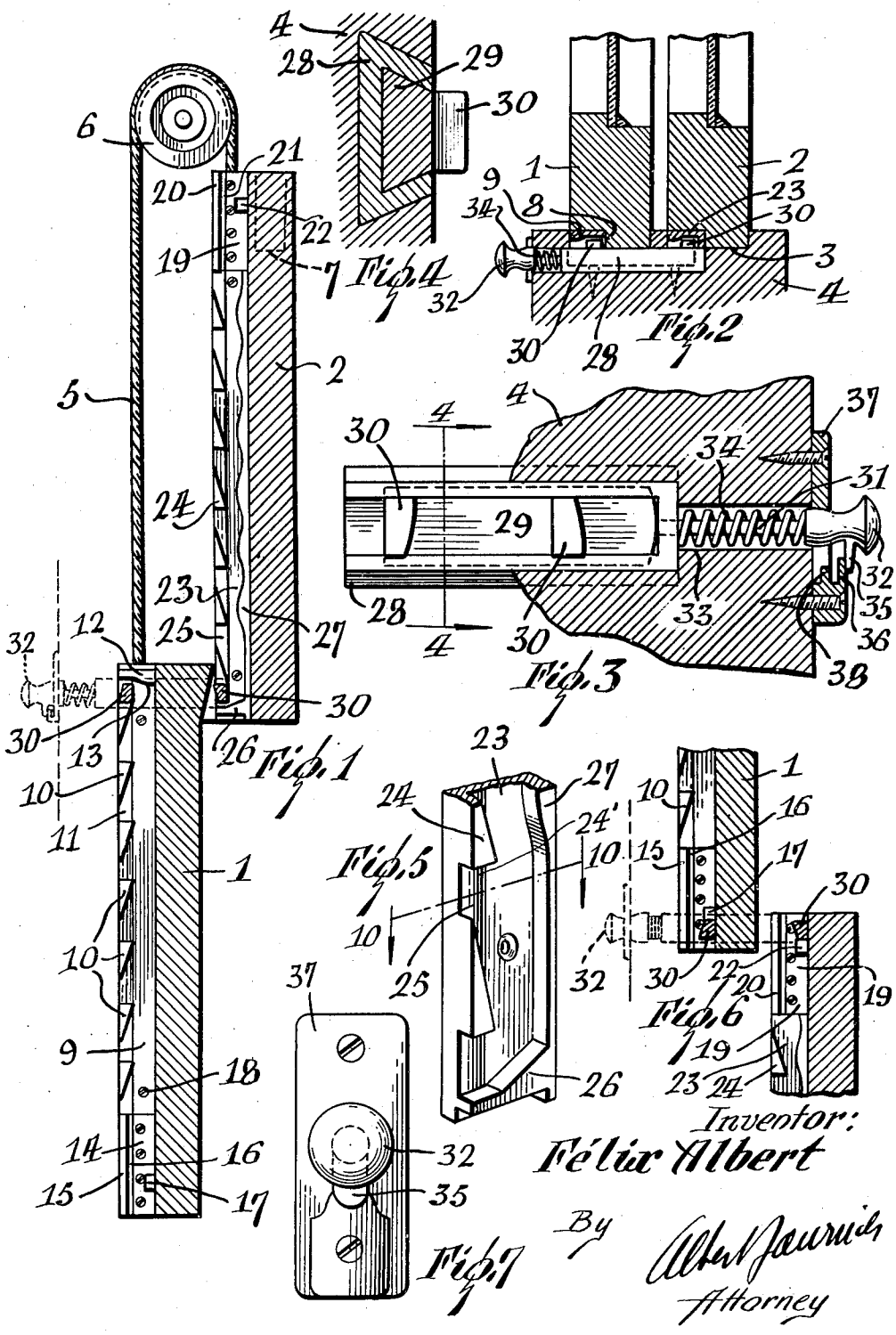
Oct. 26, 1943. F. ALBERT 2,332,979

SLIDING SASH WINDOW CONSTRUCTION

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SLIDING SASH WINDOW CONSTRUCTION

Filed Jan. 22, 1942 2 Sheets-Sheet 2

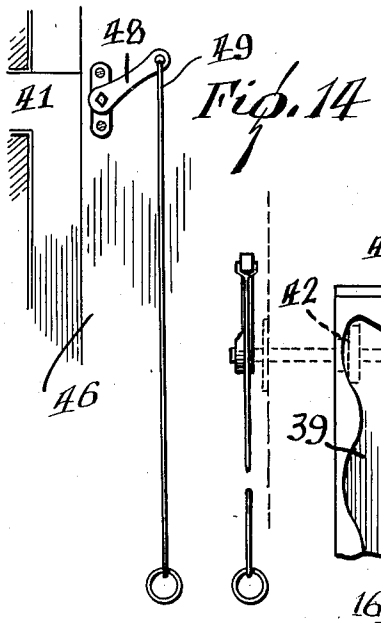


Fig. 14

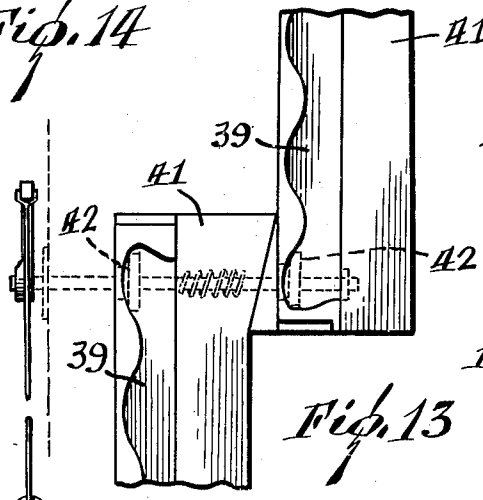


Fig. 13

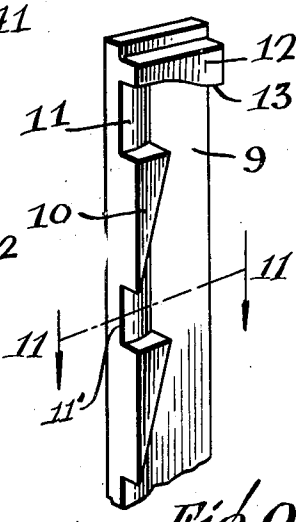


Fig. 9



Fig. 17

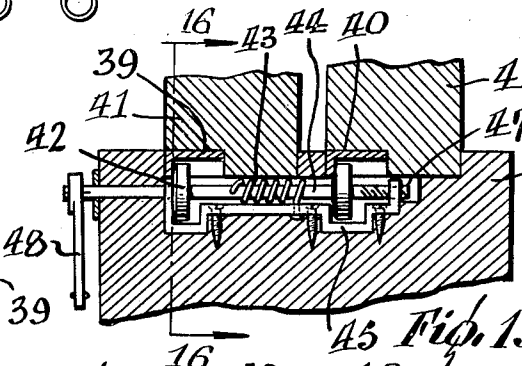


Fig. 15

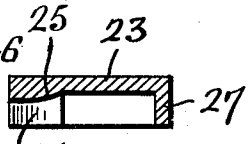


Fig. 10



Fig. 11

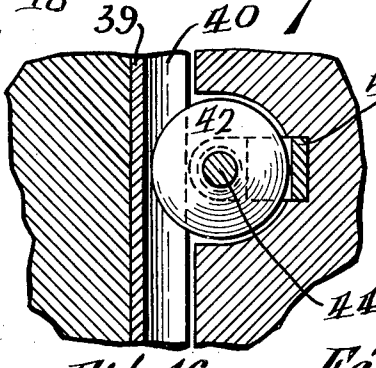


Fig. 16



Fig. 12

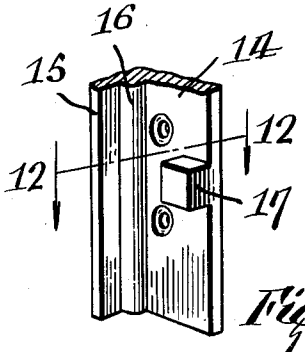


Fig. 8

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UNITED STATES PATENT OFFICE

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SLIDING SASH WINDOW CONSTRUCTION

Felix Albert, Montreal, Quebec, Canada

Application January 22, 1942, Serial No. 427,810
In Canada February 1, 1941

5 Claims. (Cl. 20—52)

The present invention pertains to a novel sliding sash window that opens automatically on release of a locking device which is easily and manually operated.

The principal object of the invention is to provide a means for locking the sashes in any desired position, independently of the automatic opening previously mentioned. The sashes are also locked in any desired position and particularly in a position wherein the opening is too small to permit a thief to enter. Moreover, the sashes are locked so that they cannot be further opened from the outside.

Another object of the invention is to provide a construction permitting the upper sash to be moved to the bottom of the fixed frame for cleaning and also to permit any desired adjustment of the sashes for proper ventilation.

Still another object of the invention is to enable easy movement of the sashes, particularly in public buildings or other structures where the sashes are heavy or out of manual reach. In this connection, the upper sash is heavier than the lower one, so that the window will open up automatically when a latch or lock is released, and the latter can be operated from a lower level by means of a link or cord suspended therefrom. Other objects of the invention, and advantages of construction, will appear as the description proceeds.

The invention is fully disclosed by way of example in the following description and in the accompanying drawings in which:

Figure 1 is a vertical section of a sliding sash, window construction according to the invention;

Figure 2 is a horizontal section illustrating the lock;

Figure 3 is a vertical section through the lower sash to illustrate the lock;

Figure 4 is the section on the line 4—4 on Figure 3.

Figure 5 is a fragmentary perspective view of the base of one of the toothed vertical pieces;

Figure 6 is a detail section similar to Figure 1 and showing the parts in a different position;

Figure 7 is an end view of the operating button;

Figure 8 is a fragmentary perspective view of a vertical member provided with a stop tooth;

Figure 9 is a fragmentary perspective view of the upper portion of another toothed vertical member;

Figure 10 is a section on the line 10—10 of Figure 5;

Figure 11 is a section on the line 11—11 of Figure 9;

Figure 12 is a section on the line 12—12 of Figure 8;

Figure 13 is a fragmentary section, similar to Figure 1; of a modification of the invention;

Figure 14 is an elevation of the operating lever for said modification;

Figure 15 is a horizontal section illustrating the lock of said modification;

Figure 16 is a section on the line 16—16 of Figure 15, and

Figure 17 is a perspective view of the upper portion of the toothed vertical piece in said modification.

Reference to these views will now be made by use of like characters which are employed to designate corresponding parts throughout.

As shown in Figure 1, the device of the invention comprises two sashes 1 and 2 as in all sliding sash windows. For convenience in description, the sash 1 will be designated the inner sash, and the other the outer sash. The sashes are illustrated as close in Figure 1 and may be opened by sliding in their respective frames, which is made possible by setting the sashes in grooves 3 cut in the vertical frame members 4, as illustrated in Figure 2. The sashes 1 and 2 are suspended from a cord 5 trained over a pulley 6 mounted in the top of the frame, the cord having its ends secured to the tops of the sashes. Contrary to the usual construction, the sashes 1 and 2 are not balanced, that is, they are not of equal weight. The outer sash 2 is heavier than the inner sash 1, and for this purpose a metal weight 7 may be inserted in the outer sash and concealed by painting. As usual the cord 5 and pulley 6 are in duplicate, with one set at each side of the frame.

Proceeding now to the novel features of the invention, the sashes 1 and 2 are grooved along an inner vertical edge in order to receive toothed vertical members. These members are two in number and extend one from the other, as illustrated in Figure 1. They are slightly different in construction and will therefore be described separately. The member in the sash 1 includes a vertical strip or plate 9 extending the height thereof and provided on one side with triangular teeth 10 as better shown in perspective in Figure 9.

The top of each tooth 10 lies in a horizontal plane for a purpose that will be described below. The member 9 is of uniform thickness adjacent to the teeth 10 and is slightly thickened at 11 in the notches 11' between the teeth for a purpose that will also be described below. The top of the member 9 is formed with a rib 12 at the lower edge of which is a downward curve 13 descending towards

the exterior. The member 9 extends along the entire length of the groove 8, as already noted, except at the lower end where another strip 14 is inserted in prolongation of the member 9. The member 14 is formed with a vertical rib or flange 15 in line with the teeth 10, and adjacent to this flange is formed a bead 16 in continuation of the thickened portion or bead 11. Near the bottom, the inner surface of the member 14 is formed with a tooth 17. The members 9 and 14 are secured to the sash 1 by screws 18.

The upper part of the sash 2 is provided in its groove 8 with a member 19 similar to the member 14. This member comprises a right angular portion 20, a bead 21, and teeth 22. At the bottom of the member 19 is secured a member 23 similar to the member 9, by means of screws. Like the member 9, the member 23 is provided with triangular teeth 24 with their horizontal faces downward, rather than upwards, and with notches 24' between the teeth. A bead 25 corresponds to the bead 11 of the member 9, and the lower end of the member 23 is formed with a rib or flange 26 corresponding to the part 12. Moreover, the member 23 includes a rib or flange 27 along the edge opposite the teeth 24. The flange 27 is not of uniform thickness but is undulated in order to form a denture or rack. The object of this flange is to prevent thieves from piercing the sash at this point and releasing the lock with an instrument or tool.

Transversely of the members 9 and 23, the vertical frame member 4 is shaped to provide a horizontal receptacle for a box member 28 having three sides as shown in Figure 4 and dove-tail in cross section. In the member 28 is slidably mounted a block 29 of similar shape. The member 29 is extended outwardly in the form of two horizontal teeth 30, the distance between said teeth corresponding to the distance between the teeth 10 and 24. One end of the box 28 is perforated to receive a shaft 31 extending outwardly and terminating in a button 32 disposed at the inner side of the frame member 4. A hole 33 is drilled in the member 4 to receive the shaft. The button 32 is of a larger diameter than the shaft 31, and a coil spring 32 surrounds the shaft in the hole 33 between the end of the box 28 and the button 32.

Normally, and as illustrated in Figure 1, the teeth 30 are in contact with the teeth 10 and 24 respectively in the sashes 1 and 2. The spring 33 secures the position, and the teeth 30 may be released for adjustment of the sashes by pushing the button 32. When the button is permitted to return to normal position under the action of spring 34, after the sashes have been adjusted, the teeth 30 engage with the teeth 10 and 24 and lock the sashes in the adjusted position. Again, when the button is pulled out, the sashes move automatically in the opening direction due to the fact that the upper sash 2 is heavier, as previously set forth.

In order to maintain the teeth 30 in a neutral or inoperative position, the button 32 is provided with a tongue 35 adapted to engage with the inner surface of another tongue 36 formed integrally with a plate 37 fixed to the frame member 4. The tongue 35 thus causes the spring 34 to be compressed slightly so that the teeth 30 are moved to an idle position. A second tongue 38 is formed on the piece 37 to determine an extreme position of the tongue 35 and button 32. This extreme position is employed in locking the sashes in a reversed relation from that shown in Figure 1, that is, with the sash 1 upward and the sash 2 downward, as shown in Figure 6. In this case the teeth 30 lock respectively beneath the tooth 17 and above the tooth 22 to lock both sashes against movement.

To complete the description of the parts already named, it is noted that inclined portions of the ribs 12 and 26 are provided for the purpose of disengaging the sashes at the end of their movement, in the event they stick to the fixed frame. Moreover, the beads 11 and 16 on sash 1 and the similar beads 21 and 25 on sash 2 reduce the lateral play of the sashes in the fixed frame. When the teeth 30 engage the ribs, the sashes are set vertically in their guides. It is well known that the sliding of the sashes is difficult if there is sufficient play to prevent a slight inclination of the sashes. Finally, the rack 27 facilitates engagement of the teeth 30 with the teeth 10 and 24 by producing a vibratory movement of the toothed member 29.

In the modified construction shown in Figure 15 and those based thereon, the vertical members 39 are fixed in the grooves 40 of the sashes 41 and are fitted with undulated racks instead of the triangular teeth 10 and 24. Each rack is engaged by a circular disk 42 under tension of a coil spring 43 tending to rotate the common shaft 44 so that the disks engage in the indentations. The disks may be fixed or rotatable on their common shaft 44. The latter is mounted in a bracket 45 fixed to the frame 46 into which it screws at its threaded end 47, whereby the axial position is properly adjusted.

The shaft 44 carries an external lever 48 from which is suspended a pull cord 49 for rotating the shaft in order to disengage the disks 42 from the racks.

Although specific embodiments of the invention have been illustrated and described, it will be understood that various alterations in the details of construction may be made without departing from the scope of the invention as indicated by the appended claims.

What I claim is:

1. A sliding sash window comprising a fixed frame, a pair of sashes slidably mounted in said frame, a pulley mounted in the top of said frame, a cable trained over said pulley and attached to said sashes for suspending the latter, the upper sash being heavier than the lower sash, a toothed member mounted vertically in an edge of each sash, a horizontally slidable toothed member mounted in said frame, a spring acting on the last named member for bringing the teeth thereof into engagement with the teeth of the first named toothed members, and a button carried by the horizontal toothed member for releasing the engagement of the teeth, whereby said sashes move automatically by reason of their unbalanced weight, the first named toothed members being of reduced thickness between the teeth thereof to provide spaces for receiving the horizontally slidable teeth, one of the first named toothed members having an undulated edge opposite the teeth thereof to affect a vibratory movement by contact with said horizontally movable teeth.

2. A sliding sash window comprising a fixed frame, a pair of sashes slidably mounted in said frame, a pulley mounted in the top of said frame, a cable trained over said pulley and attached to said sashes for suspending the latter, the upper sash being heavier than the lower sash, a toothed

member mounted vertically in an edge of each sash, a horizontally slidable toothed member mounted in said frame, a spring acting on the last named member for bringing the teeth thereof into engagement with the teeth of the first named toothed members, and a button carried by the horizontal toothed member for releasing the engagement of the teeth, whereby said sashes move automatically by reason of their unbalanced weight, the first named toothed members being of reduced thickness between the teeth thereof to provide spaces for receiving the horizontally slidable teeth, extensions at the ends of the first named toothed members, a single tooth on each extension and adapted for locking engagement with the horizontally slidable member in the locking position.

3. A sliding sash window comprising a fixed frame, a pair of sashes slidably mounted in said frame, a pulley mounted in the top of said frame, a cable trained over said pulley and attached to said sashes for suspending the latter, the upper sash being heavier than the lower sash, a toothed member mounted vertically in an edge of each sash, a horizontally slidable toothed member mounted in said frame, a spring acting on the last named member for bringing the teeth thereof into engagement with the teeth of the first named toothed members, and a button carried by the horizontal toothed member for releasing the engagement of the teeth, whereby said sashes move automatically by reason of their unbalanced weight, the first named toothed members being of reduced thickness between the teeth thereof to provide spaces for receiving the horizontally slidable teeth, extensions at the ends of the first named toothed members, a single tooth on each extension and adapted for locking engagement with the horizontally slidable teeth, and means for maintaining said horizontally slidable member in the locking position, said means comprising a tongue carried by said button and another tongue carried by said frame and with which the first tongue is engageable.

4. A sliding sash window comprising a fixed frame, a pair of sashes slidably mounted in said frame, a pulley mounted in the top of said frame, a cable trained over said pulley and attached to said sashes for suspending the latter, the upper sash being heavier than the lower sash, a toothed member mounted vertically in an edge of each sash, bracket mounted in said frame, a shaft mounted in said bracket and having one end threaded therein, disks carried by said shaft and adapted to engage said toothed members, a spring tending to turn said threaded shaft to bring said disks into engagement with said toothed members, and a lever carried by said shaft for rotating the shaft in the opposite direction to disengage said disks.

5. A sliding sash window comprising a fixed frame, a pair of sashes slidably mounted in said frame, a pulley mounted in the top of said frame, a cable trained over said pulley and attached to said sashes for suspending the latter, the upper sash being heavier than the lower sash, a toothed member mounted vertically in an edge of each sash, a horizontally slidable toothed member mounted in said frame, a spring acting on the last named member for bringing the teeth thereof into engagement with the teeth of the first named toothed members, and a button carried by the horizontal toothed member for releasing the engagement of the teeth, whereby said sashes move automatically by reason of their unbalanced weight, the first named toothed members being of reduced thickness between the teeth thereof to provide spaces for receiving the horizontally slidable teeth, extensions at the ends of the first named toothed members, a single tooth on each extension and adapted for locking engagement with the horizontally slidable teeth, means for maintaining said horizontally slidable member in the locking position, said means comprising a tongue carried by said button and another tongue carried by said frame and with which the first tongue is engageable, and another tongue carried by said frame, between the frame and the second named tongue, for engagement with the first named tongue, whereby to compress said spring and hold the horizontally slidable teeth in locking engagement with the teeth on said extensions.

FELIX ALBERT.