

Sept. 26, 1939.

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2,174,279

DOUBLE WINDOW CONSTRUCTION

Filed Sept. 3, 1937

2 Sheets-Sheet 1

Fig. 1.

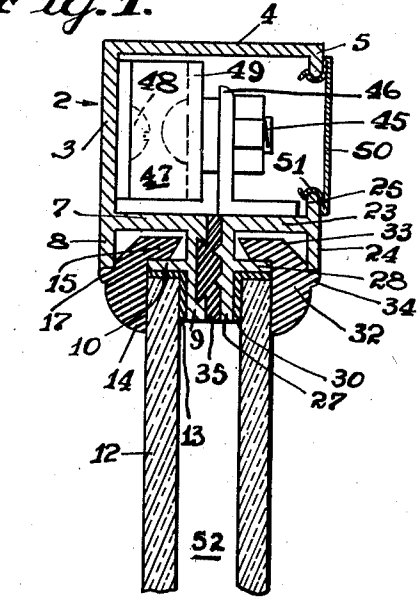
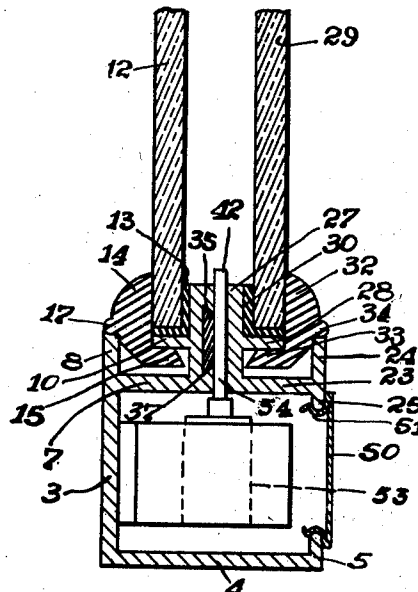
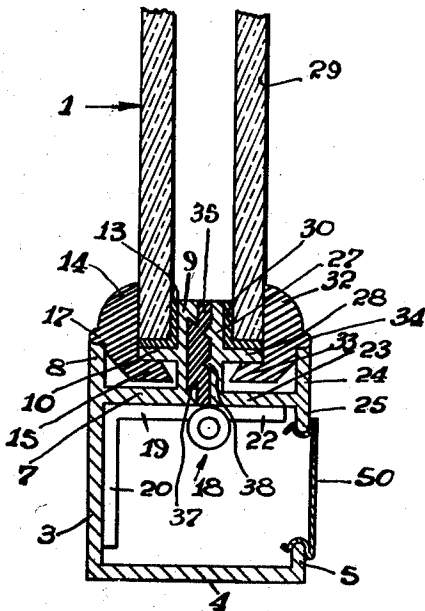
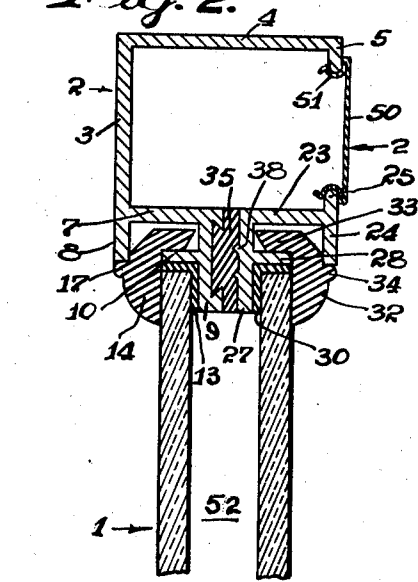


Fig. 2.



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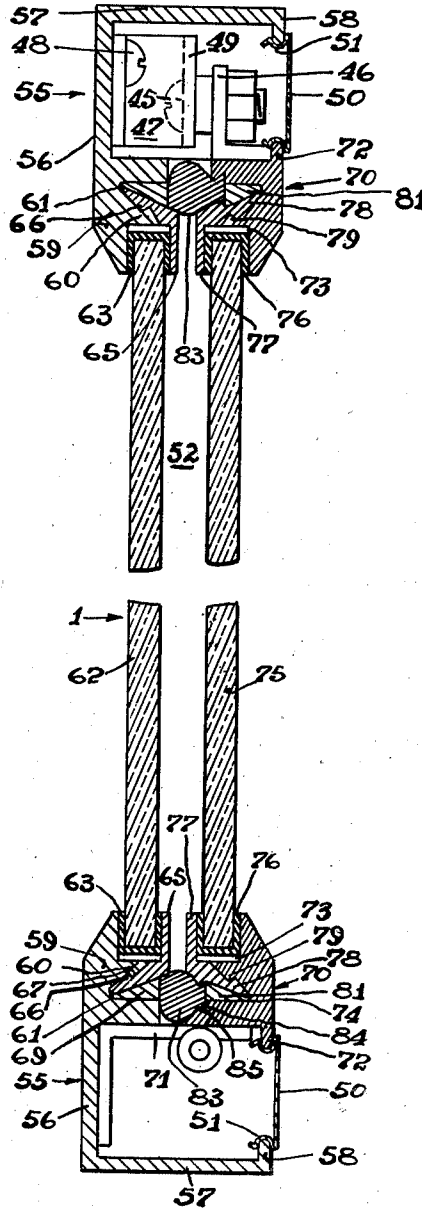
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2 Sheets-Sheet 2

FIG. 3.



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DOUBLE WINDOW CONSTRUCTION

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9 Claims. (Cl. 189—64)

This invention relates to a window construction and more particularly to a double glazed window unit.

An object of the present invention is to provide a double glazed window construction which has a high thermal insulating value. Another object of this invention is to construct a double glazed window in such manner that the two window frames may be readily separated for the purpose of cleaning the inner surfaces of the glass sheets. A further object of my invention is to provide a relatively simple frame and sash construction in which the glass sheets are firmly supported in such manner effectively to seal the space between them against the entrance of dirt and moisture, but at the same time permit of easy replacement of the glass in the frame in case of breakage. Other objects and advantages will become apparent during the course of the following detailed description of the invention.

Certain embodiments of my invention are illustrated in the accompanying drawings in which like reference numerals designate corresponding parts in all of the views, and wherein: Figure 1 is a vertical sectional view of a sash construction embodying my invention; Figure 2 is a transverse sectional view of the sash construction; and Figure 3 is a vertical sectional view of a modified form of sash construction.

Referring to Figures 1 and 2, a sash construction 1 comprises a hollow metallic frame 2 which is substantially of L-shape in cross section and includes vertical sides 3 and transverse sides 4, the latter of which have inwardly projecting edges 5 about their peripheries. The vertical sides 3 are formed with transverse flanges 7 extending therefrom and spaced downwardly from the outer margin of the sides 3, to provide rims 8 which are in the same plane of the vertical sides 3. The transverse flanges 7 have ribs 9 projecting inwardly from the edges of said flanges 7 in spaced parallel relation to the vertical sides 3. Each of the ribs 9 is provided with a transverse ledge 10, which serves as a support for a glass sheet 12 carried by the frame 2.

The glass sheet 12 is insulated from the ledges 10 by a strip 13 of resilient cushioning material in order that any breakage or chipping of the edges of said glass sheet is minimized. A resilient welt 14 of rubber or other suitable material is disposed circumferentially of the frame 2 to engage the outer surface of the glass sheet 12 adjacent the periphery thereof. The welt 14 is provided with a laterally projecting edge 15 which is designed to engage the under surface of the

ledge 10 and a laterally projecting rib 17 rests upon the rim 8. By reason of the co-action of the rib 17, the edge 15, the rim 8 and the ledge 10, the welt 14 is locked into position and prevents accidental displacement of the glass sheet from the frame 2.

A hinge 18, extending substantially the entire width of the unit 1, is secured to the inner side of the frame 2 forming the bottom rail of the sash. One strap 19 of the hinge 18 is of L-shape to provide a flange 20 which is secured to the vertical side 3 of the frame 2. The outer strap 22 of the hinge 18 carries a second frame 23. The frame 23 is provided with inwardly projecting shoulders 24 and outwardly projecting flanges 25 in spaced alignment with the inwardly projecting edges 5 formed on the frame 2. The frame 23 is also provided with inwardly projecting ribs 27 in spaced parallel relation to the shoulders 24. Each of the ribs 27 is provided with a ledge 28 which serves as a support for a second glass sheet 29 carried by the frame 23. The glass sheet 29 is insulated from the ledges 28 by a strip 30 of rubber or other resilient cushioning material. A resilient welt 32 of rubber or other suitable material similar to the welt 14 is placed circumferentially of the frame 23 to engage the outer surface of the glass sheet 29 adjacent the periphery thereof. The welt 32 is provided with a laterally projecting edge 33 corresponding to the edge 15 of the welt 14 which engages the under surface of the ledge 28. A rib 34 corresponding to the rib 17 projects laterally from the face of the welt 32 and rests upon the shoulders 24. The welt 32 is accordingly locked in position and serves to hold the glass sheet 29 securely in the frame 23.

A resilient sealing strip 35 extending circumferentially of the unit is secured in a groove 37 provided in the ribs 9 of the frame 2 and engages the outer surface of the ribs 27 of the frame 23 when the two frames are in assembled position. A plurality of longitudinal ridges 38, formed on the outer surface of the ribs 27 insures a close union between the strip 35 and the ribs 27.

The frames 2 and 23 are secured together on the side opposite to the hinge 18 in any suitable manner, as by a plurality of bolts 45 passing through an angle iron 46, secured to the frame 23, and a bar 47 secured to the vertical side 3 of the frame 2 by means of screws 48, and having an intermediate portion 49 offset to provide a space for the heads of the bolts 45.

A metallic closure strip 50 is releasably secured to the opening in the sash 1 between the flange 25 and the projecting edge 5, by means of hook-

like clips 51 formed integrally therewith by bending the marginal portions of the strip 50 inwardly to provide said clips. This strip 50 is readily removed to permit the bolts 45 to be loosened and the frame 23 to be swung open for the purpose of cleaning the inner surfaces of the glass sheets 12 and 29.

When the frames 2 and 23 are locked in assembled position, an air space 52 is provided therebetween which is sealed from the atmosphere, thereby materially reducing the possibility of the entrance of moisture and foreign material to impair the appearance of the window. A dehydrating unit 53 is secured in the hollow frame 2 and is connected with the air space 52 by means of a plurality of tubes 54, passing through the sealing strip 35. In this manner, the air entrapped within the window is maintained in substantially anhydrous condition, for any water vapor entering therein is readily absorbed in the dehydrating unit. The dehydrating unit 53 is preferably positioned in one of the side rails of the sash 1 in order to obviate interference with other elements also contained in the sash.

A modification of the proposed construction is illustrated in Figure 3 of the drawings, in which the sash 1 comprises a frame 55 substantially of L-shape in cross section having vertical sides 56 and transverse sides 57, the latter of which have inwardly projecting edges 58 about their inner peripheries. The vertical sides 56 are formed with enlarged or thickened marginal portions 59, in which are provided a ledge 60 and a longitudinal groove 61. The ledge 60 serves as a support for a glass sheet 62 carried by the frame 55. The glass sheet 62 is insulated from the ledges 60 by a channel 63 of rubber or other resilient cushioning material. The glass sheet 62 is secured upon the ledge 60 by means of a detachable metallic flange member 65 of angular cross section, having a rib 66 adapted to lie in the groove 61 of the section 59, said rib 66 engaging and locking with a shoulder 67 provided in the upper portion of the groove 61, while the flange 65 overlies the glass sheet 62 adjacent the periphery thereof. A wedge 69 is also secured in the groove 61 to engage the lower portion of the flange member 65, and to hold said flange in its interlocking position.

A frame 70 is secured to the frame 55 by means of a hinge 71, extending substantially the entire width of the unit 1, concealed within the frame 55. The hinge 71 corresponds to the hinge 18 and is secured to the frames in a manner similar to that previously set forth. The frame 70 is provided with outwardly projecting flanges 72 in spaced alignment with the inwardly projecting edges 58 formed on the frame 55, and a ledge 73, the base portion of which carries a longitudinal groove 74. This construction corresponds to the ledge 60 and groove 61 provided in the frame 55. The ledge 73 serves as a support for a glass sheet 75 carried by the frame 70. The glass sheet 75 is insulated from the ledges 73 by a marginal covering 76, of resilient cushioning material. The glass sheet 75 is secured upon the ledge 73 by means of a detachable metallic flange member 77 of angular cross section, having a rib 78 adapted to lie in the groove 74, said rib 78 engaging and locking with a shoulder 79 provided in the upper portion of the groove 74, while the flange member 77 overlies the glass sheet 75 adjacent the periphery thereof. A wedge 81 is also secured in the groove 74 to engage the

lower portion of the flange member 77 and to hold said flange in its interlocking position.

A resilient welt 83, extending circumferentially of the unit 1, having a base portion 84 of dovetail cross section including the marginal shoulders 85, is secured in the groove 74 in abutting relation to the wedge 81. The flange 77 is so formed that it interlocks with the base portion 84 of the welt 85. When the frame 70 is swung into parallel relation with the frame 55, the exposed section of the welt 83 is pressed against the frame 55 to provide a seal between the two frames. The welt 83 also serves to prevent displacement of the wedges 69 and 81 from the grooves 61 and 74 respectively, after assembling, by exerting a positive external pressure thereon.

The manner in which the frames are locked together and the means for dehydrating the unit are the same as have already been described in connection with the embodiment of the invention disclosed in Figures 1 and 2 of the drawings.

In the embodiment of my invention as illustrated in Figures 1 and 2, either of the glass sheets 12 and 29 may be removed from the sash by merely freeing the welt 14 or 32 from its interlocking engagement with the frame elements. The hook-shaped base of the rubber welts insures a positive locking action between the welt and the frame, while the body portion of the welt provides adequate support for the glass sheets. In the modified construction, shown in Fig. 3, the flange members 65 and 77 provide an even stronger support for the glass sheets, although replacement of the sheets is rendered slightly more difficult. In this modified construction, however, a supplemental feature is worthy of mention. It will be seen that a considerable portion of the flange members 65 and 77 is exposed to the air or gas entrapped in the unit. Since there is a possibility that some moisture will enter the air space and remain therein, especially when the dehydrator chemicals are exhausted, the metal surface will be colder than the glass and any condensation which might occur will be formed on this metal. Accordingly the unit would not become clouded or stained from this condensed moisture.

The cross sectional dimensions of the hollow frames 2 and 55 should be adequate to house the hinges and securing elements and also to permit the margins of the frames 23 and 70, adjacent to the hinges, to swing inwardly into the frame when the structures are opened.

What I claim is:

1. In combination in a double glazed window construction, a sash comprising a hollow metallic frame having a pair of parallel spaced flanges unitary therewith about its inner periphery, a transverse ledge extending from one of said flanges, a sheet of glass supported on the ledge and releasably secured in the frame, a second frame in spaced parallel relation to the first-mentioned frame, a sheet of glass releasably secured in the second frame, means disposed within the first-mentioned frame securing the second frame in position and a resilient sealing strip disposed between the two frames and engaging the adjacent faces thereof when the frames are in assembled position.

2. In combination in a double glazed window construction, a sash comprising a hollow metallic frame having a pair of parallel spaced flanges unitary therewith about its inner periphery, a transverse ledge extending from one of the flanges, a sheet of glass supported on the ledge

means for locking the two frames together in spaced parallel relationship.

5 9. In combination in a double glazed window construction, a sash comprising a hollow metallic frame substantially of L-shape in cross section, having spaced flanges projecting therefrom parallel to each other and a circumferentially extending opening in said frame, a glass sheet releasably secured between the parallel flanges, a hinge disposed within the hollow frame having one leaf bent at right angles to form a flange

which is secured to the vertical side of the hollow frame opposite the circumferentially extending opening therein, a second frame spaced from the first-mentioned frame and secured to the second leaf of the hinge, a glass sheet releasably secured in the second frame, means disposed within the first-mentioned frame locking the two frames together in spaced parallel relationship, and a metallic closure strip releasably secured between the frames to complete the assembly. 5 10

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