April 11, 1961 J. M. AMMERMAN 2,978,757

LOCK

Filed May 17, 1957

Fig. 2.

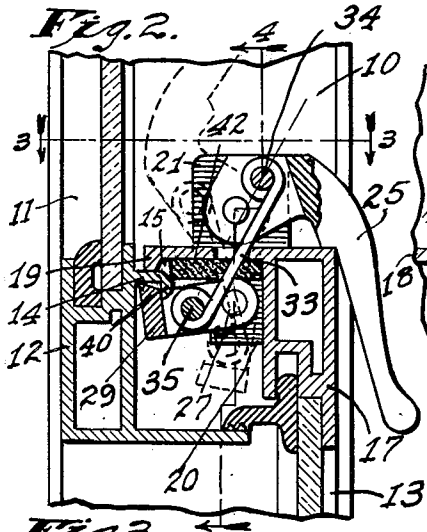


Fig. 4.

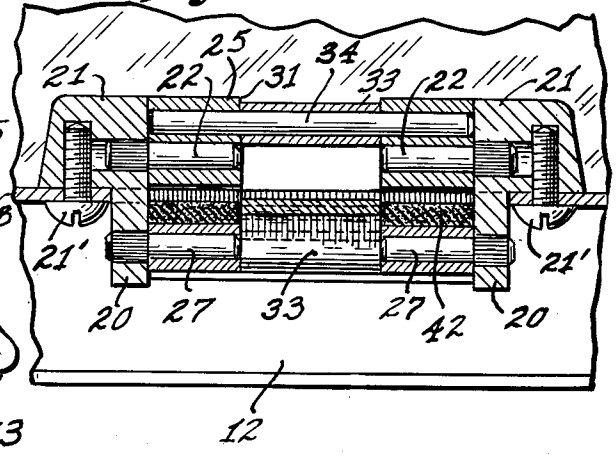


Fig. 3.

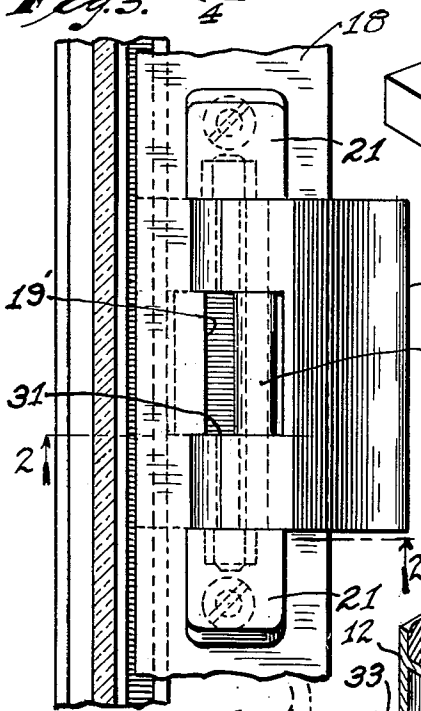


Fig. 6.

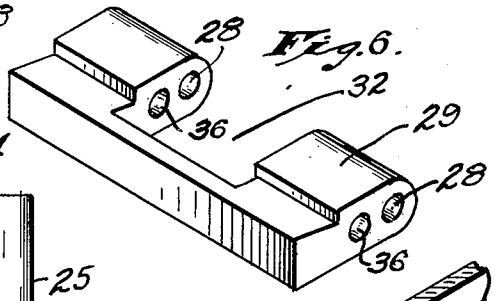


Fig. 1.

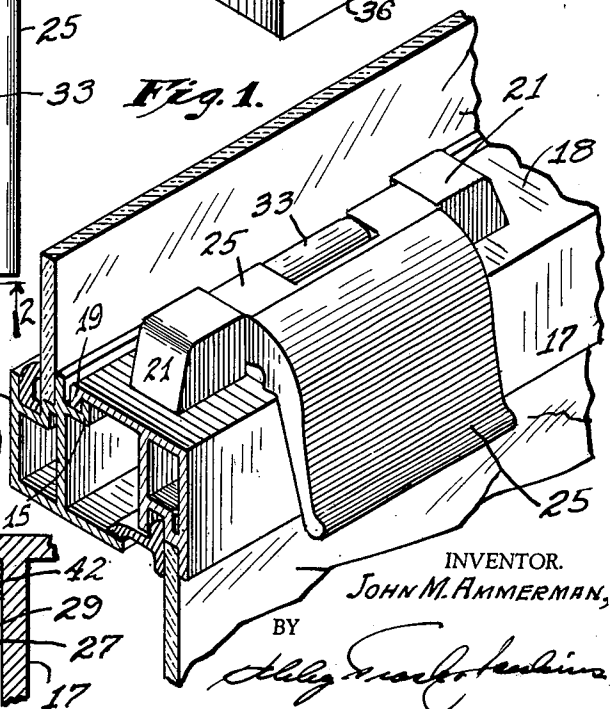
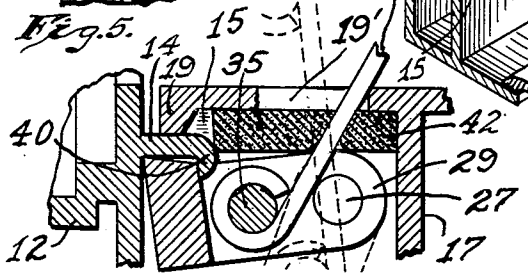


Fig. 5.



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LOCK

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4 Claims. (Cl. 20—52)

This invention relates to a locking device such as is used for locking the sash of double-hung windows in closed position. It is an object of the invention to produce a lock particularly well adapted for use with metal-framed sash. Another object of the invention is to provide a lock which, although easily engaged and released, will provide a secure locking action. Another object of the invention is to provide a locking device which will oppose separation of the meeting sash rails in a direction perpendicular to that of their sliding movement. Still another object of the invention is to provide a locking device the major portions of which are concealed.

In carrying out the invention in its preferred form, the meeting rails of the sliding sash are provided with flanges which are to be held in engagement with each other by the locking device. Supported on a horizontal axis above such flange on the upper rail of the lower sash is a swinging operating member. Also supported from the upper rail of the lower sash, but below the aforesaid flange, is a latch member mounted for swinging movement about an axis parallel to that of the operating member, such latch member being adapted to engage beneath the flange on the lower rail of the upper sash to prevent opening movement of the sashes. The latch member and operating member are interconnected by a link, the ends of which are so located on the operating member and latch member as to provide a toggle or over-center action serving to maintain the locking device in locked condition. To provide the resilience necessary to the effectiveness of the toggle action referred to, the latch member is desirably made of material possessing a degree of elasticity, such as nylon. The latch member and the latch-engaged flange on the lower rail of the upper sash have interfitting provisions which, when engaged in locking of the latch, prevent a forced separation of the meeting rails in a horizontal plane.

In the accompanying drawing which illustrates one embodiment of the invention:

Fig. 1 is a fragmental isometric view showing the locking device in locked position;

Fig. 2 is a vertical section on the line 2—2 of Fig. 3 through the meeting rails and latching device;

Fig. 3 is a horizontal section on the line 3—3 of Fig. 2, showing the locking device in plan;

Fig. 4 is a section on the line 4—4 of Fig. 2;

Fig. 5 is a fragmental view similar to Fig. 2 but on an enlarged scale;

Fig. 6 is an isometric view of the latch member removed from association with its connected parts.

The window illustrated in the drawing comprises a frame 10 in which an upper sash 11 and a lower sash 13 are vertically slidable, in the manner common in double-hung windows. The upper sash 11 has a lower rail 12, conveniently formed of extruded metal and including an inwardly projecting, horizontally extending flange 14 having at its inner edge an upwardly projecting bead 15. The lower sash 13 includes an upper rail 17 which, like the rail 12, is conveniently formed of extruded metal and

has a horizontal flange 18 which projects outwardly of the window into overlapping relation with the flange 14 of the upper sash. Extending along the outer edge of the flange 18 is a bead 19 which interfits with the lip or bead 15 on the flange 14 when the window is closed.

Intermediate its extent, the flange 18 of the sash-rail 17 is provided with an elongated slot 19' the ends of which receive the shanks 20 of two bracket members having heads 21 which extend beyond the vertical limits of the shank 20 and overlie the upper face of the flange 18. Screws 21' extending upwardly through the flange 18 and into the heads 21 secure the bracket members in place. Above the flange 18, the two bracket members receive with a press fit two pivot pins 22 which project toward each other and into aligned openings in a latch-operating member 25. Below the flange 18, the shanks of the bracket members receive with a press fit pins 27 which project toward each other in aligned relation and are received in openings 28 in a latch member 29. Such latch member is swingable about the axis of the pins 27 between an inoperative position, shown in dotted lines in Fig. 2, and an operative position, shown in full lines in Fig. 2, in which it engages beneath the flange 14 to clamp such flange between the latch member and the flange 18 of the lower sash, as perhaps best illustrated in Fig. 5.

The operating member 25 and latch member 29 are provided respectively with notches 31 and 32 for the reception of a link 33 by means of which the operating member and latch member are interconnected. As shown, such link comprises a strip of sheet metal the ends of which are rolled to form eyes one of which receives a pin 34 mounted in openings in the operating member 25 and the other of which receives a pin 35 mounted in openings 36 in the latching member.

As will be clear from Fig. 2, the latch member 29 may be moved from inoperative position to operative position by swinging the operating member 25 in the clockwise direction from the dotted-line position to the full-line position. The various pins 22, 27, 34, and 35 are so disposed relative to each other that the latch member 29 comes into engagement with the flange 14 shortly before the common plane of the pins 34 and 35 reaches the axis of the pins 22 about which the operating member swings. Further movement of the operating member in a clockwise direction therefore stresses the parts, which yield elastically and permit movement of the operating member through and beyond the position in which the axes of the pins 22, 34, and 35 are coplanar. Once the operating member has passed through that position, the elastically stressed parts urge it to continue in the clockwise direction. However, the operating member is so formed that it engages the upper rail of the lower sash before the stresses in the stressed parts have been relieved. Thus, such stresses hold the latch member firmly in engagement with the flange 14 and the operating member firmly in engagement with the upper rail of the lower sash.

Conveniently, the slight yielding of parts necessary to permit the action just described is at least largely localized in the latch member 29, which is made of elastically yieldable material. Nylon is a preferred material for the latch member, as it possesses adequate elasticity, wears well, and does not create any objectionable noise when it is moved into clamping engagement with the flange 14.

To prevent, or at least oppose, a forced separation of the two meeting sash rails in a horizontal plane, a portion of the bead 15 may be deformed to engage within the notch 32 of the latching member. Such result is conveniently accomplished by distorting the material of the bead within the limits of the notch 32 to form a lip 40 adapted to engage the base of the notch 32 as shown in Fig. 5, when the locking device is locked.

In most instances it will be desirable to associate with

the slot 19' some form of weather seal. Such a seal may take the form of a strip 42 of flexible rubber or like material which lies between the latching member 29 and the flange 18 and serves to close the slot 19. Such strip is slotted for passage of the link 33 and possesses sufficient elasticity to permit one of the eyes at the end of the link to be passed through it.

In assembling and mounting the locking device, the seal strip 42 is placed on the link and the latter is connected to the operating and latching members by inserting the pins 34 and 35. The bracket members 20—21, with the pivot pins 22 and 27 pressed in place, are positioned at the sides of the link and the pivot pins inserted into the operating and latching members. The latching member 29, the seal 42, and the shanks 20 of the bracket members are then passed through the slot 19' in the flange 18, and as a final step the screws 21' are put in place.

I claim as my invention:

1. A lock for two sliding window sash having interengaging first and second meeting rails provided respectively with first and second flanges which overlap each other in abutting relation when the sash are in closed position, said lock comprising a latch member pivotally mounted on said first meeting rail on an axis parallel thereto for swinging movement between a locked position in which it engages said second flange to clamp it against said first flange and a released position permitting separation of said flanges, an operating member pivotally mounted on said first meeting rail for swinging movement about an axis parallel to that of said latch member, the respective axes of said latch member and operating member lying on opposite sides of said first flange, said first flange having an opening, a link extending through such opening, operatively interconnecting the latch member and operating member and forming therewith a toggle which assumes a locked condition as the operating member swings the latch member into its said locked position, said link being pivotally connected to said latch member and passing between the axis thereof and the point at which the latch member engages said second flange to a point of connection with said operating member when the latch member is in locked condition, and a closure for said opening, said closure being formed of resilient material, embracing said link between the first flange and the latch member, and overlapping the edges of said opening.

2. A lock for two sliding window sash having interengaging first and second meeting rails provided respectively with first and second flanges which overlap each other in abutting relation when the sash are in closed position, said first flange being provided with an elongated slot, said lock comprising a pair of bracket members having heads located on the opposite side of said first flange from the second flange and shanks which pass through said slot at the ends thereof and project beyond the first flange, screws passing through said first flange and into

said heads to secure the bracket members in place, a latch member disposed between said shanks and pivotally connected thereto for swinging movement about a first axis between a locked position in which it clamps said second flange against said first flange and a released position permitting separation of the flanges, an operating member disposed between the heads of said bracket members and pivotally connected thereto on a second axis parallel to and spaced from said first axis, said latch member and operating member being provided with aligned notches, and a link disposed in said notches and extending through said slot for operatively interconnecting said operating and latch members, both said axes and the points of connection of the link to the operating and latching members being so located that the link, the operating member, and the latch member form a toggle which assumes a locked condition as the operating member swings the latch member into its said locked position.

3. A lock for two sliding window sash having interengaging first and second meeting rails provided respectively with first and second flanges which overlap each other in abutting relation when the sash are in closed position, said first flange being provided with an elongated slot, a pair of bracket members having heads located on the opposite side of said first flange from the second flange and shanks which pass through said slot at the ends thereof and project beyond the first flange, screws passing through said first flange and into said heads to secure the bracket members in place, a latch member disposed between said shanks and pivotally connected thereto for swinging movement between a locked position in which it clamps said second flange against said first flange and a released position permitting separation of the flanges, an operating member disposed between the heads of said bracket members and pivotally connected thereto, said latch member and operating member being provided with aligned notches, and a link disposed in said notches and extending through said slot for operatively interconnecting said operating and latch members.

4. A lock as set forth in claim 3 with the addition that said second flange is provided with a lip received in the notch of the latch member when the latter is in locked position.

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