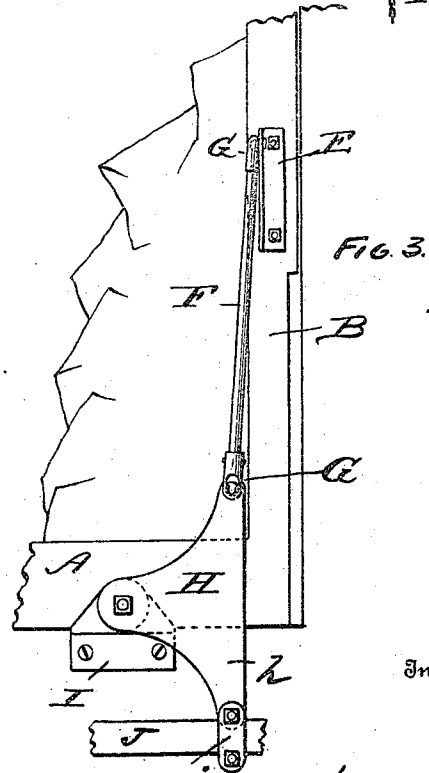
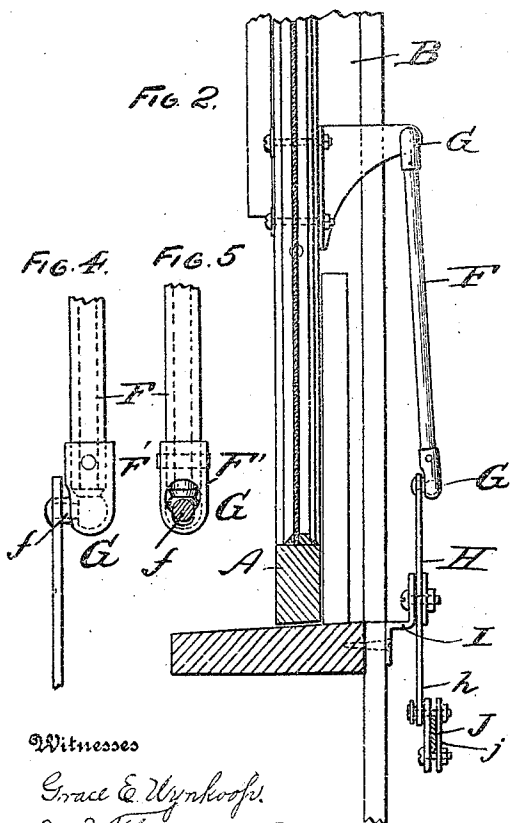
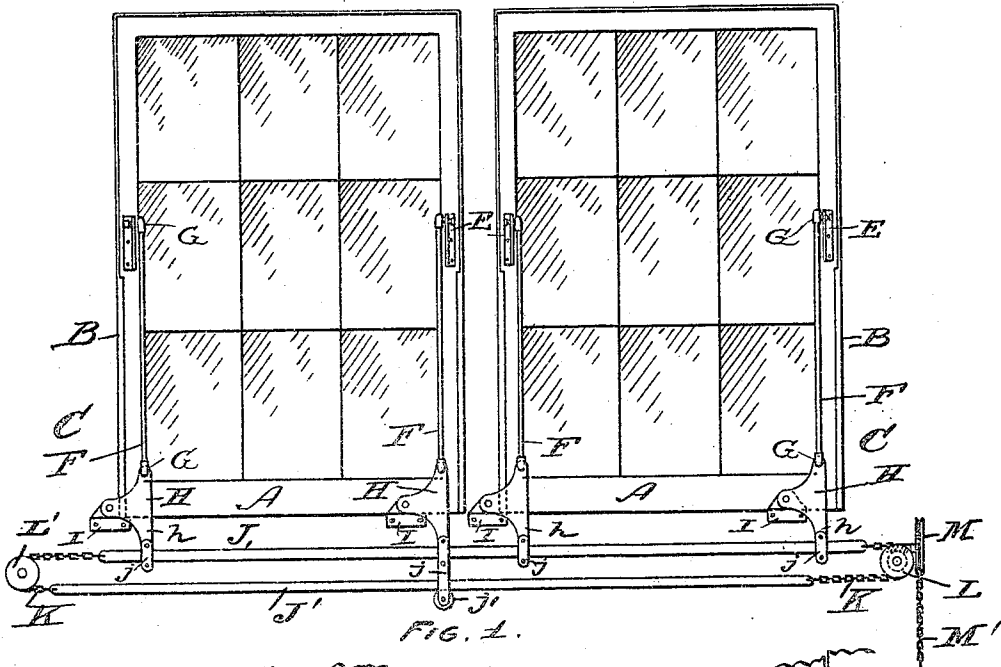


C. A. WASHBURN.
WINDOW OPERATING MECHANISM.
APPLICATION FILED MAY 17, 1909.

949,813.

Patented Feb. 22, 1910.



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WINDOW-OPERATING MECHANISM.

949,813.

Specification of Letters Patent.

Patented Feb. 22, 1910.

Application filed May 17, 1909. Serial No. 496,359.

To all whom it may concern:

Be it known that I, CHARLES A. WASHBURN, citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Window-Operating Mechanism, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to an improvement in window-opening and closing mechanism, shown in the accompanying drawings and more particularly pointed out in the claims.

The object of my invention is to simplify the operating mechanism heretofore thought necessary to actuate a plurality of windows simultaneously and a further object is to attain this end with the least possible expenditure of effort on the part of the operator.

Other advantages and improvements will hereafter appear.

In the drawings accompanying this specification: Figure 1 is an elevation of two windows with the operating mechanism connected therewith. Fig. 2 is a fragmentary view of the sash in cross-section with the operating mechanism connected therewith. Fig. 3 is a detail view of the bell-crank lever and link connecting it with the sash. Figs. 4 and 5 are detail views of the universal joint connecting the link with the bell-crank lever.

Referring now to the letters of reference shown upon the drawings:—A denotes the sash frame, B the casing, and C the wall of the building.

E is a bracket bolted to the sash frame and to which is pivoted the link F in turn connected by a ball and socket joint G with the bell-crank H.

I is a bracket bolted to the window casing or wall of the building and to which the bell-crank H is pivoted.

J is a horizontally reciprocating bar to which are secured the depending legs *h* of the bell-cranks by means of the clips *j* embracing the bar J said clips having a loose jointed connection with the depending legs *h*.

J' is a similar member suspended directly below the bar J (though it may be a chain or cable) the members being connected to-

gether at each end by sprocket chains K which in turn pass around and are actuated by the sprocket wheels L and L'.

M is a driving sprocket mounted on a shaft carrying a worm gear (not shown) adapted to operate the sprocket wheel L. M' is a chain for manually operating the driving sprocket M.

To assist in supporting the lower member J' one or more of the clips *j* to which the depending legs *h* of the bell-cranks are pivoted are made of sufficient length to loosely embrace the lower member, being provided with a friction roll *j'* over which said member travels.

As before indicated the jointed connection between the link F and the bell-crank H and between the link and the bracket E is of the ball and socket type to provide for a universal movement of the parts and it consists of a sleeve F' pinned to the link F and chambered at the end to receive the ball-shaped end of the pintle *f*,—the opposite end of the pintle *f* being rivet-headed to secure it to the leg of the bell-crank lever or bracket.

As shown in Fig. 5, the sleeve F' is provided with a large circular opening and smaller circular opening connected therewith through its side wall. To assemble the parts the ball-shaped end of the pintle *f* is inserted through the larger opening and the sleeve engaged with the end of the link F, the sleeve being forced onto the end of the link until the shaft of the pintle occupies the smaller circular opening in the sleeve, the sleeve being then pinned or otherwise secured to the link thereby locking the ball of the pintle within the sleeve but leaving it free to turn therein.

Having indicated the several parts by reference letters, the operation of the apparatus will be readily understood. By manually operating the chain M' the member J may be drawn in either direction, as desired, thereby actuating the bell-crank levers and the links connecting them with the several windows to open or close the latter as required.

While only two windows are shown in the drawings, it is evident that any required number may be connected and operated in the manner indicated.

Having thus described my invention, what I claim is:—

1. In an appliance of the class described,

a supporting structure, a structure to be moved, two operating members extending adjacent to said structure and having a flexible connection with each other, means for moving the operating members, in opposite directions, and means respectively connecting the structure to be moved with one of said operating members, consisting of bell-crank levers suitably supported, link connections between the bell-crank levers and the structure to be moved and a suitable connection between each of said levers and the operating member.

2. In an appliance of the class described, the combination of a supporting structure with a structure to be moved, of two operating members extending adjacent to said structure, means for connecting one of the operating members to said structure to be moved, the same including a lever fulcrumed to the supporting structure and pivoted to one of the operating members, a bracket fixed rigid to the movable structure with a link extending between the lever and the bracket, means for supporting said second operating member, and means for moving said members in opposite directions, substantially as described.

3. In an appliance of the class described, the combination of a supporting structure with a structure to be moved, of two operating members extending adjacent to said structure, means for connecting one of the operating members to said structure to be moved, the same including a lever fulcrumed to the supporting structure and pivoted to one of the operating members, a bracket fixed rigid to the movable structure with a link extending between the lever and the bracket, means for supporting said second operating member, friction rolls mounted in said supporting means over which said second operating member is adapted to travel, and means for moving said members in opposite directions, substantially as described.

4. In an appliance of the class described, a structure to be moved, two operating members extending adjacent to said structure and flexibly connected with each other, means for moving the operating members in opposite directions, a bell-crank lever

suitably supported, a connection between the bell-crank lever and one of the operating members, a link connection between the bell-crank lever and the structure to be moved, the same including a pintle loosely connected with the bell-crank having a ball-shaped end, a chambered sleeve provided with an opening through its side wall for the passage of said ball-shaped end before securing the sleeve to the link, and means for securing the sleeve to the link whereby the ball-shaped end of the pintle is retained within the sleeve, substantially as described.

5. In an appliance of the class described, the combination of a supporting structure with a structure to be moved, of two operating members extending adjacent to said structure and flexibly connected with each other, means for moving said members in opposite directions, levers fulcrumed to the supporting structure and pivotally engaged with one of the operating members, a bracket secured to the structure to be moved, a link connection between each of the levers and the bracket on the structure to be moved, the ends of said links each provided with a chambered sleeve in which is housed the ball-shaped end of a pintle, and pintles having ball-shaped ends serving as pivots between the link and operating lever and the link and bracket on the movable structure respectively, substantially as described.

6. In an appliance of the class described, a supporting structure, a plurality of structures to be moved, two operating members extended adjacent to said structures and connected together, means for reciprocating the operating members, a plurality of bell-crank levers supported in the same vertical plane with the supporting structure and adjacent thereto, each pivotally connected with one of the operating members, and link connections respectively between each of the levers and the structures to be moved, substantially as described.

In testimony whereof, I sign this specification in the presence of two witnesses.

CHARLES A. WASHBURN.

Witnesses:

SAMUEL E. THOMAS,
GRACE E. WYNKOOP.