(24.)

HIRAM SMITH.

Sash Balance.

No. 122,288. Patented Dec. 26, 1871.

Figure 1.

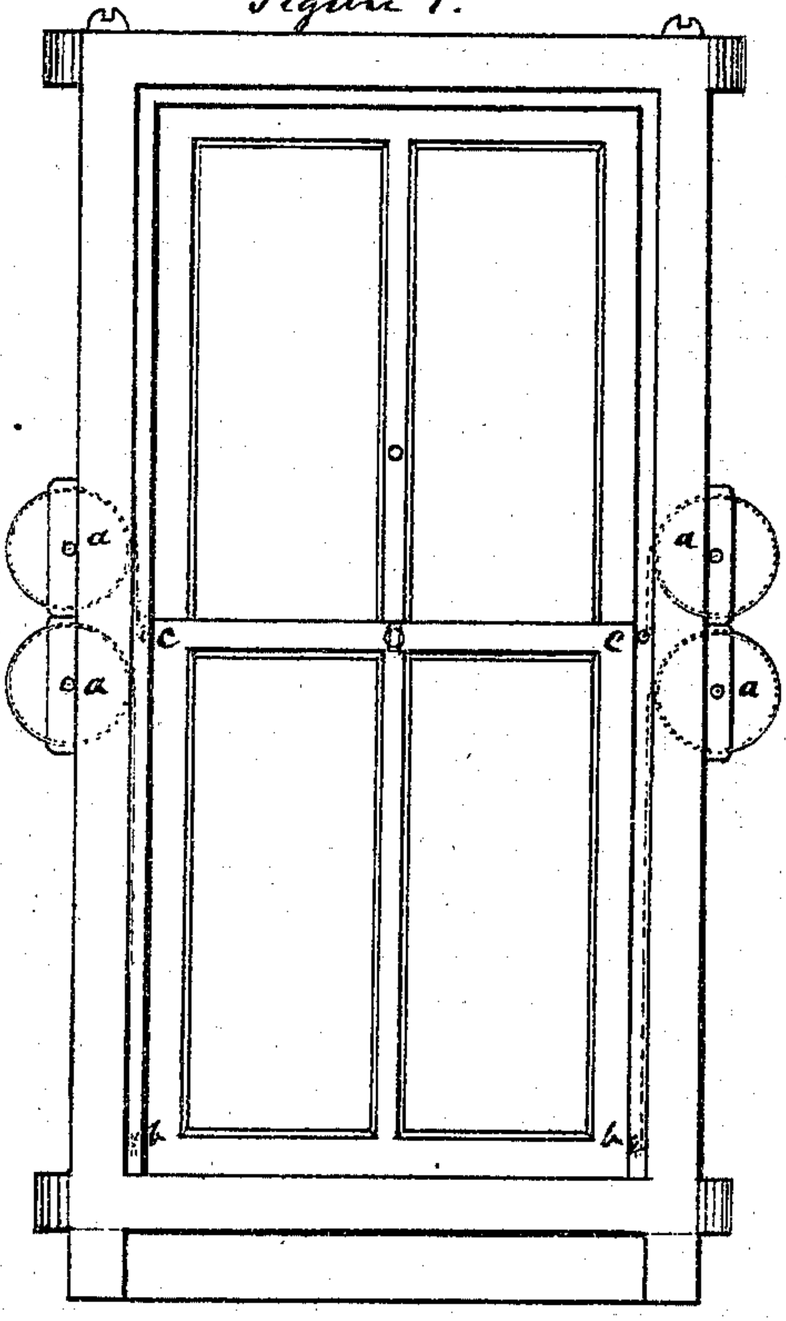


Figure 2

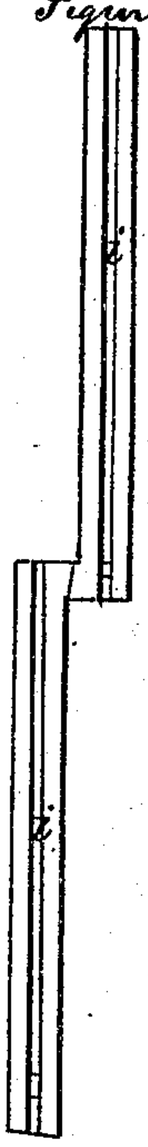


Figure 3.

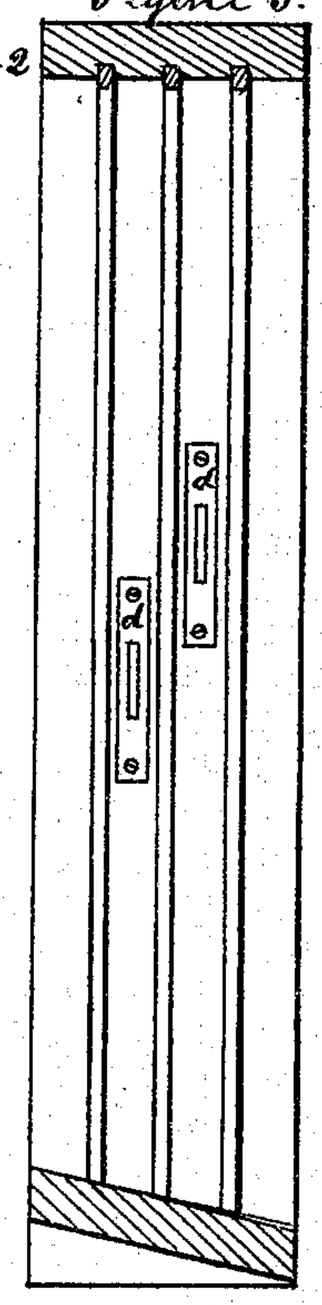


Figure 4.

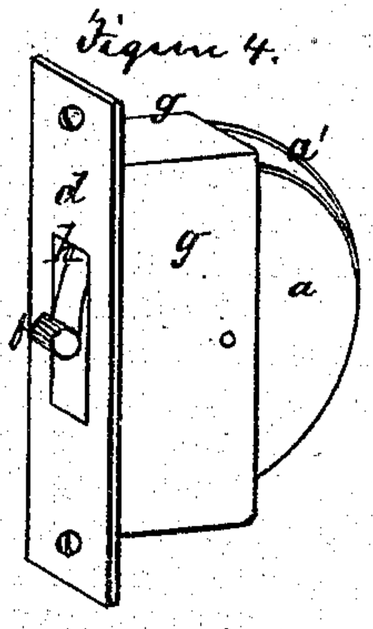


Figure 5.

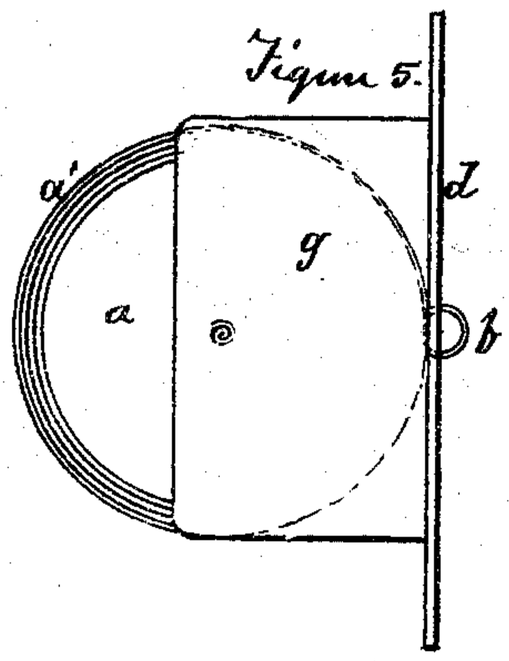
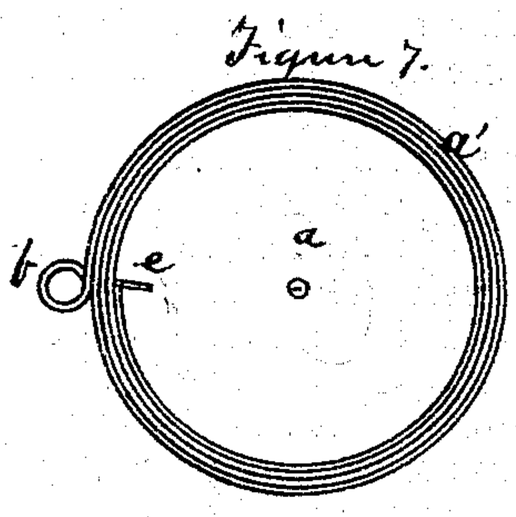


Figure 6

Figure 7.



Witnesses
A. B. Rowland
E. B. Freas

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UNITED STATES PATENT OFFICE.

HIRAM SMITH, OF TITUSVILLE, PENNSYLVANIA.

IMPROVEMENT IN SASH-BALANCES.

Specification forming part of Letters Patent No. 122,288, dated December 26, 1871.

I, HIRAM SMITH, of Titusville, in the county of Crawford and State of Pennsylvania, have invented a new and useful Improvement in Window-Sash Balance, of which the following is a specification:

In the accompanying drawing, Figure 1 represents an elevation of the inner side of a window-frame embracing my invention. Fig. 2 represents an edge view of the sash, showing the shallow groove for the play of the balance-suspending springs. Fig. 3 represents an inside view of the window-jamb. Fig. 4 represents a view, in perspective, of the face-plate, the drum, and balance-spring, the latter in the position of rest upon its drum. Fig. 5 represents a side elevation of the same. Fig. 6 represents the face-plate, and Fig. 7 the drum, and the suspending-balance spring coiled thereon in a position at rest.

The drums or pulleys *a a* of the balance-springs *a'* are solid, and each is supported by suitable bearings in the side pieces *g g* of the face-plate *d*, as shown in Figs. 4 and 5, and fitted within a recess in the window-frame, as shown in Fig. 1. The balance-springs *d'* are attached to the drums or pulleys at *e*, Fig. 7, and to the lower bars at *b b* and *c c* of the upper and lower sash, as shown in Fig. 1, by screws or otherwise, one end of each balance-spring being attached to the pulley or drum and the other to the sash. The face-plate must be provided with an opening, *h*, to allow this connection and the free play of the suspending balance-spring in its winding and unwinding movement. When the lower sash is down the balance-springs are uncoiled and straightened, and lie in the grooves *i* of the sash; and when the upper sash is closed the balance-springs are coiled upon their pulleys in positions at rest. In Figs. 4, 5, and 7 the end of the balance-spring to which the sash is suspended is shown at *f*. The distinguishing feature of my invention consists in balancing the sash directly by and upon steel springs, which are tempered in a coiled position, with one end secured to the circumference of a pulley and the other to the sash; and the pulley, being free to turn upon its axis, tends, consequently, to be revolved automatically to wind the spring by the force thereof, which also balances the sash. Moreover, it is this feature of being coiled when at rest that causes the spring to hug and cling tightly around the pulley so as to require force to straighten it out or unwind it, which force, in recoiling, will alone balance the sash and act with equal force throughout the entire movement of the sash. This is the feature which insures a uniformity in the balance of the springs throughout their entire length, while, at the same time, the means for balancing, serve also as the means for suspending and operating the sash.

These thin steel-spring suspending straps are durable, and can be applied to old windows or new where there has been no provision made for weights, and in the angles of bay windows, and in railroad cars where there is no room for weights and where they cannot be used. My improvement, moreover, is much cheaper, by half, than weights and cords, and is thereby brought within the reach of all classes of builders. These operating straps, of course, must be of sufficient strength to suit large or small sash; and the pulleys must be of such diameter that the straps, when wound, will not very materially increase their diameter; and, as each strap is secured to the circumference of the pulley and wound one fold tightly upon another, the force of the recoil of the spring is exerted always from the circumference, and not from the center of the circle which it forms upon the pulley, and thereby produces an equal degree of force upon the sash at every point throughout the length of the strap in opening or closing the sash.

The pulleys may be of wood and solid, and the spring-straps secured to their circumference in any suitable way; and the pulleys should be so arranged to allow the straps to pass through the openings in the face-plates to cause the straps to be wound and unwound in a line with the grooves in the edges of the sash.

Having described my invention, I claim—

The spring-pulley balance, consisting of the pulley *a* and spring *a'*, attached, by one end, to the periphery of the pulley, and wound compactly so as to wind and unwind directly thereon in effecting the balance of the sash to which it is attached, and thereby avoid the objection of separate loose coiled adjustable springs and pulley-straps, as described.

HIRAM SMITH.

Witnesses:

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