Sept. 2, 1952 R. O. MORGANN ET AL 2,609,071

SEALING STRIP FOR STEEL SASH WINDOWS

Filed Aug. 25, 1950 2 SHEETS—SHEET 1

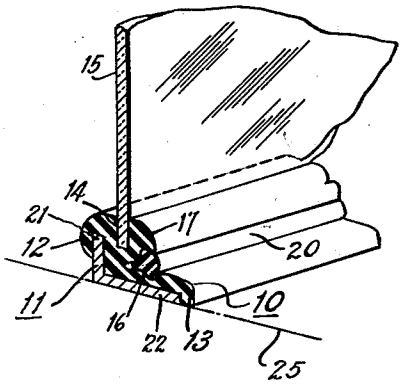


Fig. 1

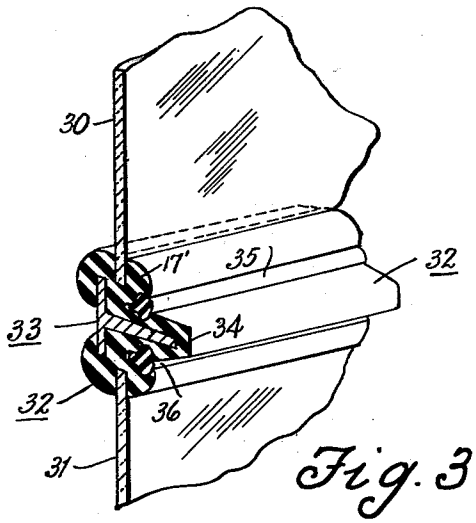


Fig. 3

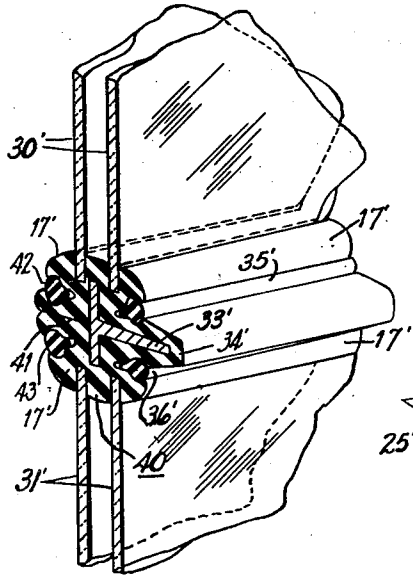


Fig. 4

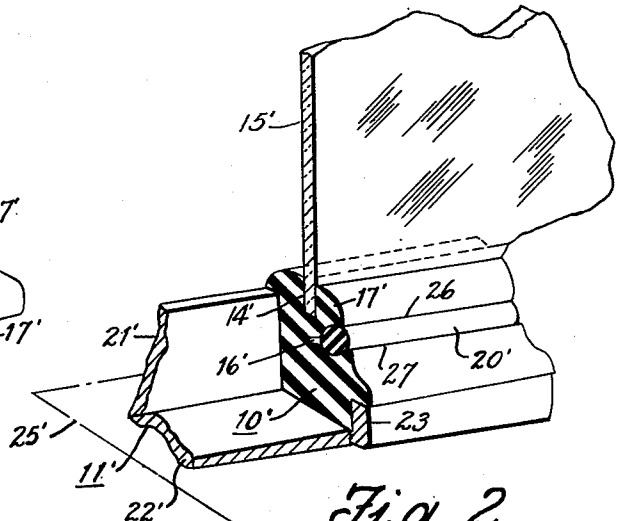


Fig. 2

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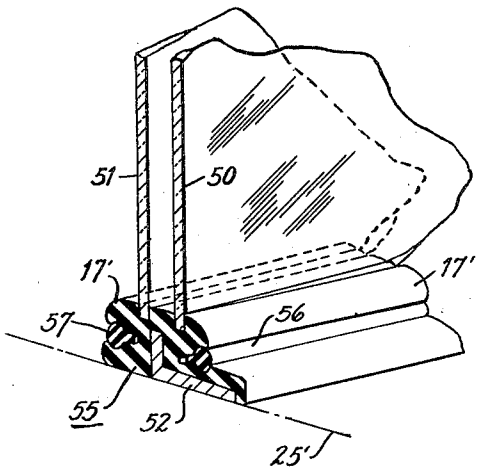


Fig. 5

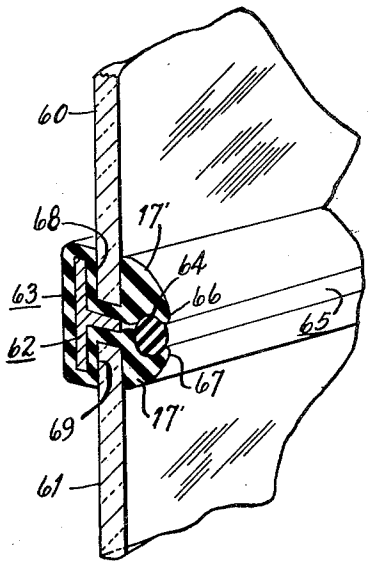


Fig. 6

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SEALING STRIP FOR STEEL SASH WINDOWS

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This invention relates to window constructions, particularly to means for securely holding glass window panes in the window sash by means of a resilient strip of rubber or similar material.

One object of this invention is to provide improved means for resiliently and securely mounting glass panes upon a metal frame consisting of relatively narrow metal bars such as L-section, T-section and channel section bars.

A further object is to provide a window construction having a mounting strip of resilient rubber or similar material extending around the glass pane by which the glass pane may be very simply and quickly mounted upon the sash frame-work in weather sealing relation therewith without the use of cement, putty, or other sealing material.

Another object is to provide a window construction having a mounting strip of resilient rubber or similar material by means of which any one glass pane may be quickly and efficiently removed from the window sash in the event of breakage of the glass or for any other reason, by first removing the wedging filler strip from its groove in the mounting strip and thereafter flexing a pane-retaining lip on the mounting strip out of the way to permit lateral removal of the glass pane.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings wherein a preferred embodiment of the present invention is clearly shown.

In the drawings:

Fig. 1 shows a cross section and perspective views of a fragment of a window construction according to this invention, wherein a glass pane is mounted upon an L-section metal sash member.

Fig. 2 shows a modification of Fig. 1 wherein the metal sash member is of channel section having upright flanges of differing heights.

Fig. 3 illustrates a tandem arrangement of two glass panes mounted upon opposite sides of a T-section metal sash member.

Fig. 4 shows a modification of Fig. 3 showing a double window tandem arrangement.

Fig. 5 shows a further modification wherein double glass panes are mounted upon an L-section, metal sash member.

Fig. 6 shows a modification somewhat similar to that of Fig. 3 but having only a single wedging filler strip.

Similar reference characters refer to similar parts throughout the several views.

The resilient mounting strip interposed between the glass pane and the metal sash member in each form of the invention may consist of elastic rubber material or other suitable elastic rubber-like material well known in the plastic arts. Each disclosed form of the mounting strip is of uniform cross section thruout its length and hence the uncured plastic material can be economically extruded to the desired cross section by the well known extrusion method for making long strips of constant cross section. Hereinafter the term "rubber" wherever used is intended to include any suitable elastic rubber-like material which can be substituted for rubber in said mounting strips.

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In Fig. 1, the rubber mounting strip 10 is supported by and rests snugly against the L-section metal sash member 11. The distortible flanges 12 and 13 on said strip 10 are readily snapped around and snugly engage the ends of the flanges on sash member 11 when strip 10 is assembled thereupon and thus these parts are held together. Strip 10 is provided with a groove 14 into which the edge of the glass pane 15 fits. Strip 10 is also provided with an expansible undercut groove 16 located alongside the glass groove 14, thus providing a flexible rubber lip 17 lying between said grooves 14 and 16. When assembling the glass pane 15 upon strip 10 lip 17 can be flexed or swung downwardly (as viewed in Fig. 1) by forcing said lip 17 into the otherwise open groove 16 until lip 17 is sufficiently out of the way to permit the edge of pane 15 to be bodily moved laterally over the depressed lip 17 and into its groove 14. It is to be understood that this strip 10 may extend around the entire margin of glass pane 15, and that the pane 15 may be inserted laterally into its groove 14 by forcing lip 17 out of the way wherever this may be necessary. Obviously at the start of such assembling, one marginal edge of pane 15 may be inserted directly into its groove 14 without the necessity of flexing lip 17 out of the way for such insertion to any great extent.

After all edges of glass pane 15 have been inserted into its groove 14 the lips 17 inherently return to their unstressed or normal position substantially as shown in Fig. 1, however with insufficient pressure contact upon pane 15 to provide the desired leak-proof seal between the pane 15 and strip 10. This leak-proof seal is then obtained as follows. A separate wedging filler strip 20 first has one end thereof forced into the expansible undercut groove 16 and then a length of filler strip 20 is progressively forced into groove 16 to fill same along each edge of pane 15. This

filler strip 20 has a cross section width somewhat larger, as desired, than the normal width of groove 16, hence filler strip 20 will act as a wedge to compress the rubber material on opposed sides thereof and force lip 17 into permanent pressure engagement with pane 15 and so provide the desired weather seal between pane 15 and lip 17. The reaction to the compressing force of lip 17 against pane 15 is taken on the opposite side of pane 15 by the upright flange 21 of sash member 11 which, for this purpose, is arranged to extend upwardly and overlap the marginal edge of pane 15. Filler strip 20 also compresses the material of strip 10 lying between filler strip 20 and the horizontal (as viewed in Fig. 1) metal flange 22 and so provides a pressure seal at this area. Thus it will be seen that the forcible insertion of the single filler strip 20 into its undercut groove 16 maintains the elastic material of strip 10 compressed against both sides of the edge of pane 15 and also against both flanges 21 and 22 of the metal sash member 11, or in other words provides a weather seal at all necessary areas. It is to be understood that the structure shown in Fig. 1 ordinarily extends around all edges of pane 15, but that in some installations it may be desirable to extend such sealing structure along only one or more edges of panel 15. The dot and dash line 25 in Fig. 1 represents the surface of the window frame to which the metal part member 11 may be fixed by screws or other suitable means. It will be noted that the rubber lip 13 presses upon surface 25 of the window sill or frame and so aids in providing a seal between sash member 11 and said sill or frame.

Fig. 2 illustrates a form of the invention which differs from that of Fig. 1 in the sectional shape of the metal sash member 11 which has a channel section rather than the angle section of Fig. 1. Insofar as applicable the above description regarding Fig. 1 applies also to Fig. 2, similar parts having the same reference numerals as in Fig. 1 but with prime marks added in Fig. 2. In Fig. 2 the mounting strip 10 is nested snugly in the channel section between its longer flange 21' and its shorter flange 23, and so requires no rubber lips extending around the edges of said flanges to retain said strip 10' against lateral displacement relative to its sash member 11'.

Also in Fig. 2, the filler strip 20' has a round cross section which facilitates its insertion into the groove 16' without any care required as to rotating the filler strip 20' to any one correct position relative to groove 16'. After filler strip 20' is forced into its groove 16' to compress the rubber lip 17' against the margin of pane 15', it is held locked therein by the overhanging lips 26 and 27 of the undercut groove 16'.

Fig. 3 shows a window structure wherein two glass panes 30 and 31 are mounted upon opposite sides of a T-section metal frame member or muntin 33. In this form of the invention a single rubber mounting strip 32 has a cross section extending around and fitting snugly about muntin 33. This strip 32 can be simply snapped into place around the T-section muntin 23 (as shown in Fig. 3) by spreading its two halves which hinge apart by a distortion of its elastic material at area 34. After this mounting strip 32 is in place upon muntin 33, each glass pane 30 and 31 is assembled and sealed thereupon substantially like pane 15 is assembled in the structure of Fig. 1 as above described. Each of the two wedging filler strips 35 and 36 individually maintains the material of strip 32 compressed against both sides of the margin of its glass pane and against the adjacent vertical flange of muntin 33.

Fig. 4 shows a double pane window structure wherein double panes 30' and 31' are mounted on each side of the T-section muntin 33' in a manner substantially like the single panes 30 and 31 in Fig. 3 are mounted, as described above. Mounting strip 40 of Fig. 4 has a section which completely encloses its muntin 33' and is assembled thereupon by spreading its two halves apart similarly to the method of assembling strip 32 in Fig. 3, and when snapped into final position its two halves contact along surfaces 41. Two additional wedging filler strips 42 and 43 and undercut grooves therefor are provided for the two additional panes which are mounted on the left side (as viewed in Fig. 4) of the vertical flange of muntin 33'. Filler strips 42 and 43 maintain the material of strip 40 compressed against the inserted margins of the two adjacent panes 30' and 31', and also maintains the material compressed together along the dividing surface represented by line 41 in Fig. 4.

Fig. 5 shows a structure similar to Fig. 1 but wherein two parallel glass panes 50 and 51 are mounted upon the L-section metal sash member 52. Here the rubber mounting strip 55 extends on both sides of the vertical flange of sash member 52 and is provided with similar pane grooves and filler strip grooves on the two sides thereof. The two wedging filler strips 56 and 57 maintain the elastic material of strip 55 compressed against the inserted margins of panes 50 and 51 in a manner similar to that described in connection with Fig. 1. However in Fig. 5 the compression caused by one of the filler strips reacts against the compression caused by the other filler strip, that is, the compression against the inserted margins of the two panes 50 and 51 is caused by the combined compression of both filler strips 56 and 57. The dot and dash line 25' represents the surface of the window frame member to which sash member 52 is fixed.

Fig. 6 shows a tandem arrangement wherein two glass panes 60 and 61 are mounted upon a T-section metal frame member 62 by means of the elastic rubber mounting strip 63 which requires only one wedging filler strip 65 to provide the desired sealing compression against the inserted margins of both panes 60 and 61. Mounting strip 63 is formed to a cross section which will fit neatly around and snugly engage the T-section metal member 62, and when snapped thereupon the normal unstressed shape of said cross section will inherently cause the overhanging undercut lips 66 and 67 to close together, or almost together, and thereby leave a longitudinally extending void 64 beneath lips 66 and 67, which void 64 in effect provides a filler strip groove into which a wedging filler strip is later forced. After mounting strip 63 is snapped around metal member 62 the edges of glass panes 60 and 61 are inserted into the grooves 68 and 69 provided therefor in the manner described with reference to Fig. 1. Then the wedging filler strip 65 is forced down between the overhanging lips 66 and 67 into the void 64 to compress the elastic material of strip 63 against the margins of both panes 60 and 61 at the same time. Obviously in so doing the elastic material of strip 63 is also compressed against the upright flanges of the T-section member 62 since said flanges take the reaction of the spreading wedging action of filler strip 65. Thus a compression seal is provided on both sides of the margins of both glass panes 60 and 61.

In each form of the invention described above, the glass pane may be removed for repair or other purposes by first removing the filler strip or strips which maintains the compression against the pane margins and then outwardly flexing the rubber retaining lip and forcing it down into the open groove from which the filler strip has been removed until the edge of the pane can pass laterally out of its retaining groove in the elastic mounting strip.

While the embodiment of the present invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted.

What is claimed is as follows:

1. In a window mounting for buildings, a structural section metal bar having a T-shaped cross section, two opposed window panes mounted respectively upon opposite sides of the stem of said T-shaped bar a mounting strip of resilient rubber like material interposed between said bar and the two panes mounted thereupon, said resilient strip having a longitudinally extending interior void substantially conforming to the section of said bar and a longitudinal slot opening into said void which permits said resilient strip to be assembled upon said bar and substantially enclose same by yieldably opening said slot and passing said bar therethrough, said strip having opposed grooves therein for retaining the margins of said opposed panes, and wedging means interlockingly engaging said resilient strip and maintaining portions thereof compressed against said pane margins.

2. In a window structure, a metal bar of generally T-shaped cross section for mounting two opposed glass window panes upon opposite sides thereof, a mounting strip of resilient rubber-like material snugly retained upon said T-shaped section and substantially enclosing the stem of said T-shaped section, said mounting strip having two opposed longitudinal grooves therein for receiving the margins of said two opposed glass panes respectively, said two opposed grooves each extending alongside and adjacent to a flange of said T-shaped section, said strip having an expansible groove extending adjacent at least one of said pane-receiving grooves, and a filler strip forcibly expanding said expansible groove and compressing the adjacent portions of said mounting strip into pressure engagement with said glass panes.

3. In a window structure, a metal bar of generally T-shaped cross section for mounting two opposed glass window panes upon opposite sides thereof, a mounting strip of resilient rubber-like material snugly retained upon said T-shaped section and substantially enclosing the stem of said T-shaped section, said mounting strip having two opposed longitudinal grooves therein for receiving the margins of said two opposed glass panes respectively, said two opposed grooves each extending alongside and adjacent to a flange of said T-shaped section, said strip having two expansible grooves respectively extending alongside said two pane-receiving grooves and located on opposite sides of the stem of said T-shaped section, and filler strips forcibly expanding said two expansible grooves and compressing the adjacent portions of said mounting strip into pressure engagement with the glass panes and with the stem of said T-shaped section.

4. In a window structure, a metal bar of generally T-shaped cross section for mounting two opposed glass window panes upon opposite sides thereof, a mounting strip of resilient rubber-like material snugly retained upon said T-shaped section and substantially enclosing the stem of said T-shaped section, said mounting strip having two opposed longitudinal grooves therein for receiving the margins of said two opposed glass panes respectively, said two opposed grooves each extending alongside and adjacent to a flange of said T-shaped section, said strip having one expansible groove extending adjacent both of said pane-receiving grooves and located outwardly beyond the edge of the stem of said T-shaped section, and a filler strip forcibly expanding said expansible groove and compressing the material of said mounting strip in opposite directions against said opposed glass panes.

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