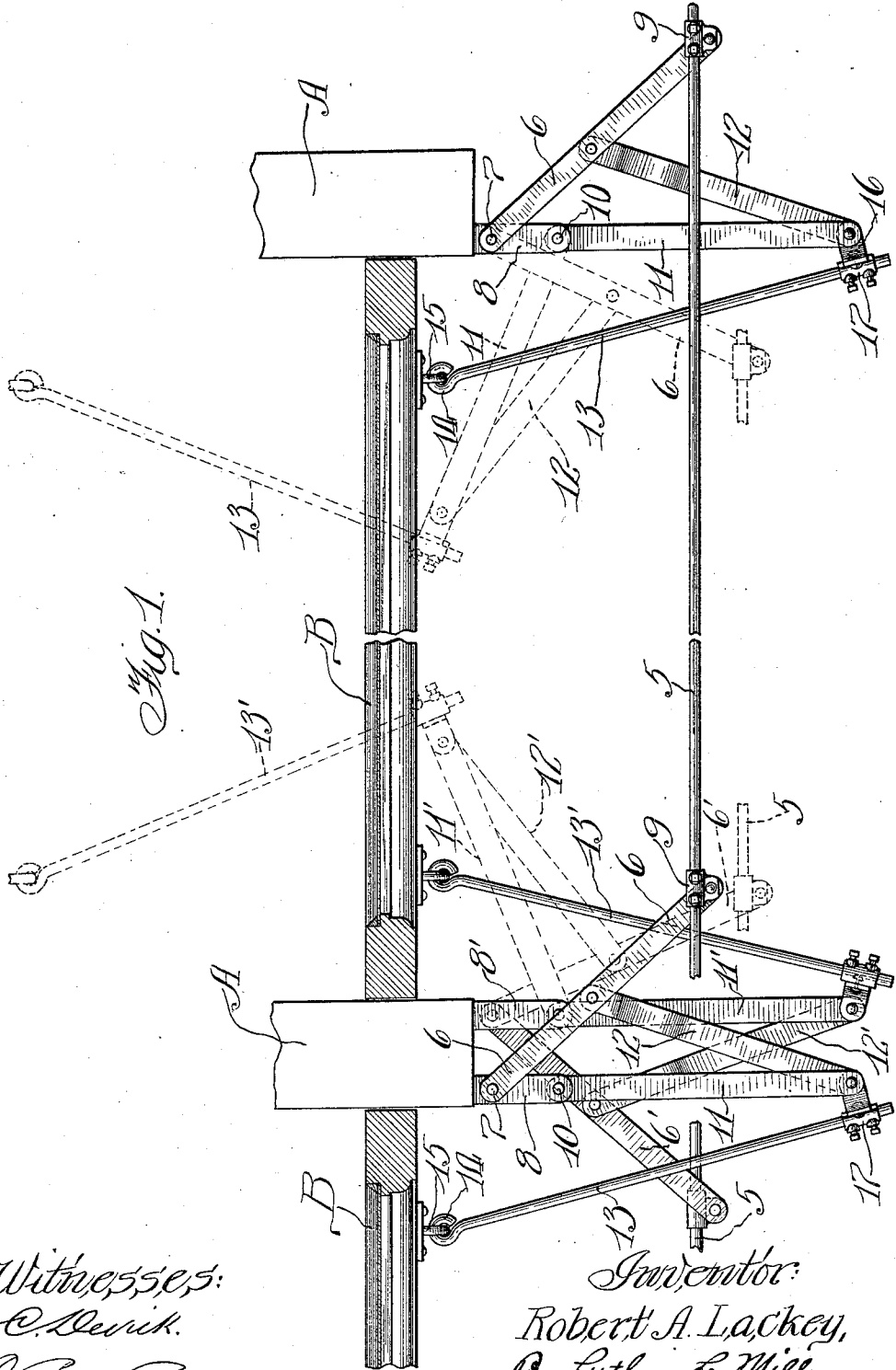


R. A. LACKEY.
 WINDOW OPERATING MECHANISM.
 APPLICATION FILED MAY 29, 1911.

1,046,202.

Patented Dec. 3, 1912.

2 SHEETS—SHEET 1.



Witnesses:
 J. C. Devick.
 C. Paul Parker.

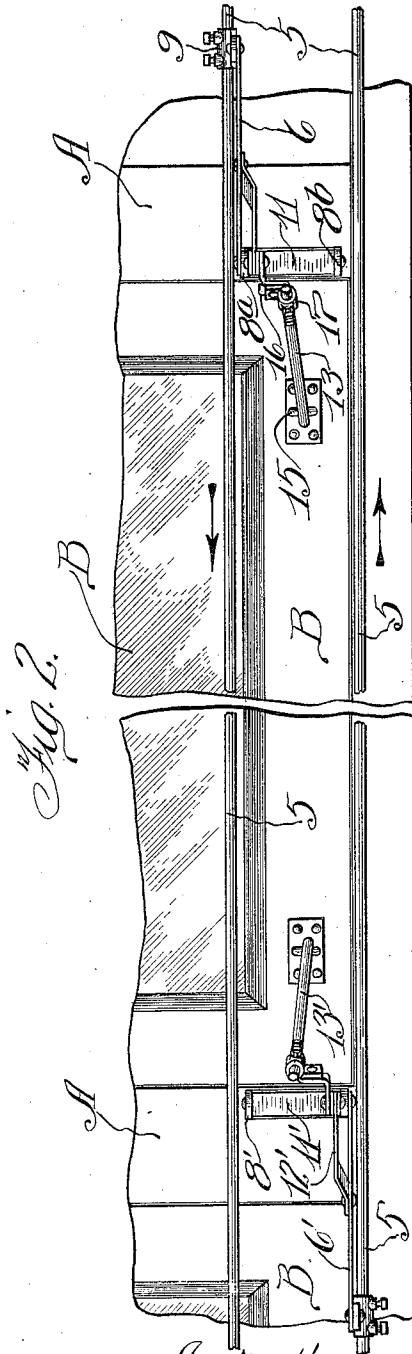
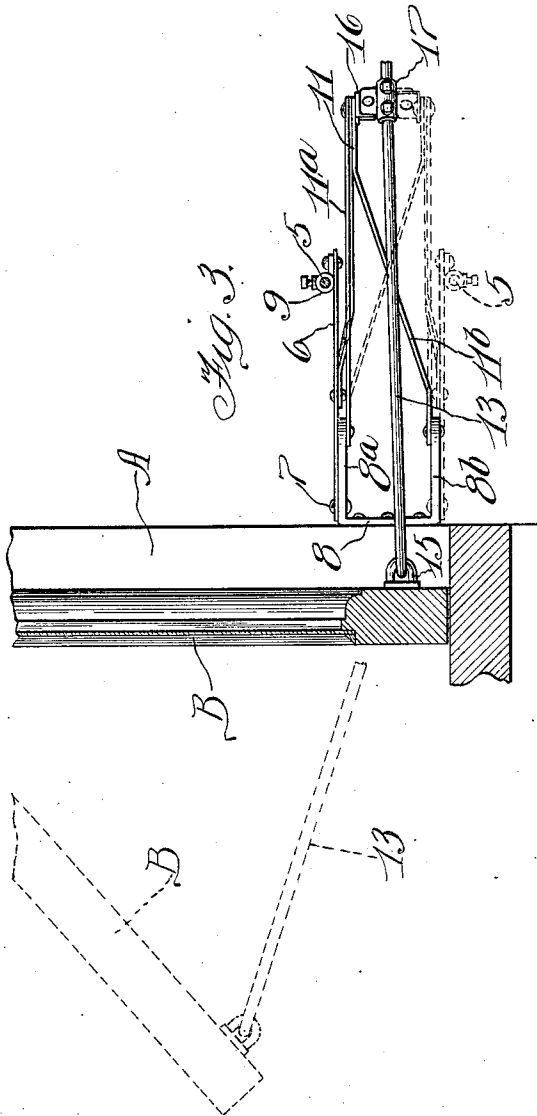
Inventor:
 Robert A. Lackey,
 By Luther L. Miller
 Att'y.

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UNITED STATES PATENT OFFICE.

ROBERT A. LACKEY, OF OAK PARK, ILLINOIS.

WINDOW-OPERATING MECHANISM.

1,046,202.

Specification of Letters Patent.

Patented Dec. 3, 1912.

Application filed May 29, 1911. Serial No. 630,178.

To all whom it may concern:

Be it known that I, ROBERT A. LACKEY, a citizen of the United States, residing at Oak Park, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Window-Operating Mechanisms, of which the following is a specification.

This invention relates to apparatus for simultaneously operating a plurality of movable members, such as windows or shutters of a building.

The objects of the invention are to improve apparatus of this class with a view to reducing the cost of manufacture, to provide improved leverage in the apparatus, and to produce an apparatus by which the window will be moved through relatively great space by a small movement of the operating member.

In the accompanying drawings, Figure 1 is a view showing in top plan an apparatus embodying my invention in operative relation to a series of windows. Fig. 2 is a front elevation of the apparatus, and Fig. 3 is a transverse section therethrough.

In the drawings A indicates a window casing and B a window to be opened and closed.

The present embodiment of my invention comprises a pair of operating members in the form of rods 5 positioned one above the other in substantially parallel relation and extending along the front of the series of windows to be operated. Any suitable means may be provided for shifting the rods longitudinally in opposite directions. I have deemed it unnecessary to illustrate such means herein.

The operating means for each window comprises a device at each side of the window, one of said devices being operable by the upper one of the rods 5 and the other of the devices being operable by the lower rod. All of these devices are substantially identical, and a description of one will suffice for all.

Referring to the device positioned at the right-hand side of the window in Figs. 1 and 2, and shown in full lines in Fig. 3: A lever 6 has one end pivoted at 7 upon the rear portion of the upper arm 8^a of a U-shape bracket 8 which is fixed to the casing A. The outer end of the lever has pivoted thereto a sleeve 9 which is suitably fixed upon the upper one of the operating rods

5. Pivoted as at 10 to the forward portion of the bracket 8 is an arm 11 comprising two sections, the upper section 11^a preferably being straight, as indicated in Fig. 3, and pivoted to the upper arm 8^a of the bracket 8; while the lower section 11^b is pivoted to the lower bracket arm 8^b and slants upwardly to bring the outer ends of the sections together. It will be noted that the pivot points 7 and 10 are some distance apart. Extending between the outer end of the arm 11 and the middle portion of the lever 6 is a brace 12. The arm 11 is connected to the window B by means of a link 13, said link having a loop 14 at its rear end engaging in an eye 15 fixed to the window sash. The forward end of the link 13 has a universal connection with the forward end of the arm 11 said connection in this instance comprising an angle member 16 one side of which is pivoted to the arm 11 to swing in a horizontal plane, and the other side of which has pivoted thereto, for movement in a vertical plane, a sleeve 17 which is suitably secured upon the link 13.

As above indicated, the device at the opposite side of the window has parts 6' 8' 11' 12' and 13' corresponding to the parts 6, 8, 11, 12 and 13 of the above described device, the second device, however, being inverted with respect to the first and adapted for attachment to the lower one of the operating rods 5. Each vertical portion of the casing A supports two of these operating devices, the brackets 8 thereof being fixed side by side and the swinging portions extending one above the other for attachment to the respective rods 5, said devices being attached to the windows at opposite sides of the particular casing portion. In Fig. 2 I have shown only one pair of devices adapted to move a single window. For the sake of clearness, the lower one of the operating devices is indicated in dotted lines in Fig. 3.

As will be seen, my apparatus may be constructed entirely from bar iron and rods, thus providing a very cheap construction and at the same time one which is sufficiently strong and rigid.

Referring to Fig. 1, it will be noted that the arc of movement of the lever 6 is relatively small compared to the movement of the arm 11 and therefore the window A. This is advantageous in that it necessitates less movement of the operating rods 5, to give a corresponding movement of the win-

dow. The difference in the arcs of movement of the two parts mentioned is due to the peculiar relation of the elements of the device.

5 I claim as my invention:

1. An apparatus of the character described, comprising a pair of longitudinally movable operating members, links attached to the window and connections between said
10 operating members and said links, arranged to give a relatively great endwise movement to said links by a short movement of said operating members.

2. An apparatus of the class described,
15 comprising a longitudinally movable operating member, a lever pivoted at one end and having its other end attached to said member, a link attached at one end of the window to be operated, and means connecting
20 said link with said lever whereby a given movement of said lever will move said link through a substantially greater distance.

3. An apparatus of the class described,
25 comprising a pair of rods adapted to be moved in opposite directions, and devices positioned at opposite sides of the window to be operated and operatively connected with said pair of rods, each of said devices
30 comprising a bracket adapted to be attached to the window casing, a lever pivoted to said bracket, an arm pivoted to the bracket at a point forwardly of the lever, a brace extending between said arm and said lever, and a
35 link adapted to connect the arm with the window.

4. An apparatus of the class described, comprising a pair of rods adapted to be

40 moved longitudinally in opposite directions, devices each attached to one of said rods and arranged to be mounted at opposite sides of a window to be operated, each of said devices comprising a U-shape bracket adapted for attachment to the window casing, a lever
45 pivoted on said bracket and attached to one of said rods, an arm comprising two sections pivoted respectively to the upper and lower arms of said bracket, a brace extending between the outer end of said arm and
50 said lever, and a link adapted to connect the outer end of said arm with the window.

5. An apparatus of the class described, comprising a pair of rods adapted to be positioned along a series of windows to be operated and lying one above the other in
55 parallel relation, and means at each side of the window for operatively connecting one of said rods to the window, each of said means comprising a U-shaped bracket adapted for attachment to the window casing, a
60 lever pivoted at one end upon the rear portion of one arm of said bracket, and having its outer end attached to one of said rods, an arm comprising two sections each pivoted at its rear end to the forward portion of the
65 respective bracket arms, a brace extending between the outer end of said arm and the middle portion of said lever, and a link adapted to connect the outer end of said arm with the window to be operated. 70

In testimony whereof I hereby affix my signature in the presence of two witnesses.

ROBERT A. LACKEY.

Witnesses:

JOSEPH R. BARSE, Jr.,

C. PAUL PARKER.