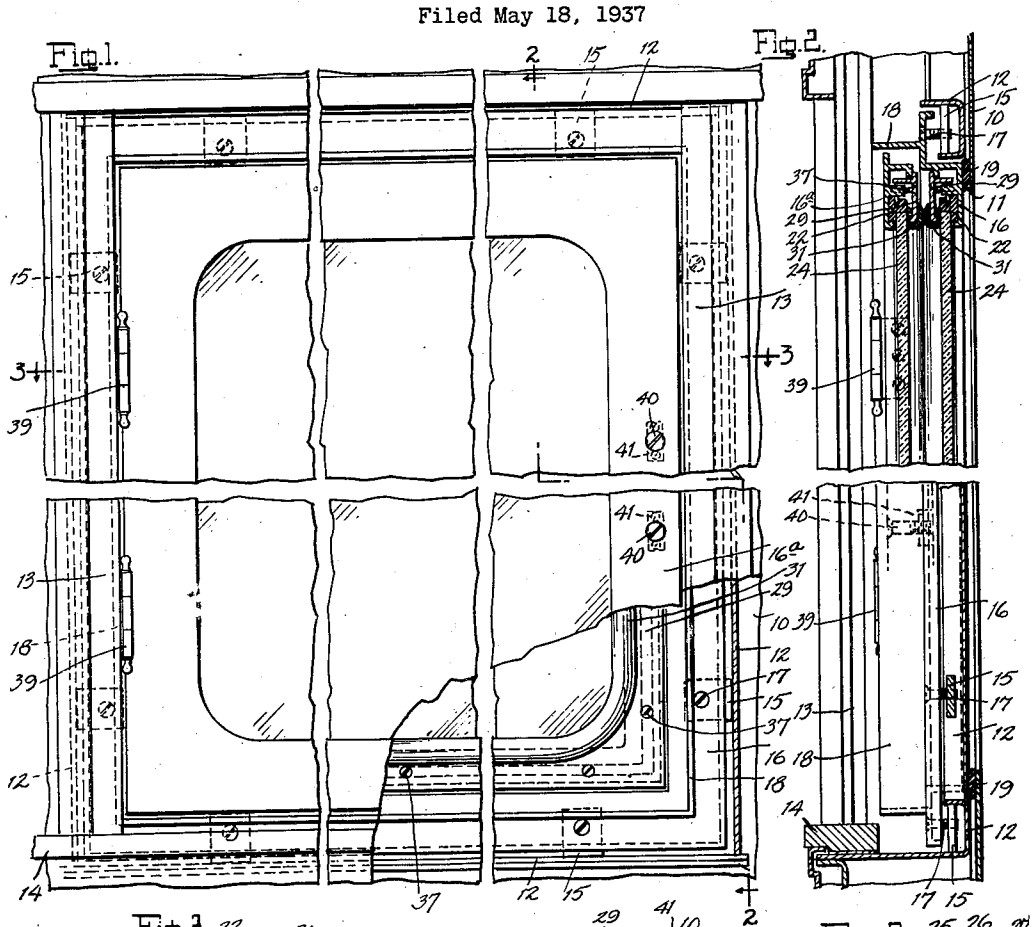
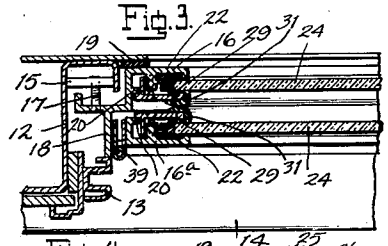
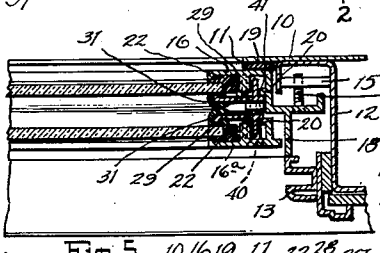
June 25, 1940. J. SCHUNK 2,205,993

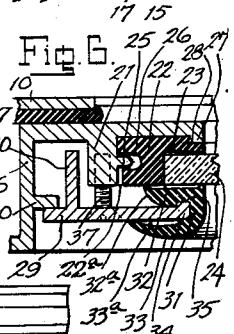
CAR WINDOW STRUCTURE

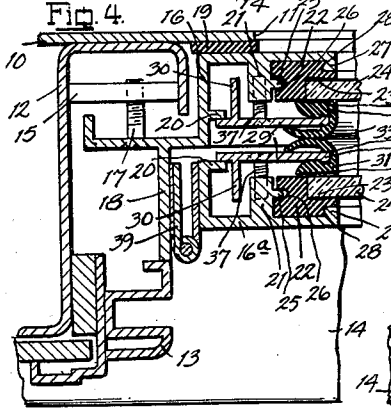
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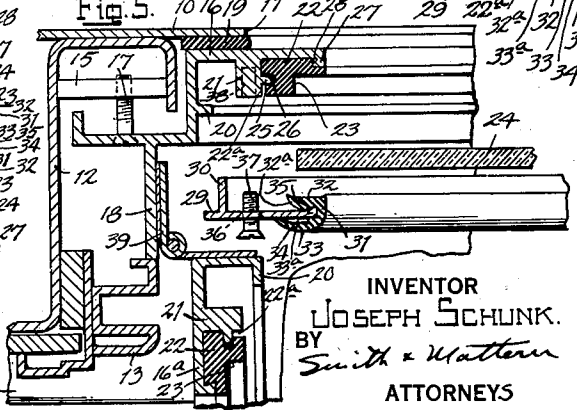












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UNITED STATES PATENT OFFICE

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CAR WINDOW STRUCTURE

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Application May 18, 1937, Serial No. 143,317

7 Claims. (Cl. 189—64)

The present invention relates to an improvement in car window structure, particularly for use in railway passenger cars, busses, or the like, of the air-conditioned type, where the windows are in the form of double sashes to provide a sealed insulating air space between them, and are a fixed installation, as distinguished from the usual type of car window which is arranged to be raised and lowered.

With this type of structure heretofore in use considerable difficulty has been experienced when re-glazing was necessary, as the structure required the removal of the sash frames in order to remove and install the glass. It is proposed in the present invention to provide a window structure in which one of the window frames is fixed while the other is hinged and adapted to be secured in fixed relation to the fixed frame, and further to provide sash retaining means which are accessible upon opening of the hinged sash, so that by simply removing the retaining means from the sash frames the glass may be readily removed and installed.

Another object is to provide a sash retaining means in the form of a strip or frame carrying a resilient sealing or glazing strip which through the attachment of the frame is securely pressed into tight engagement with the glass and at the same time presses the glass into tight engagement with the glass receiving strip carried by the frame.

A further object is to provide a window structure in which the glass retaining means will be concealed both from the outer and inner sides of the window, thereby providing a structure which may not be readily tampered with, at the same time giving to the outer and inner sides of the window structure a smooth and attractive appearance.

A further object is to provide weather stripping for supporting and sealing the glass sash which will allow the glass to move inside the frame at all times when the car structure weaves from the movement of the car, at the same time maintaining the glass in sealed relation.

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 a fragmentary inside elevation of a window structure, according to the exemplary illustrated embodiment of the invention, being partially broken away to show a portion of the inner side of the outer sash.

Fig. 2 is a vertical sectional view, taken along the line 2—2 of Fig. 1.

Fig. 3 is a horizontal sectional view, taken along the line 3—3 of Fig. 1.

Fig. 4 is an enlarged horizontal sectional view of the left hand side of the sash, also taken along the line 3—3 of Fig. 1.

Fig. 5 is a view similar to Fig. 4, showing the hinge sash in open position, and showing the glass and retaining means of the outer sash in separated relation.

Fig. 6 is an enlarged detailed view in horizontal section showing the weather stripping.

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

Referring to the drawing, the window structure, in which the invention is incorporated, comprises an outer panel 10 having a window opening 11 therein of rectangular form, and to the inner side of this panel there is secured a rectangular frame formed of channel iron members 12. To the upright frame members there are secured the vertically extending curtain guides 13—13 and to the lower horizontal frame member there is secured the sill 14.

At suitable intervals the channel members 12 are provided with window sash mounting blocks 15, which are of rectangular shape and are welded or otherwise suitably secured in place, and to these members 15 the stationary sash frame member 16 is rigidly secured by means of screws 17, this frame being of rectangular form and having the same cross-sectional shape along both the upright portions and the horizontal portions. This frame 16 is of S-like formation in cross-section and is provided at its mounting portion with an inwardly projecting flange 18 to which the hinged sash frame is adapted to be secured, as will presently more fully appear. The outer side of the glass receiving portion of the frame 16 is engaged with a resilient sealing strip 19 which is compressed between the panel 10 and the sash by tightening of the securing screws 17.

A shoulder flange 20 is provided upon the intermediate portion of the sash frame and is adapted, as will presently more fully appear, to be engaged as a fulcrum by the glass retaining member, and upon the inner side of the glass receiving portion there is provided a rib 21 to which the glass retaining means is adapted to be secured.

A resilient glass receiving strip 22 having an

angularly shaped corner recess 23, slightly diverging toward its base, for receiving the edge of the glass 24 is secured in the sash framing member by a flange 25 formed upon the rib 21 and engaging a pocket 26 in the strip, and by a dovetail shoulder 27 formed upon the inner end of the sash frame member and engaging a corner recess 28 in the strip. It will be observed that there are clearance spaces between the side surface of the recess 23 and the glass, and between the flange 25 and the sides and the base of the pocket 26, and that the inner surface of the strip 22 is spaced from the rib 21, as at 22^a, for a purpose presently to be more fully referred to.

The glass retaining strip or frame 29 is provided with a stiffening flange 30 which in the engaged position projects between the shoulder 20 and the rib 21, and secured upon the inner end of this frame there is provided a glazing strip 31 formed of suitable resilient material, as rubber or felt, having one leg portion provided with a concave outer face 32 for engaging the glass and the glass receiving strip 22 the inner surface being convex, as at 32^a, and converging from the surface of the member 29 to the outer periphery of this strip, and having its other leg portion provided with a convex outer face 33 with which the opposed glazing strip of the hinge sash engages, as will presently more fully appear, its inner surface being concave, as at 33^a. The frame 29 is provided with an enlargement 34 at its inner end which has interlocking engagement with an under cut slot 35 in the glazing strip. The glass retaining strip or frame 29 is provided at suitable intervals with counter-sunk screw receiving holes 36, and through which the securing screws 37 are engaged and screwed into threaded holes 38 in the rib 21.

The clearances provided in relation to the rubber strip 22 between the flange 25 and pocket 26 and at 22^a and 23, and in relation to the rubber strip 31 at the surfaces 32, 32^a, 33 and 33^a, are such that the glass 24 is permitted to move inside the frame at all times when the car structure weaves from the movement of the car itself on the track, especially when going around curves. At the same time the stripping is maintained in sealing engagement while thus compensatingly supporting the glass. In particular the spaces at 22^a and 26 act as a compensating means for variations in glass size, expansion and contraction, and stresses due to car weaving, and further maintain a close contact with the edge of the glass to prevent a jumping action between the glass and the rubber strip 22. The recess 23 also provides compensation for twisting of the glass due to car stresses and irregularities of car construction and further provides a line contact with the glass at the outer edge. The recess 32 of the rubber strip 31 provides compensation for twisting of the glass due to car stresses and irregularities of car construction and also provides line contact with the glass at the outer edge and with the rubber strip 32 at the inner edge. The curved surface at 32^a provides a means for compensating for glass thickness variations from normal size, which variations in practice may be as much as plus or minus $\frac{1}{16}''$, and at the same time maintain a constant sealing contact with the glass at the outer edge and with the rubber strip 32 at the inner edge. The recess 33^a of the strip 31 on the outer sash provides a resilient weather seal when brought into contact with the opposed strip 31 of the inner sash, the convex surfaces 33 of the strips 31 of the outer and inner sashes providing line contact to form a resilient weather seal to completely insulate the dead air space between the inner and outer sashes from outside through the frame.

The hinged sash frame 16^a is identical with the fixed sash frame 16, except for omission of the portion outwardly of the shoulder 20 by means of which the fixed sash is secured to the window structure. The corresponding parts of the hinged sash are therefore given the same reference characters. In the assembled relation the hinged sash is reversely disposed with respect to the fixed sash so that the glazing strips 31—31 of the fixed sash and the hinged sash contact each other. The hinged sash is mounted upon the flange 18 by means of hinges 39—39 and is secured in closed position by screws 40 extended through the hinged sash and engaged with the threaded holes of blocks 41—41 screwed upon the retaining member 29 of the fixed sash.

When these screws 41—41 are tightened the glazing strips 31—31 are pressed tightly into engagement with each other and the two sashes are in fixed relation to the window structure. The glass retaining means are entirely concealed within the sashes, and the sashes present a smooth and attractive appearance at both the outer and inner side of the window structure.

In order to re-glaze either one or both of the sashes, it is only necessary to remove the screws 40 whereupon the hinged sash may be swung to open position, as shown in Fig. 5. Thereupon the glass retaining frame 29 of either sash may be removed simply by disengaging the screws 37, the glazing strip 31 being simultaneously removed as a part of the retaining member. The glass may thereupon be lifted out of the glass receiving strip 22 and a new glass placed therein. This new glass is secured simply by screwing the retaining member in place. It will be observed that as the retaining member is secured into place the engagement of its outer end with the shoulder 20 causes the inner end carrying the glazing strip to be pulled in against the glass, thereby securely sealing the glass in place.

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 do claim and desire to secure by Letters Patent is:

1. In a car window structure, a window frame of substantially L-shape in cross-section providing an angular recess, a resilient weatherstripping member of substantially L-shape in cross-section engaged in said recess with its sides contacting and parallel to the sides of said frame and having an open sided angular recess to receive and permit removal of a glass pane transversely, a glass pane engaged at its edge in said recess exposed at one side, a removable rigid retaining member secured to and detachable from said frame, and a weatherstripping member of U-shape cross-section embracing the inner edge of said retaining member to engage its inner and outer surfaces adapted to engage said pane at its exposed side in opposed relation to said first weatherstripping member.

2. In a car window structure, a window frame of substantially L-shape in cross-section providing an angular recess, a resilient weatherstripping member of substantially L-shape in cross-section engaged in said recess with its sides contacting and parallel to the sides of said frame

and having an open sided angular recess to receive and permit removal of a glass pane transversely, a glass pane engaged at its edge in said recess exposed at one side, a removable rigid retaining member secured to and detachable from said frame, and a weatherstripping member of U-shape cross-section embracing the inner edge of said retaining member to engage its inner and outer surfaces adapted to engage said pane at its exposed side in opposed relation to said first weatherstripping member, said weatherstripping members having clearance spaces in their opposed glass engaging sides.

3. In a car window structure, a window frame of substantially L-shape in cross-section providing an angular recess, a resilient weatherstripping member of substantially L-shape in cross-section engaged in said recess with its sides contacting and parallel to the sides of said frame and having an open sided angular recess to receive and permit removal of a glass pane transversely, a glass pane engaged at its edge in said recess exposed at one side, a removable rigid retaining member secured to and detachable from said frame, a weatherstripping member of U-shape cross-section embracing the inner edge of said retaining member to engage its inner and outer surfaces adapted to engage said pane at its exposed side in opposed relation to said first weatherstripping member, there being clearance space between said first mentioned weatherstripping and said frame arranged opposite to the edge of said glass and adapted to permit relative movement between said weatherstripping and said frame in a direction parallel to the plane of said glass.

4. In a car window structure, a window frame of substantially L-shape in cross-section providing an angular recess, a resilient weatherstripping member of substantially L-shape in cross-section engaged in said recess with its sides contacting and parallel to the sides of said frame, and having an open sided angular recess to receive and permit removal of a glass pane transversely, a glass pane engaged at its edge in said recess exposed at one side, a removable rigid retaining member secured to and detachable from said frame, a weatherstripping member of U-shape cross-section embracing the inner edge of said retaining member to engage its inner and outer surfaces adapted to engage said pane at its exposed side in opposed relation to said first weatherstripping member, said second weatherstripping member having a clearance space at its side engaging said glass.

5. In a car window structure, a window frame of substantially L-shape in cross-section providing an angular recess, a resilient weatherstripping member of substantially L-shape in cross-section engaged in said recess with its sides contacting and parallel to the sides of said frame, and having an open sided angular recess to receive and permit removal of a glass pane transversely, a glass pane engaged at its edge in said recess exposed at one side, a removable rigid retaining member secured to and detachable from said frame, a weatherstripping member of U-shape cross-section embracing the inner edge of said retaining member to engage its inner and outer surfaces adapted to engage said pane at its exposed side in opposed relation to said first weatherstripping member, said second weatherstripping member having a clearance space at its side engaging said glass, and a clearance space at its side engaged with the outer surface of said retaining member.

6. In a car window structure, a window frame of substantially L-shape in cross-section providing an angular recess, a resilient weatherstripping member of substantially L-shape in cross-section engaged in said recess with its sides contacting and parallel to the sides of said frame and having an open sided angular recess to receive and permit removal of a glass pane transversely, a glass pane engaged at its edge in said recess exposed at one side, a removable rigid retaining member secured to and detachable from said frame, a weatherstripping member of U-shape cross-section embracing the inner edge of said retaining member to engage its inner and outer surfaces adapted to engage said pane at its exposed side in opposed relation to said first weatherstripping member, there being clearance spaces between said first mentioned weatherstripping and said frame arranged opposite to the edge of said glass adapted to permit relative movement between said weatherstripping and said frame in a direction parallel to the plane of said glass, and said first weatherstripping member having a clearance space at the opposite side of said glass from said second weatherstripping member.

7. In a car window structure, a window frame of substantially L-shape in cross-section providing an angular recess, a resilient weatherstripping member of substantially L-shape in cross-section engaged in said recess with its sides contacting and parallel to the sides of said frame and having an open sided angular recess to receive and permit removal of a glass pane transversely, a glass pane engaged at its edge in said recess exposed at one side, a removable rigid retaining member secured to and detachable from said frame, a weatherstripping member of U-shape cross-section embracing the inner edge of said retaining member to engage its inner and outer surfaces adapted to engage said pane at its exposed side in opposed relation to said first weatherstripping member and having a clearance space at its side engaged with said glass pane, there being clearance spaces between said first mentioned weatherstripping and said frame arranged opposite to the edge of said glass adapted to permit relative movement between said weatherstripping and said frame in a direction parallel to the plane of said glass, and said first weatherstripping member having a clearance space at the opposite side of said glass from said second weatherstripping member.

JOSEPH SCHUNK.