

M. J. DUFFY.

SASH BALANCE.

APPLICATION FILED JAN. 5, 1909. RENEWED JULY 14, 1911.

1,010,130.

Patented Nov. 28, 1911.

2 SHEETS-SHEET 1.

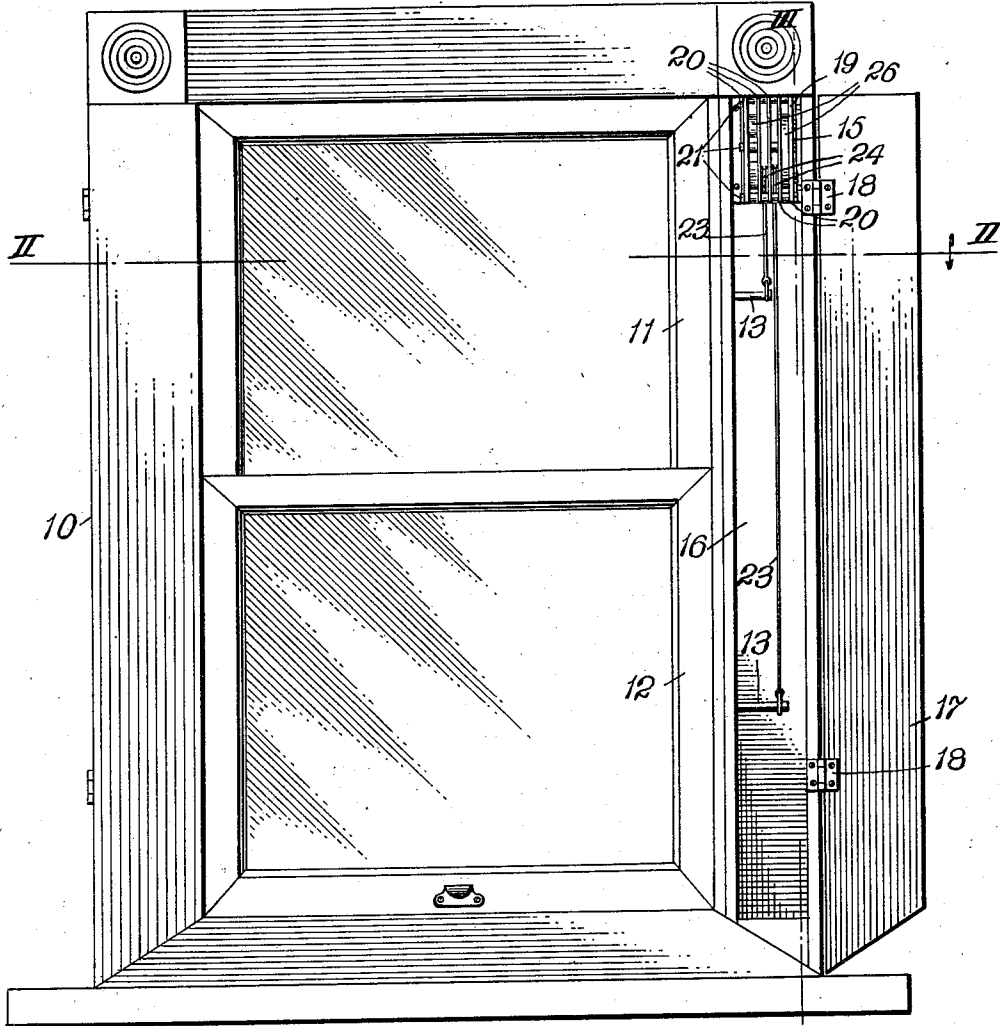


Fig. 1.

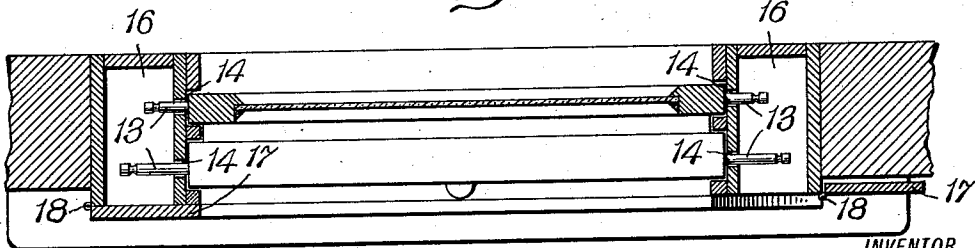


Fig. 2.

WITNESSES
Julius H. Cook
 M. Cooke

INVENTOR
 Michael J. Duffy
 BY
Crisswell & Crisswell
 ATTORNEYS

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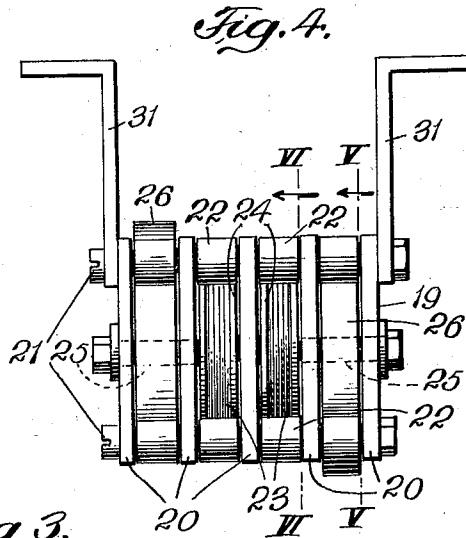
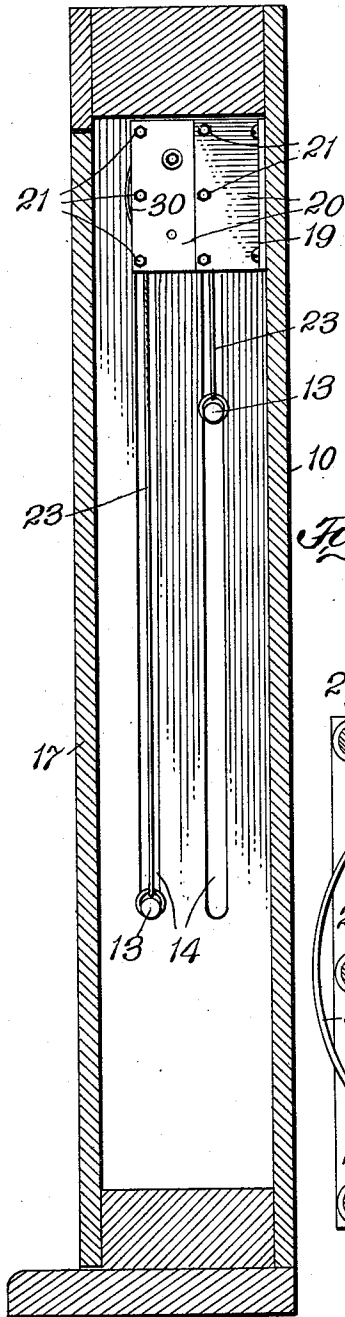


Fig. 3.

Fig. 4.

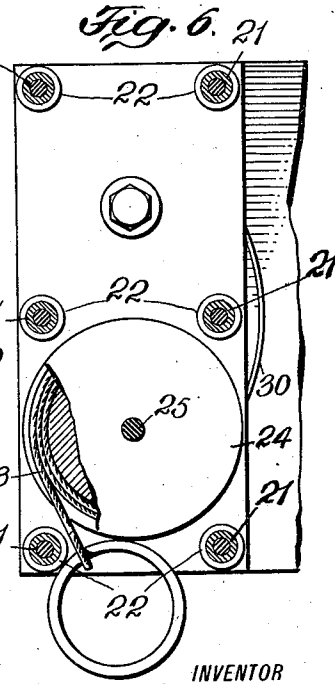
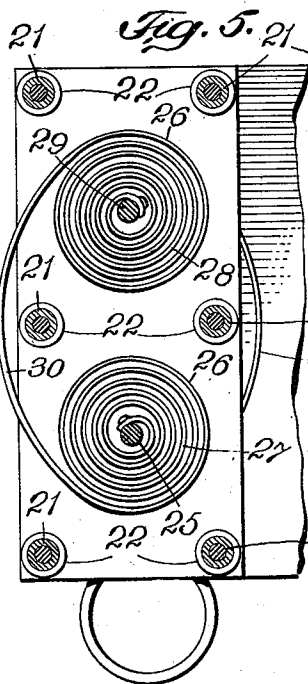


Fig. 5.

Fig. 6.

WITNESSES
Julius H. Cook
Mr. Cooke

INVENTOR
Michael J. Duffy
BY
Priswell & Priswell
ATTORNEYS

UNITED STATES PATENT OFFICE.

MICHAEL J. DUFFY, OF NEW YORK, N. Y.

SASH-BALANCE.

1,010,130.

Specification of Letters Patent.

Patented Nov. 28, 1911.

Application filed January 5, 1909, Serial No. 470,827. Renewed July 14, 1911. Serial No. 638,585.

To all whom it may concern:

Be it known that I, MICHAEL J. DUFFY, a citizen of the United States, and a resident of New York, borough of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Sash-Balances, of which the following is a full, clear, and exact description.

This invention relates more particularly to spring balances for window sashes.

The primary object of the invention is to provide a simple and efficient spring balance which may be held in a confined and compact space, and so connected to either or both of the sashes of a window, that the window will be properly balanced and the weight thereof compensated for, and the spring so connected and arranged as to materially assist in raising the sash or sashes, thereby overcoming many of the objections incident to the ordinary method in which weights and similar means are employed.

Another object of the invention is to provide a spring for a window sash in which the spring has a plurality of distinct sets of convolutions, and is so held that a small movement is imparted to the spring as compared to the movement of the window; and the life of the spring thereby materially increased.

A further object of the invention is to provide a sash balance in which a spring is so arranged that power may be stored as the sash is lowered thereby assisting in the upward movement of the sash as the same is being raised.

With these and other objects in view, the invention will be hereinafter more particularly described with reference to the accompanying drawings, which form a part of this specification, and will then be pointed out in the claims at the end of the description.

In the drawings, Figure 1 is a front elevation of a window with one form of my invention applied thereto. Fig. 2 is a sectional plan view, taken on the line II—II of Fig. 1. Fig. 3 is an enlarged vertical section, showing in elevation the invention connected to the upper and lower window sashes. Fig. 4 is a detail plan of the invention constructed to operate two sashes. Fig. 5 is a vertical section, taken on the line V—V of Fig. 4; and Fig. 6 is a vertical section, taken on the line VI—VI of Fig. 4.

The window 10 may have the upper sash

11 and the lower sash 12, which are adapted to slide vertically in the window frame in the usual manner, and projecting outward from each sash on each side substantially centrally thereof is a stud or projection 13 which extends through a vertical slot 14 in the window frame, the projections or studs from one of the sashes, as the lower one for example, being somewhat longer than the projections or studs of the other sash in order that as direct a connection as possible may be made with the sash balance 15. The sash balance 15 may be variously constructed, and may be located in the upper part of the window frame on each side thereof, and within the chamber or hollow part 16 of the window frame, one side of which is adapted to be closed by a door 17 which is hinged, at 18, to the window frame so that the parts of the balance may be readily accessible for repair or for other purposes.

The sash balance may be arranged in pairs where two sashes are intended to be operated, and each sash is adapted to be connected to its respective balance independently of the other sash. As shown a frame 19 is provided comprising a plurality of plates 20, connected by a plurality of bolts 21. Said plates are spaced apart by rotatable rolls 22. Each sash at each side thereof is connected to a cable, chain, spring or other connection 23 to one of the studs 13, and the other end of said connection is held to a drum 24, the said drum being secured to a shaft or spindle 25, though said connection may be held directly to the shaft 25 so as to rotate the same when the flexible connection is moved outward by the lowering of either of the sashes. Each shaft 25 has one end of a spring 26 secured thereto, and this spring is so wound as to form a series of convolutions 27 about the shaft 25, and has its other end formed into series of convolutions 28 and is held to a shaft 29.

The convolutions 28 are oppositely formed to the convolutions 27, and extending between said convolutions and the shafts 25 and 29 is the part 30, which normally extends outward over one of the intermediate rolls, and the spring is so arranged that when a sash is lowered the drum 24 connected thereto will operate the shaft 25 to wind the spring on said shaft, and as the sash continues to lower will unwind the balance from around the shaft 29, while the upward

movement of the sash will cause the spring to be unwound from the shaft 25 and wound about the shaft 29. By reason of the open position of the convolutions, the sash will
5 have a relatively large movement as compared to the movement of the spring until the convolutions around one of the shafts becomes tight, and the spring can be so arranged that it need move but a small part of
10 the movement of the sash, thus materially increasing the life of the spring. This construction permits a short spring to be used, and by having the spring always move in the same direction, there is less tendency for the
15 same to break while in use.

In the drawings are shown two sets or pairs of springs for the two window sashes, but it will be understood that only one window sash may have a spring or springs connected therewith, and that instead of arranging the frame of the balance in the manner shown, the said frame may be arranged at the lower part of the window frame or casing and so connected that the
20 cable 23 need not be connected to a stud or projection extending outward through a slot, but may be caused to pass over the usual form of sash pulley, and thus dispense with the slots for the projecting studs. Where
30 the frame is connected as shown, brackets, as 31, may extend outward from the frame on opposite sides thereof to adapt the frame to be held, and supported in position to have the cables 23 properly connected to its respective spring.
35

As before stated a single or a plurality of springs may be used, and where a plurality of springs are used, one end of one spring may be connected to a shaft, and one of the
40 other springs connected to a sleeve or tubular shaft; and if desired the spring or springs may be made strong enough to raise a window sash when the latter is started or released.

45 From the foregoing it will be seen that a simple, compact and efficient sash balance is provided which is adapted to be connected to the sash or sashes in such a way that the sashes will be properly balanced, and will be

materially assisted in raising the same after
50 the sash is started; that the spring is so formed and arranged that a relatively small movement is required as compared with the movement of the sash to which it is connected; and that by arranging the spring in the
55 manner shown, not only a neat and compact device is provided, but by winding the spring in the manner set forth, the movement is always in the same direction and the spring is therefore less likely to break while
60 in use.

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

1. A sash balance comprising a casing, a
65 spring having each end formed into independent oppositely coiled convolutions arranged in alinement, and a rotatable member connected to one of said ends and constructed to be operated by the movement of
70 a window sash.

2. A sash balance comprising a casing, a spring having its ends coiled in opposite directions to form independent spaced apart
75 volute portions arranged in alinement, means for preventing movement of one of said ends, a rotatable shaft connected to one of said ends, a drum carried by said shaft, and means for rotating said drum, said volute portions being so arranged that as one is
80 tightened, the other is correspondingly tightened.

3. A sash balance comprising a casing, a drum mounted therein, a flexible connection for the drum adapted to be connected to a
85 window sash, whereby the drum will be operated and a spring having each end coiled to form independent convolutions arranged in alinement, one of said ends being connected to said drum, said convolutions being
90 so arranged that as one is tightened the other is correspondingly tightened.

This specification signed and witnessed this 2nd day of January A. D. 1909.

MICHAEL J. DUFFY.

Witnesses:

M. F. KEATING,
M. COOKE.