Dec. 7, 1937. M. J. GOSSEN 2,101,577

WINDOW SASH BALANCE

Filed May 9, 1936

Fig. 1.

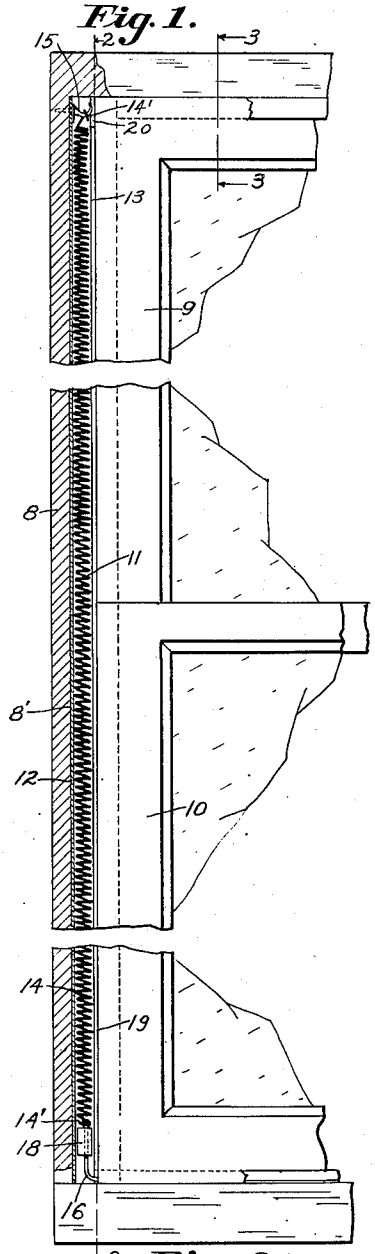


Fig. 2.

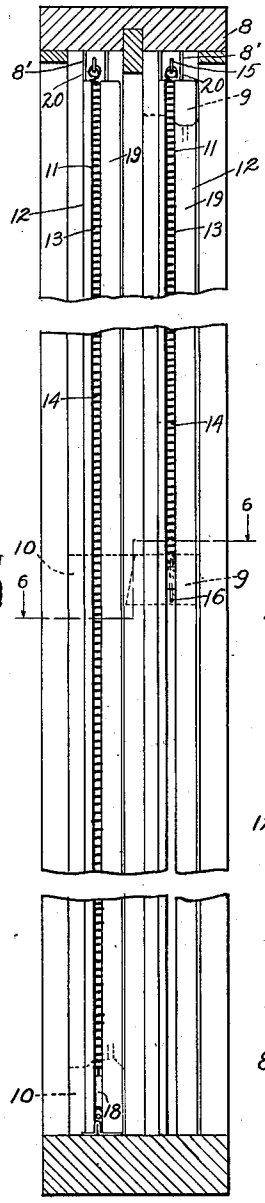


Fig. 3.

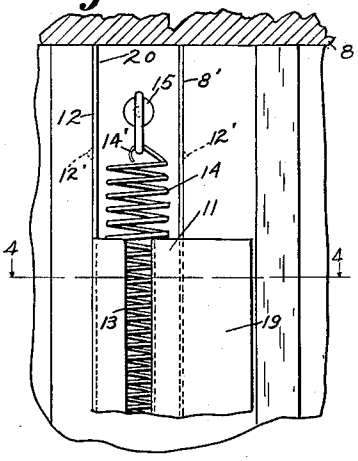


Fig. 4.

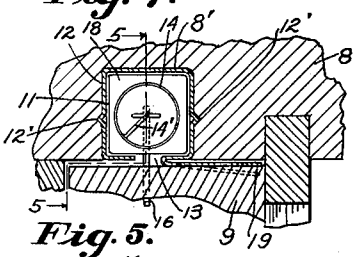


Fig. 5.

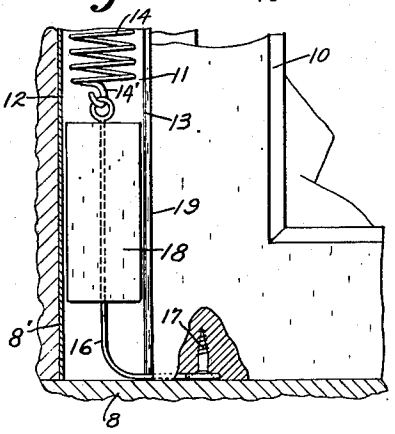


Fig. 6.

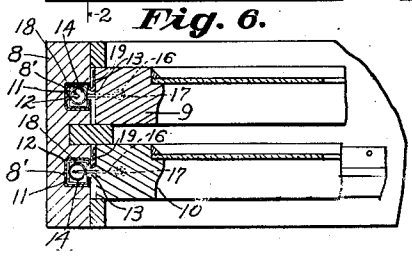
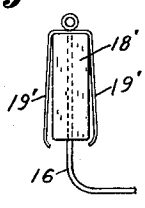


Fig. 7.



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WINDOW SASH BALANCE

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8 Claims. (Cl. 20—52)

This invention relates to improvements in window sash balance which may be mounted in the ordinary window frame for counterbalancing the window sash and facilitating the easy raising and lowering thereof and holding the sash in any position of adjustment.

A further object of the invention is to provide a window sash balance which will eliminate the use of the ordinary sash weights and the double stile forming the elongated passageways in which the sash weights move, and permitting the use of window frames of less width for window frames of a given size.

A further object of the invention is to provide a window sash balance which may be easily mounted in the window frame when manufactured, and which will not interfere with the planing of the side edges of the window sash on the job to fit the window frame.

A further object of the invention is to provide a window sash balance having a weather strip which also serves to yieldingly hold the window sash in any position of adjustment.

A further object of the invention is to provide a window sash balance in which coiled springs and metal tube guideways are used and means are provided for eliminating friction and noise between the parts.

A further object of the invention is to provide a window sash balance which is of simple construction, is strong and durable and which permits the window sash to be easily positioned in the window frame and connected to the balance on the job in a very simple manner.

With the above and other objects in view the invention consists of the improved window sash balance and its parts and combinations as set forth in the claims, and all equivalents thereof.

In the accompanying drawing in which the same reference characters indicate the same parts in all of the views:

Fig. 1 is a fragmentary inner side view of a window frame and sashes provided with the improved balance, parts of the frame and one of the guide tubes being shown in section;

Fig. 2 is a vertical sectional view thereof taken on line 2—2 of Fig. 1, the view showing dotted lines to indicate position of sashes;

Fig. 3 is a vertical sectional detail view, taken on line 3—3 of Fig. 1 and on a larger scale, of the upper portion of the sash frame;

Fig. 4 is a transverse sectional detail view taken on line 4—4 of Fig. 3;

Fig. 5 is a vertical sectional detail view taken on line 5—5 of Fig. 4;

Fig. 6 is a transverse sectional view of the frame and sashes taken on line 6—6 of Fig. 2; and

Fig. 7 is a side view of a modified form guide block used for small windows.

Referring to the drawing the numeral 8 indicates a portion of a window frame or casing having an upper and a lower sash 9 and 10 which slide in the ordinary manner in suitable ways in the frame. It will be noted that the grooves of the ordinary sashes and the elongated weight passageways of the ordinary sash frame frames are eliminated.

The improved sash balance 11 is adapted to be mounted in the opposite sides of the window frame, one on each side for each sash, and as they are all of similar construction, it is believed that a description of one will suffice.

The opposite stiles or inner side portions of the window frame 8 are formed at the mill with vertical grooves 8' to receive elongated slotted guide tubes or housing 12 of rectangular form in cross section. The elongated slots 13 of the guide tubes extend substantially the entire length of the tubes and the tubes are held in position in the grooves by means of outwardly projecting knobs or protuberances 12' which imbed into the wood of the frame when the tubes are forced in the grooves 8'. The knobs are formed by indenting outwardly spaced portions of the tube from the inner side of the tube.

Coiled spring lifting members 14 positioned within the tubes 12 have upper and lower eyed ends 14'. The upper eyed ends of the springs are connected to screw hooks 15 which extend through upper portions of the tubes and into the frame. Angular eyed connecting rods 16, connected at their outer ends to the lower edge portions of the window sashes adjacent their opposite side edges, extend through the tube slots 13 and at their upper ends are connected to the lower eyes 14' of the springs 14. Screws 17 secure the lower eyed end portions of the connecting rods 16 to the sashes 9 and 10.

Guide blocks 18 preferably formed of wood and of rectangular shape in cross section are slidably positioned within the tubes 12 and the rods 16 extend therethrough to mount the guides firmly on the rods. These guide blocks snugly slidably fit the tubes and serve to maintain the springs centrally within the tubes and prevent the convolutions of the springs from rubbing against the side walls of the tubes and thus eliminates friction and noise. The wooden guide

blocks 18 in reciprocating in the tubes will be practically noiseless.

The coiled springs 14 are of sufficient strength to counterbalance the weight of the sash to which they are connected and to hold the sash in adjusted position in the frame and the tubes 12 are formed, adjacent their slotted portions, with integral laterally extending friction and weatherstrip flanges 19. The flanges 19 extend from the lower ends of the tubes upwardly to the open inner side portions 20 of the tubes. Said flanges yieldingly bear against the side edge portions of the sash and frictionally hold the sash in adjusted position against the tension of the springs 14. These tubes and flanges are preferably formed of spring bronze and the flanges also serve as weatherstrips between the side portions of the frame and the sashes.

The upper open inner side portions 20 of the tubes 12 permit the easy removal and replacement of springs in case they become impaired in any manner without removing the sashes from the frame.

The spring flanges 19 and the connecting rods permit the sashes to expand and shrink under climatic conditions and eliminates binding and rattling between the parts.

The modified form of guide block 18' shown in Fig. 7 is adapted for use with window sashes of small size in which it is not desired to use the friction flanges. In this use the flanges are omitted from the tubes and placed on opposite sides of the guide block 18' and indicated by the reference numeral 19', and as thus positioned they will bear against the inner opposite sides of the guide tubes and hold the blocks and the sashes connected thereto, in different positions of adjustment.

From the foregoing description it will be seen that the window sash balance is of very simple construction, is strong and durable, and is well adapted for the purpose described.

It will also be seen that the construction eliminates the necessity of providing the double stiles forming sash weight boxes and thus permitting a window frame of less width for a given size sash and less expensive to manufacture.

What I claim as my invention is:

1. In combination with a sash slidably mounted in a window frame having vertical grooves, a counterbalancing means for the sash comprising fixed slotted tubes mounted in the grooves of the opposite side portions of the frame, coiled spring lifting members positioned within the tubes and having their upper end portions secured adjacent the upper end portions of the tubes, the lower end portions of the lifting members extending through the slots and connected to the sash, and yielding means integral with the tubes and between the sash and the tubes for frictionally holding the sash in any position of adjustment.

2. In combination with a sash slidably mounted in a window frame having vertical grooves, a counterbalancing means for the sash comprising slotted tubes non-movably mounted in the grooves of the opposite side portions of the frame, coiled spring lifting members positioned within the tubes and having their upper end portions connected to upper portions of the tubes, the lower end portions of the lifting members extending through the slots and connected to the sash, guide blocks within the tubes for maintaining the lifting members in central position within the tubes, and yielding members integral with the tubes and bearing against the opposite side edges of the sash for frictionally holding the sash in any position of adjustment and also serving as weatherstrips between the sash and the frames.

3. In combination with a sash slidably mounted in a window frame having vertical grooves, a counterbalancing means for the sash comprising slotted tubes non-movably mounted in the grooves of the opposite side portions of the frame, coiled spring lifting members positioned within the tubes and connected at their upper end portions to the upper end portions of the tubes, the lower end portions of the lifting members extending through the slots and connected to the sash, guide blocks within the tubes and to which the springs are connected for maintaining the springs in central position within the tubes, and yielding flanges forming part of and projecting outwardly from the tubes and bearing against the opposite side edges of the sash or frictionally holding the sash in any position of adjustment and also serving as weatherstrips between the sash and the frame.

4. In combination with a sash slidably mounted in a window frame having vertical grooves, a counterbalancing means for the sash comprising slotted rectangular tubes non-movably mounted in the grooves of the opposite side portions of the frame and having integral flanges extending outwardly from the slotted portions of the tubes and bearing frictionally against opposite side edges of the sash, said flanges also serving as weatherstrips between the sash and the frame, coiled spring lifting members positioned within the tubes and connected at their upper end portions to the upper end portions of the tubes, connecting rods secured to opposite side portions of the sash and extending through the tube slots and connected to the lower end portions of the coiled springs, and guide blocks within the tubes and connected to the lower end portions of the springs to maintain the springs centrally within said tubes, said tube flanges frictionally holding the sash in any position of adjustment.

5. In combination with a sash slidably mounted in a window frame having opposite side vertically extending grooves, a counterbalancing means for the sash comprising rectangular tubes non-movably mounted in the grooves and having vertically extending slots in their inner portions adjacent the sash, coiled spring lifting members positioned within the tubes and connected at their upper end portions to upper end portions of the tubes, angular connecting rods secured to the sash and extending through tube slots and having a hooked engagement with the lower end portions of the springs, rectangular guide blocks mounted on the connecting rods and slidably positioned within the tubes for maintaining the springs centrally within the tubes, and yielding flanges integral with the tubes and bearing against the opposite side edges of the sash for frictionally holding the sash in any position of adjustment and also serving as weather strips between the sash and the frame.

6. In combination with a sash slidably mounted in a window frame having opposite side vertically extending grooves, a counterbalancing means for the sash comprising rectangular tubes non-movably mounted in the grooves and having vertically extending slots in their inner portions adjacent the sash, coiled springs within the tubes and connected at their upper ends to the upper end portions of the tubes, said tubes

at their upper inner side portions having openings for the insertion and removal of the coiled springs, angular connecting rods secured to the sash and extending through the slots and having a hooked engagement with the lower ends of the springs, rectangular blocks mounted on the rods, and slidably positioned within the tubes for maintaining the springs centrally within the tubes, and yielding flanges forming part of the tubes and extending outwardly therefrom and yieldingly bearing against the opposite side edges of the sash for frictionally holding the sash in any position of adjustment and also serving as weather strips between the sash and the frame.

7. A window sash balance, comprising a tube for fixed connection with a window frame and having an elongated slot in one side face, a coiled spring within the tube and connected at its upper end thereto, a guide block positioned within the tube below the spring for maintaining the spring in fixed position, a connecting rod connected to the spring and the guide block and extending outwardly through the slot for connection with a sash, and a yielding flange connected to the tube and projecting outwardly therefrom for frictional engagement with the sash and also to serve as a weather strip.

8. A window sash balance, comprising a rectangular tube for fixed connection with a window frame and having an elongated slot and an opening in one side face, a coiled spring within the tube and connected at its upper end thereto, a rectangular guide block positioned within the tube below the spring for maintaining the spring in central position, an angular connecting rod connected to the lower end of the spring and extending through the block and the tube slot for connection with a sash, and a yielding flange forming part of the tube adjacent an edge forming the slot and projecting yieldingly outwardly therefrom for frictional engagement with the sash and also to serve as a weather strip.

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