June 10, 1930. A. H. KERSTING 1,762,821

SASH BALANCE

Filed July 31, 1928

Fig. 3.

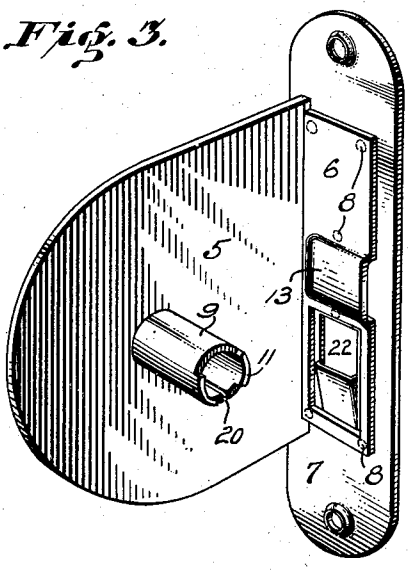


Fig. 4.

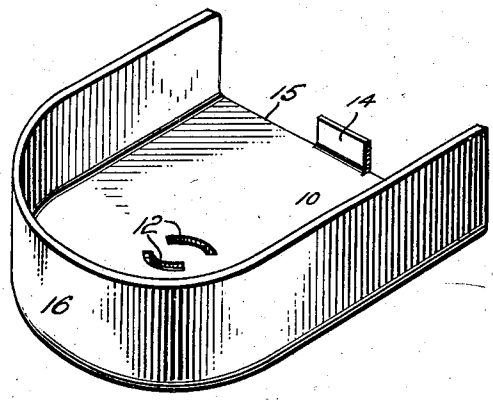


Fig. 1.

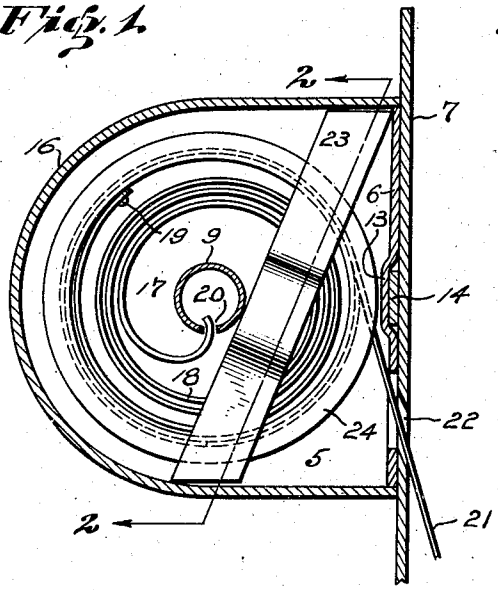
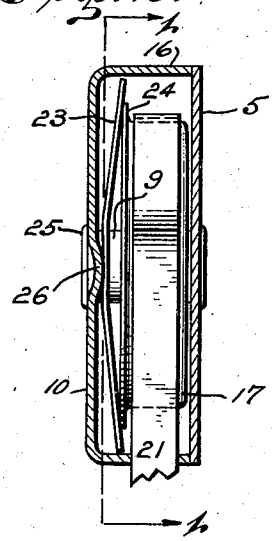


Fig. 2.



Albert H. Kersting,
INVENTOR:

BY Arthur J. Farnsworth.
ATTORNEY

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UNITED STATES PATENT OFFICE

ALBERT H. KERSTING, OF LOS ANGELES, CALIFORNIA

SASH BALANCE

Application filed July 31, 1928. Serial No. 296,575.

In this specification, and the accompanying drawing, I shall describe and show a preferred form of my invention, and specifically mention certain of its more important objects. I do not limit myself to the forms disclosed, since various changes and adaptations may be made therein without departing from the essence of my invention as hereinafter claimed; and objects and advantages, other than those specifically mentioned, are included within its scope.

My invention relates to sash balancing devices, and its principal objects include; first, to provide an improved housing construction for devices of this nature; second, to furnish superior means for applying frictional resistance to the rotating elements of such devices; third to afford facilities, exterior to the housing, for adjusting said frictional resistance; and, fourth, to accomplish these results in a very simple and inexpensive construction.

These objects are attained in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a lateral section through the casing of the device, on the line 1—1 of Fig. 2, showing the internal parts in elevation;

Figure 2 is a cross section of the invention on the line 2—2 of Fig. 1, the internal parts being in elevation;

Figure 3 s a perspective view of the main portion of the housing of the device; and

Figure 4 is a perspective view of the housing cover.

Similar reference numerals refer to similar parts throughout the several views.

The embodiment of my invention selected for illustration comprises; a housing formed of a side plate 5, having an integral web 6 at the front, bent at right angles thereto; a face plate 7, spot-welded to the web, as at the points 8; a tubular, longitudinally split, arbor 9, projecting inwardly from plate 5; and a cover 10, adapted to engage web 6 and arbor 9, to form a closed housing, in cooperation with the last named parts and the side plate 5.

The arbor 9 is castellated, as shown at 11, and cover 10 is provided with arcuate slots 12, through which the castellated portions of the arbor may be passed. Web 6 is deformed, as shown at 13, to form a pocket in cooperation with face plate 7; and cover 10 is provided with an inwardly bent tongue 14, at its forward edge 15, adapted for being inserted in said pocket. The cover is also flanged inwardly, as at 16, at all portions of its periphery except its forward edge.

A flanged-cup pulley 17 is rotatably mounted upon arbor 9; and a spiral spring 18, within the pulley, has its outer end connected to the pulley at 19, and its inner end engaged in slot 20 of the arbor. A metallic sash-supporting tape 21 is wound upon the outer rim of pulley 17. Sash tape 21 extends outwardly through suitable orifices in webs 6 and face plate 7, as at 22.

Obviously the construction described allows of winding up spring 18 to the point where its tension will be approximately the same as the opposed pull of tape 21, exerted by reason of the sash load. However, in the case of any spring sash balancing device, it is well known that the tension of the supporting spring cannot exactly equal the sash load at all points of the sash travel. This is for the reason that the sash load is constant, while the spring tension varies between certain limits, and depends upon the position of the sash. As a consequence of these conditions it is desirable to introduce frictional means for preventing movement of the sash under the influence of gravity, when its weight is not perfectly balanced by the sash-pulley spring.

In my device I supply the necessary friction by the use of a floating spring 23, of ribbon steel, slightly bent as shown. This spring is introduced between pulley 17 and

the inner wall of cover 10, and its dimensions and shape are such that it is retained in that position by web 6, arbor 9, and flange 16. It is, however, free to move slightly in any direction within its limits. The center of this spring bears against the inner wall of cover 10, and near its respective ends it bears upon the face of flange 24 of the pulley.

The parts of my sash balance are assembled as described, and the assembling is completed by upsetting or riveting the castellated portions 11, as shown at 25. Spring 23, prior to assembling, is so bent that the pressure it exerts against pulley flange 24 will afford approximately the desired amount of friction. If more friction is desired for any reason, I have provided a very simple manner whereby it may be obtained. This consists of merely denting cover 10 inwardly as at 26, opposite the central portion of spring 23, by means of a ball-pene hammer or a round-nose punch.

It frequently happens that, when sash-balancing devices are to be removed from a window casing for any purpose, workmen insert screw drivers or other tools beneath face plates 7 and pry outwardly. In prior constructions this often has had the effect of bending the face plates or loosening their connections to the housings. In my improved construction the face plate is rigidly attached, near one edge, to side plate 5 through the integral web 6; and, near the other edge, to cover 10 by means of tongue 14. As a consequence it is very rigid and cannot readily become sprung by the use of tools to remove the device from a window casing.

I particularly desire to call attention to my improved method for applying a yielding frictional resistance to the rotation of the pulley; and to the very simple and effective means for increasing this resistance if it should become necessary.

Having thus fully described my invention, I claim:

1. A device of the character described, comprising; a casing; a rotatable drum within the casing; a sash-tape wound upon the drum and extending outwardly through the casing; and a spring resiliently pressing against the drum and reacting against a wall of the casing, adapted to frictionally oppose the rotation of the drum; the casing being adapted for permitting said wall to be inwardly indented by a hammer blow at the spring reaction point, to increase the pressure of the spring without otherwise affecting the positioning or functioning of the several parts of the device.

2. A device of the character described comprising; a casing having opposed side walls fixedly spaced throughout the extent of their peripheries; an arbor fixedly spacing the central portions of said walls; a drum rotatably mounted upon said arbor; a sash-tape wound upon the drum and extending outwardly through the casing; and a floating bar spring of which the ends resiliently press against the drum and the center reacts against one of said side walls, adapted to frictionally oppose the rotation of the drum; the latter said wall being adapted for inward indentation by a hammer blow at the spring reaction point, whereby the pressure of the spring may be increased without otherwise affecting the positioning or functioning of the several parts of the device.

ALBERT H. KERSTING.