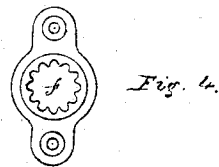
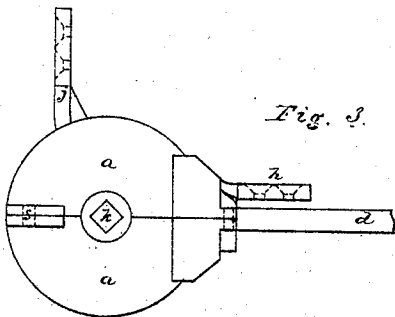
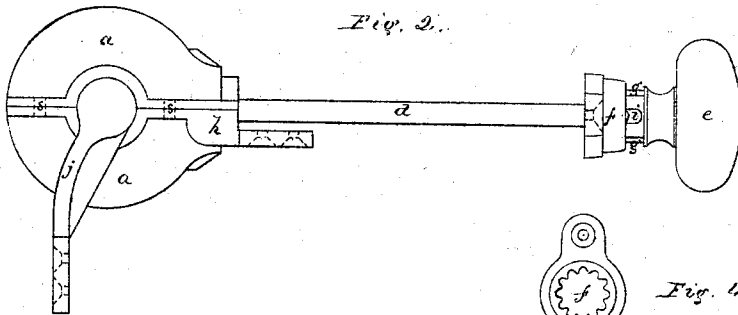
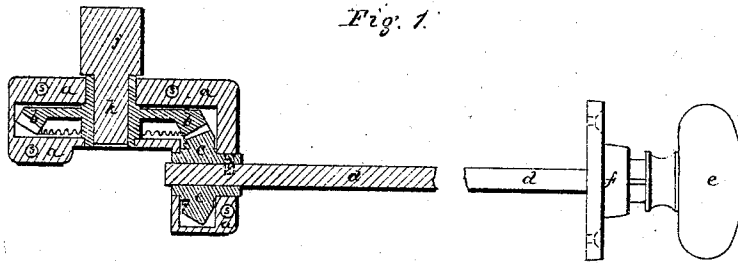


L. MULLER.
Shutter-Workers.

No. 143,416.

Patented Oct. 7, 1873.



Witnesses.

Luther W. Burt
Ben. Cook

Inventor.

Louis Muller
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UNITED STATES PATENT OFFICE.

LOUIS MULLER, OF HARTFORD, CONNECTICUT.

IMPROVEMENT IN SHUTTER-WORKERS.

Specification forming part of Letters Patent No. **143,416**, dated October 7, 1873; application filed October 3, 1872.

To all whom it may concern:

Be it known that I, LOUIS MULLER, of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Devices for Opening and Closing Shutters; and I do hereby declare that the following is a full, clear, and exact description thereof, whereby a person skilled in the art can make and use the same, reference being had to the accompanying drawing and to the letters of reference marked thereon.

Like letters in the figures indicate the same parts.

My invention consists in inclosing the gear-wheels which operate the shutters in a box or case of peculiar construction, as hereinafter described.

In the accompanying drawing, Figure 1 shows a section through the mechanism for operating a window-shutter having my improvements. Fig. 2 is a top view, and Fig. 3 is a bottom view, of the same apparatus, showing the box which incloses the gearing. Fig. 4 is a detached front view of the piece *f* of Figs. 1 and 2.

a is a casing, which incloses the bevel-gear wheels *b* and *c*. This box or case is made of two parts, fitting together along the line of the section shown in Fig. 1, and secured by the rivets or screws *s s s s* after being placed over the wheels *b c*. These wheels have projections which turn in journals in the case *a*, and form a firm bearing in the rigid frame *a*, so that they are not liable to twist or warp out of place, as is usually the case where there is a bearing on one side of the wheel only. *d* is a shaft or bar, reaching through the wall from the knob *e* to the wheel *c*. It passes through a square hole in *c*, in which it slides, so that the distance from the knob can be lengthened or shortened to accommodate different thicknesses of walls. It is secured by a set-screw to *c*, upon the inside end of the wheel at *t*, so as to be inaccessible from the outside when the apparatus is in use. *f* is a plate, attached to the inside of the wall. The aperture through which the rod *d* passes is notched or grooved,

as shown in Fig. 4, and the handle is provided with keys *g g*, which can enter into these grooves, and firmly secure it in any position. The knob *e* is made to slide upon the rod *d* by means of the slot and pin shown at *i*, Fig. 2, so that the knob can move out and in a short distance, and yet turn the shaft *d* with it in a circular direction. *h* is the part of the hinge that is secured to the window-frame, and forms part of the case *a*, being usually cast with it. *j* is the part of the hinge attached to the shutter. It turns with the wheel *b* by having a square downward-projecting bar, *k*, fitting into a corresponding hole in the center of the wheel *b*. This forms the hook or detachable portion of the hinge, the part *k* coming out when the shutter is removed from the wall.

By means of my invention the two gear-wheels, with their journals or axles and the case or box *a*, can be cast in but four pieces, and the whole placed in position and secured by the rivets or screws *s* in a very simple manner. The wheels are then entirely inclosed in a water-tight case, so that no water or dust can interfere with their operation.

It will be seen, also, that my improved device is applicable to any thickness of wall by means of the adjustable rod *d*, which can be lengthened or shortened, as desired.

By means of my improvement the blind can be held in any position desired by pressing the knob, so that the leaves or keys *g* enter into the grooves in the plate *f*.

To open or close the shutter the knob is pulled out and turned in the required direction, and then pushed back to hold it in place.

What I claim as my invention is—

The water-tight frame or box *a*, formed of two parts, joined along the line of the axes of the arbors of the wheels *b c*, and forming the journals in which both the gear-wheels revolve in the dividing line of the castings, substantially as herein described.

LOUIS MULLER.

Witnesses:

THEO. G. ELLIS,
BEN. A. COOKE.