March 14, 1967 H. THAMS 3,308,579

WINDOW CONSTRUCTION

Filed March 23, 1965 2 Sheets-Sheet 1

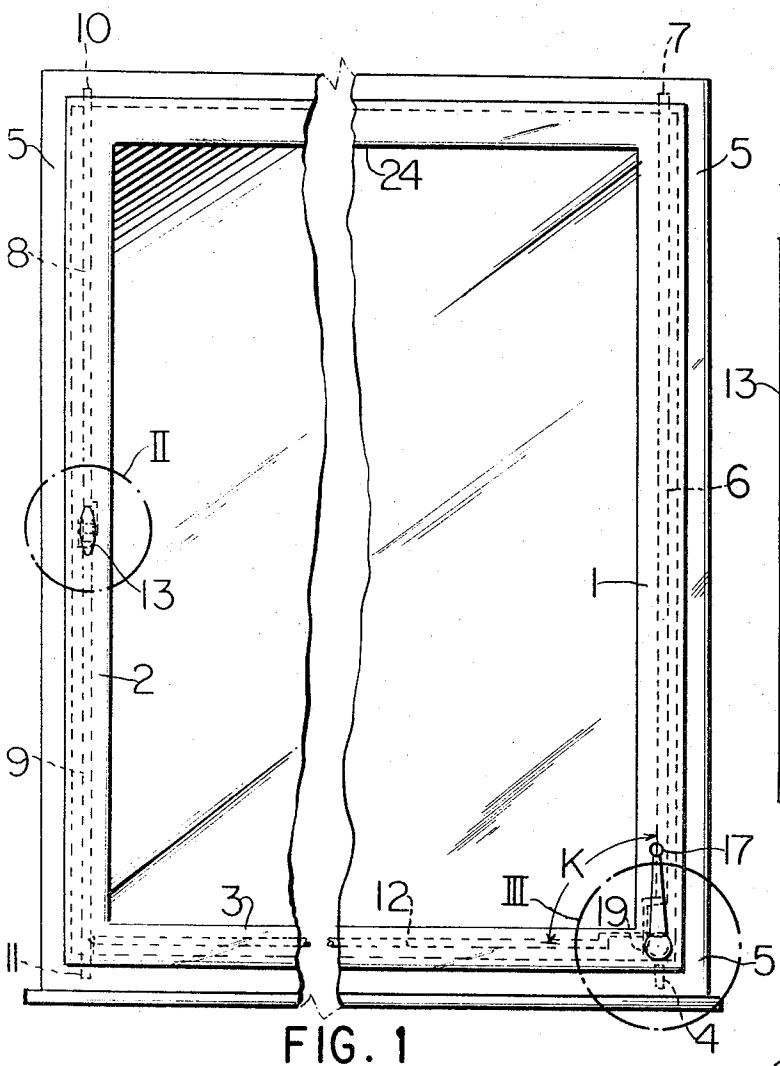


FIG. 1

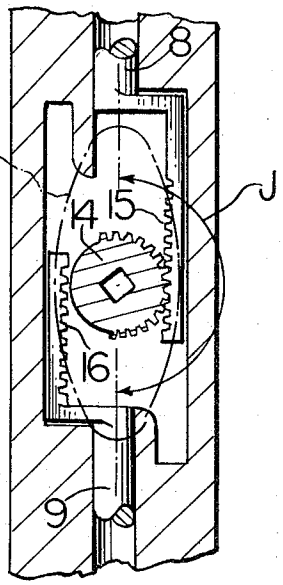


FIG. 2

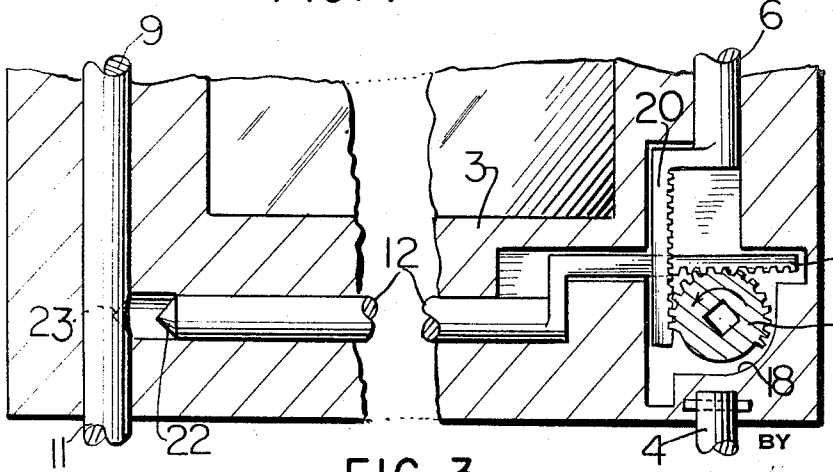


FIG. 3

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WINDOW CONSTRUCTION

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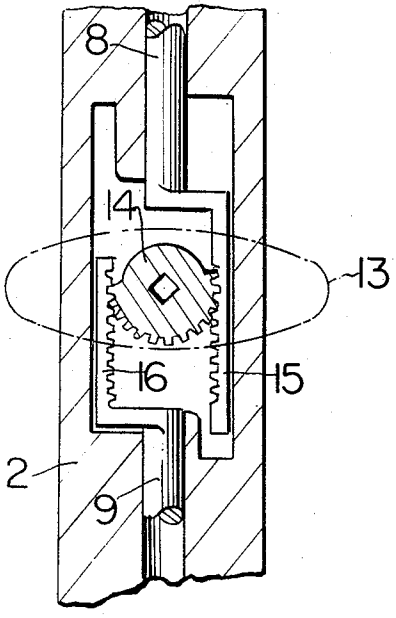


FIG. 4

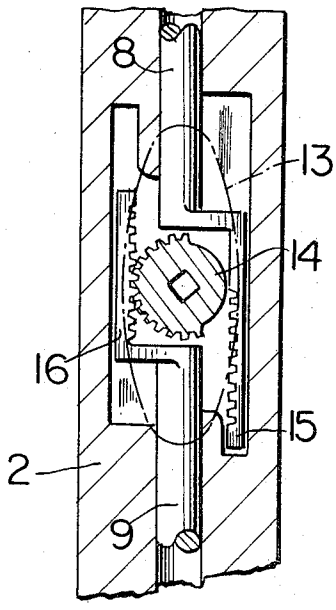


FIG. 5

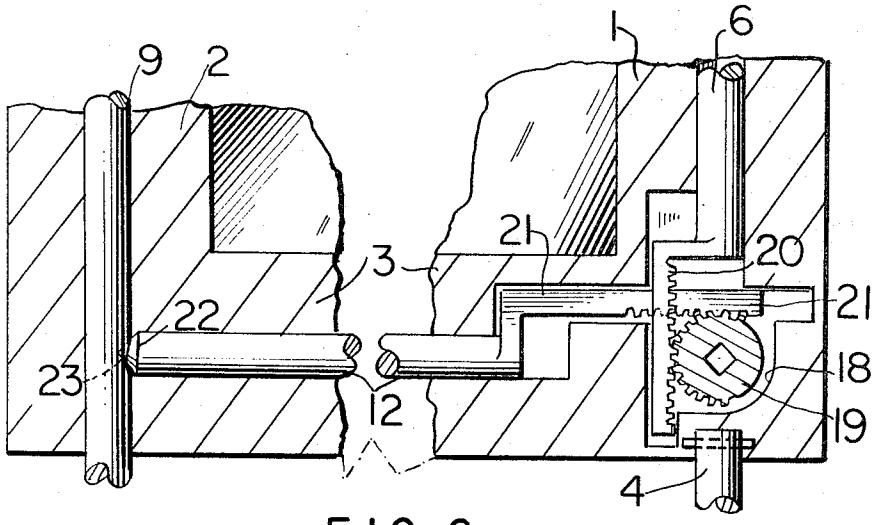


FIG. 6

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3,308,579

WINDOW CONSTRUCTION

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Claims priority, application Germany, June 5, 1964, T 26,310
1 Claim. (Cl. 49—192)

This invention relates to a novel window which may be opened completely by a swivel movement on one vertical member or partially by a tilting movement in the manner of a transom.

Windows which can be swung open or tilted open are known but are not suitable because they require a complicated series of manipulations which if not performed properly may result in the window becoming detached from its frame. Moreover, they require fastening means such as fittings, screws and the like which are particularly expensive to attach to windows made of metal or synthetic materials such as plastic.

It is an object of the invention to provide a novel window capable of being swung open or tilted open with a simple manipulation.

It is another object of the invention to provide a novel window capable of being swung open or tilted open which requires a minimum of fastening means.

These and other objects and advantages will become obvious from the following detailed description.

The swingable and tiltable window of the invention is comprised of a window having a lower rotation axis and tilting guide means in one of the vertical members, a rod in said vertical member as the upper rotation axis slidably engaged with a slidable rod in the lower horizontal member, a slidable rod in the second vertical member with means for engaging the slidable rod in the lower horizontal member and means for moving the slidable rods. The parts serving as the tilting guide are preferably made of synthetic material such as a polyamide but other materials may be used.

Operation of the window merely requires two manipulations with which the entire lever system is brought into position for the desired opening movement without any false moves. Also, the arrangement of the lever system is restricted to the window frame itself and does not require a separate mounting frame for the lever system.

Referring now to the drawings:

FIG. 1 is a cross-sectional view of a window frame of the invention.

FIGS. 2, 4 and 5 are enlarged cross-sectional views of the vertical locking mechanism of II of FIG. 1 in different positions.

FIG. 3 and FIG. 6 are enlarged cross-sectional views of the lower horizontal locking mechanism of III of FIG. 1 in different positions.

In the embodiment illustrated in the figures, the entire lever system for all the movements of the rectangular window frame is in the two vertical members **1** and **2** and in the lower horizontal member **3**. Vertical member **1** contains the bearing means for the swing movement of the window which consists of a lower fixed stud **4** in engagement with the socket of the mounting frame **5** and a longitudinally slidable rod **6** whose upper end **7** can be engaged with a socket in said frame **5**. The lever means for locking the window frame in closed position is in the vertical member **2** and is comprised of an upper partial rod **8** and a lower partial rod **9** whose respective ends **10** and **11** are engageable with sockets in frame **5**. In the lower horizontal means **3** of the window, there is a rod **12** connected with rod **6** and slidably adapted for engagement with rod **9**.

In FIGS. 1, 2 and 3, the window and the lever means are shown in their closed and locked positions. In FIG. 2, the partial rods **8** and **9** have respective gear tracks **15** and **16** for ratchet gear **14** which is only partially toothed and which is turned by handle **13** which is shown in FIG. 2 by a dot-dash line. The gear **14** is engaged with gear track **15** when the window is locked and to completely unlock the vertical means **2**, handle **13** is rotated 180° as indicated by arrow J wherein the ratchet gear **14** turns first on track **15** which pulls rod **8** down thereby disengaging its end **10** from its socket in frame **5** and then turns on track **11** which pulls rod **9** up thereby disengaging its end **11** from its socket in frame **5**. The vertical means **2** is then in an unlocked position for swinging the window open. FIG. 4 illustrates the position when the top is unlocked and FIG. 5 illustrates the position when both top and bottom are unlocked and the window may be swung open, the horizontal locking means is in the position illustrated in FIG. 3.

In FIG. 3, lever **17** of FIG. 1 is in a vertical position and the end **7** of rod **6** is engaged in its socket of the window frame **5**. The handle **17** is rigidly secured to ratchet gear **19** which has a double action tooth gear which engages gear track **20** on the lower end of rod **6** and gear track **21** on the end of rod **12**. Ratchet gear **19** is in a wing socket **18** capable of being closed. The other end of rod **12** has a head **22** which is capable of engaging socket **22** in rod **9** when rod **9** is in a locked position as shown in FIG. 2. When the vertical locking means is in the unlocked position of FIG. 5 and the horizontal locking means is in the position of FIG. 3, the window may be swung open whereby it pivots on rod **6** whose end **7** is in its upper socket of the window frame **5** and on stud **4**.

To tiltably open the window at the top, the lever **13** is only turned through 90° and the vertical locking means is shown in FIG. 4. At this point, the rod **8** has been retracted so that its end **10** is disengaged from its socket in the frame but end **11** of rod **9** is still engaged with its socket in the frame. The lever **17** is turned through 90° as indicated by arrow K whereby the head **22** of rod **12** is engaged with socket **23** of in rod **9** and end **7** of rod **6** is withdrawn from its socket in the frame. Thus, the upper horizontal member **24** is free from the window frame **5** while the lower horizontal member **12** is not free. The upper member **24** can be brought into its tilting position in which it is held by known gripping means not shown.

As can be seen from the drawings, the ratchet gear drives may be calibrated so small that they can be in chamber-like sockets without difficulty. These sockets will not impair the rigidity of the vertical and horizontal members and can be easily recessed during construction of the window, especially those made of synthetics such as plastics. The sockets may be covered in the final assembly with correspondingly shaped cover plates about the levers. The apparatus requires a minimum of mechanical parts and other accessories such as fittings, screens, etc.

Various modifications of the window of the invention may be made without departing from the spirit or scope thereof and it is to be understood that the invention is intended to be limited only as defined in the appended claim.

I claim:

A swingable and tiltable window mounted in a fixed frame comprising a window having a combination lower rotation axis and tilting bearing means at the lower end of one of its vertical members, a rod slidable in said vertical member which extends beyond the top margin of the sash for cooperation with a recess in the fixed frame to form the upper rotation axis, an upper partial rod slidable in the second vertical member which extends beyond the top

margin of the sash for cooperation with a recess in the fixed frame for locking the sash against movement and a lower partial rod slidable in the second vertical member which extends beyond the lower margin of the sash for cooperation with a recess in the fixed frame to form a pivot bearing for tilting the sash about a lower horizontal axis, the said upper and lower partial rods being movable through a double action ratchet gear whose rotation through 90° moves the upper partial rod and whose rotation through 180° moves both partial rods, a rod slidable in the lower horizontal member for engagement with a recess in the lower partial rod to lock the said partial rod when it cooperates with the recess in the fixed frame, the rod in the vertical member and the rod in the lower member of the sash being movable through a double action ratchet gear to simultaneously engage the rod in the lower

member with the recess in the partial lower rod and retract the rod in the vertical member from the recess in the fixed frame.

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