June 21, 1949. A. VIEHWEGER 2,473,666

SASH BALANCE

Filed Jan. 23, 1946

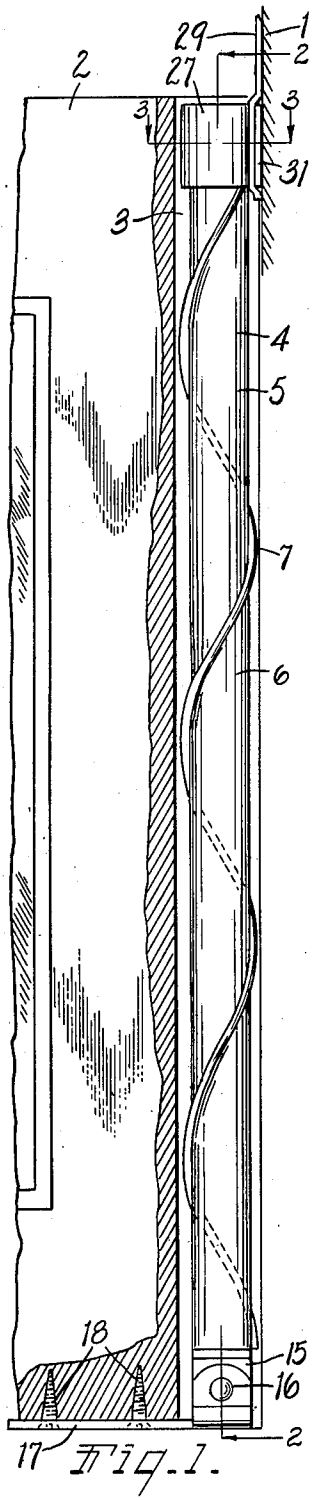


Fig. 1.

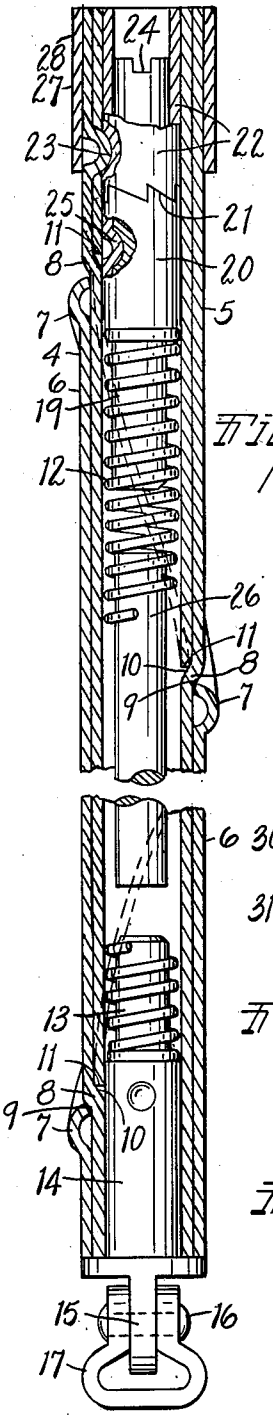


Fig. 2.

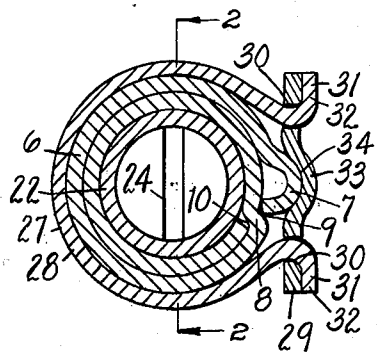


Fig. 3.

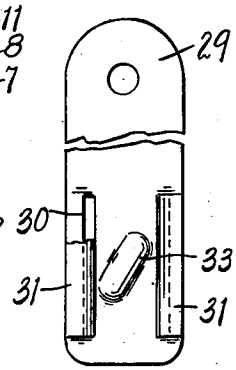


Fig. 4.

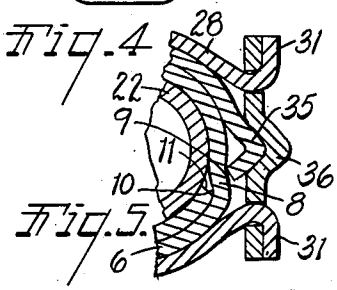


Fig. 5.

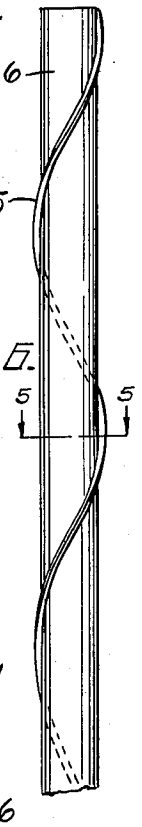


Fig. 6.

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SASH BALANCE

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8 Claims. (Cl. 16—197)

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This invention relates to improvements in sash balances.

The main objects of this invention are:

First, to provide a sash balance of the type embodying a tubular element having a spiral track which may be formed of comparatively light stock and at the same time is very rigid and not likely to spring or become distorted in use.

Second, to provide a sash balance of this type in which the tubular element with the associated anchoring and spring adjusting means constitutes an effective lubricant chamber so that the torsion spring and associated parts may be effectively lubricated and noises minimized as well as providing an effective protection for the parts.

Objects relating to details and economies of the invention will appear from the description to follow. The invention is defined and pointed out in the claims.

Preferred embodiments of the invention are illustrated in the accompanying drawing, in which:

Fig. 1 is a fragmentary elevation of a window and its associated casing with a sash balance embodying my invention installed therein, the window and casing being conventionally illustrated.

Fig. 2 is an enlarged fragmentary view of my sash balance partially in longitudinal section on line 2—2 of Figs. 1 and 3.

Fig. 3 is an enlarged transverse section on line 3—3 of Fig. 1.

Fig. 4 is a fragmentary rear view of the torsion member.

Fig. 5 is an enlarged fragmentary view on line 5—5 of Fig. 6 of a slightly modified form or embodiment of my invention, the modification being in the form of the spiral track or flight.

Fig. 6 is a fragmentary side elevational view of the tubular element of the embodiment shown in Fig. 5.

In the accompanying drawing, 1 represents a window casing and 2 a window sash having a channel or groove 3 adapted to receive the sash balance. It will be understood that commonly there is a sash balance at each edge of the sash.

The tubular element of my invention designated generally by the numeral 4 is formed of a single strip or ribbon 5 desirably of relatively thin steel, this strip being spirally wound upon itself with the convolutions thereof overlapping substantially one-half the width of the strip.

In practice the tubular element is cut in proper lengths from a tube formed as described of a strip spirally wound upon itself with the convolutions overlapping preferably substantially one-

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half the width of the strip. The overlapping portion 6 of the strip has a bead-like rib 7 formed on the edge thereof, this preferably being of inwardly facing curved channel section as best shown in Figs. 2 and 3, providing a spiral flight or track extending the length of the tubular element.

The strip 5 has an offset 8 therein of substantially the thickness of the metal, as shown in Fig. 2, this resulting in an outer shoulder 9 and an inner shoulder 10. The overlapping ribbed edge of the strip is arranged with its edge abutting the outer shoulder 9, as shown in Fig. 2, while the underlying inner edge 11 of the strip is in abutting engagement with the inner shoulder 10.

With this arrangement, the convolutions are supported so as to effectively resist torsional stresses even when formed of very light stock. Another object in thus forming the tubular element is to provide a structure adapted to retain a grease or lubricant, the convolutions being wound in close contact not only to make a closed joint but also to prevent relative movement.

The tubular element thus formed is very rigid in proportion to the stock used and this prevents springing and consequent binding and distortion even when the structure is quite carelessly installed.

The coiled torsion spring 12 is housed within the tube and one end is clutchingly engaged with the pin-like portion 13 of the anchoring rod 14. This anchoring rod is provided with an ear 15 receiving the pivot 16 carried by the attaching bracket 17, the attaching bracket in this embodiment being attached to the bottom of the sash as by means of screws 18. The other end of the spring is engaged with the reduced end 19 of the torsion rod 20 rotatable within the tubular element and provided with ratchet teeth 21 coacting with the ratchet 22 fixedly secured to the tubular element as by the indentation 23, see Fig. 2.

The torsion rod extends or projects into the ratchet member 21 and is slotted at 24 to receive an adjusting tool. In the embodiment illustrated, the ratchet portion of the torsion rod is formed as a separate sleeve and is secured thereto by the indentation 25. In this embodiment, the spring serves to urge the ratchet teeth together. The rod 26 preferably of wood or fiber is arranged within the spring to prevent kinking and clicking of the coils.

The anchoring means and the adjusting means described serve as closures for the end of the tubular member so that it may be filled with lubricant and the lubricant is effectively retained.

This minimizes noise as well as to protect the interior parts.

The torsion element designated generally by the numeral **27** comprises the annular member **28** slidably receiving the tubular member and the attaching arm **29** which has slots **30** therein receiving the ends **31** of the element **28**, the ends being retained by turning them laterally at **32**, see Fig. 3. The arm portion of the torsion member is provided with an angularly disposed offset **33** between the slots **30**, this offset providing a recess **34** receiving the spiral flight or track **7**. By thus forming the torsion member, it may be formed of light stock and is well adapted to receive the stresses of operation, the annular member mainly performing the function of slidably receiving the tubular member and holding it with its flight in effective engagement with the recess.

The embodiment shown in Fig. **5** is the same as that described except that the bead-like rib **35** is of V-section instead of rounded section and the recess **36** in the torsion member is correspondingly shaped.

I have not illustrated other shapes of ribs which I contemplate and certain other modifications as it is believed that this disclosiure will enable those skilled in the art to embody or adapt my invention as may be desired.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a sash balance, the combination of a tubular element formed of a strip of metal of substantial width spirally wound upon itself with the convolutions thereof overlapping substantially one-half the width of the strip, the overlying portion of the strip having an outwardly projecting bead-like rib of inwardly facing curved channel section on its edge providing a rounded spiral flight, the strip having a central offset of substantially the thickness of the strip providing spiral outer and inner shoulders, the overlapping ribbed edge of the strip abutting the outer shoulder and the underlying edge of the strip abutting the inner shoulder of the superimposed convolutions, a spring housed within said tubular element and connected thereto at one end, anchoring means for the other end of the spring, and a torsion element comprising an annular member slidably receiving the tubular element and an attaching arm having a recess slidably engaging said spiral track.

2. In a sash balance, the combination of a tubular element formed of a strip of metal of substantial width spirally wound upon itself with the convolutions thereof overlapping substantially one-half the width of the strip, the overlying portion of the strip having an outwardly projecting rib on its edge providing a spiral flight, the strip having a central offset of substantially the thickness of the strip providing spiral outer and inner shoulders, the overlapping ribbed edge of the strip abutting the outer shoulder and the underlying edge of the strip abutting the inner shoulder of the superimposed convolutions, a spring housed within said tubular element and connected thereto at one end, anchoring means for the other end of the spring, and a torsion element slidably engaging said spiral track.

3. A sash balance comprising an axially rotatable tubular element formed of a spirally wound strip with the convolutions thereof overlapping substantially one-half the width of the strip, the overlying edge of the strip having an outwardly offset rib providing a spiral flight the underlying portion of the strip being inwardly folded and offset substantially the thickness of the strip whereby the wall of the tubular element is of substantially uniform diameter from end to end with the spiral flight projecting therefrom, the superimposed convolutions being in closely embracing relation whereby the tubular element is adapted to retain lubricant, a spring housed within said tubular element, an anchoring means for one end of said spring constituting a closure for that end of said tubular element, adjustable means for connecting the other end of the tubular element to the spring constituting a closure for that end of said tubular element whereby the tubular element is adapted to contain a lubricant, and a torsion element slidably receiving said tubular element and provided with a flight engaging means.

4. A sash balance comprising an axially rotatable tubular element formed of a spirally wound strip with the convolutions thereof overlapping substantially one-half the width of the strip, the overlying edge of the strip having an outwardly offset rib providing a spiral flight, the underlying portion of the strip being inwardly folded and offset substantially the thickness of the strip whereby the wall of the tubular element is of substantially uniform diameter from end to end with the spiral flight projecting therefrom, a spring housed within said tubular element, an anchoring means for one end of said spring, adjustable means for connecting the other end of the tubular element to the spring, and a torsion element slidably receiving said tubular element and provided with a flight engaging means.

5. A tubular element for sash balances formed of a strip of metal of substantial width spirally wound upon itself with the convolutions thereof overlapping substantially one-half the width of the strip, the overlying portion of the strip having an outwardly projecting bead-like rib of inwardly facing curved channel section on its edge, the strip having a central offset of substantially the thickness of the strip providing spiral outer and inner shoulders, the overlapping ribbed edge of the strip abutting the outer shoulders and the underlying edge of the strip abutting the inner shoulder of the superimposed convolutions.

6. A tubular element for sash balances formed of a strip of metal of substantial width spirally wound upon itself with the convolutions thereof overlapping substantially one-half the width of the strip, the overlying portion of the strip having an outwardly projecting rib on its edge, the strip having a central offset of substantially the thickness of the strip providing spiral outer and inner shoulders, the overlapping ribbed edge of the strip abutting the outer shoulder and the underlying edge of the strip abutting the inner shoulder of the superimposed convolutions.

7. A tubular element for sash balances formed of a strip of metal of substantial width spirally wound upon itself with the convolutions thereof overlapping substantially one-half the width of the strip, the overlying portion of the strip having an outwardly projecting rib of inwardly facing curved channel section on its edge, the underlying portion of the strip being inwardly folded and offset substantially the thickness of the strip.

8. A sash balance comprising a tubular element for said balances formed of a spirally wound strip with the convolutions thereof overlapping substantially one-half the width of the strip, the overlying edge of the strip having an outwardly offset rib providing a spiral flight, the underlying

portion of the strip being inwardly folded and offset substantially the thickness of the strip whereby the wall of the tubular element is of substantially uniform diameter from end to end with the spiral flight projecting therefrom.

AUGUST VIEHWEGER.

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