Sept. 17, 1940. H. H. KISTNER 2,214,884

SAFETY LOCK FOR CASEMENT WINDOWS

Filed July 15, 1937 3 Sheets-Sheet 1

Fig. 1.

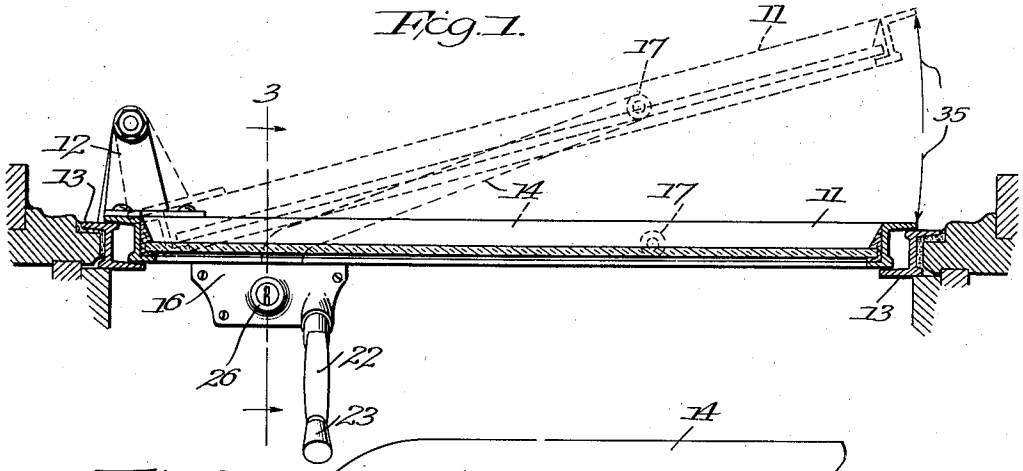


Fig. 2.

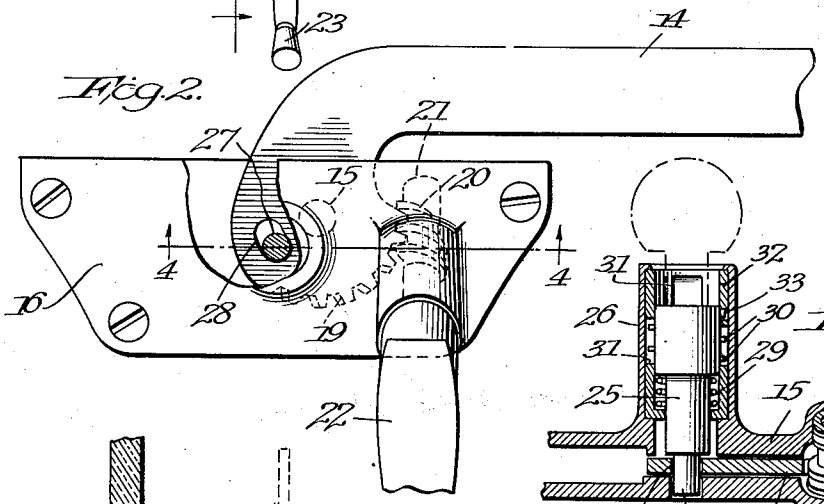


Fig. 4.

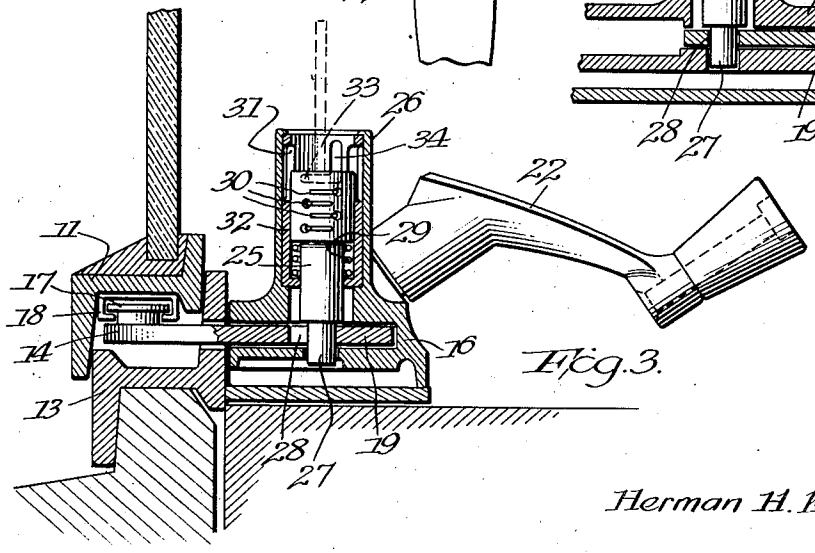


Fig. 3.

Inventor

Herman H. Kistner.

By Emery Booth Holcombe Wilkes

Attorneys

Sept. 17, 1940. H. H. KISTNER 2,214,884

SAFETY LOCK FOR CASEMENT WINDOWS

Filed July 15, 1937 3 Sheets-Sheet 2

Fig. 5.

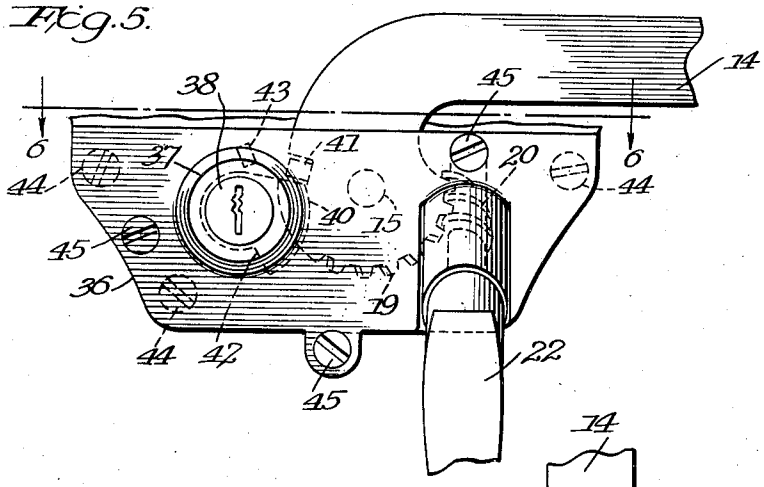


Fig. 6.

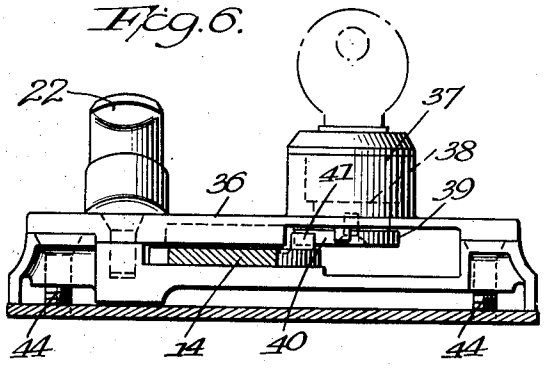


Fig. 7.

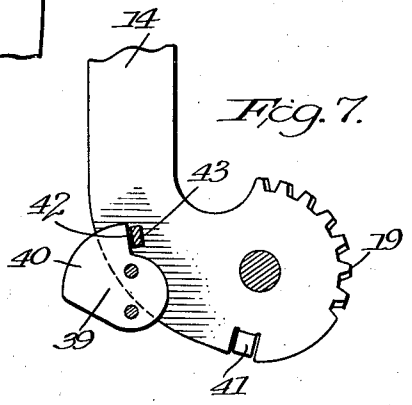


Fig. 8.

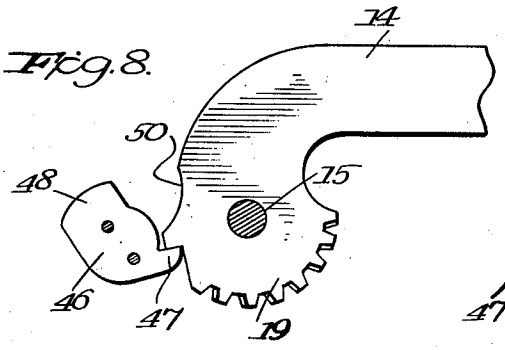
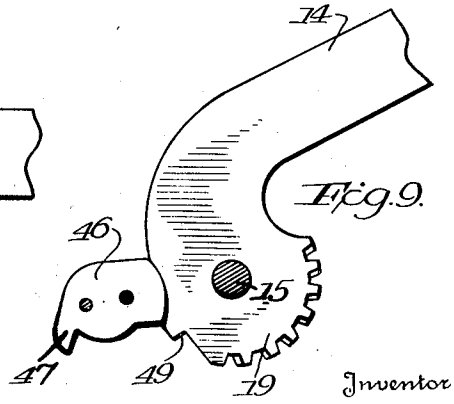


Fig. 9.



Inventor

Herman H. Kistner

By Emery, Booth, Holcombe & Miller

Attorneys

Sept. 17, 1940. H. H. KISTNER 2,214,884

SAFETY LOCK FOR CASEMENT WINDOWS

Filed July 15, 1937 3 Sheets-Sheet 3

Fig. 10.

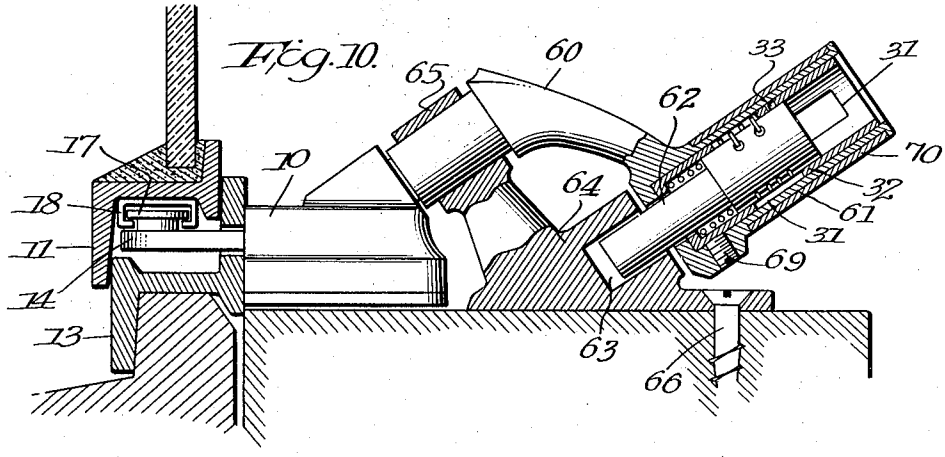


Fig. 16.

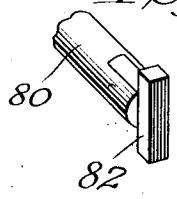


Fig. 11.

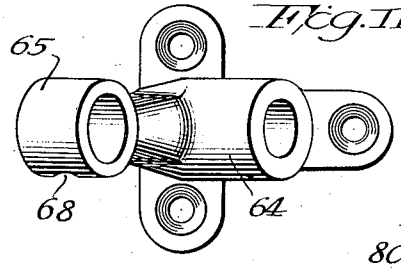


Fig. 15.

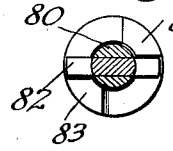
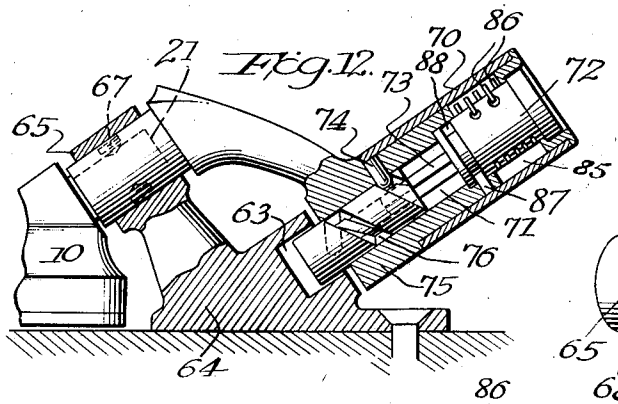


Fig. 12.



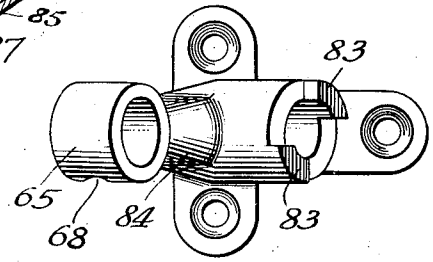
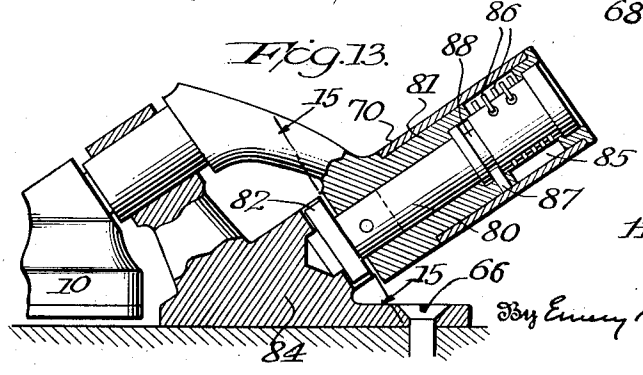


Fig. 14.

Fig. 13.



Inventor

Herman H. Kistner.

By Emery Booth & Holcombe & Miller

Attorneys

Patented Sept. 17, 1940

2,214,884

UNITED STATES PATENT OFFICE

2,214,884

SAFETY LOCK FOR CASEMENT WINDOWS

Herman H. Kistner, Baltimore, Md.

Application July 15, 1937, Serial No. 153,837

12 Claims. (Cl. 70—89)

This invention relates to safety locks for casement windows and other pivoted members which are provided with operating means comprising a screw and gear mechanism, and is particularly adapted to the metal casement windows commonly used for high class residences and office buildings.

The invention aims to provide a strong and secure key actuated locking means for preventing the window or other pivoted member from being opened sufficiently to permit of entrance of a person therethrough while permitting limited opening for ventilation. A further aim is to provide for locking the window in either closed or ventilating position.

Other objects of the invention are to simplify and reduce the cost of applying adequate safety locks to existing window installations, and to improve the appearance and facilitate the operation of such devices.

In the accompanying drawings illustrating preferred forms of the invention,

Fig. 1 is a horizontal cross-section through a metal casement window showing one form of my improved safety lock in plan, the extent of movement of the window in its locked position being indicated in broken lines;

Fig. 2 is a part plan view and part horizontal cross-section on the line 2—2 in Fig. 4 of the form of lock shown in Fig. 1, showing a portion of the window operating mechanism;

Figs. 3 and 4 are vertical cross-sections of the same on the lines 3—3 in Fig. 1 and 4—4 in Fig. 2, respectively;

Figs. 5, 6 and 7 illustrate a modified form of safety lock having a rotating barrel type of locking means, Fig. 5 being a plan view;

Fig. 6 is a vertical cross-section of the form of lock shown in Fig. 5, on the line 6—6 therein, looking in the direction of the arrows; and

Fig. 7 is a plan of part of the operating arm and locking cam showing them in wide open position of the window;

Fig. 8 is a plan view of a modified form of safety lock having provision for dead locking the window in closed and in ventilating positions, as desired, showing the parts dead locked in closed position of the window;

Fig. 9 is a plan view of the form of lock illustrated in Fig. 8, showing the parts dead locked in ventilating position of the window;

Fig. 10 is a cross-sectional view similar to Fig. 3 of a modified form of lock adapted for application to existing types of metal window operating installations;

Fig. 11 is a plan view of the body only of the locking device illustrated in Fig. 10;

Figs. 12 and 13 are views similar to Fig. 10 showing modified forms of the invention;

Fig. 14 is a plan view of the body only of the locking device illustrated in Fig. 13;

Fig. 15 is a cross-section of the locking device illustrated in Fig. 13 taken on the line 15—15 therein, looking in the direction of the arrows; and

Fig. 16 is a perspective view of the locking member of the form of device illustrated in Figs. 13, 14 and 15.

In the form of device shown in Figs. 1 to 4, the safety lock is built into the window operating mechanism in such manner as to permit the window to be opened through a narrow angle for ventilating purposes, and closed at will, even when locked, but preventing wider opening from either the inside or outside without use of the key. The window illustrated is of the outwardly swinging metal sash type, the sash frame 11 being pivoted at top and bottom upon a pair of brackets 12 fixed to the window frame 13 above and below the window opening. The window sash is swung open and shut by means of an operating arm 14 made of hardened steel and pivoted at one end on a stud 15 in a housing 16 fixed on the inner or room side of the window sill or sill member of the frame 13. The outer end of the operating arm 14 carries a button or slide member 17 which fits into a channel 18 secured on the under side of the window frame 11. The edges of this channel member are turned in to embrace the grooved neck of the button 17, as shown in Fig. 3, so that the free end of the arm is slidably secured to the window frame in all positions thereof, and cannot be separated therefrom without removing the housing 16, which is held in place by non-removable metal drive screws or other suitable means not easily attacked by means available to a burglar.

The operating arm is provided at its pivoted end with a gear sector 19, and is controlled by means of a screw or worm 20 mounted on the end of a short shaft 21 journalled in the housing 16. The outer end of the shaft 21 carries an operating crank 22 provided with a rotatable handle 23, the crank being secured to the shaft by a set screw or in any suitable manner. By rotating the crank, the arm is caused to swing and thereby the window is opened and closed.

Windows of this type are customarily provided with a latch or catch for retaining them in closed position, but this catch does not function when

the window is partly open, and if the window is open far enough to permit a person's hand to be inserted from without, the crank 22 may be rotated and the window opened wide.

My locking device comprises a key actuated locking bolt 25, of the type shown and described in my pending application Ser. No. 41,115, which is mounted in a cylindrical boss or casing portion 26 of the housing 16, as shown in Figs. 3 and 4. The inner end of the bolt has a hardened portion 27 which is adapted to be protruded into a slot 28 in the gear sector 19, to prevent more than a restricted angular turning movement of the gear and arm 14. A spring 29 retains the bolt 25 with the projection 27 out of engagement with the slot 28 when the bolt is unlocked, as is well understood in sliding bolt locks of this type, that illustrated having a plurality of discs or tumblers 30 under control of the key which engage in suitable spaced recesses 31 in the bolt receiving sleeve 32 to retain the bolt in locking and unlocked position, respectively, thereby deadlocking it.

The bolt may be moved only by means of the key inserted in the axial slot in its outer end, as illustrated in Figs. 3 and 4, and is guided in its movement by a pin 33 in its side which engages in an L-shape slot 34 in the sleeve 32, the bolt and sleeve assembly being retained in the housing 26 preferably by spinning over the end of the housing to embrace the end of the sleeve, as shown in said figures.

The pitch of the screw 20 is such that the mechanism is non-reversible, that is, the screw will turn the sector but the sector will not turn the screw, whereby it will hold the window in adjusted position without other securing means, the wind and other forces tending to swing the window having no effect in turning the screw, and thus the window may be set in any adjusted position within the range of movement permitted by the length of the slot 28 when the bolt is in locking position. In the device illustrated in Figs. 1 to 4, this range of movement is indicated by the arc marked with the arows 35.

The locking device illustrated in Figs. 5, 6 and 7 is applied to the same general style of casement window operating mechanism as shown in Figs. 1 to 4, wherein the window operating arm 14 is pivoted on a stud 15 in a housing 36 similar to the housing 16 excepting that it is made in two parts, the upper of which is provided with the casing 37 which holds the rotatable barrel or plug 38 containing the locking discs or tumblers. The inner end of the barrel 38 is provided with a plate or cam 39 which has a detent portion 40 adapted to engage the bent up tongue 41 in the edge of the gear sector 19. The back edge 42 of the detent portion of the cam 39 is adapted to abut against a fixed stop 43 on the under side of the top part of the housing 36, as shown in Fig. 7, thereby preventing turning of the barrel too far when the key is used to unlock the window.

The screws 44 which secure the lower part of the housing 36 to the window sill are covered and secured in place by the top part of the housing, which in turn is held in place by screws 45 or other suitable means. All of the operating parts of the mechanism are preferably attached to the top part of the housing 36, so that all may be removed and replaced together as a unitary assemblage.

In the modified form of locking plate and gear sector illustrated in Figs. 8 and 9, the plate 46 on the lower end of the rotatable locking barrel or plug is provided with two detents, 47, 48, the first one of which engages with a notch or shoulder 49 on the gear sector 19, to hold the latter in closed position of the window, as shown in Fig. 8. The other detent 48 is arcuate in form to fit into a corresponding recess 50 in the gear sector 19 to hold the latter in ventilating position of the window, as shown in Fig. 9, the two engaging positions of the locking barrel being at about 90° apart and corresponding to two of its deadlocked positions. A third deadlocked position is provided at 180° from the closed locking position in which the locking barrel may be left to permit free operation of the window opening mechanism.

In the forms of the invention illustrated in Figs. 10 to 16, inclusive, the window may be locked rigidly in any one of a series of positions determined by the rotation of the operating handle, which is provided with a deadlocking means for holding it fast in each lowermost position of rotation. This form of device may be applied to existing casement window installations by removing the operating crank from the end of the shaft 21 and substituting a crank 60 having provision within its handle end 61 for a locking bolt 62, the hardened extremity of which engages in a recess 63 in a keeper block 64 which has an upstanding arm provided with a bearing 65 for the crank to turn in, and which is secured to the window sill adjacent the housing 10 for the window operating mechanism in any suitable manner.

In the form of device illustrated, the keeper block is secured in place by screws 66, one of which is positioned beneath the locking position of the crank handle where it cannot be removed when the handle is locked. The screws or pins 67 which secure the crank 66 on the shaft 21 are inserted through a hole 68 in the side of the bearing 65, so located that these screws or pins cannot be removed when the handle is locked. Thereby the crank handle and locking mechanism are fixedly secured in place and cannot be removed when the handle is locked in position.

The form of the invention shown in Figs. 10 and 11 comprises a bolt locking sleeve 32 and assembled parts similar to the locking sleeve and bolt assembly illustrated in Figs. 3 and 4, which are secured to the handle 61 by means of a screw 69 passing through one side wall in such position that it cannot be removed when the handle is locked.

A knurled or otherwise finished sleeve 70 is rotatably mounted on the hollow handle 61 for a hand or finger hold, to make it easy to rotate the handle. This sleeve is preferably secured in place by spinning over the end of the handle.

The form of device illustrated in Fig. 12 is similar to that shown in Figs. 10 and 11, with respect to its general construction and mode of operation, the devices being alike except for the locking bolt 71 and associated parts, which are more rugged. The bolt is shot into locking position by rotating the tumbler barrel 72, which has a squared end 73 having a sliding fit in a squared recess in the bolt, causing the two to turn together, a pin 74 secured in the handle 75 and projecting into a spiral groove 76 on the bolt operating to move the bolt in one or the other direction, depending on the direction in which the barrel is turned.

Another modification of the invention is shown in Figs. 13, 14, 15 and 16 wherein the

locking bolt 80 is rotatable in the hollow handle 81 of the crank arm, but is not axially movable as in the other forms of the invention. The inner end of the bolt is provided with a cross bar 82, which in one position engages between quarter segments 83 on the keeper member 84, which may be secured to the window sill or frame in any suitable manner to hold it rigid. By turning the bolt through 90° in the direction away from the adjacent faces of the segments 83, the cross bar is shifted to permit it to move endwise between the segments as the handle is rotated in either direction, thereby permitting opening or closing movement of the window. Two pairs of opposed slots 85 are made in the hollow wall of the handle 81 upon diameters at right angles to each other to receive the locking tumblers 86 in one or the other position of rotation of the bolt. A pin 87 in the hollow wall of the handle, projects into a groove 88 encircling the bolt and holds it in place against lengthwise movement while permitting rotation at will.

The tumblers and key nibs can be changed to provide a large number of combinations as is well known in this type of multiple tumbler lock, and in supplying a set of locks for a house or single apartment, all would be provided with the same key combination, so as to enable the same key to operate all of the locks of the set.

It is obvious that changes in the designs may be made to suit different types of windows and frames, and to adapt the invention to other types of operating mechanism, and the invention is not restricted to the details of construction shown in the drawings.

In the claims, the word "window" is used broadly to include both vertically and horizontally swung windows, doors, shutters, hatches and similar closure members to which the invention is applicable.

I claim the following as my invention:

1. A locking device for windows having operating means for opening and closing the movable sash including a pivoted member and manually operable non-reversible means for rotating it, said locking device comprising a lock housing and a locking member mounted for movement therein, said locking member having a detent portion adapted in deadlocked position to engage said pivoted member and prevent rotation thereof in the direction to open said window, and key controlled means operable from without said housing for deadlocking said locking member.

2. A locking device for windows having operating means for opening and closing the movable sash including a pivoted member and manually operated worm and sector means for rotating it and for holding it in adjusted position, said locking device comprising a lock housing and a locking member protected by said housing and mounted for movement therein, said locking member having an end portion adapted to be held in deadlocked position in juxtaposition to said sector to prevent rotation thereof in the direction to open said window, and key controlled means for deadlocking said locking member.

3. A locking means for preventing undue opening movement of a pivoted window having an operating arm provided with a sector, said locking means comprising an elongated slot in said sector, and an endwise movable bolt adapted to engage in said slot to limit movement of said sector in both directions.

4. A safety locking means for preventing undue opening movement of a pivoted window having an operating arm provided with a sector, an elongated slot in said sector, said locking means comprising and an endwise movable bolt adapted to be projected to engage in said slot to limit movement of said sector in both directions, said bolt being provided with key operated deadlocking means for projecting it and locking it in projected position to engage said slot.

5. A locking device for windows having operating means for opening and closing the movable sash including a pivoted member and worm and sector means for rotating it and for holding it in adjusted position, said locking device comprising a lock housing and a locking member mounted for movement therein, said locking member having a portion adapted in one deadlocked position to engage with said sector to prevent rotation of said pivoted member in the direction to open said window, and a portion adapted in another deadlocked position to engage, with said sector to prevent rotation of said pivoted member in either direction to hold said window in ventilating position.

6. A locking device for windows having operating means for opening and closing the movable sash including a pivoted arm and means for rotating it, said locking device comprising a lock housing and a tumbler barrel mounted for movement therein, said tumbler barrel having an end portion adapted to be held in deadlocked position in juxtaposition to said arm to prevent rotation thereof in the direction to open said window, and tumbler means for deadlocking said tumbler barrel.

7. A locking device for windows having operating means for opening and closing the movable sash including a pivoted member and cooperating means for rotating it and for holding it in adjusted position, said locking device comprising a lock housing and a locking member mounted for rotation therein, and deadlocking means for deadlocking said locking member in either of two positions, said locking member having a portion adapted in one deadlocked position to engage with said pivoted member to prevent rotation thereof in the direction to open said window, and a portion adapted in another deadlocked position to engage with said pivoted member to prevent rotation thereof in either direction to hold said window in ventilating position.

8. A locking device for windows having operating means for opening and closing the movable sash including a pivoted member and cooperating means for rotating it and for holding it in adjusted position, said locking device comprising a lock housing and a locking member mounted for rotation therein, said locking member having a portion adapted to engage with said pivoted member to prevent rotation of the latter, and means for deadlocking said locking member to lock said window.

9. A locking device for windows having operating means for opening and closing the movable sash including a pivoted member and cooperating means for rotating it and for holding it in adjusted position, said locking device comprising a lock housing and a locking member mounted for rotation therein, said locking member having a portion adapted to engage with a cooperating portion of said pivoted member to prevent rotation of the latter in either direction, and means for deadlocking said locking member to lock said window in adjusted position.

10. A locking device for windows having operating means for opening and closing the mov-

able sash including a pivoted member and worm and sector means for rotating it and for holding it in adjusted position, said locking device comprising a lock housing and a locking member mounted for rotation therein, said locking member having a portion adapted to engage with said sector to prevent rotation of said pivoted member and carrying means for deadlocking said locking member in the sector engaging position.

11. A locking device for casement windows having an operating device for opening and closing the movable sash including a pivoted arm and manually operable means for rotating it, said locking device comprising a housing and a bolt mounted for axial movement therein and inaccessible for manipulation by the fingers, said bolt having an inner portion engaging with said arm in dead-locked position to restrict rotation thereof in the direction to open said window and an exposed end slotted to receive a mating key, and means responsive to a mating key for dead-locking said bolt in arm-engaging position, whereby insertion of the proper key enables said bolt to be moved thereby.

12. A locking device for casement windows having an operating device for opening and closing the movable sash including a pivoted arm and manually operable means for rotating it, said locking device comprising a housing and a bolt mounted for movement therein into proximity with said pivoted arm, said bolt being protected by said housing from manipulation by the fingers, means cooperating with said housing for dead-locking said bolt in moved position, and means associated with said bolt for engaging with said arm in dead-locked position of the former to restrict rotation of the latter in the direction to open said window, the outer end of said bolt being provided with an opening to receive an operating key, whereby insertion of the proper key enables said bolt to be withdrawn from dead-locking position.

HERMAN H. KISTNER.