Oct. 17, 1939. E. PEREMI ET AL 2,176,683

CASEMENT WINDOW OPERATOR

Filed June 3, 1936 4 Sheets-Sheet 1

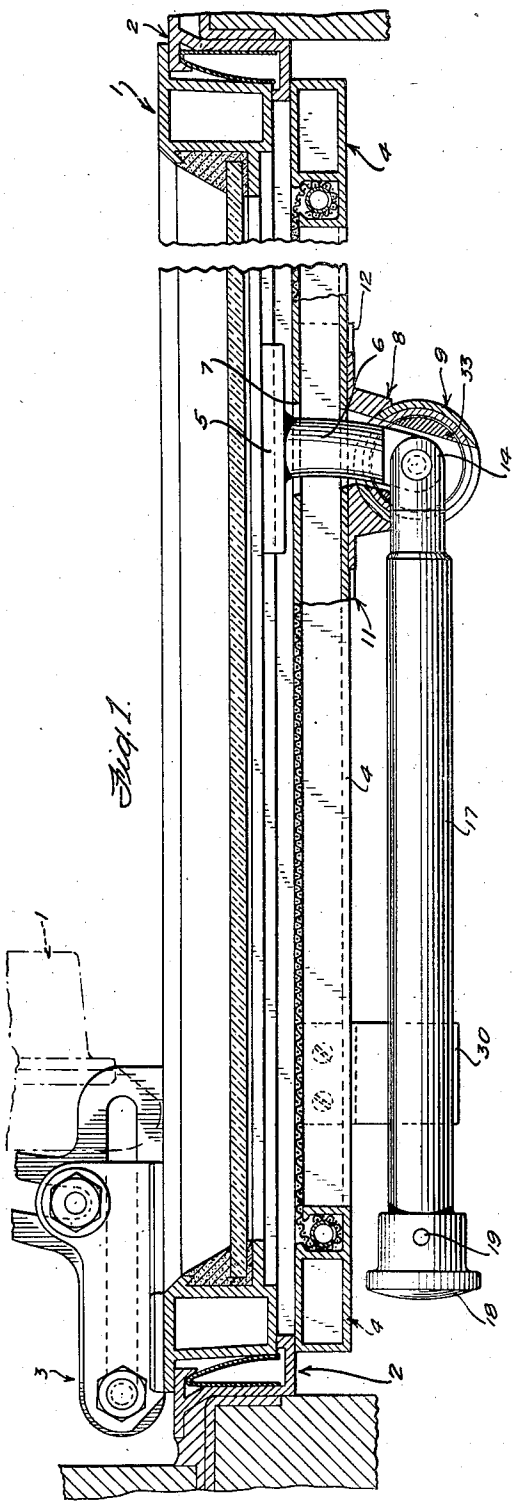


Fig. 1.

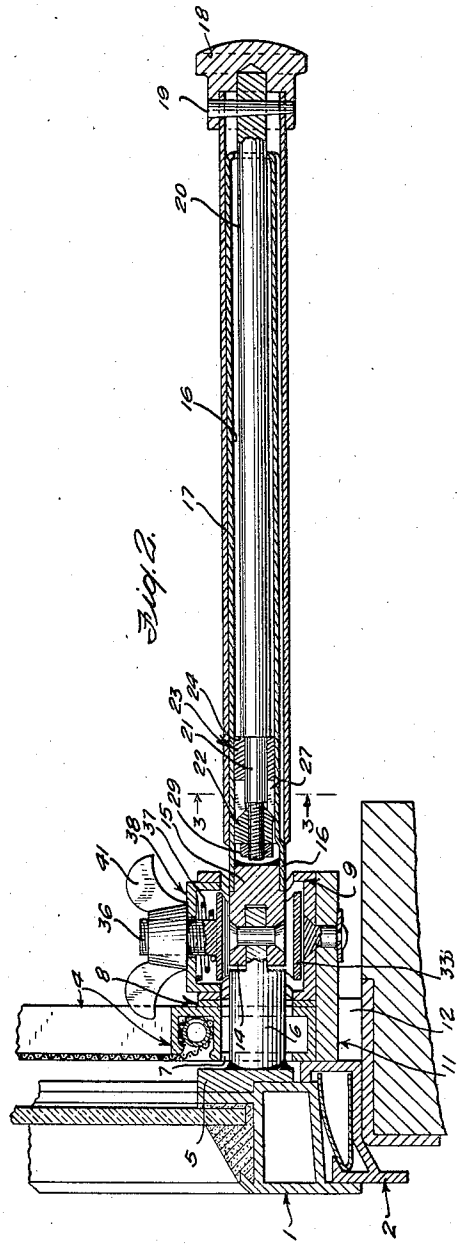


Fig. 2.

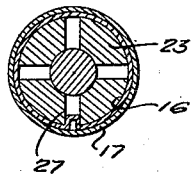
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Filed June 3, 1936 4 Sheets-Sheet 2

Fig. 3.



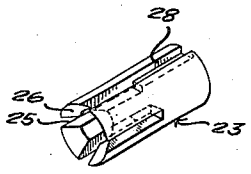


Fig. 4.

Fig. 5.

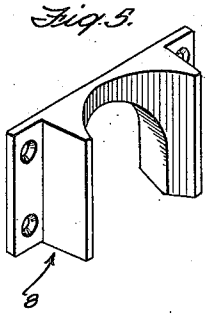


Fig. 7.

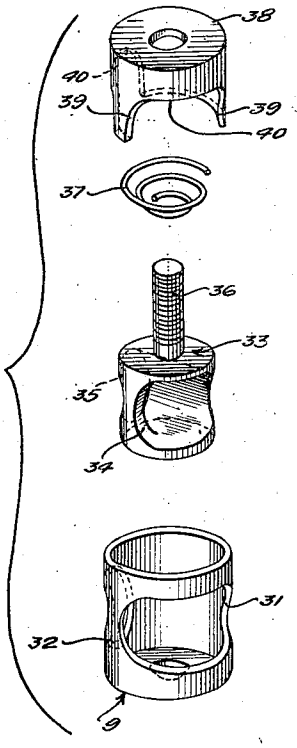
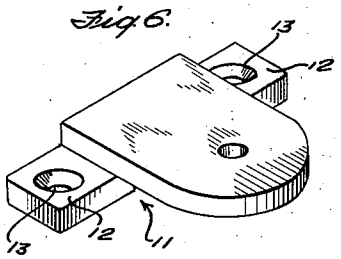


Fig. 6.



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Oct. 17, 1939. E. PEREMI ET AL 2,176,683

CASEMENT WINDOW OPERATOR

Filed June 3, 1936 4 Sheets-Sheet 3

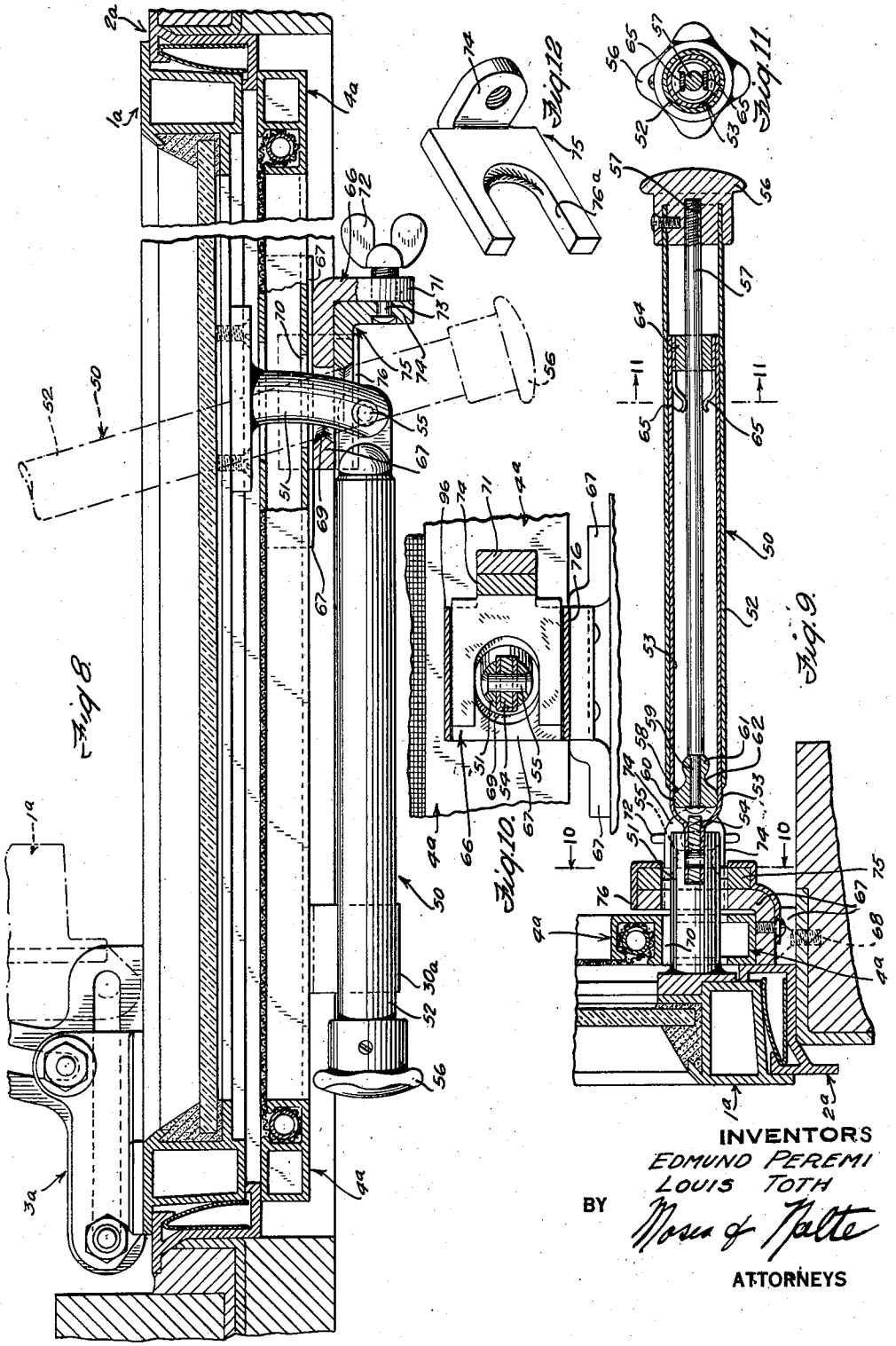


Fig. 8

Fig. 9

Fig. 10

Fig. 11

Fig. 12

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CASEMENT WINDOW OPERATOR

Filed June 3, 1936 4 Sheets-Sheet 4

Fig. 13.

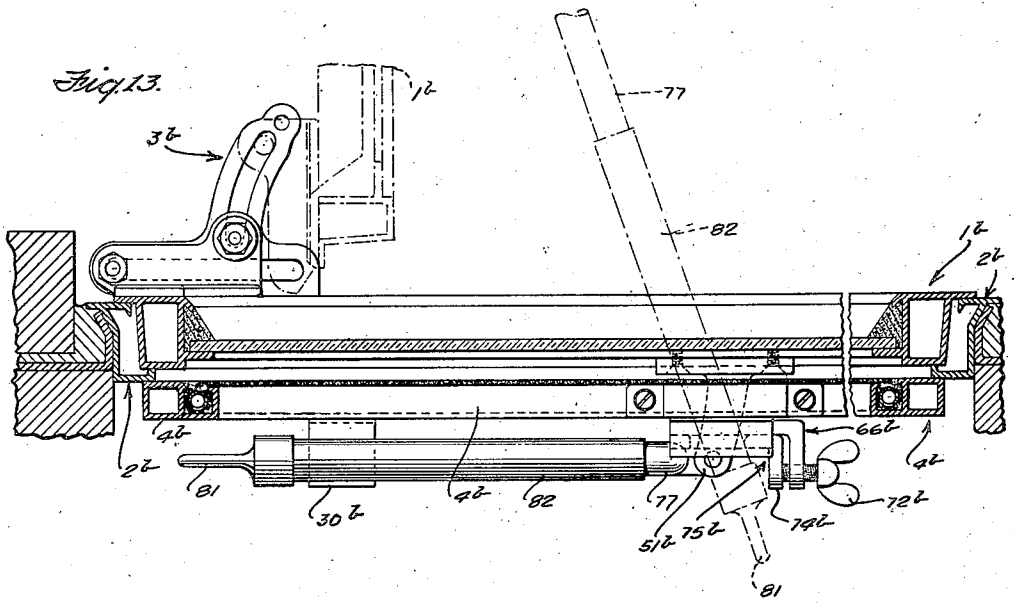


Fig. 14.

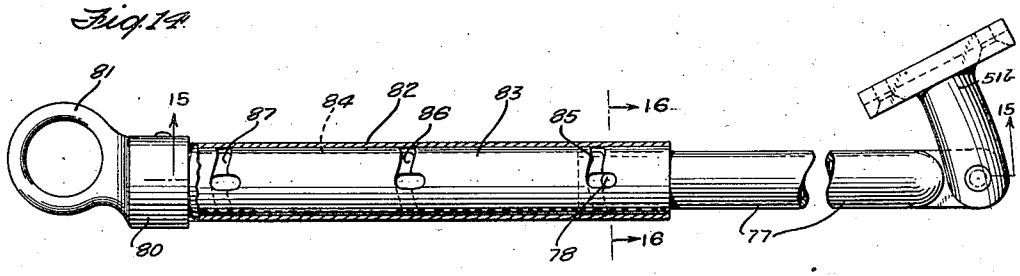


Fig. 15.

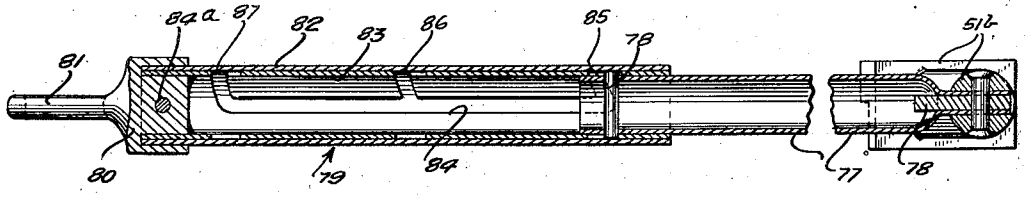
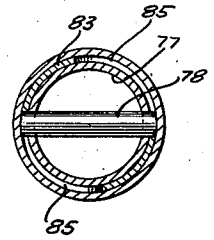


Fig. 16.



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CASEMENT WINDOW OPERATOR

Edmund Peremi and Louis Toth, Manhasset, N. Y.

Application June 3, 1936, Serial No. 83,206

11 Claims. (Cl. 268—117)

This invention relates to window operators for casement windows.

It is an object of the invention to provide a casement window operator which is arranged to pass through a screen and to swing the window open and closed by direct thrust and pull.

It is a further and more particular object of the invention to provide a window operating rod which is composed of telescoping sections so arranged that the effective length of the operating rod can be quickly and conveniently shortened or lengthened and set.

It is a further important object of the invention to provide an operating rod of the kind referred to which can be collapsed to its minimum length and then turned in, parallel to the plane of the closed sash, so as to be held completely out of the way.

Other objects have to do with the locking of the operating rod in various operative positions, and with provision for sealing the opening in the screen frame through which the rod passes, against the admission of insects, while having the screen free to be removed.

Other objects and advantages will hereinafter appear.

In the drawings forming part of this specification and illustrating certain preferred embodiments of the invention,

Fig. 1 is a fragmentary view partly in plan and partly in horizontal section illustrating a window structure embodying one form of the invention;

Fig. 2 is a fragmentary view in sectional elevation through a portion of the window of Fig. 1;

Fig. 3 is a detail sectional view taken on the section line 3—3 of Fig. 2, looking in the direction of the arrows;

Fig. 4 is a detail perspective view of an expandible sleeve employed inside the rod for locking the sections of the rod against relative longitudinal movement;

Fig. 5 is a perspective view of a bearing block which is mounted upon the screen and which constitutes one of the elements for sealing the opening through which the rod operates;

Fig. 6 is a perspective view of a base member which is applied to the sill and which carries other members for guiding the rod in its movements and for locking the rod in different adjusted positions;

Fig. 7 is a perspective view showing several elements of the rod guiding locking means separated but disposed one above the other in the order of their assembly in the complete structure;

Fig. 8 is a fragmentary plan view of a window structure embodying another form of the invention;

Fig. 9 is a fragmentary view in sectional elevation showing a portion of the window structure of Fig. 8;

Fig. 10 is a sectional view taken on the line 10—10 of Fig. 9 looking in the direction of the arrows;

Fig. 11 is a sectional view taken on the line 11—11 of Fig. 9 looking in the direction of the arrows;

Fig. 12 is a perspective view of a rod locking member employed in this form of the invention;

Fig. 13 is a fragmentary sectional view of a window structure embodying a further form of the invention;

Fig. 14 is a detail plan view of the window operating rod of Fig. 13;

Fig. 15 is a vertical sectional view taken on the line 15—15 of Fig. 14, and

Fig. 16 is a vertical sectional view taken on the line 16—16 of Fig. 14.

In the form of the invention illustrated in Figs. 1 to 7, inclusive, a casement window sash 1 is shown as hingedly mounted upon a frame 2 by means of a hinge 3, the hinge being desirably of the form disclosed in Letters Patent of the United States No. 1,987,516 granted to Edmund Peremi and Louis Toth on January 8, 1935. Since the construction of this hinge is fully disclosed in the patent referred to a detailed description of the hinge is not thought necessary. It is characteristic of the hinge, however, that as the window sash is swung open the edge of the sash supported by the hinge is carried inward across the window opening so that when in fully opened position the sash stands at right angles to its original position and in a plane located substantially inward (about one-fourth of the width of the window) from the jamb engaged by the hinged edge of the sash when the sash is in closed position.

A screen 4 is provided at the inner side of the window frame, and a bracket 5 attached to the sash has an arm 6 which extends inward through an opening 7 in the screen frame. The arm 6 extends also through a closing plate 8, which is mounted on the screen frame at the inner side thereof, and into a cylindrical socket member 9. The socket 9 is secured by a pivot bolt 10 to a base bracket 11. The base bracket 11 is best

shown in Fig. 6. It includes ears 12 provided with screw openings 13 for attaching it to the sill, and a raised central portion which engages the edge of the screen and covers the mouth of the opening 7 in the screen frame.

The inner end of the arm 6 is pivotally mounted between ears 14 of a block 15. The block 15 is fixed to the end of a tubular rod 16, which rod is telescopically received within a rod 17.

An important feature of the invention has to do with the telescopic relation of the rods 16 and 17, and with the means whereby the two rods may be conveniently adjusted longitudinally with respect to one another and locked in various adjusted positions.

The rod 17 has an operating knob or finger piece 18 affixed to its end by means of a cross pin 19. A solid rod 20 extends into a socket in the finger piece or knob 18 and is held in fixed relation to the knob by the cross pin 19. The rod 20 has a reduced inner end 21 which is threaded into a nut 22. A sleeve 23 surrounds the rod 21 between a shoulder 24 of the rod and the nut 22. As best seen in Fig. 4 the sleeve 23 has slots 25 formed in its end toward the nut so that the end of the sleeve which faces the nut may be expanded by drawing the nut into the sleeve. The nut 22 has a conical face which fits against complementary face portions 26 at the ends of the segments into which the sleeve 23 is divided by the slots 25.

The nut 22 is held against rotation by means of a slot formed in the side of the nut, which slot embraces a key or rib 27 on the interior of the tubular rod 16. It is of no importance whether the sleeve 23 turns with the rod 20 or not, but it is important that the sleeve substantially fill the tubular rod 16 so that when its end segments are expanded slightly they will be clamped against the inner face of the rod 16. The sleeve 23 is accordingly provided with a slot 28 to accommodate the key 27 of the tubular rod 16. A limiting nut 29 is provided upon the end of the threaded portion of the rod 20 to prevent the rod from being completely unscrewed from the nut 22, and also to avoid useless turning of the knob.

With the parts arranged as shown and described it is necessary only to turn the knob 18 through a fraction of a revolution to clamp or unclamp the sleeve 23 in the tubular rod 16. The sleeve is clamped by turning the knob 18 clockwise to draw the nut 22 into the recessed end of the sleeve, and is unclamped by turning the knob 18 in the opposite direction to back the nut 22 off a little.

When the operating rod formed jointly by the tubular rods 16 and 17 is to be lengthened or shortened the sleeve 23 is unclamped and the knob 18 is moved longitudinally. The new adjusted length is fixed by again turning the knob 18 to exert clamping pressure against the sleeve 23.

The rod may be collapsed to its minimum length as shown in Fig. 1, turned inward parallel to the window frame, and secured over the sill in the position shown in Fig. 1 by snapping it into a spring hook or detent 30, the detent being attached to the sill. In this position the rod occupies little space and is completely out of the way. It also serves as a reasonably effective window lock for ordinary purposes although it is not intended to be exclusively relied upon for locking a window closed.

When it is desired to open the window, the rod is pulled free of the hook 30, swung around substantially into line with the arm 6, extended to its full length or any lesser length desired, fixed at the extended length and thrust outward.

Provision is made for locking the rod in any adjusted position desired so that the window may be retained firmly in any desired position. It has already been made clear that the arm 6 and the operating rod pass through a socket 9 which is rotatably mounted upon a base 11. The socket 9 has a wide slot 31 formed in its cylindrical wall at the inner side and a smaller opening or passage 32 just large enough to accommodate the rod 17 formed in the opposite side of the cylindrical wall. A cylindrical clamping block or plug 33 fits in the socket and is similarly provided with wide and narrow openings 34 and 35 which are connected by a passage through the plug for receiving the operating rod. The plug 33 has a threaded stem 36 which extends axially upward from the center of the plug. A coil spring 37 surrounds the stem 36 and rests upon the plug. A cap 38 encircles the stem 36, covers the spring, and surrounds the plug. The cap 38 has guiding ears 39 which fit along opposite sides of the plug to guide the cap and limit rotation thereof. Within the socket and between the ears 39, the cap is provided with clamping surfaces 40. A wing nut 41 is threaded onto the stem 36 above the cap 38. Clockwise rotation of the nut 41 causes the plug to be drawn upward against the lower side of the rod and the cap to be drawn downward against the upper side of the rod so that the plug and cap clamp the rod firmly between them. When the wing nut is turned in the opposite direction the cap and plug relax their pressure upon the rod and release the rod for further adjustment. The spring 37 urges the cap and plug apart at all times.

Whenever the window is open either part-way or completely, a portion of the rod extends through the opening 32 of the socket 9. The outer rod 17 substantially fits the opening while the inner rod 16 is so near in size to the size of the opening that insects cannot pass through the socket. The bearing block 8 carried by the screen frame engages the outer surface of the socket 9 and thus precludes the possibility of an insect too large to pass through the screen mesh gaining ingress to the building.

The block 8 is not, however, attached to the socket but can be lifted off the socket with the screen when it becomes necessary to remove the screen in order to permit the window to be cleaned. The passages through the block and through the screen frame are open at the bottom to permit removal of the screen.

In the form of the invention disclosed in Figs. 8 to 12, inclusive, the sash 1*a*, frame 2*a*, and hinge 3*a* may be the same as in the form of Figs. 1 to 7. The screen 4*a* is of modified construction for cooperating with a modified form of rod clamp. The operating rod and the rod clamp are also different from the corresponding members of Figs. 1 to 7.

The operating rod 50 is hingedly connected to an arm 51 which extends inward from the sash 1*a* and comprises an outer tube 52 and an inner tube 53. The walls of the inner tube are brought together in parallel relation and, together with an interposed spacer 54, form a hinge ear. A rivet 55 passed through the arm 51 and through the ear constitutes the pivot bearing for the hinge. The outer tube 52 has a finger piece or knob 56 secured to it at one end, and this knob carries a rod 57 which extends within the tubes

and which carries at its end remote from the knob, a block 58. The block 58 is mounted upon a reduced portion 59 of the rod 57 against a shoulder, and is fixed upon the rod by upsetting or spreading the end of the reduced portion of the rod. The block 58 comprises a base portion 60 which engages the inner wall of the tube 53 and serves as a guide. The block also comprises a round head portion 61 which is divided from the base portion 60 by a reduced neck portion 62. The tube 53 carries at one of its ends a block 64 and a pair of spring fingers 65 which are curled inward and rounded at their ends so that they may be expanded around the head 61 of the block 58 and caused to embrace the neck portion 62 of the block. The fingers 65 are fairly stiff so that when they thus engage the neck portion of the block 58 they hold the rod 50 fully extended to its maximum length with considerable force and thus enable the rod to be used to thrust the window open and to secure the window in any desired position. When it is desired to collapse the rod 50, however, this may be readily done by striking the knob 56 a sharp blow with the palm of the hand. When this is done the inertia of the window sash offers sufficient resistance to cause the head 61 to spring past and free of the fingers 65.

The rod 50 is adapted to be operated through a clamping device 66 mounted on the window sill. This device comprises a supporting bracket 67 which is secured by screws 68 to the sill. The bracket 67 includes a horizontal web for engaging the edge of the screen and a vertical web which extends upward closely adjacent the screen frame and which has an opening 69 formed through it in line with a passage 70 through the edge of the screen frame. The bracket 66 includes an ear 71 through which a wing screw 72 is threaded. A reduced end portion 73 of the screw 72 is passed through an ear 74 of a clamping member 75 and upset. The clamping member 75 has a slot 76*a* formed in it through which the rod 50 operates. A covering guide plate 76 is secured to the bracket 66 and forms a cover and guide for the clamping member 75. The screw 72 is rotatable relative to the clamping member 75 but compels the clamping member to move longitudinally in unison with the screw. The rod 50 is clamped by operating the screw to force the clamping member 75 toward the left as seen in Fig. 8 and is unclamped by turning the screw in the opposite direction.

The operation is generally similar to the operation of the form of the invention disclosed in Figs. 1 to 7, but differs in that the operating rod has only one effective operating length.

In the form of the invention disclosed in Figs. 13 to 16 the sash 1*b*, the frame 2*b*, and the hinge 3*b* may be the same as in the forms already described. The screen 4*b* is like the screen 4*a* of Figs. 8 to 10 and the rod clamping device is the same as that of Figs. 8 to 10, and 12. Corresponding reference numerals have been applied to the rod clamping device with the subscript *b* added in each instance. These parts will not be described again.

The operating rod, however, is of a different construction from the operating rods already described. An arm 51*b* fixed to the sash extends inward and is pivotally connected to an end of a tubular rod 77, the rod 77 being flattened at its end and having a spacer 78*b* between its flat end walls. The rod 77 at its end remote from the arm 51*b* carries a cross pin 79 which extends through the walls of the rod and projects beyond the walls for a short distance. A second rod section 79 is arranged to telescope upon the rod 77. This rod comprises an end cap 80 having an operating ring 81 formed upon it and outer and inner sleeves or tubes 82 and 83. Both sleeves are made fast to the cap 80 by means of a cross pin 84*a*. The outer sleeve 82 is unbroken and snugly fits the inner sleeve 83. The inner sleeve 83, however, is provided at diametrically opposite points with longitudinal slots 84, and each of these slots is provided with correspondingly located bayonet slot branches at several points, the branch slots being indicated at 85, 86 and 87 in Fig. 14. The ends of the pin 78 are received in the slots of the tube 53. The illustrated arrangement gives a choice of three operating lengths for the rod, namely, the minimum length which is secured when the pin 78 occupies the innermost bayonet slots 87, the maximum length which is secured when the pin 78 occupies the outermost bayonet slots 85, and an intermediate length which is secured when the pin 78 occupies the intermediate bayonet slots 86.

The mode of operation of this form of window operator is readily apparent. To release the pin from the bayonet slots 85 the rod section 79 is rotated clockwise so as to carry the main slot 84 into engagement with the pin. The rod section 79 may now be thrust longitudinally relative to the rod section 77. If it is desired to arrest the pin 78 at the slot 86 and locate it in the slot, a slight counter-clockwise pressure may be maintained on the handle 81 of the rod section 79 as the section 79 is thrust longitudinally. If it is desired to shift the pin 78 into the slots 87, however, the rod section 79 may be thrust longitudinally without applying any torque or with a slight clockwise pressure applied until the slot 86 is passed.

The forms of operating rods shown in Figs. 8 to 11 and 13 to 16 are capable of being collapsed to the same extent as the operating rod of Fig. 1, and when so collapsed may be swung parallel to the frame plane and held over the window sill by a detent 30*a* (Fig. 8) or 30*b* (Fig. 13).

While we have illustrated and described in detail certain preferred forms of our invention, it is to be understood that changes may be made therein and the invention embodied in other structures. We do not, therefore, desire to limit ourselves to the specific constructions illustrated, but intend to cover our invention broadly in whatever form its principles may be utilized.

We claim:

1. In a swinging sash window, the combination with a frame and a swinging sash, of an operating thrust and pull rod pivotally connected to the sash, said rod comprising telescoping sections and means for locking the sections relative to one another in different adjusted operating positions to change the effective length of the rod, a screen covering the frame opening at the inner side of the window, a rod guide adjacent the screen, and means carried by the screen for interfitting with the guide to exclude insects, said rod guide being in the form of a cylindrical socket pivotally mounted adjacent the screen, and said screen carried means being in the form of a block having a concave cylindrical surface.

2. In a swinging sash window, the combination with a frame and a swinging sash, of an operating thrust and pull rod pivotally connected to the sash, said rod comprising telescoping sections and

means for locking the sections relative to one another in different adjusted operating positions to change the effective length of the rod, a screen covering the frame opening at the inner side of the window, a rod guide adjacent the screen, and guard means carried by the screen for interfitting with the guide to exclude insects, said rod guide being in the form of a cylindrical socket pivotally mounted adjacent the screen, and said screen carried means being in the form of a bearing having a concave cylindrical surface, both the screen frame and the screen carried means having openings in their margins to permit passage of the rod, said openings being in the form of slots open at the bottom to permit removal of the screen without disturbing the rod.

3. In a swinging sash window, the combination with a frame and a swinging sash, of an operating thrust and pull rod pivotally connected to the sash, said rod comprising telescoping sections and means for fixing the sections relative to one another in different adjusted operating positions to change the effective length of the rod, and means mounted on the frame sill for guiding the rod in its operating movements and for clamping the rod in different operated positions comprising a cylindrical socket rotatively mounted on the sill, a cylindrical guide block journaled in the socket and having an opening through which the rod passes, said guide block having a threaded stem, a cap mounted on said stem and having a skirt portion surrounding the guide block to bear against the rod, and a manually operable nut threaded on the stem for forcing the block and cap into binding relation against the rod.

4. A casement window operator comprising tubular telescoping sections, an expandable split sleeve within the inner section, means independent of the relative positions of the telescoping sections for expanding the sleeve and locking the sections in desired relative position, and means located at the inner end of the operator to actuate the locking means.

5. A casement window operator as claimed in claim 4 wherein the expandable split sleeve substantially fills the tubular section in which it is located so that slight adjustment of the lock actuating means clamps the sleeve against the inner face of the section.

6. In a swinging sash window the combination with a frame and a swinging sash of an operating thrust and pull rod comprising telescoping outer and inner tubular rods, an operating finger piece fixed on the outer tubular rod, an expansible member within the inner tubular rod, and means carried by the finger piece for moving the expansible member longitudinally in unison with itself and for clamping the member against the inner rod upon turning of the finger piece in one direction and unclamping it upon turning of the finger piece in another direction, said rod being pivotally connected to the sash.

7. In a swinging sash window the combination with a frame and a swinging sash of an operating thrust and pull rod pivotally connected to the sash, said rod comprising telescoping outer and inner tubular rods, an operating finger piece fixed on the outer tubular rod, a solid rod fixed to the finger piece and extending inside the outer tubular rod and into the inner tubular rod, said solid rod having a shoulder and a reduced threaded end, a split sleeve surrounding the reduced end of the solid rod, and a nut threaded on said end, and an internal rib on the inner tubular rod to prevent rotation of the nut, the arrangement being such that the nut will be forced toward the rod shoulder to expand the sleeve into clamping relation to the inner tubular rod upon turning of the finger piece in one direction, and will be moved away from the shoulder to relieve the clamping pressure upon turning of the finger piece in the opposite direction.

8. In the combination of a swinging sash, a screen frame disposed inwardly of said sash, the frame having an opening for the passage of a rod, and an operating thrust and pull rod comprising telescoping tubular parts of different outside diameters passing through said opening and pivotally connected to the sash; an adjustable clamp mounted over said opening and comprising apertured overlapping relatively movable members cooperating to form an opening of variable size through which the rod extends, and manually operable means for adjusting and locking said members relative each other to grip and clamp any of the different sized tubular parts of the rod to lock the window in any desired position and to seal the opening in the screen frame against the ingress of insects.

9. In a swinging sash window, the combination with a frame and a swinging sash, of an operating thrust and pull rod comprising parts of different outside diameters and pivoted to the sash, a guide bracket mounted on the frame sill and having a vertical web through which the rod passes, a clamping plate mounted on the guide bracket, means supporting the clamping plate in juxtaposed relation to said vertical web of the guide bracket for movement along the face thereof, and means for operating the clamping plate to and from rod clamping position along said guide bracket web.

10. In a swinging sash window, the combination with a frame and a swinging sash, of an operating thrust and pull rod comprising parts of different outside diameters and pivoted to the sash, a guide bracket mounted on the frame sill and having a vertical web through which the rod passes, a clamping plate mounted on the guide bracket, means supporting the clamping plate in juxtaposed relation to said vertical web of the guide bracket for movement along the face thereof, said guide bracket and clamping plate having opposed ears extending at right angles to the direction of their relative movement, and a wing screw threaded through the ear of the guide bracket and rotatably secured to the ear of the clamping plate to adjust the clamping plate to and from clamping position.

11. In a swinging sash window, the combination with a frame and a swinging sash, of an operating thrust and pull rod, comprising parts of different outside diameters and pivoted to the sash, a guide bracket mounted on the frame sill and having a vertical web through which the rod passes, a clamping plate mounted on the guide bracket, means supporting the clamping plate in juxtaposed relation to said vertical web of the guide bracket for movement along the face thereof, means for operating the clamping plate to and from rod clamping position along said guide bracket web, and a screen covering the frame opening at the inner side of the sash and having a slot extending through its edge for the passage of the operating rod, said guide bracket being formed to engage the side and edge of the screen in position to cover the slot.

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