straight edge for contact with said panel.

4. In a frame for mounting a panel wherein at least one of the rails thereof includes a marginal laterally inwardly directed flange, strips for securing a panel, each of said strips comprising a generally V-shaped member, the integral flanges of which being of different cross sectional thickness and subject to relative positional change under a compressive pressure, one of the flanges having an outwardly opening channel engageable with the flange of said one rail, the other flange of said member being concave and having pressure contact with said panel along its free edge and its point of jointure with the first mentioned flange.

5. In a frame having frame rails for mounting a panel wherein each frame rail has marginal inwardly directed parallel flanges, identical resilient strips in opposed relation engaged with opposite faces of said panel, each of said strips consisting of a generally V-shaped member, one flange of said member being convex and terminating in a flat edge portion spaced from the convex area by a shoulder, the other flange of said member being concave, said strips when mounted having their edges beneath the flanges of said rail and the concave flange in line contact with said panel.

6. In a frame having frame rails for mounting a panel wherein each frame rail has marginal inwardly directed parallel flanges, identical resilient strips in opposed relation engaged with opposite faces of said panel, each of said strips consisting of a generally V-shaped member, the integral flanges of which being of different cross sectional thickness and subject to relative positional change under a compressive pressure, one of said flanges having a relatively flat marginal edge offset by a shoulder, said edge projecting beneath one of said rail flanges to an extent determined by said shoulder, the other flange of said member being concave and having pressure contact with said panel along its free edge and its point of jointure with the first mentioned flange.

7. In a frame having frame rails for mounting a panel wherein each frame rail has marginal inwardly directed parallel flanges, identical resilient strips in opposed relation engaged with opposite faces of said panel, each of said strips consisting of a generally V-shaped member having diverging flanges, an offset edge on one of said flanges projecting beneath one of said rail flanges to an extent determined by a shoulder defining the offset, said one flange being convex and presenting an outwardly curved surface between said rail flange and said panel and of a cross sectional thickness to resist deformation, the other of said flanges being concave and of a cross sectional thinness to be distorted when said member is mounted and enabling spaced line contact with said panel under pressure of said one flange.

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