

June 12, 1951

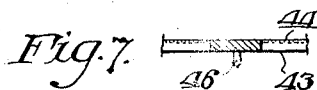
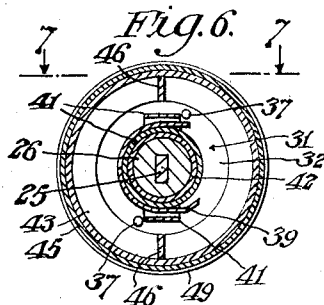
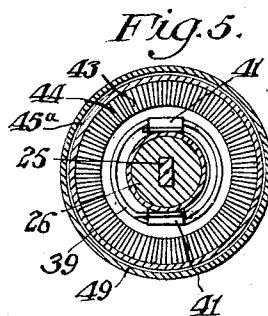
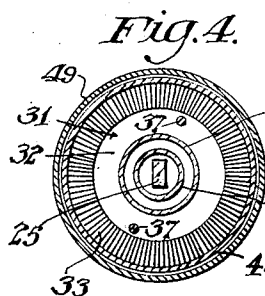
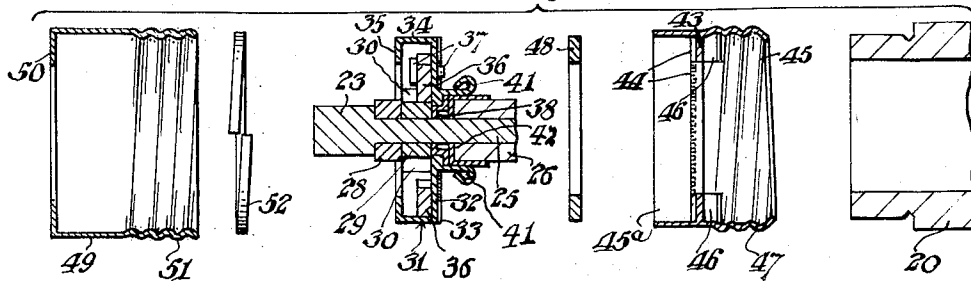
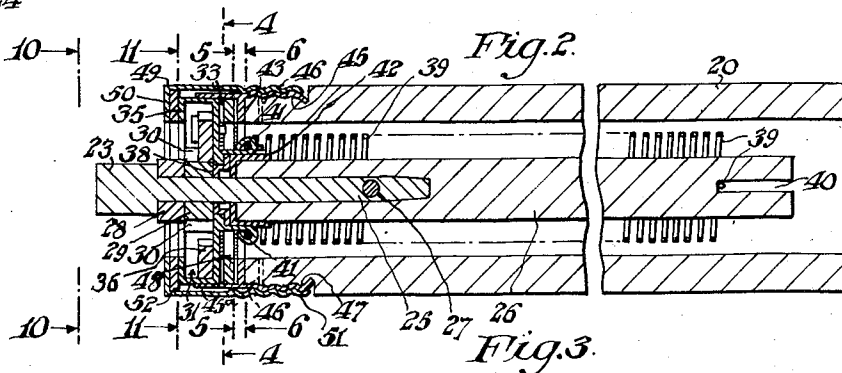
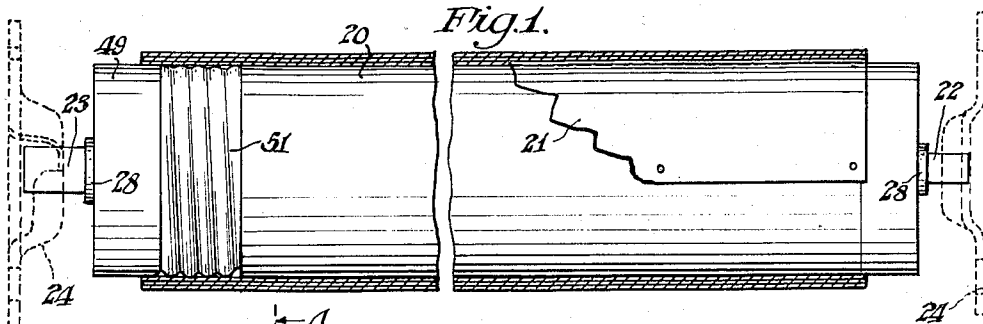
H. C. McMULLEN

2,557,005

ADJUSTABLE SPRING ROLLER FOR WINDOW SHADES

Filed Oct. 2, 1945

2 Sheets-Sheet 1



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ADJUSTABLE SPRING ROLLER FOR WINDOW SHADES

Filed Oct. 2, 1945

2 Sheets-Sheet 2

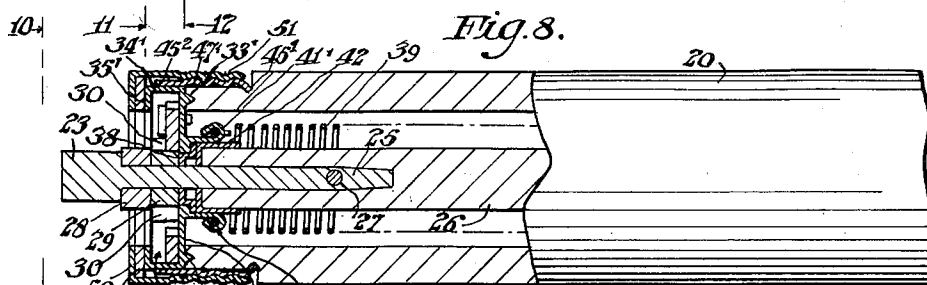


Fig. 8.

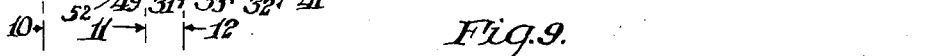


Fig. 9.

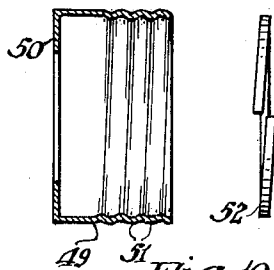


Fig. 10.

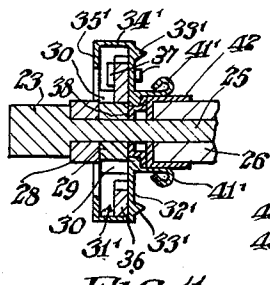


Fig. 11.

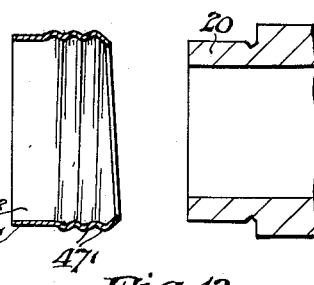


Fig. 12.

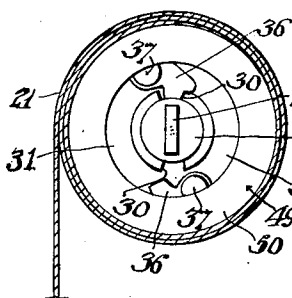


Fig. 13.

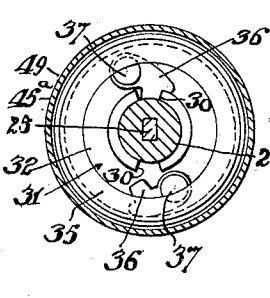


Fig. 14.

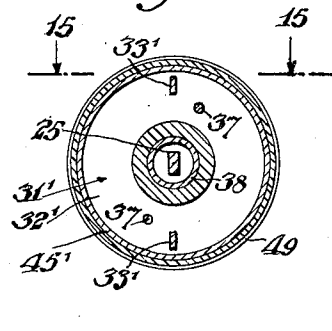
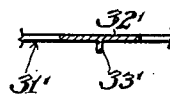
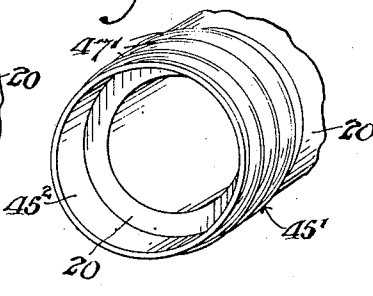
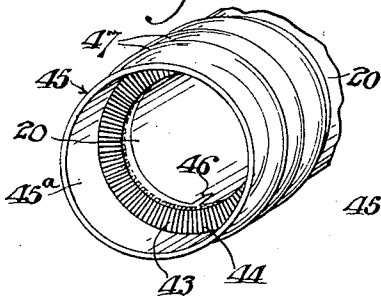


Fig. 15.



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UNITED STATES PATENT OFFICE

2,557,005

ADJUSTABLE SPRING ROLLER FOR WINDOW SHADES

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Application October 2, 1945, Serial No. 619,732

19 Claims. (Cl. 160—323)

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My invention relates to a new and useful adjustable spring roller for window shades and has for one of its objects to construct a spring roller so that the roll or cylinder and the rectangular pintle may be adjusted relative to each other to cause the free or stick carrying end of a shade to stop at any desired point in its path of travel, all with relation to the arrested positions of the roll or cylinder controlled by the ratchet.

Another object of the invention is to provide means for making the adjustment, which means can be manipulated without removing the roller from the brackets on the window frame or, if desired, while the roller is out of the brackets.

Another object of my invention is to provide means to adjust the roller and thereby adjust the shade so that the bottom of the shade will stop at any predetermined point, without the necessity of removing the shade from the roller, cutting off a short strip of the shade, nor tacking the shade at another location.

Another object of the present invention is to provide an adjustable spring shade roller in which the means for making the adjustment can be manipulated while the ratchet is or is not in the holding position, and which permits the roll or cylinder to be rotated forward or backward in accomplishing the purpose desired.

A further object of this invention is to provide a positive locking means for fixing the several elements of the adjusting means in their adjusted positions, in contradistinction to use of frictionally held parts which may slip or become worn and damaged. Such an arrangement practically eliminates all chance of wear and will positively hold the parts in their adjusted positions.

Another object of the present invention is to construct the adjusting means of several separable units whereby any unit can be replaced by another, if necessary or desirable. By so constructing the adjusting means, should the spring or ratchet become damaged or defective, or when the pawls become worn so that they no longer hold, which appears to be the most faulty element of the customary spring roller, then a new spring, pawl and ratchet unit can be inserted in the old roll or cylinder without discarding the other parts. This also will eliminate the necessity of fitting a new roll or cylinder to the space between the brackets, and also eliminate the necessity for the removal and replacement of the shade or shade fabric.

Another object of my invention is to provide a means for locking the adjustable parts together

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in a manner that can be accomplished by hand without the use of tools or instruments and one that can be accomplished by those not skilled in the art of shade hanging.

Still another object of the invention is to provide a structure that does not interfere with the usual or ordinary operation of the shade and the roller supporting the same after the adjustment has been made.

With the above and other objects in view this invention consists of the details of construction and combination of elements hereinafter set forth and then designated by the claims.

In order that those skilled in the art to which this invention appertains may understand how to make and use the same, I will described its construction in detail, referring by numerals to the accompanying drawings forming a part hereof, in which;

Fig. 1 is a broken elevational view of an adjustable spring roller for window shades constructed in accordance with my invention showing the shade or shade fabric thereon in sectional elevation.

Fig. 2 is a fragmentary longitudinal section of the roll or cylinder and the adjusting means.

Fig. 3 is a blown or exploded view of the several units of the adjusting means, some in section and some in elevation.

Fig. 4 is a section on the line 4—4 of Fig. 2.

Fig. 5 is a section on the line 5—5 of Fig. 2.

Fig. 6 is a section on the line 6—6 of Fig. 2.

Fig. 7 is a fragmentary sectional plan taken on the line 7—7 of Fig. 6.

Fig. 8 is a longitudinal sectional elevation of a modification.

Fig. 9 is a blown or exploded view of elements of the modification.

Fig. 10 is an end view of either form of the apparatus viewed from the line 10—10 of Figs. 2 and 8.

Fig. 11 is a section on the line 11—11 of Figs. 2 and 8 and applies to both forms illustrated.

Fig. 12 is a section on the line 12—12 of Fig. 8.

Fig. 13 is a perspective view of the barrel of Figs. 1, 2 and 3 shown on the end of the roller or cylinder.

Fig. 14 is a similar view of the barrel in Figs. 8 and 9.

In carrying out my invention as herein embodied 20 represents the cylinder or roller, usually of wood but may be of other material, and to this is secured the shade fabric 21, generally by tacking the same at spaced points along one edge. Pintles or trunnions 22 and 23 project

from opposite ends of the cylinder or roller 20 and are adapted to be received in suitable brackets 24 for removably mounting the shade at the window. One of said pintles, as 22, is round in cross section and the other is rectangular, or some shape other than round, in cross section.

The pindle 23 has a flat shank 25 inserted in the stick 26, as an extension of said pindle, and the two are fastened together by a pin 27 or equivalent means. On the shank 25 just inside or to the rear of the pindle head is a bushing 28 and inside or to the rear of said bushing is the ratchet including a hub 29, engaging the shank 25, and one or more teeth 30. The ratchet is located within the ratchet casing 31 which includes an end wall 32 having a rough outer surface, as an annular band of knurling 33, an annular side wall 34, and an inturned flange 35. Ratchet pawls 36 are located within the ratchet casing 31 and are pivoted to the end wall 32 on its inner face by the pivots 37, and said pawls cooperate with the ratchet teeth in the usual manner. The ratchet casing 31 is rotatably mounted relative to the pindle 23, the ratchet teeth 30 and the stick or pindle extension 26, and a bearing cup 38 on the pindle shank 25 may be provided for this purpose.

A tension spring 39 functions between the spindle 23 and the ratchet housing 31 by having one end attached to the pindle extension or stick 26, as by projecting said one end in a notch 40 in the inner end of said stick, and connecting the other end to said ratchet housing, as to an ear or ears 41 carried by said housing. The ears may be formed integral with the ratchet housing 31 or fixed thereto in any well known manner. A shoe 42 is fitted over the outer end of the stick 26 to protect the latter against wear due to movements of adjacent parts.

A plate 43, of ring formation, having a rough outer surface 44, such as knurling, is fixed to the end of the roller or cylinder 20 from which the flat pindle 23 projects. Any one of a number of fastening means may be utilized to attach the plate 43 to the roller or cylinder but a convenient means is to provide a barrel 45 carrying the plate, which barrel projects over a reduced end of the roller or cylinder and is clinched in place. To prevent rotation of said barrel, sharpened lugs 46, barbs or the like, project from the inner face of the plate 43 and are embedded or forced into the end of the roller.

The barrel 45 is provided with threads 47, particularly on the exterior, and a barrel extension 45a projects beyond the plate 43 to act as a guide for a compressible gasket 48, such as a rubber or soft lead washer, or the like, and also functions as a guide or holder for the ratchet casing 31. The gasket 48 is positioned between the rough or knurled surfaces of the plate 43 and the ratchet casing 31 so that when the latter is firmly pressed towards the plate, the parts will be securely held in their adjusted locations.

To urge the ratchet casing 31 towards the plate 43 and clamp them together through the medium of the compressible gasket 48, a sleeve 49 is projected over the ratchet casing and removably attached to the roller or cylinder 20, and has an element to engage said ratchet casing. Specifically, I have shown, for purposes of illustration, an inturned flange 50 at the outer end of the sleeve for coaction with the ratchet casing while the inner end of said sleeve is provided with threads 51 to engage the threads 47

of the barrel 45. A lock washer 52, preferably of the spring metal split type, may be interposed between the flange 50 of the sleeve 49 and the flange 35 of the ratchet casing 31 to maintain a counter pressure upon the ratchet casing and sleeve.

The modification illustrated in Figs. 8, 9, 12, 14 and 15 is similar to the first described form, the main difference being the elimination of the plate, the knurling, and the compressible gasket, and the substitution of means to attach the ratchet casing directly to the roller or cylinder.

In said modification I utilize the same kind of roller or cylinder 20 to which the shade fabric 21 is attached and said roller has the round pindle (not shown) and the flat pindle 23, which pintles engage in brackets as previously mentioned. The shank 25 of the flat pindle 23 is secured in the outer end of the extension stick 26 by the fastening means 27, and carries the bushing 28 as well as the ratchet which includes the hub 29 and the teeth 30. The ratchet is housed in a ratchet casing 31' similar to the first mentioned one, and this casing includes an end wall 32' having holding means 33', in the form of lugs, barbs or the like, which are forcibly embedded in the end of the roller or cylinder 20. Additionally, the ratchet casing includes an annular side wall 34' and an inturned flange 35'.

Ratchet pawls 36, the same as previously described, are pivoted within the casing to its end wall by pivots 37 and cooperate with the ratchet teeth, as usual. The same kind of bearing cup 38 is provided on the pindle shank as a bearing for the ratchet casing.

Also there is provided the tension spring 39 having one end attached to the pindle extension or stick 26 and the other end fastened in the ear or ears 41' carried by the ratchet housing 31'. Like the previously described form of the device, a shoe 42 is fitted over the outer end of the stick 26.

A barrel 45', to provide a connection for the sleeve 49 with the roller or cylinder 20, is telescoped over the reduced end of said roller or cylinder and clinched in place and further secured by fastening devices, if desired. This barrel 45' is also provided with threads 47' and an extension or neck 45² that extends beyond the contiguous end of the roller or cylinder. Said barrel extension functions to center the ratchet casing when the latter is assembled on the roller or cylinder 20.

The sleeve 49 is the same as previously described and includes the threads 51' for removable connection to the barrel 45' and the inturned flange 50 for coaction with the ratchet casing 31', with the lock washer 52 interposed between the flanges 50 and 35'.

Attention is particularly called to the fact that when the parts are assembled and locked or firmly held together, as illustrated in Figs. 2 and 8, the flat pindle 23, its extension stick, the ratchet, and other component parts, are rotatable relative to the roller or cylinder 20. Although, as will be apparent from Figs. 3 and 9, the ratchet casing, pawls, spring attaching ears, and spring are a part of the unit including the flat pindle, however, when the parts are held together, said ratchet casing in an element of the roller or cylinder 20, along with the barrel and sleeve, in each case, and also the plate and gasket in the form shown in Fig. 2 are elements of the roller. Therefore the roller or cylinder, as a whole, is connected with the flat pindle mech-

anism, as a whole, through the tension spring 39 for the usual and well known purposes, and the shade roller functions in the customary manner.

When it is desired to adjust the shade so that the bottom edge of the shade fabric will stop at any preselected location in its path of travel, the shade is pulled down until said bottom edge is in the region of the preselected location, either above or below said location. The holding or locking means is then released, and with the flat pintle mechanism or unit remaining stationary, a small amount of the shade fabric is wound upon or unwound from the roller or cylinder, as the case may be, to adjust the bottom edge of the shade until it coincides with said preselected location. This can be done while the shade is in place in its supporting brackets, providing there is sufficient space between the brackets, which generally exists, or the shade can be removed from the brackets and the necessary adjustments accomplished.

As illustrated in Fig. 2, the adjustment is carried out by releasing the sleeve 49 to relieve the clamping pressure from the ratchet casing 31 and then said ratchet casing is disconnected from the roller or cylinder 20. This disconnection is accomplished as follows: With the roller in a position having the flat pintle to the left and with the pawls set in the holding position, take hold of the edge of the sleeve 49 with the left hand and the roller cylinder with the right hand, turn the roller cylinder 20 towards the operator in the direction that will raise the shade. This will loosen the engagement of the screw threads 47 and 51 (47' and 51') in a manner that will not disengage the pawls from the holding position and therefore will not effect the tension set in the spring 39 when the shade is first lowered to determine how close the shade will come to reaching the preselected location. While the above method of operation is preferable, when the plate 43 is used in the assembly, adjustments can also be made without tension in the spring 39. It will not be necessary to remove the sleeve 49 from the barrel 45, or 45^a. The threads need only be loosened enough to allow space to withdraw the ratchet casing from the compressible gasket 48, or said casing and gasket from the plate 43. The flat pintle and ratchet unit now being free from the roller or cylinder, one of them, either the pintle and ratchet unit or roller, is rotated relative to the other either clockwise or counterclockwise, until an amount of the shade fabric is wound on or unwound from the roller that will take-up or release sufficient of the shade fabric to accomplish the adjustment desired. After the adjustment is completed, the clamping action of the sleeve 49 is restored, preferably through the medium of the lock washer 52, so that the ratchet casing 31 is firmly held or locked on the roller 20, through the medium of rough surface 33 of said casing, the compressible gasket 48 and the rough surfaced plate 43.

In that form shown in Fig. 8, the adjustment is achieved by releasing the sleeve 49 then pulling the ratchet casing 31' outward to withdraw the prongs 33' from the roller. The above actions release the ratchet mechanism, as a whole, from the roller and said roller may be rotated in either direction to cause a small amount of the shade fabric to be wound upon or unwound from said roller, as the may be, to adjust or regulate the bottom edge of the shade. After the adjustment has been made the prongs 33' are forced back

into the end of the roller, at the new location, and the sleeve 49 tightened to hold the parts in place.

Of course I do not wish to be limited to the exact details of construction as herein shown and described as these may be varied within the scope of the appended claims without departing from the spirit of my invention.

Having described my invention, what I claim as new and useful is:

1. The combination with a shade roller of the kind described, having a winding spring controlled by a ratchet pintle and pawls and in which rotation of the roller in one direction increases the spring tension and opposite rotation decreases said spring tension, of locking means operably engageable with and intermediate said pawls and roller whereby when said locking means is released the roller may be rotated adjustably in either direction regardless of whether the pawls are locked with or unlocked from said pintle.

2. The combination with a shade roller having supporting pintles at the ends and a roller operating spring secured to and between said roller and one of said pintles, of a pawl member between said roller and pintle to lock with the latter in only one direction of rotation of the roller, and locking means connected with and between said pawl member and roller to normally hold said pawl member in set relation to the roller, said locking means being releasable whereby the roller can be rotated in either direction to angularly adjust the same with relation to the pawl member while supported by the pintle.

3. The combination of a shade roller of the kind described having bracket-engaging supporting pintles, one of said pintles being rotatable within its cooperating bracket and the other being locked against rotation therein, and a spring operably secured to and between said roller and said locked pintle whereby the rotation of the roller in one direction while supported in said brackets will wind said spring and rotation in the opposite direction will unwind said spring, with locking pawls between said roller and the second pintle, and releasable locking means connected to and between said roller and pawls whereby when the locking means is released the roller may be rotated in either direction regardless of whether said pawls remain locked or unlocked.

4. The combination with a spring-wound shade roller of the kind described having locking pawls to normally prevent rotation of the roller in one direction, of positive locking means operably inserted between the roller and the locking pawls and releasable so that the roller may be adjustably rotated while mounted in place, to adjust the bottom of the shade vertically in either direction to any predetermined height.

5. The combination with a spring-wound shade having locking pawls, of means facilitating adjustment of the shade while mounted in place so that the bottom edge of the shade cloth will stop at any predetermined height, and comprising releasable locking means between the roller and said locking pawls, said locking means normally holding said roller and pawls in set angular relation.

6. The combination with a shade roller of the kind described, having a winding spring, a supporting pintle operably secured thereto, and locking pawls carried by said roller and engageable with said pintle, of members lockingly connected to and between said pawls and roller and when unlocked the roller may be rotated in either di-

rection regardless of whether said pawls are held in a locked or unlocked position.

7. The combination with a shade roller of the kind described, having a winding spring, a supporting pintle operably connected to said spring, locking pawls for engagement with said pintle, and an element carrying said pawls, said element and roller having locking surfaces thereon; of a compressible gasket between said surfaces and normally holding the element and roller in set angular relation while permitting of adjustable rotational movement therebetween when the locking surfaces are released from said gasket.

8. The combination with a shade roller of the kind described, having a winding spring, a supporting pintle operably connected to said spring and non-rotatably engageable with a roller supporting bracket, locking pawls for engagement with said pintle, and an element on said roller carrying said pawls, of locking elements interposed between said pawl-carrier element and roller to normally hold them in set angular relation while, when the locking elements are released, permitting adjustable rotational movement of the pawls to any position around the roller, and means to urge one of the locking elements towards the other.

9. The combination with a shade roller, of a pawl and spring unit including a pintle, a ratchet housing, pawls carried by said housing and co-operating with the pintle, and a winding spring connected with the pintle and ratchet housing, and means to releasably lock the pawl and spring unit on the roller, said means being released to rotationally adjust said unit and roller relative to each other in either direction.

10. The combination with a shade roller of the kind described having mechanical parts including a flat pintle, pawls, ratchet and tension spring, of means detachably connecting said mechanical parts to the roller whereby said mechanical parts may be removed and replaced while retaining the roller cylinder and shade in their original assembled relation to each other.

11. The combination with a shade roller of the kind described having mechanical parts consisting of a flat pintle, a stick, pawls, ratchet, a ratchet casing, said pawls mounted on said casing and the latter rotatably mounted on the pintle, and a tension spring having its opposite ends secured to the ratchet casing and the stick, of manually operable means connected to and between said casing and roller for detachably connecting said mechanical parts to the roller whereby said mechanical parts may be removed and replaced by hand.

12. The combination with a shade roller of the kind described having mechanical parts consisting of a flat pintle, pawls, ratchet and tension spring, of a threaded barrel crimped on the roller, and a threaded sleeve housing said mechanical parts and engaging the threaded barrel for detachably connecting said mechanical part to the roller.

13. The combination with a spring-wound shade roller of the kind described having locking pawls and casing therefor, of locking means com-

prising roughened interlockable surfaces located on and between the shade roller and said casing to normally hold them in preselected relation, whereby upon release of said surfaces the roller may be adjusted forward or backward regardless of whether the pawls are in either a locked or unlocked position.

14. The combination with a spring-wound shade of the kind described having locking pawls and a casing therefor, of locking means comprising lugs associated with said casing and compressible into the shade roller and a removable sleeve screw threaded onto said shade roller for forcing the lugs into said shade roller to normally hold said pawls and shade roller in preselected relation said lugs being withdrawable from the shade roller whereby said pawls and shade roller may be adjusted to other relative positions.

15. In combination a shade roller, a mechanical assembly including a flat pintle, pawls, ratchet and tension spring, means for facilitating adjusting said mechanical assembly relative to the shade roller, and means for releasably holding the mechanical assembly on said shade roller.

16. The combination with a shade roller of the kind described, having a winding spring and a supporting pintle operably connected to said spring and non-rotatably engageable with a roller supporting bracket, of means for releasably holding the shade roller relative to the pintle whereby, when released, they can be adjusted relative to each other regardless of whether said pintle is in its bracket or disengaged therefrom.

17. The combination with a shade roller having a hollow end, a unit including a pintle, a ratchet, pawls and a spring, said unit removably inserted in said hollow end of the shade roller and rotationally adjustable relative thereto, and interlocking non-frictional means to hold said roller and unit in any such adjusted position.

18. In combination, a shade roller, a mechanical assembly including a flat pintle having ratchet teeth, a ratchet casing encircling a portion of flat pintle, pawls pivoted within the casing for co-action with the ratchet teeth and a tension spring, and a sleeve coacting with the shade roller and including an intumed flange disposed in front of the ratchet casing to detachably connect said mechanical assembly to said shade roller.

19. The structure according to claim 18, in combination with means to lock the sleeve on the shade roller.

HARRY C. McMULLEN.

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