Jan. 7, 1930. W. ROPER 1,742,864

CASEMENT WINDOW

Filed Sept. 19, 1928

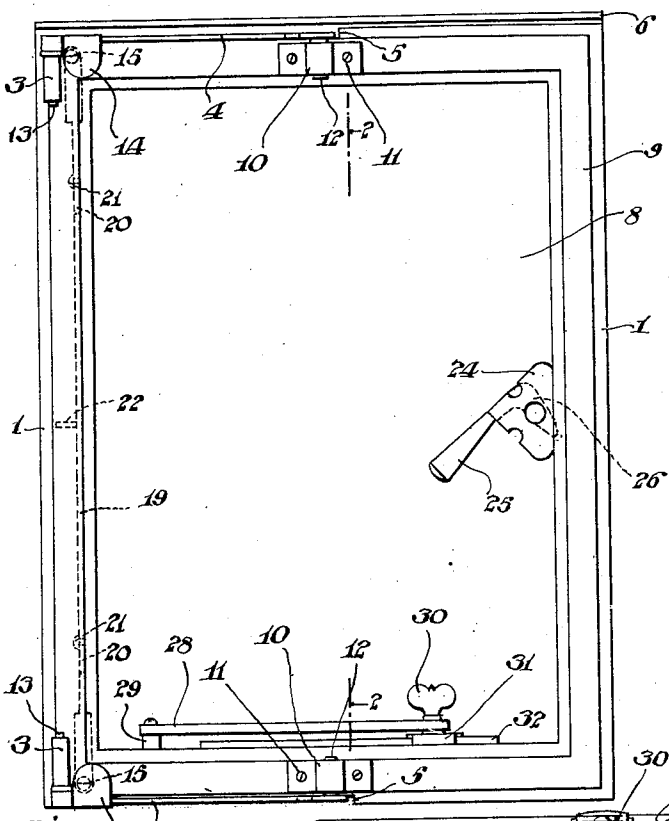


Fig. 1.

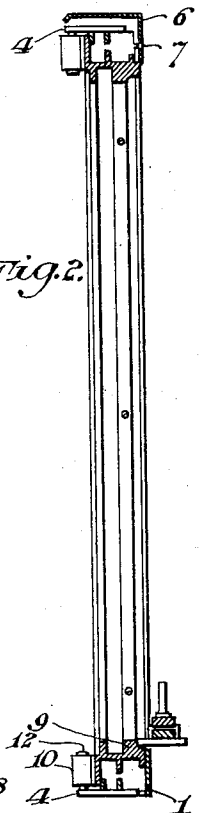


Fig. 2.

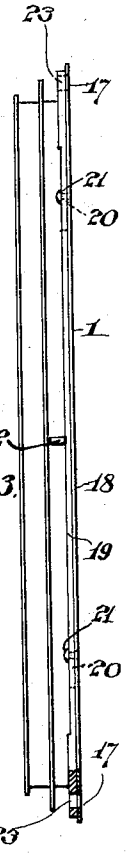


Fig. 3.

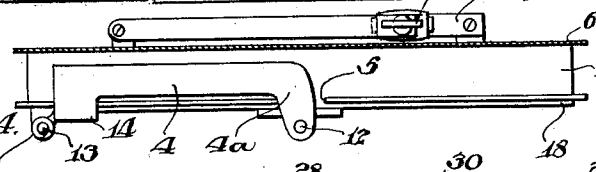


Fig. 4.

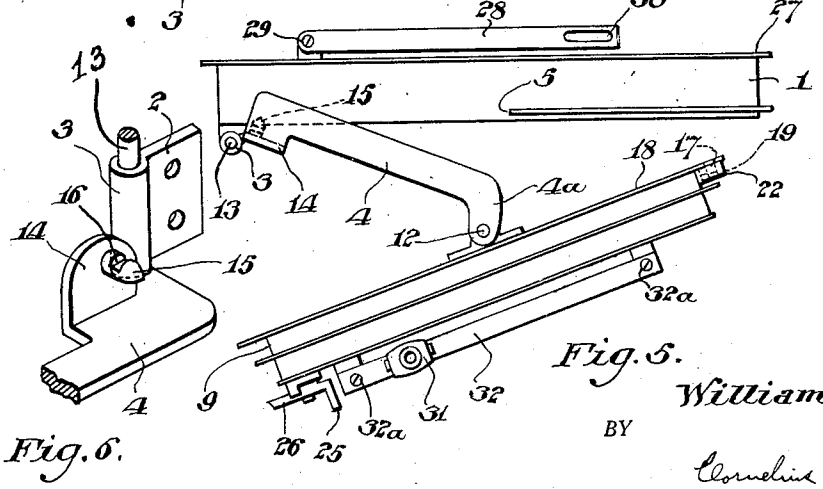


Fig. 5.

Fig. 6.

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UNITED STATES PATENT OFFICE

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CASEMENT WINDOW

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My invention relates to casement windows, and more particularly to those of the reversible type.

Casement windows of the reversible type as previously constructed have certain inherent disadvantages which often render them unreliable and unsafe. For example, it is customary for such windows to be solely supported by side hinges when in reversed or open position, and corrosion or shearing of the hinge pintles due to sudden shock might in such cases cause the window, which may be very heavy for certain types of buildings, to break loose from its hinges and fall, causing damage and possible injury to people underneath. Furthermore the hinges and supporting members for windows of the above type have generally been exposed to the weather with resulting corrosion, deterioration and weakening of the supporting structure.

In accordance with my invention, there are provided a plurality of levers for bodily supporting a casement window of the reversible type, the said levers being adapted to lie within recesses formed in a supporting frame when the window is in closed position.

Further and more specifically in accordance with my invention, the said supporting levers have lugs mounted thereon adapted to engage the movable frame member of the window to restrain movement of the same with respect to said levers and to maintain the same in closed position; the said lugs each having a locking member thereon adapted to engage a coacting locking member mounted on said movable frame, and the said locking structure having common actuating means so that said frame may be released from said lugs by a single operation.

For a better understanding of my invention, reference is to be had to the accompanying drawing in which:

Fig. 1 is an elevational view of a reversible window embodying my invention, in closed position.

Fig. 2 is a sectional view taken along the line 2—2 of Fig. 1.

Fig. 3 is an elevational view of one side of the window.

Fig. 4 is a plan view of the window in closed position.

Fig. 5 is a plan view of the window in both open and reversed positions.

Fig. 6 is a detailed view of locking structure.

Referring to Fig. 1, which shows a reversible casement window of the pivoted-lever type as viewed from the outside, a stationary frame 1 has secured thereto lug members 2 (Fig. 6) having bearing members 3 for supporting levers 4. Frame 1, as disclosed, is rectangular in shape and the top and bottom sections are each cut away as at 5 (Fig. 4) to provide recesses for levers 4. A detachable cover plate 6 is secured, as by screws 7, to the frame so that the upper lever may be completely shielded and protected when the window is in closed position.

A window 8 mounted in frame 9 is adapted to be supported by levers 4 adjacent their free ends, and has bearing members 10 secured thereto, as by screws 11, for co-operating with pins or studs 12 secured to the pivoted levers. Levers 4 are pivoted to the frame 1 by pins or studs 13 secured to the levers, which are mounted in bearing members 3. It will be observed that levers 4 are mounted so that their planes are substantially parallel with their planes of movement. This construction results in certain advantages which will be later described.

Secured to levers 4 are lugs 14 which are adapted to engage the frame 9 of window 8 when the same is pivoted at 12 in a counter-clockwise direction as viewed in Fig. 5. Referring to Fig. 6, each lug 14 has mounted thereon a pointed locking element or stud 15 having a recess 16 cut therein for engagement with a co-operating locking element carried by pivoted frame 9. The edge of frame 9 which is adapted to bear against lugs 14 has a hole 17 therein opposite each locking stud 15, and is adapted to receive stud 15 when the window is rotated to the position indicated in Figs. 1 and 4. Frame 9 has an outer flange 18 secured thereto, the same normally being on the outside of the window and has on its inner edge adjacent lugs 14 locking structure for co-operating

with studs 15. The locking structure comprises a continuous member, as a rod 19 extending vertically along flange 18 between the holes 17 therein, and is guided for reciprocal movement by any suitable means as screws 20 co-acting with slots 21 in member 19. A knob, or equivalent, 22 is secured to member 19 so that the same may be reciprocated vertically along flange 18. Member 19 has holes drilled there-through at its opposite ends in such registry with holes 17 that when the studs 15 are inserted through said holes, member 19 is adapted to move to its lower position and seat within recesses 16 of studs 15 so that relative movement between lugs 14 and window frame 9 is prevented. The member 19, which will be termed a locking bar, is permitted through guide means 20 and 21 to be in such position when the window and its supporting levers are not locked together that holes 23 are not in exact registry with holes 17, but are slightly below the same so that the pointed end of stud 15 serves to cam locking bar 19 upwardly as it enters holes 17 and 23. When stud 15 has moved to such position that lug 14 is in close engagement with flange 18, recess 16 of lug 15 will be in exact registry with locking bar 19, which will thereupon fall into said recess and effect locking of levers 4 and frame 9.

It will therefore be apparent that when frame 9 is locked to levers 4 in the manner previously described, the window 8 will pivot about pivots 13 and its movement will be that of the ordinary side-pivoted window. For such usual use, the window is provided with conventional fastening structure 24 for securing the window from the inside to stationary frame 1. Such fastening means may be of any desirable type, and may comprise an operating handle 25 for moving lever 26 secured thereto into engagement with an inner flange 27 of frame 1. In the position shown in Fig. 1, the window is unlocked on the inside, the window being fastened simply by counter-clockwise movement of arm 25. Conventional means for securing the window in various open positions comprise a lever 28 pivoted at 29 to frame 1 and having at its opposite end a thumb screw 30, or equivalent, for co-operating with a member 31 slidable on bar 32 which is secured to frame 9. Further description of this feature is deemed unnecessary, such construction being well known in the art. Thumb screw 30 is simply loosened when the window is to be moved to different positions, and tightened when the desired position is reached, it only being necessary to remember that levers 28 and 32 must be disconnected by loosening screw 30 when the window is to be reversed about pivots 12.

If now it becomes desirable to reverse window 8 for the purpose of cleaning the outer surface of the pane, or other reasons, the window 8 is first opened and swung about pivots 13, whereupon locking bar 19 is lifted and the window is thereupon free to be rotated in a clockwise direction to a position indicated in Fig. 5. In this, or a similar position, access is readily had to the normal outer surface of the window so that it may be easily washed and cleaned without danger and inconvenience. If desired, it will be understood that suitable fastening means may be provided for securing the window in different reverse positions. For example, when the wind is in such direction that it would be undesirable to have window 8 open when pivoted in its usual manner, it will be apparent that the window may be reversed and made to open in the opposite direction as indicated in Fig. 5 so that the previous objections are overcome. For such reverse positions, suitable fastening structure may be mounted on frame 19, as on flange 18, to co-act with the securing lever 28.

By referring to Figs. 4 and 5, it will be noted that the weight of window 8 is not borne by the pivots 12, but is borne directly by the offset portions 4^a of levers 4. By designing levers 4 so that the weight of window 8 is directly borne by them, the pivot pins 12 are relieved of the great strains and stresses due to shearing forces exerted when the window is opened or closed with great force, as is often the case in actual practice. Furthermore by providing recesses 5 in the top and bottom portions of frame 1 for receiving levers 4, the same are protected when in closed position against the deteriorating effects of the weather and from mechanical injury. In addition, the aforesaid structure presents an improved appearance over other types of hinged reversible windows as large unsightly hinges are eliminated. In reversible windows of the hinge type, it is apparent that the hinge pintles are continuously exposed to the deteriorating effects of the weather, and since the mechanical shock is transmitted directly through the pintles between the window and its frame, the said pintles will in time become unsafe and there will be danger of the window falling from its fastenings.

In accordance with my invention, however, the window is not hinged, within the ordinarily accepted meaning of the term, but is pivotally supported on a pair of levers which in turn are pivoted to a stationary frame.

The locking structure for maintaining frame 9 in engagement with levers 4 has other advantages than enabling the window to be used as an ordinary side-hung window. Since levers 4 may be independently mounted on frame 1, it is desirable that the action of both the top and bottom pivots be synchronized. As frame 9 is of necessarily rigid

construction, it follows that when both levers 4 are fastened to the said frame, synchronized movement will result. It is also both highly desirable and essential to have the portion of frame 9 opposite fastening means 24 and 25 in tight engagement with the stationary frame 1, so that the window may not be opened from the outside by moving the same about pivots 12 in a counter-clockwise direction as viewed in Fig. 4. If such operation were possible, fastening means 24 and 25 would have but little use. By providing lugs 14 on levers 4, however, for overlying flange 18, it will be apparent that the window may be maintained in snugly closed position when fastened from the inside. By further providing locking means for restraining movement between levers 4 and frame 9, play or rattle between said members is taken up and prevented.

It will be understood that my invention is not limited to the specific structure herein described, but is applicable to top-hung, as well as side-hung frames such as transoms, for example, and that the same is applicable to any pivoted frame structure which is to be reversibly mounted.

What I claim is:—

1. A casement window of the concealed-lever reversible type comprising a stationary frame, a pair of levers pivotally mounted on said frame, a window pivotally carried intermediate its ends by said levers so that the strain due to the weight of said window is borne directly by said levers, and means forming a part of said frame for receiving and protecting said levers when said window is in normally closed position.

2. A casement window of the concealed-lever reversible type comprising a stationary frame, a pair of levers pivotally mounted on said frame, a movable frame pivotally carried intermediate its ends by said levers so that the strain due to the weight of said movable frame is borne directly by said levers, and lugs mounted on said levers for engaging opposite edges of said movable frame and restraining pivotal movement thereof in one direction.

3. A casement window of the concealed-lever reversible type comprising a stationary frame, a pair of levers pivotally mounted on said frame, and a window pivotally carried intermediate its ends by said levers so that the strain due to the weight of said window is borne directly by said levers, said frame having recesses formed therein for receiving and protecting said levers when said window is in normally closed position.

4. A casement window of the concealed-lever reversible type comprising a stationary frame, a pair of levers pivotally mounted on said frame, a movable frame pivotally carried intermediate its ends by said levers, lugs mounted on said levers for engaging the edges of said movable frame and restraining pivotal movement thereof in one direction, a locking member carried by each lug, and locking members adapted to coact therewith carried by said movable frame for preventing relative movement between said levers and said movable frame.

5. A casement window of the concealed-lever reversible type comprising a stationary frame, a pair of levers pivotally mounted on said frame, a movable frame pivotally carried intermediate its ends by said levers, lugs mounted on said levers for engaging the edges of the movable frame and restraining pivotal movement thereof in one direction, a locking member carried by each lug, and locking members adapted to coact therewith carried by said movable frame for preventing relative movement between said levers and frame, said last-named locking members having common actuating means whereby the connection between said movable frame and levers may be established or disengaged by a single operation.

6. A casement window of the concealed-lever reversible type comprising a stationary frame, a pair of levers pivotally mounted on said frame, a movable frame pivotally carried intermediate its ends by said levers, lug mounted on said levers for engaging said movable frame and restraining pivotal movement thereof in one direction, a locking stud carried by each lug, and a member slidably carried by said movable frame for engaging or disengaging said studs simultaneously and thereby preventing or permitting respectively relative movement between said levers and said movable frame.

7. A casement window of the concealed-lever reversible type comprising a stationary frame, a pair of levers pivotally mounted on said frame, a movable frame pivotally carried intermediate its ends by said levers, said levers having lugs overlying the edges of the movable frame for restraining pivotal movement thereof in one direction, and portions forming a part of said stationary frame for receiving and concealing said levers when said movable frame is in normally closed position.

8. A casement window of the concealed-lever reversible type comprising a stationary frame, a pair of levers pivotally mounted on said frame, a movable frame pivotally carried intermediate its ends by said levers, locking members mounted on said levers adjacent the pivots thereof, and a detent member mounted adjacent the edge of said movable frame adapted to engage said locking members for preventing relative movement between said movable frame and said levers, whereby movement of said movable frame is effected only about the pivots of said levers.

9. A casement window of the concealed-lever reversible type comprising a station-

ary frame, a pair of levers individually pivotally mounted on said frame, a movable frame pivotally carried intermediate its ends by said levers, and coacting locking members on both the levers and movable frame for locking the said frame with respect to the levers and synchronizing the movement of said levers about their individual pivots.

10. A casement window of the concealed-lever reversible type comprising a stationary frame, a pair of levers pivotally mounted on said frame, said levers each comprising an offset integral portion adapted to extend beyond said frame in closed position of the window, and a movable frame mounted upon and carried by said offset portions whereby the weight of said movable frame is borne directly by said levers.

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