March 3, 1959 E. PIERSON 2,875,479

SASHLESS WINDOW STRUCTURE

Filed Feb. 14, 1955

FIG_1

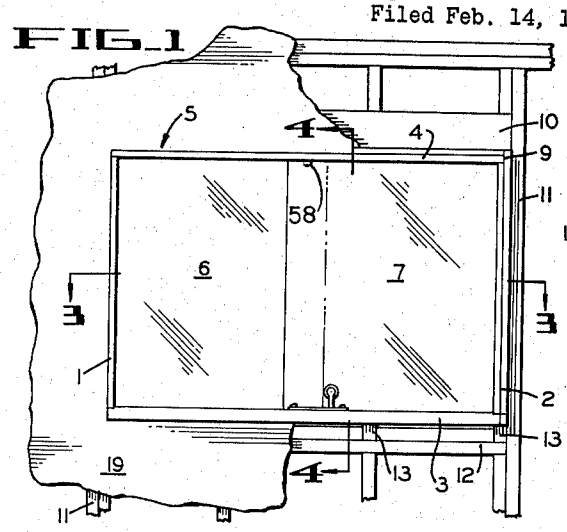


FIG_2

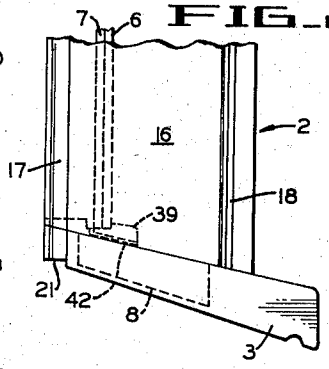


FIG_3

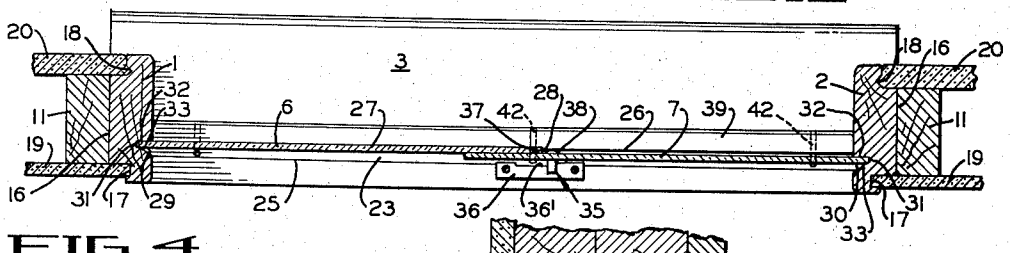


FIG_4

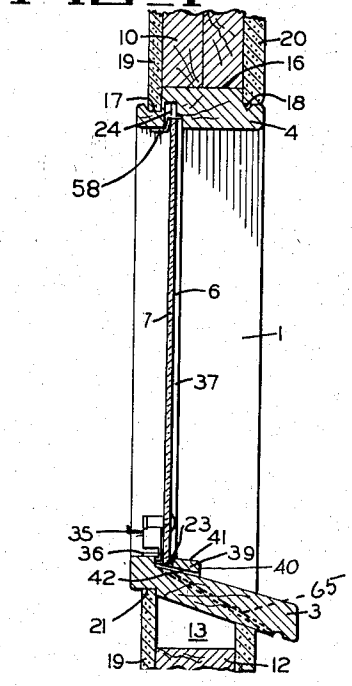


FIG_5

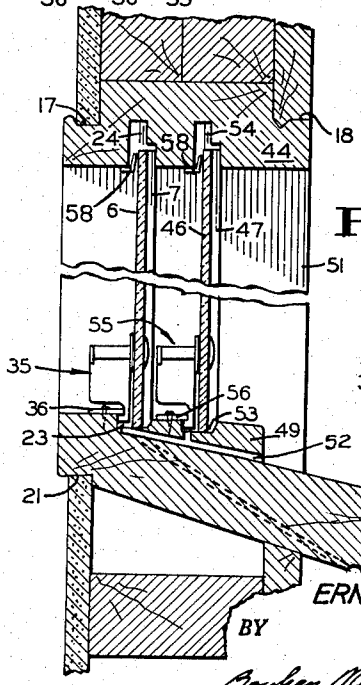
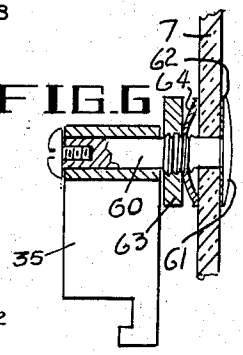


FIG_6



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SASHLESS WINDOW STRUCTURE

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5 Claims. (Cl. 20—52)

This invention relates to sashless windows, generally of a type shown in my U. S. Letters Patent No. 2,530,724 of November 21, 1953, and 2,700,801 of February 1, 1955, and more particularly relates to an improved frame for such windows.

One of the main objects of this invention is the provision of a simple, prefabricated frame for a window that is adapted to be fitted into a wall as a structural part thereof. In this connection it is important to note that the frame of this invention may be rapidly assembled of a few pre-cut pieces, ready for painting or the like, and inserted in the rough wall framing thereby eliminating most of the layout and blocking and shimming necessary for conventional window framing.

Another object of this invention is the provision of a window frame that requires no trim or fill-in members but is complete within itself. The external edges of the jamb, still, and head piece of the frame of this invention are pre-grooved or moulded so as to present a finished appearance in conjunction with wallboard, plaster, siding, or other wall-facing materials.

Still another object of this invention is the provision of a frame for sashless windows where window panes slide in a groove in the sill, which has weep-holes or drains adapted to carry away to the window exterior leakage or inside condensation moisture. The drains provided herein are so constructed that precipitation or other outside moisture cannot enter to the interior of the window.

Yet another object of this invention is a frame, including vertical jambs, for a sashless window, said jambs having means for guiding the window panes into tight engagement therewith to prevent rattling of and leakage around the marginal edges of such panes.

It is a further object of this invention to provide a shashless window frame having means for retaining an outside storm window, similar in detail to and overlying an inside window of the sashless type.

It is a still further object of this invention to provide a sill for a sashless window having a groove therein in which a pair of window panes are adapted to slide, a part of one edge of which groove is offset to prevent movement of one of such panes when such panes are in a closed and locked position.

Other objects and advantages will appear from the following description taken in connection with the accompanying drawings in which:

Fig. 1 is a side elevational view of the window frame of this invention in place in a wall and with panes therein as seen from the inside of the window;

Fig. 2 is an enlarged partial edge elevational view of the frame of Fig. 1;

Fig. 3 is an enlarged sectional view taken along line 3—3 of Fig. 1;

Fig. 4 is an enlarged sectional view taken along line 4—4 of Fig. 1;

Fig. 5 is a greatly enlarged sectional view, similar to Fig. 4 but with the central portion broken away, of a

modification of the frame of Fig. 1, 4 showing the addition of a storm window; and,

Fig. 6 is a sectional view through a lock piece.

In detail, this invention comprises a pair of vertically extending, horizontally spaced jambs **1**, **2** and a horizontally disposed sill **3** and head piece **4** extending between and secured to the lower and upper ends respectively of said jambs to form a vertical, rectangular, centrally open frame **5** (Fig. 1). Sill **3** is seen in Fig. 2 to slant downwardly and outwardly from window panes **6**, **7** (to be later described) for drainage purposes and said sill may be secured to jambs **1**, **2** by a blind mortise and tenon joint as at **8**. Head piece **4** is shown in Fig. 1 to be rabbeted **9** to jambs **1**, **2**.

Frame **5**, as a prefabricated unit, may be inserted into a window opening formed by double header **10**, studs **11**, and sill element **12**, with blocks **13** supporting sill **3** on sill element **12** (Figs. 1, 3, 4). Jambs **1**, **2** may be secured directly to studs **11** with head piece **4** secured to header **10** and/or studs **11** and sill **3** secured to blocks **13** and studs **11**.

By the above structure, frame **5** becomes a structural part of the wall in which the window is positioned. It strengthens the wall, whereas in conventional structure the jambs are not secured to the studs and neither is the head piece or sill secured to the studs or to the header and sill element in a manner to contribute to the strength of the wall.

Furthermore, the outwardly directed faces **16** of jambs **1**, **2** and head piece **4** are formed with a pair of longitudinally-extending, outwardly-opening grooves **17**, **18** (Figs. 2, 3, 4) near the edges of faces **16** for receiving the marginal portion of interior and exterior wall-facing material or panels **19**, **20** therein. The bottom of sill **3** may also be grooved or notched as at **21** (Figs. 2, 4) to receive the edges of wall panel **19** therein. Preferably, grooves **17**, **21** are continuous around frame **5** and groove **18** extends around three sides thereof exclusive of the bottom of sill **3**.

It is to be understood that any type of wall-facing material may be used with frame **5** such as plaster, dry-wall board, stucco, siding and the like. Grooves **17**, **18**, **21** not only provide support for the edges of such wall panels but also eliminate the necessity of window trim and the like. The elements of frame **5** are adapted to be machine moulded at the factory and once wall panels **19**, **20** are placed the construction is complete without the need of facia, etc. It can be seen that there is little necessity for a groove in the underside of sill **3** in continuation of groove **18** since the panel joint at such location is hidden by the afore-described slant of sill **3**. It will be noted that securing panels **19**, **20** to frame **5**, as described, further strengthens the resulting structure.

Sill **3** and head piece **4** are formed with opposedly, inwardly-opening, longitudinally extending grooves or channels **23**, **24** for slidably receiving the horizontal, marginal portions or edges of window panes **6**, **7** as more particularly described in my Patent No. 2,700,801, issued February 1, 1955.

Likewise, jambs **1**, **2** are respectively provided with opposedly, inwardly-opening, longitudinally-extending, substantially V-shaped grooves **29**, **30** for receiving the vertical, marginal portions of panes **6**, **7**, respectively. As best seen in Fig. 3 the bottom **31** of each of grooves **29**, **30** is preferably substantially the same width as the thickness of one of panes **6**, **7**, and the front or outside edge **32** of such grooves is parallel to said panes to form a seat tightly there against. The sloping, rear edge **33** will be seen to form a guide urging said panes outwardly for assuring that panes **6**, **7** slide tightly closed against bottom **31** and edge **32** of grooves **29**, **30**.

In this invention, while the rear or inside edge 25 of channel 23 is continuous, the front or outside edge has a portion 27, coextensive with pane 6, offset toward the outside of the window from portion 26 (Fig. 3). In other words, channel 23 is wider at portion 27 than at portion 26 thereby providing shoulder 28 directed toward pane 6. Even at portion 26 channel 23 is slightly wider than the combined thicknesses of panes 6, 7 for a purpose to be described. When pane 6 has been slid into engagement with bottom 31 and front edge 32 of groove 29 and pane 7 is held against pane 6 and both panes urged against the outside of groove 23 by the interaction of lock 35 (mounted on pane 7) and plate 36 (mounted on sill 3), edge 37 of pane 6 is forced into engagement with shoulder 28 thereby retaining pane 6 in the position shown in Fig. 3. When the window is so locked it is impossible to slide pane 6 horizontally so as to gain access to the interior. Lock 35 secures pane 7 in place by the interference of head 38 with edge 37 of pane 6.

Adjacent and parallel channel 23 on the outside of panes 6, 7 is ridge 39, formed integrally with sill 3 (Figs. 2, 3, 4). The outside face 40 of said ridge is substantially vertical and sill 3 slopes downwardly and outwardly thereof as described. The top 41 of ridge 39 should also slope downwardly away from panes 6, 7 for drainage purposes. Slant-drilled through said ridge and communicating between channel 23, behind said panes, and face 40 of ridge 39 is a plurality of weep holes or drain passageways 42. Preferably drains 42 intercept face 40 where said face joins the main body of sill 3 as shown in Fig. 4. Not only do drains 42 allow any inside condensation moisture or leakage accumulating in channel 23 to drain to the outside of the window, but the particular construction shown prevents outside moisture from being backed up into said drains. Channel 23, being greater in width than the combined thicknesses of panes 6, 7, provides a reservoir for inside moisture prior to its draining away under the influence of gravity and prevents the overflow of such moisture over the back or inside of sill 3.

In the modification of Fig. 5 provision is made for the addition of a pair of storm window panes 46, 47 overlying and similar to the afore-described panes 6, 7. Head piece 44 and sill 43 are similar to those shown in Figs. 1–4 except for additional channels 54, 53, respectively formed therein for the purpose of slidably retaining the horizontal, marginal edges of panes 46, 47. Panes 46, 47 are likewise provided with similar lock 55 and sill 43 is provided with similar plate 56 (interacting with lock 55) and ridge 49. Drains 52 communicate with both channels 23 and 53 for the same purpose as previously described. The jambs 50, 51 (only one of which is shown) must of course be provided with a pair of grooves similar to grooves 29, 30 and such jambs, head piece 44, and still 43 may be provided with like panel-receiving grooves 17, 18, 21.

In such a manner provision is made for a double-pane, weather-tight storm window closure which is little more difficult to assemble and operate than a single pane closure. Storm panes 46, 47 may be easily removed, if desired, by merely unlocking same (by swinging lock 35 out from under plate 36), individually lifting and swinging the bottom edge of each pane out of channel 53 (with the top edge extending into the deeper portion of channel 54), and then withdrawing the pane from the frame. Panes 6, 7 may, of course, be removed in a like manner as described in the aforementioned Patent No. 2,700,801.

In connection with the ridge 33 and its face 40, it should be noted that if the face 40 were inclined or rounded, water tends to run through the drains 42 from the outside in the case of very heavy precipitation, but where the face 40 is vertical, this does not occur.

The fact that the channel 23 is slightly greater than the combined thicknesses of panes 6, 7 insures against possible overflow of water under unusual weather conditions, but it enables the lock plate 36 to slightly overhang the channel to the depth of the side recess 36′ that is formed in the side facing the pane 6. The lock 35 is adapted to move in this recess 36′ as described in said Patent No. 2,700,801; and, if the plate 36 did not overhang channel 23 as above described, the side of the channel 23 would have to be recessed along the edge of plate 36 to the depth of recess 36′, which would be an extra operation and would increase the cost of production as well as require careful accuracy in recessing the side of said channel.

Another feature of the invention is that the grooves 29, 30, 24, 23 formed in the jambs, head piece and sill respectively for the window panes are spaced inwardly in the frame members relative to the grooves 17, 18, 21 for the wall panels, hence the frame members are not materially weakened by the grooves.

Additional means for assuring that panes 6, 7 seat tightly one against the other at their overlapping marginal portions and against the outer edge of groove 24 is provided by leaf springs 58 (Figs. 4, 5). Spring 58 is secured to the underside of head piece 4 and is cantilevered into groove 24 so as to be in slanting engagement with the inner edge of pane 7 for urging said pane aginst pane 6 and pane 6 against the outer edge of said groove. Spring 58 may be similarly placed with respect to storm panes 46, 47.

Fig. 6 shows an enlarged view of the lock 35 (or 55). This lock is generally the same as those shown in said patents.

This lock is in the form of a plate or element 35 that swingably depends from a bolt 60. This bolt extends through the pane 7 at one end of said bolt so that the lock is inside the room and said one end of the bolt, outside the room, has a head 61 that engages the outer side of the pane.

A plastic disc 62 may be positioned between said head 61 and said pane. A nut 63 is threadedly supported on bolt 60 at the inner side of the pane 7 and between the lock element 35 and said pane. A dished spring washer 64 is interposed between the nut 63 and the pane. This washer is exaggerated in Fig. 6 in order to clearly see it, but normally it would not be noticed, although it would not be fully compressed between the nut and pane.

By this structure, should any solid material become deposited in the channel 23 between the outer side of the pane (outside the room) and the side of the channel adjacent thereto, the spring washer will permit the glass and bolt to move relatively upon moving the element 35 to locking relation with plate 36. If there were no such movement, the glass might break.

Attention is also called to the fact that the sill may be provided with one or more drain passageways 65 (Fig. 5). Where such passageways are provided, the passageways 42 may be omitted.

Inasmuch as passageways 65 are used only where there are very severe storms, the provision of passageways 42 are most commonly employed.

Although the invention has been described and illustrated in detail, it should not be limited thereby as it is obvious that modifications could be made therein without departing from the spirit and scope of the invention.

I claim:

1. In sashless window construction, a pair of vertical jambs and a horizontal sill and head piece defining the sides, bottom, and top of a vertical, rectangular, centrally-open frame, said jambs being provided with oppositely-opening, longitudinally-extending, substantially V-shaped grooves for receiving the marginal edges of a window pane therein, the bottom of said grooves being no greater than equal in width to the thickness of said pane and the outer side of said groove being substantially parallel with said pane.

2. In sashless window construction, a pair of vertical jambs, a sill, and a head piece defining the sides, bottom,

and top of a vertical, rectangular, centrally-open frame, a pair of rectangular window panes, opposedly-opening, longitudinally-extending channels respectively provided in said head piece and said sill slidably receiving the top and bottom marginal portions of said pair of rectangular, vertically-extending window panes in at least partially overlying relationship, one portion of said channel in said sill being of greater width than the other portion thereof to provide a shoulder extending inwardly from one side of said channel at the width of one of said panes from one of said jambs engageable by an edge of said one pane for preventing sliding of said one pane.

3. In sashless window construction, a pair of vertical jambs and a horizontal sill and heat piece defining the sides, bottom, and top of a vertical, rectangular, centrally-open frame, a pair of rectangular window panes, a continuous, inwardly opening channel in said frame receiving the marginal portions of said pair of window panes in partially overlapping relationship, and means respectively on each said jambs, sill and head piece, adjacent the inner edge of said channel for urging both said panes into seating engagement with the outer edges of said channel.

4. In sashless window construction, a pair of vertical jambs and a horizontal sill and head piece defining the sides, bottom, and top of a vertical, rectangular, centrally-open frame, a pair of rectangular window panes, a continuous, inwardly opening channel in said frame receiving the marginal portions of said pair of window panes in partially overlapping relationship, and spring means provided adjacent said channel in said head piece

for yieldably urging said panes together at their overlapping portions and toward the outer edge of said channel.

5. In sashless window construction, a pair of vertical jambs and a horizontal sill and head piece defining the sides, bottom, and top of a vertical, rectangular, centrally-open frame, a pair of rectangular window panes, a continuous, inwardly opening channel in said frame receiving the marginal portions of said pair of window panes in partially overlapping relationship, and means provided adjacent said channel in said head piece for urging said panes together at their overlapping portions and toward the outer edge of said channel.

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