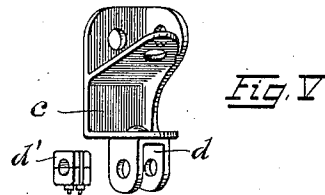
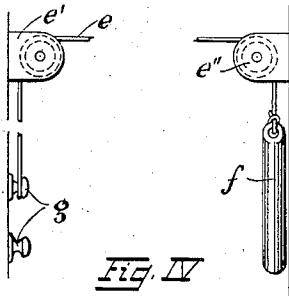
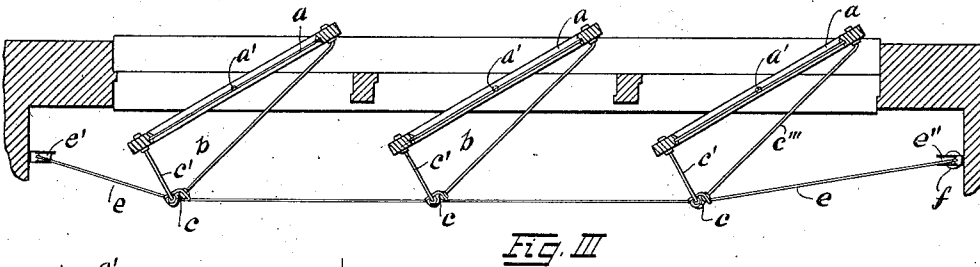
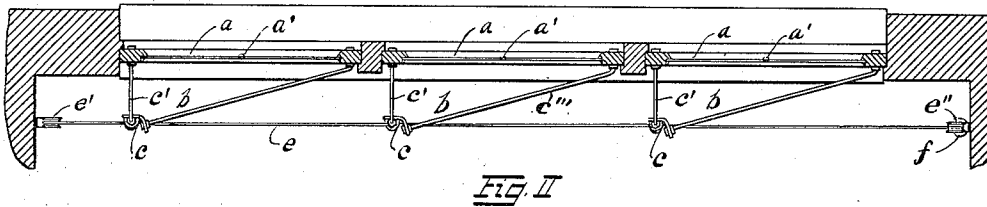
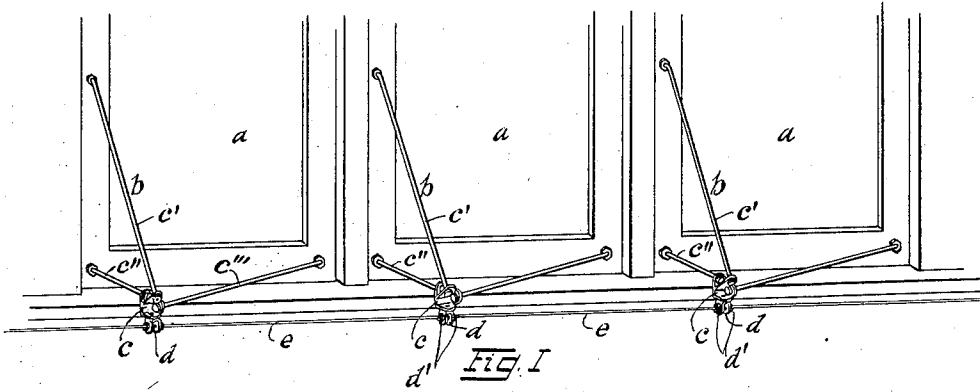


W. VON WOLFFRADT.
WINDOW SASH OPERATING MECHANISM.
APPLICATION FILED JAN. 28, 1911.

1,028,171.

Patented June 4, 1912.



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UNITED STATES PATENT OFFICE.

WILLIAM VON WOLFFRADT, OF CLEVELAND, OHIO.

WINDOW-SASH-OPERATING MECHANISM.

1,028,171.

Specification of Letters Patent.

Patented June 4, 1912.

Application filed January 28, 1911. Serial No. 605,188.

To all whom it may concern:

Be it known that I, WILLIAM VON WOLFFRADT, citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Window-Sash-Operating Mechanism, of which the following is a specification.

My invention relates to window-sash-operating mechanism, and has for its object the provision of means for readily actuating one or more relatively inaccessible windows, although the principal employment of said invention is found in the concurrent opening and closing of a series of window sashes, such as are commonly required in factory buildings.

My invention, as herein embodied, avoids the use of rotating shafts or sliding rods with gears, link or other connections to the window-sashes, which constructions involve not only a material increase in expense over my improved device, but are complicated and liable to get out of order. Moreover, my operating means permits the sashes to open completely.

Briefly stated, my invention is embodied in braced connections upon the sashes, preferably attached to the bottom rails thereof, with which are associated a single traveling rope, cable or chain, suitably counterweighted and carried over supporting pulleys, and adjustable connecting-means for individually attaching said braces (these constituting the window-actuating members) to the rope or chain.

Details of my improved construction will be more readily understood by making reference to the accompanying sheet of drawings, wherein:—

Figure I is a view in elevation showing the actuating means associated with three vertically pivoted windows, Fig. II is a transverse sectional view thereof with the windows closed, and Fig. III is a similar view showing the windows partly opened. Fig. IV illustrates details of the counterweight and attaching cleats, respectively positioned at opposite ends of the operating cable, and Fig. V shows the adjustable connections and the angular casting uniting the window brace.

Throughout the several figures of the drawing I have employed the same characters of reference to indicate similar parts.

Each of the window-sashes *a* is swung

upon central vertical pivots *a'*. A composite brace or bracket *b* is secured to the bottom and the left hand side rails of each of the window-sashes. This brace is made up of the angular casting *c* shown in Fig. V, with which are connected three rods attached at their ends to widely separated portions of the window-sash. The upwardly extending rod *c'* is attached about midway of the side-rail, while the horizontal rods *c''*, *c'''* are connected near the ends of the bottom rail of said sash.

Each of the castings *c* is provided with a depending pivotal member *d*, to which the traveling rope *e*, or other actuating member, is adjustably attached, as by the clips *d'*. This rope is carried over pulleys *e'* *e''* and a counterweight *f* is attached at the right hand end of the rope, sufficiently heavy to swing open the series of window-sashes with which it is associated. The opposite end of said rope may conveniently be looped to pass over the studs or cleats *g*, for holding the window-sashes closed, or in any desired position when opened. It is obvious that the rope will be of sufficient length to bring it within convenient reach of the person actuating the above-described mechanism.

From the foregoing it will be appreciated that my invention is embodied in the simplest form of mechanism for accomplishing the desired result. The counterweighted member *e* may be made of hemp or wire rope, or a chain may be employed to afford a sufficiently flexible traveling member for attaching to the actuating braces. The latter, in the preferred form for operating heavy window-sashes preferably extend the length of the bottom rail of the sash, so that both a pushing and pulling effect is secured to turn the window-sash upon its pivots. Moreover, the diagonal, upright brace renders the construction more rigid and truss-like in character.

It will be observed that the brace is attached to the bottom rail of the window-sash and that the pivotal member of the casting is slightly below the bottom rail at its point of attachment with the rope. Consequently the window-sashes are unobstructed, so that they may swing freely upon their pivots, as the rope is below their horizontal plane of rotation. It follows that the windows may be swung through the full arc of ninety degrees.

The braces, it will be understood, preferably are individually adjustable with respect to the flexible traveling member, so that any difference in the length thereof
 5 may be compensated for, and all the windows may be given an equal opening or closing movement. By means of the weight, a single traveling member is rendered sufficient for opening or closing the windows
 10 from one position, although it will be understood that should the windows stick or bind they may be swung open by pulling upon the weighted end of the rope.

Having now described the preferred embodiment of my invention, I claim as new, and desire to secure by Letters Patent, together with such changes as may be made by mere skill, the following:—

1. In a window-sash operating mechanism, the combination with a vertically pivoted window-sash, of a traveling flexible member supported in a plane lower than said window-sash, a counterweight attached to said flexible member, an angularly-extending member mounted upon the window-sash and adjustably connected with said traveling member and means for holding said flexible member in adjusted positions, substantially as set forth.

2. In a window-sash operating mechanism, the combination with a plurality of vertical pivoted window-sashes of a plurality of braces extending laterally beyond the planes thereof and rigidly secured to said
 35 window-sashes, a traveling flexible member, a counterweight at one end thereof, adjustable connecting-means for securing said traveling member to each of the braces and means for holding said flexible member in
 40 adjusted positions, substantially as set forth.

3. In window-sash operating mechanism, the combination with a plurality of pivoted window-sashes, of a plurality of bracket members rigidly attached thereto
 45 and extending beyond the plane of said windows, a flexible and relatively inextensible member mounted to travel transversely

of the movement of the windows, adjustable connecting-means for securing the bracket members individually thereto, a counter-
 50 weight for actuating the traveling member, and means for holding it in its adjusted positions, substantially as set forth.

4. In window-sash operating mechanism, the combination with a pivotally mounted window-sash, of a brace or bracket member connected with the window-sash substantially at the extremities of one of its pivotally movable rails and extending laterally beyond the plane of said window-sash, a
 60 flexible traveling member, a counterweight thereon, means for retaining said member in its adjusted position, and adjustable means for connecting the traveling member with the brace, substantially as set
 65 forth.

5. The combination with a plurality of vertical pivoted window-sashes, of a plurality of braces attached respectively near the extremities of their horizontal rails, a
 70 rope extending past said braces and over pulleys positioned beyond the series of windows, a counterweight attached at one end of the rope, retaining means for the opposite end of the rope, and adjustable connecting-means for securing the braces in-
 75 dividually to said rope, substantially as set forth.

6. The combination with a plurality of vertically pivoted window-sashes, of a plu-
 80 rality of braces attached respectively to the bottom rails thereof, a traveling flexible member actuated beneath the braces in a plane lower than the window-sashes, and means for connecting said braces with the
 85 flexible member, whereby the window-sashes are actuated to swing through substantially an arc of ninety degrees, as set forth.

In testimony whereof I do now affix my signature in the presence of two witnesses. 90

WILLIAM VON WOLFFRADT. [L. S.]

Witnesses:

ISAAC T. KAHN,

ALBERT LYNN LAWRENCE.