Dec. 8, 1931. R. T. AXE 1,835,258

SPRING BARREL CONSTRUCTION

Filed July 29, 1925

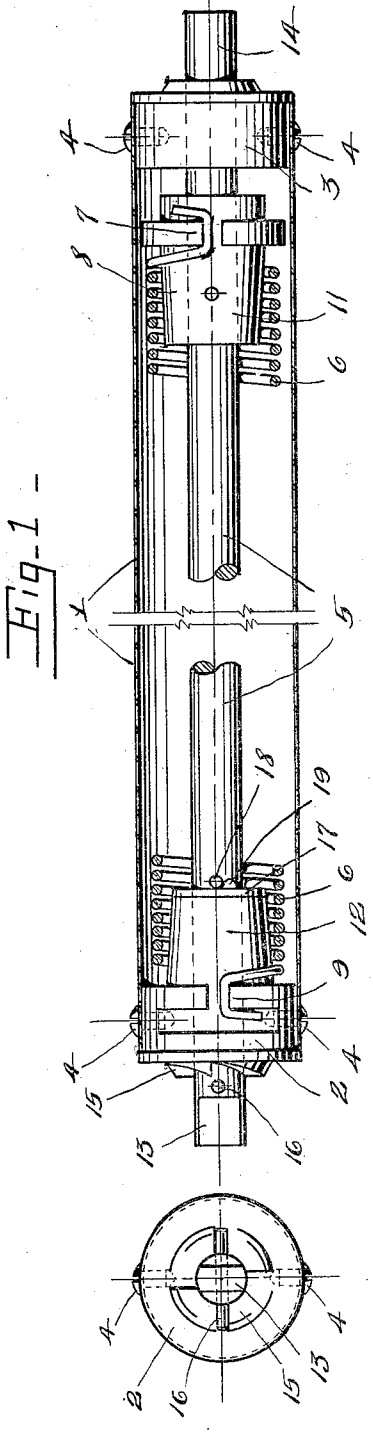


Fig-1-

Fig-2-

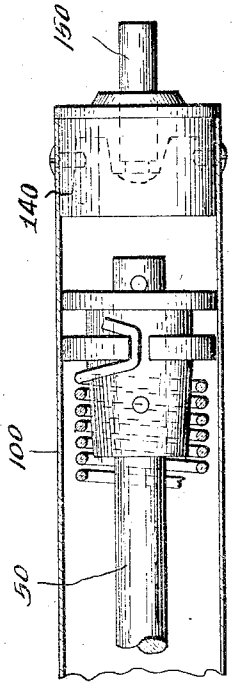


Fig-3-

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UNITED STATES PATENT OFFICE

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SPRING BARREL CONSTRUCTION

Application filed July 29, 1925. Serial No. 46,773.

This invention relates to spring rollers such as are used for counterbalancing curtains, window sashes and the like, particularly those used in railroad cars where it is impractical to use window weights, and has for its object a spring roller which is particularly simple, compact and economical in construction and highly efficient and durable in use.

The invention consists in the novel features and in the combinations and constructions hereinafter set forth and claimed.

In describing this invention, reference is had to the accompanying drawings in which like characters designate corresponding parts in all the views.

Figure 1 is a longitudinal sectional view of a spring roller embodying my invention.

Figure 2 is an end elevation of parts seen in Fig. 1.

Figure 3 is a fragmentary sectional view of a roller embodying another form of my invention.

This spring roller comprises generally a barrel, a shaft on which the barrel is mounted, a torsion spring anchored at one end to the shaft and at its other end to the barrel, the barrel being shiftable axially of the shaft the spring counterbalancing the curtain or sash supported by the roller, the barrel and the shaft being provided with coacting means for holding the barrel from being actuated by the spring, the portion of said means on the barrel being movable into and out of engagement with the portion on the shaft by the axial movement of the barrel.

1 designates the barrel of the roller, the roller being here shown as having heads 2, 3 at opposite ends of the barrel, the heads being inserted in the ends of the barrel and secured in position in any suitable manner as by screws 4.

5 designates the shaft extending axially of the barrel, the barrel being mounted on the shaft to rotate about the shaft.

6 is the torsion spring located in the barrel 1 and encircling the shaft 5, the spring 6 being anchored at one end to the shaft 5 and at its other end to the barrel or to one of the heads 2, 3. The spring 6 is here illustrated as anchored at one end at 7 to a spring abutment 8 mounted on and fixed to the shaft 5, and at its other end at 9 to the head 2.

Both abutment 8 and the head 2 are formed with hubs 11 and 12 about which the end coils of the spring extend. The shaft extends beyond the ends of the barrel, the end 13 thereof constituting one of the axles for the roller and the end 14, the other axle. The end 13 is flattened to fit into a suitable bracket for holding the shaft from turning movement in the normal operation of the roller. The barrel 1 is shiftable axially slightly and is formed with an annular ratcheting surface or rack 15 at one end for coacting with a tooth or pawl 16 on the shaft 5.

As seen in Figs. 1 and 2, this rack 15 is provided on outer end face of the head 2 and the tooth or pawl 16 is a pin extending transversely through the shaft 5 or the end 13.

The spring is initially tensioned by turning the shaft 5 and the spring held under tension until the roller can be mounted in supporting brackets by sliding the barrel axially of the shaft to engage the rack 15 with the tooth or pawl 16 on the shaft. The friction between the tooth or pawl 16 and the rack face 15 is sufficient to hold the barrel against being shifted endwise by the spring 6 and thus disengage the tooth or pawl 16 from the rack face.

After the spring barrel has been mounted in the brackets and connected to the curtain or window sash to counterbalance it, the barrel is shifted endwise to disengage the rack 15 from the tooth or pawl 16. In operation the spring 6 holds the barrel shifted to the right so that rack 15 is away from the tooth or pawl. This shifting to the right is limited by a thrust washer to be described later. The rack 15 and the tooth or pin 16 have no function except when the barrel is being mounted or dismounted in its supporting brackets. Before removing the barrel from its mounting it is first shifted endwise to reengage the rack 15 with the tooth 16 to prevent unwinding of the spring.

An end thrust bearing is provided between the shaft 5 and the head 2, this being here shown as a washer 17 thrusting against the

end of the hub 12 of the head 2, and against a shoulder 18 as a transverse pin on the shaft 5. The washer has a shoulder 19 engaging the shoulder 18 on the shaft to hold the washer from undue turning movement relatively to the shaft and cause the normal bearing surface to come between the washer 17 and the head 12.

In Fig. 3, the shaft 50 is shown as terminating within the barrel 100 and the head 140 of the barrel provided with an axle 150 fixed thereto. By this construction, the spring and shaft with the head 2 or spring abutment therein can be made of standard length and adapted to barrels of various lengths.

What I claim is:

1. A counterbalance for sashes including in combination a barrel having a head at one end; a shaft rotatively mounted in the barrel and extending through the head and axially shiftable with respect to the barrel; a coiled spring located in the barrel and anchored at one end to the head and at its other end to the shaft, so as to urge the shaft to shift axially with respect to the barrel, and to wind up when the barrel is turned with respect to the shaft; means on the barrel and shaft shiftable into engagement when the shaft is shifted axially, against the pressure of the spring, to lock the shaft and barrel against relative rotation.

2. A counterbalance for sashes including in combination a barrel having a head at one end; a shaft rotatively mounted in the barrel and extending through the head and axially shiftable with respect to the barrel; a coiled spring located in the barrel and anchored at one end to the head and at its other end to the shaft, so as to urge the shaft to shift axially with respect to the barrel, and to wind up when the barrel is turned with respect to the shaft; means limiting the travel of said shaft in an axial direction under urge of the spring, means on the barrel and shaft shiftable into engagement when the shaft is shifted axially, against the pressure of the spring, to lock the shaft and barrel againt relative rotation.

3. A counterbalance for sashes including in combination a barrel having a head at one end; a shaft rotatively mounted in the barrel and extending through the head and axially shiftable with respect to the barrel; a coiled spring located in the barrel and anchored at one end to the head and at its other end to the shaft, so as to urge the shaft to shift axially with respect to the barrel, and to wind up when the barrel is turned with respect to the shaft; a thrust bearing member on the shaft having a bearing surface engageable with the head for limiting the travel of said shaft in an axial direction under urge of the spring, means on the barrel and shaft shiftable into engagement when the shaft is shifted axially, against the pressure of the spring, to lock the shaft and barrel against relative rotation.

4. A counterbalance for sashes including in combination a barrel having a head at one end; a shaft rotatively mounted in the barrel and extending through the head and axially shiftable with respect to the barrel; a coiled spring located in the barrel and anchored at one end to the head and at its other end to the shaft, so as to urge the shaft to shift axially with respect to the barrel, and to wind up when the barrel is turned with respect to the shaft; rack means secured to the barrel; rack engaging means connected to the shaft and shiftable into engagement with said rack means of the barrel when the shaft is shifted relative to the barrel against the urge of the spring, to lock the shaft and barrel against relative rotation.

5. A counterbalance for sashes including in combination a shaft; a barrel mounted on the shaft; a spring located within the barrel; one part of the spring being attached to the shaft and another part to the barrel so that said spring will wind up when the barrel and shaft are turned with respect to one another, means shiftable into engagement to lock the barrel and shaft against relative rotation, said locking means being normally held out of engagement by the spring.

In testimony whereof, I have hereunto signed my name, at Syracuse, in the county of Onondaga, and State of New York, this 19th day of June, 1925.

ROY T. AXE.