Oct. 24, 1967 A. MAURO 3,348,335

PIVOTABLE SASH WINDOW

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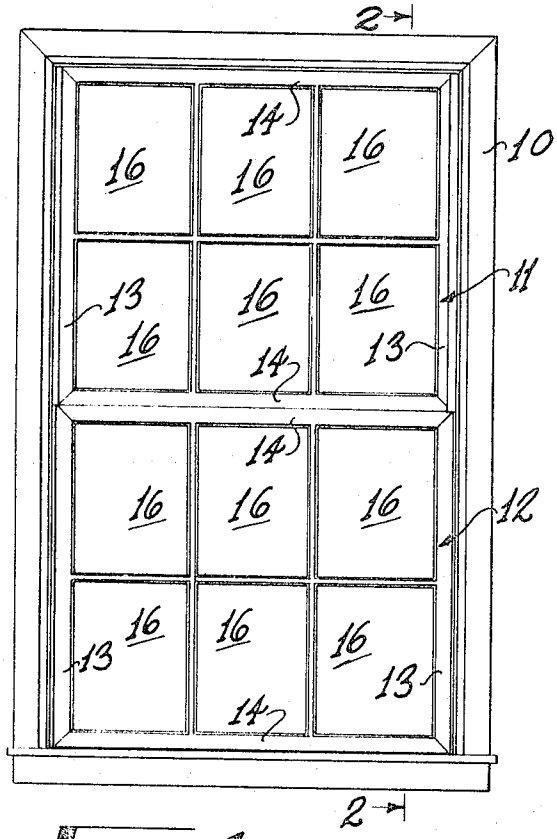


FIG 1

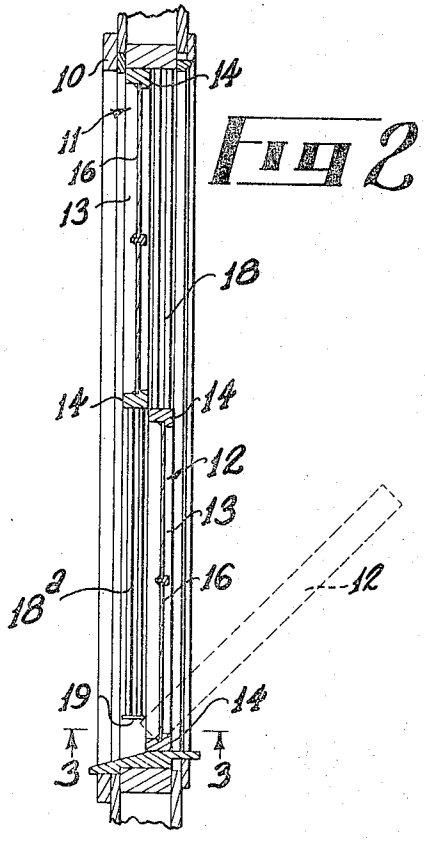


FIG 2

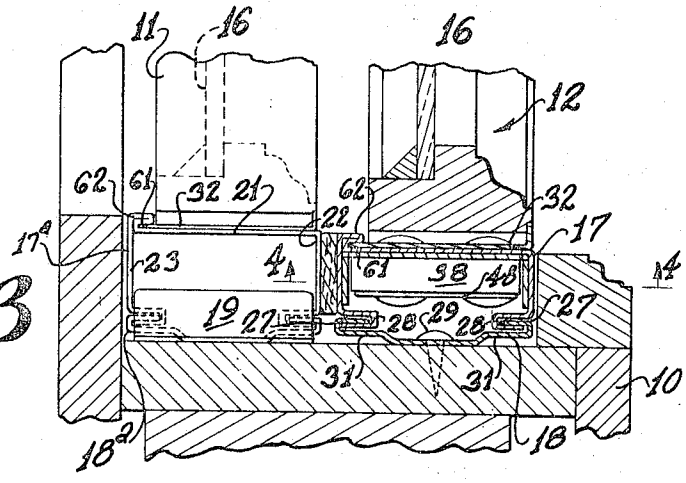


FIG 3

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Fig 6

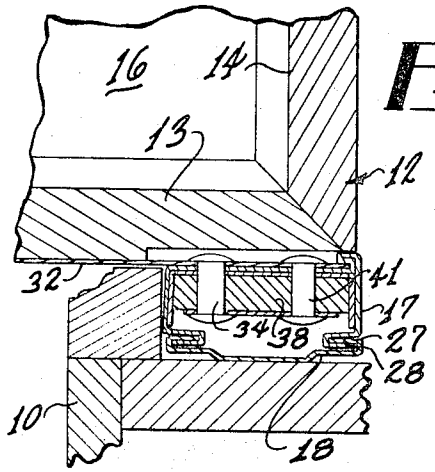


Fig 4

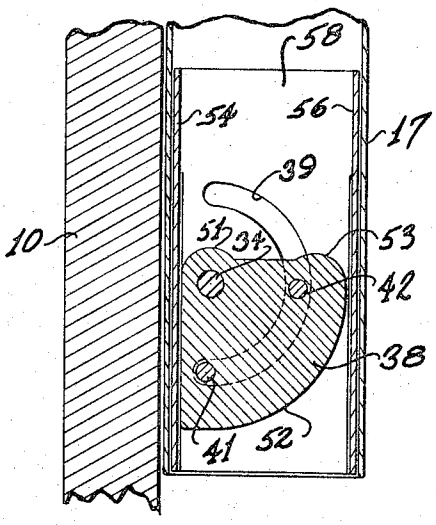
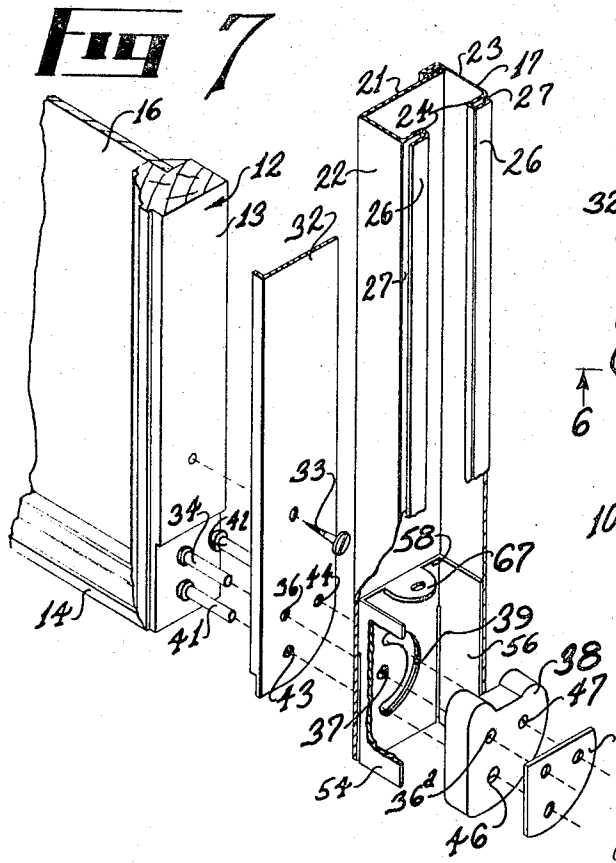


Fig 7



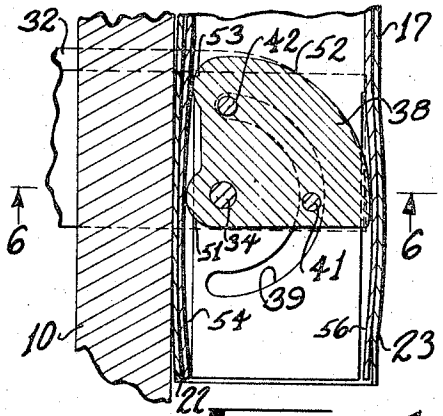


Fig 5

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PIVOTABLE SASH WINDOW

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ABSTRACT OF THE DISCLOSURE

A window in which the sash may be tilted to an angular position while at any vertical position in a window frame. A cam carried by the sash cooperates with the track and runner by which the sash is mounted in the frame to lock the sash in position when it is tilted.

This invention relates to sliding sash type windows. More particularly this invention relates to such windows in which the sash, while at various vertical positions, may be tilted or pivoted in louvre-like fashion to an angle between vertical and horizontal.

Summary of the invention

Briefly, my invention comprises a channel-like runner member pivotally secured to each of the stiles of each sash. The runner is slidably carried by a track mounted on the inner faces of the window frame. A cam is secured to the sash at the pivot point in position to cooperate with the flanges of the runner so that when the sash is tilted the flanges of the runners are urged outwardly against track member, thereby locking the sash in position on the track.

The primary object of my invention is to provide a sliding sash window, the sash being tiltable to any angle between vertical and horizontal, in which the sash is positively locked in its vertical position when tilted.

Another object of my invention is to provide a window of the character designated in which positive stop means is provided to hold the sash in the horizontal position.

Still another object of my invention is to provide a window of the character designated in which the pivotal movement of each sash is independent of the other, whereby the operation of one does not affect the operation of the other.

A further object of my invention is to provide a window of the character designated in which the sashes are flexibly supported in the window frame thus allowing for expansion and contraction of the sash structure.

A still further object of my invention is to provide a window of the character designated which is simple and economical to manufacture, easy to install, and durable in use.

Apparatus illustrating features of my invention is shown in the accompanying drawings forming a part hereof in which:

FIG. 1 is a front elevational view of a typical installation of my invention;

FIG. 2 is a vertical sectional view taken generally along the line 2—2 of FIG. 1;

FIG. 3 is a fragmentary detail horizontal sectional view taken generally along the line 3—3 of FIG. 2, and drawn to an enlarged scale;

FIG. 4 is a fragmentary vertical sectional view generally along the line 4—4 of FIG. 3;

FIG. 5 is a fragmentary vertical sectional view corresponding to FIG. 4 in which the sash has been tilted to the horizontal position;

FIG. 6 is a fragmentary detail sectional view taken generally along the line 6—6 of FIG. 5; and

FIG. 7 is an exploded isometric view of the operating parts, partly broken away and in section.

Referring now to the drawings, I show in FIG. 1 a double-hung sliding sash window, comprising a window frame proper 10 and upper and lower sashes 11 and 12 respectively. Each sash has side stiles 13 and rails 14 which support the glazing 16. The lower sash 12 is carried by a runner 17 which is adapted to slide along a track 18. In like manner the upper sash 11 is carried by a runner 17a adapted to slide along a track 18a. The track 18a is provided with a stop member 19 adapted to stop the downward movement of sash 11 several inches above the sill of the window frame 10, for a purpose later to appear.

The runners 17 and 17a each comprise a channel like member having a base portion 21 and leg portions 22 and 23. At the end of each leg portion there is an integrally formed flange like member 24 which extends inwardly of the channel 17 for some distance and is bent back upon itself as indicated at 26, thus forming an elongated recess 27 adjacent the lower portion of each leg 22 and 23 of the runner 17. This structure is shown most clearly in FIG. 7. An inturned flange 28 is provided on each edge of each track member 18 and 18a as shown in FIG. 3. The track flange 28 and the runner recesses 27 are disposed to interlock as shown, thus providing positive guides for the runner 17 in its vertical sliding movement relative to the tracks 18 and the window frame 10. The track itself comprises an elongated member the center portion of which is depressed relative to the edge portions. The tracks are secured to the frame by means of screws or the like 29 which pass through holes in the depressed center portion. Thus the edge portions 31 of the track 18 are spaced from the frame, as shown. The material of which the track 18 is made is flexible and therefore the raised edge portions 31 are adapted to give somewhat in order to allow for expansion or contraction of the various members of the window frame and sash structure.

A metal bearing plate 32 is secured to each stile 13 of the sash 12 by screws 33 as shown in FIG. 7. The purpose of this bearing member 32 is to provide a smooth sliding surface for the runner 17, as well as to provide a firm anchor for the pivot member securing the sash to the runner.

The sash is pivotally secured to the runner by means of a pivot pin 34 which may be in the form of a rivet. The pin 34 passes through a hole 36 provided in the bearing member 32, and thence through hole 37 provided in the base portion 21 of the runner 17. A cam 38 is secured to the sash 12 by the rivet 34 and other rivets 41 and 42. An arcuate slot 39 is provided in the base portion 21 of the channel 17. The rivets 41 and 42 pass through holes 43 and 44 respectively in the member 32, and thence through the arcuate slot 39 in the runner 17. Holes 36a, 46 and 47 are provided in the cam 38 to receive the rivets 34, 41 and 42, thus rigidly holding the cam in position relative to the sash 12. A back-up plate 48 having holes corresponding to the holes 36a, 47 and 46 in the cam 38 is provided adjacent thereto to provide a firm surface against which the heads of the rivets 34, 41 and 42 are formed. The center of curvature of the arcuate slot 39 corresponds to the center of the hole 37 through which pin 34 passes and thus the bolts 41 and 42 are permitted to move in an arcuate path relative to the channel 17 when the sash 12 is pivoted about the pin 34, as will hereinafter be more fully explained.

The cam 38 is preferably made of some slightly resilient material such as hard rubber or the like. As shown in FIGS. 4, 5 and 6 the cam is provided with a pair of curved contact surfaces 51 and 52 which are defined by circular arcs. In operation the cam rotates about the center of the pin 34 relative to the runner 17. The centers of the arcs defining surfaces 51 and 52 are spaced somewhat from the center of the pin 34, whereby as the cam

rotates the surfaces **51** and **52** exert an outward pressure on the legs **22** and **23** of the runner member **17**. The slot **39** coacts with the pins **41** and **42** passing therethrough to prevent backward rotation of the sash as well as rotation through an angle greater than 90°. A slightly raised stop **53** provided on cam **38** also serves to prevent rotation of the sash beyond the horizontal position as indicated in FIG. 5. Reinforcing members **54** and **56** may be interposed between the legs **22** and **23** and the cam **38**, whereby the cam does not bear directly on the legs. Thus the pressure exerted by the cam surfaces is more uniformly applied. The reinforcing members **54** and **56** may be in the form of legs of a channel member **58** positioned within the channel comprising the runner **17**.

As shown in FIGS. 5 and 6 when the sash is rotated out of the vertical the cam **38** is also caused to rotate, being secured rigidly to the sash by the pins **34**, **41** and **42**. As the cam turns it exerts outward pressure on each of the legs **22** and **23** of the channel **17**, thereby causing these legs to separate or move outwardly. Thus the flanges **24** forming the recesses **27** are also caused to move outwardly relative to the runner **17**. Since the flanges **28** of the track **18** interlock with the recesses **27**, the outward movement of the legs **22** and **23** causes the flanges **28** and the recesses **27** to become tightly engaged or jammed whereby the runner is prevented from sliding along the track **18**. Because of the shape of the cam this jamming commences as soon as the sash is tilted any amount. It should be noted here that this jamming effect will take place whenever the sash is tilted regardless of its vertical position relative to the frame of the window. Thus the sash may be tilted to any angular position while at any vertical position relative to the window whereupon it will be locked in that position until it is rotated back to its original position. When the sash is returned to its original vertical position the natural resiliency of the runner returns the legs back to their original position and the sash is free to slide relative to the window.

The operation of the upper sash **11** is identical to that of the lower sash **12** and no description thereof is deemed necessary. The stop member **19** limiting the downward movement of the upper sash **11** is so positioned that when the lower sash is tilted to its horizontal position from its lowermost vertical position the upper sash **11** may also be tilted to the horizontal position while at its lowermost position without contacting the lower sash. It will be noted that in FIG. 3 I show the runner 17^a for the upper sash **11** as having a somewhat greater horizontal dimension than the runner **17** for the lower sash **12**. The purposce of this is to allow the upper sash to tilt past the runner for the lower sash.

The member **32** may be made wider than the sash to which it is attached, and a recess **61** may be provided in an upstanding member **62** adjacent the edge of the runner in position to receive the overlapping edge portion of the member **32**, thus providing a substantially weather tight seal for the sash when it is in its vertical position. This also serves to prevent the sash from rotating backwardly to the outside or screen side of the window.

It should be noted that the runner and track assembly is as wide as the rails of the sash, and therefore no parting strips are necessary. By providing a relatively wide runner I am able to provide a large action surface for the cam whereby the operation of the cam as described above is further enhanced. A felt dust pad may be provided between the runners, being secured, as by gluing to one of the runners. The dust pad slides against the other runner and insures quiet operation of the runners as they slide past one another.

In order to facilitate the description of my invention I have omitted from the embodiment described above any reference to sash balancing devices that might be employed in connection with the window. It is obvious that any of the numerous commercial balancing devices available would be adaptable to this window construction. For this purpose a tab **67** may be provided as shown in FIG. 7 for attachment to a balancing device.

In the foregoing it is seen that I have devised a new and improved pivotable sash window in which the sash may be tilted to any degree between the vertical and the horizontal while at any vertical position relative to the window. When the sash is tilted it is locked in place in a positive manner. A positive stop is provided to prevent the sash from rotating beyond the horizontal so that when in that position the glazing may be repaired or cleaned while the sash is firmly held in position. My pivotable sash window is simple of construction, and therefore economical of manufacture, and durable in use. It is easily installed in any standard frame and never requires adjustment once it is installed.

While I have shown my invention in but one form, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various changes and modifications without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claims.

What I claim is:

1. In a window including a frame and at least one sash mounted for vertical sliding movement relative to said frame and adapted to be tilted toward a horizontal position the improvement which comprises:

(a) a track secured to said frame,

(b) a channel-like runner carried by said track and having a pair of flanges,

(c) an interlocking joint between the track and the runner,

(d) a pivot pin securing the sash to the runner,

(e) a cam carried by the sash and provided with two substantially circular bearing surfaces disposed eccentrically relative to said pivot pin in position to move the flanges of the channel-like runner outwardly when the sash is tilted thus to jam the interlocking joint between the track and the runner and restrain vertical movement of the runner and the sash carried thereby, and

(f) a stop member carried by said cam to prevent rotation of the sash beyond a predetermined angular position.

2. Apparatus as defined in claim **1** in which the cam is carried within the channel comprising the runner, and is secured to said pivot pin.

3. Apparatus as defined in claim **2** in which a connecting pin is secured to both the sash and the cam, there being an arcuate slot concentric with the pivot pin provided in the base of the channel-like runner for receiving said connecting pin.

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