Dec. 8, 1942. M. B. SCHILLER 2,304,423

METAL WINDOW SASH

Filed Feb. 26, 1940

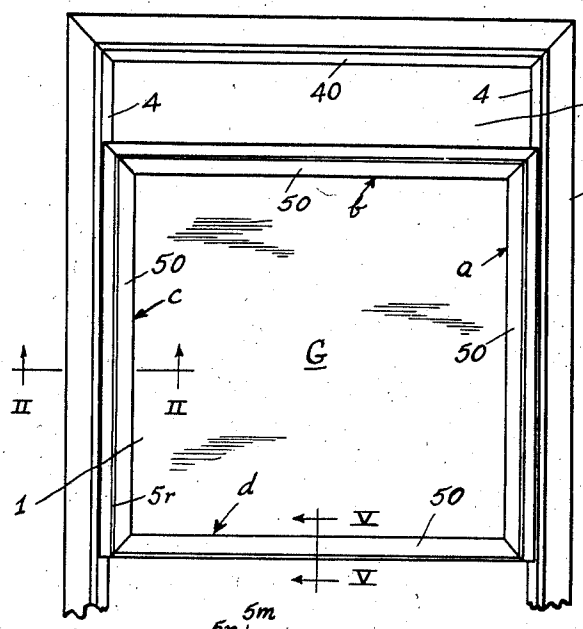



Fig. I.

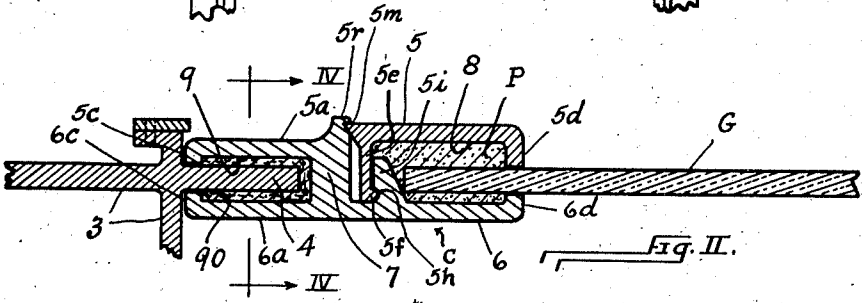



Fig. II.

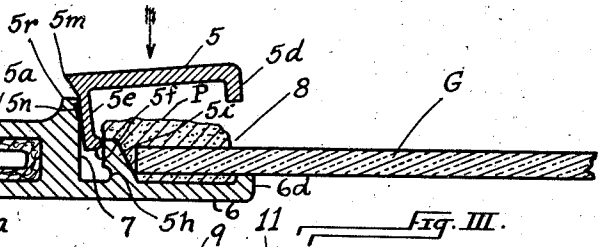



Fig. III.

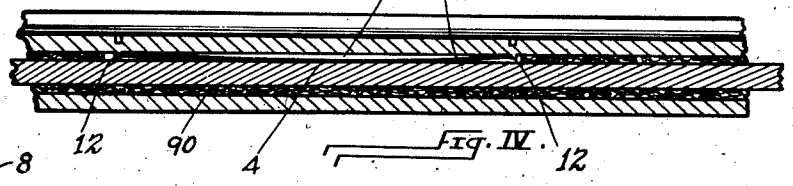



Fig. IV.

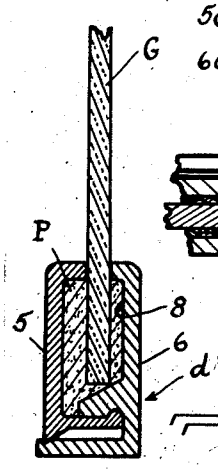



Fig. V.

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# UNITED STATES PATENT OFFICE

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## METAL WINDOW SASH

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Application February 26, 1940, Serial No. 320,886

2 Claims. (Cl. 189—76)

My invention relates to window structures, more particularly to window sashes, and consists in improvements and refinements in structure.

The sash of the invention, providing as the usual sash the immediate support for a glass window pane, is essentially constructed of metal. It is a sash in which the pane of glass may be readily assembled and marginally sealed, and it is characteristic of the sash structure that no putty or other sealing material is exposed to view, or to the deteriorating influences of the weather. My sash is of the sliding type, adapted to be moved up and down in its frame. It is of neat and pleasing appearance.

In the accompanying drawing,

Fig. I is a fragmentary view of a window frame, showing in front elevation a sash of my invention mounted therein;

Fig. II is a fragmentary view, showing the structure to larger scale and in cross section, on the plane II—II, Fig. I;

Fig. III is a view comparable with Fig. II; the window frame portion is deleted from the showing of Fig. III, and, whereas in Fig. II the sash is shown completely assembled, in Fig. III a certain sash element is illustrated in course of assembly;

Fig. IV is a fragmentary sectional view of the sash frame, on the plane IV—IV of Fig. II; and

Fig. V is a fragmentary sectional view, on the plane V—V of Fig. I.

Referring to the drawing, the sash 1 of the invention is mounted for vertical adjustment in the opening 2 of window frame 3. The window frame includes at each of the opposite vertical sides or edges of the opening a thin flange 4; the two flanges 4 extend in common plane and provide guide-rails upon which the sash 1 is vertically slidable. The frame 3 will ordinarily include two slidable sashes, but inasmuch as my present invention is concerned primarily with the structure of the sash per se, the illustration of one of the sashes will herein suffice.

The sash 1 consists in a reactangular frame formed of four frame members *a*, *b*, *c*, and *d*, assembled end to end and united, say by welding. The frame members are formed of extruded or rolled sections of metal (preferably a metal of light weight, such as aluminum) cut to proper length and united, as said. The detailed structural shape of these metal frame members is of the essence of the invention.

Turning to Fig. II, it will be understood that the frame members *a*, *b* and *c* are of H shape in cross section, the H lying on its side as viewed in Fig. II, with the two legs 5 and 6 of the H horizontal and the cross-arm 7 vertical. The H-sectioned frame or sash portions extend (save for an exception later noted) throughout the peripheral extent of the rectangular frame. With such peripheral continuity of the structure held in mind, a simple description that deals primarily with the legs of the H will suffice to give an understanding of the structural features of the invention.

The portions of the two legs of the H on one side of the cross-arm 7—the leg portions to which the reference numerals 5 and 6 are immediately applied—form a groove 8 that opens through the inner peripheral edge of the sash or frame. In the assembly of the four frame members the groove 8 is of uninterrupted circumferential continuity, and in this groove the pane G of glass is marginally engaged and secured in the sash. A packing P of putty or other packing compound is provided in the groove 6, to insure the desired hermetic sealing of the rim of the pane G in the sash. On the opposite side of the cross arm 7 of the H, the leg portions 5*a* and 6*a* form a groove 9 that opens in the outer edge or periphery of the frame and extends in uninterrupted continuity throughout the continuous periphery of the three frame members *a*, *b*, and *c*. At the vertical sides of the sash, the guide-rails 4 are slidably engaged in the groove 9, and by virtue of such engagement the sash is secured in assembly with the main window frame 3. It may be noted that the frame 3 includes at the top of opening 2 a flange 40, identical with, and extending in common plane with the flanges 4 that form the guide-rails for the sash. When the sash is positioned at the top of the opening 2 in the frame, the flange 40 enters the portion of groove 9 that extends in the sash frame member *b*, thereby insuring weather-tight conditions at the top of the window structure as well as elsewhere. The walls of the groove 9 may be, as here shown, lined with felt 90, to enhance the desired snug and weather-tight engagement of the parts.

It is desirable that the sash shall engage the guide-rails 4 with friction which is such in effect and magnitude that, while not preventing the intended sliding adjustment of the sash, will serve to secure the sash in the position to which it has been adjusted in the frame. To such end, I advantageously provide in the portions of the groove 9, that are included in the opposite vertical sides of the sash, one or more leaf-springs 11 (Fig. IV). These springs are secured in place in the groove, by means of teats 12, formed in the metal

body of the sash frame, say by an embossing or punching operation. The body of each leaf-spring 11, flexed between the teats 12, bears yieldingly upon the surface of the associate guide-rail 4, and provides a frictional engagement of desired sort.

It will be perceived that the legs of the H are provided at their ends with inturned portions 5c, 6c and 5d, 6d, respectively. The inturned portions 5c, 6c, extending peripherally of the sash frame, serve to secure the felt lining in place, and to insure nicety of engagement of the sash with the guide-rails 4. The inturned portions 5d and 6d provide in like manner a snug engagement of the legs of the H with the opposite faces of the marginally engaged glass pane G, and additionally serve to complete the protective enclosure of the packing P within the groove 8.

The groove 9 is not required in the lower horizontal limb *d* of the sash frame in this case, and thus in such limb the groove-forming leg portions 5a and 6a of H are omitted. The less specialized section of the lower frame or sash portion *d* is illustrated in Fig. V.

In order to permit the ready assembly of the pane of glass G in the sash, the leg portion 5 of the H is provided in the form of a separate element. Indeed, such leg portion 5 of the H represents in the rectangular sash frame four removable strips 50, one for each of the limbs *a*, *b*, *c* and *d*, and when these four strips are assembled in the frame they meet end to end, as shown in Fig. I. The four strips 50 are provided with means for effecting their ready and secure assembly in the sash structure. Returning to a consideration of the cross-sectional form of the structure (Figs. II and III), it will be understood that each of the strips 50 is of L-shape in cross section, including a side flange 5 that engages the edge of the pane, and a basal flange 5e that is interlocked with the sash body on two lines of engagement that are severally effective at the toe and at the heel of the L. The basal flange 5e carries at its inner end or edge (that is, at the top of the L) a bead 5f which is engaged in a groove 5h formed in a rib portion 5i integral with the rigid leg portion 6 of the H. Cooperating with the bead-and-groove engagement 5f, 5h (in the securing of the detachable strips 50 in the sash assembly) is a tapered, sharp-edged rim 5m and this rib, located at the heel of the L, is engaged in a peripherally extending notch 5n formed in a peripheral ridge 5r on the rigid body portion of the frame of the sash.

The assembly of a glass pane G in the metal sash of this invention is a simple matter. The four strips 50 are removed from the sash frame, and the pane is laid in place, with its marginal edge lying in the open or uncovered peripheral groove 8. (See Fig. III.) Next, a packing P of putty is applied around the edges of the pane, and then the strips 50 are applied one by one and locked in assembly. (Note Fig. II.) Fig. III illustrates in cross section one of the strips in course of assembly. The flange portion 5e carried by the strip is inserted in the interval between the cross-arm 7 of the H and the rib 5i, and then pressure is applied in the direction of the arrow. Under such pressure the strip moves downward (as viewed in Fig. III), and the tapering nether face of the rib 5m makes contact with the proximal edge of the ridge 5r. As the strip is thus moved towards assembled position (Fig. II), the sliding engagement of the tapering nether face of rib 5m against the edge of ridge 5r exerts a wedging effect, such that the body of the strip shifts in left-to-right direction, Fig. III, and laterally flexes the body of the downwardly and inwardly moving flange portion 5e between its points or lines of contact with the edge of ridge 5r and the surface of rib portion 5i above the groove 5h. As the strip reaches fully assembled position, the bead 5f on the flange snaps into place in the groove 5h, and the sharp edge of rib 5m latches in the notch 5n in the body of ridge 5r. With the parts in such positions of engagement the strip is firmly secured in assembled position, as shown in Fig. II.

In such manner all four of the strips 50 are assembled and locked upon the edge of the pane or panel of glass.

I claim as my invention:

1. A window sash comprising a rectangular frame including a peripherally extending recess that receives the rim of a panel secured in the frame, one of the peripherally extending recess-forming walls of the frame comprising a removable strip of L-shape in cross section, with a rib at the toe of the L and a rib at the heel of the L, the body of the strip between such ribs being elastic, and the body of the frame including two grooves severally receiving said ribs in yielding strip-securing engagement.

2. In a window sash comprising a rectangular frame including a peripherally extending recess that receives the rim of a pane of glass assembled in the frame, and means securing the pane in such assembled position; said means comprising doubly-flanged keeper strips of L-shape in cross section, each strip being assembled with one flange in engagement with the margin of the pane and the other flange yieldingly interlocked with the frame on two lines of engagement that are severally effective at the toe and at the heel of the L, the engagement at the heel of the L consisting in a beveled rib on the keeper strip and a notch in the frame body that receives the rib, said beveled rib being adapted as the strip is pressed into assembled position to engage the body of the sash with wedging effect, whereby the last-mentioned flange is stressed into yielding engagement with the frame body.

MORGAN B. SCHILLER.