July 7, 1942. M. B. SCHILLER 2,288,923

WINDOW FRAME AND SASH

Filed Feb. 26, 1940 2 Sheets-Sheet 1

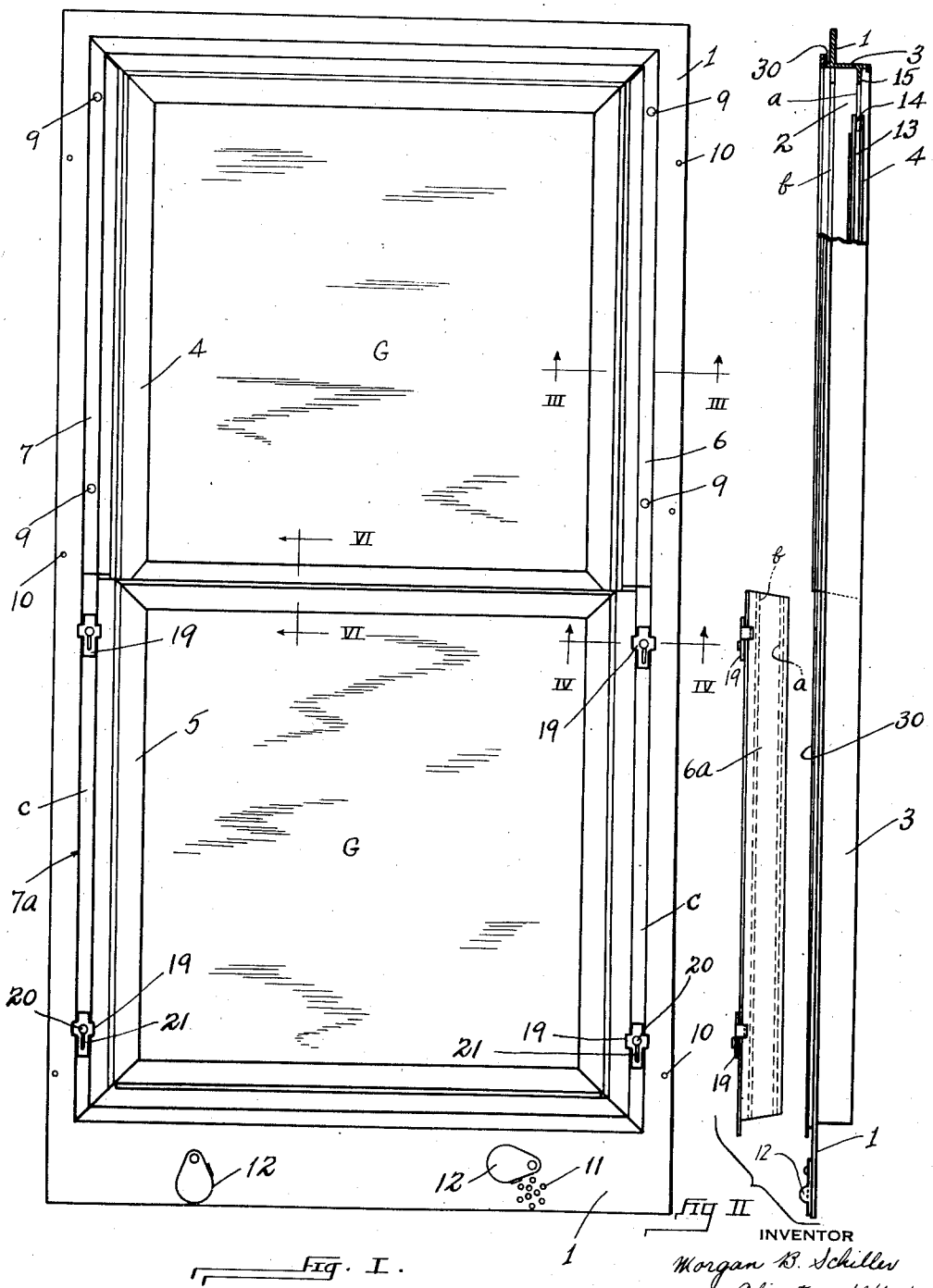


FIG. I.

FIG II

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Filed Feb. 26, 1940 2 Sheets-Sheet 2

Fig. III.

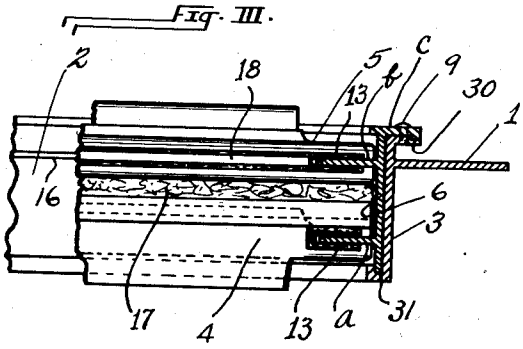
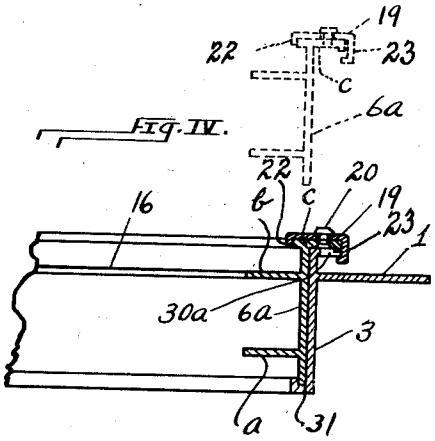


Fig. IV.



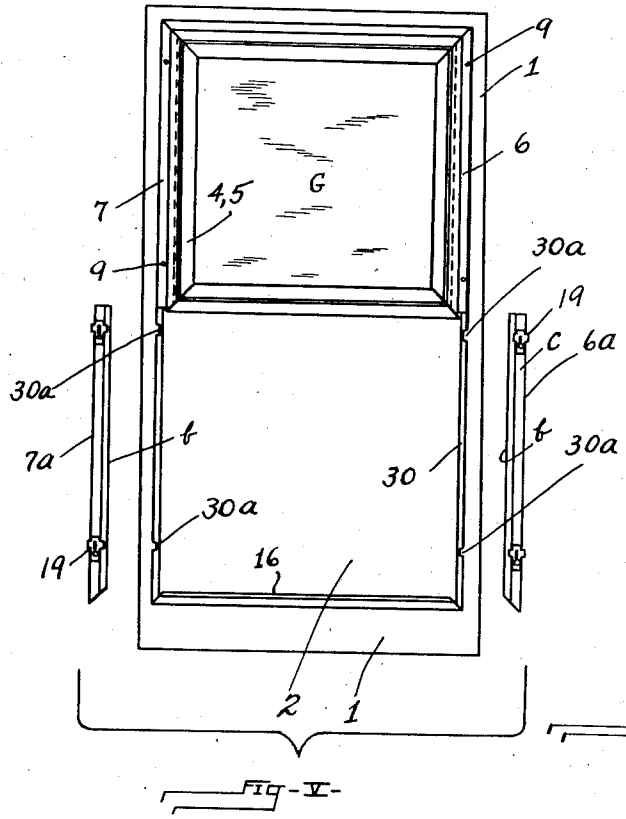


Fig. V.

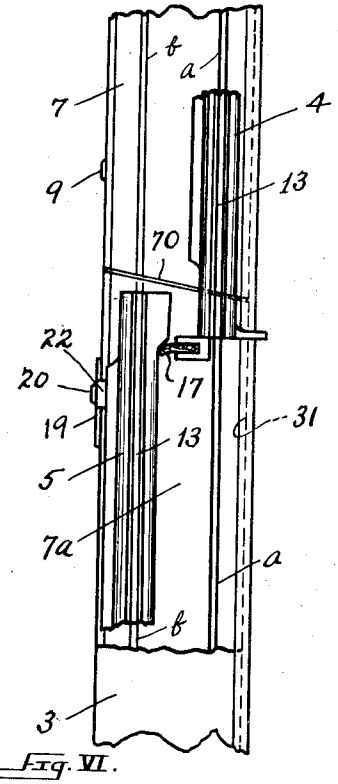


Fig. VI.

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UNITED STATES PATENT OFFICE

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WINDOW FRAME AND SASH

Morgan B. Schiller, Sewickley, Pa., assignor to American Tubular Elevator Company, a corporation of Pennsylvania

Application February 26, 1940, Serial No. 320,884

1 Claim. (Cl. 189—73)

My invention relates to window structures in general, and in particular to window structures whose main frames and sash frames are formed of metal.

The invention is particularly directed to the construction of storm windows, windows arranged externally of the windows that are permanently included in the walls of homes and other buildings, but it is to be added that I do not limit my invention to storm windows. More specifically, the window structure, in which the invention is centered, includes two vertically sliding sashes, sashes that in known way are adapted to slide on vertical rails in the window frame. My object is to provide for the ready removal of the slidable sashes from the window frame, so that in warm weather panels of fly screen may be substituted for the glass sashes used in winter, and the invention consists in particulary effective structure to such end.

A window structure embodying the invention is shown in the accompanying drawings. Fig. I is a view in front elevation of such structure. Fig. II is a view partly in side elevation and partly in vertical section, with the upper sash shown in partly lowered position in the frame. Fig. III is a fragmentary view, showing the window frame to larger scale and in cross section, on the plane III—III of Fig. I, and showing the two window sashes in edge elevation. Fig. IV is a fragmentary sectional view of the window frame alone, as seen on the plane IV—IV of Fig. I. Fig. V is a view comparable with Fig. I, but showing the structure to smaller scale, with certain parts of the structure detached from assembly, to permit the sashes to be removed from the frame. And Fig. VI is a fragmentary view of the window structure, showing the two sashes in edge elevation, and showing the frame structure as it appears on the plane of view indicated at VI—VI in Fig. I.

Referring to the drawings; the window structure consists in a rectangular plate-like frame 1, including a rectangular opening 2, bordered by a casement-like portion 3 that is integrally formed with the plate-like portion 1. The frame also includes a flange 30 that is spaced from the face of the plate-like body 1, and extends peripherally of said opening 2. (See Figs. II and V.) The entire frame is in this case integrally formed of metal, preferably a metal of light weight, such as aluminum. Two sliding window sashes 4 and 5 are mounted in the frame on two slide-bars 6 and 7, assembled in the frame, one at each of the opposite vertical sides of the sash-receiving opening 2. Before proceeding with a minute description of the structure, I shall mention some of the general considerations which have been held in mind.

As already remarked, the window structure is particularly, though not exclusively, designed for service as a storm window. Accordingly, it is desirable that the structure may be readily installed in the usual window frame or casing (not shown) of a home or other building, externally of the windows or sashes mounted in such casing. It will be understood that my window structure may be installed temporarily in such casing, say for the duration of a winter; alternately, the window may be permanently installed in the casing, and only the sashes 4 and 5 (or only one of the sashes (removed during the warm seasons, so that one or more panels or sashes of fly screen may be assembled in the permanent installation.

The plate-like frame 1 is formed in proper size to fit the particular window casing, and such frame is provided with marginal perforations 10 (Fig. I), for the reception of screw nails or other devices for securing the frame within or upon such casing in spaced relation with respect to the window sashes permanently installed therein. In Figs. I and V the window structure is shown from the inside, that is, from the side that faces the panes of the permanent window structure. The plate-like body of the frame includes adjacent to its lower edge one or more sets of weep-holes 11, by means of which condensate may escape from the space between the storm window and the permanent window sashes. The weep-holes are also serviceable, in that they admit of a slight circulation of air between the windows, and thus prevent the glass panes from sweating. In usual way pivoted flaps 12 are arranged to cover the weep-holes when desired.

Turning to a more detailed consideration of the structure, it will be noted that, in accordance with the invention, the slide-bars or rails 6 and 7, on which the sashes 4 and 5 are mounted, are severally formed in a plurality of sections or portions. In this case such rails include two portions 6 and 6*a*, and 7 and 7*a*, respectively; the portions 6 and 7 may be integrally formed in the body of the frame, or they may with advantage be separately formed, as shown herein, and integrated to the frame; and the rail portions 6*a* and 7*a* are detachably secured to the frame, with the effect that, with both sashes slid to the top of the frame (Fig. V), such rail portions 6*a* and 7*a* may be removed, whereupon the sashes may be slid downward, disengaged from the rail portions 6 and 7 permanently secured in the frame, and lifted out. In this way the window sashes 4 and 5, including the glass panes G may be removed from the frame, and substitute sashes or panels of fly screen introduced in their place.

The construction of the window sashes 4 and 5, and of the screen panels (not shown) that are interchangeable with them, is not of immediate concern, and I refer to the description in my copending application for patent, Serial

No. 320,886, filed February 26, 1940, of a sash structure that may be used in the window of my present invention. Suffice herein to say that the sashes comprise rectangular frames of metal in which the glass panes G are marginally secured and sealed; that both sash frames are grooved, as at 13, in each of their vertical side edges; that such grooves are continuous throughout the extents of such side edges, and are adapted, as presently will more fully appear, to cooperate with the rails 6, 6a and 7, 7a; that the upper edge of the sash 4 is grooved, as at 14 (Fig. II), to receive in weather-tight engagement a flange 15 provided in the frame 1, 3, at the top of the opening 2; that the lower edge of sash 5 is similarly grooved, as at 18 (Fig. III), to receive a flange 16 (Fig. V) at the bottom of the opening 2; that the two sashes 4 and 5, as assembled in the frame structure, extend in closely spaced, parallel planes, and that in such planes they are severally movable through the vertical extent of the frame opening 2; and that the upper sash 4 carries at its lower edge a flexible sealing strip 17 (Figs. III and VI) of felt, or the like, and that such strip bridges the interval between the two panes and provides a weather-tight union of the medial, horizontal edges of the sashes when the sashes are adjusted in closed position in the frame, as shown in Figs. I and VI.

Returning to a detailed consideration of the rails 6, 6a and 7, 7a, it may be noted that they consist in integrally rolled or extruded sections of metal, cut to proper length to fit the sides of the opening 2 in the frame, and then cut medially of their extent, to provide the separate rail portions 6 and 6a on one side of the sash-receiving opening 2, and portions 7 and 7a on the opposite side of such opening. The line or plane of cleavage between the portions 7 and 7a is indicated at 70 in Fig. VI, and it will be noted that such line or plane is arranged at an interval above the horizontal meeting edges of the two sashes in closed position, and is inclined between the front and the rear faces of the window structure. Referring particularly to Figs. III and IV, it may be understood that the body of each rail carries two thin flanges *a* and *b* that extend in parallelism longitudinally of the rail, and that are respectively centered in the planes of the two sashes, and that are slidably engaged by the grooved side edges (13) of the sashes. Thus, a rail element *a* is provided along each vertical side of the opening 2 for the sash 4, and a rail element *b* along each of such sides for the sash 5. The sashes are adapted to slide vertically on their rail elements, throughout the vertical extent of the opening 2.

The rail sections include flange portions *c* that meet in face-to-face abutment the flange 30 which borders the opening 2 in the frame 1, 3, and in the case of the two upper rail portions (6 and 7) rivets 9 unite the flanges *c* and 30, and thus integrate such rail portions with the window frame. The rigidity and security of assembly is augmented by the provision in the casement-like portion 3 of the frame of a peripherally extending clincher groove 31, in which groove the edges of the rail portions opposite to the flanged edges *c* are securely engaged. The groove 31 extends in parallelism with the flange 30 that borders the sash-receiving opening in the window frame. In the case of the lower rail portions 6a and 7a, detachable means are provided for securing such slide-bar portions in assembly. Such means consist in locking elements 19, two for each of such removable rail sections. The locking elements 19 are in the form of thumb-catches, in this case slotted slides, each secured upon the flange *c* of the particular rail section, as by means of a headed pin 20, and adapted to be operated by the human finger or thumb. Within the limits of the slot 21 (Fig. I) formed in the body of each locking element, the locking element is longitudinally slidable on the flange *c* of the rail section. The body of each locking element carries two rigid fingers 22 and 23 (Fig. IV) that embrace the two edges of the flange *c*, and finger 23 is further characterized, in that it includes an inturned tip that is adapted to embrace the edge of flange 30 on the window frame 1, 3. When the rail sections 6a, 7a are assembled with the window frame, the engagement of the fingers 23 with the flange 30, together with the engagement of the bodies of the rail sections in the clincher groove 31, provides security of assembly. As shown in Figs. IV and V, the peripheral flange 30 includes, on opposite sides of the opening 2 in the frame, marginal slots or recesses 30a, and these recesses are so located that, by shifting the locking elements 19 upward against gravity, the fingers 23 may be brought to positions of registry with such recesses, with the consequence and effect that the rail sections or portions 6a and 7a may be removed from assembly with the window structure (as indicated in full lines in Figs. II and V and in dotted lines in Fig. IV), it being understood, of course, that the sashes 4 and 5 are first slid to the top of the window opening 2. When the lower rail portions 6a and 7a have thus been removed, the sashes may be slid downward, one at a time, and disengaged from the upper rail portions 6 and 7 that remain integral with the frame. As the lower edge of each downwardly moved sash approaches the bottom of the opening 2, the sash is angled in its position—the bottom edge of the sash being drawn outward—and then removed from the frame. Thus, the window sashes 4 and 5 may be readily removed from the permanently installed window frame.

Screen sashes of the sort described in my said copending application may be introduced and secured in the window frame, simply by reversing the order of the manipulations, described above.

I claim as my invention:

In a rectangular window frame carrying on its opposite and parallel sides vertical rails, window sashes mounted on said rails for sliding movement in the frame, and a section of one of said rails being removable from the frame to admit of the removal of said sashes; the invention herein described that comprises flanges on the frame and the removable rail section that in the assembly meet in face-to-face abutment, one of the two said members being equipped with a vertically movable slide adapted to embrace the edges of the assembled flanges, the flange of the other member being notched, the slide being movable upon the member that carries it from locking position, in which it embraces the flanges, to releasing position in which it registers with the said notch in the flange of the other member.

MORGAN B. SCHILLER.