W. B. STRONG.

APPARATUS FOR OPERATING WINDOWS.

APPLICATION FILED DEC. 5, 1907.

906,749. Patented Dec. 15, 1908.

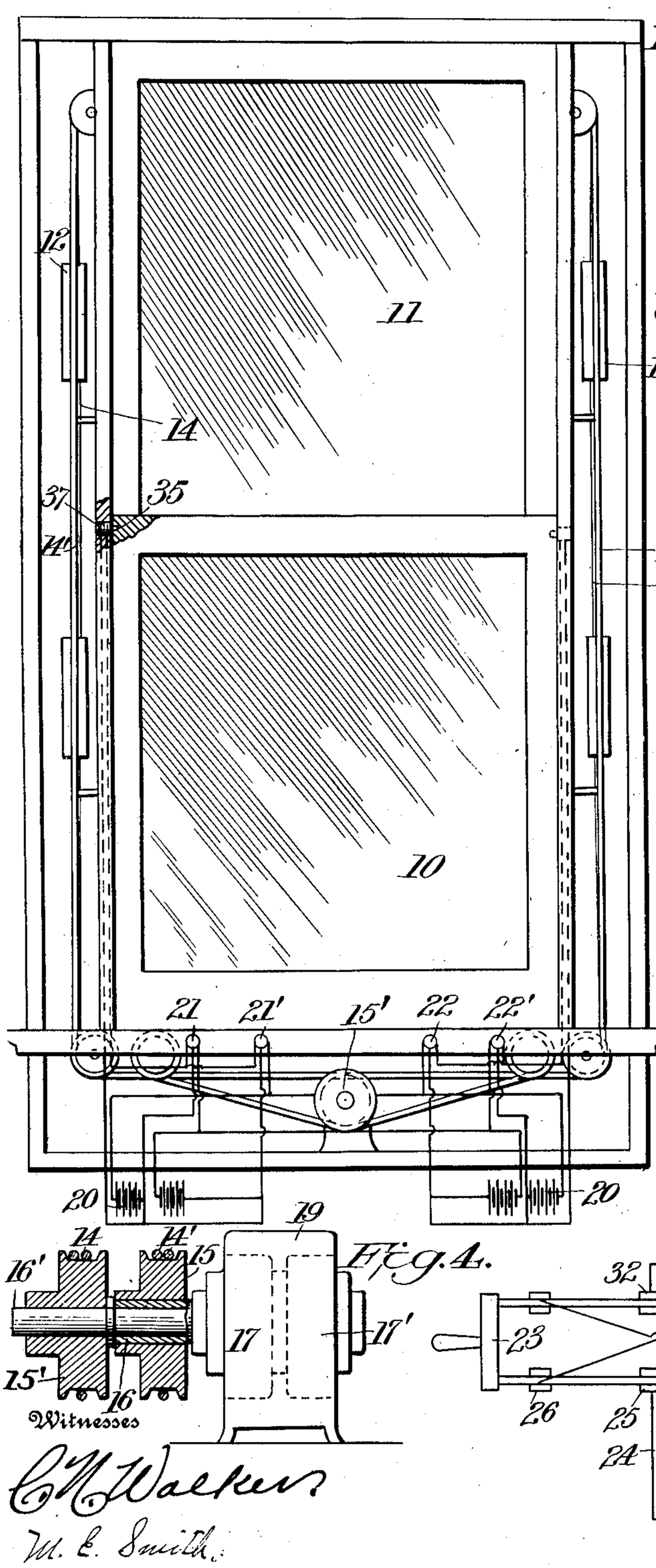

Fig. 1.

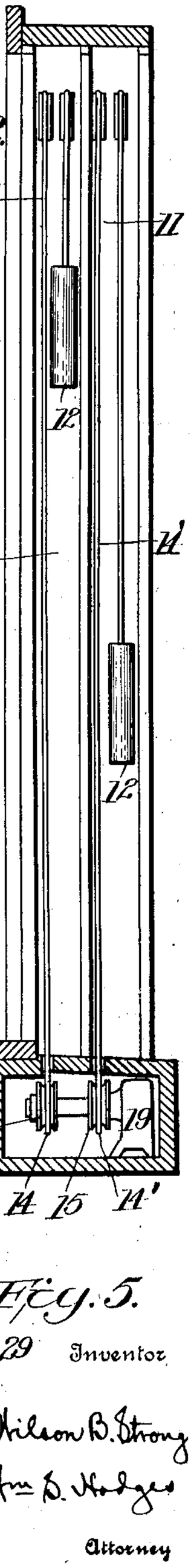

Fig. 2.

Fig. 3.

Fig. 6.

Fig. 5.

Witnesses

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APPARATUS FOR OPERATING WINDOWS.

No. 906,749. Specification of Letters Patent. Patented Dec. 15, 1908.

Application filed December 5, 1907. Serial No. 405,203.

To all whom it may concern:

Be it known that I, WILSON B. STRONG, of Easthampton, in the county of Hampshire, State of Massachusetts, have invented certain new and useful Improvements in Apparatus for Operating Windows, of which the following is a specification.

This invention relates to certain new and useful improvements in apparatus for operating windows, fire or other shutters, and the like.

The invention has for its object to provide a simple and inexpensive means whereby windows, and the like may be readily opened and closed, and the extent of movement thereof controlled from the sill of the window or from a distance, without in any manner interfering with the ordinary manual operation of the sashes at any time the same might be desired.

A further object is to provide means whereby the upper and lower sashes of a window may be individually controlled so as to move independently or in unison.

A further object is to provide improved means for governing the direction of movement of the sashes.

The invention will be hereinafter fully set forth and particularly pointed out in the claims.

In the accompanying drawings:—Figure 1 is a front elevation of an ordinary sliding sash window with my invention applied thereto, parts of the frame being broken away and shown in section. Fig. 2 is an edge view of a window with a portion of the casing removed to illustrate the sash operating cords. Fig. 3 is a view illustrating a slight modification. Fig. 4 is an enlarged view of one form of motor employed by me in connection with my invention. Fig. 5 is a diagrammatic view of an electric circuit that may be employed in connection with my invention. Fig. 6 is a detail view of the locking bolt.

Referring to the drawing, 10, 11 designate the lower and upper sashes respectively, of a window, each of which is provided with the usual counterbalance weights 12 suspended from the usual cords passed over pulleys in the ordinary manner. Cords 14, 14′ are connected in any suitable manner to the upper and lower sashes, respectively, on each side thereof the cord 14′ being passed around a winding drum 15 secured to the hollow shaft 16 of a motor 17. The cord 14 is passed in a similar manner around a second winding drum 15′ secured to a shaft 16′ passed through the shaft 16 and operatively connected with a motor 17′.

The motors 17, 17′ are located in a chamber C formed in the window casing below the sill, and may be of any preferred structure, although I have shown for convenience two motors located in a single casing 19 and receiving energy from any suitable source, preferably storage batteries illustrated conventionally at 20. The current to motor 17′ is controlled by push buttons 21, 21′, the arrangement being such that the lower sash is raised by pressing button 21 and lowered by pressing button 21′. The operation of the upper sash is secured in a similar manner by buttons 22, 22′ connected with motor 17. Thus it will be seen that each motor can be rotated in either direction, and either sash may be moved independently, or they may both be moved in unison by pressing the controlling buttons at the same time.

In Fig. 5 I have illustrated diagrammatically, a modification in which the same result is obtained by means of a single pole changing switch 23 pivoted at X. In this view the wire 24 leads from the battery 20 to one of the switch contacts 25, the space between this contact and the contact 26 being bridged by one arm of the switch. From contact 26 a wire extends to contact 27 and the latter is connected by wire 28 with the motor. The return is through wire 29, contact 30, wire 31, switch 23, contact 32 and wire 33. The parts are shown to operate the motor in a direction to raise the lower sash and lower the upper sash. To reverse this movement the switch 23 is swung over to the opposite contacts, whereupon the current will pass from the battery through wire 24, contact 25, switch 23, contact 30, wire 29 to the motor and return through wire 28, contact 27, through switch 23 to contact 32 and wire 33 to battery.

In Fig. 3, I have shown a slight modification of the operating means which consists in employing a single winding drum 34 over which the cords 14, 14′ of both sashes are passed. In this form, however, the two sashes must be operated in conjunction. It is obvious, however, that the same construction could be so arranged as to operate but one sash by elimimating either cord 14 or 14′.

In connection with my operating device I employ a locking bolt 35 held normally in en-

gagement with each sash by suitable means such as a spring 36, and retracted by means of a magnet 37 in circuit with the batteries 20 and controlled by the push buttons above described. By this arrangement the locking bolt is automatically withdrawn by closing the circuit to the motor.

It will be understood that while I have described my window operating mechanism as controlled by an electric motor, I do not limit myself in this respect, as it is quite obvious that any other form of rotating motor might be substituted, the essential feature of my invention being the operation of window sashes and the like, either independently or conjunctively by any suitable form of rotatable motor. It is also obvious that my apparatus may be so arranged as to operate a plurality of windows simultaneously, and if desired fire or other shutters may be similarly operated, by a mere duplication of the parts at each window, and controlling the same from a central station.

The advantages of my invention will be readily apparent to those skilled in the art to which it appertains. It will be particularly observed that the same is especially adapted for the operation of heavy windows such as are used in the larger residences, hotels, churches, and public buildings of all kinds, and yet will not interfere with the manual or ordinary operation of said windows, the parts being so arranged that the windows may be operated manually or automatically, at will. It will also be noted that I have provided improved means whereby the upper and lower sashes of a window may be individually controlled so as to move independently or in unison, and that the direction of movement and extent thereof can be controlled to a nicety. It will be further observed that my invention can be readily applied to many windows that have already been installed without requiring any alteration or mutilation of such windows or their frames, and to others with but little change. It will be understood, of course, that where a different form of motor is substituted for that shown and described, the push buttons will be dispensed with, and suitable controlling devices, conforming to the character of motor used, will be employed instead.

I claim as my invention:—

1. The combination with a window provided with upper and lower sashes, and counterweights connected with said sashes, of rotatable sash operating means, cords directly connected with each sash and in operative relation with said operating means, and means for starting, stopping and reversing said sash operating means, said sashes being free to be manually operated independently of the operation of said sash operating means.

2. The combination with a window provided with upper and lower sashes, and counterweights for each sash, of a rotatable motor for each sash, endless cords arranged adjacent the edges of each sash and in operative relation with the respective motors, means for securing each cord to the adjacent edge of each sash, and means for independently starting, stopping and reversing each motor, said sashes being free to be manually operated independently of the operation of said motors.

3. The combination with a window provided with upper and lower sashes, of rotatable sash operating means, cords directly connected to each sash and in operative relation with said operating means, a locking bolt for one of said sashes, means connected with the operating means for controlling the application of power to said operating means, said controlling means including means for simultaneously operating said bolt, and also including means for causing said operating means to rotate in either a forward or a reverse direction.

4. Means for operating windows comprising two motors each provided with a drive shaft, the shaft of one motor extending through the shaft of the other, a winding drum secured upon each shaft, a cord wound upon each drum and adapted for connection with a window sash, and means for operating said motors independently or in unison.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

WILSON B. STRONG.

Witnesses:
W. JOSEPH DOYLE,
WM. S. HODGES.