(No Model.)

A. W. BIDDLE.

SASH BALANCE.

No. 406,987. Patented July 16, 1889.

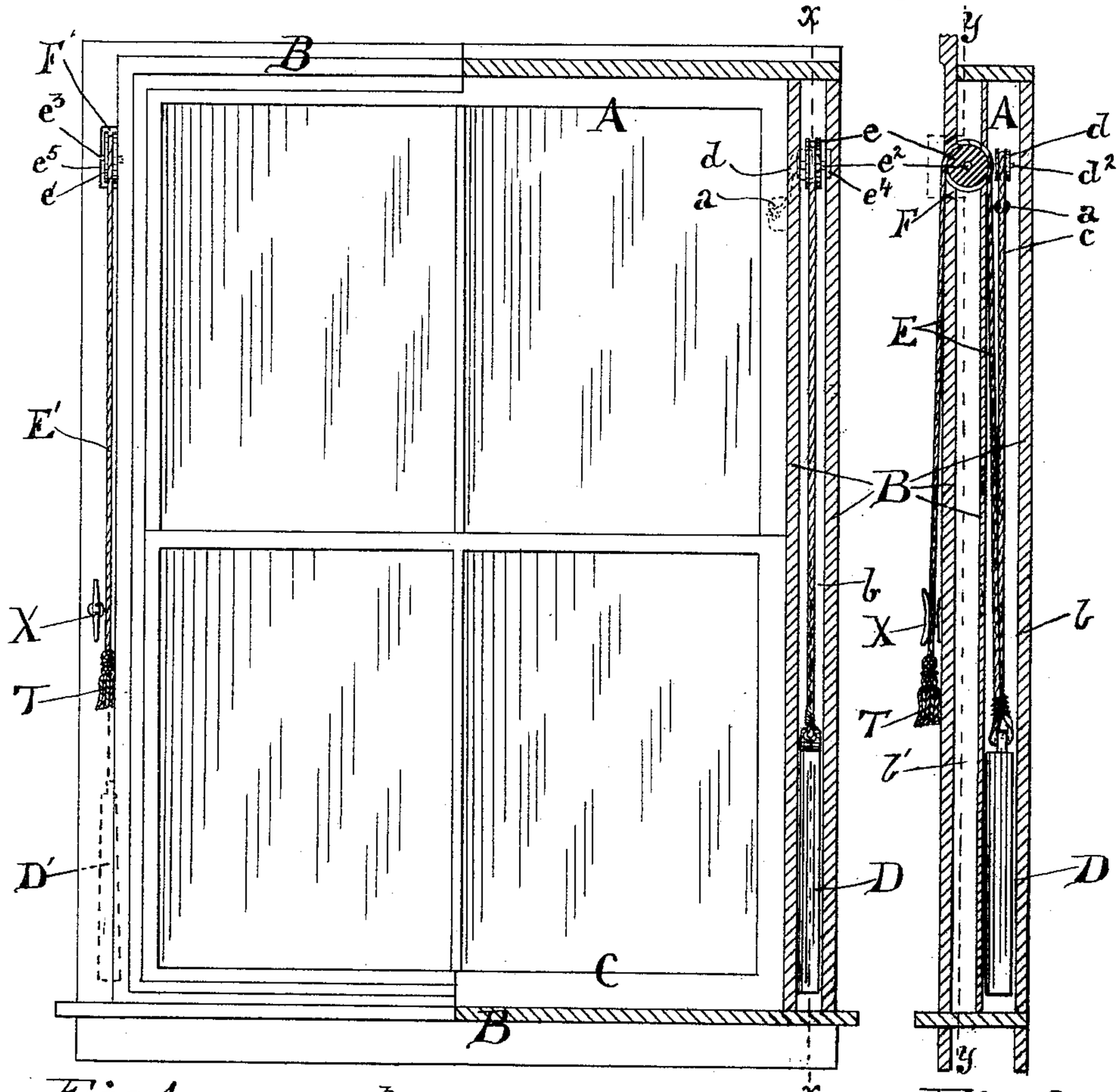

Fig. 1. Fig. 2.

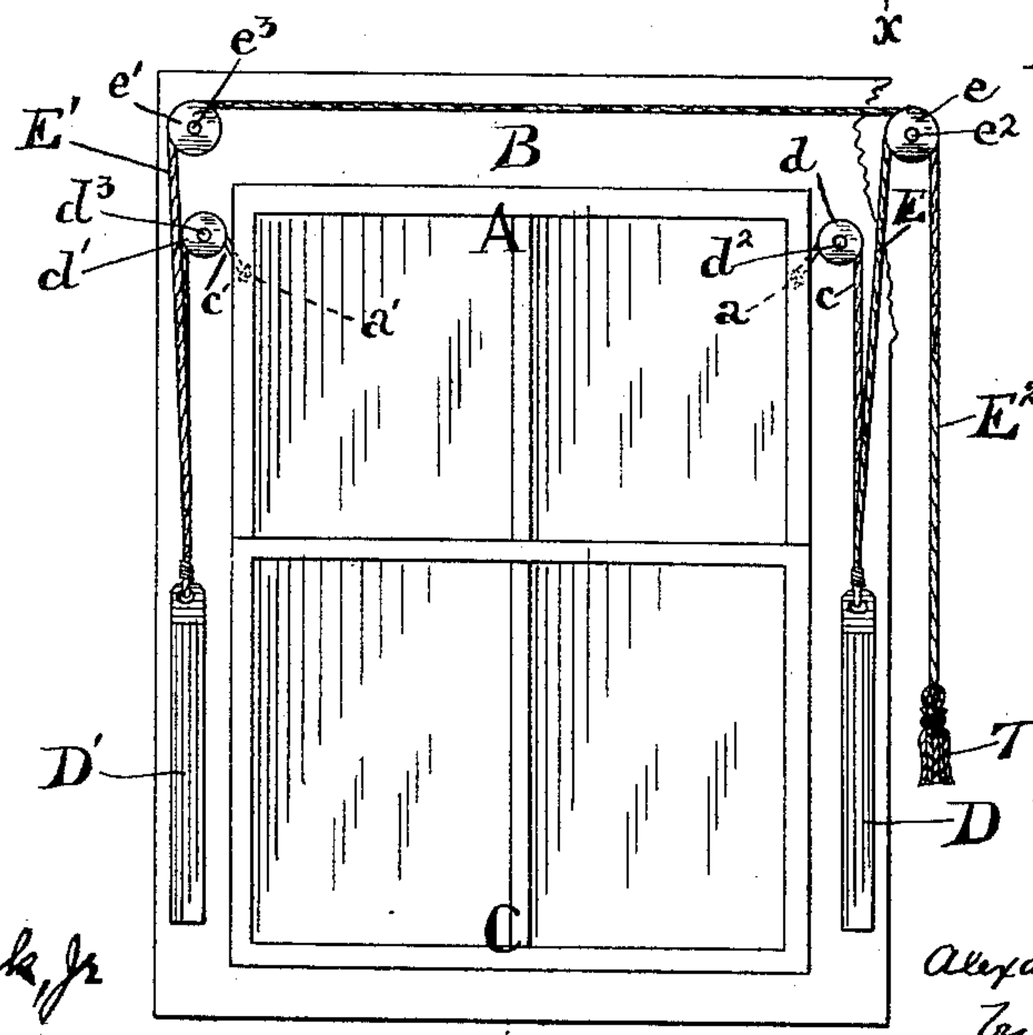

Fig. 3.

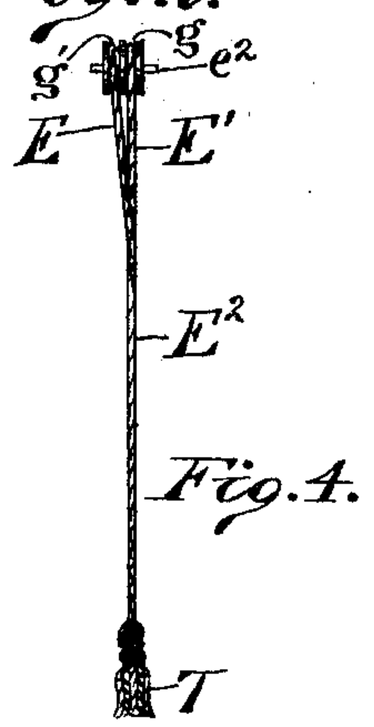

Fig. 4.

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UNITED STATES PATENT OFFICE.

ALEXANDER W. BIDDLE, OF PHILADELPHIA, PENNSYLVANIA.

SASH-BALANCE.

SPECIFICATION forming part of Letters Patent No. 406,987, dated July 16, 1889.

Application filed April 22, 1889. Serial No. 308,062. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER W. BIDDLE, a citizen of the United States, residing in the city and county of Philadelphia, in the State of Pennsylvania, have invented a certain new and useful Improvement in Window-Sash Rigging, of which the following is a specification.

My invention, while it especially relates to the operating of sashes in such windows as either by reason of their great size or of their extraordinary height above the floor have heretofore made climbing upon window-sills, furniture, steps, &c., or the use of poles necessary to the operations of raising and lowering them, is also well adapted for use with ordinary window-sashes in ordinary positions of easy access.

Heretofore window-sashes have usually been balanced by attaching to either side of them at some little distance from their tops cords, which, being passed over pulley-sheaves pivoted in suitable gudgeons upon the adjoining side of the sash-casing frame, thence pass downward into the interspaces of that frame, and there are attached to weights, the whole being so contrived that wherever placed the sash on one hand and the weights on the other co-operate to balance and counterpoise each other.

Now my present invention, broadly speaking, consists in providing, instead of mere counterbalancing-weights, weights which are not only equal to each other, but such as shall overweigh the sash and by means of their attaching sash-cords tend to keep their sash normally raised to its full extent, and also in combining therewith additional operating-cords, which I lead away from these overweights to some point or points of convenient access outside the sash-casing frame, where I also provide means for securing these operating-cords, as by a cleat, &c., so that when it is desired to open a window equipped with my improved rigging it is only necessary to seize and pull upon conveniently-located cords, and as they overcome the overweights by their tension the gravitation of the sash itself acts to slide it down in the guides of its casing-frame. When the desired opening has been obtained, the cords are then belayed about their cleats or otherwise secured, and kept so until such time as a return to the former or some other state of the window is required, when a reverse or correspondingly-modified operation will effect the necessary change. By means of the equality of the overweights and their consequent equable actions, coupled with the possibility which such rigging as is herein described affords for splicing or uniting the separate operating-cords into a single leader before it passes within reach of the operator, I am able to insure the better working, as well as almost absolute freedom from tripping, of the sash in its guide parts, and with my improved rigging not only is the tendency of the sash to trip in its guides practically avoided, but my device without such adjuncts as friction-rollers, winches, or other specially-contrived hardware can be combined directly with ordinarily-constructed sliding-sash windows.

Reference now being had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts throughout the several figures, they will be found to illustrate my present invention as follows, viz:

Figure 1 represents in front elevation a sliding "double-sash" window and casing, of which the upper sash is provided with my improved rigging device, the right-hand portion of this view being given in section taken by a plane passed on the dotted line *y y* of Fig. 2; Fig. 2, a side elevation of the structure shown in Fig. 1. It is wholly in section by a plane passed at right angles to the former on dotted line *x x* of Fig. 1; but in common with Fig. 1 this figure suppresses and does not represent the rigging and weights of the lower sash. This is for the purpose of preventing confusion, although it is within the purview of this invention that both upper and lower sashes should be equipped with my improved rigging, if desirable. Fig. 3 represents a front elevation of a modification wherein the exterior portion and guides of the sash-casing are removed for the sake of showing internal arrangement of the parts; Fig. 4, a detail of portion of rigging shown in Fig. 3.

In the figures, A represents the upper sash, (which is alone rigged;) B, the sash-casing, of which *b b'* are the sash-weight interspaces or runlets. *c c'* are the ordinary weight-cords;

C, the lower sash; D D′, the equal but jointly overbalancing upper sash-weights; *d d′*, their respective pulley-sheaves, of which d^2 d^3 are the axles, *a a′* being the knotted cord-attaching ends anchored in suitable recessed cavities in the sash. E E′ represent my operating-cords, which are in Figs. 1 and 2 shown as passing at a slightly-higher altitude, but near the aforesaid pulley sheaves *d d′*, over the auxiliary or guide sheaves *e e′*, respectively, which latter are there pivoted by their axles e^2 e^3 and gudgeons e^4 e^5 to the sash-casing frame, so as to rotate at right angles to the plane of the sash, as well as to lead the cords E E′ first upward from their respective attached weights to an altitude at least as high as the top of said weights' operating ranges and thence outward, as through the sash-casing apertures F F′, to any convenient external operating position, such as that of the tassels T near the cleat X.

In Fig. 3 the modification upon the structure above alluded to consists of placing the auxiliary or operating cord-pulleys *e e′* above the uppermost range of the sashes, as well as in leading one of those cords across, and preferably within, the upper transverse sash-casing to its mate's pulley, which in this case should either have a double sheave or at least a double groove *g g′* in its periphery, in order to accommodate the two cords without jamming. Then (should the sash be fully raised) after passing over it and extending a distance corresponding in length to that of the weights' operating range downward toward a desirable operating position, I generally prefer that these two cords should there be spliced or united into a single leader E^2, for by being forked from a common stem these cords are more certain to actuate their respective weights uniformly when they may be called upon to lift them than when they remain independent. It is also within my invention that the cords may be of wire, chain, &c., for the word "cord" is herein used generically.

The operation of either form of the device is simply to pull and belay at any proper amount of opening, or else to release the operating-cords and allow the weights to act as automatic sash-raisers.

In conclusion, I am aware that Merckel's patent, No. 384,459, June, 1888, comprises an overweighted sash whose tendency, even with its unequal weights, is to keep closed, or to raise itself automatically, and therefore make no claim to such a device; but,

Having now fully described my present invention, what I do claim, and desire to secure by Letters Patent of the United States, is—

1. The combination, with a sliding sash and sash-guiding casing-frame equipped with ordinary sash cords and pulleys, of a pair of equal overbalancing-weights, operating-cords secured thereto, and auxiliary pulleys whereby said cords are led from said weights to an altitude at least as high as that of the ordinary sash-pulleys and thence passed to convenient external operating positions, substantially as and for the purposes hereinbefore described.

2. The combination, with a sliding sash and sash-guiding casing-frame equipped with ordinary sash-weight cords and pulleys, of a pair of equal overbalancing-weights, overhead auxiliary pulleys, and a forked operating-cord, the common stem of which after branching leads its parts by way of said pulleys to the sash-weights, to which its branched ends are respectively attached, substantially as and for the purposes hereinbefore described.

ALEXANDER W. BIDDLE.

Witnesses:
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