Aug. 23, 1955 A. A. SAWYER 2,716,038

LOCKING DEVICE

Filed July 21, 1952

Fig. 1.

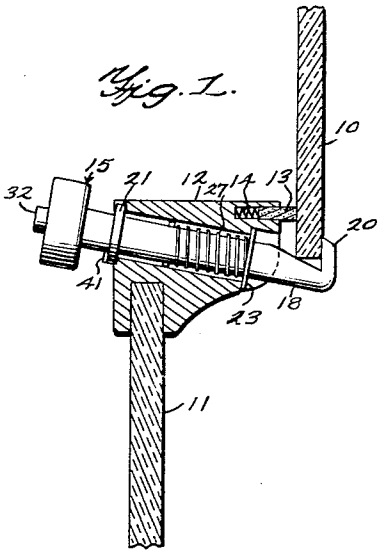


Fig. 3.

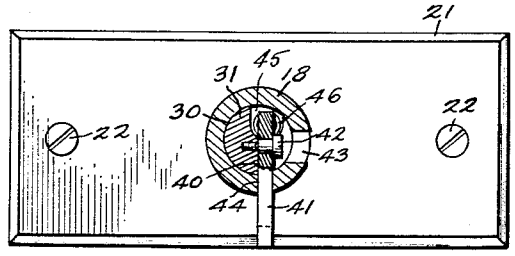


Fig. 4.

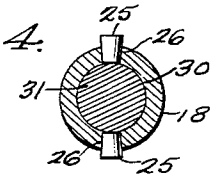


Fig. 2.

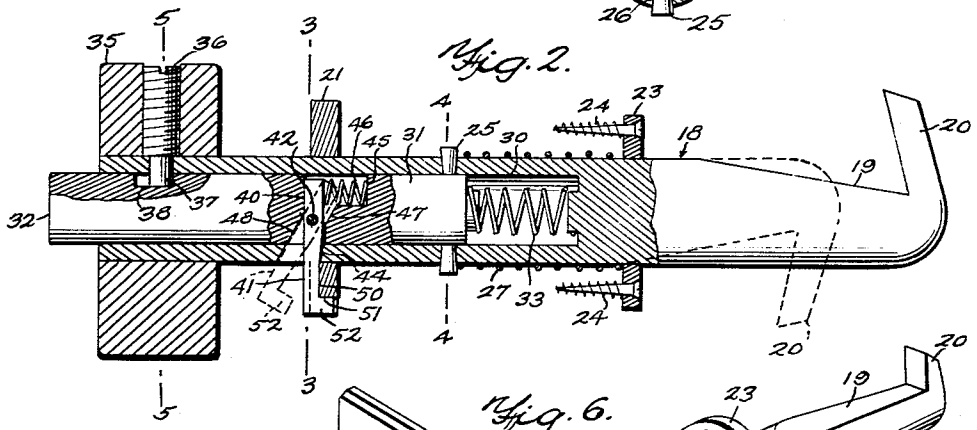


Fig. 6.

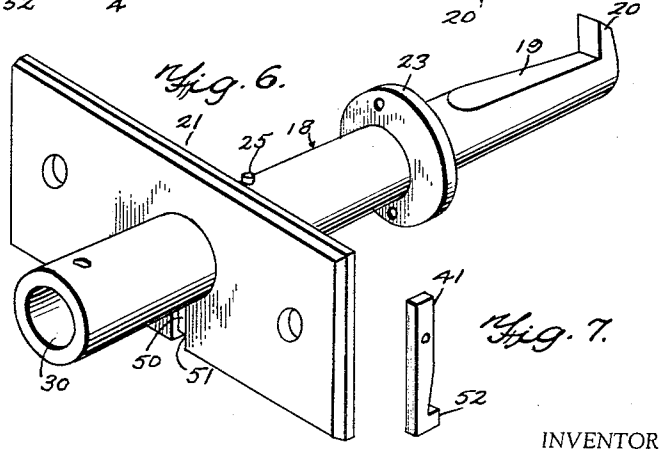


Fig. 5.

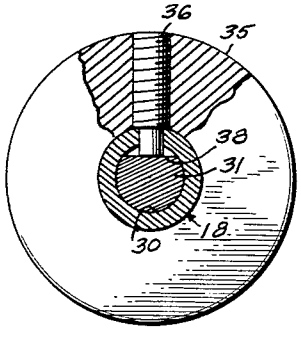


Fig. 7.

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LOCKING DEVICE

Archie A. Sawyer, Laramie, Wyo.

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5 Claims. (Cl. 292—62)

This invention relates to a locking device and more particularly to a locking device for frameless plate glass windows.

There are numerous types of window locking devices available for locking in closed position ordinary window sashes having frames. As is well known, the common type of window locking means provides engagement between elements on the top rail of the lower and the lower rail of the top sash. The operating means for such devices are available only from inside the building except by actually breaking the window pane. However, in the use of slidable plate glass windows wherein the lower edge of the upper sash is not provided with a frame to which parts of a fastening device can be secured, it is extremely difficult to lock the window in closed position.

An important object of the present invention is to provide a novel locking device particularly intended for locking in closed position a pair of slidable plate glass window elements wherein the upper sash has no lower frame, the device having a locking element engageable beneath the edge of the upper sash to hold it in upper position while holding the lower sash in lower position, and wherein the locking element, while accessible from the outside of the building, cannot be moved to the unlocked position except by operating means accessible from the inside of the building.

A further object is to provide a device of the character referred to wherein the locking element is rotatable and endwise movable between locked and unlocked positions and wherein the locking element can be moved to unlocked position only by first rocking or rotating it, which operation can be performed only from within the building.

Other objects and advantages of the invention will become apparent during the course of the following description.

In the drawing I have shown one embodiment of the invention. In this showing:

Fig. 1 is a fragmentary vertical sectional view through adjacent portions of upper and lower plate glass sashes showing the present invention in elevation in the top rail associated with the lower sash;

Fig. 2 is a vertical axial sectional view through the locking device substantially enlarged, parts being shown in elevation;

Fig. 3 is a section on line 3—3 of Fig. 2;

Fig. 4 is a similar view on line 4—4 of Fig. 2;

Fig. 5 is a similar view on line 5—5 of Fig. 2, a portion of the knob being shown in elevation;

Fig. 6 is a perspective view of the locking bolt and associated elements; and

Fig. 7 is a detail perspective view of the latch element.

Referring to Fig. 1, the numerals 10 and 11 respectively indicate the upper and lower sashes of a window preferably formed of plate glass so as to possess sufficient strength to eliminate the necessity for frames except that the upper edge of the sash 11 is provided with

a rail 12 because of the offsetting of the sash for sliding movement in spaced channels. The rail 12 is provided with a sealing member 13 preferably in the form of a relatively rigid felt strip backed up by a spring 14 to maintain the member 13 in sealing engagement with the sash 10. The rail 12 is utilized for the mounting of the lock forming the subject matter of the present invention and indicated as a whole in Fig. 1 by the numeral 15.

Referring to Fig. 2, the body of the lock comprises a bolt indicated as a whole by the numeral 18. This bolt toward one end thereof has its normally top portion sloped downwardly as at 19 and such end of the bolt terminates in a generally upwardly extending hook 20. As shown in Fig. 1, the lower edge of the upper sash 10 is arranged in the angle between the surface 19 and the hook 20 when the bolt is locked, as will become more apparent below.

A plate 21 is fixed to the rail 12 by means of screws 22 (Fig. 3) and the bolt 18 is slidable in such plate. A second opposite plate 23 is attached to the rail 12 outwardly thereof by screws 24, and the bolt 18 also is slidable in the plate 23. Intermediate the two plates, the bolt carries diametrically opposite pins 25 (Figs. 2 and 4) which may be driven into openings 26 in the bolt. A coil spring 27 surrounds the bolt between the pins 25 and plate 23 and since the latter is stationary, the spring urges the bolt inwardly or to the left as viewed in Figs. 1 and 2.

The bolt 18 is provided with a cylindrical bore 30 in which is slidably arranged a rod 31 the left-hand end of which projects from the corresponding end of the bore 30 to form a push button 32. A spring 33 is arranged between the inner end of the bore 30 and the adjacent end of the rod 31 to urge the latter to the left to its normal position shown in Fig. 2. It is obvious that the pins 25 do not project into the bore 30 and consequently do not interfere with the sliding movement of the rod 31.

A handle or knob 35 is mounted on the inner or left-hand end of the bolt 18. A set screw 36 extends through the knob 35 and is provided with an axial extension 37 which projects through the bolt 18 and into a slot 38 formed in the rod 31. The extension 37 acts to limit axial movement of the rod 31, the normal position of which under the influence of the spring 33 is shown in Fig. 2.

The rod 31 is provided in one side thereof with a recess 40 (Figs. 2 and 3) to receive a latch 41 pivoted to the rod 31 by a screw 42. The bolt 18, as shown in Fig. 3, is provided with a radial opening 43 for the insertion of the screw 42 into position. The latch 41 projects downwardly through a slot 44 formed in the bolt 18 and longitudinally elongated as shown in Fig. 2 to permit the bolt to swing to its unlocked position as shown in dotted lines. The rod 31 is provided with a recess 45 projecting longitudinally thereof and communicating with the recess 40. The recess 45 receives a coiled spring 46 engaging the upper end of the latch 41 to urge the latter to the operative position shown in solid lines in Fig. 2. To permit the latch 41 to swing to the inoperative position shown in dotted lines in Fig. 2, opposite walls of the recess 40 are sloped as at 47 and 48.

As shown in Figs. 2 and 6, the outer face of the plate 21 is provided with a radial groove 50 the lower end of which is undercut as at 51 to receive a projection 52 on the latch 41. When the latch is in its operative position, the lower end of the body of the latch is arranged in the radial groove 50 while the projection 52 is arranged in the undercut 51, thus positively preventing turning movement of the bolt 18 on its axis.

Operation

The parts normally occupy the solid line positions

shown in Figs. 1 and 2, the projecting bolt end **20** lying outwardly of the sash **10** and the lower end of the latter lying in the angle between the slope **19** and hook or projection **20**. Obviously the sash **10** cannot be lowered and the sash **11** cannot be raised so long as the parts are in the positions referred to. It will be apparent that the bolt **18** can be released from the sash **10** only by rotating the bolt and sliding it endwise to the left as viewed in Figs. 1 and 2, until the projection **20** assumes the dotted line position shown in Fig. 2. The latch **41** projects through the slot **44** which is of a width equal to the latch (Fig. 2) and the latch engages the grooves **50** and **51** in the fixed plate **21**. Accordingly, the bolt **18** is normally fixed against turning movement. The hook **20** maintains the bolt against sliding movement to the left, thus maintaining the latch **41** in its locking grooves.

When it is desired to release the bolt, the operator will push to the right on the push button **32** and the latch **41**, bearing against the right-hand end of the slot **44** in Fig. 2 as the rod **31** moves endwise, swings the latch **41** in a clockwise direction to assume the dotted line position in Fig. 2 relative to the rod **31**. Actually, the latch **41** will be bodily moved to the right by sliding movement of the rod **31** but the latch swings clear of the groove **50** and undercut **51**, thus freeing the bolt **18** for turning movement. Holding the button **31** depressed by his thumb, the operator will then turn the knob **35** through 180° and then allow the knob to move toward the left under the influence of the spring **27**. The turning movement of the knob **35** swings the hook **20** through 180° to project downwardly, whereupon the sliding movement of the bolt moves the hook **20** to the dotted line position shown in Fig. 2. The push button **32** and knob **35** are then released with the bolt wholly free of the sash **10**. This sash then can be lowered or the sash **11** raised, or both operations may be performed.

The hook **20** is at an acute angle to the axis of the bolt **18** in the arrangement of the parts shown and the upper extremity of the hook in Fig. 1 tends to swing in an arc of a circle in a plane perpendicular to the axis of the bolt. This turning movement is freely permitted, however, since the bolt is endwise movable to the right as the hook **20** turns, and accordingly the hook is free to turn without binding against the sash **10**.

Obviously, engagement of the left-hand end of the slot **38** engaging the member **37** limits movement of the rod **31** toward the right in Fig. 2 when the button **32** is pushed. However, the projection of the slot **38** to the left in Fig. 2 is unimportant so long as the length is great enough to permit sufficient movement of the rod **31** to swing the latch **41** to inoperative position. The shoulder **48** and the left-hand limit of the slot **44** will engage the latch to limit movement of the rod **31** toward the right regardless of the length of the slot **38**. However, the slot **38** should be of such length in the opposite direction to limit sliding movement of the rod **31** toward the left with the latch **41** in the fully operative position shown in solid lines in Fig. 2.

The operation of locking the window will be obvious from the foregoing. The operator will push the button **32** to swing the latch **41** to inoperative position, push the knob **35** to the right to move the hook **21** inwardly beyond the sash **10**, rotate the knob **35** through 180°, and then release the knob **35** and push button **32**. The knob **35** may be rocked to insure the engagement of the latch **41** in its grooves.

From the foregoing it will be apparent that the present device is highly effective for the locking of plate glass frameless sashes. There is no frame carried by the sash **10** to which an element of a locking device can be fixed. The present device positively locks the sashes in closed position and while the hook **20** is accessible from outside the building, it can be released only by first rotating the bolt and this is impossible because of the engagement of the latch **41** in the groove **50** and the undercut **51**. The

operation of the device both for locking and unlocking the sashes obviously is quite simple as set forth above.

The construction shown for the purposes of illustration embodies the invention in a preferred form, but it is intended that the disclosure be illustrative rather than definitive of the invention. The invention is defined in the claims.

I claim:

1. A locking device comprising a bolt, means for supporting said bolt for turning movement on its axis and for axial sliding movement, means biasing said bolt for sliding movement in one direction, the end of said bolt opposite said direction having a laterally projecting hook engageable with an element to be locked when said bolt is turned on its axis to a predetermined position, said hook being releasable from the element to be locked upon turning movement of said bolt, a member slidable in said bolt and projecting from the other end thereof, and a pivoted latch carried by said member, said bolt being provided with a longitudinal slot through which said latch projects laterally from said bolt, said latch having an operative position engaging a stationary member to fix said bolt against turning movement when said hook is in locking engagement with the element to be locked, means biasing said member for movement in one direction in said bolt to tend to move said latch to operative position and said latch being engageable with one end of said slot upon movement of said member in the other direction to swing said latch to unlatched position.

2. A locking device comprising an elongated bolt, means inwardly of the ends of said bolt supporting it for turning movement on its axis and for axial sliding movement, means biasing said bolt for sliding movement in one direction, the end of said bolt opposite said direction being provided with a laterally projecting hook engageable with an element to be locked when said bolt is turned to a predetermined position, the end of said bolt in said direction having an axial bore, a rod slidable in said bore and biased for movement in one direction, and a latch pivotally connected to said rod, said bolt being provided with a longitudinal slot through which said latch projects laterally from said bolt for engagement with a stationary element to prevent turning of said bolt when said hook is in locking engagement with the element to be locked, said slot having an end against which said latch is engageable upon movement of said rod in the other direction to release said latch whereby said bolt may be turned to release said hook from the element to be locked.

3. A locking device comprising a bolt of circular cross section throughout the greater portion of its length, bearing means supporting said bolt for turning movement on its axis and for axial sliding movement, means biasing said bolt for sliding movement in one direction, a knob carried by said bolt at the end thereof in said direction, a hook carried by the other end of said bolt and projecting laterally therefrom for engagement against the side of an element to be locked opposite said direction when said bolt is turned to a predetermined position, the first named end of said bolt being provided with an axial bore, a rod slidable in said bore and projecting from the first named end of said bolt beyond said knob to form a push button, means biasing said rod for sliding movement in said direction, means limiting movement of said rod in said direction to a normal position, and a latch having mechanical engagement with said rod and operative when the latter is in normal position and said hook is in locking engagement with said element for fixing said bolt against rotation, said bolt having a portion engageable with said latch upon movement of said rod in the other direction by operation of said push button for releasing said latch.

4. A locking device comprising a bolt, means for supporting said bolt for rotation on its axis and for axial sliding movement, said means comprising a stationary element, means biasing said bolt for sliding movement in one direction, said bolt having a portion engageable with an element to be locked when said bolt is moved against

its biasing means and is turned to a predetermined position, a member mounted in said bolt for axial sliding movement relative thereto, a latch carried by said slidable member, said bolt having a radial slot through which an end of said latch projects and said stationary element having a radial groove in which said end of said latch is arranged when said bolt is in said predetermined position, and means biasing said slidable member in one direction to a normal operative position, said slidable member having an end projecting axially from said bolt to form a finger piece movable against said last-named biasing means to release said latch from said groove.

5. A locking device comprising a bolt, means supporting said bolt for rotation on its axis and for axial sliding movement, means biasing said bolt for sliding movement in one direction, said bolt being provided with a portion engageable with an element to be locked when said bolt is turned on its axis to a predetermined position and is moved away from its biased direction, said portion of said bolt being releasable from the element upon rotation

of the bolt on its axis, a latch supported by said bolt and biased to an operative position locking said bolt against rotation when said portion thereof is in engagement with the element to be locked, said means for supporting said bolt for rotational and sliding movement comprising a plate having a recess therein receiving said latch when the latter is in operative position to fix said bolt against turning movement, and a push button having mechanical connection with said latch and operable for releasing it to release said bolt for turning movement on its axis.

References Cited in the file of this patent

UNITED STATES PATENTS

960,585	Rosenberg	June 7, 1910
1,326,937	Kasper	Jan. 6, 1920
2,298,559	Fredholm	Oct. 13, 1942

FOREIGN PATENTS

13,981	Netherlands	May 15, 1925
207,119	Great Britain	Nov. 11, 1923