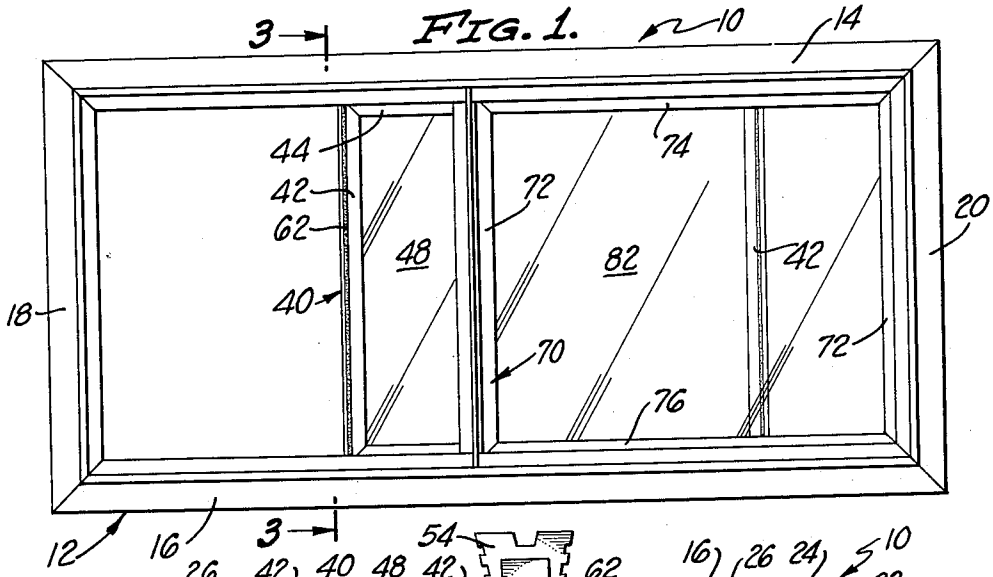
Nov. 26, 1963 A. GROSSMAN 3,111,726

FIXED AND MOVABLE SASH WINDOW CONSTRUCTION

Filed Sept. 23, 1960

FIG. 1.



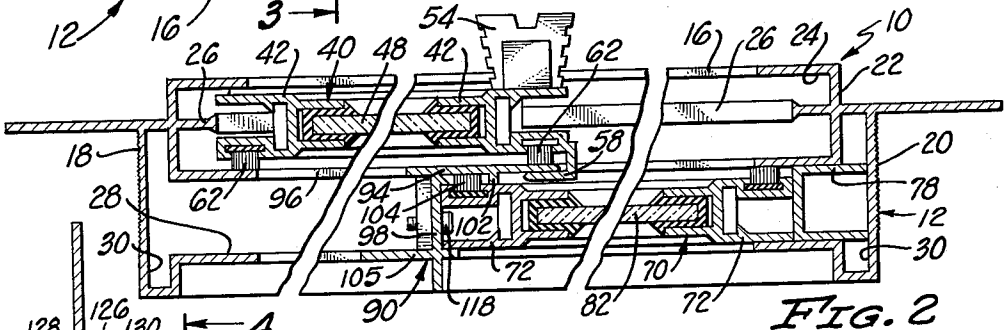


FIG. 2

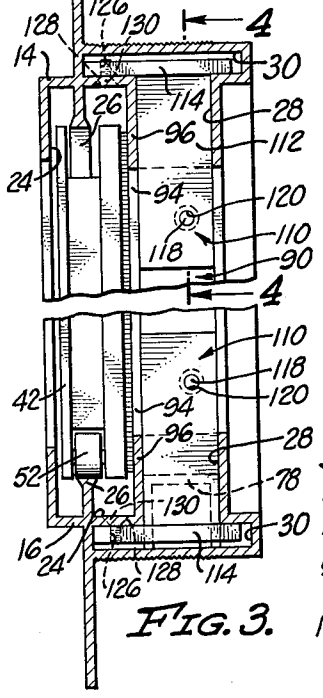


FIG. 3.

FIG. 4.

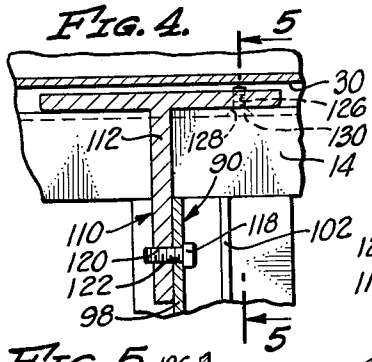
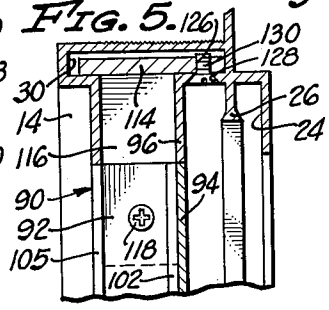


FIG. 5.



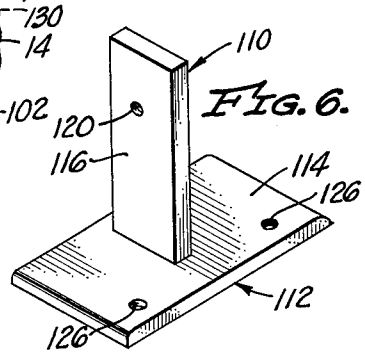


FIG. 6.

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FIXED AND MOVABLE SASH WINDOW CONSTRUCTION

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This invention relates to a window construction incorporating a horizontally slidable inner sash and an outer sash which is fixed against movement with respect to said inner sash. The teachings of the invention may be applied, if desired, to the construction of doors of a similar nature and it is not intended that said teachings be limited specifically to the type of window disclosed.

However, as will be apparent to those skilled in the art, the teachings of the invention are particularly applicable to windows and doors constructed from aluminum extrusions since the configurations in which said extrusions may be designed greatly facilitate the application of the teachings of the invention to such windows. In prior art fixed and sliding sash horizontal window constructions, the installation of the fixed sash and the securement thereof against movement in the frame of the window has entailed considerable hand work and the provision of numerous auxiliary parts or extrusions intended to integrate the fixed sash as a part of the window frame construction.

It is, therefore, an object of my invention to provide a horizontal window incorporating a horizontally slidable sash and a mating fixed sash which includes a perimetrical frame including a head and a sill maintained in spaced relationship with each other by means of laterally spaced jambs, the aforesaid sill incorporating inner track means adapted to receive and support the sliding sash and the fixed sash being located in an outer channel in said head and said sill but being restrained against movement in said channels by means of a tie post which is slidably movable into abutting relationship with the exposed stile of the fixed sash to restrain said fixed sash against movement with respect to said frame.

Another object of my invention is the provision of a window including a frame of the aforementioned character wherein the aforesaid head and sill have elongated receptacles communicating with the channels in said head and sill which, respectively, receive the upper and lower rails of the fixed sash whereby said elongated receptacles will serve as tracks and retention means for interlocking means connected to the opposite extremities of said tie post which serves to restrain the fixed sash against movement in said frame.

Therefore, during the assembly of the window or door constructed in accordance with the teachings of my invention, one jamb and the associated head and sill may be joined in abutting relationship with one another, the fixed sash can then be slid into place in the outer channels of said head and sill and the interlocking means on the tie post inserted in the elongated receptacles communicating with said channels. The entire assembly of tie post and interlocking means can then be slid through the channels into abutment with the adjacent stile of the fixed sash. Subsequently, the other jamb is attached to the free ends of the head and sill to define the window frame. The movable sash can then be inserted in the frame in accordance with conventional practice.

After the tie post has been moved into abutting relationship with the stile of the fixed sash in the above described manner, the interlocking means is secured to adjacent portions of the head and sill to fixedly retain the tie post against movement with respect to the frame of the window. Therefore, the tie post thus serves the dual

function of preventing movement of the fixed sash and also of rigidifying the frame at its center by securing the head and sill rigidly to each other.

Other objects and advantages of my invention will be apparent from the following specification and the accompanying drawing which is for the purpose of illustration only and in which:

FIG. 1 is a front elevational view of a window constructed in accordance with the teachings of my invention;

FIG. 2 is a transverse sectional view showing the relationship of the fixed and sliding sashes of said window;

FIG. 3 is a vertical sectional view taken from the broken line 3—3 of FIG. 1;

FIG. 4 is an enlarged fragmentary sectional view taken on the broken line 4—4 of FIG. 3;

FIG. 5 is a vertical sectional view taken on the broken line 5—5 of FIG. 4; and

FIG. 6 is an isometric view of a typical interlocking device utilized in conjunction with the tie post of the window of my invention.

Referring to the drawing and particularly to FIGS. 1–3 thereof, I show a window 10 constructed in accordance with the teachings of my invention and including a frame 12 which is constituted by a series of identical aluminum extrusions serving the functions of a head 14, a sill 16 and jambs 18 and 20. Each length of extrusion 22 constituting the various members of the frame 12 is characterized by the provision, as best shown in FIGS. 2–5 of the drawings, of an inner channel 28 having a track 26 therein and of an outer channel 24, said inner channel having an elongated receptacle 30 in communication therewith.

Mounted for movement on the track 26 in the sill 16 is a sliding sash 40, said sash including stiles 42 and top and bottom rails 44 and 46, respectively, said stiles and rails encompassing a pane 48 of glass. Mounted in the lower rail 46 are rollers 52, one of which is shown in FIG. 3 of the drawings, said rollers engaging the track 26 located in the inner channel 28 of the sill 16 to permit the sliding sash 40 to be moved on the track 26. A handle 54 secured to the right-hand stile 42, as viewed in FIG. 2 of the drawing, may be grasped to facilitate movement of the sliding sash 40.

The right-hand stile 42 of the sliding sash 40 has interlocking means 58 thereupon, as best shown in FIG. 2 of the drawings, for a purpose which will be described in greater detail below. Vertical weatherstripping 62 constituted by mohair filaments is mounted on each of the stiles 42 to seal the outer surfaces of said stiles against infiltration of air, dirt or moisture.

The fixed sash 70 is fabricated from the same basic extrusion as the sliding sash 40 and includes vertical stiles 72 and upper and lower rails 74 and 76. However, the lower rail 76 of the sash 70 does not incorporate rollers similar to the rollers 52 incorporated in the lower rail 46 of the sliding sash 40. As a matter of fact, the lower rail 76 of the fixed sash 70 is superimposed on an inverted channel 78, shown in phantom in FIG. 3 of the drawing. Thus, the inverted channel 78 located in the outer channel 24 of the sill 16 maintains the rail 76 of the fixed sash 70 at the same level as the rail 46 is maintained by engagement of the rollers 52 upon the associated track 26.

It will also be noted that, as best shown in FIG. 2 of the drawing, a channel 78 is disposed in the right-hand jamb 20 of the frame 12 and the right-hand stile 72 of the fixed sash 70 abuts thereupon. Thus, the lengths of channel 78 serve to locate the fixed sash 70 with respect to the frame 12. It will be noted that the sash 70 incorporates a pane 82 of glass.

Mounted at the left-hand stile 72 of the fixed sash

70 is a tie post 90, said tie post being constituted by an aluminum extrusion 92 which, as best shown in FIG. 2 of the drawing, includes an inner face 94 whose lower extremity overlies the channel wall 96 and a transverse web 98 adapted to span the outer channels 24 of the head 14 and sill 16 of the frame 12. It should be noted that, as best shown in FIG. 3 of the drawing, the upper extremity of the inner face 94 of the tie post 90 engages the underside of the channel wall 96 in the head 14 of the frame 12.

A rib 102 is provided on the inner surface of the inner face 94 of the extrusion 92 constituting the tie post 90 to define a receptacle for the reception of a vertical weatherstrip 104 on the left-hand stile 72 of the fixed sash 70. The extrusion 92 also includes an outer face 105 which overlies the left-hand stile 72 of the fixed sash 70.

The tie post 90 is, as best shown in FIGS. 2–6 of the drawing, maintained in operative relationship with the adjacent left-hand stile 72 of the fixed sash 70 and the outer channels 24 of the head 14 and sill 16 by interlocking and securement means generally indicated at 110. The interlocking and securement means 110 is constituted by a substantially T-shaped clip 112, said clip being fabricated from an aluminum extrusion and including a head 114 and a shank 116. When the clip 112 is inverted, the head 114 actually assumes the function of a base for the shank 116.

In any event, one of the interlocking and securement means 110 constituted by the clip 112 is secured to each extremity of the tie post 90 by means of a screw 118, or similar fastener, extending through corresponding openings in the shank 116 and the transverse web 98 of the tie post. The openings 120 and 122 in the shank 116 and the web 98, respectively, are pre-drilled and may be pre-threaded if desired. In addition, pre-drilled openings 126 are formed in the base or head 114 of the clip 112.

During the assembly of the component parts of the window 10, the right-hand jamb 20 and head and sill 14 and 16 are assembled in end-to-end relationship and the channels 78 inserted in the right-hand jamb 20 and the outer channel 24 of the sill 16 in the manner shown in FIGS. 2 and 3 of the drawing, respectively. The fixed sash 70 is then slid into the outer channels 24 of the head and sill until it abuts on the vertically oriented filler channel 78 in the right-hand jamb 20 and is supported on the underlying filler channel 78 in the outer channel 24 of the sill 16.

When such location of the fixed sash 70 with respect to the aforementioned frame members has been accomplished, the interlocking means 110 on the opposite extremities of the tie post 90 are inserted in the elongated receptacles 30 communicating with the outer channels 24 in the head and sill 14 and 16, respectively. The tie post 90 is then pushed between the head and sill 14 and 16, respectively, until the transverse web 98 thereof abuts on the left-hand stile 72 of the fixed sash 70. When this occurs one of the openings 126 in the head or base 114 of the clip 112 is juxtaposed to a corresponding opening 128 in the bottom of the inner channel 28 immediately adjacent the track 26. This is true of both the upper and lower interlocking members 110 and is illustrated in FIGS. 4 and 5 of the drawing.

Moreover, it is possible to eliminate the screws 130 and rely upon frictional engagement of the bases 114 of the clips 112 with the adjacent walls of the receptacles 30. As a matter of fact, the frictional engagement between the receptacles 30 and the bases 114 of the clips 112 is frequently augmented by the slightly angular orientation of the bases 114 of the clips 112 with respect to the receptacles 30.

When the openings 126 in the head or base 114 and 128 in the bottom of the channel 28 in the sill 16 and the similar openings in the head 14 are juxtaposed, screws 130 are driven into said openings to secure the head or base 114 of the clip 112 against movement with respect to the head 14 and sill 16 of the frame 12. In this manner the tie post 90 serves as the sole restraining element for the fixed sash 70 and also acts as a structural beam integrating the head 14 with the sill 16. After the tie post 90 has been assembled in operative relationship with the head and sill 14 and 16, respectively, the left-hand jamb 18 may be assembled with the associated extremities of said head and sill. The sliding sash 40 can then be inserted into operative relationship with the track 26 in the inner channel 28 of the sill 16.

It will be noted that, when the movable, sliding sash 40 is in closed relationship with the opening defined by the frame 12, the stile interlock 58 on the right-hand stile 42 of the sliding sash 40, as best shown in FIG. 2 of the drawing, will engage the inner side of the inner face 94 of the tie post 90 and the vertical weatherstrip 62 thereupon will engage the outer surface of said inner face to create a weather seal therebetween. It will also be noted that the weatherstrip 62 on the left-hand stile 42 of the sliding sash 40 engages the inner surface of the inner wall of the inner channel 28, as best shown in FIG. 2 of the drawing, when the sash 40 is in closed position.

By providing a window incorporating a fixed sash which is retained against movement by the simple expedient of a sliding tie post, I eliminate the necessity for the extensive modifications of the frame previously found in prior art constructions. In other words, by the simple expedient of pre-drilling the holes in the bottoms of the channels and in the base or head of the clips, I make it possible to readily assemble the tie post 90 in operative relationship with the sill and head of the frame and with the exposed stile of the fixed sash. Therefore, the necessity for providing fastening clips and direct connections for the fixed sash to the frame of the window is eliminated.

Furthermore, the time which must be expended in assembling the window of my invention is much less than that entailed in the assembly of prior art window constructions and the inherent rigidity imparted to the window frame by the tie post materially enhances the structural integrity of the entire window construction of my invention.

I claim:

In a window construction, the combination of: a frame having a head and sill and upper and lower track means at the front of said head and sill, said head and sill having receptacles therein at the rear thereof and jambs supporting said head and sill in spaced relationship; a sliding sash supportd on said track means; a second sash supported on said head and sill; a tie post extending between said head and sill and engaging said second sash to prevent movement thereof; and interlocking means connected to the opposite extremities of said tie post for connecting said extremities to said head and sill, said interlocking means being constituted by clips each having a leg secured to an extremity of said post and a base longitudinally slidable and engaged in an associated receptacle of said head and sill, whereby frictional engagement of said base in an associated receptacle will prevent longitudinal, slidable movement of said clip.

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