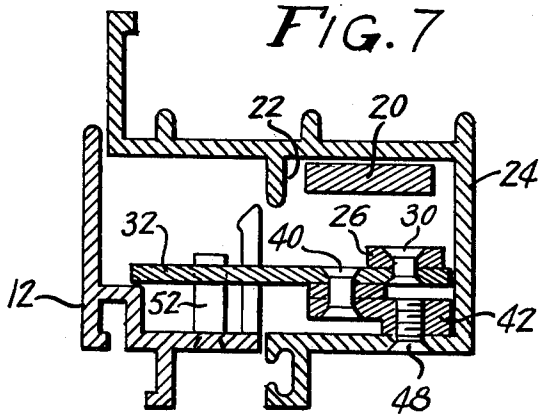
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LOCKING MECHANISM FOR AWNING WINDOWS

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FIG. 7



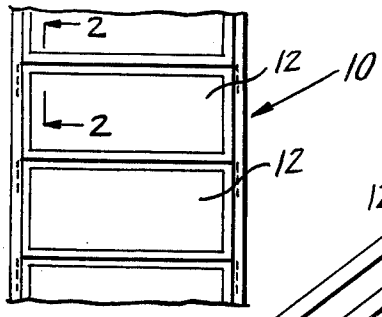


FIG. 1

FIG. 4

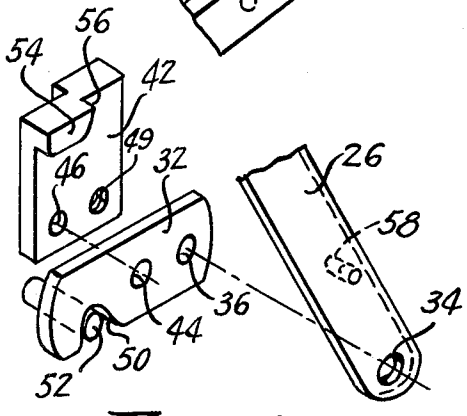


FIG. 8

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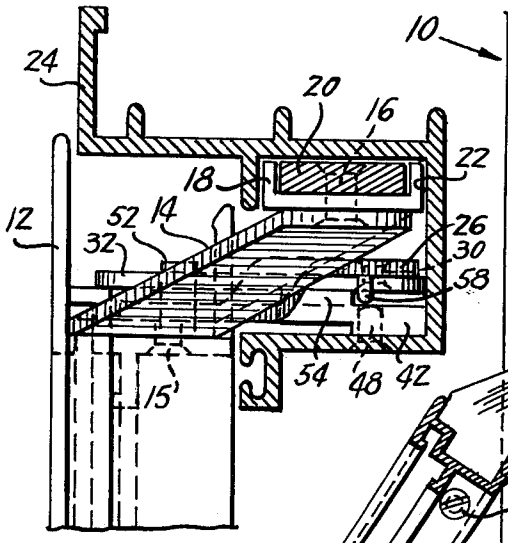
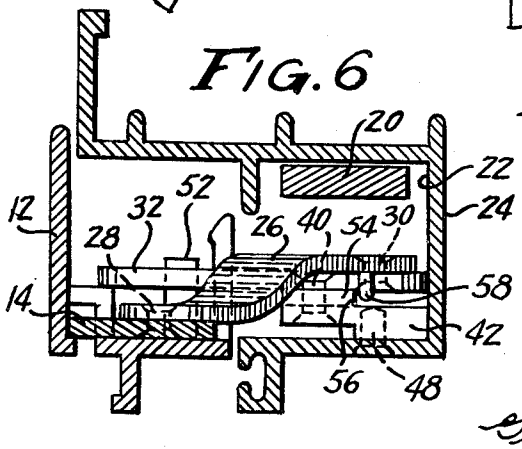


FIG. 5

FIG. 6

FIG. 3

FIG. 2



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LOCKING MECHANISM FOR AWNING WINDOWS

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7 Claims. (Cl. 20—42)

This invention relates to awning type windows, and it particularly relates to a new and improved locking means for such type windows.

Awning type windows, which are becoming increasingly popular, generally comprise a plurality of sashes or vents simultaneously swingable about horizontal axes between open and closed positions. This simultaneous movement is usually effected by a vertically movable travel bar operatively associated with all the vents. One of the vents, usually the lower one, is employed as the control vent, the operation of which controls the movements of all the other vents.

It has generally been the practice, heretofore, to provide a latch mechanism only on the control vent, the latching of the control vent serving to latch all the others. It was found, however, that this type of arrangement was unsatisfactory because, unless the tolerances between the connecting parts were unusually close, there would be sufficient play between them to prevent complete closing of the other vents. Consequently, the other vents could often be pried open by a tool or other device to permit unauthorized entry. Furthermore, the incomplete closure of these vents resulted in the formation of undesirable drafts and leakages.

In order to overcome the above difficulties, it was, heretofore, proposed to make various types of positive latching mechanisms for the individual vents. However, all these prior efforts were subject to one or more disadvantages such as either being unduly complex and difficult to manufacture and install, or being insufficiently effective to adequately perform the desired purpose while being subject to easy breakdown or disrepair.

It is one object of the present invention to overcome all the aforesaid difficulties by providing a latch mechanism which will automatically but positively latch all the vents individually but simultaneously in such a manner that each vent will be completely closed and locked.

Another object of the present invention is to provide a latch mechanism of the aforesaid type which does not require unduly close tolerances of the various parts thereof.

Another object of the present invention is to provide a latch mechanism of the aforesaid type which is relatively simple in construction, easy to install and easy to operate.

Other objects of the present invention are to provide an improved latch mechanism of the character described, that is easily and economically produced, which is sturdy in construction, and which is highly efficient in operation.

With the above and related objects in view, this invention consists in the details of construction and combination of parts, as will be more fully understood from the following description, when read in conjunction with the accompanying drawings, in which:

FIG. 1 is a fragmentary, front elevational view of an awning vent window provided with a latch mechanism embodying the present invention.

FIG. 2 is a fragmentary sectional view taken on line 2—2 of FIG. 1, with the vent in closed, locked position.

FIG. 3 is a view similar to FIG. 2, but showing the vent in partly open position.

FIG. 4 is a view similar to FIGS. 2 and 3, but showing the vent in fully open position.

FIG. 5 is a sectional view taken on line 5—5 of FIG. 2.

FIG. 6 is a sectional view taken on line 6—6 of FIG. 2.

FIG. 7 is a sectional view taken on line 7—7 of FIG. 2.

FIG. 8 is an exploded perspective view of the latch elements and their associated parts.

Referring in greater detail to the drawings, wherein similar reference characters refer to similar parts, there is shown an awning type window, generally designated 10, having a series of vertically arranged, horizontally hinged vents 12.

Each vent 12 is provided at its upper edge with a pair of hinge arms 14 secured thereto as by a stud screw 15, one adjacent each upper corner of the vent. Each of these arms 14 is pivotally connected as by a pivot rivet 16, through U-shaped nylon bushing 18 to a vertically movable slide bar 20. The bar 20 moves within a channel 22 of the corresponding jamb 24 of the main outer frame of the window, and the flanges of the bushing reduce friction between the slide bar 20 and the jamb, and the bushing also reduces friction between the arms 14 and slide bar 20.

A link 26 is pivotally connected at 28 to the vent 12 while, at the link's opposite end, the link 26 is pivotally connected by a rivet 30 to a latch bar 32, the rivet 30 extending through mating holes 34 and 36 in the link 26 and latch bar 32 respectively (see FIG. 8). The latch bar 32 is also pivotally connected by a rivet 40 to a cam block 42, the rivet 40 extending through mating holes 44 and 46 in the latch bar 32 and cam block 42 respectively (see FIG. 8). The cam block 42 is connected to the jamb 24 by screw 48, threaded through the jamb into hole 49.

The latch bar 32 is provided with an undercut notch 50 adapted to engage over a lock pin 52 on the vent 12 in the manner of a hook.

The cam block 42 is provided on its upper portion with a cam 54 defined by a cam surface on its upper edge and by a second cam surface on a rear shoulder 56. A follower pin 58 is provided on link 26 to coact with cam 54.

In operation, when the vent 12 is moved from the fully open position (FIG. 4) to the closed position (FIG. 2), follower pin 58 first engages the underside of cam 54 (as in FIG. 3) and then follows the cam face of cam 54. During this movement, the latch bar 32 first pivots upwardly along with link 26 into the position wherein the pin 52 can pass under the latch bar into notch 50 (as in FIG. 3).

The engagement of follower pin 58 with the underside of cam 54 and the movement of the link latch bar pivot 30 act to prevent the latch notch end of the latch bar 32 from pivoting downwardly until the follower pin 58 has passed beyond the underside of cam 54 to the cam surface on the rear shoulder 56. Movement of the follower pin 58 along the cam surface on the rear shoulder 56 frees the latch link pivot 30, which is off-center to the cam block latch bar pivot 40, to exert a vertical force upward on latch bar link pivot 30, thereby pivoting latch bar 32 about latch bar cam block pivot 40, causing the latch notch 50 to move down and engage on lock pin 52, which has meantime moved into appropriate position, as shown in FIG. 2. In other words, as the vent 12 closes completely (as in FIG. 2), the pin 58 moves in a vertical direction along shoulder 56 of cam 54. The closing movement of the vent is due to the upward movement of slide bar 20 operable in any conventional manner. Consequently, after the vent has moved to the fully closed position (of FIG. 2), further upward movement of slide bar 20 pulls the latch bar up, through the link 26, thereby causing the latch

bar to pivot at 40 into the straight horizontal position wherein pin 52 is securely engaged in notch 50.

To open the window vents, the slide bar 20 is moved down causing the vent 12 to slide down thereby applying pressure to latch bar 32 at the area of rivet 30. This causes the latch bar to pivot at 40 into the release position whereby further downward movement of the slide bar 20 causes link 26 and arm 14 to pivot into the open position.

During opening, the engagement of pin 58 against cam 54 prevents any shaking or other vibration while, when the window vent 12 is in fully open position, the cam 54 acts as a stop against which pin 58 is adapted to abut to prevent accidental closing or undue vibration.

Although this invention has been described in considerable detail, such description is intended as being illustrative rather than limiting, since the invention may be variously embodied, and the scope of the invention is to be determined as claimed.

Having thus set forth and disclosed the nature of this invention, what is claimed is:

1. In an awning type window, a window frame including a pair of oppositely disposed side jambs, a channel in each of said jambs, a slide bar vertically movable in the channel of each of said jambs, at least one window vent having an upper edge, a lower edge and a pair of side edges, the upper edge of said vent being hingedly connected to both of said slide bars for hinged movement on a horizontal axis from a closed vertical position to an inclined open position, a link pivotally connected at one end to each side of said vent, each of said links being pivotally connected at its opposite end to a latch bar, each of said latch bars being pivotally connected to a cam block attached to the corresponding jamb, the pivotal connection between the links and the latch bars being off-center to the pivotal connection between the latch bars and the cam blocks, latch cooperating lock pins on said vent engageable with said latch bar when said vent is in said closed position, said link acting to move said latch bar into and out of engagement with said latch cooperating lock pins upon vertical movement of said slide bar, said cam blocks each having a cam, a cam follower on each link, said cam follower cooperating with said cam on said cam block to permit said link to first raise the latch end of said latch bar and then lower said latch bar latch end into lock pin cooperating position.

2. The window of claim 1, the hinged connection between said vent and said slide bars including an arm connected to each side of said vent adjacent the upper edge of said vent, each of said arms being pivotally connected to a corresponding slide bar.

3. The window of claim 1, said latch bar having an undercut notch forming a hook while said latch means comprises a pin on said vent, said hook being pivotally engageable over said pin.

4. The window of claim 1, said cam having a horizontal and vertical cam face, said follower pin being so arranged on its link that it initially engages the horizontal cam face during vent closing movement and then engages the vertical cam face during continued movement of the slide bar after the vent has moved into closed position.

5. In an awning type window, a window frame including opposite side jambs, at least one vent horizontally hinged between said side jambs to vertically movable slide bars, a pair of links pivotally connected at one of their ends to said vent and at the other of their ends to a latch bar connected to the corresponding jamb, latch means on said vent for releasable engagement by said latch bar, a pivot connecting each latch bar to its corresponding jamb, said pivot being off-center to the pivotal connection between the latch bar and the corresponding link, and cam means on each jamb to coact with a cam follower on the corresponding link, said cam means and cam follower serving as a guide means for said link while it is pivoting during closing movement of said vent caused by upward movement of said slide bars and thereafter serving to convert the pivotal movement of said link to straight line vertical movement during continued upward movement of said slide bars.

6. The window of claim 5, said latch bars each having a hook portion engageable over the corresponding latch means by pivotal movement of said latch bar, said latch bar being pivoted on its pivot by the off-center force exerted by its corresponding link.

7. The window of claim 5, said cam means comprising a cam block connected to the corresponding jamb, the corresponding latch bar being pivoted to said cam block which forms its connection to the jamb.

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