June 20, 1939. S. E. BLESSIN 2,163,566

FRONT OR REAR WINDOW CONSTRUCTION FOR MOTOR BUSES OR THE LIKE

Filed Oct. 28, 1937

Fig. 1.

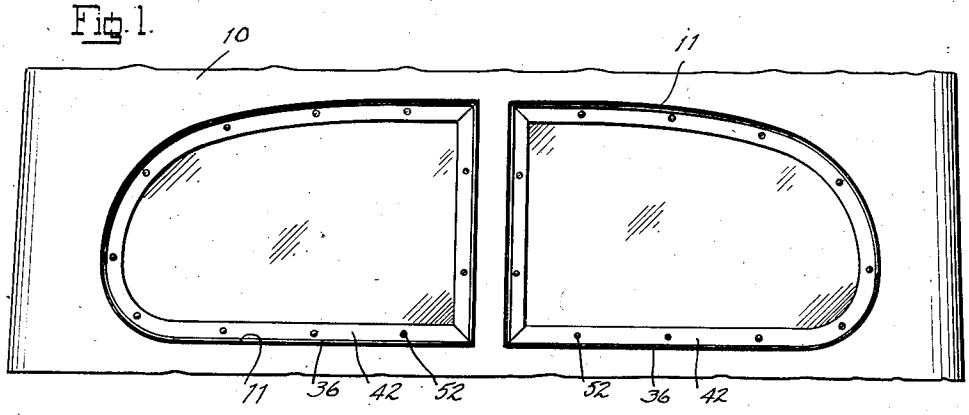


Fig. 2.

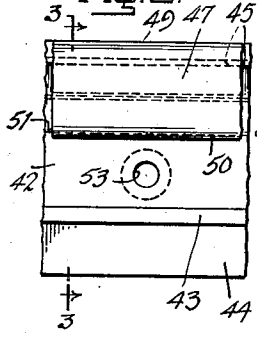


Fig. 3.

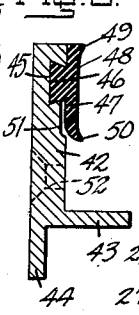


Fig. 4.

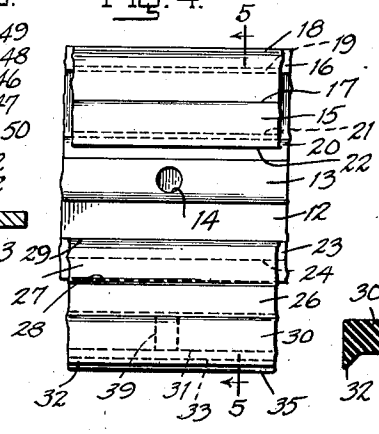


Fig. 5.

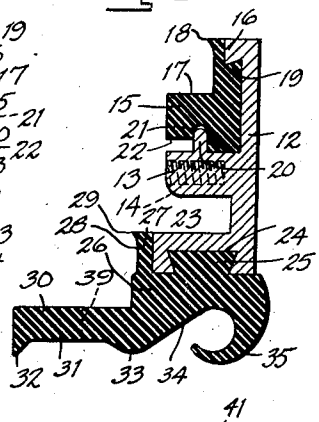


Fig. 6.

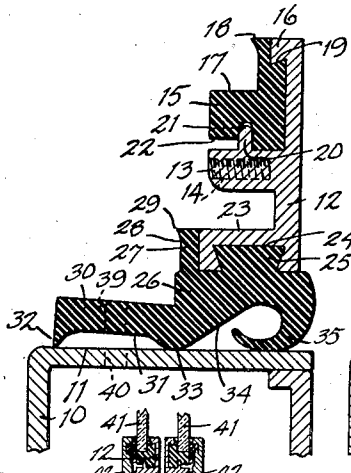


Fig. 7.

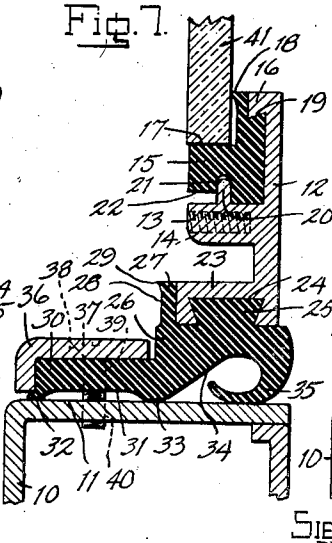


Fig. 8.

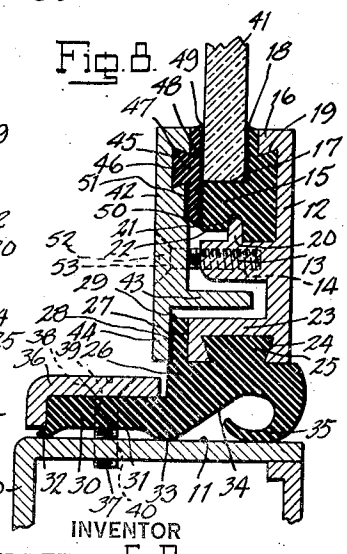
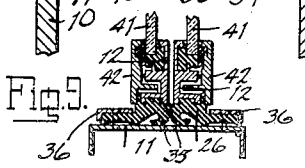


Fig. 9.



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FRONT OR REAR WINDOW CONSTRUCTION FOR MOTOR BUSES OR THE LIKE

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Application October 28, 1937, Serial No. 171,407

12 Claims. (Cl. 296—44)

The present invention relates to an improvement in window construction for motor buses or the like, particularly the front window, customarily called a windshield, and the rear window, the front and rear windows being similar in construction, except that the shape of the window openings may vary to suit the particular design of the bus, and both the front and rear window constructions may consist of either a single window or double windows, the latter being separated by a post of suitable width.

An object of the invention is to provide a window construction of this character which will require no special structure or shape in the wall of the window opening, the surface of the wall being a plain flat one which makes for economical and convenient construction of the bus. Another object is to provide a window construction which may be easily installed to provide a window completely sealed against air and water and which will compensate for limited variations in the size of the window opening, due to manufacturing tolerances. A further object is to provide a window construction in which the window frame will be permanently connected to the window opening to provide a sealed air and water tight connection, and which will permit of the quick and convenient installation and removal of the glass pane by means of a removable retaining member, the retaining member being such as to produce an air and water tight sealing relation between the glass pane and the frame and between the retaining member and the frame.

A further object is to provide a window construction which will provide a floating support between the window opening and the glass pane, to the end that the normal weaving and twisting action, which occurs in a bus body and which continually distorts the window opening, will be absorbed in the window frame without transmission to the pane, so that fracture of the glass due to this cause is overcome.

Another object is to provide a window construction in which the frame and retaining member will compensate for variations and irregularities in the thickness of the glass pane while at the same time providing an adequate seal and clearance for twisting and weaving of the frame.

Another object is to provide a window construction adapted for the installation of either a single sash or a double sash, the latter being such that an effectually sealed dead air space will be maintained between the two sashes.

With the above and other objects in view, an embodiment of the invention is shown in the accompanying drawing, and this embodiment will be hereinafter more fully described with reference thereto, and the invention will be finally pointed out in the claims.

In the drawing:

Fig. 1 is an elevation showing a portion of the rear end of a bus having a window construction according to the invention embodied therein.

Fig. 2 is a fragmentary inside elevation of the retaining means for securing the glass pane in the window frame.

Fig. 3 is a vertical sectional view taken along the line 3—3 of Fig. 2.

Fig. 4 is a fragmentary inside elevation of the window frame member.

Fig. 5 is a vertical sectional view taken along the line 5—5 of Fig. 4.

Fig. 6 is a vertical sectional view showing the window frame inserted in the window opening, and before attachment of the metal binder member, which holds the assembly in place, the glass pane and the retaining member being removed.

Fig. 7 is a similar view showing the metal binder member secured to the window opening, and showing the glass pane in place within the frame, the retaining member being removed.

Fig. 8 is a similar view showing the complete installation with the retaining member secured in place.

Fig. 9 is a sectional view, reduced, showing a double sash according to the invention.

Similar reference characters indicate corresponding parts throughout the several figures of the drawing.

Referring to the drawing the bus 10 is provided with one or more window openings 11 of suitable shape, the illustrated openings at the rear of the bus being rounded and converging at their outer ends, while the front windshield window openings are preferably rectangular in shape. The window frame members which are preferably formed of extruded aluminum alloy, and rubber inserts, are formed by suitable bending tools into the shape of the window opening and may consist of one or more pieces, the frame illustrated consisting of two pieces which are welded together at the inner corners to thus provide a one piece frame structure which may be inserted into the opening. The glass pane retaining member is also similarly formed in one piece. The metal binder which is drawn toward the wall of the window opening when it is being secured in place is preferably formed of a plurality of pieces, or a single piece having a split, to permit of the necessary expansion toward the wall of the window opening.

The frame member 12 is provided with a rib 13 to which the retaining member is adapted to be secured as will presently more fully appear, being provided for this purpose with tapped holes 14 located at suitably spaced positions. This rib is provided intermediate the inner and outer edges of the frame member and its upper surface forms the base of a recess for a resilient glass pane receiving strip 15, preferably of rubber, the upper end of this recess consisting of an inwardly projecting dovetail shoulder 16 at the inner edge of the frame member. The strip 15 is provided with a right angular glass pane receiving corner recess 17, the vertical wall of which is provided at its upper end with a projecting lip 18, and which upon compression seals against the surface of the glass pane while providing a clearance space between the glass and the vertical wall of the recess below said seal. The strip 15 is retained in the recess by interlocking engagement of the dovetail shoulder 16 with a correspondingly shaped recess 19 in the strip, and by an upwardly projecting rib 20 provided upon the upper surface of the flange 13, which engages a pocket 21 in the under-surface of the strip 15, this pocket being deeper than the engagement of the rib therein, and the under-surface of the strip 15 inwardly of the rib being upwardly spaced from the upper surface of the flange 13, as at 22. This arrangement is such as to permit considerable relative movement of the glass pane toward the frame due to weaving, vibration, or the like, the clearances beneath the surface 22 and in the pocket 21 permitting the rubber strip 7 to move in relation to the flange 13 and rib 20.

The frame 13 is provided at its lower end with an inwardly extending right angular base flange 23 having a dovetail pocket 24 in its under surface, and in which pocket there is interlockingly engaged a dovetail rib 25 formed upon the upper surface of the resilient mounting strip 26, preferably rubber. This strip is provided in forwardly spaced relation to the rib 25 with an upwardly extending flange 27 which engages the front wall of the base flange 23 of the frame member, the front surface of this flange 27 being inwardly recessed as at 28, and provided at its upper edge with a forwardly projecting lip 29, for sealing cooperation with the retaining member as will hereinafter more fully appear. The flanges 13 and 23 of the frame member being at right angles to the vertical wall both reinforce the frame member and enable it to be bent into the desired shape of the window opening.

The strip 26 is provided with a forwardly extending leg 30 which is downwardly offset from the upper surface of the strip, and this leg is provided in its under surface with a recess 31, having at its forward end a downwardly projecting lip 32 and at its rearward end a rounded fulcrum rib 33 which is disposed substantially midway between the front and rear extremities of the mounting strip. The rearward surface of the rounded fulcrum rib extends in upwardly inclined relation to form a pocket 34, into which the end of the forwardly and upwardly curled rear wall portion 35 of the mounting strip extends, this curled rear wall portion being gradually tapered so that its inner surface in the undistorted state shown in Fig. 5 is circular and tangential to the inclined wall of the pocket 34 while its outer surface provides at its lower end a convexly rounded shoe surface for engagement in the window opening and a convexly rounded rear surface projecting with respect to the rear surface of the frame 12 in the normal undistorted condition as shown in Fig. 5. The lip 32 projects slightly below the plane of the rounded fulcrum rib 33 and the lower shoe surface of the tapered portion 35 projects slightly below the plane of the rib 32.

When the frame member is inserted in the window opening, as shown in Fig. 6,—it being understood that the frame is slid into the opening from the left or front side of the opening—the rounded shoe portion 35 first engages the opening and curls into the recess 34, the inclined wall of the recess 34 next engages so that the rounded fulcrum rib 33—which is preferably designed so that it substantially fits the window opening without compression—is guided into the opening, and lastly the lip 32 engages the opening. Due to the normal projection of the lip 32 below the plane of the rounded rib 33 the leg 30 is caused to be flexed upwardly to a slight extent as shown in Fig. 6. It will be seen that in the case of the window opening being either slightly larger or slightly smaller than the rib 33 the curled shoe portion 35 will support the frame as it is being slid into place and compensate for such variation.

The frame is now secured in place by means of the angle cross-section metal binding strip 36, this strip being designed so that its rearward edge is normally spaced from the inner end of the leg 30 and the lower end of its forward flange is normally spaced from the wall of the window opening. The strip is secured by screws 37 engaged in countersunk holes 38 in the strip extending through holes 39 in the leg 30 of the mounting strip and screwed into threaded holes 40 in the wall of the window opening. By tightening down this strip the leg 30 of the mounting strip is brought into parallel relation with the opening and the lip 32 is compressed into sealing relation between the lower edge of the strip and the wall of the window opening, as shown in Fig. 7.

The glass pane 41 is set into the recess 17 and the compensating action of the sealing strips is such, as will hereinafter more fully appear, that the thickness of this glass may, within reasonable limits, be either greater or less than the lateral depth of the recess 17.

The retaining member 42 is provided with a stiffening flange 43 which in the engaged position projects into the space between the flange 13 and the base 23 of the frame member. This flange provides a righ angular reinforcement which enables the retaining member to be bent into the desired shape of the window opening. The retaining member is provided below the flange 43 with a downwardly extending portion 44 which in the engaged position is opposed to the recess 28 and engages within this recess upon compression of the lip 29 of the rubber mounting strip. Upon its inner surface and spaced from its upper end there is provided a dovetail recess 45 within which is interlockingly engaged the dovetail rib 46 of a resilient sealing strip 47, preferably rubber, which extends above and below the dovetail rib 46 and has its inner face recessed, as at 48, to provide projecting lips 49 and 50 at the upper and lower edges. The surface of the retaining member 42 below the dovetail recess 45 and opposed to the lower portion to the strip 47 is provided a recess 51 into which the lower portion of said strip moves when the binding member is in place, as shown in Fig. 8. The retaining member 42 is secured by means of screws 52 engaged in countersunk holes 52 in the retaining member

and screwed into the threaded holes 14 of the frame member.

The lip 49 engages the surface of the glass pane and the lip 50 engages the forward surface of the rubber strip 15 and upon tightening of the retaining member forms a seal in relation to both the pane and the rubber strip, the recessed surface 48 providing in cooperation with the recessed surface of the strip 15 for relative weaving or angular movement between the frame and the pane, and also for considerable variation in the thickness of the glass. At the same time the tightening of the retaining member compresses the flange 27 to form a seal between the retaining member and the interior of the frame member.

In Fig. 9 I have illustrated a double sash window construction according to the invention. The window opening is approximately twice the width of the window opening of the single sash construction, and a pair of window assemblies, exactly like those of the single sash construction, are mounted therein in reversely opposed relation to each other, so that the convexly rounded rearward surfaces of the rear wall portions 35 of the resilient mounting strips contact each other under pressure, and thus form a cushion separator between the two frame members to keep them spaced apart and also effectually seal the dead air space between the two sashes. As both retaining members 42 are outwardly disposed either or both of the glass panes may be removed when desired simply by removing the retaining members.

The window construction according to the invention provides a full floating support for the glass pane in which all of the metal parts, as well as the glass pane, are effectually insulated from each other by resilient rubber stripping. At the same time the interior of the frame as well as the inside of the bus is completely sealed against the entrance of air or water. The clearances provided by the rubber stripping with respect to the glass pane permit it to have considerable movement either in up and down or angular direction, without impairing the sealed relation. Glass panes of different thickness may be mounted in the same frame and variation in the thickness of the glass, which is sometimes wider at one portion than another, is compensated for. The pocket 34 and the curled wall 35 of the mounting strip provides a resilient cellular cushion directly between the frame and the window opening, while the fulcrum rib 33 prevents distortion of this cellular cushion from disturbing the securing and sealing leg 30. At the same time movement imparted to the binding strip 36 through weaving or vibration of the window opening 11 will not be imparted to the frame.

In order to remove the glass pane it is only necessary to remove the retaining strip, and when this is done it is not necessary to handle the rubber sealing strips separately, the strip 15 remaining fixed with respect to the frame member 12 and the strip 47 remaining fixed with respect to the retaining member 42. In addition to the floating support provided by the mounting strip 26 the construction of this strip is such that variations in the size of the opening between its ends will be compensated for, and also variations in the surface of the window opening from front to rear, such as slight inclination from the normal flat position, will be compensated for.

I have illustrated and described a preferred and satisfactory embodiment of the invention, but it will be understood that changes may be made therein within the spirit and scope thereof as defined in the appended claims.

Having thus described my invention what I claim and desire to secure by Letters Patent is:—

1. In a window construction for use in a window opening having a frame receiving surface, a glass pane supporting frame member, a resilient mounting strip secured to said frame member including a cushion portion adapted to engage said frame receiving surface to provide a resilient spacer between said surface and frame and an attaching portion projecting with respect to said cushion portion and engaged at its under surface with said frame receiving surface, binder means engaged with the upper surface of said attaching portion in opposed relation to said frame receiving surface, and means for securing said binder means to said frame receiving surface and compressing said attaching portion therebetween.

2. In a window construction for use in a window opening having a frame receiving surface, a glass pane supporting frame member, a resilient mounting strip secured to said frame member including a cushion portion disposed in planular alignment with said frame and an attaching portion projecting with respect to said cushion portion out of the plane of said frame member, said cushion portion and said attaching portion adapted to directly engage said frame receiving surface at their under surfaces, binder means engaged with the upper surface of said attaching portion in opposed relation to said frame receiving surface, and means for securing said binder means to said frame receiving surface and compressing said attaching portion therebetween.

3. In a window construction for use in a window opening having a frame receiving surface, a glass pane supporting frame member, a resilient mounting strip secured to said frame member including a cushion portion adapted to engage said frame receiving surface to provide a resilient spacer between said surface and frame and an attaching portion projecting with respect to said cushion portion and engaged at its under surface with said frame receiving surface, said cushion portion being recessed at its under surface, binder means engaged with the upper surface of said attaching portion in opposed relation to said frame receiving surface, and means for securing said binder means to said frame receiving surface and compressing said attaching portion therebetween.

4. In a window construction for use in a window opening having a frame receiving surface, a glass pane supporting frame member, a resilient mounting strip secured to said frame member including a cushion portion adapted to engage said frame receiving surface to provide a resilient spacer between said surface and frame and an attaching portion projecting with respect to said cushion portion and engaged at its under surface with said frame receiving surface, said attaching portion being recessed at its under side, binder means engaged with the upper surface of said attaching portion in opposed relation to said frame receiving surface, and means for securing said binder means to said frame receiving surface and compressing said attaching portion therebetween.

5. In a window construction for use in a window opening having a frame receiving surface, a glass pane supporting frame member, a resilient mounting strip secured to said frame mem-

ber including a cushion portion adapted to engage said frame receiving surface to provide a resilient spacer between said surface and frame and an attaching portion projecting with respect to said cushion portion and engaged at its under surface with said frame receiving surface, binder means engaged with the upper surface of said attaching portion in opposed relation to said frame receiving surface, and means for securing said binder means to said frame receiving surface and compressing said attaching portion therebetween, said binder means being spaced from said frame member and from said frame receiving surface.

6. In a window construction for use in a window opening having a frame receiving surface, a glass pane supporting frame member, a resilient mounting strip secured to said frame member including a cushion portion adapted to engage said frame receiving surface to provide a resilient spacer between said surface and frame and an attaching portion projecting with respect to said cushion portion and engaged at its under surface with said frame receiving surface, said mounting strip having a fulcrum rib at its under side dividing said cushion portion and said attaching portion, binder means engaged with the upper surface of said attaching portion in opposed relation to said frame receiving surface and means for securing said binder means to said frame receiving surface and compressing said attaching portion therebetween.

7. In a window construction for use in a window opening having a frame receiving surface, a glass pane supporting frame member, a resilient mounting strip secured to said frame member including a cushion portion adapted to engage said frame receiving surface to provide a resilient spacer between said surface and frame and an attaching portion projecting with respect to said cushion portion, said mounting strip having a fulcrum rib at its under side dividing said cushion portion and said attaching portion, a sealing lip on said attaching portion in spaced relation to said fulcrum rib, and a sealing shoe on said cushion portion in spaced relation to said fulcrum rib, binder means engaged over said projecting portion, and means for securing said binder means to said frame receiving surface.

8. In a window construction for use in a window opening having a frame receiving surface, a glass pane supporting frame member, a resilient mounting strip secured to said frame member including a cushion portion adapted to engage said frame receiving surface to provide a resilient spacer between said surface and frame and an attaching portion projecting with respect to said cushion portion, said mounting strip having a fulcrum rib at its under side dividing said cushion portion and said attaching portion, a sealing lip on said attaching portion in spaced relation to said fulcrum rib and projecting below the plane of said rib, and a sealing shoe on said cushion portion in spaced relation to said fulcrum rib, binder means engaged over said projecting portion, and means for securing said binder means to said frame receiving surface.

9. In a window construction for use in a window opening having a frame receiving surface, a glass pane supporting frame member, a resilient mounting strip secured to said frame member including a cushion portion adapted to engage said frame receiving surface to provide a resilient spacer between said surface and frame and an attaching portion projecting with respect to said cushion portion, said mounting strip having a fulcrum rib at its under side dividing said cushion portion and said attaching portion, a sealing lip on said attaching portion in spaced relation to said fulcrum rib, and a sealing shoe on said cushion portion in spaced relation to said fulcrum rib, and projecting below the plane of said rib, binder means engaged over said projecting portion, and means for securing said binder means to said frame receiving surface.

10. In a window construction for use in a window opening having a frame receiving surface, a glass pane supporting frame member, a resilient mounting strip secured to said frame member including a cushion portion adapted to engage said frame receiving surface to provide a resilient spacer between said surface and frame and an attaching portion projecting with respect to said cushion portion, said cushion portion having a recess at its under side, and a curled extension integral with said cushion portion extending into said recess and disposed in opposed direction to the direction of engagement of said mounting strip with said frame receiving surface, binder means engaged over said attaching portion, and means for securing said binder means to said frame receiving surface.

11. In a window construction for use in a window opening having a frame receiving surface, a glass pane supporting frame member having an open side for receiving a glass pane, a resilient mounting strip secured to said frame member including a cushion portion adapted to engage said frame receiving surface, a glass pane retaining member secured over the open side of said frame member, sealing means integral with said mounting strip engaged between said frame member and said retaining means in the secured relation of the latter, and means for securing said mounting strip to said frame receiving surface.

12. In a window construction for use in a window opening having a frame receiving surface, a glass pane supporting frame member, a resilient sealing strip secured to said frame member having an open side for receiving a glass pane, a resilient mounting strip secured to said frame member including a cushion portion adapted to engage said frame receiving surface, a glass pane retaining member secured over said frame member, a resilient sealing strip secured to the inner side of said retaining member adapted to engage over the open side of said sealing strip of said frame member, sealing means integral with said mounting strip engaged between said frame member and said retaining means in the secured relation of the latter, and means for securing said mounting strip to said frame receiving surface.

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