

(No Model.)

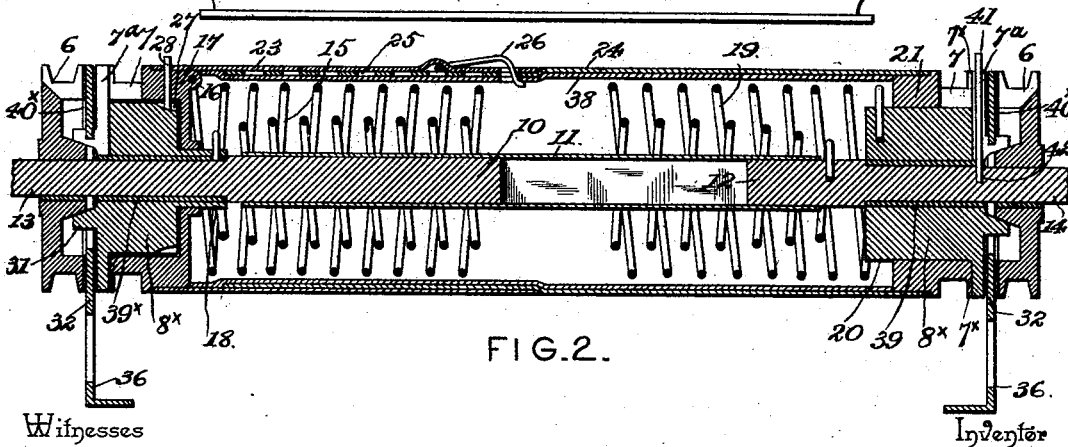
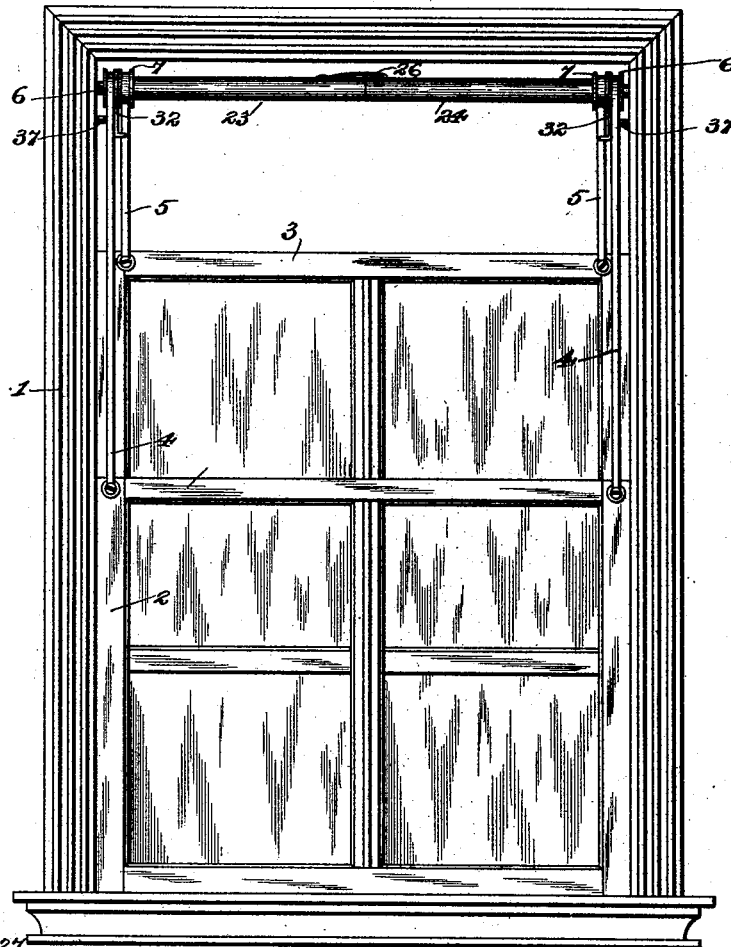
2 Sheets—Sheet 1.

F. P. JOHNSON.
SASH BALANCE.

No. 491,114.

Patented Feb. 7, 1893.

FIG. 1.



Witnesses

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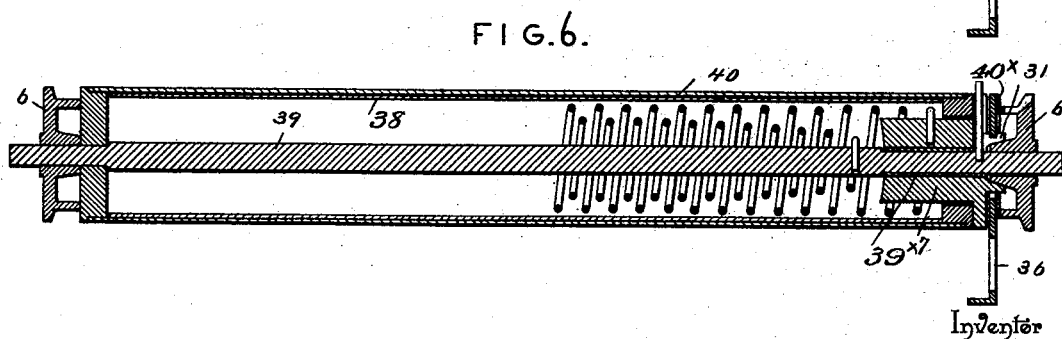
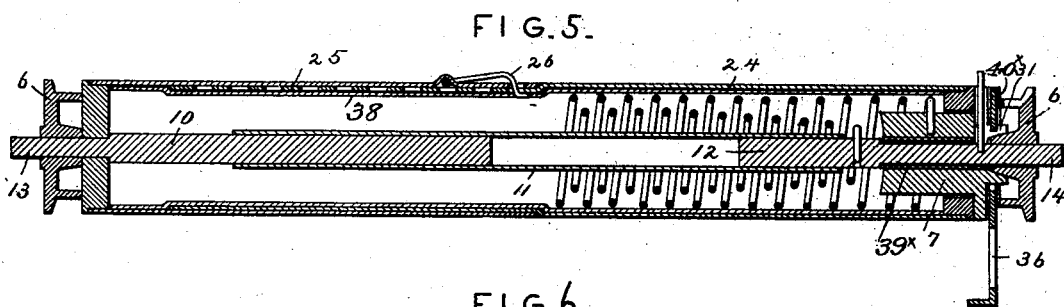
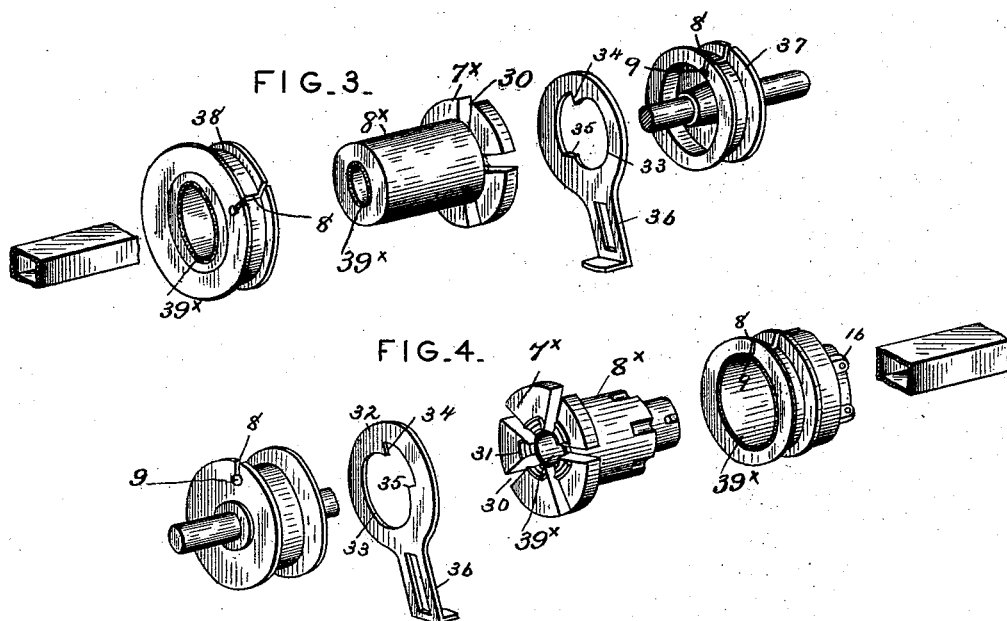
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2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

FRANK P. JOHNSON, OF DANVILLE, PENNSYLVANIA.

SASH-BALANCE.

SPECIFICATION forming part of Letters Patent No. 491,114, dated February 7, 1893.

Application filed July 15, 1892. Serial No. 440,171. (No model.)

To-all whom it may concern:

Be it known that I, FRANK P. JOHNSON, a citizen of the United States, residing at Danville, in the county of Montour and State of Pennsylvania, have invented a new and useful Sash-Balance, of which the following is a specification.

This invention relates to improvements in sash-balances, and forms an improvement on Patent No. 449,538, granted to me March 31, 1891, and the object of the same is to so improve the device shown in the patent above referred to as to cause each sash to act independently of the other, and provide means for adjusting the springs so that they may be set to different tensions to control light and heavy weight sash by the same device.

With this object in view, the invention consists of the construction and arrangement of parts as will be more fully hereinafter described and claimed.

In the drawings:—Figure 1 is an elevation of a window-frame with sash therein, looking toward the inside thereof and having the improved device applied thereto. Fig. 2 is a longitudinal vertical section of the device as illustrated in Fig. 1, on an enlarged scale. Figs. 3 and 4 are perspective views of the mechanism at the opposite ends of the device in detail and separated. Fig. 5 is a view similar to Fig. 2 of a modified form of construction. Fig. 6 is a view similar to Fig. 5 of a still further modification.

Similar numerals of reference indicate corresponding parts in the several views.

Referring to the drawings, the numeral 1 designates a window-frame, in which move sash 2 and 3, as in the ordinary manner. To each sash, and at the top edge thereof, metallic straps 4 and 5 are respectively secured to the same on each side thereof and lead upward therefrom, the straps 4 on the lower sash 2 leading in one direction around outer drums 6, and the straps 5 on the upper sash 3 leading in the opposite direction around the inner drums 7, which are located just inside of the said drums 6. In the face of each of the drums set forth is formed a slot 8, having an enlarged inner end 9 in which the ends of the said straps 4 and 5 are secured. As shown in Figs. 2 and 5, the inner member of the balance comprises a rod 10, which is

preferably of angular form and telescopically fitted in a tube or sleeve 11, secured to a supporting rod or stub 12 at the opposite end of the balance. The ends 13 and 14 of the rod 10 and the rod or stub 12 project through the ends of the balance and on which the drums hereinbefore set forth are located.

The drums 6 and 7 are located at opposite ends of the balance and surround the extension 13 of the rod 10, and extension 14 of the rod or stub 12, and the drums 6 are fast to the extensions 13 and 14 and adjacent thereto are located the drums 7, that are secured to the outer telescopically adjustable covering tubes hereinafter more fully set forth, and thereby said drums 7 are free to move on said extensions 13 and 14. It will be seen that the drums 7 are formed with the heads 17 and 21 at opposite ends of the balance and are completed by flanges 7^x formed with the outer ends of each of the same. At each end of the balance volute spiral springs 15 and 19 are situated and surround the tube or sleeve 11, the rod 10, and the rod or stub 12, at opposite portions of the balance, as shown. The end of the outer coil of the spring 15 is secured to an ear 16 of the head 17, and the end of the inner coil is connected to an inner reduced extension 18 of an adjacent sleeve 8^x. The inner coil of the said spring 15 is continuous from the outer coil, and the winding of one portion thereof, and likewise the operation of the same, effects the movement or operation of the other part. At the opposite end of the balance is mounted the spring 19, as before set forth, which is similar in construction to the spring 15, and both of said springs are distinct and have an independent movement and operation. The end of the outer coil of the spring 19 is connected to the inner extension 20 of an adjacent sleeve 8^x and the end of the inner coil of the same is secured to the rod or stub 12. The spring 15 controls the movement of the drums 7, and the spring 19 controls the outer drums 6. The springs 15 and 19 are right and left springs and are so mounted that the drums 6 and 7 will revolve in opposite directions when winding the straps 4 and 5 of the sash thereon, and it is obviously apparent that the movement of said drums may be reversed in order to accommodate varying constructions and arrangements. The

tension of the spring 15 is varied, and its force is exerted by reason of the fact that one end of the same is fastened to the rotating sleeve 8^x and the other to the fixed drum 7 adjacent thereto. The tension exerted by the spring 19 is by reason of the fact that one end of the spring is made fast to the rotating sleeve 8^x on the right side, and the other end of said spring fastened to the fixed shaft 12.

The heads 17 and 21 having the drums 7 in connection therewith, are secured to metallic tube-sections 23 and 24, which are telescopically fitted to each other for the purpose of adjustment and the section 24 is provided with a series of apertured openings 25 to receive the bent end of a locking catch 26, attached to the section 23. By means of this arrangement of parts, and the telescopic feature hereinbefore set forth consisting of the rod or bar 10, the rod or stub 12, and the tube or sleeve 11, the balance can be adjusted to fit window-frames of different widths without in the least impairing or obstructing the proper operation of the several parts. The inner end of one of the sleeves 8^x is provided with notches 27, which are arranged at regular intervals and adapted to receive a wire pin or nail 28, inserted through the heads 17 and 21 to hold the balance in proper wound condition when it leaves the factory, and when set up for use and fastened in position, the said pin 28 is removed, as the weight of the sash connected thereto will hold the drums 7 and the spring 15 controlling the same in proper relation. The outer portion of each of the sleeves 8^x is provided with a flange 7^x as stated having a series of radial slots 30 therein which run or extend to the central openings of the said drums to receive a nail or pin 41 to wind in or let out the set of the balance. These flanges 7^x also form a guard for a plate or locking lever 32 to hold the springs 15 and 19 in proper position, the rod or bar 10 and the rod or stub 12, which exert a rotating influence on the drums 6. On the outer faces of the flanges 7^x are formed a series of lugs 31, which are engaged by the plate or lever 32 which consists of a circular plate with an eccentric opening 33 therein having a finger 34 projecting thereinto which takes into the space between the lugs 31, and the said lever is also constructed with a shoulder 35, which braces against one of said lugs 31 and prevents unlocking or release of the set of the springs. The opening 33 of the lever is larger than a circumferential line drawn around the lugs 31, to thereby permit free movement of the said lever and engagement of the finger 34 thereof with the lugs 31. The lever is also formed with a slotted arm 36 through which a screw or other suitable fastening 37 is inserted to hold the device in proper position after it has been employed to exert the necessary tension on the springs. One of these levers is placed at each end of the balance, and owing to the connection and arrangement of the springs 15 and 19 as has

been hereinbefore set forth, the inside and outside coils of the spring are uniformly and properly wound by operating the said levers 70 in the proper manner, and by means of the said spring-adjusting devices, sash varying in weight may be readily accommodated and balanced by one and the same device.

In operation the springs exert their influence in assisting in raising the sash; and as each end-mechanism of the same is independent, it may be adjusted as found desirable and necessary.

Within the metallic tube sections 23 and 24 80 is mounted a paper tube 38 which is adapted to deaden the sound of the movement of the springs. Also the sleeves 8^x are each supplied with a wooden bushing 39^x which deadens the sound of said sleeves during rotation 85 thereof over the parts on which they are mounted.

Between each of the levers 32 and the inner sides of the outer drums 6 is mounted a leather washer 40^x which also deadens sound 90 at this point, and by means of the several constructions just set forth, a comparatively noiseless mechanism results.

In Fig. 5 a slight modification in construction is shown, and therein single drums 95 only are employed and supplied with a winding device similar to that hereinbefore set forth. A single spring is employed in this instance as it is necessary to only control the movement and operation of one set of drums. 100 This form of device is especially adapted for use in connection with single-sash window-frames, such as car windows, and embodies the adjustable feature of the device first described. 105

In Fig. 6 a construction somewhat similar to that illustrated by Fig. 5 is shown, except that all features of adjustability are dispensed with and a rigid continuous rod or bar 39 is employed together with a continuous 110 surrounding tubular casing 40. A single spring is employed in this instance and one pair of drums with one of which the winding lever operates. This form of the device is adapted to be manufactured in the form set 115 forth and to correspond with standard widths of window-frames and sent from the factory in condition to be set up.

The form of the device in Fig. 6 is shown applicable for use with a single sash only, 120 but without any departure from the invention and in view of what has already been described, it is obviously apparent that double drums and springs could readily be arranged in this form. The outer end drums 125 6 when the device is sent from the factory may be in like manner locked, as are the drums 7 hereinbefore referred to by temporarily inserting a pin 41 through the flange 7^x of one of the sleeves 8^x, which pin engages a 130 slot or opening 42 in extension 14.

The advantages are similar in this form of device to those set forth by my aforesaid patent, with the addition of a simplified con-

struction, the employment of shorter springs which extend only part way over the length of the device and are independent of each other. These features, together with the details of construction and arrangement set forth, have been found to be possessed of considerably more utility than the form of construction embodied in the patent mentioned.

10 Having thus described the invention, what is claimed as new is:—

1. In a sash-balance, the combination of an inner axial member with drums mounted thereon a part of said drums being radially slotted, said axial member being of single form and having said drums at opposite ends thereof, a resilient member controlling the movement of said drums, a winding device for said parts, and a casing surrounding the same, substantially as described.

2. In a sash-balance, the combination of an inner axial rod or member with a drum fixed on each end thereof, other drums rotatably mounted thereon, and an independent spring arranged in connection with each of the ends of said balance, substantially as described.

3. In a sash-balance, the combination of an inner axial telescopic rod or member with a drum fixed on each end thereof, other drums rotatably mounted thereon, a part of said drums being radially slotted a coiled spring arranged in connection with each of the ends of said balance, and a winding device in connection with opposite ends of said balance and adapted to engage said radially slotted portions of the drums, substantially as described.

4. In a sash-balance, the combination of an inner axial rod having drums thereon, an outer tubular member, other drums in connection with the ends of the device, individual springs to control the movements of the drums, and winding levers having slotted arms, substantially as and for the purpose set forth.

5. In a sash-balance, the combination of an inner axial telescopic member having drums

in connection therewith, other drums at the ends of the device, independent springs at opposite ends of the device, and an outer telescoping tubular casing, substantially as described.

6. In a sash-balance, the combination of an axial rod telescopically fitted in a tubular sleeve having a rod or stub connected to said opposite end thereof, drums connected to said parts, other drums located thereon, springs located at opposite ends of the device and independent of each other, and an outer tubular casing composed of telescopic sections, substantially as described.

7. In a sash-balance, the combination of an inner axial member having drums thereon, other drums on said member, a portion of said drums having projections extending from one side thereof, springs for controlling the movement of said drums, and a winding lever in connection with each end of the device having a finger projecting thereinto adapted to engage said projections of the drums, substantially as described.

8. In a sash-balance, the combination of an inner axial member having drums on the inner and outer portions thereof, an expansible tube, a wooden bushing in a portion of said drums, springs surrounding said axial member for operating the several parts, and a paper tube within the said expansible tube, substantially as described.

9. In a sash-balance, the combination of an inner axial member, inner and outer drums thereon, sleeves having flanges between said inner and outer drums, springs on said inner axial member, winding levers between the flanges of said sleeves and said outer drums, and leather washers between said levers and said outer drums, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

FRANK P. JOHNSON.

Witnesses:

H. M. HINCKLEY,
J. E. MOORE.