J. MATTHEWS, E. W. FREEMAN & W. H. S. BATEMAN.

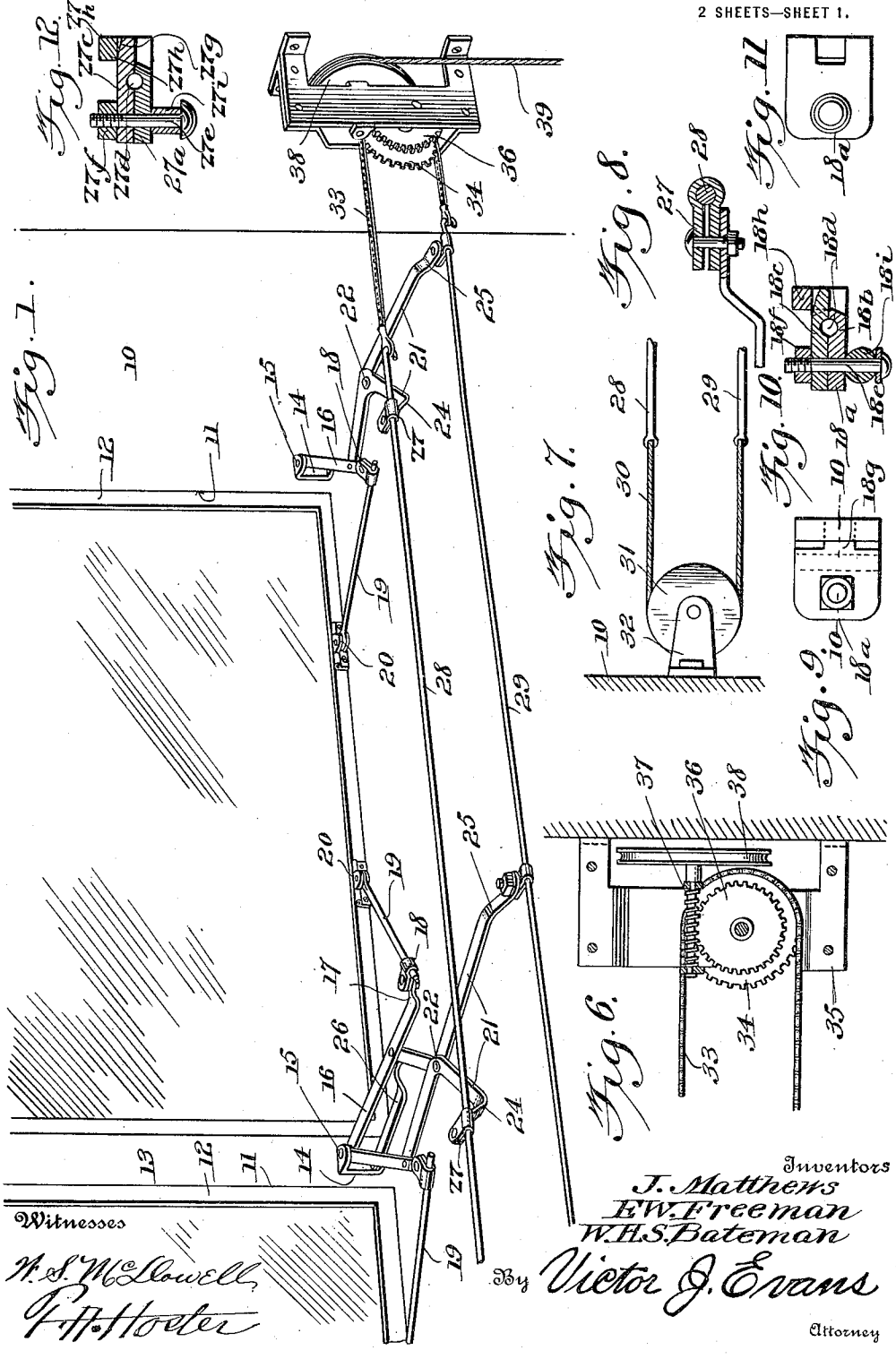
MULTIPLE SASH OPERATING DEVICE.

APPLICATION FILED SEPT. 19, 1914.

1,139,205.

Patented May 11, 1915.

2 SHEETS—SHEET 1.



Witnesses

W. S. McDowell

F. H. Hooter

Inventors

J. Matthews

E. W. Freeman

W. H. S. Bateman

By Victor J. Evans

Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

J. MATTHEWS, E. W. FREEMAN & W. H. S. BATEMAN.

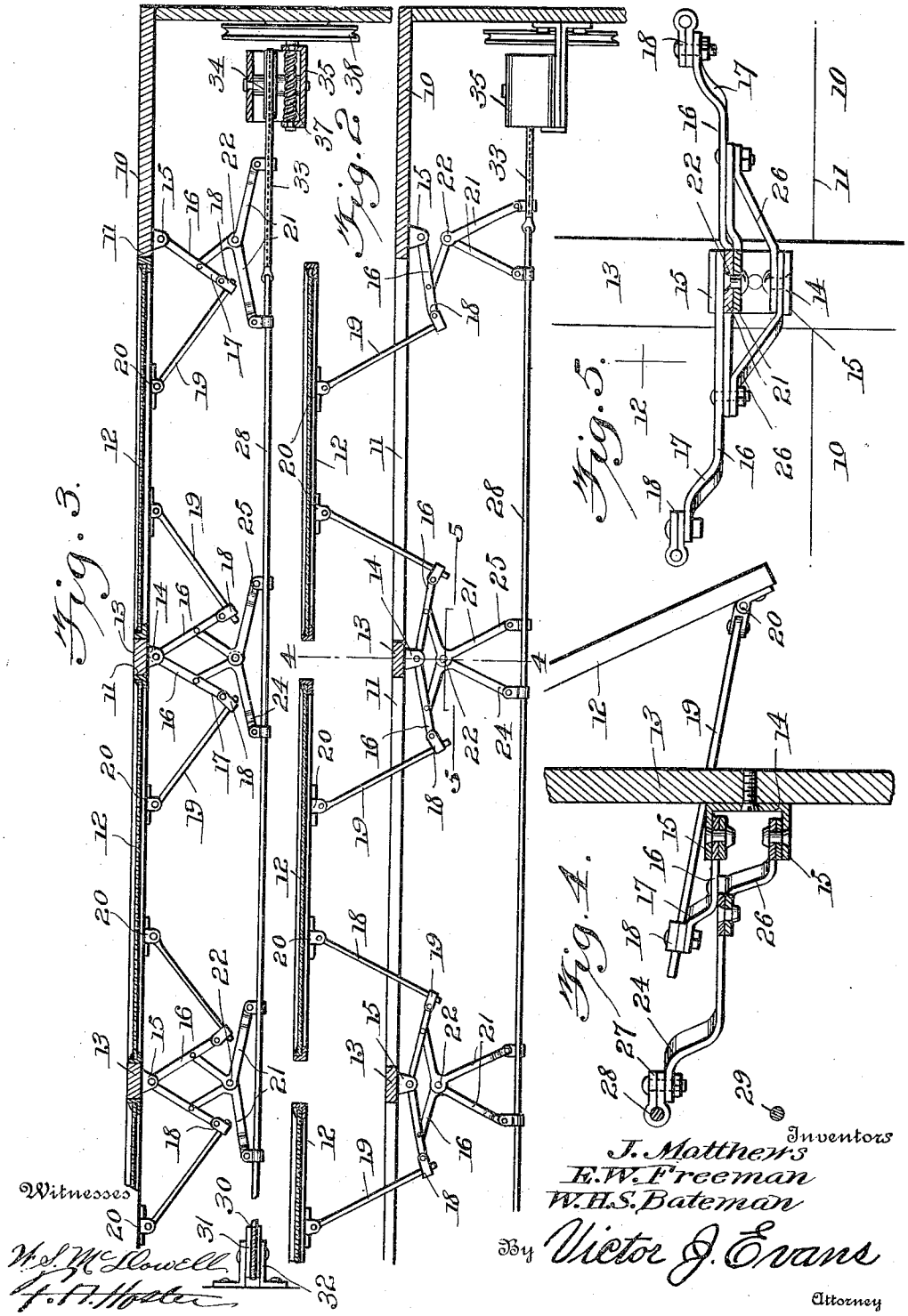
MULTIPLE SASH OPERATING DEVICE.

APPLICATION FILED SEPT. 19, 1914.

1,139,205.

Patented May 11, 1915.

2 SHEETS—SHEET 2.



Witnesses

W. S. McDowell

F. P. Hoole

Inventors

J. Matthews

E. W. Freeman

W. H. S. Bateman

By Victor J. Evans

Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOSEPH MATTHEWS, EDWARD W. FREEMAN, AND WILLIAM H. S. BATEMAN, OF PHILADELPHIA, PENNSYLVANIA.

MULTIPLE-SASH-OPERATING DEVICE.

1,139,205. Specification of Letters Patent. Patented May 11, 1915.

Application filed September 19, 1914. Serial No. 862,574.

To all whom it may concern:

Be it known that we, JOSEPH MATTHEWS, EDWARD W. FREEMAN, and WILLIAM H. S. BATEMAN, citizens of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented new and useful Improvements in Multiple-Sash-Operating Devices, of which the following is a specification.

The invention relates to devices for window sashes and the like, and has for an object to provide a device for readily and effectively operating window sashes to secure the same in open, closed or adjusted positions relatively to the frames thereof.

The invention contemplates, among other features, the provision of a device which preferably is arranged to simultaneously operate a number of similar sashes and which, therefore, in its use and adaptation to window sashes, transoms or other similar structures, will effectively operate and be common to a large number of adjacently arranged sashes or other similar structures.

To this end use is made of a number of cooperating arms or levers common to a single operating mechanism which, when operated, will simultaneously open, close or secure in desired positions the various sashes with which the coöperating arms or levers have connection.

In the further disclosure of the invention reference is to be had to the accompanying drawings, constituting a part of this specication, in which similar characters of reference denote corresponding parts in all the views, and in which:

Figure 1 is a fragmentary perspective view, looking at the device from the rear, with parts broken away to disclose the underlying structure; Fig. 2 is a horizontal sectional view of the device shown in Fig. 1, looking down upon the operating mechanism, with the same shown to secure the sashes in open position; Fig. 3 is a similar view, the sashes being closed; Fig. 4 is a vertical sectional view taken on the line 4—4 in Fig. 2; Fig. 5 is a vertical sectional view taken through one of the clamps, on the line 5—5 in Fig. 2; Fig. 6 is a view looking at the side of the cable operating structure, one of the supporting brackets thereof having been previously removed; Fig. 7 is a view of the sheave through which one end of the cable passes; Fig. 8 is a detail vertical sectional view of the clamp connecting the toggle lever with the operating rod; Fig. 9 is a plan view of a modified form of the clamp shown in Fig. 8; Fig. 10 is a vertical sectional view taken on the line 10—10 in Fig. 9; Fig. 11 is a bottom plan view of the structure disclosed in Figs. 9 and 10; and Fig. 12 is a vertical sectional view of a clamp showing a modification of the clamp shown in Fig. 8 and which is a slight modification of the structure shown in Fig. 10.

Referring more particularly to the views, we disclose a frame 10 forming a series of openings 11 in which are arranged sashes 12, each being independently mounted to swing in the various openings in the frame 10, and being preferably adjacently arranged, with intermediate uprights 13 provided to form the openings 11 in which the sashes 12 are adapted to operate. Secured to each upright on its inner face is a bracket or support 14 having upper and lower projections 15, and pivoted to swing horizontally on the upper projection of each bracket are a plurality of diverging arms 16, each having their free ends 17 offset as shown and having pivoted on the offset ends suitable clamps 18 to which are secured the inner ends of rods 19 having their outer ends in pivotal connection with adjacent sashes 12 through the medium of ears 20 on the sashes, it being understood that one of the arms connected with one of the sashes is connected to one of the clamps on the offset end of one of the arms 16, whereas the rod connected with the next adjacent sash has connection with the clamp on the offset end of the other end pivoted on the upper projection of the bracket. A plurality of similar toggle levers 21 are relatively pivoted at their knuckles 22 and have their relatively diverging ends 23 pivotally connected with the arms 16 at substantially their medial portions, the inner ends of the toggle levers being offset in opposite directions, so that one end 24 of one of the toggle levers will project upwardly and the other end 25 of the other toggle lever will project downwardly. Brace rods 26 are provided for each of the toggle levers, with the said brace rods at their ends being relatively pivoted on to the lower projection 15 of the bracket 14 and being adapted to diverge and

extend upwardly to pivotally connect with the inner ends of the toggle levers at their points of connection with the arms 16.

The outer offset ends of each toggle lever 21 have pivotally arranged thereon a clamp 27, with the clamp on the upwardly projecting toggle lever being arranged to encircle a rod 28 and the clamp on the lower projecting toggle lever arranged to encircle the rod 29, the inner ends of the said rods being connected by a cable 30 which passes over a sheave 31 journaled in a bracket or support 32 on the frame 10. Similarly, the other ends of the rods 28 and 29 are connected by a chain 33 which is wound around a sprocket wheel 34 journaled on a bracket or support 35 secured to the other end of the frame 10, said drum having a toothed wheel 36 revoluble therewith, with the toothed wheel in mesh with a worm 37 journaled on the support 35 and carrying on its free end an operating wheel 38, over which preferably passes a hand cable 39 or the like, whereby rotation is imparted to the wheel 38. Now it will be seen that when the wheel 38 is rotated, rotation will be imparted through the medium of the wheel and worm 36, to the drum 34 and which, having the cable 39 wound around the same, will result in the rods 28 and 29 being moved in opposite directions, thus simultaneously swinging the inner ends of the toggle levers 21 in opposite directions to simultaneously move the adjacent sashes relatively to the frame so that the sashes can be swung inwardly or outwardly with respect to the frame and be held in an adjusted position when the pull on the rods 28 and 29 is discontinued by discontinuing the rotation of the wheel 38.

As mentioned heretofore, we preferably employ a large number of the sashes arranged in a horizontal line, one adjacent the other, and by employing the operating mechanism described and the means connecting the operating mechanism with the sashes, it will be seen that the sashes will all be common to a single operating mechanism and thus will be simultaneously operated through the medium of the toggle levers, arms and rods which coöperate and are mounted to produce the desired result.

In Figs. 9, 10, 11 and 12 there are shown modified forms of the clamp shown in Fig. 8 and which forms of clamp may be used in place of the clamp 18 or the clamp indicated by the numeral 27 in Fig. 8, said clamp 18 connecting the arm 16 with the rod 19 as shown in Fig. 1 and said clamp 27 connecting the rod 28 with the arm 24.

The modified form of clamp shown in Figs. 9, 10 and 11 is preferably used to replace the clamp 18 and is therefore indicated by the numeral 18^a and consists, in detail, of a lower transverse grooved plate 18^b and an upper transversely grooved plate 18^c which plates, when arranged to abut against each other, have their transverse grooves forming an opening 18^d through which the rod 19 is adapted to extend, said plates 18^b and 18^c being held together by a transverse bolt 18^e carrying a suitable nut 18^f, with the upper plate 18^c having a forwardly extending tongue 18^g passing beneath a head 18^h formed with the lower plate 18^b, as will be clearly seen by referring to Figs. 9, 10 and 11. Carried loosely on the bolt 18^e is a member 18^i forming a portion of the arm 16 and whereby connection between the rod 19 and arm 16 is secured. The structure shown in Fig. 12 is preferably used to connect the rod 28 with the lever 21 at its end 24, thus replacing the clamp 27 shown in Fig. 1 and in detail in Fig. 8. This clamp is indicated by the numeral 27^a and consists of a lower transversely grooved plate 27^b and an upper transversely grooved plate 27^c, with the transverse grooves of the plates, when they are connected, forming an opening 27^d through which the rod 28 passes to be clamped between and by the upper and lower plates 27^d and 27^c. A transverse bolt 27^e passes through the plates 27^b and 27^c and is secured by a suitable nut 27^f. The upper plate 27^c has a forwardly extending tongue 27^g similar to the tongue 18^g shown in Fig. 9 and which tongue passes beneath a head 27^b similar to the head 18^h shown in Fig. 10. A member 27^c encircles the bolt 27^e and forms a part of the end 24 of the lever 21 shown in Fig. 1.

Thus it will be clearly seen that although we preferably employ the clamps 18 and 27, we can also very readily employ the clamps 18^a and 27^a indicated in Figs. 9 to 12 inclusive, either of which sets of clamps will readily perform the function for which they are desired and result in the parts which they associate being relatively operated to secure the most effective result with the least possible movement.

Having thus described our invention, we claim:

1. In a device of the character described, the combination with a frame and movable sashes thereon, of a bracket on the frame, diverging arms pivoted on the bracket, rods connecting with the sashes and in pivotal connection with the said arms, a pair of toggle levers connecting with the said arms, and means for actuating the free ends of the toggle levers to operate the sashes relatively to the frame.

2. In a device of the character described, the combination with a frame having movable sashes thereon, of arms pivoted on the frame, rods connecting with the sashes, clamps pivotally carried on the arms and in clamping engagement with the rods, toggle

levers connecting with the arms, and means for operating the toggle levers.

3. In a device of the character described, the combination with a frame having movable sashes thereon, of diverging arms pivoted at a common point on the frame, means connecting with the sashes and with the arms for operating the sashes when the arms are actuated, toggle levers having a common pivot point and having independent connection with the arms, and means for actuating the toggle levers to operate the arms.

4. A means for operating a sash upon a frame, comprising an arm pivoted on the frame, a rod connecting with the sash and the arm, a pivoted toggle lever having an end in pivotal connection with said arm, said toggle lever having an integral end portion offset to one side of the lever operating means, and a clamp on the offset portion of the toggle and connecting with said operating means.

5. A means for operating a sash upon a frame comprising an arm pivoted on the frame, a rod connecting with the sash, a clamp on the arm and adjustably clamping one end of the rod to the arm, a toggle lever in pivotal connection with said arm, said toggle lever having an integral end portion offset to one side of the lever actuating means for said toggle lever, and a clamp swingingly supported on said offset portion of the toggle and adjustably clamping said offset portion of the toggle with said actuating means.

6. A means for operating a sash upon a frame comprising an arm pivoted on the frame and having an integral offset end portion, a rod pivoted on the sash, a clamp on the offset portion and adjustably clamping one end of the rod thereto, a pivoted toggle lever having one end thereof connecting with said arm adjacent said offset portion, said toggle having an offset end, a clamp on the offset end of the toggle, and a toggle operating mechanism having said toggle adjustably connected therewith by said clamp.

7. A means for operating sashes upon a frame comprising similar arms pivoted on the frame, each of said arms having an integral offset end portion rods connecting with the sashes and with the said offset end portion, a pair of toggle levers connecting with said arms adjacent said offset end portions, with end portions of said toggle levers bent in opposite directions, an operating mechanism, and means connecting the oppositely bent end portions of said toggle levers to said operating mechanism.

8. A means for operating sashes upon a frame comprising arms pivoted on the frame, each of said arms having an integral offset portion rods pivoted on the sashes, clamps pivoted on the offset portions of the arms and adjustably clamping said rods thereto, toggle levers in pivotal connection with said arms, each of said toggle levers having offset portions an actuating mechanism, and means connecting the offset portions of said toggle levers with said actuating members.

9. A means for operating sashes upon a frame, comprising arms pivoted to swing on the frame and having their free ends offset, rods pivoted to swing on the sashes, clamps on the offset portions of the arms and in clamping engagement with the rods, toggle levers having their inner ends in pivotal connection with said arms and their outer ends offset in opposite directions, an operating mechanism, and clamps on the offset portions of the toggle levers and in clamping engagement with the operating mechanism.

In testimony whereof we affix our signatures in presence of two witnesses.

JOSEPH MATTHEWS.
EDWARD W. FREEMAN.
WILLIAM H. S. BATEMAN.

Witnesses:
WILLIAM KUHN, Jr.,
ALFRED F. DAUBERT.

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