

Nov. 3, 1925.

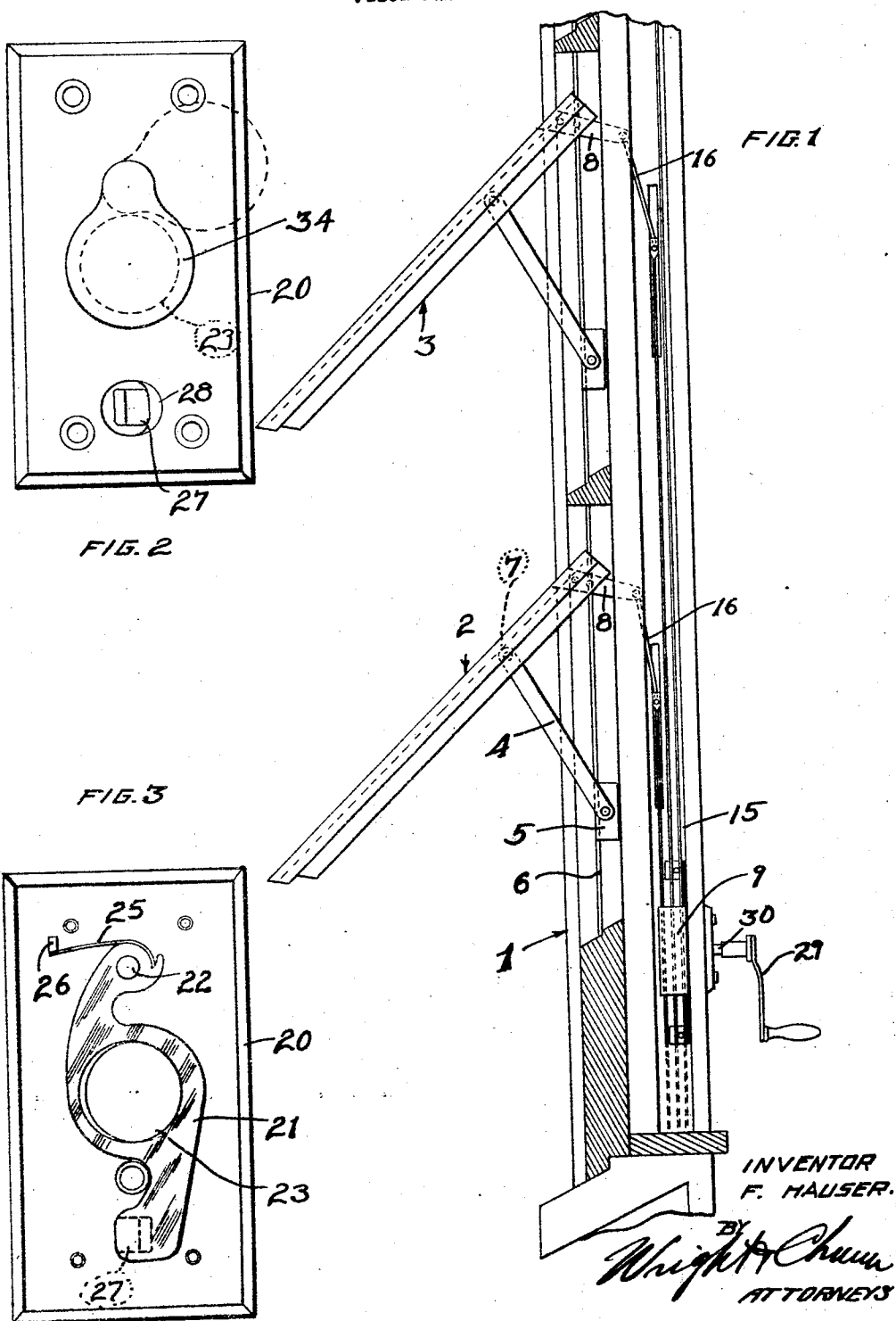
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F. HAUSER

MECHANICAL WINDOW OPERATOR

Filed Jan. 2, 1924

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

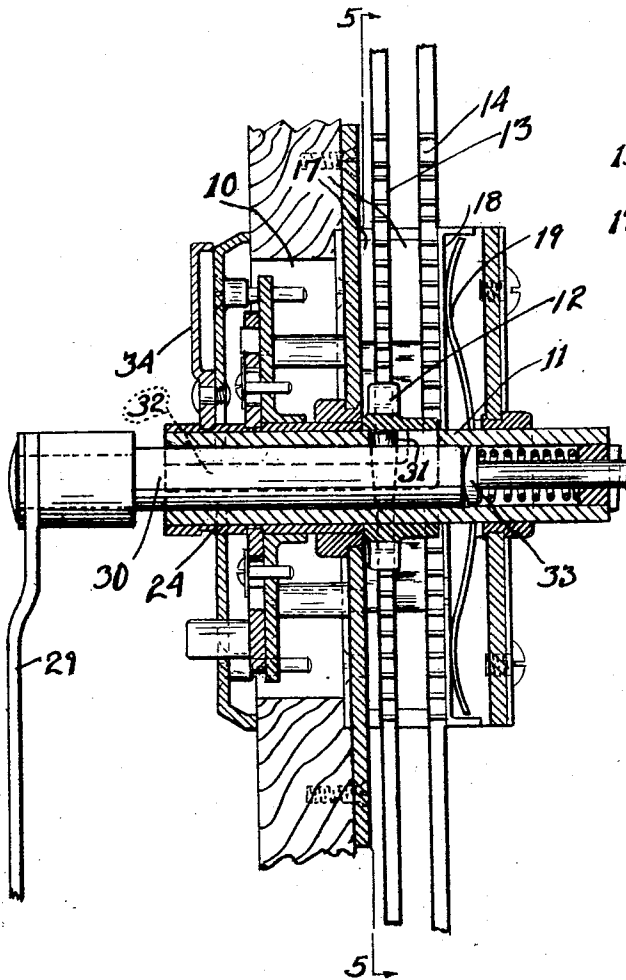


FIG. 4

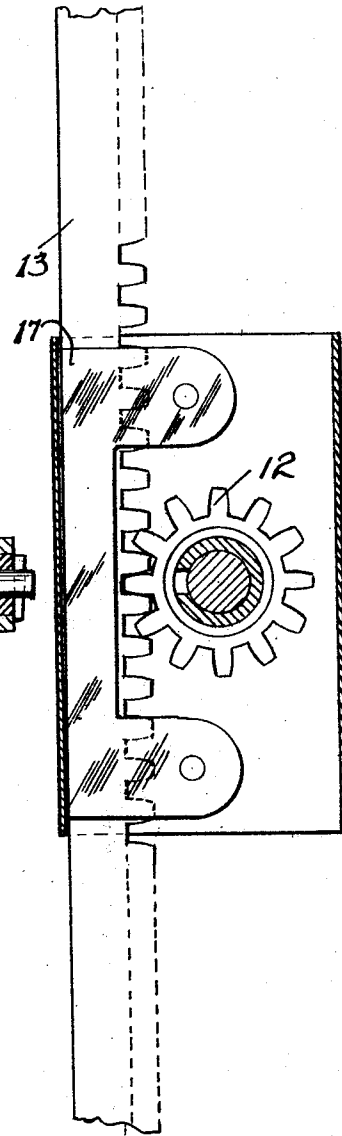


FIG. 5

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UNITED STATES PATENT OFFICE.

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MECHANICAL WINDOW OPERATOR.

Application filed January 2, 1924. Serial No. 683,872.

To all whom it may concern:

Be it known that I, FREDERICK HAUSER, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented new and useful Improvements in Mechanical Window Operators, of which the following is a specification.

This invention relates to an improved means for operating the sashes of a multi-sash window, particularly of the swinging sash type.

The primary object of the invention is to provide a simple, compact and efficient means whereby through manipulation of a crank located at a convenient point on the window frame, the sashes of a multi-sash window may be moved into and out of open position as desired.

A further object of the invention is to provide operating means of the character described with which it is possible to selectively operate the sashes so that one sash may be opened to a greater extent than the other or in fact, operated entirely independent of the other.

With the above mentioned and other objects in view, the invention consists in the novel construction and combination of parts hereinafter described, illustrated in the accompanying drawings, and set forth in the claims hereto appended, it being understood that various changes in the form, proportion, size and minor details of construction within the scope of the claims may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Referring to the drawings:

Fig. 1 represents a fragmentary vertical sectional view through a multi-sash window showing the mechanism of my invention as applied thereto.

Fig. 2 represents a front elevation of the face plate.

Fig. 3 represents a rear elevation of said face plate showing part of the mechanism associated therewith.

Fig. 4 represents a vertical sectional view of the operating mechanism of the invention showing parts broken away and in elevation.

Fig. 5 represents an enlarged fragmentary sectional view with part shown in side elevation of the operating mechanism.

In the embodiment of the invention illus-

trated in the accompanying drawings, 1 designates a window frame having a plurality of sashes 2 and 3 mounted therein so as to be swung into and out of open position. The sashes are mounted on links 4 which are pivoted on slide members 5 vertically slidably mounted in guides 6 on the frame 1, the other ends of the links are pivoted as at 7 to the sides of the sashes between the upper and lower ends thereof. Extending from the upper ends of the sashes on the sides thereof are levers 8 to which the mechanism of my invention is connected, said mechanism being generally designated 9 and adapted as shown in Fig. 1, to be mounted on one side of the window frame.

The mechanism 9 comprises a frame-like casing 10 extending through which is a tubular shaft 11. On the shaft 11 is a pinion 12 which is adapted to be moved on shifting of the shaft into and out of engagement with rack bars 13 and 14, which latter extend vertically through the casing and up and into a vertical compartment 15 formed in one side of the window frame. The upper ends of these rack bars are connected by links 16 with the free ends of the levers 8 so that on vertical movement of the rack bar, the sashes will be moved, there being one rack bar for each sash.

The rack bars slide between guides 17 carried on the casing 10. One of the rack bars is engaged on its outer side by a plate 18 which is yieldingly urged into engagement with the rack bar by a leaf spring 19 fastened to the casing 10. This arrangement provides for holding the rack bars against rattling and in adjusted position, and insures a smooth operation of the mechanism.

The shaft 11 extends out through a face plate 20, which plate is fastened to the inner face of one side of the window frame as shown in Fig. 1. Provision is made for holding the shaft in adjusted position to maintain the pinion in engagement with either one of the rack bars, through use of a lock plate 21, which is carried on the rear side of the face plate 20 and pivoted at its upper end, as at 22, to said plate. The lock plate 21 is formed with a central opening 23 through which the shaft 11 extends. The shaft is provided with circumferential grooves 24 in which the edges of the plate

21 around the opening, are adapted to be engaged to hold the shaft in adjusted position. A leaf spring 25 associated with the upper end of the plate 21 and engaging a projection 26 on the plate 20 exerts a force such as will at all times maintain the plate with the opening 23 in an eccentric relation to the opening in the face plate. The lower end of the plate 21 is provided with a finger piece 27 which extends out through on opening 28 formed in the plate 20. On moving the finger piece in the opening 28, the member 21 will be rocked so that the opening 23 therein will be moved to align with the opening in the face plate and cause the shaft to be released whereupon the shaft may be adjusted as desired. On release of the finger piece 27, the member 21 will be moved by the spring 25 so as to engage in one of the grooves 24 and lock the shaft in adjusted position.

A crank 29 is employed to rotate the shaft 11 and its stem 30 is adapted to be extended into the tubular shaft 24. A projection 31 on the stem is adapted to engage in a bayonet slot 32 provided in the shaft. When the stem of the crank is extended into the tubular shaft, it engages a spring urged plunger 33 provided at the inner end of the tubular shaft. This causes the projection to be securely held in the bayonet slot. When the crank is removed, a cover plate 34 pivoted on the face plate 20, is swung into position to cover the opening through which the shaft extends, said shaft being first moved into its innermost position to permit of the movement of the cover plate.

The mechanism of the invention having been installed in connection with a window as shown, may be readily operated by turning the crank 29 to open or close the sashes, the operation being selective. When it is desired, for example to open the upper sash with the lower sash remaining closed, the operator after mounting the crank in place presses the finger piece 27 to one side so as to release the lock plate 21 and then pulls out on the crank so as to cause the shaft 11 to slide outwardly and bring the pinion 12 into mesh with the teeth on the rack bar 13. Upon turning the crank so as to rotate the shaft in a counter-clockwise direction, the rack bar 13 will be moved downwardly and through the link 16 and lever 8, swing the upper sash 3 into open position, the extent of movement of said sash being dependent on the extent of rotation of the shaft. The operator may in this way open the sash to the extent desired. The friction set up by the spring pressed guides 17 on the rack bars is sufficient to hold the sashes in position into which it has been moved. To open the lower sash, the shaft 11 is again adjusted as desired so as to bring the pinion 12 into engagement with the other rack bar and the

operation is repeated. Obviously the crank is operated in the reverse direction in order to close the windows. As the pinion may be moved into engagement with either rack bar, the mechanism is selective and may be operated to quickly and easily control the movement of any one of several sashes. The entire mechanism may be easily encased in the frame of a window so that it is practically hidden when assembled for use and presents a neat appearance. The mechanism of the invention may be employed to great advantage in connection with swinging sash windows in which two or more sashes are employed and the upper of the sashes are out of reach with respect to the floor. It is obvious the mechanism may be adapted for operating as many sashes as desired, it only being necessary to increase the number of rack bars.

I claim:

1. Means for operating sashes of a multi-sash window comprising a casing adapted to be mounted in a window frame, a shaft rotatable in the casing, a pinion on the shaft, rack bars slidable in the frame, said shaft being adjustable to bring the pinion into engagement with any one of the several rack bars, means providing for connection between the sashes of a multi-sash window and said rack bars and means for rotating the shaft.

2. Means for operating sashes of a multi-sash window comprising a casing adapted to be mounted in a window frame, a shaft rotatable in the casing, a pinion on the shaft, rack bars slidable in the frame, said shaft being adjustable to bring the pinion into engagement with any one of the several rack bars, means providing for connection between the sashes of a multi-sash window and said rack bars, means for rotating the shaft and means for locking the shaft in adjusted position.

3. The combination with a window frame and sashes mounted to swing into and out of open position in the frame, of a casing carried by the frame, a shaft mounted in the casing, a plurality of rack bars vertically adjustably mounted in the frame, means of connection between the rack bars and sashes providing for movement of the sashes into and out of closed position on movement of the rack bars, a pinion on the shaft adapted for engagement with any one of the rack bars, said shaft being adjustable to dispose the pinion for engagement with the different rack bars, said rack bars extending through the casing, guide means in the casing with which said rack bars engage and spring means for forcing the guide means into yielding frictional engagement with the rack bars.

4. The combination with a window frame and sashes mounted to swing into and out

of open position in the frame, of a casing frame so as to be moved into and out of
 carried by the frame, a shaft mounted in open position, of a casing provided in the
 the casing, a plurality of rack bars ver- frame, a plurality of rack bars vertically
 tically adjustably mounted in the frame, adjustable in the frame and extending
 5 means of connection between the rack bars through the casing, means of connection be- 25
 and sashes providing for movement of the between the rack bars and sashes providing
 sashes into and out of closed position on for movement of the sashes into and out of
 movement of the rack bars, a pinion on the closed position when the rack bars are
 shaft adapted for engagement with any one moved, a shaft adjustable in the casing, a
 10 of the rack bars, said shaft being adjustable pinion fixed to the shaft and arranged to 30
 to dispose the pinion for engagement with engage with any one of the rack bars, means
 the different rack bars, said rack bars ex- providing for rotation of the shaft, means
 tending through the casing, guide means for locking the shaft in position to maintain
 in the casing with which said rack bars en- the pinion thereon in mesh with the rack
 15 gage and spring means for forcing the bars, a plurality of members in the frame 35
 guide means into yielding frictional engage- between which the rack bars slidably en-
 ment with the rack bars and means provid- gage and spring means for causing said
 ing for locking the shaft in adjusted position. members to yieldingly and frictionally en-
 5. The combination with a window frame engage the rack bars.
 20 and a plurality of sashes mounted in the

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