

(No Model.)

W. ORMSBY.
SASH BALANCE.

No. 285,505.

Patented Sept. 25, 1883.

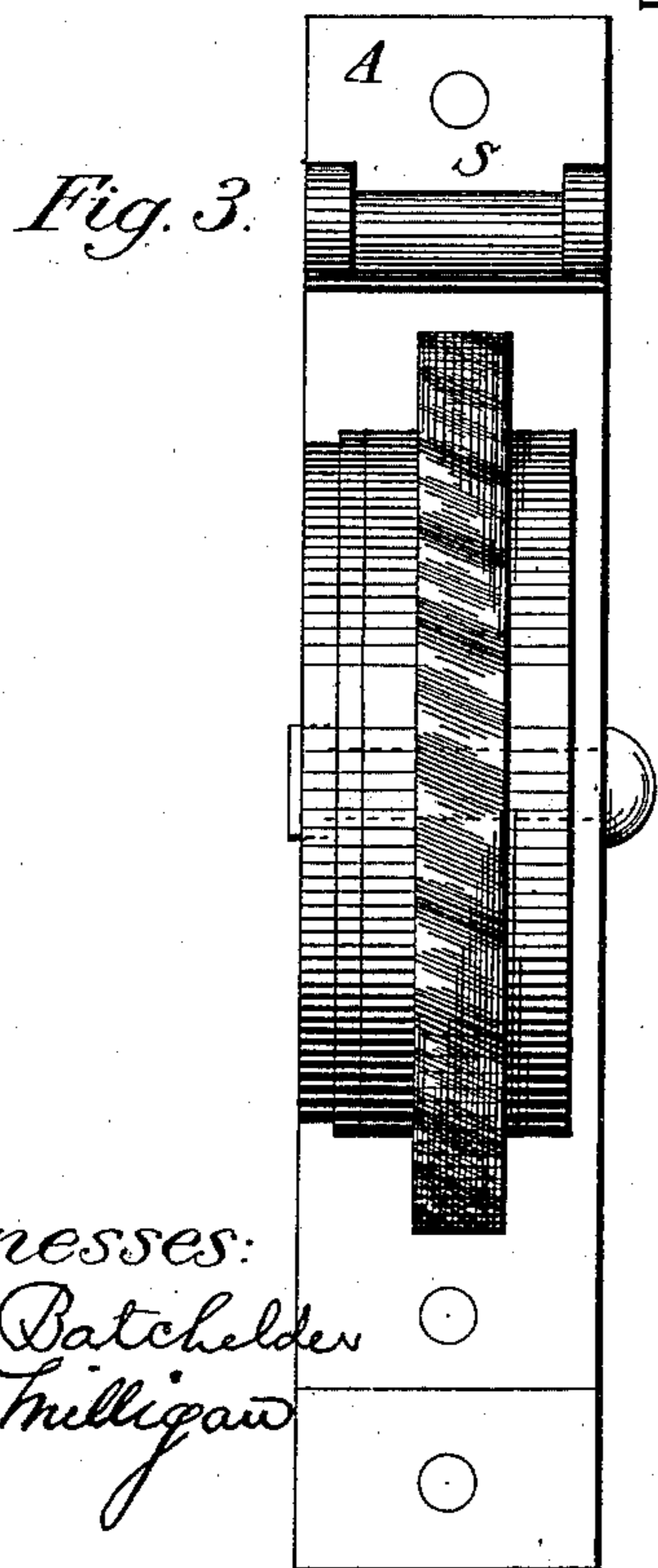
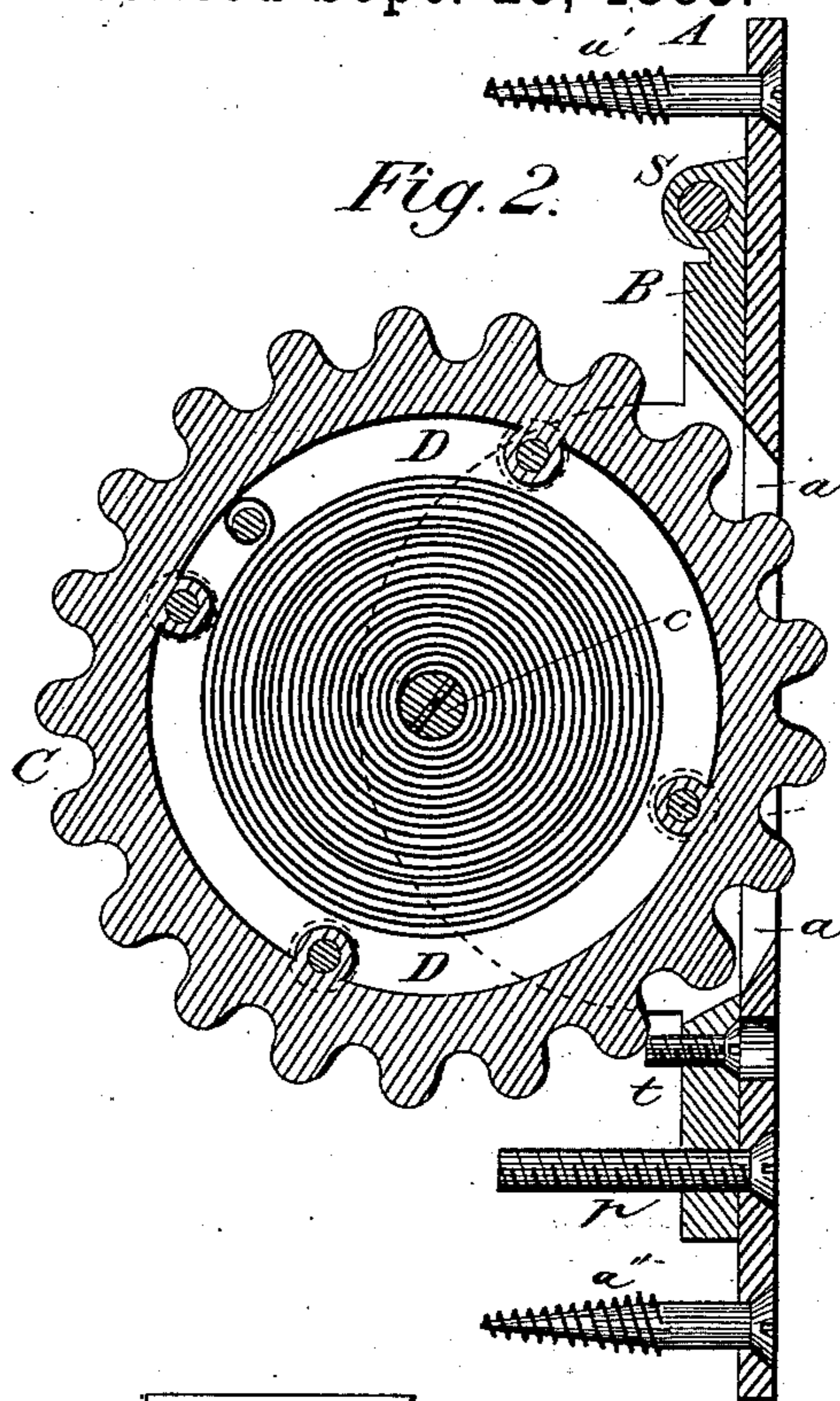
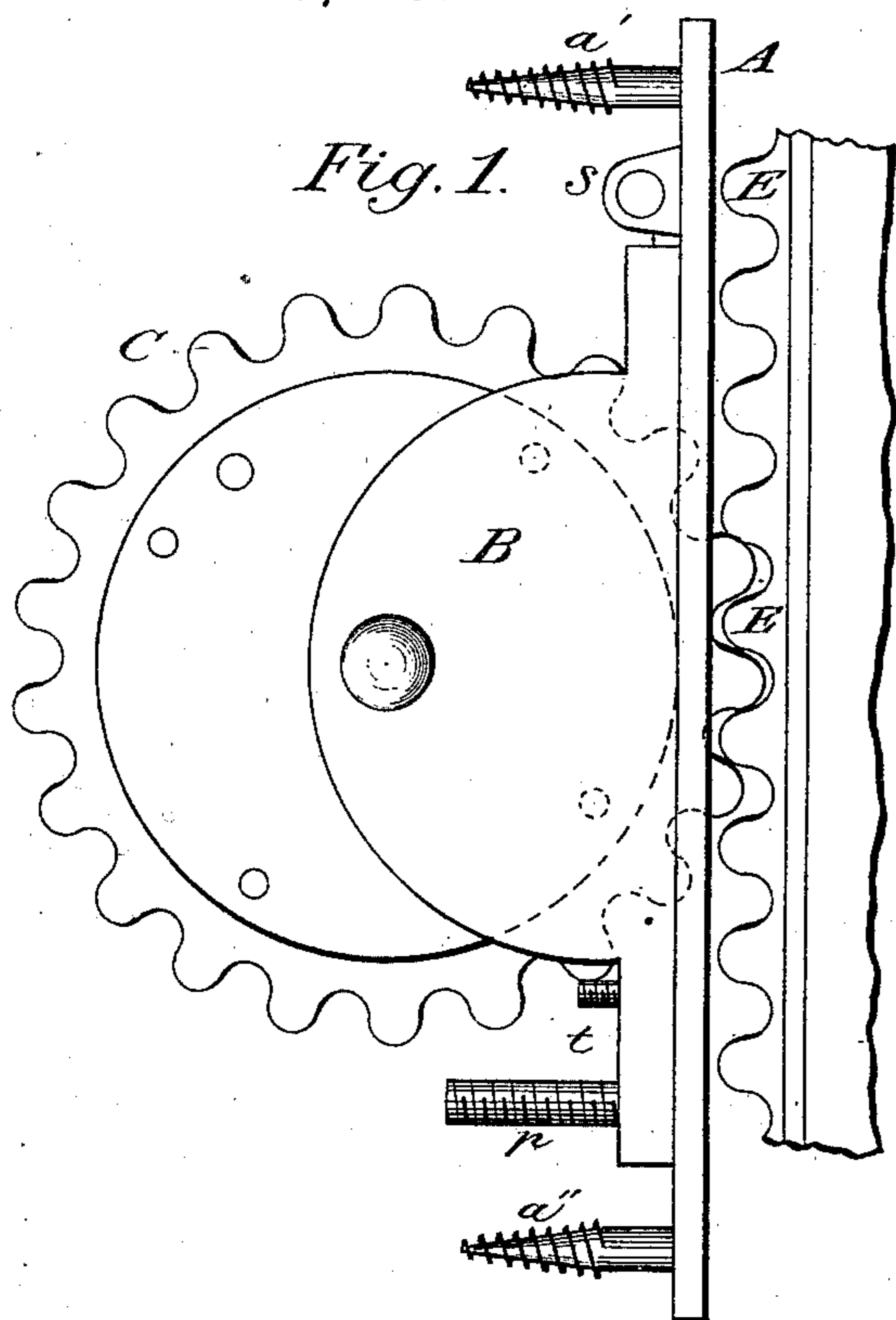
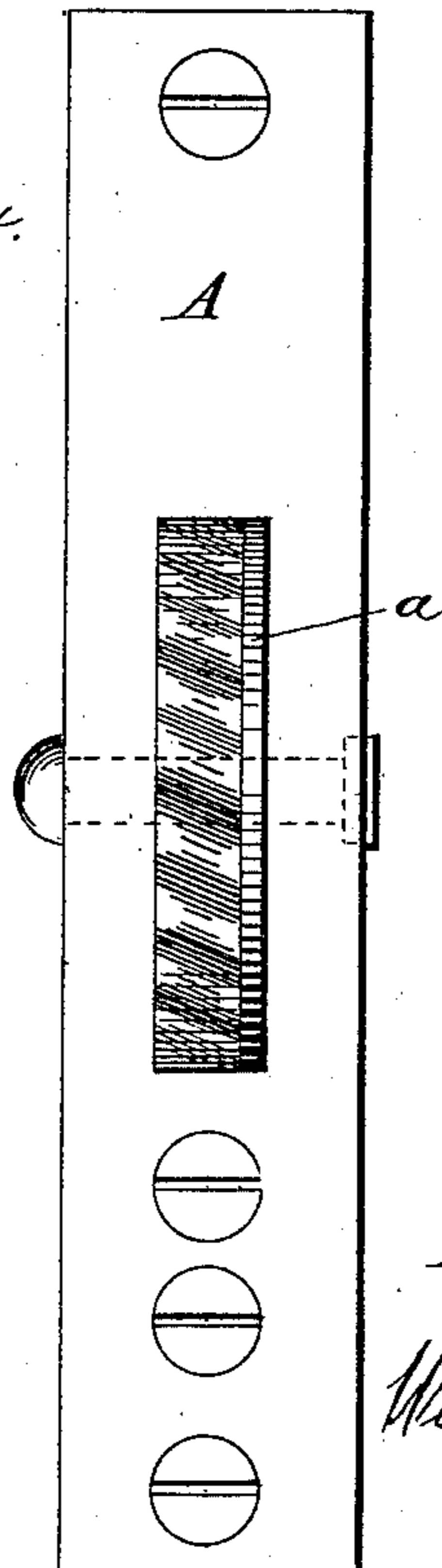


Fig. 4.



Witnesses:
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UNITED STATES PATENT OFFICE.

WILLIAM ORMSBY, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO HIMSELF,
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SASH-BALANCE.

SPECIFICATION forming part of Letters Patent No. 285,505, dated September 25, 1883.

Application filed May 2, 1883. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM ORMSBY, a citizen of the United States of America, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Sash-Balances, of which the following is a specification, reference being had therein to the accompanying drawings.

The object of my invention is to provide means whereby the sashes of windows or doors which slide in a vertical direction may be more easily operated—that is, opened and closed.

My invention relates to that class of sash-balances in which springs take the place of the ordinary weights and cords, as hereinafter more particularly set forth.

In the drawings, Figure 1 is a side elevation of a sash-balance made in accordance with my invention. Fig. 2 is a sectional view of the same. Fig. 3 is a plan view, looking toward the edge of the sash to be operated upon. Fig. 4 is a face view, the sash and rack being removed.

Similar letters of reference refer to like parts in the several figures.

A is the face-plate or bed-piece of the sash-balance, to which is hinged at S, near its upper end, the carriage B, which carries the wheel C. Within the barrel-wheel C (shown in section in Fig. 2) is the coiled spring D, one end of which is attached to the arbor *c*, and the other or outer end to the inside of the wheel C. The arbor *c* has no rotary motion, being prevented from turning in the ears of the carriage B by the form of its bearing ends, or by any other suitable means. This arrangement of the coiled spring and arbor is the same as that usually adopted with springs inclosed within a barrel.

The periphery of the barrel-wheel C is provided with projections resembling cogs, but without angles, the contour of the wheel presenting a sinusoidal line circular in main form or direction. These projections and indentations, forming in reality corrugations in the face of the barrel-wheel, have a direction not at right angles to the plane of the wheel—that is to say, not in a line with the arbor—as is clearly shown in Figs. 3 and 4. For clearness

of description I term them “beveled corrugations,” and their function is, first, by engagement with the rack E to exert, by virtue of the power stored in the coiled spring, a lifting force upon the window-sash or door to be operated to counterbalance its gravity; and, second, by reason of the shape of the corrugations, to give to said window-sash or door a motion to or from the operator, in order that in case of windows the sash shall always bear against the outside strip, and thus prevent the ingress of cold air, dust, &c.

The rack E has beveled or inclined corrugations corresponding to those upon the periphery of the barrel-wheel. When in position the corrugated wheel, projecting a proper distance from the free opening *a* in the face-plate or bed-piece A, is let into the window-post or jamb-casing at a point slightly below the highest part of the sash or door to be operated upon, (when closed,) and is in engagement with the rack E, which latter is let into the edge of said sash flush with the surface, so that no portion of it is observable from either side of the sash. The height to which the sash can be raised should be such as to expose only that portion of the sash-balance proper which contains the detent-screw *t* and the carriage-screw *p*.

With a corrugated wheel located upon each side of a sash, and each engaged with its proper corrugated rack, the sash could not be removed from the frame without raising it clear of the wheels, thus leaving the springs free to uncoil, and, to provide for putting the sash in place and removing the same at pleasure, the carriage B, with the carriage-screw *p* and detent-screw *t*, before alluded to, is provided. As the carriage B is hinged at its upper end to the face-plate A, and as the wheel has a to-and-fro motion with the carriage, a sufficient oscillating motion of the carriage away from the sash will clear the wheel from engagement with the rack and allow of the removal of the sash. This motion of the carriage B is governed by the carriage-screw *p*, which is threaded into the lower cross-piece of the carriage, but has a free motion in the face-plate, both rotary and longitudinal, its head alone preventing it from leaving said face-plate when pressure is exerted upon the car-

riage to move it away from the sash. It is clear, then, that by turning this screw in the proper direction the corrugated wheel can be disengaged from the rack, or be brought into engagement therewith with any desirable degree of pressure. Disengagement, however, as already explained, would allow of the uncoiling of the spring and the loss of the power stored therein; and to prevent this I provide the detent-screw *t*, which is threaded into a portion of the cross-piece of the carriage very near the periphery of the barrel-wheel C. Like the carriage-screw *p*, it has free motion in the face-plate; but, unlike the carriage-screw, its head does not prevent it from leaving the face-plate when screwed in. In fact, the opening in the face-plate, where it occurs, is merely to give access to it. When screwed in its point engages with one of the corrugations upon the periphery of the barrel-wheel and effectually prevents its rotation.

The operation of my device is as follows: Before placing the balance proper in position the wheel is revolved until the approximately proper degree of tension is obtained, when the detent-screw *t* is driven forward, thus preventing the uncoiling of the spring. It is then placed in position in a proper mortise, the face-plate being flush with the surface of the jamb, and is held in position by the screws *a'* and *a''*. The carriage-screw *p* is now turned to the left until the projecting part of the wheel is flush with the face-plate, when the sash, provided with the rack, as hereinbefore explained, can be put in place and raised to its greatest height, when, although the opening *a* is nearly or quite covered by the sash, access is free to the carriage-screw *p*, which is now turned to the right to bring the carriage and wheel forward to engage with the rack. Lastly, the detent-screw *t* is turned out to free the wheel, which should exert just sufficient force to hold

the sash firmly in place. Now, a downward motion of the sash will coil the spring still more, and afterward the window may easily be raised and lowered.

The convolutions of the spring are so many, and the diameter of the wheel such that the difference in tension, caused by placing the sash at various elevations, is slight, and is inconsiderable when friction is taken into account, and I take advantage of this necessity for slight friction by causing it to occur mainly between the sash and the outside strip, where it is utilized, as before explained, for the exclusion of cold air, &c.

It is intended that every sash shall be furnished with two balances; but I have not thought it necessary to complicate the description by reference to both, except where one would interfere with the other.

An important advantage gained by my device is its adaptability to being entirely concealed. As tension is given to the spring before the sash is placed in position, there is no necessity for any disfigurement of the face-casing of the window-frame by making an opening through which to wind the spring.

Having thus described my invention, I claim—

In combination with the beveled corrugated rack and face-plate, the corrugated wheel containing and actuated by a coiled spring, and journaled in the swinging frame or carriage B, and the adjusting-screw *p* and detent-screw *t*, all operating in the manner described, and for the purpose specified.

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

WILLIAM ORMSBY.

Witnesses:

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