A. M. & W. H. JOHNSON.
Shutter-Workers.

No. 223,354. Patented Jan. 6, 1880.

Fig. 1.

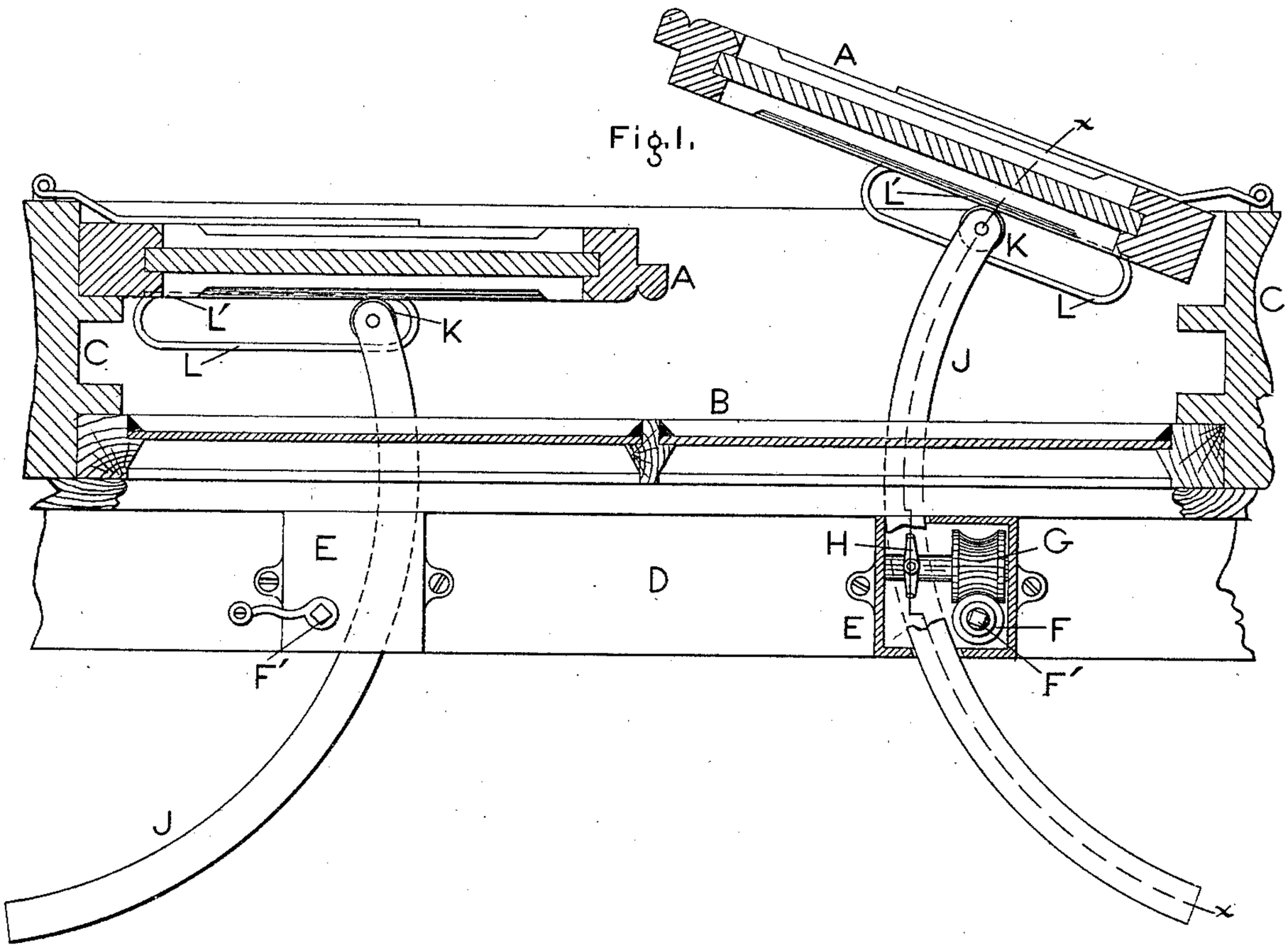


Fig. 2.

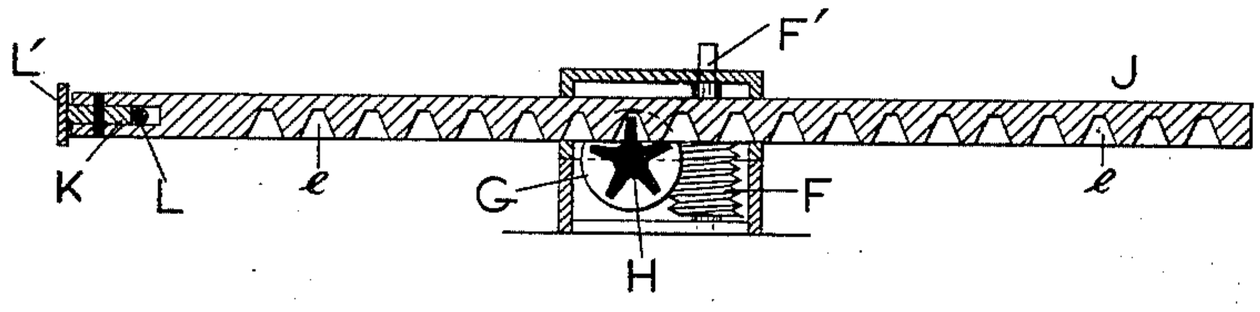
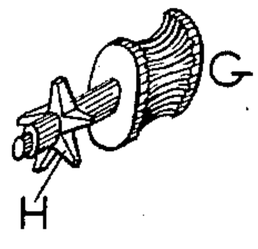


Fig. 3.



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UNITED STATES PATENT OFFICE.

ALBERT M. JOHNSON AND WILLIAM H. JOHNSON, OF PHILADELPHIA, PA.

SHUTTER-WORKER.

SPECIFICATION forming part of Letters Patent No. 223,354, dated January 6, 1880.

Application filed November 10, 1879.

To all whom it may concern:

Be it known that we, ALBERT M. JOHNSON and WILLIAM H. JOHNSON, both of the city and county of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in a Shutter Holder, Bower, and Lock, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 is a top view, partly broken away, of the shutter holder, bower, and lock embodying our invention, the sash, frame, and shutters being in horizontal section. Fig. 2 is a vertical section in line *x x*, Fig. 1. Fig. 3 is a perspective view of a detached portion.

Similar letters of reference indicate corresponding parts in the several figures.

Our invention consists of segmental arms connected to the shutters and guided in boxes secured to the window-sill. The under side of each arm is notched for the reception of the teeth of a spur-wheel, the shaft of which carries a worm-wheel, which meshes with a worm whose shaft projects from the box, so as to be conveniently operated by a crank-handle.

When the worm is rotated power is communicated to the segmental arm, whereby the shutter is drawn in or moved out to partial or entire extent, and thus locked when shut, held when opened, or bowed when partially open, as the case may be. As the teeth of the spur-wheel project into the notches of the segmental arm the latter in its curved motions does not bind with said wheel, and thus is operated with ease, all as will be hereinafter fully set forth and definitely claimed.

Referring to the drawings, A represents a pair of shutters; B, the sash; C, the frame, and D the sill, all of which are of usual form and construction.

To the sill at opposite sides are secured boxes E E, each forming the bearings for a worm, F, having a vertical shaft, F′, whose upper end projects through the top of the box, so as to be accessible for application of a crank-handle or other convenient means for operating the same, and for a horizontally-arranged worm-wheel, G, whose shaft carries a spur-wheel, H, the points whereof thus extend vertically.

J represents two segmental arms, each of which is passed through openings in the upper part of a box, E, so as to be guided thereby, and its under side is notched, as at *e*, for the reception and engagement of the points of the spur-wheel H. The outer ends of the arms are connected to the shutters by means of pulleys K, which are journaled to the arms and engage with horizontally-arranged guides L, consisting of loop or staple like pieces fixed at their ends to plates L′, screwed or otherwise fastened to the inside of the shutters. When the shutters are closed the arms J are in to their full extent, projecting into the apartment, and, as the spur-wheels H engage with said arms and are immovable unless the shafts F′ of the worms F are properly rotated, it is evident that the arms F, and consequently the shutters, are locked, and prevented from being operated and opened from the outside.

In order to open the shutters to partial or entire extent the shafts F′ are properly turned by their crank-handles, thus imparting motion to the worms F, worm-wheels G, and spur-wheels H, the action whereof, owing to the engagement of said wheels H with the segmental arms, moves the latter outwardly, and with them the shutters, which, if to entire extent, are fully opened, or, to partial extent, are lowered. In either case, as the segmental arms are immovable, except by the proper operation of the worm-shafts F′, the shutters are firmly held in bowed or opened position.

The pulleys K rotate in contact with the plates L′ when the shutters are being opened, and with the guides L when the shutters are being closed, thus permitting the greatest freedom of motion between the arms and shutters. As the notches of the segmental arms are on the under side thereof, and the boxes E E on the inside of the apartment, the several parts are protected from rain and dirt.

The segmental arms move in the arc of a perfect circle, and thus, should it be desired to pass them through the bottom strips of the sash-frame and bead, the openings in said strips and the bead may be only sufficiently wide to receive said arms, and, as the boxes lie close to said bead, access of air, &c., through the openings is prevented. As the points of the teeth of the spur-wheel move in the notches of the segmental arms, the play between the

same prevents binding of the wheel and arms, regardless of the curved path of motion of the arms.

We are aware that shutter bowers, workers, &c., have been variously constructed. Some of them have toothed segmental arms, worms, and worm-wheels and other gearing. Guides have also been connected to the shutters, and the arms fitted thereto by pulleys or rollers, wherefore we disclaim such features broadly.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The segmental arm J, in combination with the box E and the worm and worm-wheel F G, spur-wheel H, and guide L, substantially as and for the purpose set forth.

2. The segmental arm J, with notch on its lower face, in combination with the spur-wheel H on the shaft of the worm-wheel G, the box E, having guiding-openings for the arm, the worm F, with upwardly-projecting shaft F′, and the shutter having fixed guide L, substantially as and for the purpose set forth.

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