

No. 637,402.

Patented Nov. 21, 1899.

M. MULDER.
SPRING SASH BALANCE.
(Application filed July 27, 1899.)

(No Model.)

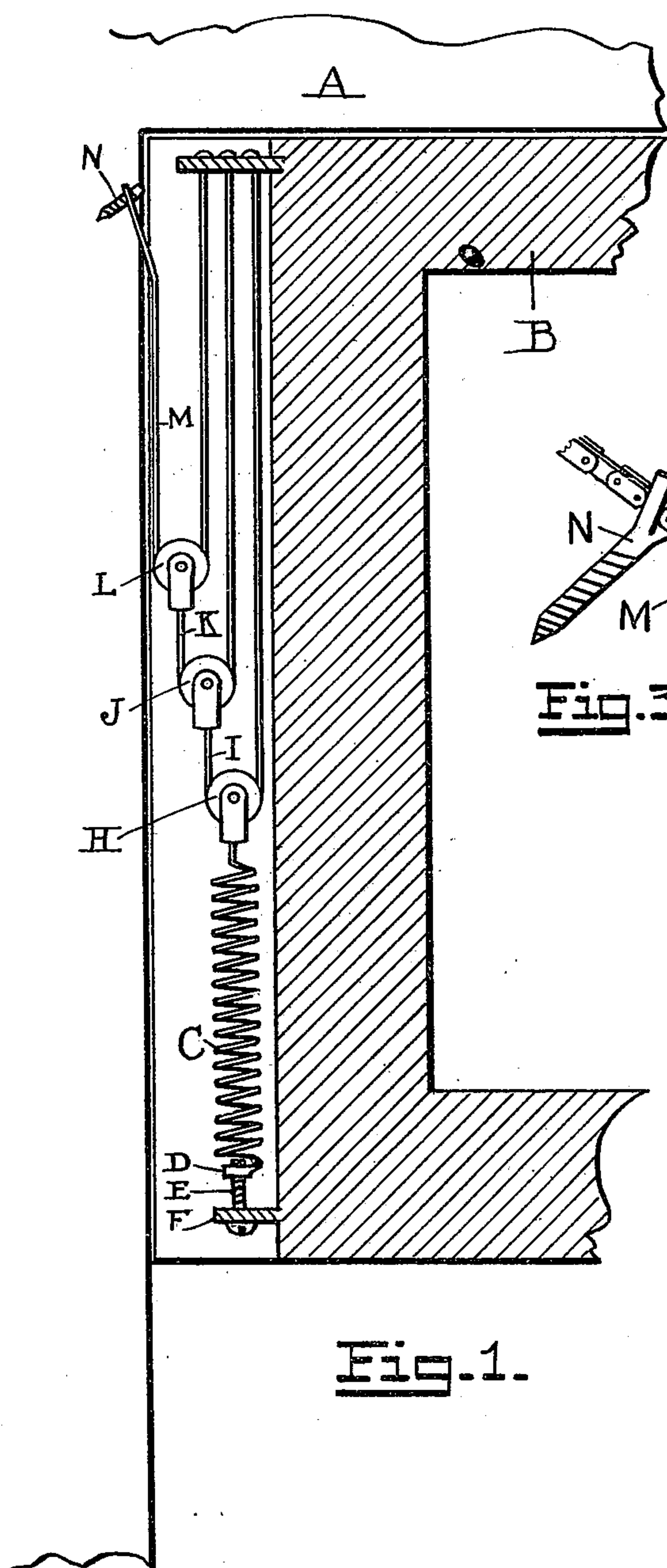


Fig. 1.

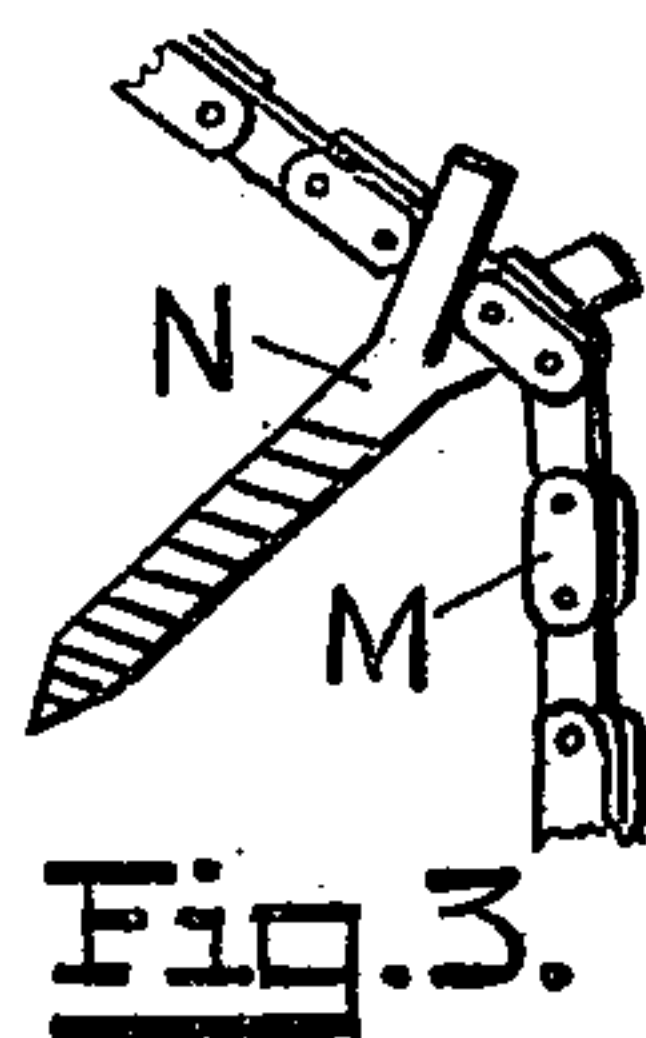


Fig. 3.

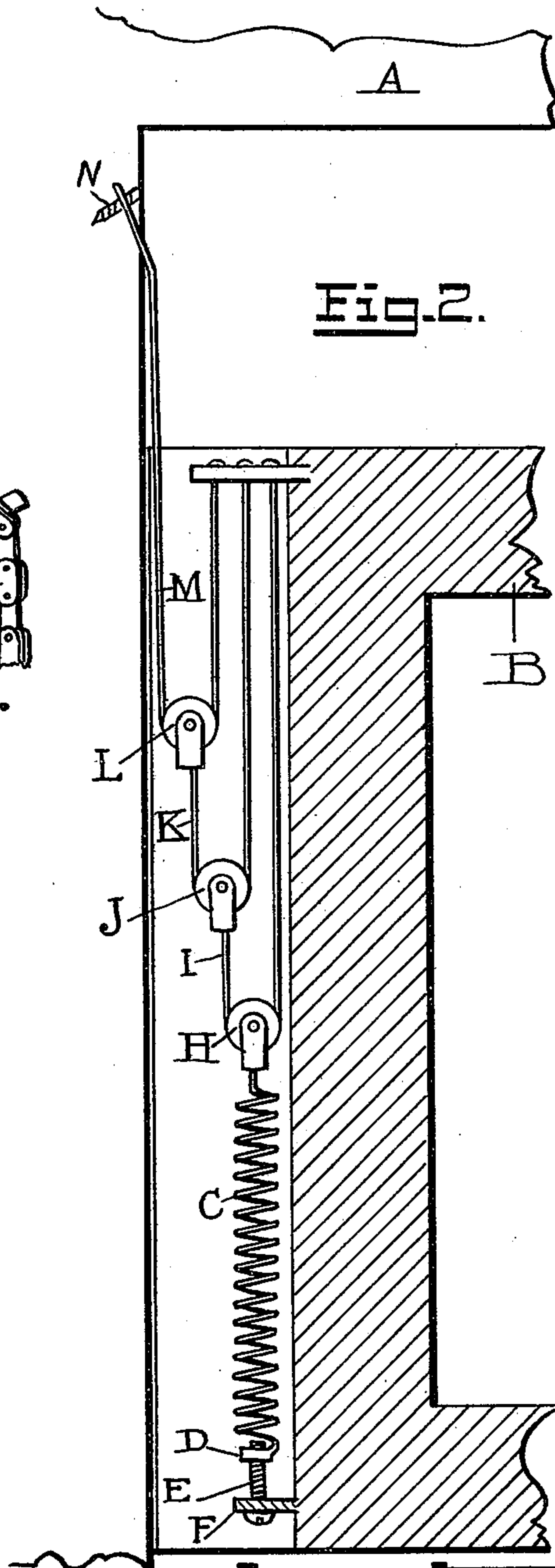


Fig. 2.

Witnesses
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UNITED STATES PATENT OFFICE.

MARTIENUS MULDER, OF NEW BALTIMORE, NEW YORK, ASSIGNOR OF ONE-HALF TO RICHARD H. GOLDSMITH, OF SAME PLACE.

SPRING SASH-BALANCE.

SPECIFICATION forming part of Letters Patent No. 637,402, dated November 21, 1899.

Application filed July 27, 1899. Serial No. 725,240. (No model.)

To all whom it may concern:

Be it known that I, MARTIENUS MULDER, a citizen of the United States of America, and a resident of New Baltimore, county of Greene, State of New York, have invented certain new and useful Improvements in Spring Window-Sash Counterbalances, of which the following is a specification.

My invention relates to springs as a substitute for weights for the purpose of counterbalancing window-sashes; and the object of my invention is to provide window-sashes with a novel arrangement of cords, springs, and pulleys by which they may be easily raised and lowered and will remain in any desired position. I attain this object by means of mechanism illustrated in the accompanying drawings, in which—

Figure 1 represents a vertical section of a window-frame, with the upper window-sash closed, showing my spring and pulleys attached thereto. Fig. 2 is a vertical section of a window-frame and upper sash with the sash lowered somewhat and held in position by my spring and pulley attachment.

Similar letters refer to similar parts throughout the several views.

A is a frame of a window.

B is a window-sash with the portion next to the frame cut away, so as to show my invention.

C is a spring attached in the window-sash in a groove made in the edge of the sash next to the side of the window-frame for the whole or substantially the whole length of the window-sash. The bottom of the spring C ends in a nut D, having screw-threads in the hole in the center. A bolt E with screw-threads adapted to mesh with the screw-threads of the nut D and having a head flush with the plate F at the lower end of the window-sash. The lower end of the bolt E is provided with a screw-head or bolt-head, so that it may be turned around, and by turning the bolt E it will draw down the lower end of the spring C, so as to tighten up the spring E when it may become weakened by long-continued use. The upper end of the spring C is attached to a pulley H, around which a cord or window-chain passes, one end of which is attached to the upper part of the window-sash inside of

and at the top of the groove and the other end attached to the side of the window-frame near the top or to another pulley, as shown by the drawings. In actual use three pulleys are preferable, as shown in the drawings.

The cord or chain I, passing around the pulley H, is attached to another pulley J, and a cord or chain K with one end attached in the top of the groove in the window-sash and passing around the pulley J and the other end attached to a pulley L, and another cord M with one end attached at the same place as the other two cords in the window-sash and passing around the pulley L and the other end attached in the side of the window-frame by any suitable means at N.

The strength of the spring is governed by the size and weight of the window in which it is to work; also, the number of pulleys employed depends somewhat upon the weight of the window and the distance to which it is desired to be moved up or down. Fig. 1 of the drawings shows the window closed and the spring at rest. Fig. 2 shows the window open for a short distance and the spring somewhat distended. It is evident that if but one pulley were used and the spring C attached direct to the pulley L by opening the window eight inches would distend the spring four inches, and the spring would thus exert a much greater force and would be soon worn out. By using two pulleys and attaching the spring C to the pulley K by lowering the window eight inches would distend the spring two inches, and by using the three pulleys, as shown in the drawings, by lowering the window eight inches would distend the spring one inch. By using the three pulleys, as shown, a moderate and uniform force is obtained, so that the window-sash may be held in any desired position.

The drawings show my invention attached to the upper sashes of the window. The springs are attached to the lower sash in exactly the same manner except that the spring is most distended when the window is closed, and as the window is raised the spring tends to return to its original position.

The springs and pulleys are with my attachment all concealed from view in the groove in the window-sash. The plate F and

the lower end of the bolt E may be flush with the bottom of the sash, and when the sash is in place the spring and the pulley cords or chains are taut. By using the three pulleys 5 as shown in the drawings the movement of the sash will distend the spring so slightly and easily that a very uniform force is exerted upon the window-sash, and the window-sash is very easily lowered and raised and re- 10 tained in any desired position.

My invention is especially useful in windows where there is not room for weights or in boats where the movement of the swinging weights are undesirable and in all other 15 cases where an easy and uniform movement of the window-sash is desired. For the same reason my invention is also especially useful upon cars where the ordinary weights cannot be used or are undesirable. Where the win- 20 dow-sash is too narrow to admit of the groove to contain the spring and pulleys, the groove may be made in the window-frame next the window-sash and the spring and pulleys contained in a groove in the window-frame and 25 one end of one cord or chain attached to the window-sash. In this way the operation is precisely the same as when the groove and pulleys are in the sash.

Fig. 3 shows a screw with a V-shaped head 30 in which an ordinary window-chain can be held by one of the thinner links of the chain being wedged in the V-shaped head of the screw, as at N in Figs. 1 and 2.

What I claim as my invention, and desire 35 to secure by Letters Patent, is—

1. A counterbalance for a window-sash comprising a spiral spring having one end at- 40 tached to a fixed support and provided at its opposite end with a pulley, a cord or chain passing around the pulley carried by the spring and having one end attached to a fixed support and the opposite end provided with a pulley, and a supporting cord or chain pass-

ing around the pulley on said cord and hav- 45 ing one end attached to the member carrying the spring and the opposite end fixed to an adjacent member; substantially as specified.

2. A counterbalance for a window-sash comprising a spiral spring having one end at- 50 tached to a fixed support and provided at its opposite end with a pulley, a cord or chain passing around the pulley carried by the spring and having one end attached to a fixed support and the opposite end provided with a pulley, a supporting cord or chain passing 55 around the pulley on said cord and having one end attached to a member carrying the spring and the opposite end fixed to an adjacent member, and means for adjusting the tension of said spring; substantially as speci- 60 fied.

3. The combination with a window sash and frame, of a counterbalancing device comprising a coil-spring provided at its lower por- 65 tion with a supporting-plate, an adjusting-screw carried by a lug from said sash and threaded into said plate, a pulley at the opposite end of said spring, a bracket carried by said sash, a cord or chain secured to said bracket and passing around the pulley carried 70 by said spring, a pulley secured to the free end of said cord or chain, a secondary cord or chain supported by said bracket and passing around the pulley carried by the first-mentioned cord, a pulley secured to the end 75 of said secondary cord, and a supporting-cord passing around the pulley carried by the secondary cord and secured to said bracket and to the window-frame; substantially as speci- 80 fied.

Signed by me at Albany, New York, this 24th day of July, 1899.

MARTIENUS MULDER.

Witnesses:

WALTER E. WARD,
WILLIAM E. VAN WERT.