Jan. 8, 1957 J. J. SCHWERAK 2,776,458

WINDOW SASH GUIDE STRUCTURE

Filed Oct. 18, 1954 3 Sheets-Sheet 1

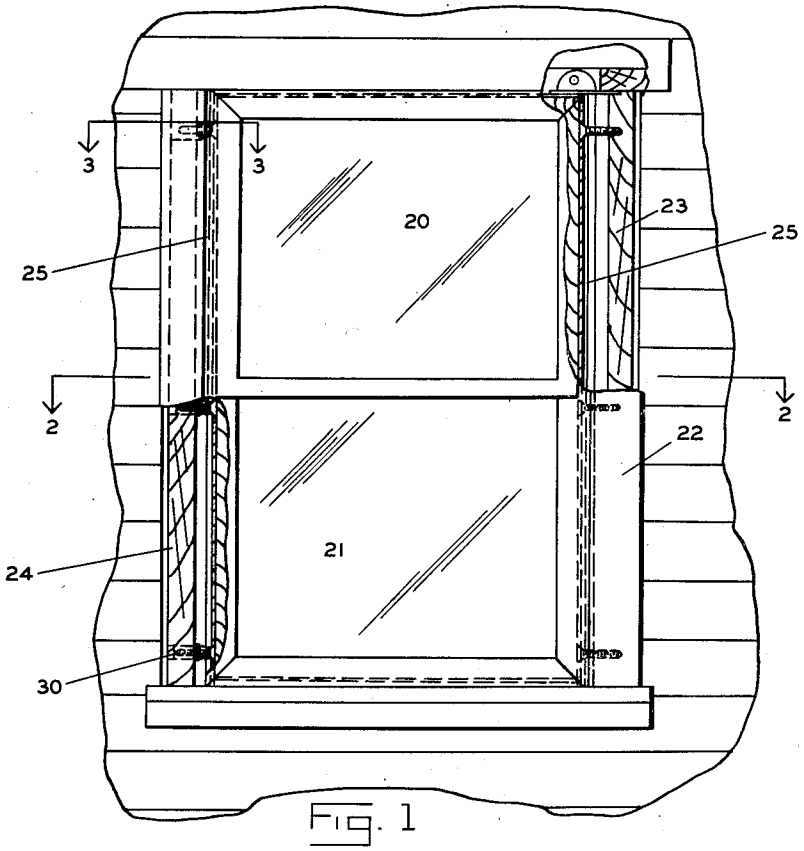


Fig. 1

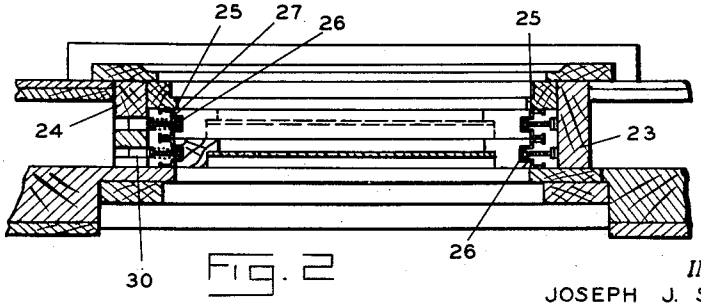


Fig. 2

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WINDOW SASH GUIDE STRUCTURE

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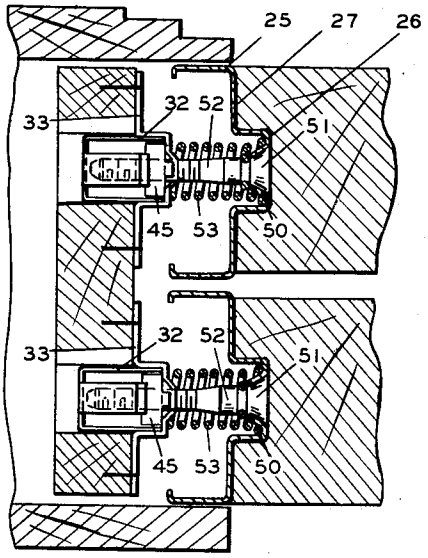


Fig. 3

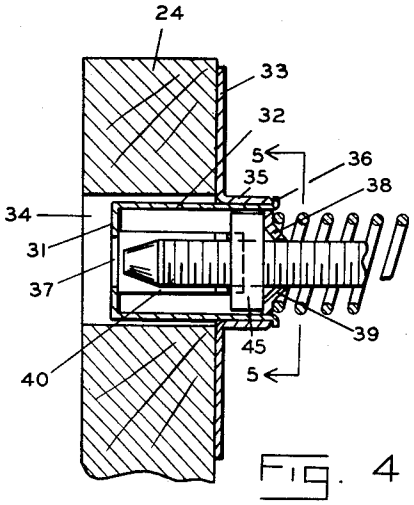


Fig. 4

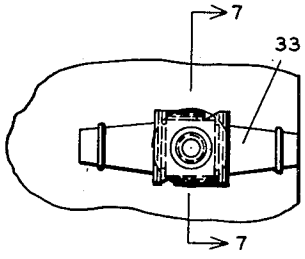


Fig. 5

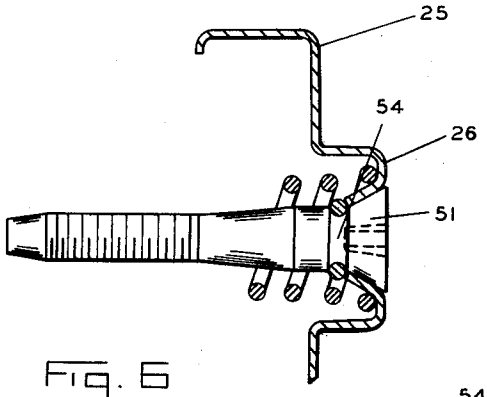


Fig. 6

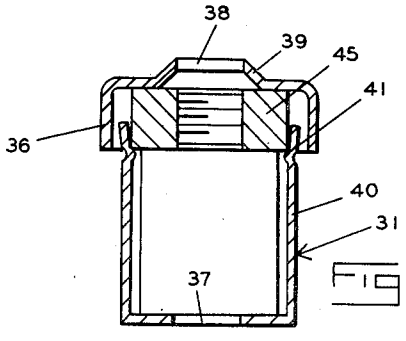


Fig. 7

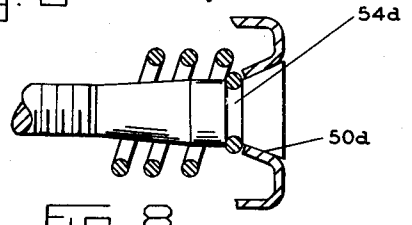


Fig. 8

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WINDOW SASH GUIDE STRUCTURE

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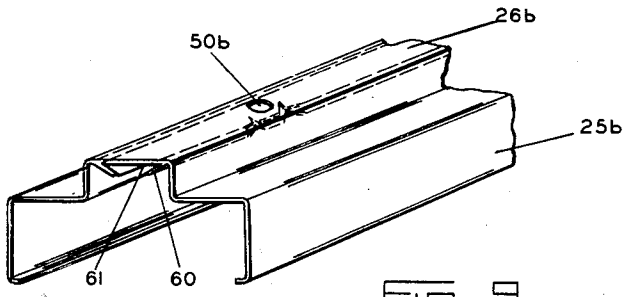


Fig. 9

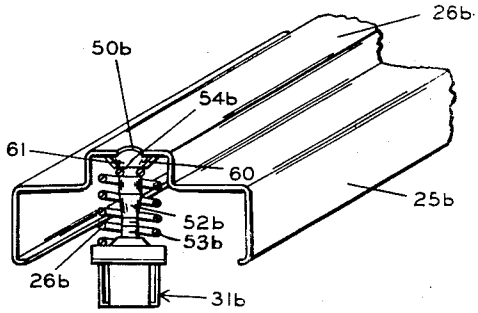


Fig. 10

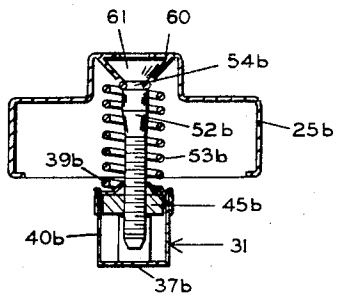


Fig. 11

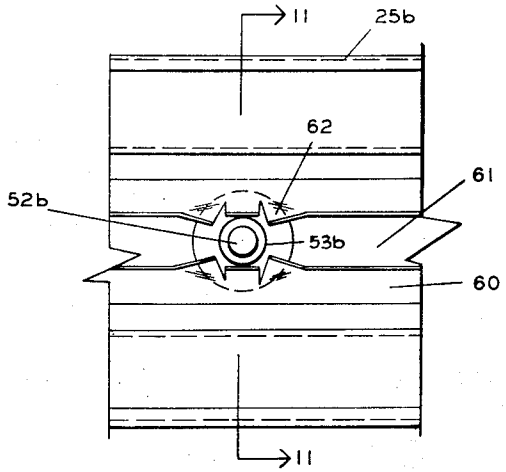


Fig. 12

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2,776,458

WINDOW SASH GUIDE STRUCTURE

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Application October 18, 1954, Serial No. 462,799

14 Claims. (Cl. 20—12)

My invention relates to a window sash guide structure. It has to do, more specifically, with a guide structure for each of the vertically slidable window sash of a double hung window although it is not necessarily limited to that type of window.

It has been proposed to provide guide rails at each side of the window, for receiving the edges of the window sash, the guide rails at the one side being pressed inwardly from the frame into resilient engagement with the edges of the sash by spring plungers disposed between the side of the window frame and the guide rails. These guide rails not only serve to provide the proper pressure on the edges of the sash to keep them in any vertical positions to which they are adjusted, but also serve to provide means for permitting the complete removal of each window sash when desired.

The present invention relates to improved spring-type plunger units which are used with each of the pressure-applying guide rails and to improved means for connecting the plunger units to the guide rails and to the associated window frame.

In the accompanying drawings I have illustrated several examples of my invention. In these drawings:

Figure 1 is an outside elevational view, partly broken away, of a window structure of the double hung type to which my invention has been applied.

Figure 2 is a horizontal sectional view taken on line 2—2 of Figure 1.

Figure 3 is an enlarged fragmentary horizontal sectional view taken along line 3—3 of Figure 1 showing the spring plungers associated with both of the guide rails at one side of the window structure.

Figure 4 is an enlarged sectional detail of the nut-housing of one of the plunger units and illustrating how it is mounted on the window frame.

Figure 5 is a view of the inner side of the nut-housing taken along line 5—5 of Figure 4.

Figure 6 is an enlarged sectional detail of the screw and associated spring of one of the plunger units showing how the screw is anchored to the associated guide rail.

Figure 7 is an enlarged sectional detail taken axially through the nut-housing along line 7—7 of Figure 5.

Figure 8 is a view similar to Figure 6 but showing a slightly different spring arrangement.

Figure 9 is an isometric view of a different type of guide rail which I may provide.

Figure 10 is a similar isometric view showing the spring plunger unit which I provide for use with a rail of the type shown in Figure 9.

Figure 11 is a transverse sectional view taken on line 11—11 through the guide rail shown in Figure 12.

Figure 12 is an outside view of the guide rail of Figure 9 showing how the screw of a plunger unit is held in place longitudinally thereof.

With reference to Figures 1 and 2 of the drawings, I have illustrated my invention applied to a window structure of the double hung type consisting of the upper sash 20, the lower sash 21, and the frame 22. The window

frame 22 has the vertically disposed side frame members 23 and 24 between which the sash 20 and 21 are mounted for vertical sliding movement.

The sash are guided in their vertical movements by metal guide rails 25 which are provided at opposite sides of the window frame, a pair of opposed rails being provided in the proper plane for guiding each of the sash. Each guide rail 25 is of channel form outwardly turned relative to the window sash and being of a depth approximating the thickness of the window sash. Each guide rail has an inwardly projecting continuous rib or tongue 26 which is adapted to be positioned in a guide channel 27 in the adjacent edge of the sash. The guide rails 25 at the right-hand side of the frame are suitably fixed to the side frame member 23. Each guide rail 25 at the left-hand side of the frame is yieldingly connected to the side frame member 24 by means of the spring plunger units indicated generally by the numeral 30. Three of these units are preferably provided for each guide rail, the middle unit of the outer rail (Figure 1) being exposed when the upper sash 20 is raised as far as possible. Similarly the middle unit of the inner guide rail is exposed (not shown) by the lower sash when in its lowermost position. By proper manipulation of the sash all units 30 are accessible for adjustment in a manner which will be apparent later.

The units 30 which I provide according to my invention are shown in Figures 1 to 7. Each unit comprises a nut-housing 31 formed of two sheet metal stampings 32 and 33. The nut-housing is disposed in a bore 34 formed in the proper location in the side frame member 24 of the window frame. The stamping 32 is bent mainly into a body of U-form to provide opposed legs which extend into an inverted U-shape boss 35 formed intermediate the ends of the stamping 33 and which are secured therein by the cooperating tongues and openings 36. The laterally projecting tabs of the stamping 33 may be stapled to the side frame member 24 to hold the nut housing 31 in the bore 34 during assemblage of the window. The bottom of the stamping 32 has an opening 37 and the top of the boss 35 of the stamping 33 has an aligning opening 38 around which a spring retaining annular shoulder 39 is formed. The stamping 32 is further provided with a pair of opposed spring fingers 40, at right angles to the U-shaped body, and each is provided with a retaining shoulder 41 transversely thereof and spaced slightly from the free ends thereof as shown best in Figure 7.

The housing 31 is of sufficient cross-sectional area to receive the square nut 45 which is positioned therein before the two housing parts 32 and 33 are assembled. When such parts are assembled, the nut will be prevented from rotating therein by the main legs of the U-shaped stamping 32 as shown in Figure 4. Furthermore, as shown in Figure 7, the nut 45 is normally held by the springs 40 at the inner end of the housing in flat contact with the inner surface of the boss 35 and with its threaded opening in alignment with the opening 38 in the boss.

The housing 31, with the nut therein as indicated, is mounted on the window frame side frame member 24 as indicated. The other parts of each of the plunger units 30 are mounted in a guide rail 25. Each guide rail 25 at the proper locations longitudinally of the tongues 26 is provided with countersunk openings 50 which, when the rails are properly positioned in the window frame, will align with the corresponding openings 34 bored in the side frame members of the window.

Each opening 50 is adapted to receive the head 51 of a screw 52 which is directed outwardly through the opening. Each screw is provided with a compression spring 53 which is disposed in surrounding relationship

to it and outside the rail. The spring 53, even in its uncompressed condition, is shorter than the screw 52 which it surrounds so that the outer end of the screw will project outwardly from the spring. The spring 53 is used to anchor the screw 52 to the rail 25. This is accomplished by having one of the convolutions of the spring adjacent its inner end more constricted so that it winds inwardly into an annular groove 54 (Figure 6) formed in the screw just outside the cup of the countersink. The convolutions at the inner end of the spring surround such cup and the extreme inner end of the spring 53 bears against the outer side of the inner wall of the tongue 26 of the rail 25. Thus, the screw 52 will be anchored to the rail 25 and the spring 53 will always be properly located on the screw, preventing axial displacement relative to the rail or even loss of the screw or spring.

To assemble the rails 25 on the window frame it is merely necessary to properly position them vertically in the frame adjacent side frame members 24 and to locate the outer ends of the various screws 52 in alignment with the openings 38 in the corresponding nut-housings 31 which have been mounted on the side members of the window frame as previously described. The screw members 52 will be threaded into the nuts 45 and the rails 25 will thereby be connected to the side frame member 24. The distance of each rail from the associated side frame member 24 can be varied by turning the screws of the plunger units 30 of that rail properly. The resistance exerted by the spring 53 of each plunger unit can be varied by turning the screw 52 thereof to further compress or expand the screw. The pressure exerted by the springs 53 will keep the nut-housings 31 in the bores 34 in the side frame member 24. The nut 45 will at all times be prevented from rotation in the housing 31 and ordinarily will be held at the inner side of the housing by the spring fingers 40. However, by forcing the rails bodily toward the associated side frame member, the nuts can be moved to the outer ends of the housings 31. This action is necessary when removing the sash since the rails at the left side can be pushed bodily to the left of the frame (Figure 1) when sufficient pressure is applied to the right edge of the sash, so as to release the right edge of the sash from the rails cooperating therewith, and then permit release of the left edge of the sash from the cooperating guide rails.

In shipping the assembled window, it is desirable to adjust the screws 52 of all the units 30 to prevent sliding of the sash in the frame. Normally the spring 53 of each unit 30 pulls the screw 52 inwardly so as to keep the nut 45 beyond the shoulders 41 of the spring fingers 40. However, with the sash in place between the opposed guide rails 25 if the screw 52 is rotated so that it threads out of the nut 45 sufficiently, the nut 45 will be forced outwardly in the housing 31 beyond the shoulders 41 and eventually will be jammed against the outer wall of the housing. This will cause the sash to be held tightly between the opposed guide rails 25.

In Figure 8, I show a spring structure like that of Figure 6 except that it terminates at the small locking convolution 54*a* and this locking convolution bears against the outer edge of the countersink cup 50*a*. The functioning of this structure is substantially like that of Figure 6.

In Figures 9 to 12, I have illustrated a different form of my invention in which a different arrangement is provided for anchoring the screw and spring assembly to the guide rail.

In this instance, the rail 25*b* has formed on the outer surface of the tongue 26*b* thereof the two continuous angular flanges 60 which extend diagonally outwardly from the channel thereof. These two flanges form an undercut or dovetail groove or channel 61 extending the full length of the guide rail which is adapted to receive the heads of the screws 52*b* which will be inserted from the ends of the groove. At properly spaced intervals along the tongue 26*b*, it is provided with openings 50*b* which are large enough to permit the insertion of a tool to engage the heads of the screws but are small enough to prevent the heads from passing therethrough. When the screw heads are located in axial alignment with the openings 50*b* the flanges 60 my be clinched around the head, as indicated at 62 (Figures 11 and 12), from the outside of the guide rail so as to prevent displacement of the screws along the rail. The screws 52*b* will thus be anchored to the rail 25*b*. The springs 53*b* can then be placed on the screws 52*b* and can be anchored thereon by having the constricted end convolution of the screw wind into an annular groove 54*b* formed in the shank of the screw near its head. Thus, both the screws 52*b* and the springs 53*b* are anchored to the rail 25*b* to prevent displacement or loss thereof.

The rails 25*b* can then be mounted on the side frame member of the window frame by positioning the screws 52*b* in alignment with the nut-housings 31*b* and rotating the screws by means of a screwdriver inserted through the openings 50*b*. The nut-housings 31*b* have the lower openings 37*b* and include the springs 40*b* which hold the nuts 45*b* exactly as before, and the spring retainer 39*b*. This arrangement will function practically the same as that previously described.

It will be apparent from the above description that I have provided a window sash guide structure in which the screws of the spring plunger units are anchored to the guide rails and cannot become displaced or lost before or after assembly of the rails in the window. Also, the springs are anchored on the screws for the same reasons. The resistance of the springs can be readily varied by rotating the screws relative to the nuts of the plunger units and the rails can be adjusted towards or from the side frame member of the window. The guide structure will function to apply the necessary force to the edges of the sash to keep them in any adjusted vertical position, will permit any necessary expansion or contraction, or will compensate for irregularities therein, and will even permit removal of the sash.

Various other advantages will be apparent.

Having thus described my invention, what I claim is:

1. In a window construction having oppositely disposed guide rails for guiding the sliding movement of a window sash, means for connecting the guide rail to an adjacent frame member of the window, said means comprising spring plunger units, each of said units comprising a screw anchored to the rail in a selected position and extending outwardly therefrom towards the frame member, a spring surrounding said screw and anchored in place thereon to prevent relative axial movement and displacement of the spring from the screw during assembling or disassembling of the window construction, a nut for cooperating with said screw, and means for locating said nut on said frame member in a selected position for cooperation with said screw.

2. A construction according to claim 1 in which the screw is anchored to the rail by passing it through an opening in the rail so that the head is in engagement with one side thereof and the spring has a convolution which cooperates with a shoulder on the screw and engages the opposite side of the rail.

3. A construction according to claim 2 in which the shoulder on the screw is an anchoring groove spaced axially from the head in which one of the convolutions of the spring is disposed to prevent axial movement on the screw.

4. A construction according to claim 2 in which the means for locating the nut on the frame member is a nut-housing, said housing receiving the nut and cooperating therewith to prevent rotation thereof.

5. A construction according to claim 4 in which the housing is formed to permit axial movement of the nut

therein, and yieldable means for normally preventing said axial movement unless a substantial axial force is applied thereto.

6. A construction according to claim 5 in which said yieldable means comprises opposed spring fingers which engage opposite sides of the nut, and retaining shoulders on said fingers.

7. A construction according to claim 3 in which the first surface of the rail that is engaged by the screw head is countersunk and in which the convolution of the spring fitting into said groove is at the extreme end of said screw and engages the end of the countersunk cup.

8. A construction according to claim 3 in which the first surface of the rail that is engaged by the screw head is countersunk and in which the convolution of the spring fitting into said groove is spaced from the end of the spring with the spring convolutions towards the end surrounding the countersink cup and bearing against the adjacent surface of said rail.

9. A construction according to claim 1 in which the screw is anchored to the rail by means of flanges formed on the rail which form a dovetail groove in which the head of the screw is disposed, the walls of the groove being clinched to prevent longitudinal movement of the screw along the rail, and an access opening in alignment with the screw in the bottom of the groove of in-

sufficient area to permit axial movement therethrough of the head of the screw.

10. A construction according to claim 9 in which the spring is anchored to the screw by a shoulder which is engaged by a convolution of the screw.

11. A construction according to claim 10 in which the shoulder is formed by a groove in the screw spaced from its head and in which one of the convolutions of the screw is disposed.

12. A construction according to claim 11 in which the means for locating the nut on the frame member is a nut-housing, said housing receiving the nut and cooperating therewith to prevent rotation thereof.

13. A construction according to claim 12 in which the housing is formed to permit axial movement of the nut therein, and yieldable means for normally preventing said axial movement unless a substantial axial force is applied thereto.

14. A construction according to claim 13 in which said yieldable means comprises opposed spring fingers which engage opposite sides of the nut, and retaining shoulders on said fingers.

References Cited in the file of this patent

UNITED STATES PATENTS

Re. 23,931 Weissman ---------- Jan. 25, 1955