

Jan. 5, 1954

A. ZITOMER
WINDOW STRUCTURE

2,664,599

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2 Sheets-Sheet 1

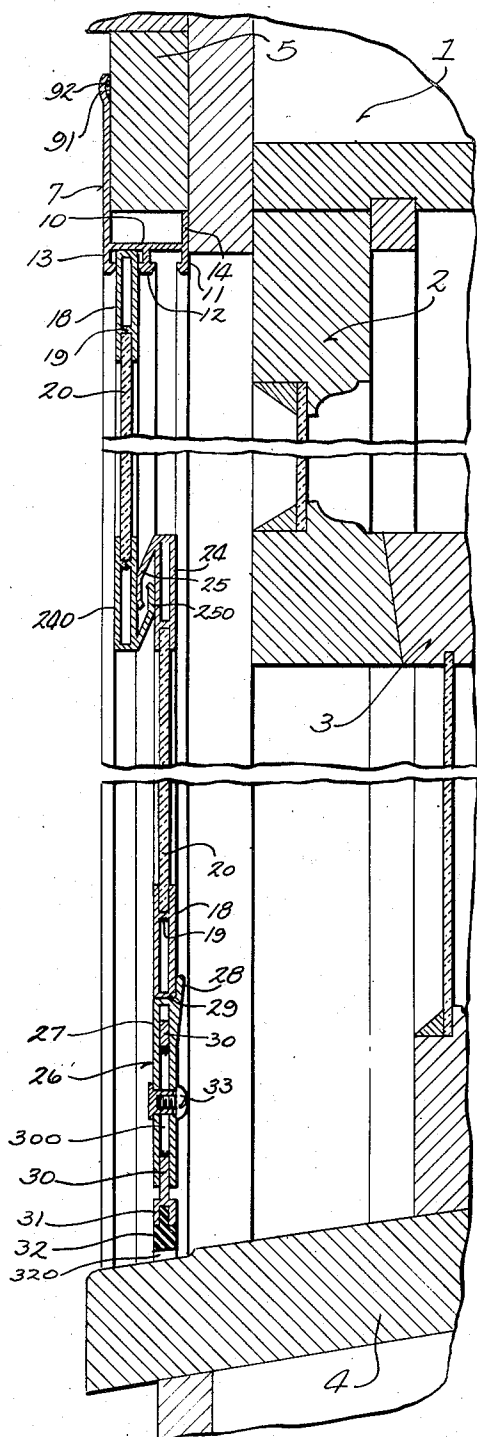


Fig. 4

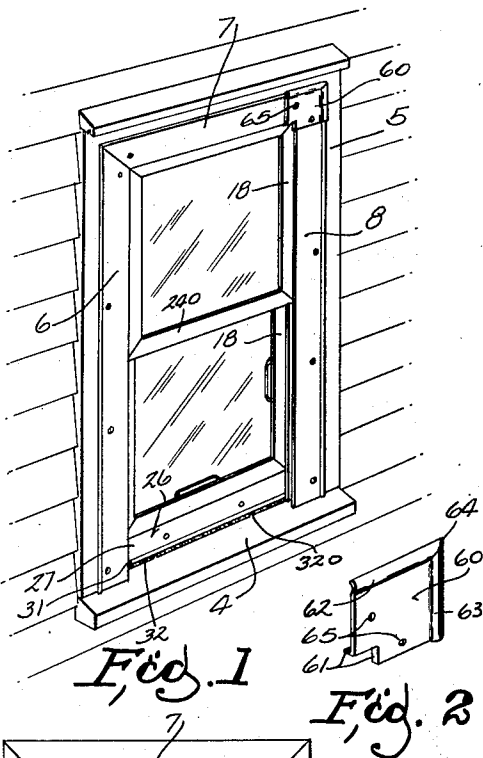


Fig. 1

Fig. 2

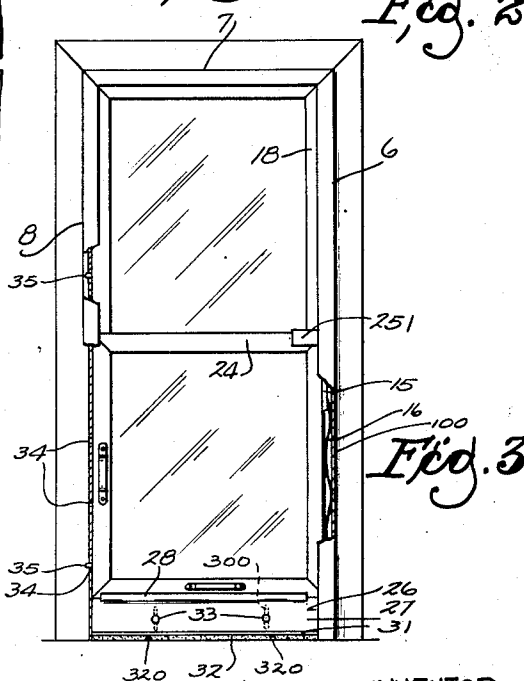


Fig. 3

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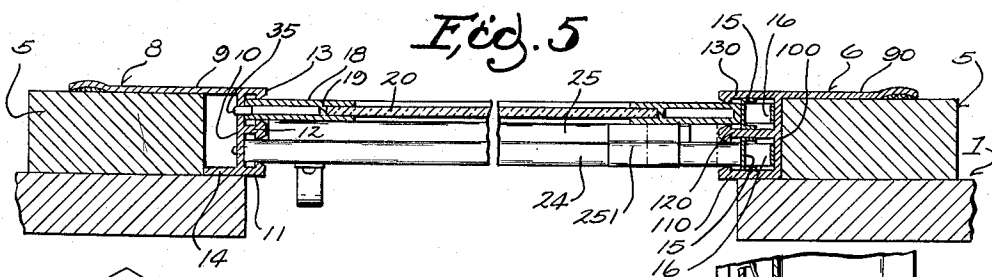
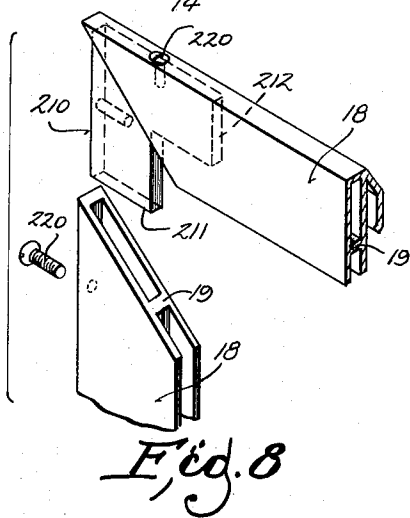
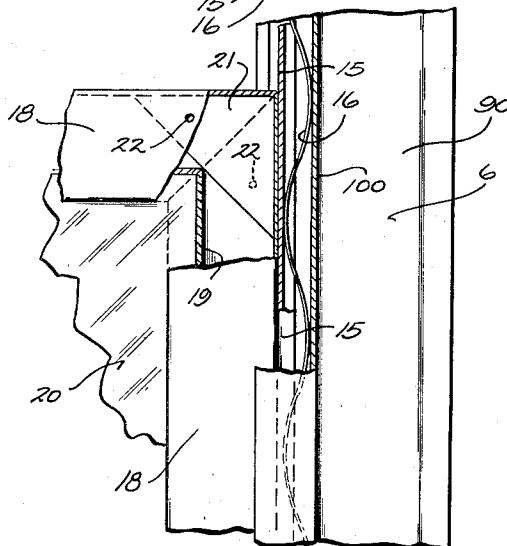
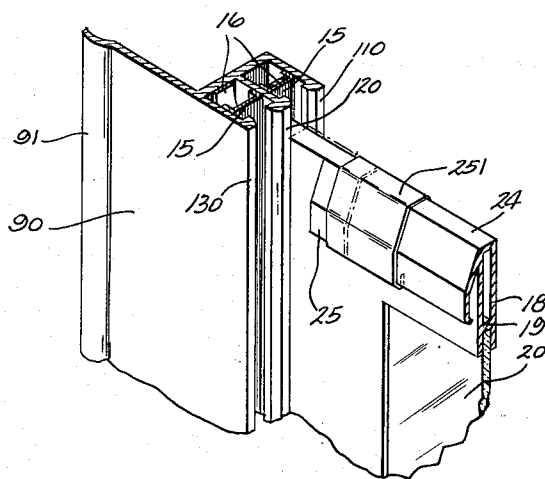


Fig. 7

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WINDOW STRUCTURE

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1 Claim. (Cl. 20—52.2)

1

This invention relates to improvements in window structures using sliding metal sash. As explained in my companion application 728,229, filed February 13, 1947, now Patent No. 2,630,891 issued March 10, 1953, the invention is particularly adapted for use in storm sash, but the entire structure or individual features thereof, may also be used interiorly as the main sash.

The present invention relates to improvements on the device of my companion application above identified for the purpose of making the sash more weathertight and facilitating the construction thereof and improving the appearance. A further and major improvement relates to a provision for locking the sash either in their closed position or in intermediate positions of adjustment and effecting the releasing and locking by the same lateral movement of the sash which, carried further, will release the sash from the side guides.

In the drawings:

Fig. 1 is a view in perspective showing the exterior appearance of my improved window structure as applied to a building, one of the corner plates preferably employed therewith being omitted.

Fig. 2 is a view in perspective on a slightly enlarged scale of one of the corner plates used in finishing the window structure.

Fig. 3 is a view of the window structure from the interior, portions thereof being broken away.

Fig. 4 is a view through the window structure in vertical section on a greatly enlarged scale, portions thereof being broken away.

Fig. 5 is a view taken in horizontal section through the window structure, portions thereof being broken away.

Fig. 6 is a fragmentary detail view partially in elevation and partially in section.

Fig. 7 is a fragmentary detail view in perspective.

Fig. 8 is a fragmentary detail view in perspective showing a corner of one of the sash embodying a modified construction.

In the embodiment in which the invention is illustrated, it is particularly designed for application to existing window frames. The generally conventional frame shown at 1 in Figs. 4, 5 and 6 provides channels or ways for the conventional double-hung sash which includes upper sash 2 and lower sash 3. The frame comprises a sill at 4 and external facing trim 5.

To such a frame I have applied a set of sash guides 6, 7 and 8 which, assembled as illustrated in Fig. 1, have the appearance of constituting

2

a frame but are, in fact, separate pieces, having no connection except such as is derived from their individual mounting on the external finish 5 of the wooden frame shown.

The sash guide members 6, 7 and 8 are preferably all made of extruded sections. Members 7 and 8 may be identical in cross section as shown in Figs. 4 and 5. Each includes a flange 9 of substantial width which overlies the face of the frame trim member 5 and is individually screwed thereto. To the flange 9 is integrally connected the base web 10 from which projects the flanges 11, 12, 13 in which the sash move. From the inner edge of the base web 10 extends a short flange 14 preferably parallel to flange 9, the end of which abuts the bottom or inner edge of the trim member 5, as shown in Fig. 5.

The guide member 6, at the opposite side of the window opening, is of modified construction. It has at 90 a flange substantially identical in width and form to the flange 9. Like flange 9 it is screwed at intervals to the window trim or facing 5. Its base web 100 corresponds in function to the base web 10 but is set back to dispense completely with the short flange 14. The flanges 110, 120 and 130 are correspondingly elongated to provide deeper ways than those of guide member 8. In each such way is placed a channel-shaped slide 15 which extends the full height of the window and is biased laterally by a convoluted spring 16 which likewise extends the full height of the window, this arrangement being best shown in Figs. 5, 6 and 7.

To cover the mitered corners where the sash guides 6, 7 and 8 meet, I may employ corner pieces 60 (Fig. 1 and Fig. 2), each comprising a plate in the form of a right angle having an inwardly turned right angled flange at 61 fitting the inside margins of the contiguous sash guides and outer marginal flanges 62, 63 meeting at the corner apex 64 and embracing the outer margins of contiguous sash guides. The plate may be apertured to receive mounting screws as shown at 65. Where the plate is used, the corners of the guide members need not even be mitered.

Another feature which is an improvement over the sash guides disclosed in my companion application consists in the preferred provision on each of the flanges of an outwardly formed rib 91 behind which I may introduce calking at 92 (Fig. 4) to seal the joint between the flanges and the wood trim 5. Where the corner plate 60 is used its recessed flanges 62 and 63 provide for unbroken calking even where the sash guides are

not mitered. This calking and the corner plates 60 above described, provide a relatively weather-tight connection between my installation and the window frame structure to which it is applied.

The sash are preferably also made of extruded metal sections. These sections may be uniform around three sides of each sash, using the construction shown at 18 in Figs. 4, 6 and 7. Each of the sash rails thus formed is channel-shaped in cross section and provided interiorly with an integral rib 19 against which the glass 20 seats, as also shown in Fig. 6. The extruded rails are mitered together at their corners and the corner is spanned by a gusset 21 engaged from both sides by a boss 22 produced by punching inwardly on the metal walls of the hollow rails 18. This holds the rails tightly together at the corner and they may also be soldered or brazed if desired.

Alternatively, I may use the construction shown in Fig. 8 whereby the reinforcing member 210 comprises a corner piece having legs 211, 212 at right angles to each other and fitted with substantial accuracy into the contiguous rails 18, the inner margins of the legs 211, 212 abutting the rib 19 above described. This makes a very rigid construction and the corner insert 210 may be tapped to receive the screws 220 inserted through the outer sides of the respective rails. As in the construction previously described, the miter joints between the rails, and the joints of the respective rails with the corner insert 210 may be soldered or sweated or even cemented together if desired.

The check rail 24 of the lower sash and the bottom rail 240 of the upper sash (Fig. 4) are nearly identical with each other but different from the rails 18 already described. They are respectively extruded to provide integrally the weatherstripping flanges 25, 250, the respective flanges passing each other in the closed position of the sash and each having face bearing contact with the inner surface of the rail of the opposite sash as shown in Fig. 4.

As will hereinafter be described, the respective sash are movable laterally in the sash guides for removal and insertion. In order to accommodate such relative lateral movement, it is necessary that the weatherstripping flange 25 of the respective sash be somewhat shorter than the total width of the sash. Accordingly, it terminates short of the flange 120, as is best shown in Figs. 5 and 7 and I provide a slide 251 which is flanged to hook over the top of the check rail trunk 24 and to engage beneath the free margin of the weatherstripping flange 25 and is slidable on the check rail 24 between the full line position and the dotted line position illustrated in Fig. 7. In the latter position, the gap left between the flange 120 of the sash guide and the flange 25 of the check rail 24 is closed, whereas in the full line position the gap is open to permit the lateral movement of the sash preliminary to its removal.

In order to facilitate fitting the sash to any conventional window opening, while allowing for inevitable differences in dimension, I provide a special adjustable sill or seat best shown in Figs. 3 and 4 and designated generically by reference character 26. This also is made of extruded sections. The channel-shaped section 27 has an angularly divergent flange 28 providing a straight sided shoulder at 29 upon which the lower window sash seats, when closed. Within the channel 27 is the plate member 30, also of an extruded section, such plate having slots 300 for adjust-

ment and being bifurcated at 31 to receive elastic weatherstripping 32. The weatherstripping may have notches 320 shown in Figs. 1, 3 and 4 for allowing the escape of any water which might otherwise be trapped therewithin. Clamping bolts 33, extending through the opposing sides of the channel-shaped outer member 27, hold such sides in clamping adjustment upon the inner slotted plate 30. The slots 300 accommodate a considerable range of adjustment between the plate 30 and the channel 27 so that the composite sill 26 may be so fixed as to height that the seat 29 will, in each installation, receive the lower sash when the weatherstripping flanges 25 are engaged substantially as shown in Fig. 3.

The thickness of the supplemental sill member 26, and its width, are substantially the thickness and width of the sash. Consequently, the ends of the sill 26 are received into the ways of the sash guides 6 and 8 and are detachable therefrom in the same manner as the sash, as will presently be described. The flange 28 must necessarily be cut off to permit the ends of the sill 26 to be received into such ways.

Whether the sash as herein described are glazed or fitted with screen cloth, their weight is extremely slight as compared with conventional window structures. The extruded metal is preferably aluminum or magnesium alloys and its mass is small. Consequently no sash balances of any kind are required. The sash moves freely up and down in the ways provided by the sash guides 6 and 8 and are held by the bias of their respective springs 16 in any position of adjustment.

The beaded edges of the flanges 11, 12, 13 and 110, 120, 130 fit very closely to the rails of the sash and the channels 15 which bear against the sides of the sash under the thrust of springs 16 hold the sash tightly engaged at their edges to provide substantially hermetic sealing.

Yet the sash may be removed almost instantly by pressing it to the right, as viewed in Fig. 3 (to the left as viewed in Fig. 7) to displace its associated thrust channel 15 by compressing the convoluted spring 16 until the lefthand side of the sash clears the way in which it slides in the guide member 8. Thereupon the sash may be lifted bodily from its guides, the bead of flanges 110, 120, 130 restraining the channels 15 from escaping from the righthand ways in guide member 8 when the sash is removed. As the sash are normally positioned for sliding movement in their respective ways, they are centered in the window opening, there being approximately the same portion of the sash concealed behind the flange 11 of guide member 8 as is concealed behind the flange 130 of guide member 6. The ability of the spring biased channel 15 to yield when the sash is thrust to the right must be such that the lefthand margin of the sash will completely clear flange 11.

Upon withdrawal of the sash, the channel 15 moves out under thrust of spring 16 to the full limit permitted by the marginal beads. It will be noted from Fig. 7 that the beads are tapered to guide the sash as it is being reintroduced into the way in which it slides.

If the main window sash 2 and 3 meet at a point such as to preclude manipulation of the lower sash in the manner above described, it is only necessary to raise the lower sash slightly and then remove the sill unit 26 by pressing it to the right (Fig. 3) and withdrawing its lefthand end. The lower storm sash may then be lowered to

5

clear the main window sash 2 completely and may readily be withdrawn through the opening provided by raising the main lower sash 3. The upper storm sash may then be lowered to the same level and removed through the same opening. This makes it possible to wash the glazed sash at the kitchen sink, if desired, or to replace them with screen sash with equal facility. Yet the assembled window structure is more weather-tight than the average storm sash equipped with weatherstripping.

By simply providing web 19 of the sash guide 3 with apertures 34 opening from the respective guide channels, and by providing the sash with projecting pegs 35 receivable into such apertures as shown in Figs. 3 and 5, it is possible to hold the sash locked against vertical movement in any position at which apertures are provided. The sash are readily disengaged from any aperture by moving the sash bodily to the right as viewed in Fig. 3 and may then be raised or lowered and engaged, if desired, with another aperture at a different level. Fig. 3 shows a number of such apertures. The length of the pegs is such that less movement is required to engage and disengage them respecting the apertures than is required wholly to free the sash from its guide channel. Since the movement of the sash laterally for disengagement of the pegs is subject to bias of the springs 16, the springs tend at all times to hold the sash in locked position.

Due to the use of standardized extruded sections, my improved window may be applied to practically any conventional window regardless of its size. The members 6, 7 and 8 may be cut and mitered on the job and simply screwed in place, giving the appearance, however, when assembled, of a complete metal frame.

The slideable sash used in the guides may likewise be assembled on the job if so required to fit an odd shaped window, although it is normally intended that these be manufactured in stated sizes.

Not only does the adjustable sill make possible the application of my improved window structure in windows having minor variations in dimensions, but it will also be noted that the screwing of the guide members 6, 7, 8 to the window frame trim permits my guide members to be mounted in accurate relationship to each other, regardless of inaccuracies in the spacing, or lack of parallel of the sides of the wooden frame.

I claim:

In a window structure the combination with a sash member and a guide member, the sash member being slidable and movable laterally respecting the guide member, and the guide member having a channel in which the said movements of the sash member are accommodated and interlocking means on said members 60

6

normally restraining the sash member from movement in a sliding direction respecting the guide member, one of said members having a fixed projection and the other a recess comprising said means in further combination with a second guide member having a sash receiving channel sufficiently deep to accommodate lateral movement of the sash sufficiently to disengage said means, together with a spring in said last mentioned channel biasing said sash toward a position for engagement of said means, and a spring follower interposed between the spring and sash in the last mentioned channel, said last mentioned channel being sufficiently deep so that, upon full compression of said spring, the sash may be wholly disengaged from the channel of the guide member first mentioned, the said means being engageable and disengageable upon sash displacement laterally to an extent less than that required for the removal of the sash.

ABE ZITOMER.

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