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M. J. REILLY

2,453,343

RETAINER STRIP

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FIG. 2

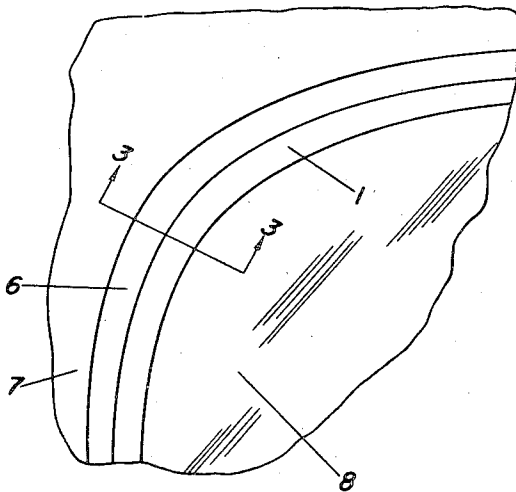


FIG. 6

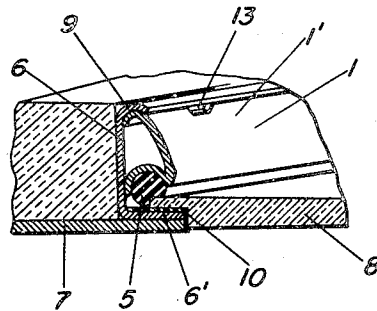


FIG. 3

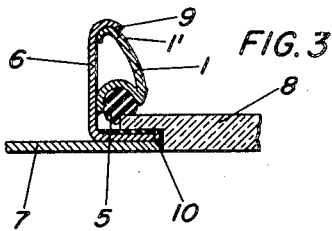


FIG. 1

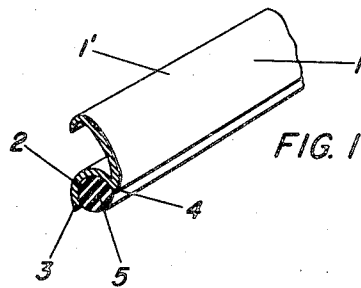


FIG. 4

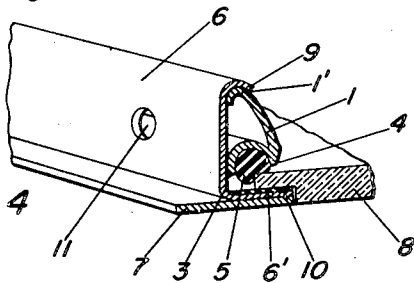
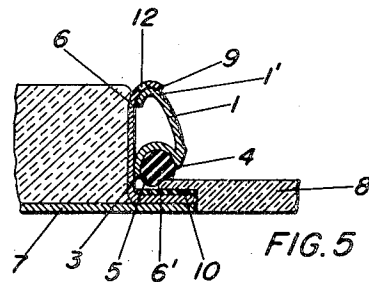


FIG. 5



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RETAINER STRIP

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2 Claims. (Cl. 189—78)

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This invention relates to a panel or window retainer and more particularly to a retainer that includes a removable sealing and holding strip which may quickly and easily be manipulated to effect panel or window replacement.

Among the methods heretofore employed in fastening windows in aircraft fuselages are those conforming to the conventional window sash art such as for instance, caulking the edge of the glass in a frame or securing the glass between a frame and a strip by screws or bolts through the strip. The methods and devices heretofore employed have resulted in making window replacement a lengthy and costly operation and one unsuited to unskilled labor.

According to the present invention there is provided a frame to receive the glass or panel the frame being constructed and arranged to receive a holding and sealing strip that is characterized by a resilience transversely of its length which resilience effects a sealed joint and holds the strip in the frame.

It is among the objects of the present invention to provide a means for holding a panel or the like within a frame wherein the frame is shaped to receive and hold a resilient strip formed to engage the panel along one edge of the strip and simultaneously effect a retaining fit of the strip within the frame along an opposite edge of the strip.

Another object of the invention is to provide a means for holding a panel or the like within a frame wherein the frame is shaped to receive and hold a panel engaging member formed with a gasket holding groove so as to effect a seal between the panel and frame.

A further object of the invention is to provide a means for holding a panel or the like within a frame by means of a resilient strip formed to engage the panel and be easily and quickly removed without special tools and equipment by an unskilled person.

Another object of the invention is to provide a means for holding a panel or the like within a frame wherein the frame is shaped to receive and hold a retainer strip made of a material such as an acrylic plastic which may easily be shaped by application of heat to conform to curved apertures.

Other objects of this invention will become apparent from the following description when taken in conjunction with the accompanying drawing in which like numbers refer to like parts in different views.

In the drawings:

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Figure 1 is a fragmentary perspective view of a cutaway section of the retainer strip of this invention.

Figure 2 is a fragmentary plan view of a window having a curved frame showing the retainer strip in place.

Figure 3 is a fragmentary section taken on line 3—3 of Figure 2.

Figure 4 is a fragmentary perspective view of a form of a window frame channel with the retainer strip in place showing a drilled hole in the channel for use in removing the retainer strip.

Figure 5 is a sectional view of a modified form of a window frame channel with the surrounding frame or wall material flush with the channel, the retainer strip in place, showing a slot cut in the channel for use in removing the retainer strip.

Figure 6 is a fragmentary perspective view of a section of window frame channel with the surrounding frame or wall material flush with the window frame channel, the retainer strip in place showing a notch formed in the top edge of the retainer strip for use in removing the strip.

The present invention is particularly well suited for round cornered or irregularly shaped windows and a round cornered window conventional to aircraft is shown in Figure 2 illustrating the strip 1 in its assembled position with the frame 6 carried by the wall 7 of the aircraft fuselage.

The retainer strip indicated in its entirety as 1 is preferably formed of thermoplastic material to provide a cross section of the shape shown in Figure 1. One edge of the strip 1 presents curved surface 1' conforming to a reentrant curve along the free edge 9 of a frame or channel 6.

The strip is proportioned with respect to distance between frame portion 9 and the edge of the panel so that the strip must be compressed or flexed transversely to position the strip as shown in Figure 3.

A groove 2 is formed in one side of strip 1 and one lip 3 extending slightly below the plane of lip 4 to receive a gasket 5 of sealing material such as sponge rubber. The gasket 5 is retained in place by lips 3 and 4, and it may be further secured by application of a cementitious material thereto.

The retainer comprising strip 1 and gasket 5 is placed in position in a window as shown in Figure 2. The window frame channel 6 is attached to the surface material or skin 7 of the aircraft and the free edge of the upstanding flange of channel 6 has a lip 9 to conform with the radius of the edge 1' of the retainer strip. To assemble

parts the inside lip 3 at the bottom of the strip is positioned adjacent channel 6 which positions the resilient packing 5 so as to bear against the surface of closure panel 8. The curved top 1' of the retainer is flexed so that it may be pressed into place within the radius of the over-hanging lip 9 of the window frame channel. It will be understood that prior to the insertion of the panel 8 which may be of glass or other suitable material such as Plexiglas or Lucite, a gasket 10 is placed along the inner surface of the flange 6' of the channel 6, and may be attached thereto with adhesive material. The gasket so placed at the edge of the panel 8 when assembled provides a cushion and seal between the panel 8 and the flange 6'. The pressure developed by the flexing of the strip to assemble it with the channel is effective in its assembled position to force the sponge rubber 5 against and around the inner edge of the window closure 8 to provide an air and water tight seal.

Preferably the retainer is installed by placing the rubber strip against the surface of window closure 8 adjacent the frame channel 6 and forcing the top 1' of the retainer strip 1 under flange 9. The described method of installation is a simple manual operation that requires no special training or tools. It is a characteristic of the invention that the resilience of the strip material is utilized to effect a "snap" action assembly so that the edge of the strip remote from the panel is "snapped" beneath the overhanging edge of the frame.

In the invention as illustrated in Figures 1 to 4 inclusive the retainer strip 1 is removed by forcing top 1' of the retainer strip inwardly from the window frame channel 6 by the insertion of a rod or like instrument through the hole 11 provided in the channel and lifting the retainer strip away from the channel and closure. Figure 5 illustrates a variation of the frame opening type of construction suited to an installation where the side of the frame is adjacent a thick walled fuselage or the like. In this form a slot 12 is provided through which the removing tool may be inserted.

In those installations (see Figure 6) where it is not feasible nor desirable to provide holes or slots in the window frame channel the retainer strip 1 may be formed with notches 13 along the curved top edge 1' and the retainer strip 1 may be removed by forcing top 1' of the strip outwardly from the channel 6 by the insertion of a screw driver or like instrument through the notches 13.

In all forms of the invention it is preferred that the strip 1 be of a thermo-plastic material, in as much as this material, upon the application of heat, may be curved to fit circular or oval shaped windows. A strip formed from Plexiglas or any other acrylic plastic may readily be formed by immersing the strip in boiling water. However, this invention also contemplates retainer strips of resilient materials that are not thermo-plastic and which may not be as readily bent or formed. The retainer strip of this invention may be used to retain windows 4 in frames having straight sides.

Although three modifications of the invention have been shown and described in detail, and the environment of the invention referred to as aircraft fuselage, it will be appreciated that certain changes, alterations, modifications and substitutions can be made without departing from the spirit and scope of the appended claims.

I claim as my invention:

1. In combination in a window structure, a wall member having an aperture formed therein, a closure panel positioned over said aperture, a channel extending around said aperture having a continuous recess formed with an upstanding free edge and a back wall disposed outwardly of said free edge, an inner flange placed at right angles to said back wall and extending inwardly of the edge of said panel to form a seat therefor with a sealing gasket spaced between the panel and said inner flange, a resilient gasket circular in cross section in engagement with the surface and edge of said panel, a thermoplastic retainer strip in engagement under compression between said free edge of the channel and said resilient gasket, said retainer strip being formed with one edge curved to conform with the curvature of the said upstanding free edge of the channel and the opposite edge positioned inwardly of the channel to engage the channel back wall with the strip area disposed inwardly of said last mentioned edge shaped to provide a semi-circular groove embracing the resilient gasket whereby said resilient gasket is worked around the panel edge co-incident with pivotal movement of the strip as the curved edge thereof is latched under said upstanding edge of the channel to secure the panel in place.

2. In combination in a window structure, a wall member having an aperture formed therein, an upstanding flange having a back wall and a free edge mounted on said wall member surrounding said aperture, the free edge of said flange being curved inwardly toward said aperture, a panel member extending over said aperture within the enclosure formed by said flange, a retainer strip inserted under compression between said panel member and the outer curved edge of said flange comprising a formed strip of material having one edge curved to conform with the curvature of the inner side of the curved edge of said flange for latched engagement therewith, with the other edge folded back inwardly of the flange edge to form an arched portion adjacent the edge of said panel member, a resilient gasket carried by said arched portion of the retainer strip and in compressed engagement between the edge of the panel member and the edge of said arched portion of the retainer strip on downward movement of the arched portion in engagement with the back wall of said channel co-incident with levered movement of the retainer strip into engagement under the free edge of said flange with opening means formed in a portion of the window structure and adapted for insertion of a tool to dislodge said retainer strip from under the flange.

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