

Nov. 14, 1967

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3,352,586

LOCKING DEVICE FOR SLIDING WINDOWS AND DOORS

Filed Sept. 20, 1965

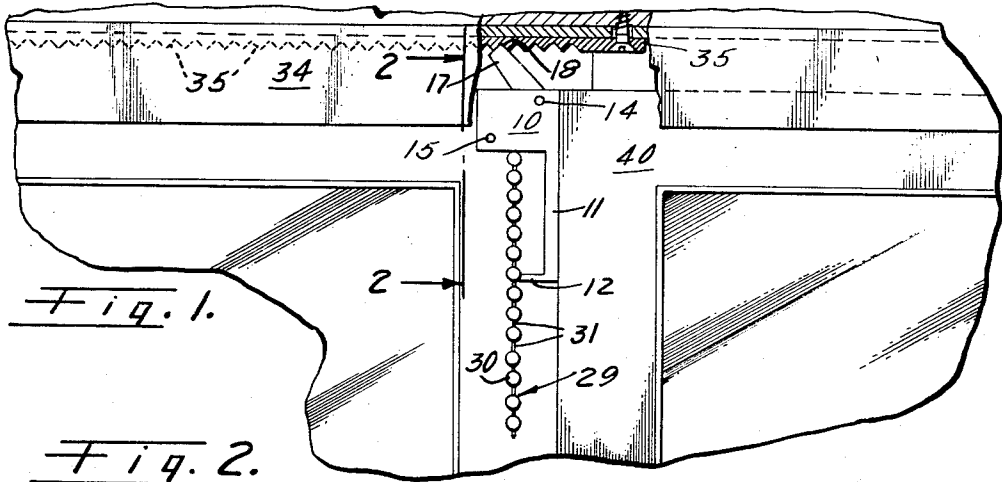


Fig. 1.

Fig. 2.

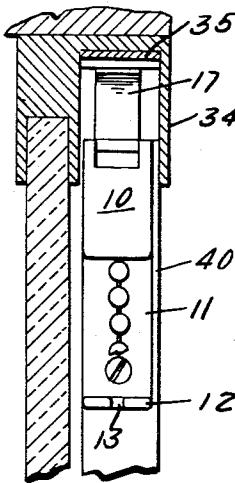


Fig. 3.

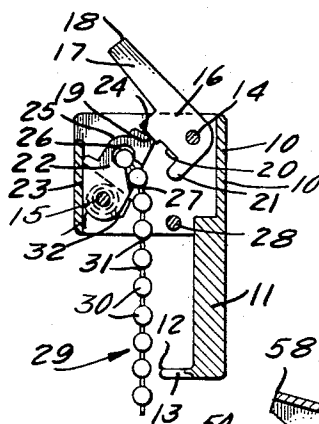


Fig. 4.

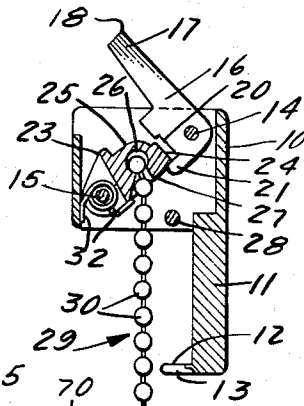


Fig. 5.

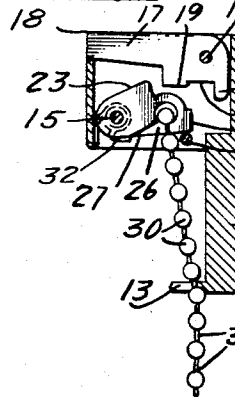


Fig. 6.

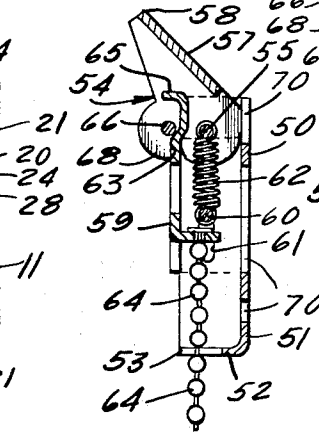
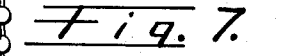


Fig. 7.



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LOCKING DEVICE FOR SLIDING WINDOWS AND DOORS

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Filed Sept. 20, 1965, Ser. No. 488,481
6 Claims. (Cl. 292—225)

ABSTRACT OF THE DISCLOSURE

A locking device for sliding windows and doors in which the end of a pivotable lock member mounted on a movable frame engages any one of the teeth of a corrugated member mounted on a stationary frame. A control member controls the positioning of the lock member and blocks it against disengagement from the corrugated member.

This invention relates to a locking device for sliding windows and doors.

My invention is particularly adapted for use on sliding windows and doors which are constructed of aluminum or other metallic material. Such windows and doors are customarily provided only with a simple latch which holds them in closed position.

It is the primary object of my invention to provide a locking device which can be quickly and easily installed on substantially any sliding window or door and which acts to lock the sliding frame thereof against movement in either direction.

Another object of my invention is to provide such a locking device which operates when the movable frame is in any position, either fully open, fully closed or partly open.

My invention also comprises such other objects, advantages and capabilities as will later more fully appear and which are inherently possessed by my invention.

While I have shown in the accompanying drawings a preferred embodiment of my invention, it should be understood that the same is susceptible of modification and change without departing from the spirit of my invention.

Referring to the drawings,

FIG. 1 is a side elevational view, partly in section, showing one embodiment of my locking device in use on a sliding window or door;

FIG. 2 is a sectional view of the same, taken along line 2—2 of FIG. 1;

FIG. 3 is a longitudinal sectional view of my locking device in fully locked position;

FIG. 4 is a similar view showing movement of a control member toward unlocked position;

FIG. 5 is a similar view showing the locking device in completely unlocked position;

FIG. 6 is a longitudinal sectional view of another embodiment of my locking device in locked position;

FIG. 7 is a similar view of the same in unlocked position;

FIG. 8 is a perspective view of the lock member of the embodiment shown in FIGS. 6 and 7.

A preferred embodiment which has been selected to illustrate my invention comprises a housing 10 which is preferably formed of aluminum, although any suitable material may be used. The housing 10 is fixedly secured to the movable frame 40 of the sliding window or door. The inner portion of the housing 10 forms a hollow rectangle.

Depending downwardly from one side of the housing 10 is an extension 11, the lower edge of which carries a laterally directed flange 12. A slot 13 is cut into the edge of the flange 12. The extension 11 and flange 12 may be

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formed integrally with the housing 10. Extending transversely across the open interior of the housing 11 are a pair of pivot pins 14 and 15, which are disposed adjacent diagonally opposite corners of the housing 10.

5 Pivotaly mounted on the upper pivot pin 14 is a lock member 16 having an elongated straight latch 17. The end of the latch 17 remote from the pivot pin 14 is provided with a right angular portion 18.

The portion of the lock member 16 adjacent to the pivot pin 14 comprises a downwardly directed substantially straight cam surface 19, a recess 20 and a downwardly directed lip 21, all of which are disposed adjacent to each other in the order named. All of such parts may be formed as integral portions of the lock member 16.

15 Pivotaly mounted on the lower pivot pin 15 is a control member 22, which includes a straight stop portion 23 which is disposed adjacent to the pivot pin 15 and adjacent to the inner wall of the housing 10. A slightly curved cam 24 is spaced from the stop portion 23 by a curve portion 25. The curved portion 25 is provided with a keyhole-shaped recess area 26. The surface of the control member 22 adjacent to the opening of the recessed area 26 is straight and provides a second stop portion 27 which forms one edge of the cam 24.

25 A third pivot pin 28 extends transversely across the interior of the housing 10 adjacent the lower portion thereof. The third pivot pin 28 acts as a stop member, engaging the stop portion 27 to limit the rotational movement of the control member 22.

30 The pull chain 29 has a plurality of balls 30 spaced from each other by substantially thinner sections of chain 31. The upper ball 30 is fixedly mounted and held in the recessed area 26 of the control member 22, with the chain 29 depending downwardly therefrom.

35 A wire spring 32 is mounted on the pivot pin 15 within a slot 33 formed in the control member 22. One end of the spring 32 bears against the adjacent side wall of the housing 10, while the other end bears against the bottom of the control member 22. The spring 32 urges the control member 22 in a counter-clockwise direction, with the stop portion 23 engaging the inner side wall of the housing 10 to limit the counter-clockwise rotation of the control member 22.

45 In this position, in which the control member 22 is normally held by the spring 32, the cam 24 of the control member 22 engages the cam surface 19 of the lock member 16 to hold the latch 17 at a diagonally upward angle from the pivot pin 14.

Mounted within the upper portion of the fixed frame 50 34 is a corrugated member 35. The corrugated member 35 is fixedly attached to the stationary frame 34 of the window or door. The corrugated member 35 is provided with a plurality of adjacent corrugations, the walls of which extend at approximately a 45 degree angle with respect to vertical or horizontal.

55 The right angular portion 18 of the latch 17 forms a complementary angle and is dimensioned to removably fit within any of the corrugations of the corrugated member 35 when the latch 17 is disposed in upwardly projecting position. The engagement between the latch 17 and the corrugated member 35 prevents any sliding movement of the movable frame 40 with respect to the fixed frame 34.

60 In order to release the locking device, it is necessary to pull downwardly on the pull chain 29, causing the control member 22 to pivot in a clockwise direction against the urging of the spring 32.

65 As the control member 22 pivots, the cam 24 moves along the cam surface 19 and then across the recess 20 and into engagement with the lip 21. As the control member 22 continues to rotate, the second stop portion 27 which forms the edge of the cam 24 engages and carries

the lip 21 with it, causing the lock member 16 to rotate in a counterclockwise direction. This rotation of the lock member 16 causes the latch 17 to rotate and move the right angular portion 18 at the end thereof downwardly out of engagement with the corrugated member 35.

This rotational movement of the control member 22 is limited by engagement of its second stop portion 27 with the third pivot pin 28. Before the control member 22 reaches this position, the cam 24 moves out of engagement with the lip 21, but the lock member 16 will continue to rotate in a counter-clockwise direction due to the force of gravity. It will continue such movement until its cam surface 19 engages the curved portion 25 of the control member 22, at which time the upper surface of the latch 17 is flush with the top of the housing 10.

The latch 17 may be held in this position by passing the chain 29 through the slot 13 in the flange 12. The slot 13 is wide enough to accommodate the thin sections of chain 31, but too narrow to pass the balls 30. The chain 32 is accordingly held in its pull position and the locking device is held in the open or unlocked position described above.

Upon release of the pull chain 29 from the slot 13, the spring 32 will immediately rotate the control member 22 in the opposite counter-clockwise direction. As the control member 22 rotates, its curved portion 25 engages the cam surface 19 to start the lock member 16 rotating in a clockwise direction.

As the control member 22 continues to rotate, its cam 24 moves into the recess 20 and engages the edge of the cam surface 19, causing the lock member 16 to continue to rotate in a clockwise direction. The cam 24 then moves out of the recess 20 and moves along the cam surface 19 until the stop portion 23 of the control member 22 engages the adjacent inner wall of the housing 10. At this time, the cam 24 is in complete engagement with the cam surface 19, to prevent any downward movement of the latch 17.

Another embodiment of my invention is shown in FIGS. 6-8 of the drawings. In this embodiment, a housing 50 has an extension 51, flange 52 and slot 53 corresponding to those described above. A lock member 54 is pivotally mounted on a pivot pin 55, which extends transversely across the upper end of the housing 50. The upper end of the lock member 54 comprises a latch 57. The upper end of the latch 57 has a substantially right angular portion 58, which is adapted to engage the fixed corrugated member.

A U-shaped control member slide 59 is slidably mounted around the outside of the housing 50. The slide 59 has a transversely directed pin 60 which connects its sides through elongated slots 61 in the opposite sides of the housing 50. A coil spring 62 extends vertically between the pin 60 and the pivot pin 55. The spring 62 acts to normally urge the slide 59 toward its upward position.

The lock member 54 is provided with a pair of slots 63 which are adapted to receive the upper end of the slide 59 when the slide is disposed in its normal upward position. When the slide 59 is so disposed in the slots 63 it acts to prevent the lock member 54 from being pivoted in either direction and it accordingly holds the latch 57 in locked engagement with the corrugated member.

A pull chain 64 is secured at its upper end to the lower part of the slide 59. When the chain 64 is pulled, the slide 59 is moved downwardly against the urging of the coil spring 62 to move the slide 59 out of the notches 63.

The upper end of the slide 59 carries a hook 65 which engages a pin 66 extending between openings 67 in the opposite sides of the lock member 54. As the hook 65 engages the pin 66, it causes the lock member 54 to pivot and move the latch 57 out of engagement with the corrugated member.

The lock member 54 is provided with a pair of ears 68 having curved cam surfaces 69 which are adapted to be

engaged by the upper end of the slide 59 to pivot the lock member 54 when the slide 59 is moved upwardly by the spring 62.

The back of the housing 50 is provided with a plurality of openings 70 to permit attachment of the housing 50 to various types of frames. The sides of the housing 50 may also be provided with a plurality of vertically spaced openings for alternative placement of the pivot pin 55 at different heights to accommodate different types of frames.

It will be seen that the slide 59 of this embodiment of my invention corresponds to and serves the same purpose as the control member of the first embodiment.

I claim:

1. A locking device for sliding windows and doors comprising a substantially rectangular housing having a hollow interior, a pair of pivot pins extending transversely across said interior adjacent diagonally opposite corners thereof, a lock member pivotally mounted on the upper of said pivot pins, said lock member having an elongated latch, the end of said latch having a substantially right angular portion, said lock member having a downwardly directed substantially straight cam surface and a downwardly directed lip, a control member pivotally mounted on the other of said pivot pins, said control member having a stop portion disposed adjacent to the inner wall of said housing and a cam, a spring mounted on said second named pivot pin, said spring normally urging said control member in a direction in which said cam engages said cam surface to hold said latch in a diagonally upwardly position from the top of said housing, said housing being attached to a movable frame, a corrugated member fixedly mounted with respect to said movable frame, said corrugated member having a plurality of spaced corrugations dimensioned to removably receive and hold the right angular portion of the end of said latch when said latch is disposed in said upward position to prevent sliding movement of said movable frame in either direction, said control member being rotatable against the urging of said spring, said cam upon such rotation engaging said lip to rotate said latch downwardly and move said right angular portion out of engagement with said corrugated member to release said movable frame for sliding movement in either direction, said control member being rotatable by said spring in the opposite direction, said cam upon such rotation engaging the edge of said cam surface to pivot said lock member and return said latch into engagement with said corrugated member.

2. The structure set forth in claim 1 and an extension extending downwardly from said housing, said extension having a substantially right angular flange at the lower end thereof, a slot extending inwardly from the edge of said flange, a pull chain comprising a plurality of balls spaced from each other by thinner sections of chain, said slot being smaller in width than said balls, but wider than said thinner sections of chain, said pull chain being attached at the upper end thereof to said control member, said pull chain adapted to be pulled to move said latch to unlocked position and held in said slot to hold said latch in unlocked position.

3. A locking device for sliding doors and windows comprising a housing, a lock member pivotally mounted on said housing, a control member slidably mounted on said housing adjacent to said lock member, resilient means normally urging said control member into engagement with said lock member to prevent the rotation of said lock member and hold said latch in a locked position extending upwardly from said housing, said housing being attached to a movable frame, a corrugated member fixedly mounted with respect to said movable frame, said corrugated member having a plurality of corrugations dimensioned to removably receive and hold said latch when said latch is disposed in said upward position, to prevent sliding movement of said movable frame in either direction, said control member being movable out of engagement

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with said lock member against the urging of said lock member having at least one slot engageable with the upper portion of said control member to hold said lock member in locked position, resilient means, and means engageable between said control member and lock member whereby movement of said control member pivots said lock member to move said latch downwardly out of engagement with said corrugated member, to release said movable frame for sliding movement in either direction.

4. A locking device for sliding windows and doors comprising a housing, a pivot pin extending transversely across said housing, a lock member pivotally mounted on said pivot pin, said lock member having an elongated latch, the end of said latch having a substantially right angular portion, said lock member having a pair of downwardly directed slots, a U-shaped control member slidably mounted on said housing, a pin extending transversely between the sides of said control member through a pair of elongated slots in the sides of said housing, a coil spring extending between said control member upwardly along said housing so that the upper end of said control member enters said slots to prevent the rotation of said lock member and hold said latch in upward position, said housing being attached to a movable frame, a corrugated member fixedly mounted with respect to said movable frame, said corrugated member having a plurality of spaced corrugations dimensioned to removably receive and hold the right angular portion of the end of said latch when said latch is in upward position to prevent sliding movement of said movable frame in either direction, said control member being slidable downwardly against the urging of said spring to move said control member out of said slots, said control member having a hook at the upper end thereof, a pin extending transversely across said lock member adjacent to said slots, said hook adapted to engage said pin to pivot said lock member and move said latch downwardly out of engagement with said corrugated member and release said movable frame for sliding movement in either direction, said control member being slidable upwardly by the urging of said spring so that the upper edge of said control member engages cam surfaces on said lock member to pivot said lock member and return said latch into locked engagement with said corrugated member.

5. A locking device for sliding windows and doors comprising a housing, a lock member pivotally mounted on said housing, said lock member having an elongated latch, said lock member having at least one downwardly directed slot, a U-shaped control member slidably mounted on said housing, a coil spring extending between said control member and said lock member, said spring normally urging said control member upwardly along said housing so that the upper end of said control member enters said slot to prevent the rotation of said lock member and hold said latch in upward position, said housing being attached to a movable frame, a corrugated member fixedly mounted with respect to said movable frame, said

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corrugated member having a plurality of spaced corrugations dimensioned to removably receive the end of said latch to prevent sliding movement of said movable frame in either direction, said control member being slidable downwardly against the urging of said spring to move said control member out of said slot, said control member having a hook at the upper end thereof, a pin extending transversely across said lock member, said hook adapted to engage said pin to pivot said lock member and move said latch downwardly out of engagement with said corrugated member and release said movable frame for sliding movement in either direction, said control member being slidable by said spring in the opposite direction, so that the upper edge of said control member engages said lock member to pivot said lock member and return said latch into locked engagement with said corrugated member.

6. A locking device for sliding windows and doors comprising a housing, a lock member pivotally mounted on said housing, said lock member having an elongated latch, a control member slidably mounted on said housing, a coil spring extending between said control member and said lock member, said spring normally urging said control member upwardly along said housing so that said control member prevents the rotation of said lock member to hold said latch in upward position, said housing being attached to a movable frame, a corrugated member fixedly mounted with respect to said movable frame, said corrugated member having a plurality of corrugations dimensioned to removably receive and hold the end of said latch to prevent sliding movement of said movable frame in either direction, said control member being slidable downwardly against the urging of said spring, said control member pivoting said lock member to move said latch downwardly out of engagement with said corrugated member and release said movable frame for sliding movement in either direction.

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