Aug. 26, 1969 J. M. BROWN, JR 3,462,882

WINDOW STRUCTURE

Filed April 27, 1967

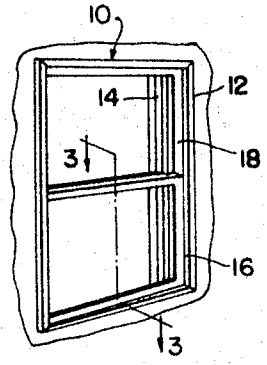


FIG.1

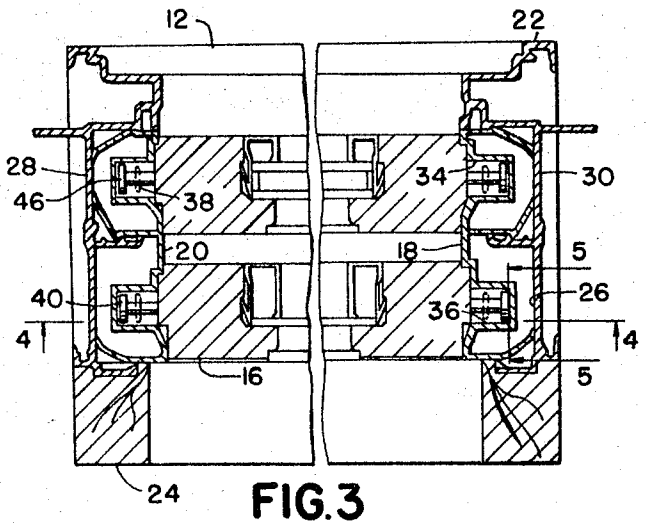
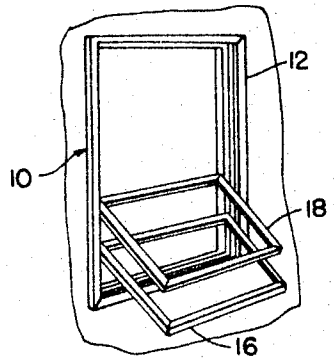


FIG.3

FIG.2



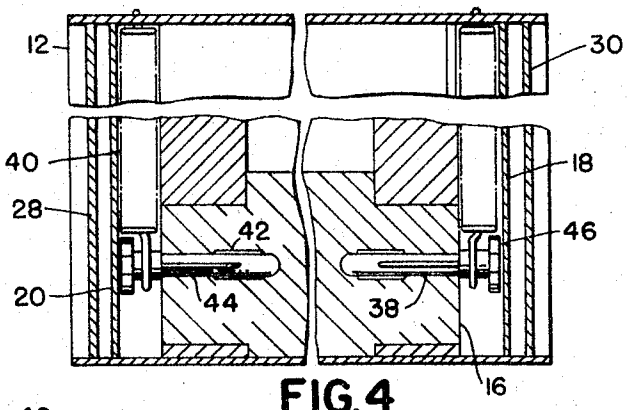


FIG.4

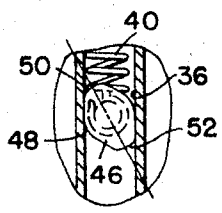


FIG.6

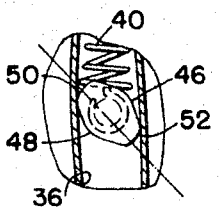


FIG.7

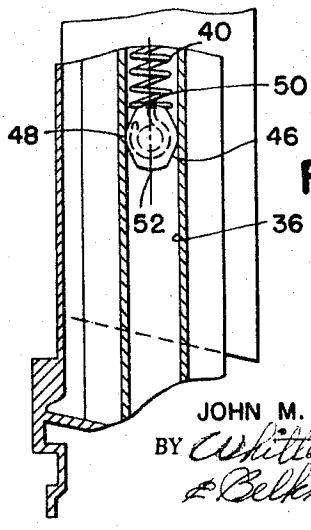


FIG.5

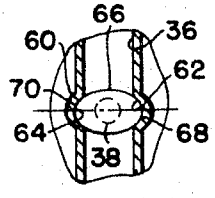


FIG.8

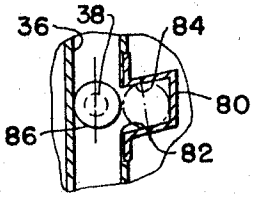


FIG.9

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United States Patent Office 3,462,882
Patented Aug. 26, 1969

3,462,882

WINDOW STRUCTURE

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Filed Apr. 27, 1967, Ser. No. 634,170
Int. Cl. E05d 15/22
U.S. Cl. 49—181 4 Claims

ABSTRACT OF THE DISCLOSURE

Tilting double hung window structure having a resilient guide between a window frame and window sash and a pivot member secured to the sash between the sash and guide including means for holding the sash in a predetermined vertical position relative to the frame on tilting of the sash. The means for holding the sash, in a preferred embodiment of the invention, includes a camming head having a major axis extending vertically and longitudinally of the window frame and a minor axis extending transversely of the window frame with the sash in a closed position in the window frame which camming head is rounded at the sides and at the ends and the sides of which are tapered at each end toward each other whereby initial tilting of the window sash in the frame produces no camming action between the camming head and resilient guide and additional tilting of the sash with respect to the window frame will provide camming action to lock the sash in a predetermined vertical position with respect to the frame. Modifications of the invention include an elliptical head on the pivot member cooperable with arcuate recesses in the guide and an inclined recess in the guide operable to receive the head of the pivot member on tilting of the sash to similarly prevent vertical movement of the sash at the pivot member on tilting of the sash.

BACKGROUND OF THE INVENTION

The invention is in the field of window structures and in particular is directed to double hung tilting window structures of the type wherein sash are mounted in a frame for vertical sliding relative to each other and wherein the sash may be tilted about an axis in the plane of the frame to expose both sides of a window pane in the sash for cleaning and the like.

In the past such tilting double hung window structures have required a plurality of separate members for guiding the sash in the frame for weatherproofing between the sash and frame and for resiliently holding a guide member against the sash spaced from the frame. In addition in prior tilting double hung window structure on tilting of the windows to expose opposite sides of the window pane, the sash has been subjected to further tilting of one side thereof about the other side so that the sash has been removed from the frame accidentally on occasions. This is especially true when counterbalance means are connected to the sash on the pivot axis of the sash in the plane of the frame. With such structure, on tilting of a sash, one side of the sash may suddenly be drawn upward by the counterbalance means which may result in injury to nearby persons, breakage of the window pane, or the like.

Where means have been provided to lock the sash in a predetermined vertical position in the frame or guide means on tilting thereof, in the past such locking means have been complicated in structure, difficult to produce and/or inefficient in operation.

SUMMARY OF THE INVENTION

The invention comprises a particularly simple economical and efficient structure for locking a tilted window

sash in a vertical relation with respect to the window frame in which the sash is mounted. The locking structure of the invention is provided in combination with tilting double hung window structure having a combination plastic guide, weatherproofing and compression member between the window frame and each side of the sash mounted therein.

In particular the locking structure includes a pivot member secured to the sash at each side thereof against rotation relative to the sash which pivot member has a camming head thereon movable in the plastic guides at the sides of the sash and having sides extending generally vertically of the window structure converging toward each other at the opposite ends thereof to permit initial tilting of the sash without locking and which camming head further has a rounded portion at the center of each side and at the end thereof. The rounded ends of the camming head provide substantial camming force over the remainder of the tilting angle of the window.

Modifications of the invention include an elliptical head on the pivot members adapted to fit transversely of the frame into corresponding recesses in the guides with the sash in a desired pivoted position and a circular head on the pivot members adapted to be moved transversely of the frame into recesses in the guide members during tilting of the sash.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 is a perspective view of tilting double hung window structure including the locking structure of the invention.

FIGURE 2 is a perspective view of the tilting double hung window structure of FIGURE 1 showing the sash in a tilted position.

FIGURE 3 is an enlarged, broken, transverse section view of the window structure illustrated in FIGURE 1 taken substantially on the line 3—3 in FIGURE 1.

FIGURE 4 is an enlarged, broken, section view of the window structure illustrated in FIGURE 1 taken substantially on the line 4—4 in FIGURE 3.

FIGURE 5 is an enlarged, partial section view of the window structure illustrated in FIGURE 1 taken substantially on the line 5—5 in FIGURE 3.

FIGURES 6 and 7 are section views of the window structure illustrated in FIGURE 1 substantially the same as the section view of FIGURE 5 but with the sash in progressively greater tilted positions.

FIGURES 8 and 9 are section views similar to FIGURES 6 and 7 of modified locking structure constructed in accordance with the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

As shown in FIGURE 1, the double hung tilting window construction **10** includes the frame **12**, and two sash **14** and **16** mounted for vertical sliding movement in the frame **12**. The window **10** further includes the plastic guide members **18** and **20** positioned at the opposite sides of the frame **12** between the frame **12** and the sash **14** and **16**.

As shown more particularly in FIGURES 3 and 4, the frame **12** includes the exterior molding portion **22** and interior molding **24** extending therearound. A pocket **26** is provided extending along the jambs **28** and **30** of the frame to receive the plastic guide members **18** and **20**.

The plastic guide members **18** and **20** are received in the pockets **26** of the jambs **28** and **30** and perform a weatherstripping and guiding function for the sash **14** and **16**. The guide members **18** and **20** further provide necessary compression on the sides of the sash **14** and **16** to prevent undesired vertical movement of the sash **14** and **16** with the sash in a vertical position.

The guide members 18 and 20 are provided with channels 34 and 36 therein in which the pivot members 38 about which the sash 14 and 16 may be tilted out of the plane of the frame 12, as shown in FIGURES 2, 6 and 7, are guided. Counterbalancing means 40 secured at the top to the top of the guide members 18 and 20 are located in the channels 34 and 36 are secured to the pivot members 38 at the bottom and are provided in the window structure 12 to aid in vertical sliding of the sash 14 and 16 in the usual manner.

Thus in the usual operation of tilting double hung windows 10, as set forth in more detail in the commonly owned patent application of Richerd N. Anderson, filed concurrently herewith, the sash 14 and 16 may be raised and lowered relative to the frame 12 in the guide members 18 and 20. When it is desired to tilt the sash 14 or 16, for example to the position illustrated in FIGURE 2 for cleaning or the like, the top of the desired sash 14 or 16 is gripped and the sash is pulled forward whereby the sash rotates about the pivot members 38 positioned at the bottom of the sash at the opposite sides thereof into the position illustrated in FIGURE 2.

With such sash, and in particular where counter-balance means 40 in used, on tilting of the sash 14 or 16 into the position illustrated in FIGURE 2, the usual pivot members will permit raising of one edge of the sash by the counterbalance means 40 so that the sash is in a cocked position in the frame 12 and may be entirely removed from the window 10.

To prevent the undesirable removal of the sash 14 of 16 from the frame 12 on positioning of the sash in a tilted position, as shown in FIGURE 2, the pivot members 38 are rigidly secured to the sash 14 and 16 against rotation with respect thereto by means of flanges 42 on the pins 38 extending transversely in openings 44 in the bottom rails of the sash.

A camming head 46 is formed on each pivot member 38 which is shaped, as best shown in FIGURE 5. The camming head 46 thus has a rounded portion 48 at each side thereof which makes contact with the sides of the channels 34 and 36 in the guide members 18 and 20 with the sash in a vertical position in the frame 12. The sides of the camming head 46 further converge toward the ends 50 and 52 of the camming head 46 from the rounded central portion of the sides, as shown in FIGURE 5, at an angle of approximately thirty degrees from the vertical. In addition the ends 50 and 52 of the camming head 46 are rounded, as shown in FIGURE 5.

Thus in operation the camming head 46 provides a guide for the sash 14 and 16 within the channels 34 and 36 during normal raising and lowering of the sash 14 and 16. In addition when it is desired to tilt the sash 14 or 16 out of the plane of the frame 12, the sash 14 or 16 is initially tilted about thirty degrees to align the converging sides of the camming member with the sides of the channels 34 or 36, as shown in FIGURE 6, during which initial tilting there is no locking action of the camming head 46. After the initial tilting of the sash 14 or 16 additional tilting of the sash, as shown in FIGURE 7, through approximately one hundred twenty degrees will provide substantial locking pressure of the ends of the camming head against the sides of the channels 34 or 36 of the resilient guide members 18 or 20. This locking pressure is sufficient to prevent accidental vertical movement of the sides of the sash 14 or 16 in a tilted position, as shown in FIGURE 2, even under bias of the counterbalance means 40.

The modified locking structure 60, illustrated in FIGURE 8, includes the oppositely opening arcuate recesses 62 and 64 in the channel 36 of the guide member 18 and a cooperating elliptical head 66 on the pivot pin 38. In operation of the modified locking structure of FIGURE 8 which is intended to be duplicated in each of channels 34 and 36 in guide members 18 and 20, with the sash in a closed position the minor axis of the elliptical head 66 is transverse of the window frame 12 so that the opposite ends of the minor axis are in engagement with the sides of the channel 34 or 36 in which the head 66 is placed. When it is desired to tilt the sash to which the head 66 is secured by pivot pin 38, the eliptical head 66 is rotated with the sash whereby the opposite ends 68 and 70 thereof extend within the arcuate recesses 62 and 64 with the major axis of the elliptical head transverse of the frame to prevent upward movement of the sash at the pivot pins 38 as before.

In the modified structure of FIGURE 9, the insert 80 is placed in an opening 82 in the wall of a channel 34 or 36 in the guides 18 and 20 to provide an upwardly inclined recess 84 into which the head 86 of the pivot member 38 is moved transversely of the frame 12 during the initial pivoting of a sash 16 or 18. Again, with the head 86 of the pivot pin 38 in the recess 84, upward movement of the sash 16 on 18 at the pivot pins 38 on tilting of the sash 16 or 18 into an open position, as shown in FIGURE 2, is prevented.

While one embodinemt of the present invention and modifications thereof have been considered in detail, it will be understood that the other embodiments and modifications are contemplated.

What I claim as my invention is:

1. Window structure comprising a generally rectangular frame including head jamb and sill members, said jamb members having a generally U-shaped cross-section including leg portions and a connecting portion forming inwardly opening pockets for receiving guide members therein in conjunction with a centrally located longitudinally extending and inwardly projecting flange secured to the connecting portion of the jamb cross-section, said flange and frame members having projections thereon extending transversely of the frame into the pockets formed by the jambs, a single resilient guide member positioned within the pockets at each side of the frame, each including separate flanges extending inwardly of the pockets and transversely thereof in engagement with the connecting portion of the associated jamb U-shaped cross-section and each including an abutment engageable with a projection on the leg portions of the U-shaped cross-section of the jamb and the centrally located longitudinally extending flange whereby the guide members may be resiliently moved inwardly of the pockets and are prevented from movement out of the pockets, a pair of recesses in the guide members opening inwardly of the frame and extending longitudinally thereof for receiving window sash, window sash mounted in the recesses including head jamb and sill members, pivot pin means secured to each side of the sash, each including an elongated stem at one end thereof having radial projections thereon extending into the opposite ends of the sill, an enlarged diameter portion at the other end of the pin means providing an abutment for locating the pin means relative to the sill member ends and for securing a counterweight to the pin means, a further recess in each recess also extending longitudinally of the guide members and opening inwardly of the frame and a camming head on the enlarged diameter portion of the pin means cooperable with the sides of the corresponding further recess in the guide members to lock the pivot pin means in a vertical position with respect to the guide members on tilting of the window sash out of the plane of the window frame.

2. Structure as set forth in claim 1, wherein the camming head of the pivot pin means is elongated and has a transverse dimension slightly larger than the enlarged diameter portion of the pin means at the other end of the pin means and substantially equal to the transverse dimension of the further recesses in the guide members, the longitudinal edges of the camming head tapering toward the ends thereof and arcuate ends on the camming head whereby on initial tilting of the sash, the camming head of the pivot pin means initially maintains sliding engage-

ment with the sides of the further recess and subsequently cams into locking engagement with the further recess to lock the sash in a tilted position.

3. Structure as set forth in claim 1, wherein the camming head is elliptical and has a minor axis slightly greater than the enlarged portion of the other end of the pivot pin means and further including concave arcuate portions having substantially the same curvature as the ends of the ellipse in the further recesses to receive the ends of the camming head on tilting of the window sash.

4. Structure as set forth in claim 1, wherein the camming head of the pivot pin means is circular and a still further recess is provided in the guide members extending into and transversely of the longitudinally extending further recesses therein for receiving the camming head on tilting of the window sash.

References Cited

UNITED STATES PATENTS

2,870,494	1/1959	Love et al.	49—440
3,133,323	5/1964	Robards	49—181 X
2,862,258	12/1958	Oehmig	49—430
2,871,522	2/1959	Nardulli	49—440 X
2,877,514	3/1959	Mears	49—430
3,118,190	1/1964	Love	49—181 X
3,146,501	9/1964	Peters	49—174
3,199,154	8/1965	Johnson	49—419 X
3,235,916	2/1966	Dunsmoor et al.	49—174 X
3,336,698	8/1967	MacGregor	49—423 X

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U.S. Cl. X.R.

49—419