

March 2, 1943.

A. LANG

2,312,720

CASEMENT WINDOW OPERATOR

Filed April 5, 1941

2 Sheets-Sheet 1

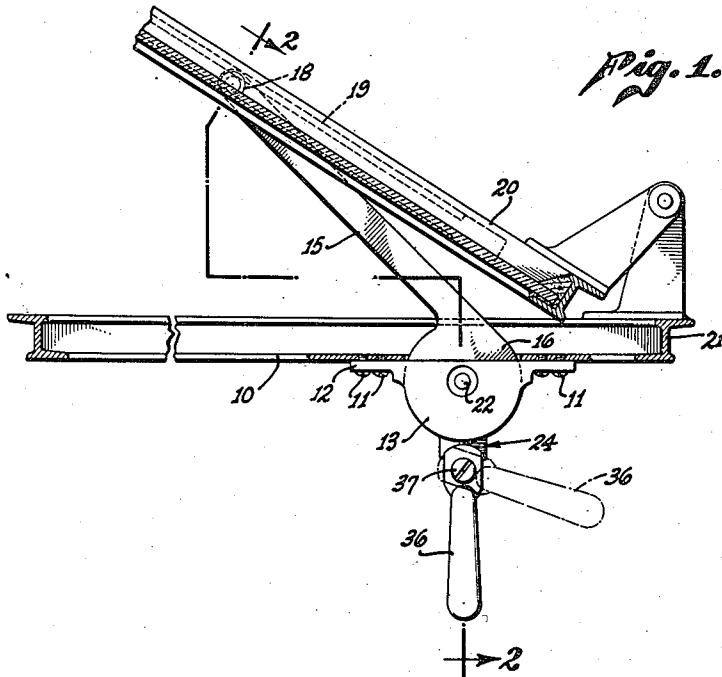


Fig. 1.

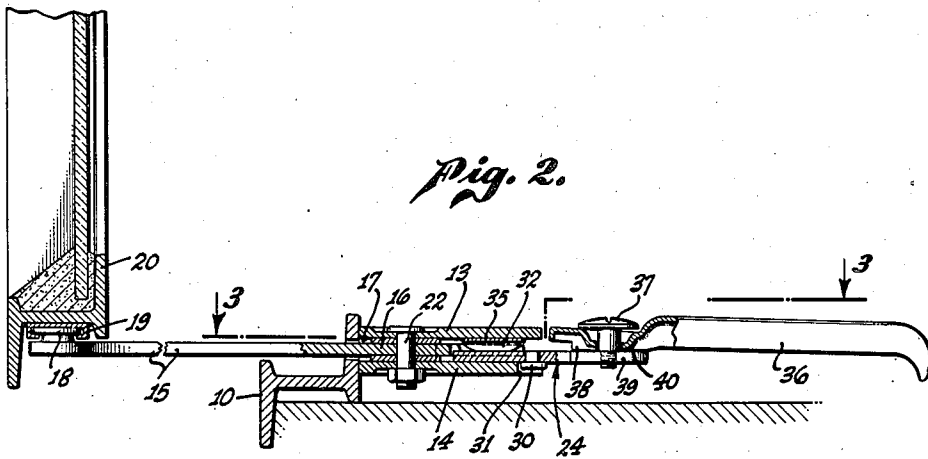


Fig. 2.

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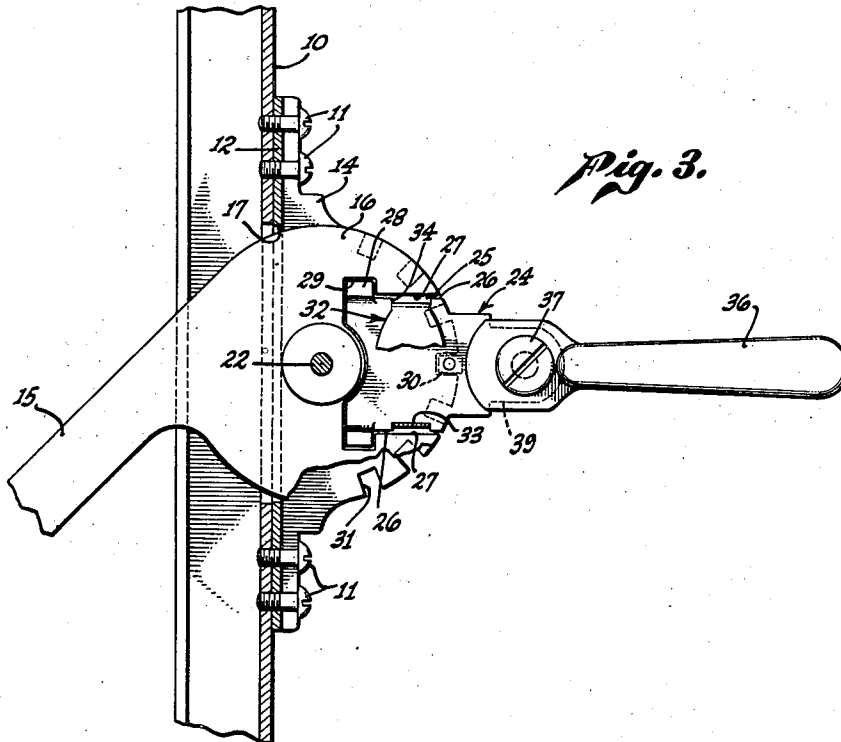


Fig. 3.

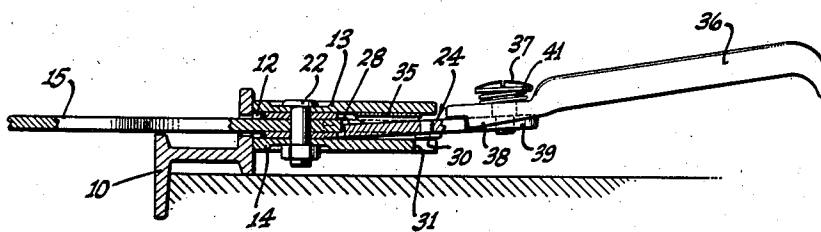


Fig. 4.

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CASEMENT WINDOW OPERATOR

Albert Lang, Berkeley, Calif.

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5 Claims. (Cl. 268—117)

This invention relates to devices for opening and closing windows, being specifically directed to devices designed for operating casement windows.

It is an object of the present invention to provide a casement window operator which projects a minimum distance above the window sill, thereby allowing the lowering of shades or Venetian blinds to a greater extent to prevent vision and transmission of light into the room.

A further object of the invention is to provide a casement window operator embodying a lever construction which may be positioned closely adjacent the window sill, but which still allows ample finger and hand clearance because of its mode of operation in effecting opening or closing of the swing-leaf.

Another object of the invention is to provide a casement window operator having a handle mounted on its associated operating mechanism in such manner as to be moved automatically from a room protruding position when engaged by any object, thereby avoiding injury to persons or property.

A further object of the invention is to provide a casement window operator in which both a rigid and a hinge connection is formed between the window operating arm and its associated latch member without resort to auxiliary pins or other pivot devices, thereby simplifying the window operator as a whole and enabling its production in compact form.

This invention possesses many other advantages and has other objects which will become apparent from a consideration of the embodiment shown in the drawings accompanying and forming part of the present specifications. This form will now be described in detail to illustrate the general principles of the invention, but it is to be understood that such detailed description is not to be taken in a limited sense, since the invention is best defined in the claims appended thereto.

Referring to the drawings:

Fig. 1 is a top plan view of a casement window operator, shown operatively connected to a casement window;

Fig. 2 is a section on an enlarged scale, taken generally along the line 2—2 in Fig. 1;

Fig. 3 is a section taken generally along the line 3—3 in Fig. 2, parts being broken away for purposes of clarity; and

Fig. 4 is a view similar to Fig. 2, with some of the parts disclosed in another operative position.

As disclosed in the drawings, the casement

5 window operator is secured to a window frame sill member 10 by screws 11 or other suitable elements extending through the wall 12 of the operator body, which serves to interconnect the parallel, flat top and base members 13, 14 of the body in spaced relation. A flat operating arm 15, with its generally circular head 16 mounted on the body between its top and base members, extends outwardly through a slot 17 in the wall 12, and carries a rivet 18 at its end for sliding movement in a channel 19 secured to the under- side of a swinging sash 20 suitably pivoted to the window frame 21.

15 The operating arm 15 is mounted on a bolt 22 or other pivot extending through the top and base members 13, 14 of the body, being movable about the fulcrum 22 by an operating mechanism, which can also serve to lock the operating arm in any position of adjustment. This purpose is achieved by mounting a latch member 24 in the head of the operating arm in such manner that it lies substantially in the plane of the arm 15 and is rigidly connected with it for lateral movement of the two parts in unison. Specifically, as shown in the drawings, the latch member 24 is of generally flat configuration, being received within an opening 25 in the inner end of the head 16, with its side faces 26 engageable with the adjacent sides 27 of the opening. End- wise removal of the latching member 24 from the arm is prevented by outwardly extending and slightly elevated ears or wings 28 received within arm pockets 29 merging into the opening 25. The thickness of the latch member 24 is less than the distance between the top and base members 13, 14 to permit tilting of the latch with respect to the operating arm, for purposes described below.

40 The latch member 24 is provided with a depending lug or detent 30 adapted for reception within notches or serrations 31 in the base member 14, in order to lock the operating arm 15 in any position to which it has been laterally moved or adjusted. Although the force of gravity acting on the locking lever 24 is sufficient to maintain its lug 30 in any selected notch or serration 31, this effort may be supplemented by a spring member 32 mounted on the locking lever, with its depending terminals 33 seated within recesses 34 in the latch side faces, and with its intermediate bowed portion 35 engaging the underside of the body top 13 to urge the locking lever 24 downwardly and hold the lug 30 in one of the selected notches 31.

Whenever it is desired to shift the operating

arm 15 laterally, a handle or lever 36 secured to the locking lever 24 is elevated to tilt the latter upwardly on its ears 28 as a fulcrum and elevate the lug 30 from the particular notch in which it was received. While the handle and locking lever are in this tilted and elevated position, no restraints are offered by the engagement of the detent 30 with the sides of a notch 31, allowing the operating arm to be rotated on its fulcrum pin 22 by the desired angle to effect corresponding movement of the swing-leaf 20. Release of the tilting effort permits the locking lever 24 to drop or lower until its lug 30 again is received within a selected notch 31 to secure the arm 15 and swing-leaf 20 in the positions to which they have been moved. This reengagement of the lug in the notch or serration is assisted by the bowed spring 32, if one is utilized. Otherwise, the action of gravity alone is sufficient to effect such engagement automatically and maintain the locking lever 24 in its latched position.

The operating handle 36 may be secured rigidly to the latch lever and the window operator employed with safety if the window reveal is sufficient to prevent the handle from protruding into the room. However, if such projection does occur, it is preferred to non-rigidly mount the handle 36 on the latch member 24 to permit its inward swinging from the protruding position. As shown in the drawings, the handle is mounted on the upper surface of the latch member 24 for swivelling movement on a suitable fulcrum, such as a swivel screw 37 extending through the handle and threadedly secured to the latch member. The handle is provided with opposed depending projections 38 capable of embracing the sides 39 of the latch member near its outer end to rigidly couple the handle and latch together, enabling their operation as a unit whenever the arm position is to be altered. Normally, the force of gravity acting on the outwardly directed, overhanging portion of the handle 36 moves its outer end downwardly, about a fulcrum 40 provided by engagement of the handle undersurface with the top of the latch lever 24. This downward shifting elevates the handle projections 38 on the other side of the fulcrum 40 from engagement with the sides 39 of the latch member 24, and permits lateral swinging movement of the handle about the swivel screw 37.

With the force of gravity acting on the handle 36, its projections 38 are maintained from cooperative engagement with the sides 39 of the latch member. Inadvertent sidewise engagement of this handle by a person or object merely swings it inwardly about its swivel screw 37 toward the body and out of the way, thereby preventing accidents. As a complete safeguard, the handle should be positioned and maintained inwardly when not in use.

Whenever the position of the operating arm 15 is to be altered, the handle 36 is extended outwardly and its free end elevated to reengage the projections 38 with the sides 39 of the latch member 24, effecting a rigid operating connection between the two parts, both for tilting of the latch member 24 on its ears 28 upwardly to disengage its locking lug 30 from the particular serration 31 in which it was received and for rotating the operating arm 15. This rigid relationship between the handle 36 and latch member 24 is produced by the engagement of the upper surface of the handle with the swivel screw head and the underside of the inner end of the handle with the top face of the latch member.

From the foregoing description it is apparent that elevation of the handle member 36 not only locks it to the latch member 24, but also effects an upward tilting of the latter to release its lug 30 from the base plate 14 and allow swinging of the operating arm 15. Release of the handle permits the latch member 24 to drop automatically and reposition its detent 30 in a selected holding notch 31, in addition to uncoupling the handle projections 38 from the latch and allowing its inward swinging movement from a protruding position.

A coil spring 41 may be placed between the head of the swivel screw 37 and the handle 36 to maintain the projections 38 in engagement with the latch member sides 39. This arrangement may be provided with safety whenever the window reveal is sufficient to prevent the handle from protruding into the room, thus obviating the necessity for swinging the handle toward the window and away from the interior of the room; although, if desired, such swinging action can still occur.

The casement window operating device described occupies a minimum of space above the window sill, the handle being normally positioned at a low level. This allows shades, Venetian blinds and the like to be dropped to a low point for the purpose of preventing light transmission from the outside. Despite the fact that the handle is normally positioned adjacent the window sill, ample finger and hand clearance under the handle is allowed whenever the operating arm 15 is to be shifted, since the handle must be elevated to effect its coupling with the latch member 24 and the extent of handle elevation is further increased upon upward tilting of the latter to unlock the arm 15 from the base member 14. The manner of mounting the latch member 24 in the arm head 16 provides a strong hinge without the need for auxiliary pivoting members other than those provided by the arm and latch member themselves. The arrangement of the handle 36 on the latch member 24 not only allows the casement window operator to be mounted with a minimum of clearance space above the window sill, but also furnishes a safety feature by being maintained normally out of coupling engagement with the latch member by the force of gravity, so that upon engagement by objects it is merely moved without restraint out of the way.

While I have shown the preferred form of my invention, it is to be understood that various changes may be made in its construction by those skilled in the art without departing from the spirit of the invention as defined in the appended claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A casement window operator including a body having flat plate-like spaced top and bottom members arranged in parallelism in a horizontal plane, a window operating arm having a flat portion lying between said top and bottom members and pivotally connected thereto for swinging movement in a horizontal plane, said flat portion of the arm being cut out at one side to form a radial opening therein, a latch member disposed between the top and bottom members and fitting said opening, the configuration of said opening and latch member being such as to form an interlocking member therebetween to prevent radial and lateral movement of the latch member with respect to said arm, the spacing

between the top and bottom members being such as to permit vertical tilting movement of said latch member but in an amount insufficient to cause disengagement thereof with said arm, a cooperating latching means on said latch member and said bottom member normally effective to prevent relative lateral movement therebetween but disengageable upon upward tilting movement of the latch member.

2. A casement window operator including a body having a pair of relatively fixed flat horizontally disposed members arranged in parallelism in a horizontal plane and having a pivot pin extending therebetween, the marginal edges of said members at one side of the body being arcuate on a radius emanating from the center of said pivot pin, a window operating arm having a flat portion fitting between said members and pivoted about said pivot pin and having an arcuate marginal edge substantially conforming to the arcuate marginal edges of said members, the spacing between said members being slightly greater than the thickness of the flat portion of said arm, said flat portion of said arm being cut out at one side to form a radial opening therein, a substantially flat latch member of a thickness agreeing with the thickness of the flat portion of the arm disposed between said members and fitting said opening in the flat portion of the arm, the configuration of said opening and said fitting portion of the latch member being such as to form an interlocking connection therebetween and prevent radial and lateral movement of the latch member with respect to said arm, the spacing between the top and bottom members being such as to permit vertical tilting movement of said latch member but in an amount insufficient to cause disengagement thereof with said arm, the arcuate marginal edge of the lowermost of said members being serrated, a latching lug on said latch member to normally engage said serrations, said latch member being permitted sufficient tilting movement to effect disengagement of the latching lug and said serrations.

3. A casement window operator including a supporting body, a window operating arm pivotally mounted on said body, a latch hingedly connected to said arm for lateral swinging movement in unison therewith about the arm pivot, said latch being tiltable with respect to said arm, latching means on said body and latch for normally holding said arm in various positions of adjustment about its pivotal point, a handle pivotally connected at one end to the latch and normally forming a radial extension thereof, connecting means between the handle and the latch normally ineffective to prevent relative lateral movement therebetween, said connecting means being rendered effective upon upward movement of the outer end of the handle relative to the latch when the same is in radial alignment therewith to fix the same together for lateral movement.

4. A casement window operator including a body having flat plate-like spaced top and bottom members arranged in parallelism in a horizontal plane, a window operating arm having a flat portion lying between said top and bottom members and pivotally connected thereto for swinging movement in a horizontal plane, said flat portion of the arm being cut out at one side to form a radial opening therein, a latch

member disposed between the top and bottom members and fitting said opening, the configuration of said opening and latch member being such as to form an interlocking member therebetween to prevent radial and lateral movement of the latch member with respect to said arm, the spacing between the top and bottom members being such as to permit vertical tilting movement of said latch member but in an amount insufficient to cause disengagement thereof with said arm, a cooperating latching means on said latch member and said bottom member normally effective to prevent relative lateral movement therebetween but disengageable upon upward tilting movement of the latch member, a handle pivotally connected at one end to the outer end of the latch member and normally forming a radial extension thereof, connecting means between the handle and the latch member normally ineffective so that the handle may be swung about its pivotal connection with the latch member, said connecting means being rendered effective upon vertical movement of the outer end of the handle relative to the latch member to relatively fix the same together for horizontal movement.

5. A casement window operator including a body having a pair of relatively fixed flat horizontally disposed members arranged in parallelism in a horizontal plane and having a pivot pin extending therebetween, the marginal edges of said members at one side of the body being arcuate on a radius emanating from the center of said pivot pin, a window operating arm having a flat portion fitting between said members and pivoted about said pivot pin and having an arcuate marginal edge substantially conforming to the arcuate marginal edges of said members, the spacing between said members being slightly greater than the thickness of the flat portion of said arm, said flat portion of said arm being cut out at one side to form a radial opening therein, a substantially flat latch member of a thickness agreeing from the thickness of the flat portion of the arm disposed between said members and fitting said opening in the flat portion of the arm, the configuration of said opening and said fitting portion of the latch member being such as to form an interlocking connection therebetween and prevent radial and lateral movement of the latch member with respect to said arm, the spacing between the top and bottom members being such as to permit vertical tilting movement of said latch member but in an amount insufficient to cause disengagement thereof with said arm, the arcuate marginal edge of the lowermost of said members being serrated, a latching lug on said latch member to normally engage said serrations, said latch member being permitted sufficient tilting movement to effect disengagement of the latching lug and said serrations, a handle pivotally connected at one end to the outer end of the latch member and normally forming a radial extension thereof, connecting means between the handle and the latch member normally ineffective so that the handle may be swung about its pivotal connection with the latch member, said connecting means being rendered effective upon vertical movement of the outer end of the handle relative to the latch member to relatively fix the same together for horizontal movement.

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