April 27, 1926. 1,582,504

F. BIRD

MEANS FOR OPENING AND CLOSING WINDOWS

Filed August 27, 1924

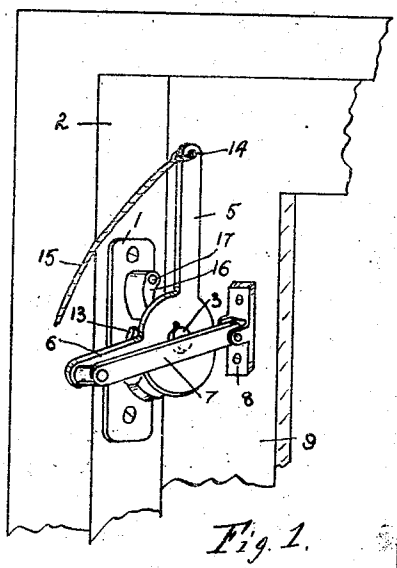


Fig. 1.

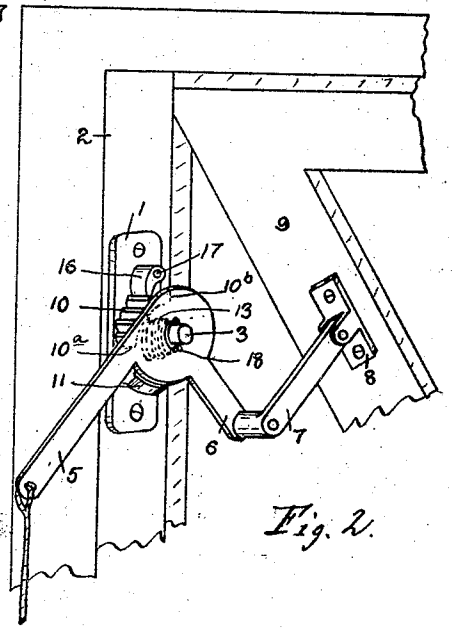


Fig. 2.

Fig. 3

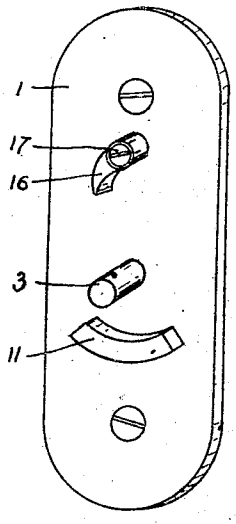


Fig. 4

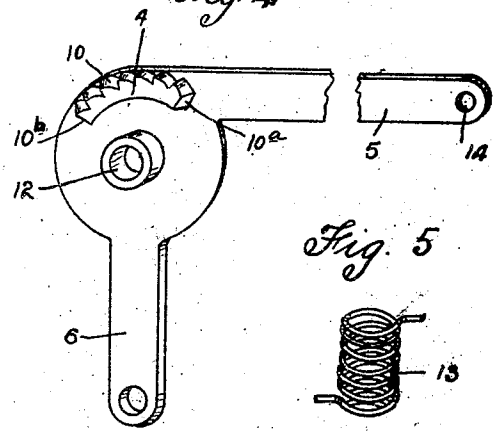
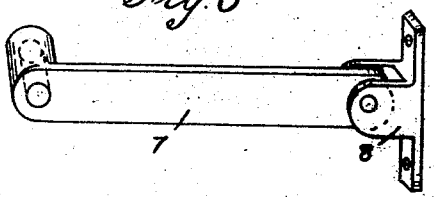


Fig. 5

Fig. 6



Inventor,
Frank Bird
By Lane Aitken & Co
Attorneys.

Patented Apr. 27, 1926. 1,582,504

UNITED STATES PATENT OFFICE.

FRANK BIRD, OF HAMILTON, NEW ZEALAND.

MEANS FOR OPENING AND CLOSING WINDOWS.

Application filed August 27, 1924. Serial No. 734,468.

To all whom it may concern:

Be it known that I, FRANK BIRD, subject of the King of Great Britain, residing at Ohaupo Road, Hamilton, in the Dominion of New Zealand, have invented a new and useful Improved Means for Opening and Closing Windows, of which the following is a specification.

This invention relates to means for opening windows, particularly casement windows, which are hinged either on the top or bottom rail so as to be opened as a fanlight.

The object of my invention is to make a fitting which will both open and close the window, set same to any position, and lock the window when closed, by means of a single cord, and which will be quick and positive in action without requiring the use of screws, worm wheels or other complicated mechanism, and which can be easily and quickly fitted to windows hinged either on the top or bottom member as described.

The invention will be further described with reference to the accompanying drawing where:

Figure 1 shows a perspective view of the window closed.

Figure 2 shows a perspective view with the window open.

Figure 3 is a plan of the bracket with the operating element removed.

Figure 4 is an elevation of the working face of the operating element.

Figure 5 is a perspective view of a coil spring which is employed.

Figure 6 is a perspective view of the connecting rod.

In the different views the same reference figures refer to like parts.

The bracket 1 which is screwed to the casing 2 of the window, has a projecting stud 3 on which oscillates an operating element embodying a cord arm 5 and a crank arm or lever 6. Secured to the enlarged central portion of the operating element is a rack 4, both arms 5 and 6 being preferably integral from one casting, the cord arm 5 having one or more holes 14 to take the cord for opening and closing the window proper.

The other end of the crank arm 6 is pivotally connected to a connecting rod 7, the outer end of which is pivotally secured to a bracket 8 screwed to the vertical member 9 of the frame of the casement window.

The rack 4 is made to a sector of a circle having a number of teeth 10 formed on the edge as shown, the ends 10^a and 10^b of the sector acting as stops to prevent the window being opened too far and to lock the window when the latter is closed by holding the connecting rod 7 in a horizontal position parallel with the crank arm 6, the line of force, if the window has weight put on same, being through axis 3.

This is accomplished by ends 10^a and 10^b of the rack 4 resting against the ends of a stop 11 cast integral with the bracket 1. The stop 11 is here shown as one continuous segment of a circle, though it could be fixed as two separate projections if required.

The rack sector 4 carrying the ratchet teeth 10 projects from the central portion of the cord arm 5 as previously stated, a space being left between the inner face of the sector and the boss 12 which swivels on the centre pin 3 for the insertion of a spiral spring 13, the object of the latter being to assist in bringing the cord arm 5 to its top vertical position (Figure 1), and overcome the inertia of the moving parts of the fitting, in addition to keeping the subsequently mentioned pawl 16 in contact with the ratchet teeth.

The spring is formed from a number of turns of spring wire, one end being anchored to the stationary bracket of the frame member and the other end to the end of the rack sector 4.

The pawl 16 is pivotally connected to the bracket 1 by any suitable means, it being shown on the drawing *a* carried by a stud or screw 17.

The pawl is preferably of the gravity type, no spring being required to keep it in position, as during the opening or closing of the window, the pawl always returns to its normal position by gravity on to the teeth of the oscillating segment 4. In operation, when the cord 15 is pulled, the window is opened to any extent required and may be held open to any position by releasing the pull on the cord and allowing the pawl to rest against one of the ratchet teeth.

To close the windows, the cord is pulled down to its extreme position where the end 10^a of the rack 4 comes in contact with one end of the stop 11.

In this position, the pawl is entirely disengaged from the ratchet teeth, after which the window is closed either by its own weight or, when hinged at the bottom, by pulling on the cord.

While the widow is returning to the closed

position, the back of the pawl rides free on the edges of the teeth 10 but falls to its working position again on same at the end of the stroke when the window is closed. In the latter position the end 10^b of the ratchet 4 strikes against one end of the top 11, the window being locked tight in the closed position owing to the rod 7 and the crank arm 6 being horizontal and on a dead centre through the axis of the pin 3.

During the closing of the window, the spiral spring 13 assists in bringing the fittings 5 and 6 to the closed position with the arm 5 vertical, and in opening the window the tension of the spring ensures the pawl keeping in the ratchet teeth. The engagement illustrated in Figures 1 and 2 of the drawing shows the fitting secured to a casement window hinged at the top. It may, however, be fitted to casement windows hinged at the bottom by reversing the position of the cord arm 5 and the ratchet segment 4 so that the cord arm 5 will then extend downward instead of upward when the window is closed, while the rack 4 will be situated below instead of above the boss 12, the pawl 16 and stop 11 being likewise reversed.

By this means, the window can be set to any position, and opened or closed by the simple action of pulling on one cord.

I claim:—

1. Casement window operating mechanism, comprising a bracket for attachment to the window casing and provided with a pivot pin; an operating element pivoted on said pin and embodying a cord arm and a crank arm integral with and disposed at an angle to each other; an arcuate rack fixed to the inner face of the operating element at the junction of its component arms and in concentric relation to the pivotal axis of said element; a bracket for attachment to the frame of the casement window; a connecting rod pivoted at one end to the last-named bracket and at the other end to the free end of said crank arm; a pawl pivoted to the first-named bracket in position for co-action with said rack; and means engageable by the end faces of the rack to limit the swinging movements of the window in either direction.

2. Casement window operating mechanism, comprising a bracket for attachment to the window casing and provided with a pivot pin; an operating element pivoted on said pin and embodying a cord arm and a crank arm disposed at an angle to each other; an arcuate rack fixed to the inner face of the operating element at the junction of its component arms and in concentric relation to the pivotal axis of said element; a bracket for attachment to the frame of the casement window; a connecting rod pivoted at one end to the last-named bracket and at the other end to the free end of said crank arm; a pawl pivoted to the first-named bracket at one side of the pivot pin for co-action with said rack; and a stop fixed to said first-named bracket at the other side of said pin for engagement by the end faces of the rack to limit the swinging movements of the window in either direction.

In testimony whereof, I affix my signature.

FRANK BIRD.