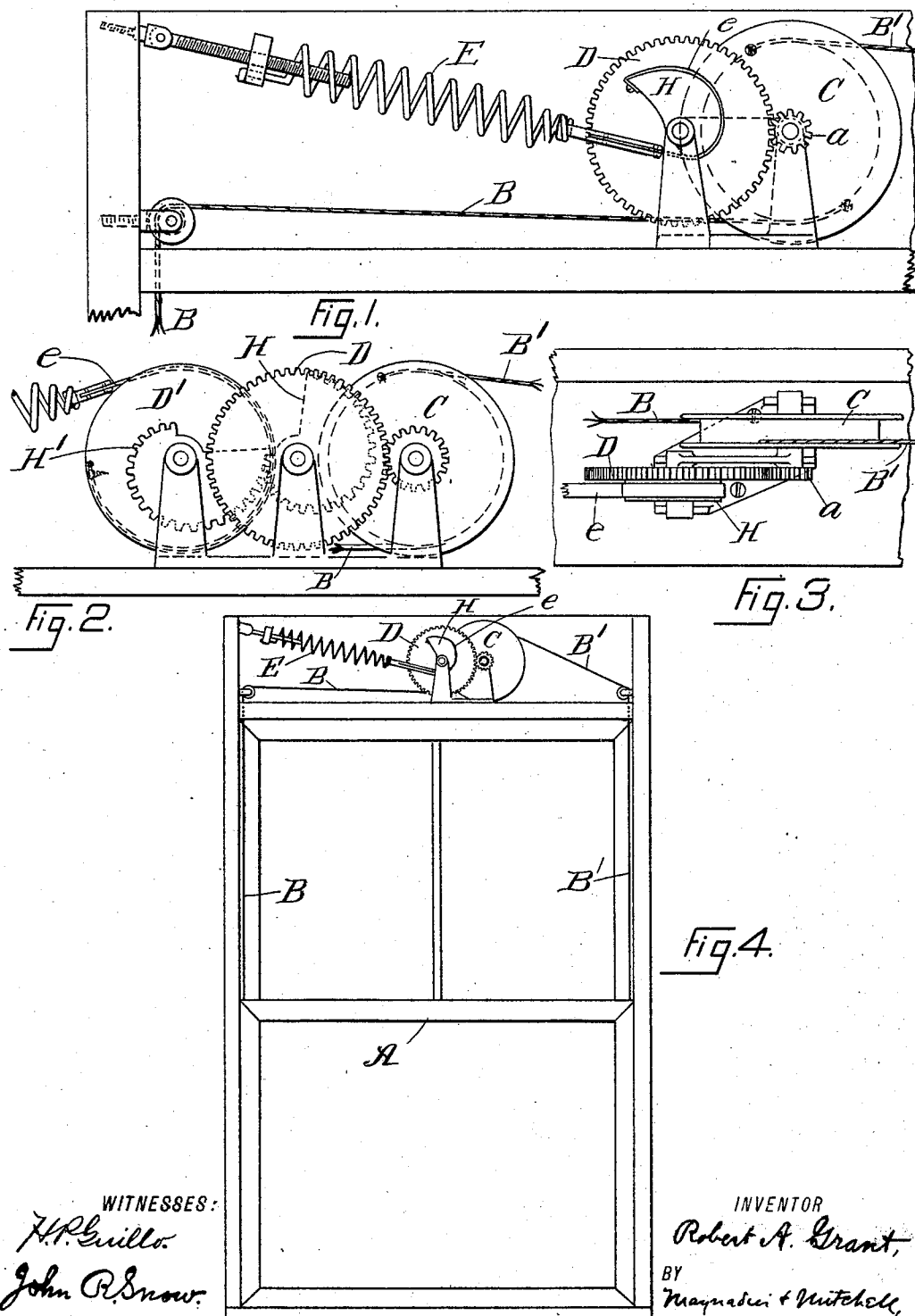


(No Model.)

R. A. GRANT.
SASH BALANCE.

No. 575,926.

Patented Jan. 26, 1897.



WITNESSES:

H. P. Guillo.
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UNITED STATES PATENT OFFICE.

ROBERT A. GRANT, OF CAMBRIDGE, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO ELIJAH A. SHAW, OF LEXINGTON, MASSACHUSETTS.

SASH-BALANCE.

SPECIFICATION forming part of Letters Patent No. 575,926, dated January 26, 1897.

Application filed November 30, 1896. Serial No. 613,935. (No model.)

To all whom it may concern:

Be it known that I, ROBERT A. GRANT, a subject of the Queen of Great Britain, residing at Cambridge, in the county of Middlesex and State of Massachusetts, have invented a new and useful Counterpoise for Window-Sashes and the Like, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is an elevation of my counterpoise. Fig. 2 is an elevation of a modified form. Fig. 3 is a plan of Fig. 1, and Fig. 4 is an elevation showing a window with its lower sash attached to my counterpoise.

My invention is a counterpoise for window-sashes and the like, and is designed to take the place of the weights and pulleys now in common use.

My invention is the combination of a window-sash or the like whose weight is to be counterpoised provided with cords with a drum or roll to which the cords are attached, which drum or roll is connected to a spring which exerts its force to cause the drum to turn, thus winding the cords upon it and aiding in lifting the weight attached to the cords.

In the drawings, A is the sash, to which are attached the cords B B', which are also attached to the periphery of the drum C. The shaft of drum C carries the pinion a, which meshes with the toothed wheel D, whose shaft carries the cam H. The spring E, one end of which is secured to the window-casing, is secured to the cam H by means of flexible connections e in such a manner that when the sash is down, as shown in the drawings, the connection e is wound on the cam H, and when the sash is raised the force of the spring causes the cam H to turn, thus turning the wheel D and through it the drum C and winding the cords on the drum. It is clear that when the sash A is at the position shown in the drawings the spring E is stretched to its greatest length and is consequently exerting

its greatest force, which force diminishes in a direct ratio as the length of the spring diminishes.

In order to equalize the force of spring E, I attach one end of it by flexible connections e to the cam H, so that when the sash is down and the spring exerting its maximum power there is a small leverage to aid the spring in turning the wheel D, but as the wheel turns and the power of the spring diminishes the leverage in favor of the spring increases, so that by a proper construction of the cam H and spring E a uniform force will be exerted by the spring throughout the entire operation of raising the sash.

In Fig. 2 I have shown a modified form of my counterpoise, in which the spring is attached by flexible connection 2 to a wheel D', which carries a toothed cam H', mounted on it. Toothed cam H' intermeshes with toothed cam H on wheel D. By using the wheel D' and its cam H', I am able to stretch the spring much farther than by using only the wheel D and cam H, for in the form shown in Fig. 1 the connection e is only wound around the face of cam H, while in the form shown in Fig. 2 the connection e is wound around the periphery of wheel D'.

It is obvious that my invention may be applied to sliding doors, dumb-waiters, and the like without any material change in construction.

What I claim as my invention is—

The combination of sash A and its cords B B' with drum C, wheel D; cam H mounted on wheel D and spring E one end of which is fast to the window-casing and the other to cam H; all combined to allow spring E to exert its power to turn drum C and thereby raise the sash, substantially as described.

ROBERT A. GRANT.

Witnesses:

JOHN R. SNOW,
WILLIAM MAYNADIER.