

H. L. EICHHORN.
 WINDOW OPERATING MECHANISM.
 APPLICATION FILED OCT. 26, 1912.

1,069,682.

Patented Aug. 12, 1913.

Fig. 1.

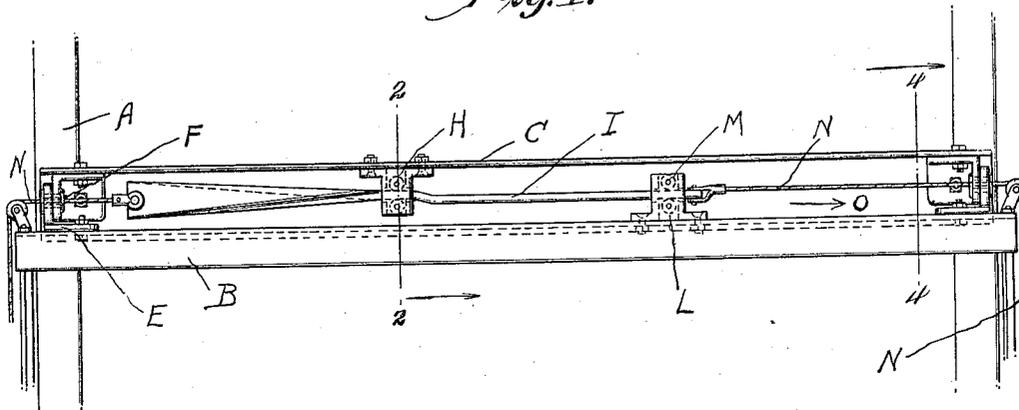


Fig. 2.

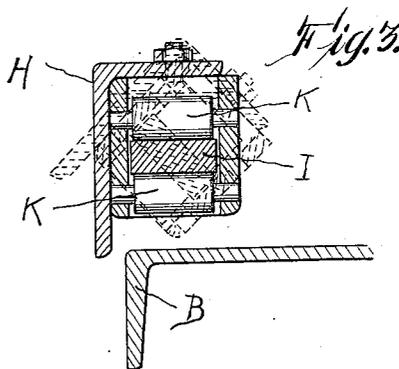
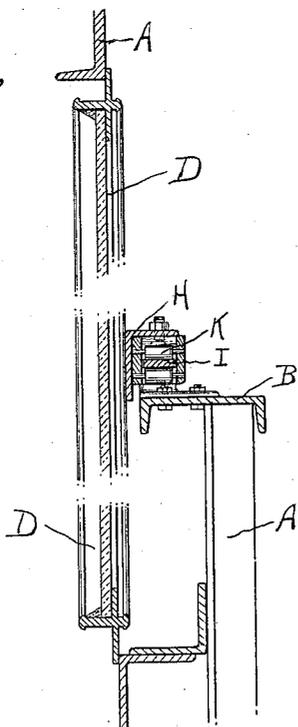
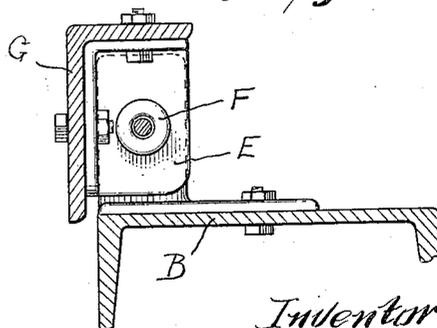


Fig. 4.



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UNITED STATES PATENT OFFICE.

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WINDOW-OPERATING MECHANISM.

1,069,682.

Specification of Letters Patent.

Patented Aug. 12, 1913.

Application filed October 26, 1912. Serial No. 727,841.

To all whom it may concern:

Be it known that I, HARRY L. EICHHORN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Window-Operating Mechanisms, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this application.

My invention relates to devices for operating pivoted closures for openings in walls or roofs, and is particularly applicable to the opening and closing of windows, shutters or ventilators made with steel frames and pivoted in steel mullions. Where a number of such windows are to be opened or closed simultaneously, it has heretofore been customary to use operators consisting of rocking shafts supported on brackets near the windows and connected to the windows by links or gears. With such a construction, the links, brackets and shafts usually project in an unsightly fashion. Moreover, the lost motion between the various elements of such a window-operating system makes the mechanism apt to cause a noisy rattling. Also, it is often difficult to close the windows tightly, as the lost motion in many joints intervenes between each window and the point at which the manually actuated part of the operating mechanism is fastened.

The object of my invention is to produce a window-operating mechanism having its parts so arranged that they will not project in unsightly fashion from the walls, but will be partly hidden from view; one that will lock each window securely in any position right at the window; that will be simply and cheaply built; and one that may easily be installed without changes in the framing of the building. I accomplish these objects by the construction shown in the accompanying drawings, in which—

Figure 1 is a partial elevation of one form of my operating mechanism as applied to a steel sash window. Fig. 2 is a vertical section through the same along the line 2—2. Fig. 3 is an enlarged vertical section through the guide member fastened to the window. Fig. 4 is an enlarged section along the line 4—4.

In the drawings, A is a window-frame having a transverse mullion B adjacent to the central cross-bar C of a swinging win-

dow D. Mounted upon the mullion B are trunnions E pivoted by hollow bearings F to brackets G upon the cross-bar C of the window. Fastened to this cross-bar C is a guide H having a rectangular opening through which a flat bar I is adapted to be slid in a direction parallel to the cross-bar C. This guide H preferably has rollers K to reduce the friction of the bar I when the latter is slid through the guide. L is a similar guide fastened to the mullion B and similarly fitted with rollers M engaging the same bar I.

N is a flexible member such as a wire rope or chain, attached at its ends to opposite ends of the bar I and preferably passing through the hollow bearings F.

When the bar I is in the position shown in Fig. 1, the portion between the two guides H and L is preferably untwisted, while the portion of the bar extending beyond the guide H has a twist slightly greater than the angle through which the window is to be moved when opening the same. The bar I is preferably made of wrought iron and sufficiently heavy to resist any torsional strain which might be caused by wind pressure tending to open the window. If the flexible member N is drawn in the direction of the arrow O, the bar will engage the guide H along its twisted portion, and as the guide L will prevent the bar itself from turning, the latter will rotate the guide H to an amount corresponding to the twist between the engaged portion of the bar and that engaged by the fixed guide L. Consequently, the window-moving guide H will swing the window D, to which it is fastened, through a corresponding angle. Likewise, if the flexible member N is drawn back in the opposite direction, the twist in the bar I will cause the window-operating guide H to return the window to its closed position.

It will be obvious that by varying the twist of the bar I, the window-operating member H may be caused to move the window through any desired angle. Also, that by spacing the rollers K and M to leave just room enough between them for the bar I, the latter will lock the guides H and L against relative rotation at any position in which the bar may be stopped. Consequently, the window to which the window-moving member H is fastened will be locked in position regardless of any lost motion between the mechanism as pictured and the point at

which the operator imparts motion to the flexible member N. By placing the guide members H and L within the angle of the cross-bar C of the window, they will be practically concealed from the view of any one standing at some distance below the window. Likewise, the flexible member N may be run close to the steel framework or walls of the building, so that the whole mechanism may be much less conspicuous than has been possible with the devices heretofore used. Moreover, the reciprocable bar I may be actuated by any one of many means of reciprocating the chain or flexible member N, the only requirement being that motion shall be imparted to the bar I in the direction of its length, and that the bar shall have a twisted portion adjacent to one pair of the guide rollers when the bar is at one extreme of its reciprocation.

While I have shown the bar I as of a wide rectangular section, I do not wish to be limited to this particular form of angular section. Neither do I wish to be limited to other details as pictured and described, since it will be obvious that numerous modifications could be made without departing from the spirit of my invention. For example, the drawings show the axes of the rollers upon the guides H as substantially in alinement with the axes of the rollers of the guides L when the window is in its closed position, these roller guides being thrown out of alinement when the window is opened. However, the action would be the same regardless of the initial alinement of the parts when the window is closed, since a twist in the bar would always serve to move the axes of the rollers into or out of alinement with each other when the bar is slid through the guides.

What I claim as new and desire to cover by Letters Patent is:

1. A window operating mechanism, including a longitudinally reciprocable angular bar twisted for a portion of its length; a guide mounted upon the window frame; and a window-moving member mounted upon the window; the guide and window-moving member each having a plurality of rollers affording sliding engagement with the angular bar, whereby the twist in the bar will cause the bar to rotate the window-moving member with respect to the guide when the bar is moved longitudinally.

2. An operating mechanism for a window having pivoted bearings, including in sub-

stantial alinement with the said bearings a window-moving member mounted upon the window; a guide-member upon the framework of the window; and a reciprocable member having sliding engagement with the said window-moving and guide-members; the reciprocable member having a twisted portion adjacent to one, and an untwisted portion adjacent to the other, of the members with which it has sliding engagement.

3. An operating mechanism for a window having pivoted bearings, including in substantial alinement with the said bearings a window-moving member mounted upon the window; a guide-member upon the framework of the window; and a reciprocable bar having sliding engagement with the said window-moving and guide-members; the reciprocable bar having a twisted portion adjacent to its engagement with one of the said members when the bar is at one extreme of its reciprocation.

4. A window operating mechanism including a guide upon the window frame; a window-moving member; a longitudinally reciprocable flat bar in substantial alinement with the said guide and window-moving members; the guide and window-moving member each having a pair of parallel rollers affording sliding engagement with the flat bar, the bar being twisted adjacent to its engagement with one of the said two pairs of rollers when the bar is at one extreme of its reciprocation.

5. A window operating mechanism, including a pair of guide rollers mounted upon the window frame; another pair of guide rollers mounted upon a window-moving member; and a longitudinally reciprocable bar twisted for a portion of its length and adapted to slide between the two pairs of rollers.

6. An operating mechanism for a window pivoted upon hollow bearings, including in substantial alinement with the said bearings a flexible member passing through one of the bearings; guides mounted respectively upon the window and its frame; and a twisted bar engaging the guides and adapted to be moved longitudinally by the flexible member.

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