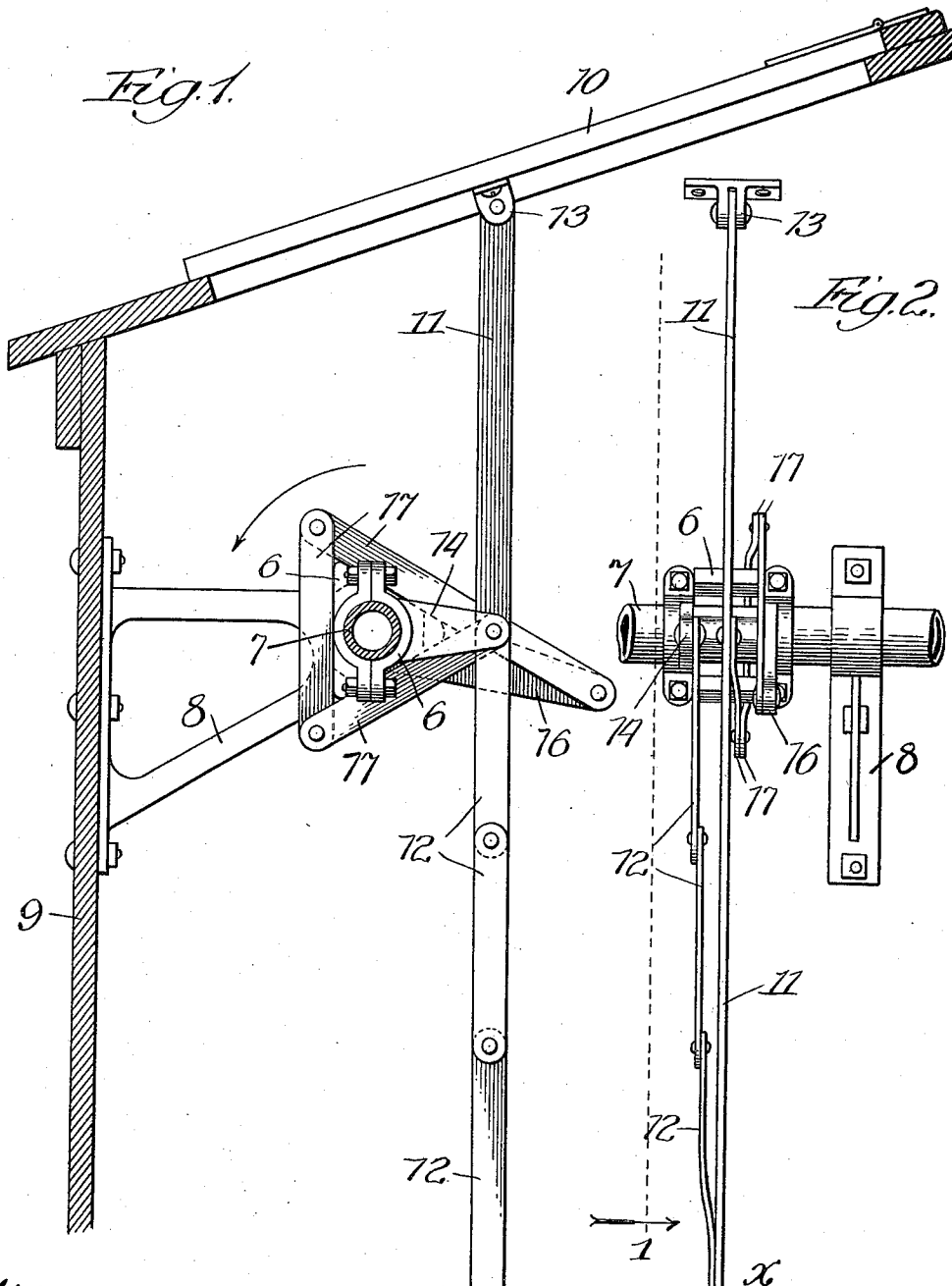


M. A. GROBL.
LIFTER ARM.
APPLICATION FILED OCT. 9, 1911.

1,015,017.

Patented Jan. 16, 1912.

2 SHEETS—SHEET 1.



Witnesses:
E. C. Gaylord.
H. F. Chase.

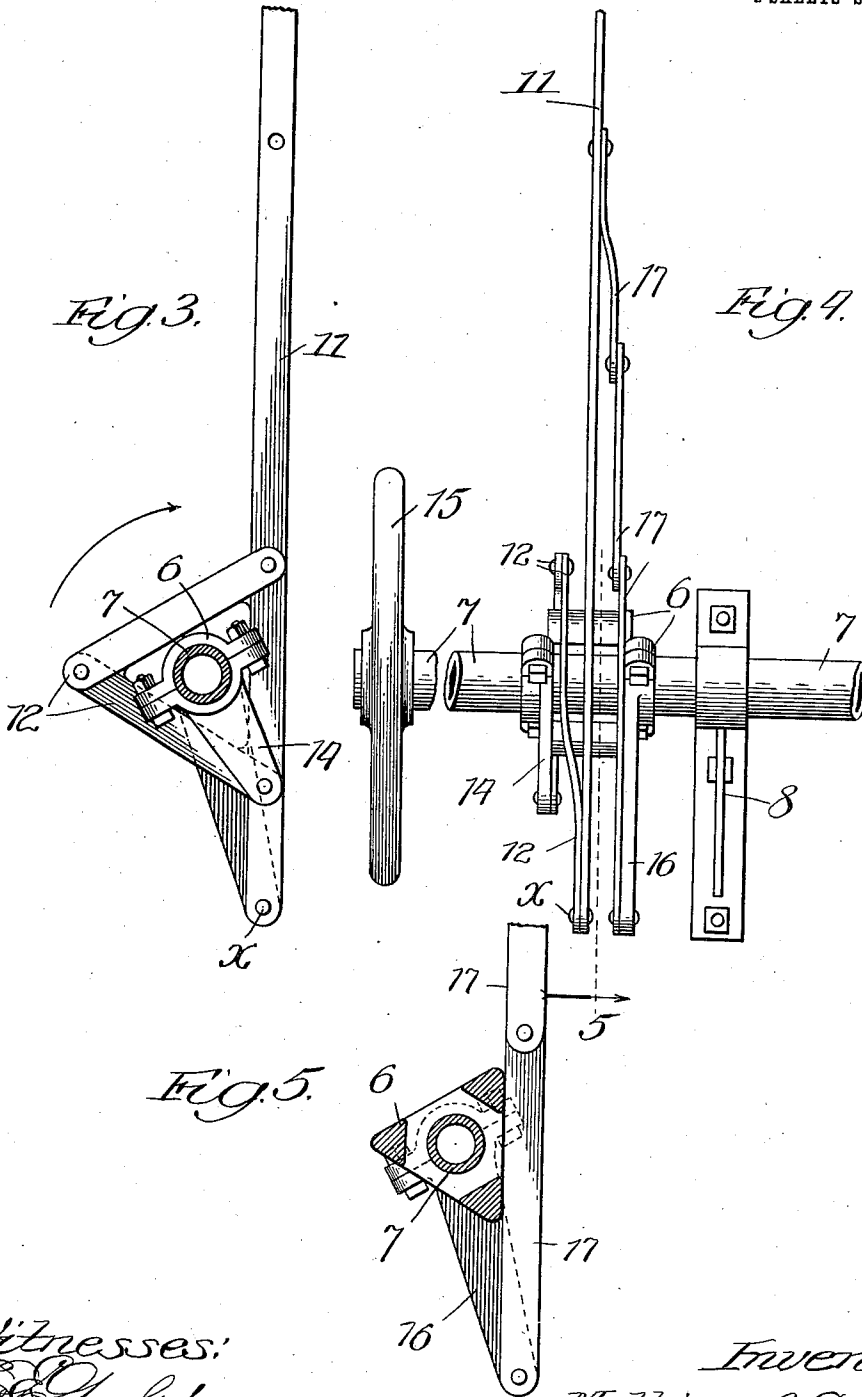
Inventor:
Matthias A. Grobl.
Beddyneuforth, Sec., *Christman & Wills.*
Attorneys.

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2 SHEETS-SHEET 2.



Witnesses:
G. P. Gaylord,
J. F. Chase.

Inventor:
Mathias A. Grobl,
By Dymally, Le, Crittore & Miles,
Attorneys.

UNITED STATES PATENT OFFICE.

MATHIAS A. GROBL, OF CHICAGO, ILLINOIS.

LIFTER-ARM.

1,015,017.

Specification of Letters Patent.

Patented Jan. 16, 1912.

Application filed October 9, 1911. Serial No. 653,686.

To all whom it may concern:

Be it known that I, MATHIAS A. GROBL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Lifter-Arms, of which the following is a specification.

My invention relates to an improvement in the class of devices known as lifter-arms used for raising, propping and lowering sashes, such as those used in the roofs of green-houses, windows, transoms, and the like.

In the accompanying drawings, Figure 1 is a broken, sectional view showing my improved lifter-arm by a section on line 1, Fig. 2, as operatively applied to a roof-sash, with the latter closed; Fig. 2 shows the lifter-arm in its condition represented in Fig. 1 by a view in front elevation; Fig. 3 shows the lifter-arm by the same view that represents it in Fig. 1, but with the arm partly folded in performing its raising function; Fig. 4 shows the same by a broken view in front elevation, and Fig. 5 is a broken section on line 5, Fig. 4.

The object of my invention is to provide a novel construction of lifter-arm device, whereby it shall be operative through the medium of a rotatably-supported head on the flexible end of the arm to raise and lower it for opening and closing, and adjusting or setting a sash or the like with which its opposite end is connected.

In the illustrated preferred embodiment of my invention, the head 6 is of general triangular shape, though it may be of any other suitable shape. The head, as shown, is formed of two open-sided sections bolted together through flanges upon them, to facilitate clamping it about a tubular shaft 7 to cause it to rotate with the shaft, which is journaled in suitable bearings 8 in proper position for conveniently handling the device, as on a wall 9 of a structure, such as a green-house, having hinged sashes, of which one is represented at 10 in Fig. 1. The bar proper consists of a rigid section 11 of any desired length, and a flexible section composed of a series of links 12, in any desired number, pivotally connected to its lower end at x ; the upper end of the bar carrying pivotally a bracket 13 adapted to be secured to the sash, or the like, to be operated. The links 12 may be uniform or varying in length, and of the straight shape

shown, or curved or of other shape to conform to the surface of the head. For a flat-sided head, such as that illustrated in the drawings, the links should have straight edges. A crank-finger 14 extends from the head near one end thereof, and the end-link 12 of the series is connected to the crank.

In the condition of the lifter-arm represented in Figs. 1 and 2, the sash is in its closed position with the links 12 extending upwardly along the side of the rigid section 11 of the lifter to which the link-series is pivoted. By turning a hand-wheel 15 (Fig. 4) to rotate the head 6 in the direction indicated by an arrow in Fig. 1, the links 12 are pulled upwardly, thereby raising the arm-section 11 and the sash 10, and folding one after the other of the links 12 against the successive sides of the head presented thereto in rotating it. If it be desired to raise the sash but slightly, only one link will be thus folded and the extent of raising will depend on the length of the link and degree of rotation of the shaft; while further raising of the sash will fold two or more of these links, in the sense of wrapping them about the head, as represented in Fig. 3. Obviously, by rotating the head in the opposite direction indicated by an arrow in Fig. 3, it will return the links 12, from their position shown in that figure, to or toward the relative position represented in Fig. 1 and cause partial or complete closing of the sash, depending upon the extent of rotation.

The construction involving the parts thus described is operative to raise the sash positively by folding the links 12 against the head; in unfolding them, however, they do not pull the sash, to lower it, positively, but its gravity in closing tends to straighten the links 12 along the arm-section as they are unfolded, thereby merely permitting closure of the sash. To close or lower the sash, as well as to raise it, positively, the following means are provided: A second and relatively-longer crank-finger 16 extends from the head 6 at the end thereof opposite that carrying the crank 14. With the finger 16 is pivotally connected one end of a series of links 17, substantially like the links 12, and the final link 17 on the opposite end of the series is pivotally connected to the adjacent side of the rigid arm-section 11 between its ends. When, therefore, the sash is closed, bringing the links 12 to the unfolded con-

dition shown in Fig. 1, the links 17 are folded about the head, as represented in that figure. By rotating the head in the direction indicated by the arrow in Fig. 3, there-
 5 by folding the links 12 about it to raise the sash, the links 17 unfold to the distended condition represented in Fig. 4, and in folding, they pull positively on the sash to lower it under the control of the operator.

10 What I claim as new and desire to secure by Letters Patent is—

1. A lifter-arm device of the character described, comprising a head rotatable on an axial support, and a lifter-arm having a
 15 rigid section adapted to be connected to a sash, or the like, and a flexible section formed of a series of links pivotally connected at one end to said rigid section on one side thereof and at its opposite end to
 20 said head, and a second series of links pivotally connected at one end to said head and

at its opposite end to said rigid section between its ends on the other side thereof.

2. A lifter-arm device of the character described, comprising a head rotatable on an
 25 axial support and having crank-fingers extending from its opposite ends, and a lifter-arm having a rigid section adapted to be connected to a sash, or the like, and a flexible section formed of a series of links pivot-
 30 ally connected at one end to said rigid section on one side thereof, and at its opposite end to the crank-finger at that side, and a second series of links pivotally connected at
 35 one end to the other crank-finger and at its opposite end to said rigid section between its ends on the other side thereof.

MATHIAS A. GROBL.

In the presence of—

A. U. THORIEN,

R. A. SCHAEFER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents
 Washington, D. C."