A. McALLISTER.

SASH OPERATING MECHANISM.

APPLICATION FILED NOV. 27, 1918.

1,337,461.

Patented Apr. 20, 1920.

2 SHEETS—SHEET 1.

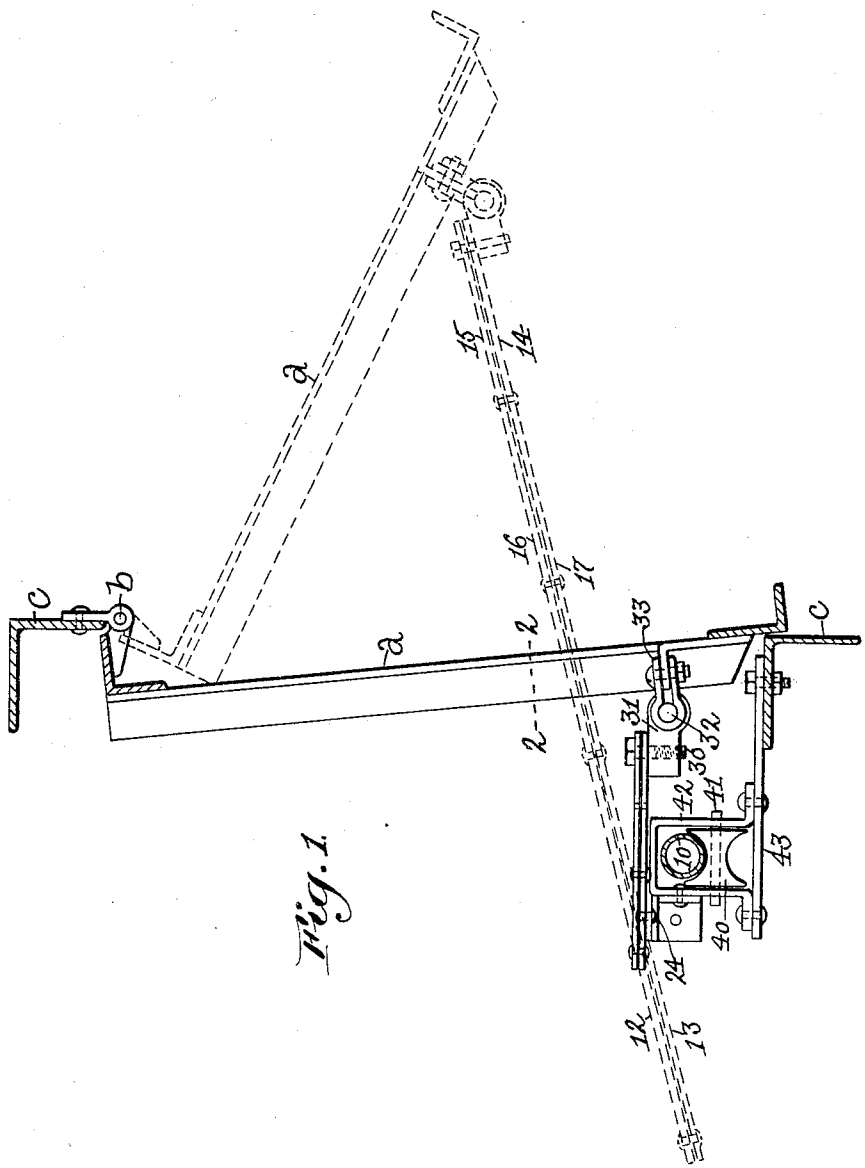


Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 2.

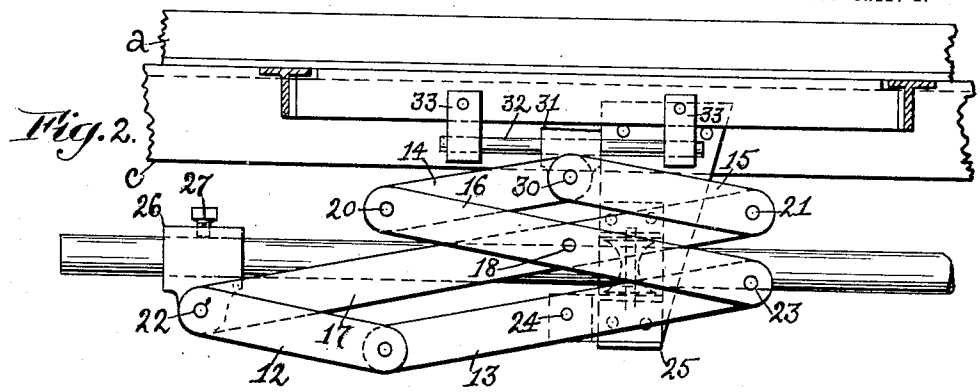
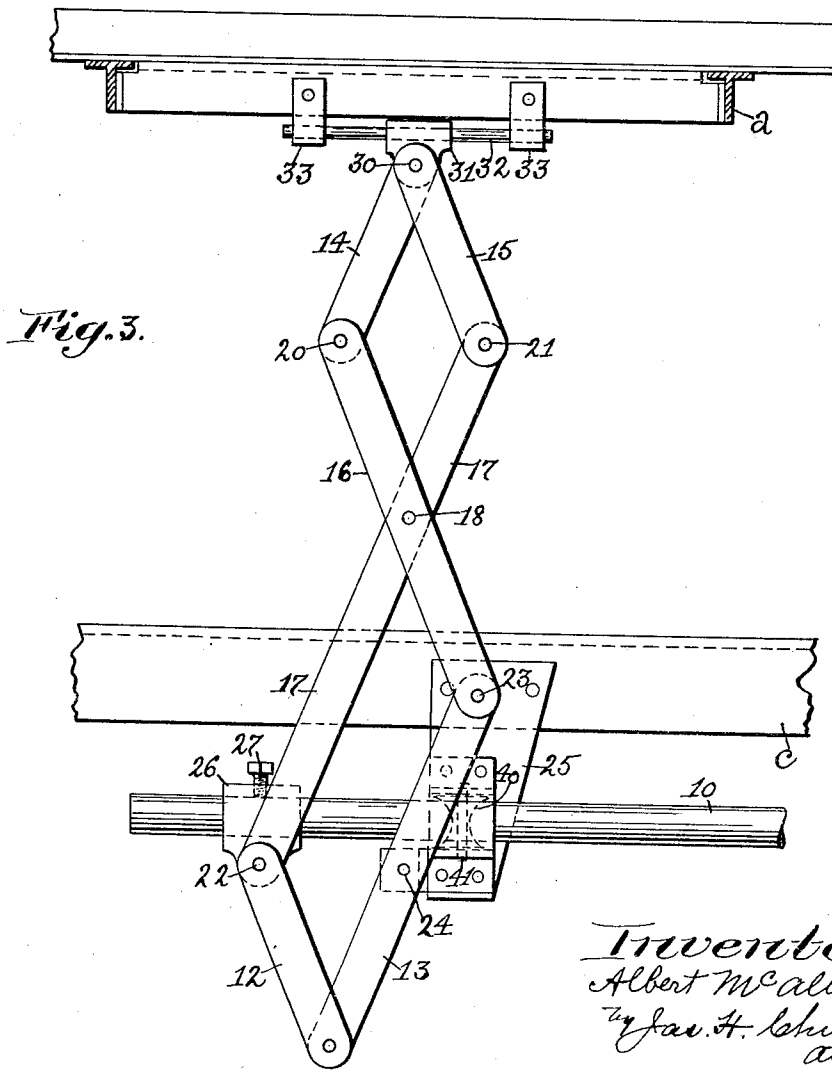


Fig. 3.



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UNITED STATES PATENT OFFICE.

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SASH-OPERATING MECHANISM.

1,337,461. Specification of Letters Patent. Patented Apr. 20, 1920.

Application filed November 27, 1918. Serial No. 264,427.

To all whom it may concern:

Be it known that I, ALBERT McALLISTER, a citizen of the United States, residing in Pittsburgh, county of Allegheny, and State of Pennsylvania, have invented an Improvement in Sash-Operating Mechanism, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to an operating mechanism for window sashes, shutters and the like, of that class in which the opening and closing movements of the window or shutter is effected by longitudinal movement of a shaft, rod or like actuating device.

The invention has for its object to provide a simple and highly efficient mechanism with which a maximum opening movement of the window sash or shutter may be obtained with a minimum longitudinal movement of the actuating device, and further to obtain the desired maximum opening movement with an operating mechanism which projects a minimum distance into the building when the window or shutter is closed, whereby the space within the building may be utilized to near the window without interfering with the sash-operating mechanism.

To this end I employ a pair of substantially short toggle levers which are operatively connected with the longitudinally movable actuating device, such as a shaft, rod, cord or the like, a second pair of substantially short toggle levers connected with the window sash, and one or more pairs of intermediate scissors levers, which are connected with the two pairs of substantially short toggle levers and which may be materially longer than the end toggle levers.

The particular features of the invention will be pointed out in the claims at the end of this specification.

Figure 1 represents a window sash connected with an operating mechanism embodying this invention, the window being shown in its closed position by full lines and in its open position by dotted lines.

Fig. 2, a horizontal section on the line 2—2, Fig. 1, showing the operating mechanism in its folded up or contracted condition, and

Fig. 3, a like view showing the operating mechanism in its opened up or extended position.

Referring to the drawing, *a* represents a window sash, which is pivoted or hinged at *b* to the wall *c* of a building or other structure, which latter may be of any suitable or desired construction.

The window sash *a* has coöperating with it an operating mechanism for opening and closing the same from within the building *c*, and said operating mechanism comprises a longitudinally movable actuating member 10, and a plurality of sets of levers connecting said actuating member with said window sash.

The plurality of sets of levers in accordance with this invention comprise a pair of substantially short end toggle levers 12, 13, operatively connected with the actuating device or member 10, a second pair of substantially short end toggle levers 14, 15, operatively connected with the window sash *a*, and in the present instance a single pair of substantially long crossed levers 16, 17, pivoted together as at 18, and pivotally connected at their outer ends to the end toggle levers 14, 15, respectively, as at 20, 21, and pivotally connected at their inner ends to the end toggle levers 13, 12, respectively, the lever 17 being pivotally connected at 22 with the lever 12 and the lever 16 being pivotally connected to an extension or arm 23 of the lever 13 at 23. The lever 13 is pivoted at 24 to a fixed support, herein shown as a bracket 25 attached to the wall *c* of the building, and the lever 12 is pivoted to a collar 26 mounted to slide on the actuating member or shaft 10 and which is secured in its adjusted position by the set screw 27.

The toggle levers 14, 15, as herein shown, are pivoted at 30 to a collar 31 fast on a rod 32 mounted in brackets 33 attached to the window sash *a*.

By reference to Figs. 2 and 3, it will be seen that the end toggle levers are composed of substantially short levers, while the intermediate connecting levers 16, 17, are relatively long and as a result the window sash *a* can be opened a maximum distance with a relatively short longitudinal movement of the shaft 10, and when the window is in its extreme opened position as indicated by dotted lines in Fig. 1 and full lines in Fig. 3, the lever 12 and the lever 13 from the pivot 24 project into the building but a short

distance, thereby leaving the space within the building free to be utilized substantially close up to the wall *c* of the building, which is highly desirable especially in manufacturing plants.

The shaft 10 may be supported in any suitable manner, and in the present instance it is shown as supported by a roller 40 mounted on a shaft 41 supported by a housing 42 secured to an arm 43 attached to the wall *c*.

In the present instance, I have shown but a single pair of crossed or as they may be termed scissors levers, which connect the pairs of end toggle levers and by means of which the maximum opening movement of the window sash may be obtained with a minimum projection of the operating mechanism into the building when the window is closed, and with a minimum movement of the shaft or rod 10, but it is not desired to limit the invention in this respect as it is evident that a plurality of pairs of scissors levers may be used if it is desired to extend the opening movement of the window and yet obtain the minimum projection within the building when the window is closed.

By the term "sash" as employed in the claims I desire to be understood as including not only window sashes but also shutters and the like.

Claims.

1. The combination with a movable sash, of an operating mechanism therefor comprising a longitudinally movable actuating device, a pair of end toggle levers connected with said actuating device, a pair of end toggle levers connected with said sash, and and a pair of materially longer scissors levers intermediate said end toggle levers and operatively connected therewith.

2. The combination with a movable sash, of an operating mechanism therefor comprising a longitudinally movable actuating device, a pair of end toggle levers having their center pivot connected with said sash, a second pair of end toggle levers having the free end of one lever of said pair pivotally connected with said actuating device and having the other lever of said pair pivoted to a fixed support between its ends, and a pair of crossed levers materially longer than said toggle levers and pivoted together and having their free ends pivotally connected with said pairs of end toggle levers.

In testimony whereof, I have signed my name to this specification.

ALBERT McALLISTER.