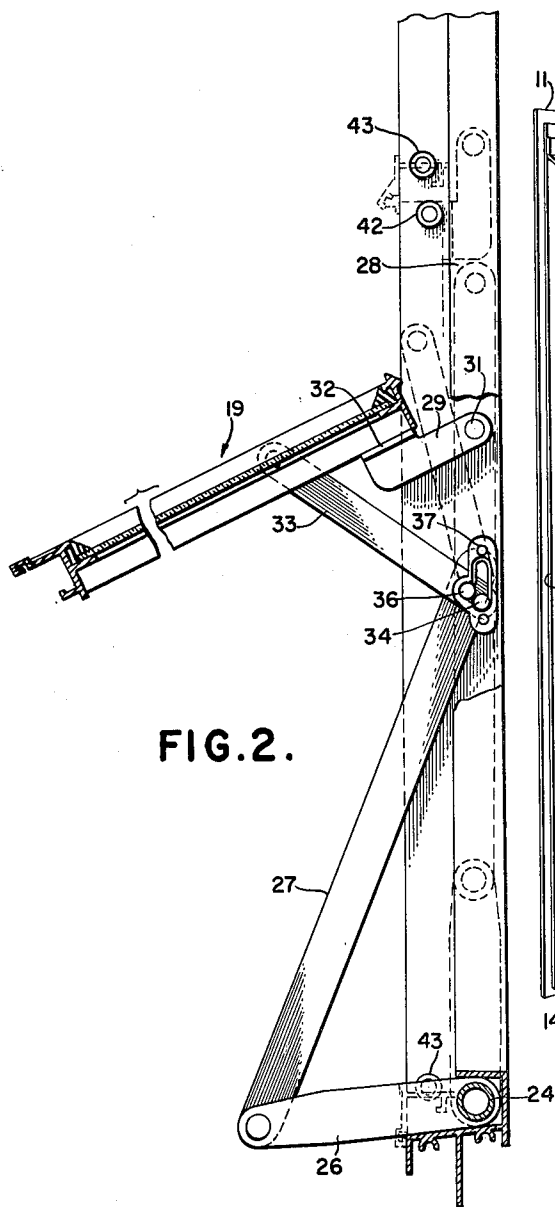


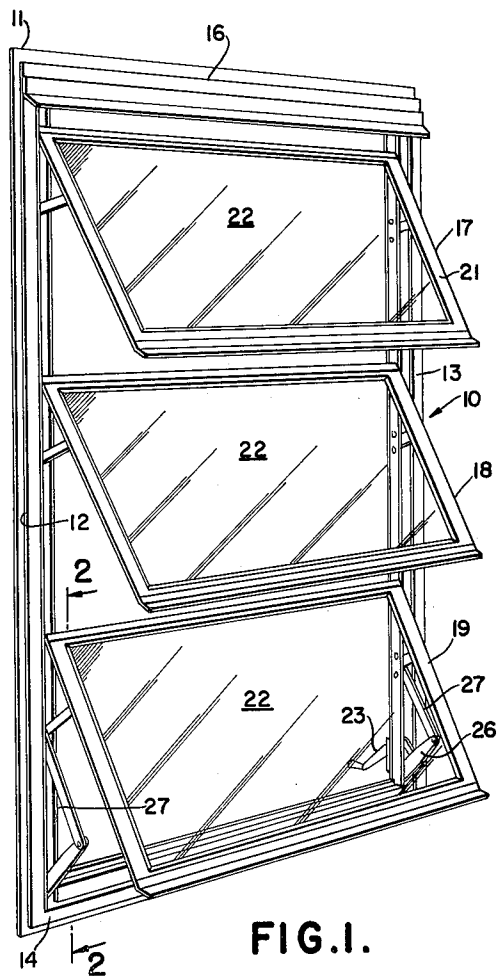
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AWNING WINDOW

3 Sheets-Sheet 1



**FIG.2.**



**FIG.1.**

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AWNING WINDOW

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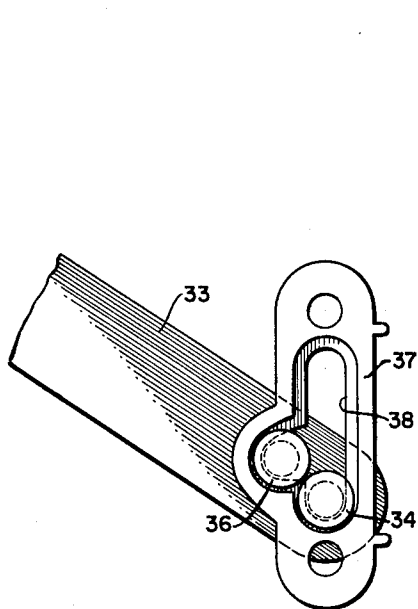


FIG. 3.

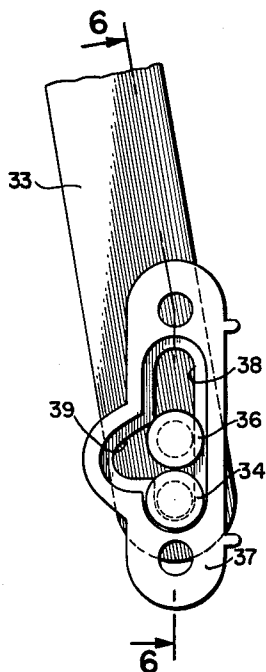


FIG. 4.

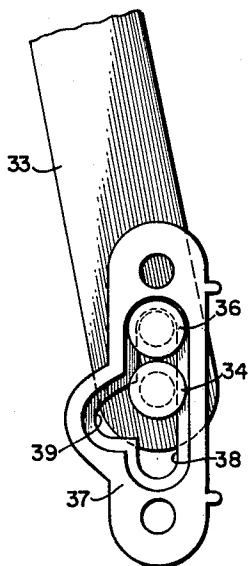


FIG. 5.

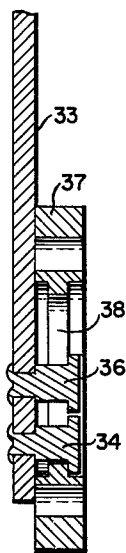


FIG. 6.

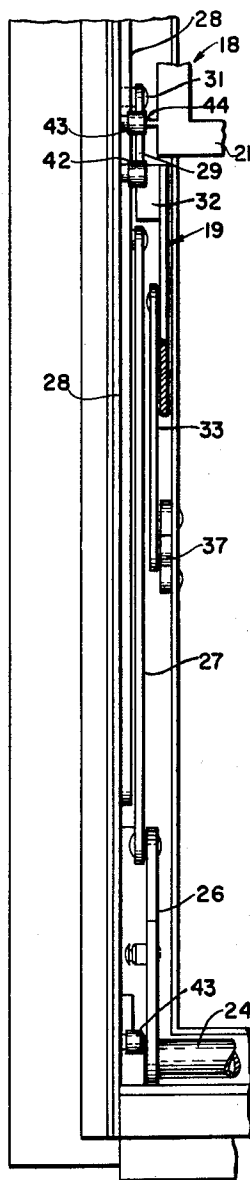


FIG. 7.

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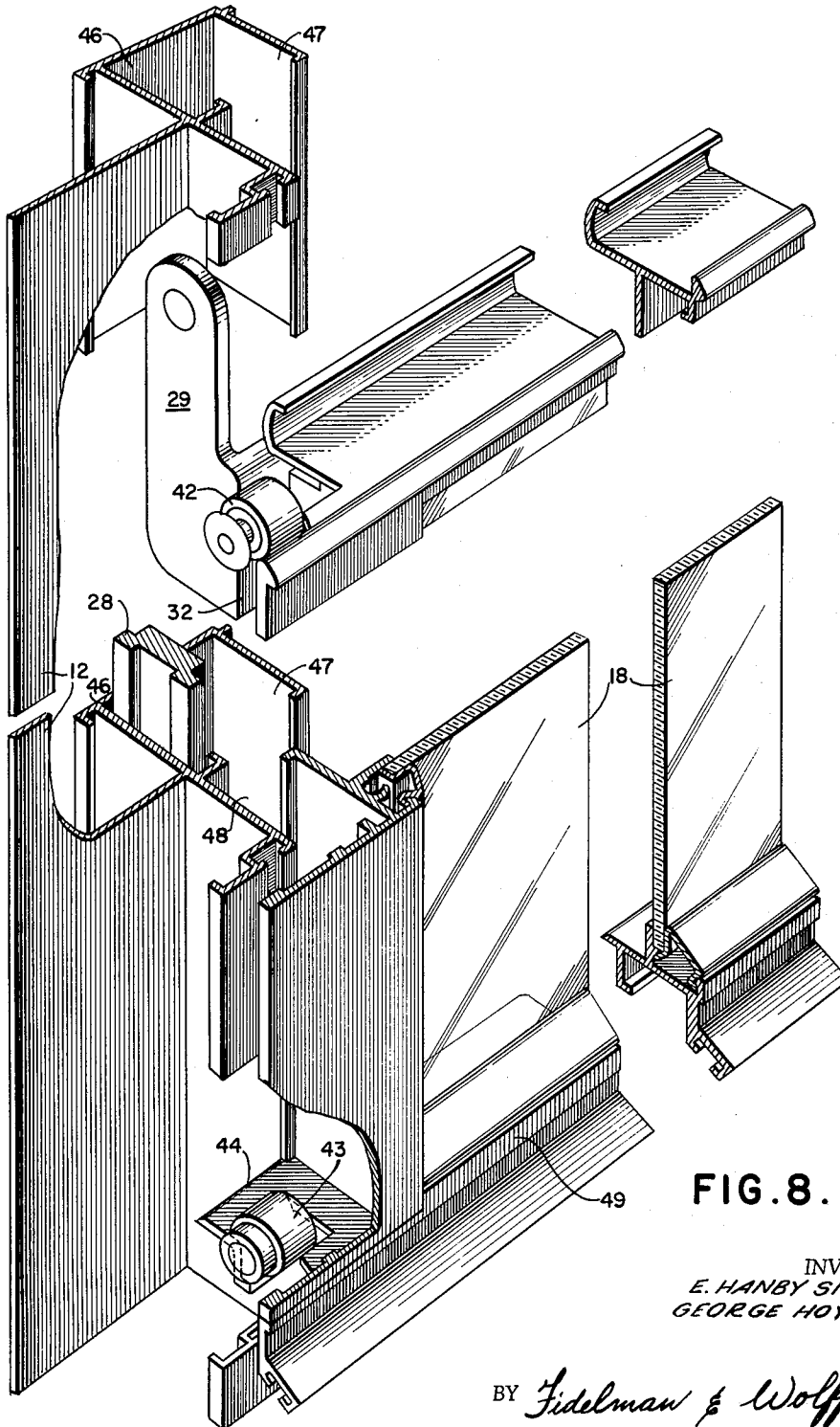
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3 Sheets-Sheet 3



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## AWNING WINDOW

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1 Claim. (Cl. 20—42)

The present invention relates to awning windows, and more particularly to awning windows having improved locking arrangements for the windows in both the open and closed positions.

Awning windows are those type of windows which are provided with a plurality of panes or vents usually mounted in vertical array. Through a common operator, the windows may be swung between open and closed positions, the swinging taking place in a vertical plane. More particularly, in some improved constructions of such windows, there is first effected a downward sliding movement of the vents, followed by an outward swinging movement, this being in a vertical plane as aforementioned. On the closing movement, the reverse order of operation occurs; that is, the vents are first swung in a vertical plane until they are in a position generally flush with the window frame, and then are moved upwardly in a linear motion.

In this type of awning window, it is desirable that the vent be firmly held, or locked, in the fully open position, in order that it may be as strong as possible and resist forces imposed thereon, as by the wind. It is also desirable that these vents be securely locked in the closed position so as to prevent any accidental opening of them, and so as to prevent rattling of them.

There has heretofore been suggested various constructions of locks for the vents while in closed position. Those known constructions have been, however, of expensive construction and generally complex. For example, one such construction required an expensive molded fitting which permitted only a sliding motion between the abutting surface on the vent and the fitting.

An object of the present invention is to provide positive locking of an awning type window.

Another object of the present invention is the provision of an awning type window having positive locking in both the open and closed positions.

Yet another object of the present invention is to provide an improved locking arrangement for an awning type window when in the closed position, which locking arrangement will be of simple and economical construction.

A still further object of the present invention is the provision of an awning type window with a locking arrangement for the closed position which provides for rotary motion between the locking parts.

Another object of the present invention is the provision of a locking arrangement for an awning type window when the vents are in open position.

Another object of the present invention is the provision of an awning type window having a lock for the vents when the vents are in open position, which lock is positive in operation and which may be readily and automatically released.

Yet another object of the present invention is to provide an open position lock for the vent of an awning type window where the window is of that type which swings vertically from an open to a closed position and which then slides to a secured position.

Other objects and many of the attendant advantages of the present invention will be apparent from the following description and drawings wherein:

FIG. 1 is a perspective view of an awning window in accordance with the present invention.

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FIG. 2 is a cross-sectional view taken on the line 2—2 of FIG. 1.

FIGS. 3, 4 and 5 are detail views showing the vent link in three different positions.

FIG. 6 is a cross-sectional view taken on the line 6—6 of FIG. 4.

FIG. 7 is a front elevation, with parts removed, showing the same structure as in FIG. 2.

FIG. 8 is an enlarged isometric view with parts removed illustrating the locking structure at the vent sill and at the vent bracket regions of the awning window.

Referring now to the drawings, wherein like or corresponding reference numerals are used to designate like or corresponding parts throughout the several views, there is shown in FIG. 1 an awning window generally designated 10 and comprising a window frame 11 extending in a generally rectangular configuration. The frame 11 comprises frame sill 14 and frame header 16 and a pair of vertically disposed frame jambs 12 and 13, each jamb having, of course, the same structural details. There may also be seen in FIG. 1 the three vertically spaced vents 17, 18 and 19, each of which comprises a frame 21 and a glass pane 22.

Operation of the vents 17, 18 and 19 is initiated, in known manner, by rotation of a crank 23 having a suitable connection with a torque bar 24, which may be seen in FIGS. 2 and 7. Rotation of the torque bar 24 causes the torque arms 26 to rotate, to thereby actuate the two connecting bars 27.

Referring now to FIG. 2, there may be seen the aforementioned torque bar 24, the torque arm 26 and the connecting bar 27, which latter is pivotally connected at its upper end to the linkage bar 28. Linkage bar 28 is constrained to slide in a suitable channel extending linearly of the jamb portion 12.

Secured to the upper part of each of the vents is a vent bracket 29 which is also pivotally secured, as at 31, to the linkage bar 28. As may best be seen in FIGS. 2, 7 and 8, the vent bracket 29 has thereon a laterally extending abutting surface 32, the function of which will be hereinafter described. A vent link 33 is pivotally connected at its upper end to the vent, and carries two shouldered pins at its lower end. These pins, comprising the lower pin 34 and the upper pin 36, coact with a vent link slide block 37 which is secured to the jamb, 12, as may best be seen in FIGS. 2 and 7.

Referring now to FIGS. 3 to 6, it may be seen that the vent link slide block 37 has a generally vertically extending slot 38 and a recess 39 therein adjacent to and communicating with the slot 38. The recess 39 is slightly above the bottom of the slot 38 and is toward the vent, as is clearly shown in FIG. 2.

As may be seen from FIG. 6, the pins 34 and 36 may be provided with suitable shoulders to provide for engagement with co-acting shoulders on the block 37.

In operation of the mechanism thus far described, when the parts are in the full line position shown in FIG. 2, to which corresponds the position shown in FIG. 3, the pin 34 will be lodged at the bottom of slot 38 and the pin 36 will be lodged in the recess 39, so that there will be a rigid holding of the vent in the open position. Upon turning of the crank 23, the torque bar 24 will be caused to rotate, to thereby rotate the torque arm 26 in a clockwise direction, and to thereby raise the linkage bar 28 through the intermediary of the connecting bar 27. This will in turn raise the pivot 31, so as to carry upwardly the vent bracket 29 and in fact, the vent itself. The upper end of vent link 33 will thereby be caused to rotate about pin 34, so as to bring pin 36 out of the recess 39 (see FIG. 4) and into the slot 38. Upon continued upward movement of the linkage bar 28, the pins 34 and

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36 will be raised to the position shown in FIG. 5, being carried thereby the vent bracket 29, the vent to which it is attached and vent link 33. When in the position shown in FIG. 5, it is impossible for vent link 33 to rotate, and its only possible motion is to descend along the slot 38 back to the position shown in FIG. 4, and thence into the position shown in FIG. 3.

By the above construction, and particularly that of the vent link pins 34 and 36 and the vent link slide block 37, the vents will be held firmly in the fully open position and the awning window 10 will have a rigid and durable construction for maintaining it in this position against all loads imposed upon it.

FIGURE 8 shows in detail the cross-sectional shape of jamb 12 illustrating among other things, how linkage bar 28 slides vertically inside a channel 46 disposed adjacent the rear of jamb portion 12. A flange 47 disposed opposite channel 46 on jamb 12, serves for mounting slide block 37 thereon (not shown in FIG. 8). The vertical channel-like 48 surface toward the front, so to speak, of jamb 12 has mounted thereon locking rollers 42, 43 at appropriate locations. This displacement of locking rollers 42, 43 from linkage bar 28 may, perhaps, best be seen in FIGURE 2. Although only one roller 42 and one roller 43 are illustrated in FIGURE 8, it should be appreciated that the jamb 12 has mounted thereon a higher or upper roller 42 and a lower roller 43 for each vent of the window, the upper rollers co-acting with the vent brackets 29 and the lower rollers co-acting with the vent sills 49 to lock the vents in closed position.

The specific positioning of each lower locking roller 43, is, as shown in FIGURE 8, adapted for locking engagement in the closed and closing position by an abutment surface 44 which forms an extension of the vent sill 49. FIGURE 8 specifically illustrates how abutting surface 44 on the vent sill 49 of vent 18 engages locking roller 43 to the rear thereof when the vent is closed.

Each upper roller 42 is positioned for abutting engagement with the surface 32 on vent bracket 29, again in a closing and closed position of the vent. The abutting engagement of locking roller 42 with surface 32 is again to the rear of the roller. FIGURE 2 shows how rollers 42, 43 associated with different vents, e.g. 17, 18 are actually disposed adjacent each other (being, however, vertically and horizontally off-set one from the other) and co-act to maintain a tightly closed window by their locking action on adjacent vents 17, 18 or 18, 19.

During the closing motion of the vents, as will be understood from the above description, the vents are first swung in a vertical plane until they are generally flush with the jamb portions of the frame 11; thereafter, they will be urged linearly in an upward direction parallel to frame 11 by the continuing upward movement of linkage bar 28. During this upward movement the abutting surface 44 on the vent frame will engage the locking roller 43 which will then rotate as necessary, this being in a counter-clockwise direction as viewed in FIG. 8. At first the abutting surface 44 will engage the locking roller 43 at a point on the roller periphery inwardly, or to the left of a vertical plane passing through the pivotal axis of locking roller 43 and during further closing movement will thereby be urged towards the inner part of the window, to thereby more securely lock the vent, by the inward movement. In similar fashion, the abutting surface 32 on vent bracket 29 will strike some point on the periphery of the locking roller 42 and will be urged inwardly, or away from the observer as is shown in FIG. 8.

The action of these locking rollers, provides positive locking for the vents in the closed position with an extremely simple structure lending itself to a rotary cam-

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ming motion, rollers 42, 43 being, of course, freely rotatable around the rivets or pins on which they are mounted.

Ideally, the vents should close with virtually no stress being exerted on rollers 42, 43 by the vents, but as a practical matter virtually no installed window retains perfect alignment over years of use. For this reason, the rotary and camming motion by action of rollers 42, 43 is peculiarly advantageous for the awning window as a whole. Misalignment will simply cause the edge surface 32 of vent bracket 29 to actually strike an upper roller 42 instead of gently abutting the same as the vent closes and will occasion a rotary movement of roller 42 which cams surface 32 on vent bracket 29 into its proper abutting position. In like manner, lower roller 43 will cam the lower frame portion of the vent into proper alignment. Also since the rollers turn freely the point of actual impact on roller 42 or 43 (which may be made from nylon or any suitable plastic) nearly always occurs at a different location on the periphery of the roller. As a result, cutting of the roller material does not occur; instead the roller periphery wears down in a relatively uniform manner. Thus, the awning window as a whole is capable of a lengthy period of trouble free operation even with a sloppy installation and severe or abusive use.

It will be obvious to those skilled in the art that various changes may be made without departing from the spirit of the invention and therefore the invention is not limited to what is shown in the specification, but only as indicated in the appended claim.

What is claimed is:

An awning window comprising a window frame having a pair of vertically disposed jamb portions, a linkage bar slidably mounted along each of said jamb portions, means for sliding said linkage bars along said jamb portions, a plurality of vents positioned one above the other on said window frame for vertical swinging movement from said window frame, vent brackets secured at the upper part of each vent and pivotally attached to a said linkage bar, vent links each pivotally mounted at one end to a said vent, means mounting the other end of each said vent link to said window frame, and comprising a block having a generally vertically extending slot therein, said block having a recess therein adjacent to and communicating with said slot, said recess being slightly above the bottom of said slot and towards said vent, said vent link having upper and lower pins thereon extending at least partially through said block, said upper pin being positioned to enter said recess when said vent is opened while said lower pin is at the bottom of said slot, whereby upon upward sliding of said linkage bar said vents will be given an inward swinging motion to a position generally flush with said jamb portion and then will be moved linearly upwardly, said vents having outwardly facing abutting surfaces adjacent the upper and lower margins thereof, and locking roller means on each said jamb portion for urging said vents inwardly during said linear movement comprising a first upper roller positioned to be engaged by a said upper abutting surface and a second lower roller positioned to be engaged by said lower abutting surface.

# References Cited by the Examiner

## UNITED STATES PATENTS

1,132,652	3/1915	Crane	189—67 X
2,693,622	11/1954	Brenner	20—42
2,905,981	9/1959	Brenner	20—42
3,044,131	7/1962	Reynaud	20—42

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