No. 670,679.

Patented Mar. 26, 1901.

R. A. MacKENZIE.

SASH BALANCE.

(Application filed Aug. 14, 1900.)

(No Model.)

2 Sheets—Sheet 1.

FIG. 1

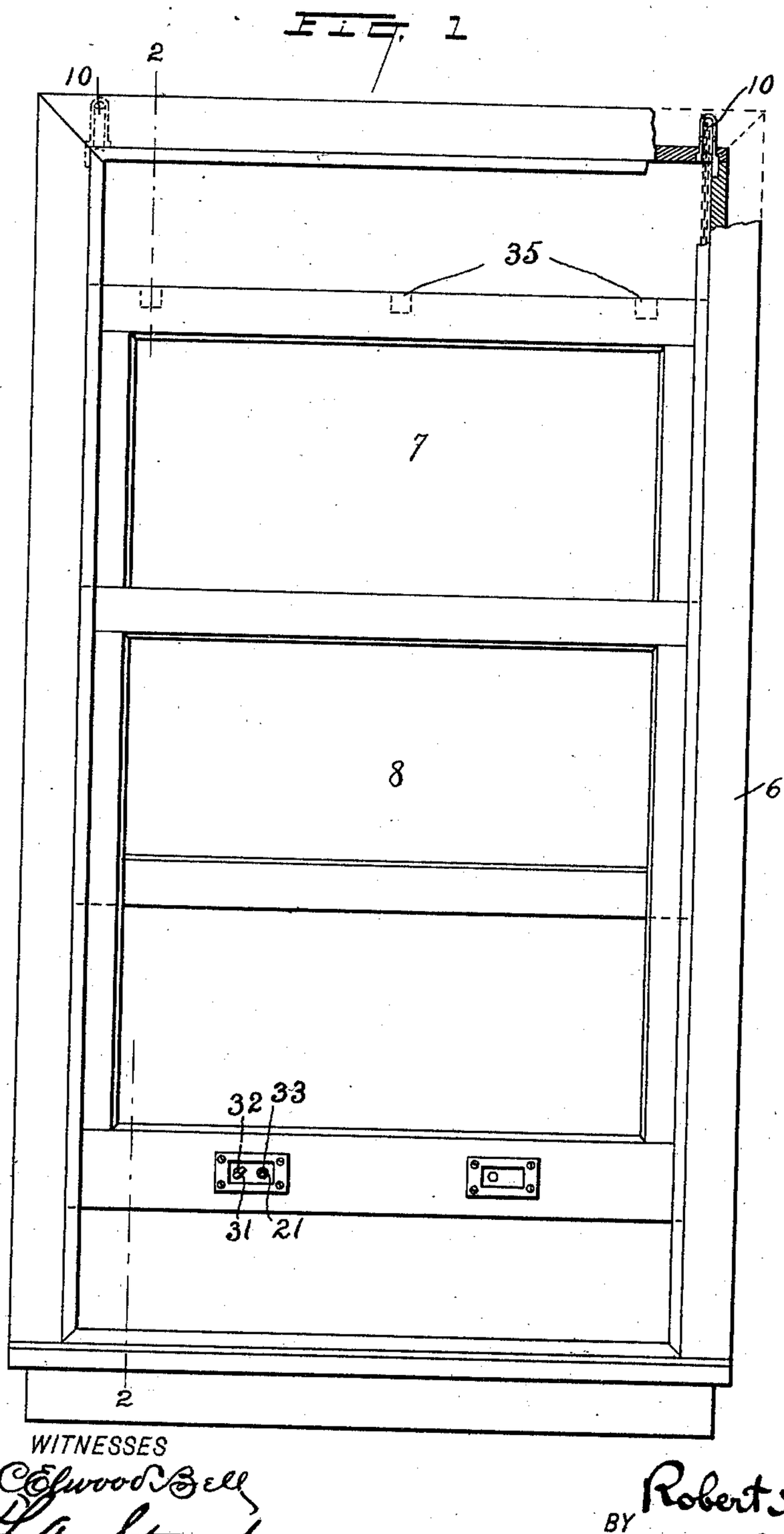
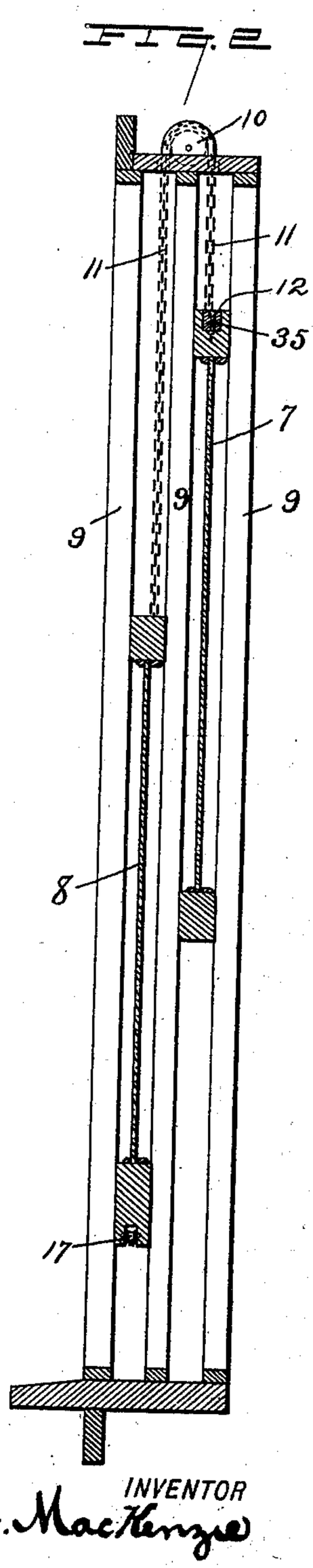


FIG. 2



WITNESSES

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FIG. 3

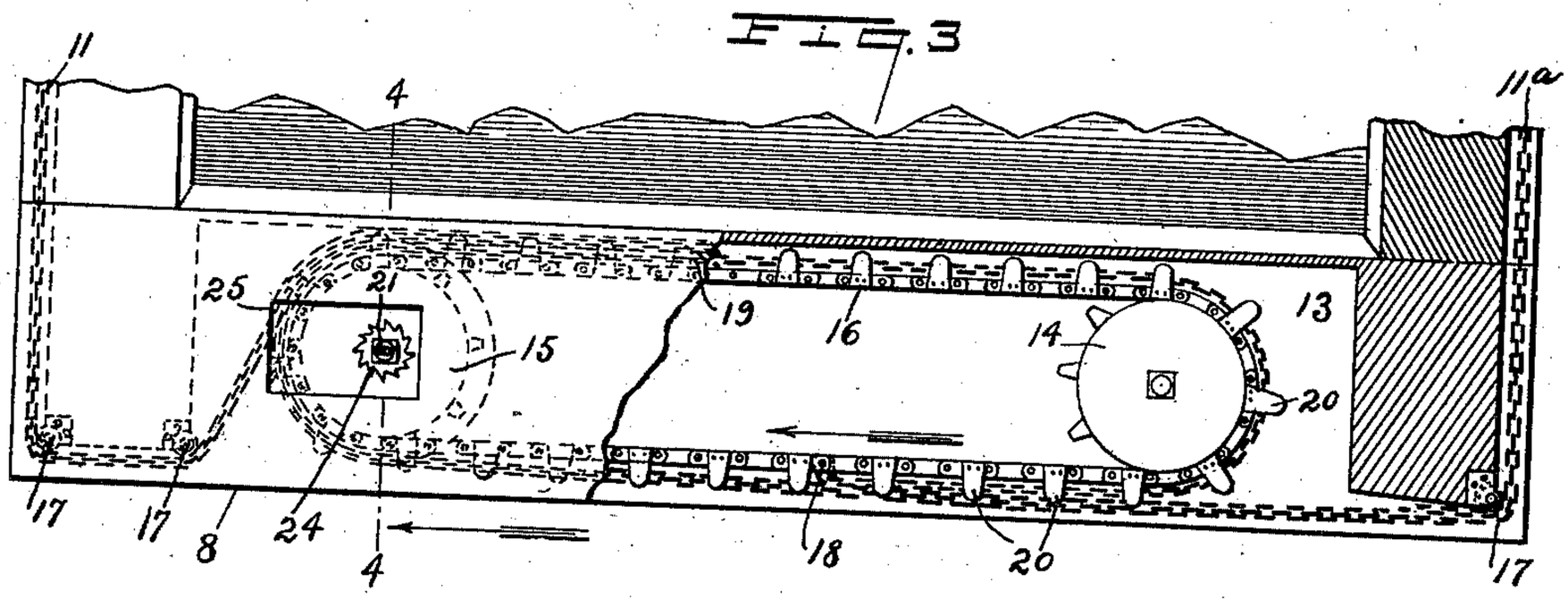


FIG. 4

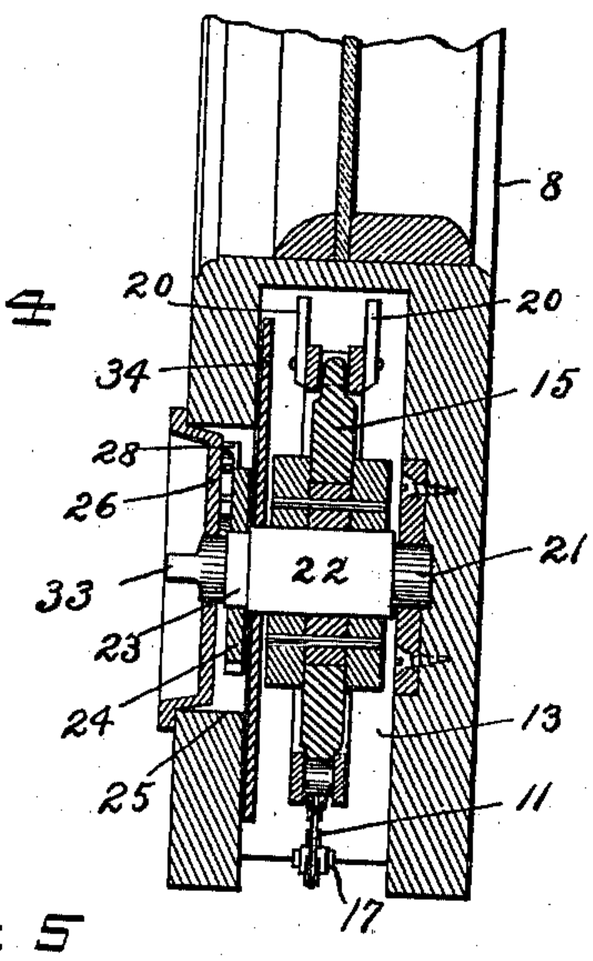
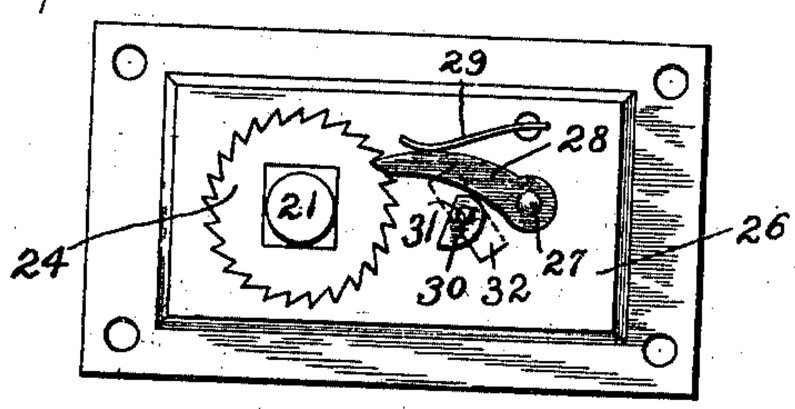


FIG. 5



WITNESSES

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ROBERT A. MACKENZIE, OF NEW YORK, N. Y.

SASH-BALANCE.

SPECIFICATION forming part of Letters Patent No. 670,679, dated March 26, 1901.

Application filed August 14, 1900. Serial No. 26,843. (No model.)

To all whom it may concern:

Be it known that I, ROBERT A. MACKENZIE, a subject of the Queen of Great Britain, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Sash-Balances, of which the following is a full and complete specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to window-frames and sashes; and the object thereof is to provide improved means for counterbalancing the sashes in the frame and for opening the sashes both at the top and bottom and for locking the same in any desired position.

The invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which the separate parts of my improvement are designated by the same reference characters in each of the views, and in which—

Figure 1 is an inside view of a window-frame and the sashes therein provided with my improvement; Fig. 2, a vertical section on the line 2 2 of Fig. 1; Fig. 3, a view similar to Fig. 1 of the bottom portion of the lower sash, part of the construction being broken away and part shown in section; Fig. 4, a section on the line 4 4 of Fig. 3, and Fig. 5 an inside view of a detail of the construction.

In the drawings forming part of this specification I have shown at 6 an ordinary window-frame and at 7 and 8 the upper and lower sashes, respectively. The frame is provided at the opposite sides thereof with the usual beads or strips 9, between which the sashes are placed, and in the practice of my invention I mount in the upper part of the frame and over the central beads or strips 9 and at each side of the frame a wheel 10, and over these wheels are passed chains or other flexible suspending devices 11 and 11^a, which are connected at one end with the upper sash 7 in any desired manner, as shown at 12 in Fig. 2, and for the purposes of this description the chain at the left side of the frame is designated by the reference-numeral 11 and that at the right by the reference-numeral 11^a.

Formed in the bottom of the lower sash is a chamber 13, which extends from one side of the sash to the other, as shown in Fig. 3, and in this chamber 13, adjacent to the opposite sides of the sash, are mounted two sprocket-wheels 14 and 15, the latter being shown in dotted lines in Fig. 3 and in full lines and in section in Fig. 4.

On the sprocket-wheels 14 and 15 is mounted an endless drive-chain 16, which forms an endless belt, and in practice the ends of the chains 11 and 11^a opposite the ends which are connected with the upper sash are passed over rollers 17 at the bottom of the sides of the window-sash, and the chain 11 is passed upwardly over the wheel 15 and over the upper reach of the sprocket chain or belt 16 and down over and around the wheel 14 and is connected with the said sprocket chain or belt 16 at 18, and the chain 11^a is carried along the bottom of the chamber 13 in contact with the bottom reach of the chain or belt 16 and up and around the wheel 15 and along the upper reach thereof to about the middle thereof, where it is connected therewith at 19. The chain or belt 16 is provided at the sides and throughout its length with projecting fingers 20, between which the chains 11 and 11^a are passed.

The wheel 15 at the left-hand side of the frame, as shown in Fig. 3, is provided, as shown in Fig. 4, with a central shaft 21, the body portion 22 of which is rectangular or angular in cross-section, and the outer end of the shaft 21 is provided with an angular portion 23, on which is mounted a ratchet-wheel 24, and formed in the bottom of the lower sash and communicating with the chamber 13 is an opening 25, closed by a plate 26, and pivoted to the inner side of the plate 26, as shown at 27, is a pawl 28, provided with a spring 29, which bears on the upper side thereof, and beneath the pawl 28 is a cam 30, mounted on a shaft 31, which passes outwardly through the plate 26 and is provided with a head 32, as shown in Fig. 1, by which the cam 30 is operated, and the shaft 21, on which the ratchet-wheel 24 is mounted, also projects through the plate 26 and is provided with a head 33, by which said shaft may be operated, together with the wheel 15, mounted thereon.

The head 32 of the shaft 31 and the head 33 of the shaft 21 are operated, when desired, by means of keys or cranks provided with suit-

able heads which are adapted to be engaged with the said heads 32 and 33 of the said shafts 31 and 21.

The plate 26 is detached in Fig. 3, and the hole or opening 25, in which said plate is placed, is shown in full lines; but the ratchet-wheel 24 and the end of the shaft 21, on which it is mounted, are shown in this figure, and I also in practice preferably place between the hub of the wheel 15 and the side of the bottom of the lower sash in which the opening 25 is formed a plate 34.

The operation will be readily understood from the foregoing description when taken in connection with the accompanying drawings and the following statement thereof.

In practice both the upper and lower sashes are provided with locking devices for holding them in the closed position, or said locking devices may be so formed as to hold the sashes in an open position; but these locking devices form no part of this invention and are therefore not shown and described. The wheel 15 can only turn with the shaft on which it is mounted, and said wheel cannot be turned to the left against the operation of the pawl 28 unless the cam 30 is operated, which results in detaching the pawl from the wheel. The upper sash is weighted, as shown at 35, by means of lead or other weights secured therein in order that the weight of said sash may be substantially equal to the weight of the bottom sash with the parts connected therewith, and whenever it is desired to raise the lower sash and lower the upper sash all that is necessary is to release the locking devices hereinbefore referred to and raise the lower sash and the upper sash will correspondingly descend. If it is desired to lower the upper sash and leave the lower sash closed, the wheel 15 is turned to the right, this operation resulting in drawing down the upper sash, it being understood that the lower sash is locked in the closed position, and if it is desired to raise the lower sash without moving the upper one the upper sash is locked in the closed position, and the wheel 15 is turned to the right, as before, and this will result in raising the lower sash, and the pawl 28 will operate at all times to prevent the reverse movement of said wheel 15 and hold either the upper or lower sashes in an open position.

My improvement is simple in construction and operation and perfectly adapted to accomplish the result for which it is intended, and it will be apparent that changes in and modifications of the construction described may be made without departing from the spirit of my invention or sacrificing its advantages.

Having fully described my invention, I claim as new and desire to secure by Letters Patent—

1. A window-frame provided with the usual sashes and with pulley-wheels which are mounted in the top thereof at the opposite sides thereof, flexible sash-supporting devices passed over said pulley-wheels and down through the sides of the frame between the guide beads or strips of the sashes and connected with the upper sash at the opposite sides thereof, wheels mounted in a chambered form in the bottom of the lower sash, and a flexible endless device mounted on said wheels with which said sash-supporting devices are connected, said sash-supporting devices being also passed around pulley-wheels mounted in the lower sash near the opposite side thereof, one of the wheels on which the endless flexible device is mounted, being also provided with devices to prevent it from turning in one direction and one of the wheels being provided with means for turning the same, substantially as shown and described.

2. A window-frame provided with the usual sashes and with pulley-wheels which are mounted in the top thereof, at the opposite sides thereof, flexible sash-supporting devices passed over said pulley-wheels and down through the sides of the frame between the guide beads or strips of the sashes and connected with the upper sash at the opposite sides thereof, sprocket-wheels mounted in the bottom of the lower sash, and an endless chain or belt mounted on said sprocket-wheel with which said flexible devices are connected, said flexible devices being passed around pulley-wheels mounted in the lower sash before they are connected with said endless chain, one of said sprocket-wheels being provided with a ratchet-wheel which is mounted on the shaft thereof, and a spring-operated pawl which operates in connection with said ratchet-wheel, and means for releasing said pawl from said ratchet-wheel, and for turning said sprocket-wheel, substantially as shown and described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of the subscribing witnesses, this 28th day of July, 1900.

ROBERT A. MACKENZIE.

Witnesses:
F. A. STEWART,
M. K. LOWERRE.