

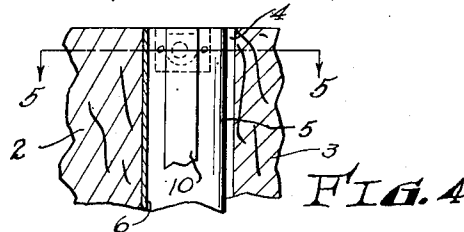
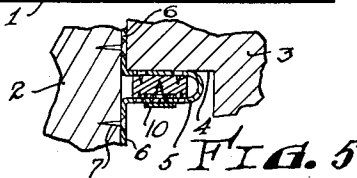
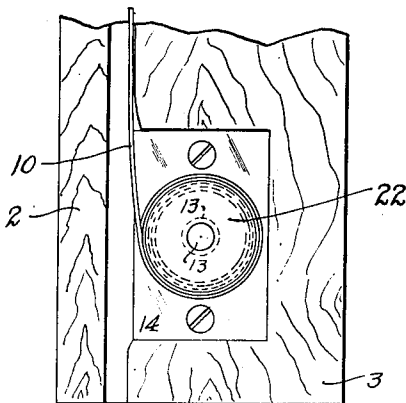
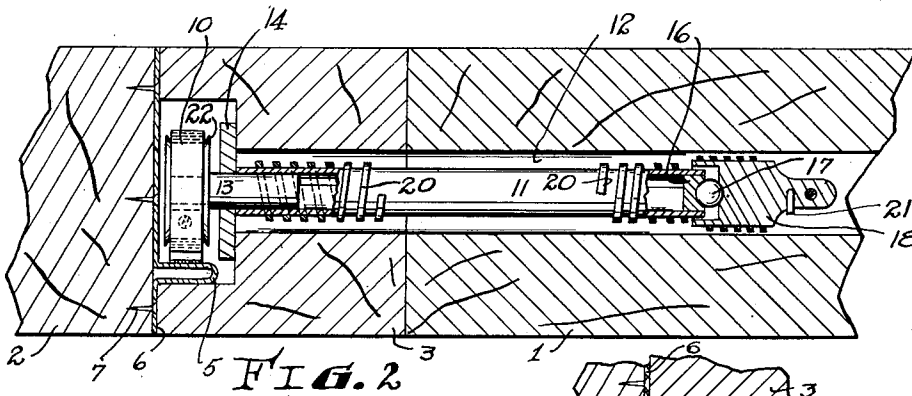
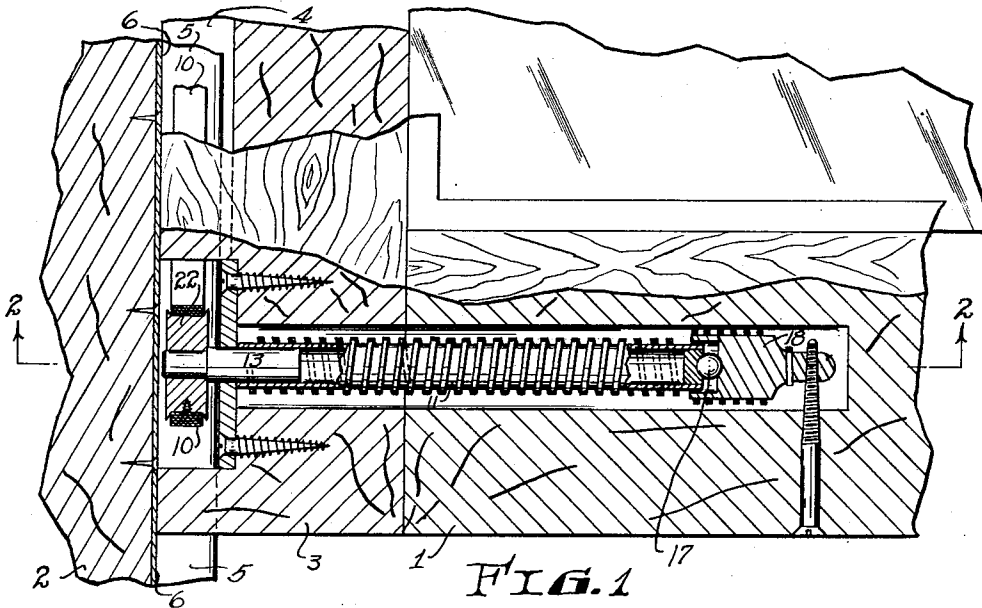
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J. W. SMITH

1,965,478

WINDOW SASH BALANCE

Original Filed Feb. 26, 1929



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UNITED STATES PATENT OFFICE

1,965,478

WINDOW SASH BALANCE

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Original application February 26, 1929, Serial No.
342,919. Divided and this application August
17, 1931, Serial No. 557,588. Renewed December
18, 1933

2 Claims. (Cl. 16—198)

This invention relates to an improvement in sash balances and particularly to a simplified and economical device for counterbalancing the weight of a sash wherein the usual sash balancing weights, pulleys and hollow jamb are eliminated, and is a divisional application of my copending application Serial No. 342,919, filed Feb. 26, 1929.

The objects of this invention are to counterbalance the sash by means of springs placed under tension when the sash is moved in its casing, and thereby to simplify and improve the sash mountings.

Another object is a simplified balance which may be easily removed or replaced for repairing without removal or damage to the window casings.

Other objects and advantages of my invention will become apparent from the following description wherein reference is made to the accompanying drawing.

In the drawing—

Fig. 1 is a front elevation partially in section of an embodiment of my invention.

Fig. 2 is a sectional view taken on a plane indicated by the line 2—2 of Fig. 1.

Fig. 3 is an end view of the device enclosed in the sash.

Fig. 4 is a side elevation of the weather strip and operating means carried thereby.

Fig. 5 is a sectional view taken on a plane indicated by the line 5—5 of Fig. 4.

Referring to the drawing, the window comprises the sash 1 slidable in the casing 2. The side members 3 of the sash are provided with longitudinal grooves 4 extending vertically throughout the length of the sash. These grooves receive a substantially U-shaped weather strip 5 having flanges 6 turned outwardly to engage the casing in face to face relationship, the flanges 6 being secured to the casing by means of suitable fasteners, such as the tacks 7.

It will be noted that the body of the U shaped weather strip 5 extends into a groove of the sash so as to prevent passage of air currents or moisture between the sash and casing from the outside of the window to the inside. Carried by the casing and preferably secured to the weather strip 5 at the upper end is a flexible band 10, which may be steel and which depends from the top of the weather strip and lies face to face with one side thereof, extending downwardly substantially to the bottom of the sash when in closed position. The strip 10 is preferably located on the inside face of the weather strip to better protect it from the weather. A tubular shaft 11 is rotatably mounted in a bore 12 in the sash 1. Into

the outer end of the shaft 11 is rigidly fitted the end of the stub shaft 13, which extends outwardly through an opening in a suitable bearing plate 14 secured to the sash. The shaft 13 is adapted to rotate in the bearing plate 14 consequent upon the turning of the shaft 11.

To render the shaft 11 freely rotatable, the inner end of the shaft 11 may be provided with, a plug 16 having a depression for engaging a ball bearing 17. A cup-shaped member 18 is secured in fixed position in the bore 12 of the sash and is provided with a depression for engaging the ball bearing 17. A spring 20 is secured at one end onto the cup-shaped member as indicated at 21, and extends spirally around the cup-shaped member and shaft 11, the outer end of the spring fixedly engaging the shaft 11 near the outer end.

A pulley 22 is rigidly mounted on the stub shaft and is positioned so that its outer face is close to the face of the casing 2 as illustrated in Fig. 2. The flexible member or band 10 is secured at its lower end to the pulley and is adapted to roll thereon as the sash is raised and lowered.

The device is installed with the spring held under tension. This tension is increased as the window is moved downwardly due to the rotation of the shaft 11 through the pulley and band 10. Thus, when the window is in the fully closed position the spring is at a tension great enough to substantially counterbalance the weight of the sash. As the window is raised the shaft and pulley are rotated by the spring, thus winding the band 10 onto the pulley and tending to lift a portion of the weight of the sash. The spring is so tensioned and of such size that it substantially counterbalances the weight of the sash in either the raised or lowered position. The strip 10 normally lies in face to face relationship with the weatherstrip 5 and is not visible as the window is raised and lowered.

From the foregoing description it will be seen that I have provided an effective and improved sash balance which may be economically manufactured and installed and which is easily accessible for repairs and replacement. As described in my above identified copending application, suitable means may easily be provided for lubricating the working parts.

It will also be seen that I have provided for effectively protecting all parts of the counterbalancing device from the effects of the elements.

Various changes may be made in details of construction and arrangements of the parts of the device herein described, without departing from the spirit of my invention.

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I claim:

1. In a window sash and casing structure, including a sash having a longitudinal groove along one side and a casing having a weather strip extending into said groove, a sash balance comprising a spring enclosed in the sash, a flexible band secured at one end to the weather strip and lying in face to face relationship to said weather strip and within said groove of the sash, means for varying the stress of said spring as the sash is moved in the casing, said means comprising a pulley carried in the sash and cooperating with said spring and connected to the other end of said flexible band for winding said band onto and off from said pulley as the sash is raised and lowered, whereby the band is guided evenly onto the pulley and is maintained free from twisting or pulling and the stress of the spring is utilized for counterbalancing the sash.

2. In a window sash and casing structure including a sash having a longitudinally extending groove along one side and a casing carrying a weather strip extending into said groove, a sash balance including a coiled spring enclosed in said sash, a pulley operably engaging said spring for varying the stress thereof consequent upon rotation of the pulley, a flexible band operatively supported at one end by the casing and lying in face to face relationship to said weather strip and within said groove, said flexible band being secured at the other end to said pulley and winding and unwinding thereon as the sash is raised and lowered and cooperating with said spring through said pulley for utilizing the force of the spring for counterbalancing the sash.

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