

Nov. 29, 1938.

O. M. EDWARDS

2,138,374

WINDOW CONSTRUCTION

Filed Jan. 18, 1938

2 Sheets-Sheet 1

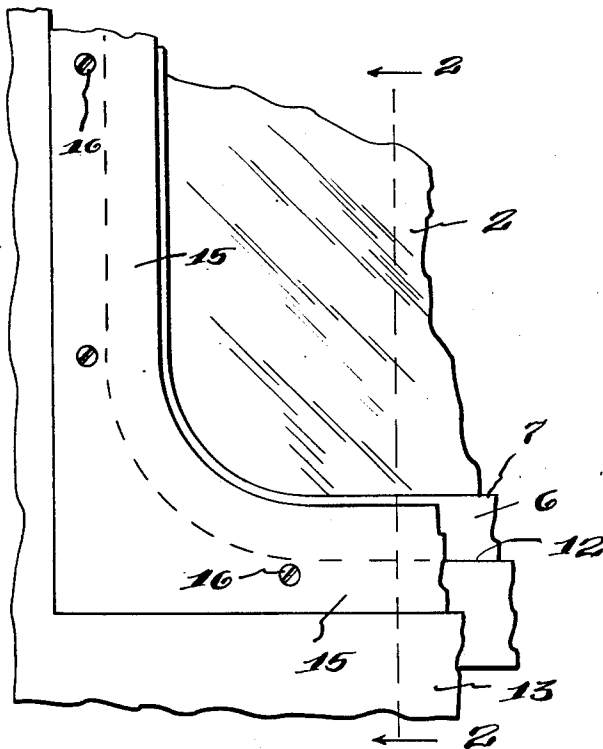


Fig. 1 -

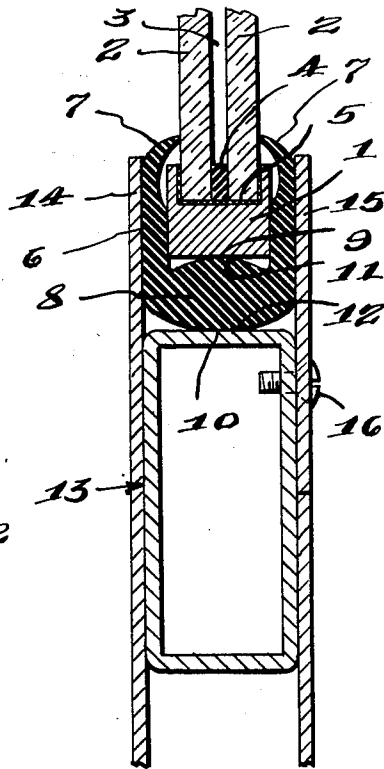


Fig. 2 -

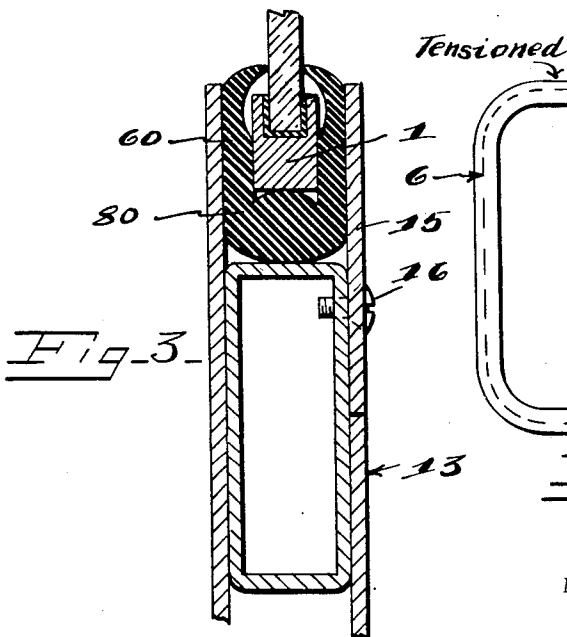


Fig. 3 -

Tensioned

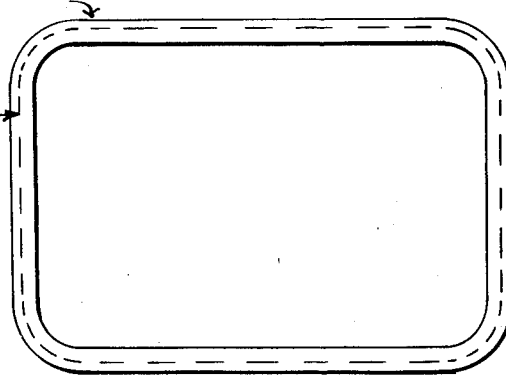


Fig. 4 -

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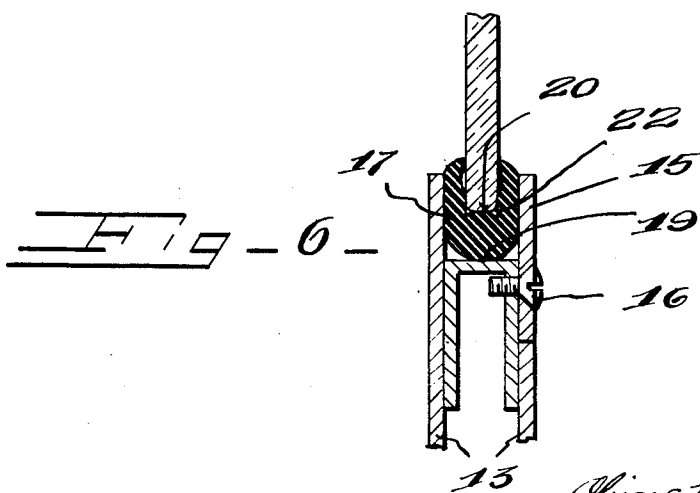
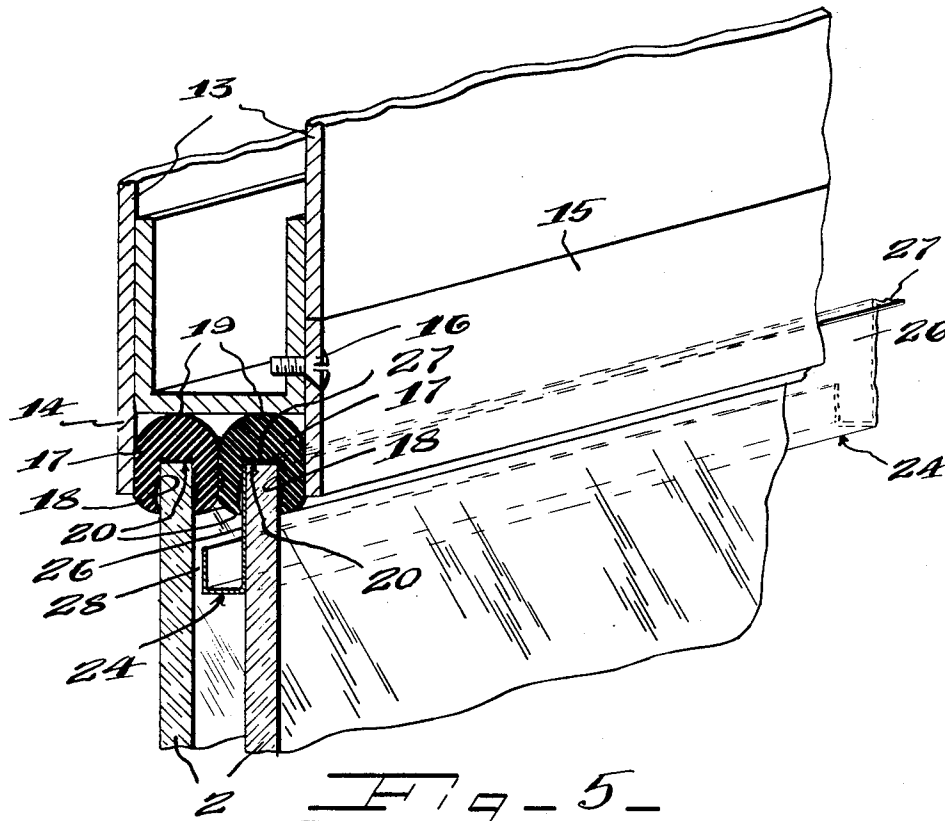
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WINDOW CONSTRUCTION

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2 Sheets-Sheet 2



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2,138,374

WINDOW CONSTRUCTION

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Application January 18, 1938, Serial No. 185,565

8 Claims. (Cl. 189-64)

This invention relates to windows for railway cars, buses and other structures, and particularly structures where window sashes must or should be relieved of edgewise shocks and jars and must be practically weather tight, and in some situations air tight, as where the structure or enclosure is air conditioned.

It has for its object a particularly simple and economical window embodying a buffer and sealing strip, wherein the buffer and sealing strip not only relieves the glass thereof of transverse shocks but also edgewise shocks.

More specifically, it has for its object a buffer and sealing strip channel-shaped in cross section for embracing the sash frame or itself forming the sash frame and embracing the glass pane and having the bottom of the channel formation so shaped that it is thicker intermediate of its side edges than at its sides where it adjoins the sides of the channel formation, so that upon being compressed in the channel of the window frame, the bottom portion bulges or expands in a direction edgewise of the sash against the edge of the sash or the glass pane and the bottom of the channel of the window frame.

The invention consists in the novel features and in the combinations and constructions hereinafter set forth and claimed.

In describing this invention, reference is had to the accompanying drawings in which like characters designate corresponding parts in all the views.

Figure 1 is a fragmentary elevation of a window structure embodying this invention and including a sash frame embraced by an outside frame of compressible material.

Figure 2 is an enlarged sectional view on line 2-2, Figure 1.

Figure 3 is a view similar to Figure 2 of a slightly modified adaptation of the invention.

Figure 4 is a face view on a reduced scale of the window sash and sealing strip thereon.

Figure 5 is an enlarged isometric view of a double sash in which the glass panes are received in a sash frame or seal of compressible material, as rubber, so that the seal constitutes the sash frame.

Figure 6 is a sectional view, similar to Figure 3, showing the glass panes as received in a compressible sash frame without the metal frame shown in Figure 3.

1 designates the sash frame, which, in Figure 2, is shown as provided with two glass panes 2 with an air space 3 between them. These are shown as having their margins extending into a

channel in the sash frame 1 and as held apart by a spacer 4, usually of rubber. Also, the channel of the sash frame 1 is provided with a lining 5 of rubber, or any suitable material.

The construction of the sash frame per se and the assembly of the glass panes 2 forms no part of this invention.

6 designates the sealing strip or frame of elastic, resilient, compressible material, as some form of rubber. This is channel-shaped in cross section, and the margins 7 of the side walls or flanges of the channel formation are provided with lips which press against the outer faces of the panes 2, and thus additionally seal and protect the joints between the glass panes 2 and the sash frame 1. The margins 7 are so formed as to be distorted and pressed against the glass panes, when the sash and the sealing strip 6 are under compression in the channel of the window frame. The strip 6 is continuous and when on the sash frame is under tension and provides a resilient, compressible, tirelike buffer strip and not transferred through the sash frame to the glass panes.

The bottom portion 8 of the channel formation is of greater thickness at its intermediate portion in a direction edgewise of the sash than at its side portions where it adjoins the side walls or flange formation, and the bottom portion engages the edge of the sash only at the thickest point of the bottom portion, and likewise engages the bottom of the channel of the window frame only at the thickest point of the bottom portion. As here illustrated, the bottom portion 8 is substantially elliptical in cross section, so that its inner and outer walls 9, 10 are convex or arcuate and engage the edge of the sash 1 and the bottom of the channel of the window frame at 11 and 12 respectively.

13 designates the window frame having a flange 14 forming one side of the channel of the window frame, and a removable flange 15 forming the other side of the channel. The edge face of the sash and the bottom of the channel of the window frame are of different contours from the inner and outer faces of the bottom portion 8 of the sealing strip, and as here shown, the edge face of the sash and the bottom of the channel of the window frame are flat. The removable flange 15 of the channel of the window frame is clamped or held in position in any suitable manner, as by screws 16.

In mounting the sash in the window frame, the side 15 is demounted and the sash frame with the sealing strip 6 thereon placed in the channel; then the side 15 applied and clamped in position

by tightening of the screws 16. The clamping of the removable side 15 in position compresses the sealing strip in a direction transversely of the sash, and hence applies a compressing force in a direction along the major diameter of the elliptical formation of the bottom 8 of the sealing strip 6. This clamping action not only clamps the resilient sealing strip between the sides 14 and 15, but also causes the bottom 8 to bulge in a direction edgewise of the sash frame, causing it to press against the sash frame at 11 and against the bottom of the channel of the window pane at 12, thus tightly holding the sash in the window frame and cushioning the sash frame against shocks in all directions, and particularly in a direction edgewise of the sash.

In Figure 3, the sealing strip 60 is shown as applied to a single frame, the sealing strip having a bottom portion 80, similar to the bottom portion 8 (Figure 2.)

In either form of the invention shown, because the sealing strip is tensioned and because of the formation of the bottom of the channel of the sealing strip, not only are the glass panes sealed but also any strains transferred equally throughout and the sash and glass panes cushioned in all directions against shocks and jars.

In Figure 5, the glass panes 2 are shown as mounted directly in individual sash frames 17 of compressible material, as rubber, formed with grooves 18 for receiving the margins of glass panes, so that the frame members 17 are channel-shaped in cross section. The bottom of the channel is formed elliptical as in Figures 2 and 3, and the portions of the bottom at opposite ends of the minor diameter of the elliptical formation, thrust, respectively, at 19 and 20 against the bottom of the channel of the window frame and the edge of the glass pane. These members 17 are compressed and distorted when the removable side 15 is clamped in position by means of the screws 16, as in Figure 2.

In Figure 6, a single glass pane is shown embodying the same features as shown in connection with the double sash of Figure 5. The glass is shown as ground off at the corners at 22. However, the elliptical bottom of the channel of the compressible frame member 17 thrusts against the bottom of the channel of the window frame at 19 and against the edge of the glass as at 20, as in the structure shown in Figure 5.

In both Figures 5 and 6, the frame members 17 are compressible and resilient and placed under tension around the glass pane.

In the constructions shown in Figures 1, 2 and 3, the sealing strip 6 is an outer sash frame or section relative to the inner sash or section 1; and in Figures 5 and 6, the sealing strip 17 constitutes the entire sash.

In any exemplification of the invention, the elliptical or semi-elliptical shape of the bottom of the channel formation of the compressible frame members 6, 60 or 17 facilitates the placing of the sash into the window opening and the removal therefrom because while being so placed or removed, the portions of the members 6, 60, 17 slide on the bottom of the window frame channel only at the end of the minor diameter of the elliptical formation. The elliptical formation also compensates for variations in both size and shape of window openings more readily than if these parts 6, 60, and 17 were rectangular or other shape. When the removable sides 15 of the channel of the window frame are clamped in position, these members 6, 60 and 17 are under compres-

sion and distortion in such direction as to hold them snugly in the window frame and also snugly and yieldingly support the glass panes.

For the purpose of holding a dehydrating or moisture absorbing agent for removing moisture from the air between the glass panes and thereby preventing clouding of the panes, a container 24 for a dehydrating material, as activated alumina, in granulated, block or cartridge form is provided, and as here shown, this is in the form of a trough extending along the upper margin of one of the glass panes and supported from the edge of the said pane. It is here shown as having an elongated side 26 extending into the glass groove of the sash frame of one of the members 17 and 15 having a flange 27 hooking over the upper edge of the glass pane 20. This trough is spaced about from the other glass pane forming an air passage 28.

What I claim is:—

1. A window including a circumferential frame channel-shaped in cross section and including a sealing strip of a resilient compressible material, the portion thereof forming the bottom of the channel formation being of greater thickness through its central portion than at its side portions adjacent the sides of the channel-shaped formation, whereby the bottom portion tends to expand in a direction edgewise of the sash when under transverse compression.
2. A window including a circumferential frame channel-shaped in cross section and including a sealing strip of a resilient compressible material, the portion thereof forming the bottom of the channel formation being of greater thickness through its central portion than at its side portions adjacent the sides of the channel-shaped formation, whereby the bottom portion tends to expand in a direction edgewise of the sash when under transverse compression, the inner side of said bottom portion engaging only at its central portion with the edge of the adjacent portion of the window; in combination with a window frame having a channel for receiving and compressing the compressible, resilient frame, thereby causing the bottom portion thereof to expand against the edge of said adjacent portion of the window and the bottom of the channel of the window frame.
3. A window including a circumferential frame channel-shaped in cross section and including a sealing strip of a resilient compressible material, the portion thereof forming the bottom of the channel formation having its outer edge face arcuate, the inner face engaging the edge of the adjacent portion of the window at the highest point of the arcuate formation; in combination with a window frame having a channel for receiving and compressing the compressible, resilient frame, thereby causing the bottom portion thereof to bulge in a direction edgewise of the sash against said adjacent portion of the window, and the bottom of the channel of the window frame.
4. A window including a circumferential frame channel-shaped in cross section and including a sealing strip of a resilient and compressible material, the portion thereof forming the bottom of the channel formation having its inner and outer edge faces arcuate, the inner face engaging the edge of the adjacent portion of the window at the highest point of the arcuate formation; in combination with a window frame having a channel for receiving and compressing the compressible resilient frame, thereby causing the bottom

portion thereof to bulge in a direction edgewise of the window against said adjacent portion of the window and the bottom of the channel of the window frame.

5 5. A window including a circumferential frame channel-shaped in cross section and including a sealing strip of resilient compressible material, the portion thereof forming the bottom of the channel formation being substantially elliptical
10 in cross section; in combination with a window frame having a channel for receiving and compressing the compressible resilient frame transversely relatively to the window, thereby causing the bottom portion thereof to expand edge-
15 wise of the window against the edge of the adjacent portion of the window and the bottom of the channel of the window frame.

6. A window including a circumferential frame channel-shaped in cross section and including a
20 sealing strip, the strip being continuous and forming a tirelike enclosure around the window and being formed of elastic, resilient, compressible material and being under tension, the portion thereof forming the bottom of the channel
25 formation being of greater thickness through its central portion than at its side portions adjacent the sides of the channel-shaped formation, whereby the bottom portion tends to expand in a direction edgewise of the window when under
30 transverse compression, the inner side of said bottom portion engaging only at its central portion with the edge of the adjacent portion of the window; in combination with a window frame having a channel for receiving and compressing
35 the window transversely, thereby causing the bottom portion of the strip to expand against the edge of the adjacent portion of the window and the bottom of the channel of the window frame.

7. A window including a circumferential frame channel-shaped in cross section and including a sealing strip, the strip being continuous and forming a tirelike enclosure around the window glass and being formed of elastic, resilient, compressible material and being under tension on
5 the glass, the portion thereof forming the bottom of the channel formation being substantially elliptical in cross section; in combination with a window frame having a channel for receiving
10 the sash for compressing the sealing strip transversely relatively to the glass, thereby compressing the sealing strip in the channel and causing the elliptical bottom portion thereof to expand edgewise against the glass and the bottom of the
15 channel of the window frame.

8. In a window construction, a window frame, a sash frame forming a circumferential sealing strip embracing a window glass pane, the sealing
20 strip being formed of a resilient compressible material, and the portion thereof forming the bottom of the channel formation being of greater thickness through its central portion than at its side portions adjacent the sides of the channel-
25 shaped formation, whereby the bottom portion tends to expand in a direction edgewise of the sash when under transverse compression, the inner side of said bottom portion engaging only at its central portion at the edge of the window
30 glass pane; in combination with a window frame having a channel for receiving the window pane with its sealing strip or frame thereon and compressing the sealing strip transversely relative to
35 the sash frame, thereby causing the bottom portion thereof to expand against the edge of the glass pane and the bottom of the channel of the window frame.

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