Jan. 15, 1924. 1,480,994

I. A. CHURCH

WINDOW SASH BALANCE

Filed Jan. 21, 1922

Fig. 1.

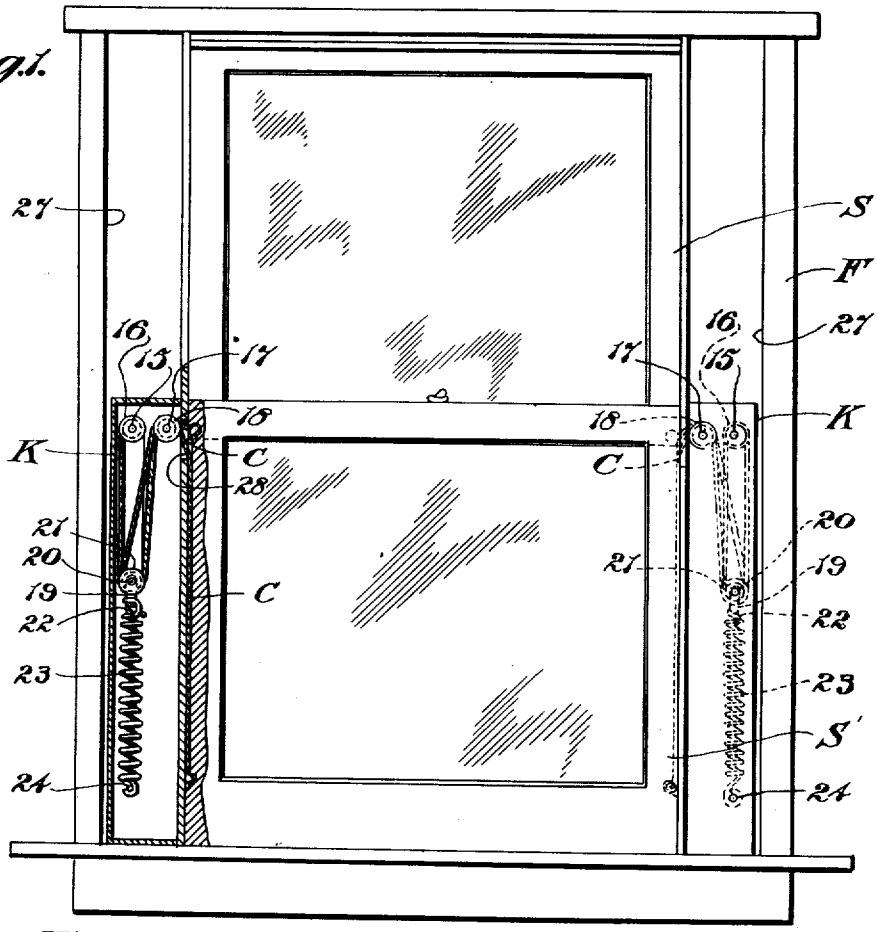


Fig. 2.

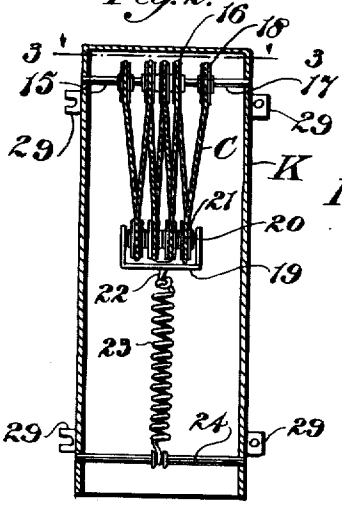


Fig. 3.

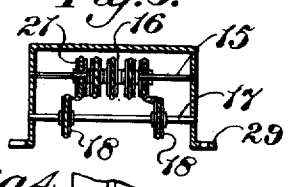
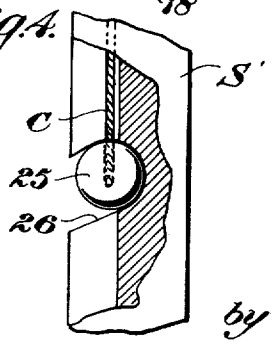


Fig. 4.



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UNITED STATES PATENT OFFICE.

IRA A. CHURCH, OF LONG BEACH, CALIFORNIA, ASSIGNOR TO L. H. SMITH AND DANIEL SMITH, BOTH OF FULLERTON, CALIFORNIA.

WINDOW-SASH BALANCE.

Application filed January 21, 1922. Serial No. 530,886.

To all whom it may concern:

Be it known that I, IRA A. CHURCH, a citizen of the United States, residing at Long Beach, in the county of Los Angeles and State of California, have invented new and useful Improvements in Window-Sash Balances, of which the following is a specification.

My invention relates to window sash balances, and a purpose of my invention is the provision of a window sash balance which eliminates the use of weights, while at the same time effectively serving to maintain either sash of a window in any adjusted position within the frame.

I will describe one form of sash balance embodying my invention and will then point out the novel features thereof in claims.

In the accompanying drawings,

Figure 1 is a view showing in side elevation with portions thereof broken away, a window having applied thereto one form of sash balance embodying my invention.

Fig. 2 is a sectional view of the casing for one of the balances in outside elevation.

Fig. 3 is a transverse sectional view taken on the line 3—3 of Fig. 2.

Fig. 4 is a fragmentary view partly broken away showing one means of connecting the cable ends to the window sash.

Referring specifically to the drawings, in which similar reference characters refer to similar parts, my invention, in its present embodiment, comprises a casing designated at K, this casing being preferably formed of metal and of rectangular formation. Mounted within the casing adjacent its upper end is a shaft 15, upon which are supported a plurality of pulleys 16. In the same plane as the shaft 15 is a second shaft 17, upon which are mounted pulleys 18.

Beneath the shafts 15 and 17 is arranged a yoke 19 in which is journaled a shaft 20 carrying pulleys 21. A hook 22 is swivelly sustained on the yoke 19 and serves to connect the upper end of a coil and contractile spring 23 thereto, the lower end of the latter being connected to a rod 24 fixed within the casing K adjacent the lower end of the latter. A single length of cord or the like C is trained over one of the pulleys 18 and downwardly to one of the pulleys 21, where it is then extended upwardly to one of the pulleys 16. From the pulley 16 the cord extends downwardly to the next pulley 21, and so on alternating with the pulleys 16 and 21 until it reaches the last pulley 21, where it is extended upwardly and over the other pulley 18. The ends of the cord C are provided with balls 25 adapted to cooperate with sash recesses 26 for securing the cord to the upper and lower sashes of a window.

As shown in Fig. 1, the window frame designated at F is provided with the usual channels 27, and between the channels the upper sash S and the lower sash S′ are adapted to slide in the usual manner. The balancing devices embodying my invention are arranged within the channels 27 with the casings K arranged with their open sides inwardly and in such manner that the pulleys 18 are disposed adjacent slots 28 formed in the window frame, and through which the ends of the cords C are adapted to extend. The balls 25 are disposed within the recesses 26, with each sash provided at corresponding points with two recesses 26 so that the same ends of the two cords C will be connected to the same sash. The casings are adapted to be secured against movement within the channels by securing lips 29, certain of which are slotted to facilitate the application or removal of suitable fastening members thereto.

In operation, the springs 23 serve to absorb all slack in the cords C, it being understood that they normally urge the yokes 19 downwardly so as to maintain the pulleys 21 in extended position with respect to the pulleys 16 and 18. Consequently, any movement of the sashes S and S′ which tends to lengthen or shorten the cord C will be absorbed by movement of the pulleys 21 through expansion or contraction of the springs 23, thereby serving to maintain the sashes in adjusted position within the frame.

Although I have herein shown and described only one form of window sash balance embodying my invention it will be understood that various changes and modifications may be made herein without departing from the spirit of the invention and the spirit and scope of the appended claims.

I claim:

1. A sash balance, comprising a casing, pulleys mounted in the casing, a yoke within the casing, pulleys on the yoke, a flexible

member trained about the first and second pulleys with the ends thereof adapted for connection with the sashes of a window, and a resilient member associated with the yoke for urging the pulleys carried thereby to a position in which the flexible member is maintained under tension irrespective of the position of said pulleys.

2. A sash balance comprising two sets of pulleys rotatable about different fixed axes, a third set of pulleys rotatable about a movable axis, a flexible member trained about all of the pulleys with the ends adapted for connection with the two sashes of a window, and a resilient member associated with the third set of pulleys for urging the same to a position in which the flexible member is held under tension.

3. A sash balance, comprising a casing, pulleys mounted in the casing, a yoke within the casing, pulleys on the yoke, a flexible member trained about the first and second pulleys, means carried by the ends of the member for attaching the member to the sashes of a window comprising balls adapted to fit in sash recesses, and resilient means connected to the yoke for urging the pulleys carried thereby to a position in which the flexible member is held under tension.

In testimony whereof I have signed my name to this specification.

IRA A. CHURCH.