Nov. 21, 1950 W. S. GWIN 2,530,462

SHADE ROLLER

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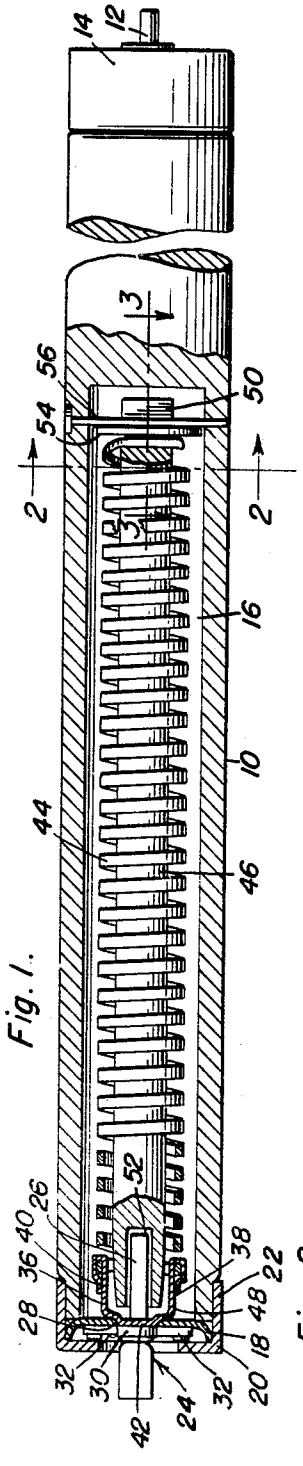


Fig. 1.

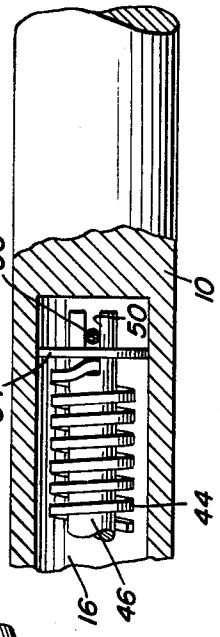


Fig. 3

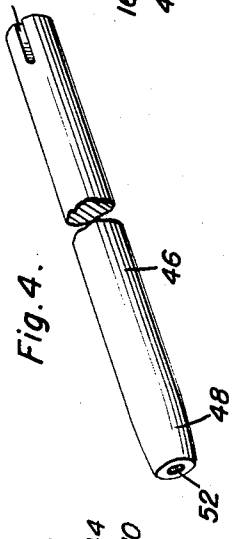


Fig. 4.

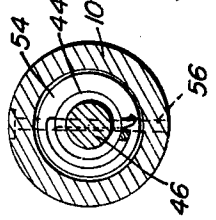


Fig. 2.

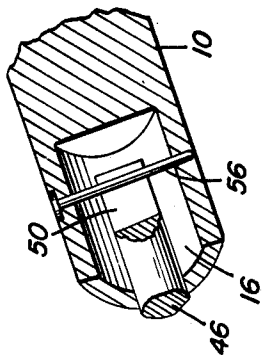


Fig. 5.

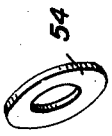


Fig. 6.

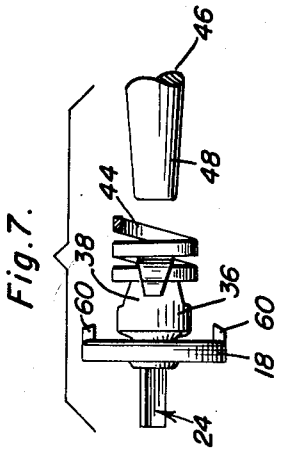


Fig. 7.

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SHADE ROLLER

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7 Claims. (Cl. 160—313)

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This invention relates to novel and useful improvements in shade rollers or supports.

An object of this invention is to improve the general operation and prolong the life of a shade roller through the utility of an improved structure which includes a roller having a bore in one end with the usual shaft carried at the end of the bore and with a floatingly mounted spindle disposed in the bore having a rotative connection with the shaft and a connection at the other end of the spindle preventing relative rotation between the spindle and the roller but allowing axial displacement of the spindle within the bore.

Another object of this invention is to materially lessen shade support or roller failure through the utility of a flat spring having one end fixed to the spindle so that the spring and spindle articulate together within the bore of the roller, the opposite end of the spring being fixed to a ferrule which is secured to the end shaft or spear of the shade roller construction, and the opposite end of the spindle being tapered to fit within the ferrule whereby a loose fit is achieved.

Ancillary objects and features of novelty will become apparent to those skilled in the art, in following the description of the preferred form of the invention, illustrated in the accompanying drawings, wherein:

Figure 1 is an elevational view of the preferred form of the invention, the operative elements thereof being shown in section;

Figure 2 is a transverse sectional view taken on a line 2—2 of Figure 1 and in the direction of the arrows;

Figure 3 is a longitudinal sectional view taken on a line 3—3 of Figure 1 and in the direction of the arrows;

Figure 4 is a perspective view of the spindle;

Figure 5 is a perspective view with parts shown in section of the end connection between the spindle and the roller;

Figure 6 is a perspective view of a washer used in connection with the end connection of the spindle with the roller, and;

Figure 7 is an exploded elevational view of the opposite end of the spindle construction from that shown in Figure 5.

It has been found that conventional shade rollers or shade supports of the mechanical type in some instances have been prone to mechanical breakdown in that occasionally the spring became removed from the bung collar of the wooden bung in the bung type shade roller. Spring fastening in other types of shade rollers have also caused mechanical breakdown due to failure.

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The present invention deals with a device designed for obviating or at least materially lessening this cause of mechanical failure. In the general assembly view of Figure 1 the shade roller 10 is provided of the usual material and has a trunnion 12 fixed to the collar 14 at one end of the roller. There is a bore 16 provided in the opposite end of the roller and an end plate 18 for the bores disposed thereover. A collar 20 has its flange 22 disposed in a suitable recess (unnumbered) at this end of the roller and is used for covering the end plate and holding it in place on this end of the roller.

A spear generally indicated at 24 which includes a shaft or a shaft portion 26 is mounted for rotative movement in a central opening 28 of the end plate 18. A ratchet 30 and dog 32 locking device is operatively connected with the end plate 18 and the spear 24 for retaining the spear in selected rotative positions.

A ferrule 36 consisting of a bottom portion which is fixed to the shaft 26, and having legs 38 and 40, is disposed in the bore 16. Noting Figure 1 it is evident that the slightly raised lower portions 42 of the ferrule serves as a bearing which is disposed in the opening 28.

A flat spring 44 is disposed in the bore 16 and has one end fixed to the ferrule 36. The means for fastening this end of the spring to the ferrule consists of the legs 38 and 40 which have their ends folded back to assume a substantially U-shaped configuration, one coil of the spring being encircled thereby.

A spindle 46 is disposed in concentric relationship with the spring 44. This spindle has a tapered end portion 48 and a slot 50 at the opposite end. A recess or opening 52 is provided in the tapered end of the spindle 46 and is of ample size so as to accommodate the shaft 46 for rotatable movement. The tapered end of the spindle is disposed within the ferrule 36 so that it is free to move with respect thereto.

Means fastening the opposite end of the spring to the roller 10 is provided. This means employs the slot 50 in the spindle 46 in such a manner as to prevent relative rotation of the spindle 46 in the roller 10 and in such a manner as to allow axial displacement of the spindle 46 with respect to the roller and within the bore 16. A washer 54 is fixed around the slotted end of the spindle 46 at a point spaced from the bottom of the said slot 50. This end of the spring is passed through the slot 50 and the washer is pulled on the spindle 46 pressing this end of the spring against the bottom of the slot 50. A pin 56 which may be

in the form of an inexpensive nail is disposed transversely across the bore **16**, being fixed to the material of the roller **10**. The pin is also passed through the slot **50** on the side of the washer **54** opposite that contacting the spring **44**.

There is a three fold purpose of the washer **54**. The washer acts as a guide for the spindle to straddle the nail **56**; keeps the spring centrally disposed in the roller bore; and protects the spindle from splitting.

In operation an ordinary shade is placed on the exterior surface of the roller **10** in the usual manner. After the spear **24** and the trunnion **12** are placed in the conventional brackets, the shade is ready to be operated upwardly or downwardly. When the roller is caused to rotate by operation of the shade, rotation is imparted from the spear **24** to the ferrule **36**. To assist in retaining the end plate **18** in place when the locking device is operative, the projections **60** of the end plate **18** are anchored in the end of the roller **10**.

As a ferrule rotates, the spring is placed under a torsional load, since the opposite end of the spring is fixed immovable with respect to rotation of the roller. When the spring is placed under a torsional load it contracts. Accordingly, since the spindle, to which the spring is attached, is capable of axial displacement within the bore **16**, the contraction of the spring is compensated slightly but sufficiently to prevent the maximum breaking tendency of the spring and the spring fastenings at the ends thereof.

Since the shaft portion **26** is freely rotatable in the recess **52** and the tapered end **48** of the spindle **46** is disposed in the ferrule giving sufficient clearance, the spindle is free to float within the confine of the lower or inner end of the recess **16** and the end plate **18**.

Having described the invention, what is claimed as new is:

1. A shade support comprising a roller having a longitudinal bore in one end, a pin passed through said bore, a spindle disposed in said bore and having one end floatingly fastened to said pin, said spindle having a recess in the opposite end, an end plate for said bore secured to said roller and having a shaft rotatably carried thereby, a part of said shaft being rotatively disposed in said recess, a ratchet and dog locking device operatively connected with said shaft and said plate, and a spring disposed in concentric relationship with said spindle, the ends of said spring being fixed respectively to said shaft and to said spindle.

2. In a shade support which includes a roller having a bore in one end with an end plate for said bore fixed to said roller, a trunnion secured at one end of said roller and a shaft passed through said plate, and a ratchet and dog locking device operatively connected with said shaft and said plate, the improvement which comprises; a spring disposed in said bore, a spindle concentric with said spring having said spring secured thereto, and means floatingly securing said spindle to said roller.

3. In a shade support which includes a roller having a bore in one end with an end plate for said bore fixed to said roller, a trunnion secured at one end of said roller and a shaft passed through said plate, and a ratchet and dog locking device operatively connected with said shaft and said plate, the improvement which comprises; a spring disposed in said bore, a spindle concentric with said spring having said spring secured thereto, and means floatingly securing said spindle to said roller, including a transverse pin disposed in said bore, a slot in and longitudinally of said spindle, said pin being loosely disposed in said slot, and said spindle being longitudinally displaceable when said spring is placed under a torsional load.

4. In a shade support which includes a roller having a bore in one end with an end plate for said bore fixed to said roller, a trunnion secured at one end of said roller and a shaft passed through said plate, and a ratchet and dog locking device operatively connected with said shaft and said plate, the improvement which comprises; a spring disposed in said bore, a spindle concentric with said spring having said spring secured thereto, and means floatingly securing said spindle to said roller including a transverse pin disposed in said bore, a slot in and longitudinally of said spindle, said pin being loosely disposed in said slot, said spindle being longitudinally displaceable when said spring is placed under a torsional load, one end of said spring being fixed to said shaft and the other end to said spindle, and the spindle adjacent the connection of the shaft being tapered.

5. In a shade support, a roller having a bore in one end, an end plate for said bore having a shaft rotatively disposed therein, a shaft locking device operatively connected with said plate and said shaft, a spring disposed in said bore, means fixing one end of said spring to said shaft, and means fixing the opposite end of said spring to said roller, including a spindle floatingly disposed in said bore, a slot in said spindle, a pin disposed in said slot and fixed to said roller, and a washer secured to said spindle around said slot with a part of said spring behind said washer.

6. In a shade support, a roller having a bore in one end, an end plate for said bore having a shaft rotatively disposed therein, a shaft locking device operatively mounted on said plate and said shaft, a spring disposed in said bore, means fixing one end of said spring to said shaft, a spindle having one end rotatively connected with said shaft and the opposite end connected to said roller by a slot and pin connection for rotative movement therewith and for axial displacement, the opposite end of said spring being connected to said spindle.

7. The combination of claim 6 and the means for fixing said one end of said spring to said shaft including a ferrule fixed to said shaft and means fixed to said ferrule locking the spring thereto, and the end of said spindle being tapered and disposed in said ferrule.

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