

(No Model.)

S. N. GOLDY.
SASH BALANCE.

No. 466,941.

Patented Jan. 12, 1892.

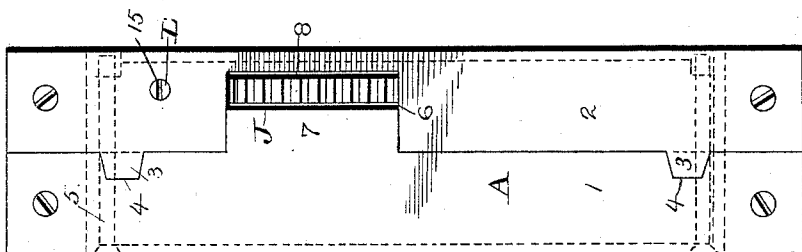


Fig. 5-

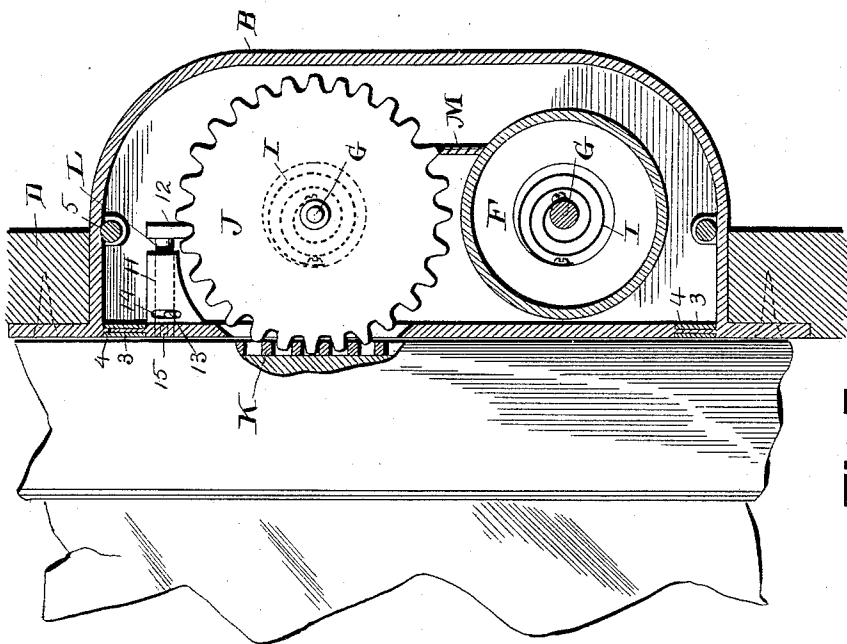


Fig. 6-

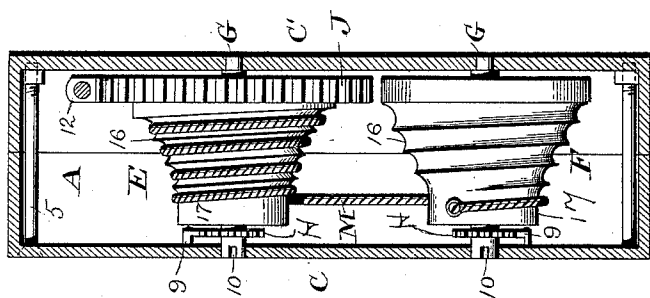


Fig. 7-

Witnesses
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By his Attorney,
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UNITED STATES PATENT OFFICE.

SAMUEL N. GOLDY, OF SAN FRANCISCO, CALIFORNIA.

SASH-BALANCE.

SPECIFICATION forming part of Letters Patent No. 466,941, dated January 12, 1892.

Application filed April 14, 1891. Serial No. 388,879. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL N. GOLDY, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Sash-Balances; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to a sash-balance in which a gear-wheel meshing with a rack-plate on the sash is secured to a combined spring-actuated fusee and barrel, with which latter another like fusee and barrel is connected by a flexible connection attached at one end to one of the fusees at its largest diameter and at its other end to the barrel of the opposite combined fusee and barrel, whereby I am enabled to use comparatively short springs, the tension of the springs is equalized at all points of elevation of the sash, and compensation is made for loss of tension of the springs when the sash is raised. I accomplish the above results by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is an end elevation of the sash-balance, the casing being in section, showing the position occupied by the operating mechanism. Fig. 2 is a side elevation, the casing and one of the combined fusee and barrel cylinders being in section, showing the gear-wheel of the other fusee and barrel in engagement with a rack-plate on the sash. Fig. 3 is an end elevation showing the casing as it appears when in the frame.

Referring to the drawings, A designates the face-plate, B the rim, and C C' the side plates, of the boxing or casing in which the operating mechanism is housed, which boxing is fitted and secured in a recess formed in the window-frame D. The face-plate is formed of two sections 1 2, the one having lugs 3 and the other recesses 4, in which the former fit to hold the sections in the proper position with relation to each other, screws 5 passing

through the two sections, serving to hold them together. The section 2 is formed with a recess 6, into which fits a shoulder 7, carried by the section 1, the vertical wall of the recess and the shoulder forming a slot 8, the width of which may be increased or diminished by lengthening or shortening the said shoulder.

E F designate two combined fusee and barrel cylinders, which for the sake of convenience of description will be hereinafter designated as "fusee-cylinders," which cylinders are loosely mounted upon shafts G, journaled in the sides C C' of the casing. One end of each of these shafts carries a rigidly-attached ratchet-wheel H, which is engaged by pawls 9 on the side C of the casing, whereby the said shafts are free to revolve in but one direction only. The end of each shaft is also provided with a recess 10, into which a key is inserted when it is desired to turn the shaft, for a purpose that will presently appear.

I designates two helical springs, one end of each of which is secured to shaft G and the other end to the inner surface of the said cylinder.

J designates a gear-wheel which is carried by the cylinder E, a portion of the periphery of which wheel extends through the slot 8 in the face-plate and engages a rack-plate K, carried by the window-sash.

L designates a pin which is mounted in an apertured lug 11 on section 2 of the face-plate and carries on its inner end a toe 12, designed to be turned into engagement with the gear-wheel J to prevent uncoiling of the springs when the sash is removed, a projection 13, working in a slot 14 in the lug, serving as a stop to prevent the toe being turned too far. The outer end of the pin is provided with a nick 15, into which is inserted the point of a screw-driver when it is desired to turn the pin for the purpose above stated.

The cylinders E F, to which reference has been made, are each constructed with a tapered spirally-grooved fusee portion 16 and with a straight or barrel portion 17, which portions are preferably of the same dimensions in each cylinder, although, if desired, the dimensions may be varied. A cable or chain M serves to connect the two cylinders and is secured to the large diameter of fusee

16 of one cylinder and to the straight or barrel portion 17 of the other cylinder.

In setting the balance for operation the springs are put under the desired tension by turning the shafts in the manner described, which tension is sufficient to hold the window at its highest raised point, at which time the cable is wound upon the cylinder F. As the window is lowered the cable is unwound from cylinder F and wound upon cylinder E, and as the cable is leaving the largest diameter and is approaching the smallest diameter of both cylinders, and vice versa when the window is raised, it follows that the tension of both springs is equalized, thereby requiring but little power either to raise or to lower a window.

In practice the gear J is preferably made of such a size that it will not make more than three revolutions while the sash is being raised to its full height, thus causing but a small loss of tension in the springs, and, as a consequence, requiring but a small change of the diameter of the cylinder; but it is to be understood that I may, if desired, diminish the diameter of gear J and increase the diameter of cylinders E F. By either construction, but preferably by the former, I provide for an increase of leverage as the springs lose tension and the reverse when they are being placed under tension, whereby the tension of the springs is always equalized whether the sash is being raised or lowered.

By means of the barrel portions of the cylinders the gear J is allowed, preferably, to make one complete revolution before the cable begins to climb the tapered portions, as the loss of tension in one revolution is so slight as scarcely to be perceptible and not enough to effect the working of the sash-balance.

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

1. In a sash-balance, a casing, two spring-actuated fusee-cylinders journaled therein, one of which carries a gear-wheel, and a flexi-

ble connection uniting the large diameter of one cylinder with the small diameter of the other cylinder and contacting normally with the small diameters of the two cylinders, in combination with a fixed rack-plate with which the said gear-wheel meshes.

2. In a sash-balance, a casing, two spring-actuated fusee-cylinders journaled therein, each consisting of a fusee portion and a barrel portion, a gear-wheel carried by one of the cylinders, and a flexible connection uniting the said cylinders, in combination with a rack-plate with which the said gear-wheel meshes.

3. In a sash-balance, a casing, two shafts journaled therein, fusee-cylinders loosely mounted on the shafts, one of which cylinders carries a gear-wheel, springs connecting the shafts and the cylinders, and a flexible connection uniting the two cylinders, in combination with a fixed rack-plate with which the said gear-wheel meshes.

4. In a sash-balance, a casing, two shafts journaled therein, fusee-cylinders loosely mounted on the shafts, one of which cylinders carries a gear-wheel, springs connecting the shafts and the cylinders, means for regulating the tension of the springs, and a flexible connection uniting the two cylinders, in combination with a rack-plate adapted to be engaged by the said gear-wheel.

5. In a sash-balance, a casing, two shafts journaled therein carrying rigidly-attached ratchet-wheels, pawls carried by the casing and engaging the said wheels, fusee-cylinders loosely mounted on the shafts, one of which cylinders carries a gear-wheel, helical springs connecting the shafts and the cylinders, and a flexible connection uniting the two cylinders, in combination with a fixed rack-plate with which the said gear-wheel meshes.

In testimony whereof I affix my signature in presence of two witnesses.

SAMUEL N. GOLDY.

Witnesses:

JAS. C. L. WADSWORTH,
GEO. T. KNOX.