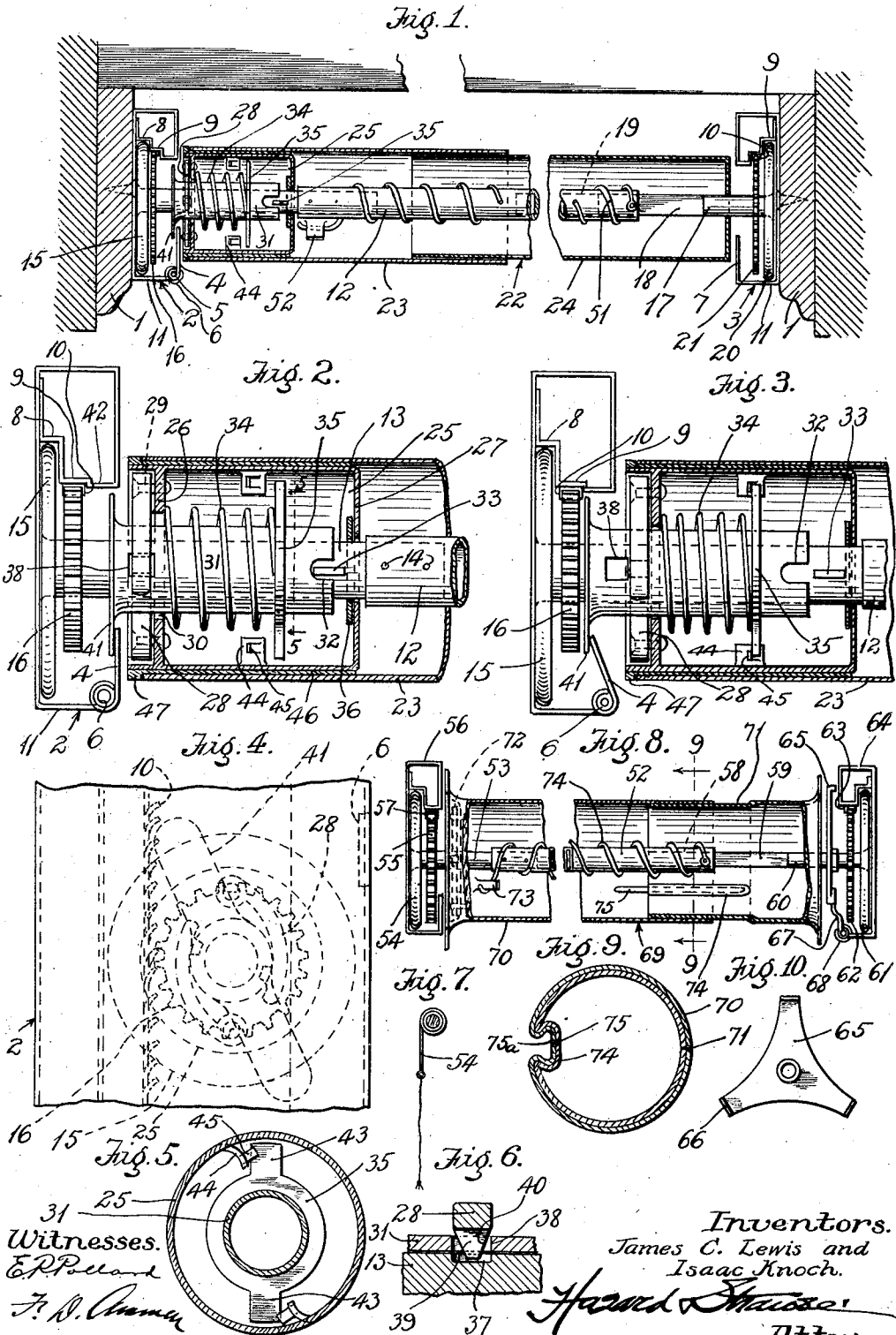


J. C. LEWIS & I. KNOCH.
SHADE ROLLER.

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UNITED STATES PATENT OFFICE.

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Specification of Letters Patent.

Patented Apr. 8, 1913.

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To all whom it may concern:

Be it known that we, JAMES C. LEWIS and ISAAC KNOCH, citizens of the United States, residing at Los Angeles, in the county of Los Angeles, and Susanville, in the county of Lassen, State of California, have invented new and useful Improvements in Shade-Rollers, of which the following is a specification.

This invention relates to shade rollers and particularly to shade rollers which are constructed and mounted in such a way that the position of the roller may be adjusted in the window, that is, so that the roller may be moved down if desired to a point low down on the window frame. In this way the curtain may be made to shade any part of the window desired.

The object of this invention is to provide a roller of this class having a simple construction and which can readily be adjusted to any position desired.

A special object of the invention has been to construct the roller so that when in position at any point its mode of operation will be substantially the same as shade rollers of usual construction. In other words the curtain of the shade may be raised or lowered by manipulating the curtain itself and without taking hold of any other part of the device. We provide means for holding the spindle or the shell of the roller against rotation.

A further object of the invention is to construct the roller so that its length can be adjusted to fit windows of different widths.

In the annexed drawing which fully illustrates our invention, Figure 1 is a longitudinal section taken through the shade roller constructed according to our invention and through a window frame, certain parts being broken away. This section is taken in a horizontal plane. Fig. 2 is a horizontal section taken upon an enlarged scale at the left end of the roller and showing the spindle held against rotation. Fig. 3 is a view similar to Fig. 2, but showing the shell held against rotation. Fig. 4 is a side elevation showing a part of one of the sheaths or guides for the end of the roller and further illustrating details of the construction. Fig. 5 is a cross section taken on the line 5—5 of Fig. 2 and illustrating the means for locking the clutch sleeve to the tubular shell. Fig. 6 is a fragmentary section taken through a part of the clutch sleeve and illus-

trating the manner in which it locks the spindle against rotation and releases the pawls, which may lock the shell to the spindle. Fig. 7 is a section taken at one end of the shade and showing the manner in which the curtain is rolled thereupon. Fig. 8 is a longitudinal section and partial elevation showing a modified construction of the shade roller, certain parts being broken away. Fig. 9 is a cross section taken on the line 9—9 of Fig. 8. Fig. 10 is a side elevation of the construction shown in Fig. 8.

Referring more particularly to the parts, 1—1 represents the side stops of a window frame to which our invention has been applied. In applying our invention, to the side faces of these stops 1 we attach vertically disposed guide sheaths or guides 2 and 3. These guides or guide-ways are very similar. The guide 2 at the right of the window differs slightly from the guide at the left. This variation consists in providing the guide 2 with a releasing plate 4 which extends longitudinally throughout the length of the sheath, and is attached to the body of the sheath at its forward edge by a hinge connection 5.

Coil springs 6 are provided at the hinge which tend to hold the releasing plate 4 in the position shown in Fig. 1, that is in a plane substantially at right angles to the axis of the roller. In the guide sheath 3 a fixed flange 7 is provided which corresponds to the releasing plate 4. The bodies of the sheaths are of simple construction. They are preferably formed of sheet metal bent as shown so that a pair of guide channels 8 and 9 are formed. The metal which forms the guide channels 9 is punched outwardly so as to form a plurality of teeth which constitute guide racks for a purpose which will appear more fully hereinafter. Opposite the guide racks the body of each sheath presents a guide web 11 which projects outwardly from the face of the side stop as shown.

The shade roller comprises a spindle having a tubular body 12 in one end of which a neck or stem 13 of reduced diameter is fixed by suitable cross pins 14 and on the end of this stem 13 a loose guide wheel or roller 15 is provided which runs between the guide channel 8 and the web 11 at the left of the window as indicated. On this neck 13 a gear wheel 16 is provided, the teeth of which run on the teeth 10 of the

adjacent rack, as will be readily understood. At the opposite end of the tubular body 12, a reduced stem 17 is arranged said stem having an angular shank 18 which slides in or out in a square or angular socket 19 formed in the end of the body 12, as indicated. On the end of the stem 17 a roller 20 is provided similar to the roller 12 and this roller is guided in the sheath 3 at the right of the window, as indicated. On the stem 17 there is also provided a gear wheel 21 similar to the gear wheel 16, and this gear wheel meshes with the teeth 10 of the guide rack at this side, as will be readily understood. This arrangement enables the spindle to be adjusted longitudinally to suit window frames of different widths.

On the spindle of the roller there is mounted a tubular shell or roller body 22, which is in the form of two telescopic sections 23 and 24, section 23 being disposed at the left, as indicated. In the end of the section 23 a cylindrical thimble 25 is mounted, said thimble having an outer head 26 and an inner head 27. In the inner head 27 the neck or stem 13 is rotatably mounted, as shown. The outer head 26 is depressed inwardly into the end of the thimble so as to form a pawl chamber and in this pawl chamber a pair of pawls 28 are mounted, the same being attached on pivots 29, which are secured in the head 26 as indicated.

The outer head 26 has an enlarged opening 30 through which passes a clutch sleeve 31 which is mounted to slide longitudinally on the stem 13, as indicated. This clutch sleeve has notches 32 at its inner end, which are normally engaged by the ends of a cross key 33 mounted in the stem 13 as indicated. The sleeve is normally held with the notches in engagement with the cross key 33 by means of a helical spring 34 which is disposed around the sleeve and which thrusts against a collar 35 integral with the sleeve, as indicated. Between the projecting ends of the cross key 33 and the head 27 a washer 36 is provided, and the edges of the key 33 rest substantially against this washer, as will be readily understood. As indicated most clearly in Fig. 6, the neck 13 is provided with recesses or pawl pockets 37. The sleeve 31 is provided with openings 38 which normally register with these pockets, as shown. Pawls 28 are provided with teeth 39 which normally extend through the openings 38 and engage the pockets 37 as indicated in Figs. 2 and 6. These teeth 39 present inclined side faces 40, and this form of tooth is adopted to enable the sleeve when slid longitudinally toward the left to throw the pawls out of engagement with the pawl pockets.

The end of the sleeve 31 is enlarged so as to form a cross head or cross bar 41 and this cross head is so long that in rotating with

the spindle its end will engage the inner wall 42 of the left guide sheath 2 and prevent the sleeve from rotating, as will be readily understood. This cross head lies adjacent to the swinging plate or releasing plate 4 and may be moved by pushing the plate inwardly toward the side of the window frame as indicated in Fig. 3.

As indicated in Fig. 5 the collar 35 is provided with diametrically opposite lugs 43 and adjacent to the normal position of these lugs the side wall of the thimble is provided with inwardly projecting ears 44. The material of these ears 44 is struck upwardly so as to form stops 45, which are adapted to come into the path of the lugs 43 when the collar 35 is advanced, so as to lock the shell section 23 to the sleeve. In this connection it should be understood that the thimble constitutes a plug for the end of the section 23 being rigid with the section 23. In order to seat the thimble nicely in the section 23 we envelop the thimble in a sleeve 46, which has a head or shoulder 47 seating on the end of the shell 23 as shown.

At the right end of the tube 12 one end of a helical spring 51 is attached and this spring is disposed around the tube 12 as shown, its other end being secured in an ear 23^a struck inwardly from the wall of the section 23. This spring is applied as indicated, that is, so that the curtain 54 depending from the inner face of the roller may be pulled down against the force of the spring, the spring then operates in the usual manner tending to raise the curtain and rewind it upon the roller.

The mode of operation of the preferred form of the invention will now be described.

When the roller is in a normal position, as indicated in Fig. 2, by pulling the curtain 54 suddenly the pawls 28 can be disengaged from the pawl pockets in a well known manner. As the roller is rotating the pawls will not have opportunity to reengage the pockets. In this connection it should be understood that there are two pawls disposed diametrically from each other, this arrangement being adopted to insure that one or the other of the pawls will tend to gravitate back into one of the pockets. If the roller is operated slowly one of the pawls will reengage in the manner suggested so as to hold the tubular shell 22 of the roller against rotation on the spindle. Of course as the shell 22 is rotated by pulling on the curtain it increases the torsion or tension in the spring 51 so that the spring constantly tends to wind up the curtain. When it is desired to adjust the roller to a more elevated position in the window frame, the releasing plate 4 is swung toward the left as indicated in Fig. 3. This movement presses its edge against the cross head 41 and slides the sleeve toward the left, the edges of the openings 38

engaging the inclining side faces of the pawls 28 disengage the pawls from the pawl pockets 37. In addition to this, the sliding movement of the sleeve releases the notches 5 32 from the ends of the key 33 so that the spindle and the sleeve 31 are independently rotatable. At the same time the movement of the sleeve 31 engages the lugs 43 with the ears 44, as indicated in Fig. 5, so that the 10 sleeve becomes locked to the tubular shell 23. On account of the fact that the cross head 41 prevents the rotation of the sleeve 31 by striking the wall 42 of the sheath it follows that the tube 23 will be held against 15 rotation. This enables the spring 51 to react against the tube, and the spindle being free to rotate the spring will then rotate the spindle. The direction of rotation of the spindle given by the spring 51 will be such 20 as to cause the gear wheels 16 and 21 to roll up on the racks formed by the teeth 10. In this way the spring operates to raise the roller to the desired height. As soon as this point is reached, the plate 4 can be released, whereupon the spring 34 will return the clutch sleeve 31 to its normal position releasing the tube 23 and locking the sleeve 25 again to the spindle through the medium of the notches 32. The pawls then return to the pawl pockets and the roller is again in 30 its normal state. In order to lower the roller the clutch sleeve 31 is released in the same manner as before, but the lower end of the curtain should be pulled down with sufficient 35 force to overcome the force of the spring 51. This will roll the gear wheels 16 and 21 downwardly on the racks and when the roller reaches the point desired the plate 4 can be released, which will return the parts 40 to their normal position.

In the modified form of the invention shown in Figs. 8, 9 and 10 we omit the releasing sleeve. We provide means for normally locking the spindle against rotation 45 by engaging a part of one of the guide sheaths. In its construction the spindle comprises a tubular body 52 in one end of which a stem 53 is rigidly attached, said stem being provided with a roller 53^a and 50 a gear wheel 55 rigid therewith. The roller 54 is guided in a sheath 56 in the usual manner, and the sheath is provided with a rack 57 meshing with the gear wheel 55. The opposite end of the tube 52 has an angular 55 or square socket 58 to receive the angular or square shank 59 formed on the sliding stem 60 and this stem 60 is provided with guide rollers 61 similar to the guide roller 54. It also carries a rigid gear wheel 62 meshing 60 with the racks 63 formed on the sheath 64 at the right of the window frame, as indicated. On the stem 60 adjacent to the sheath 64 a stop wheel 65 is rigidly attached, said stop wheel having a plurality of arms and laterally projecting fingers 66 formed there-

upon. The forward part of the sheath 64 is provided with a locking or releasing plate 67, which is pressed by a spring 68 so that it tends to move toward the left and maintains itself normally in engagement with 70 one of the arms of the stop wheel 65. In this way it projects itself into the path of the fingers 66 so that it normally prevents the spindle from rotating. The body of the roller is in the form of a tubular shell 75 formed of two telescoping tubular sections 70 and 71. The section 70 is provided with pawls 72 which cooperate with the stem 53 in the same manner as the pawls 28 cooperate with the stem 13, that is, they afford 80 means for locking the tube 70 to the stem adapted to be released by pulling on the curtain. The section 70 is provided with an ear 73 to which the end of a helical spring 74 is attached, said spring being 85 wound on the tube 52 and having its other end attached to the tube 52 as shown. In order to guide the tubular sections 70 and 71 upon each other, the section 71 has its material offset inwardly so as to form a dove 90 tail guide groove 75, as indicated in Fig. 9, and the material of the tube 70 is offset so as to form a dove tail tongue 75^a, which is adapted to slide into this groove and interlock therewith as indicated. 95

In the operation of this modified form of the invention, the curtain hangs down from the inner face of the roller as in the preferred form, and when it is desired to raise 100 the roller to a more elevated position on the window frame, the lower end of the curtain should be pulled downwardly, the plate 67 being moved toward the right at the same time so as to release the stop wheel 65. This will rotate the roller, and the gear wheels 105 55 and 62 will run upwardly on the racks 57 and 63. When the plate 67 is released it will lock the spindle against rotation. When it is desired to lower this roller it is only necessary to release the stop wheel 65 from the 110 plate 67 so as to permit the roller to descend by gravity. In raising the roller as suggested the pull on the curtain should not be sudden but steady so that the pawls 72 will operate to rotate the spindle. In allowing 115 the roller to descend by gravity, the spring 74 does not of course influence the operation in any way for the shell of the roller is locked to the spindle by the pawls 72.

Attention is called to the function of the guide rollers 15 and 20. They operate to guide the roller and keep the gear wheels in engagement with their racks. A similar function is performed by the guide rollers 120 53^a and 61. 125

Attention is called to the fact that the spindle of the roller is extensible independently of the tubular shell. This is an advantage for the reason that if the window frames 130 varies in width, the spindle will adapt itself

automatically to the change in width. The shell, however, is adjusted once for all to the proper length, and this length is fixed by having the curtain attached to the shell.

5 Having described our invention what we claim as new and desire to secure by Letters Patent is:

1. In an adjustable shade in combination, a pair of guide ways, a shade roller rotatably mounted in said guide ways, resilient means carried within said roller tending to raise said shade roller in said guide ways, and means for locking said shade roller against an upward or downward movement at any point along its path of travel.

2. In an adjustable shade in combination, guide ways, wheels adapted to travel in said guide ways, a shade roller connected with said wheels, a shade carried by said shade roller, resilient means within said roller adapted to rotate said wheels to advance said shade roller upwardly, and means for controlling the rotation of said wheels.

3. In an adjustable shade in combination, a vertically disposed rack, a spindle, a gear wheel carried by said spindle and meshing with said rack and adapted to roll up and down thereupon, a tubular roller mounted on said spindle, a shade attached to said roller and adapted to rotate the same, a spring connecting said spindle with said roller, and means for arresting the rotation of said roller to enable said spring to rotate said spindle and said gear, the rotation of said gear by said spring affording means for raising the roller on said rack.

4. In a shade roller of the class described, guides adapted to be attached to the side of a window frame, a spindle, means for guiding said spindle in said guides, a tubular shell rotatably mounted on said spindle adapted to have a curtain wrapped thereupon, means for normally locking said shell against rotation on said spindle and releasable by the sudden rotation of said shell, means for holding said shell against rotation, and resilient means between said spindle and said shell affording means for raising said spindle in said guides when said shell is held against rotation.

5. In a roller of the class described, a spindle, gear wheels carried by said spindle, guides at the sides of the window frame having racks meshing with said gear wheels, means for maintaining said gear wheels in mesh with said guide racks, a tubular shell mounted on said spindle and adapted to have a curtain wrapped thereupon, means for locking said shell to said spindle adapted to be automatically released by the curtain, and means independent of the curtain for disengaging said locking means.

6. In a roller of the class described, a spindle, gear wheels carried by said spindle, guides at the sides of the window frame hav-

ing racks meshing with said gear wheels, means for maintaining said gear wheels in mesh with said guide racks, a tubular shell mounted on said spindle and adapted to have a curtain wrapped thereupon, means for locking said shell to said spindle adapted to be automatically released by the curtain, means for disengaging said locking means, and a spring between said shell and said spindle tending to rotate said shell in a direction to wind up said curtain.

7. In a shade roller of the class described, a pair of guide racks, a spindle, gear wheels carried by said spindle meshing with said racks, a tubular shell disposed around said spindle and adapted to have a curtain wrapped thereupon, a spring between said shell and said spindle tending to rotate said shell, means for normally locking said shell to said spindle, means independent of the curtain for releasing said locking means so as to enable said spindle to rotate independently of said shell, and means for locking said shell against rotation.

8. In a shade roller of the class described, a pair of guide racks, a spindle, gear wheels carried by said spindle and meshing with said racks, a tubular shell disposed around said spindle and adapted to receive a curtain wrapped thereupon, pawls affording means for locking said shell to said spindle, a sliding member mounted on said spindle adapted to disengage said pawls, means carried by said member for locking the same to said shell, and means for locking said member against rotation.

9. In a shade roller, a spindle, gear wheels carried thereby, guide racks meshing with said gear wheels, means for holding said gear wheels in mesh with said racks, a tubular shell mounted on said spindle, pawls carried thereby, said spindle having pawl pockets normally engaging said pawls to hold said shell against rotation on said spindle, a sleeve mounted to slide on said spindle, means for normally locking said sleeve on said spindle, means for locking said sleeve against rotation on said shell, said sleeve affording means for disengaging said pawls from said pawl pockets and having means for preventing the rotation of said shell.

10. In an adjustable shade, in combination, a rack, a spindle, a shell mounted on said spindle adapted to having a shade rolled thereupon, a gear in connection with said spindle, said shell being rotatable upon said spindle, and a member arranged so as to prevent the free rotation of said spindle and permit the rotation of said shell and adapted to engage said shell and permit the free rotation of said spindle.

11. An adjustable roller having a spindle, means for holding said spindle against rotation, means for guiding said spindle so as

to raise or lower said roller in the window-frame, a shell rotatably mounted on said spindle, means for checking the rotation of said shell on said spindle, and a member for
5 holding said spindle against rotation and permitting the free rotation of said shell and adapted to hold said shell against rotation and permitting the free rotation of said spindle.

10 12. An adjustable roller having a spindle, means for holding said spindle against rotation, means for guiding said spindle so as to raise or lower said roller in a window frame, a shell rotatably mounted on said spindle,

means for checking the rotation of said shell 15 on said spindle, and a member for holding said spindle or said shell against rotation.

In witness that we claim the foregoing we have hereunto subscribed our names this 2nd day of March, 1910.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
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