

(No Model.)

A. M. HOWARD.
SASH BALANCE.

No. 514,005.

Patented Feb. 6, 1894.

Fig. 1.

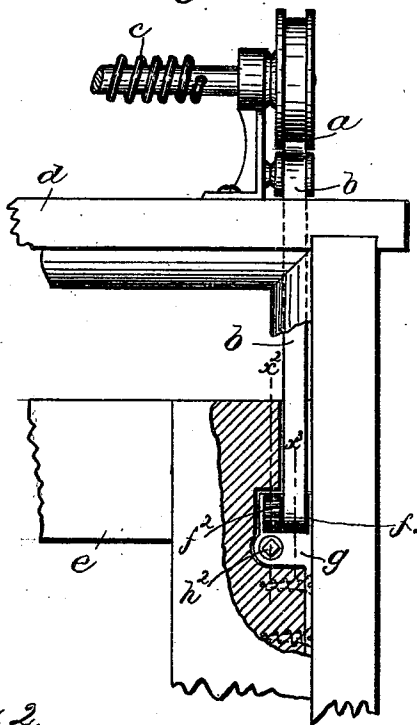


Fig. 2.

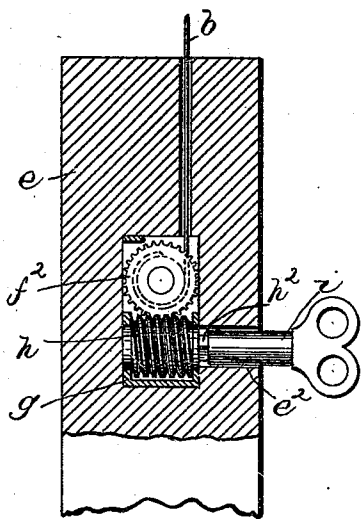


Fig. 3.

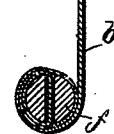
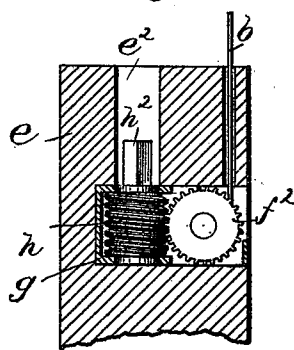


Fig. 4.



Witnesses

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UNITED STATES PATENT OFFICE.

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SASH-BALANCE.

SPECIFICATION forming part of Letters Patent No. 514,005, dated February 6, 1894.

Application filed July 31, 1893. Serial No. 481,986. (No model.)

To all whom it may concern:

Be it known that I, ANSON MERRICK HOWARD, of New Haven, county of New Haven-State of Connecticut, have invented an Improvement in Sash-Balances, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention relates to a sash balance and is embodied in a tension regulator to be used in connection with window sashes that are balanced by a spring applied to a flexible sash suspender such as a cord or band which is wound up by the spring as the sash rises and is unwound against the stress of the spring when the sash is lowered. In sash balances of this class as usually constructed the spring and winding appliances are commonly located above the head of the sash frame or below the sill thereof, and are not easily accessible after the window frame is finished, and if the spring should become weaker after a period of use it might fail to hold the sash in its highest position in the frame, that being the point at which the spring is weakest.

The object of the present invention is to provide a simple, convenient, and efficient device for adjusting the tension of the spring under such conditions and it consists in the combination with the spring actuated sash suspender of a device adapted to be secured to the sash comprising a take-up spool with which the lower end of the sash suspender is connected so that it can be wound thereon, said spool being provided with a worm gear and a worm meshing with said gear for turning said spool so that the lower end of the suspender may, if found necessary, be wound or drawn off from the spring actuated reel and taken up at the sash. Such drawing off of the suspender from the winding reel will rotate the latter against the stress of the spring and thus bring the spring to a higher state of tension with the sash at any given height than it was before the suspender was thus wound off from the reel and taken up at its point of connection with the sash. The worm for turning the winding spool in the sash is provided with a key shaft adapted to be operated by a key or winding handle applied

through a suitable hole in the sash and as the adjustment needs to be made only at long intervals if at all, the key-hole may if desired be concealed by the inside or parting bead of the sash frame which may be removed when the adjustment is to be made, or the key-hole may be in such position as to be accessible without removing the beading strips, either at the front of the stiles or at the top of the sills of the sashes.

Figure 1 is a front elevation of a sufficient portion of a sash and balancing mechanism therefor to illustrate this invention, a portion of the sash being broken away and shown in section to exhibit the take-up or adjusting attachment for the lower end of the suspender in elevation; Fig. 2 a transverse vertical section on line x^2 , Fig. 1, showing the take-up device with the key applied; Fig. 3 a sectional detail on line x^3 , Fig. 1, and Fig. 4 a sectional view illustrating the take-up device applied in a different position with relation to the sash.

The invention is applicable with any suitable or usual form of spring balancing mechanism, being shown in this instance as employed in connection with a winding reel a to which the upper end of the sash suspender b is attached and upon which the said suspender is wound by the action of a spring c as the sash is raised; the force of said spring tending to wind the suspender upon the reel a and being normally sufficient to balance the weight of the sash tending to unwind the suspender from the reel, so that the sash will be properly counter-balanced and will run easily up and down and will remain at any height at which it is placed in the sash frame. The balancing mechanism is shown in this instance as mounted upon the upper surface of the head d of the sash frame so that it is inclosed when the frame is finished and is therefore not easily accessible for the purpose of adjustment after the window frame is finished and in order to provide for adjustment of the tension of the spring, if required, the lower end of the suspender, instead of being fastened directly to the sash e is connected with an adjustable attaching device or take-up properly secured to the stile or other suitable

part of the sash. As shown in this instance the take-up consists of a small reel or spool *f* journaled in suitable bearings in a frame piece *g* that may be let into the wood of the sash and fastened thereto by screws or otherwise, the end of the suspender *b* being as shown in this instance connected to the said winding spool by being passed through a slot therein as best shown in Fig. 3.

In order to provide for the rotation of the spool *f* it is as shown in this instance provided with a worm gear *f*² meshing with a worm *h* as best shown in Fig. 2, also turning in suitable bearings in the frame piece *g* and provided with means for rotating the same as for example the squared arbor *h*³ to be engaged by a key *i* introduced through a suitable hole *e*² in the sash.

The key-hole *e*² may either be in such location as to be concealed behind the bead *d*² of the sash frame, which would then have to be removed in order to permit the key to be applied for the purpose of adjusting the sash suspender; or by properly constructing the frame *g* and working parts the said key-hole may either be accessible at the front of the sash or if preferred from the top of the sash rail as shown in Fig. 4. The thread of the worm *h* is of such pitch that it cannot be rotated by the pressure of the teeth of the worm gear and will thus remain in whatever position it is left by the key. If at any time it should be found that the spring of the balancing mechanism was not strong enough to hold the sash in its highest position in the frame so that the sash would drop by its weight an inch or two for example, to the position with relation to the top of the window frame, shown in Fig. 1, the key could be applied to the take-up device and the latter operated to wind the band *b* upon it which operation would raise the sash to the top of the frame if the reel *a* remained stationary during the operation; or, what amounts to the same thing, if the sash remained stationary, the operation would unwind a corresponding portion of the suspender *b* from the reel *a* thus turning the latter against the stress of the spring *c* and thereby tightening the said spring so that it

would exert greater force and would consequently counterbalance the sash when pushed clear to the top of the frame. It is of course necessary to provide a sufficient length of the suspender *b* to enable a portion of it to be thus unwound from the reel *a*, and wound upon the reel *f* when required to adjust the spring *c*, and yet leave enough on the reel *a* to permit the sash to be moved down to its lowest position.

It is obvious that if the balancing spring should be rendered too strong by adjustment or otherwise, the reverse adjustment might be made by unwinding a portion of the lower end of the band from the take-up spool *f* and thus permitting the spring *c* to wind the corresponding amount upon the reel *a* thus relaxing and thereby reducing the strength of the spring.

In case the sash suspender becomes stretched or lengthened by use, the sash can be properly adjusted by winding a portion of the lower end of the suspender on to the take-up spool *f*.

Where two tapes or suspenders are used to support the sash and two of my tension regulators are employed, it is obvious that by adjusting one or both of them the length of the suspenders can be altered so as to compensate for unevenness in their length, and that thereby the sash may be properly hung.

I claim—

The combination with a spring actuated sash suspender of a take-up spool adapted to be secured to the sash and have the lower end of said suspender connected therewith and wound thereon, a worm gear connected with the said spool and a worm meshing therewith provided with a key shaft accessible through an opening in the sash, substantially as and for the purpose described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ANSON MERRICK HOWARD.

Witnesses:

PHILIP POND, 2nd,
CHARLES C. FORD.