

O. KOLLER.

GEARING.

APPLICATION FILED APR. 10, 1919.

1,341,237.

Patented May 25, 1920.

2 SHEETS—SHEET 1.

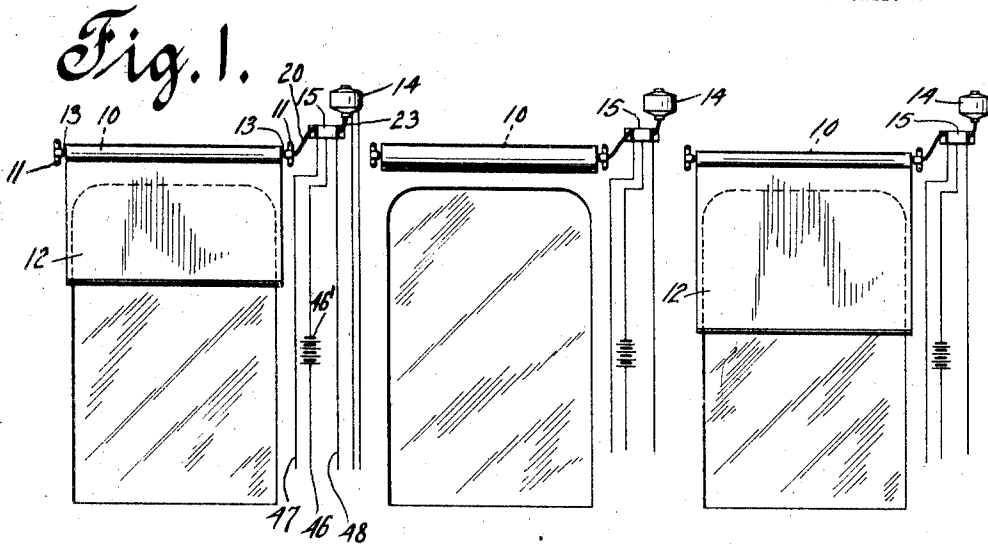


Fig. 2.

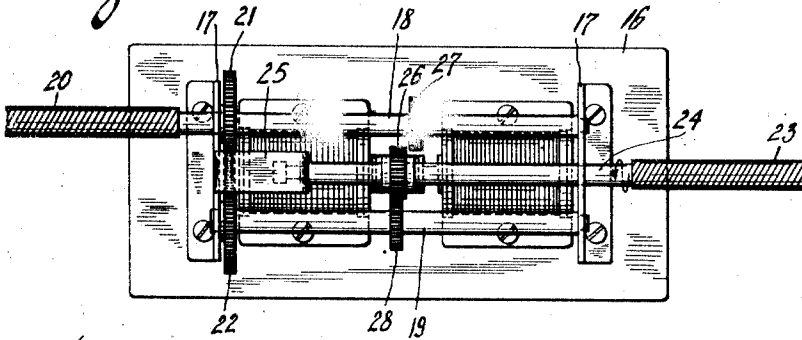
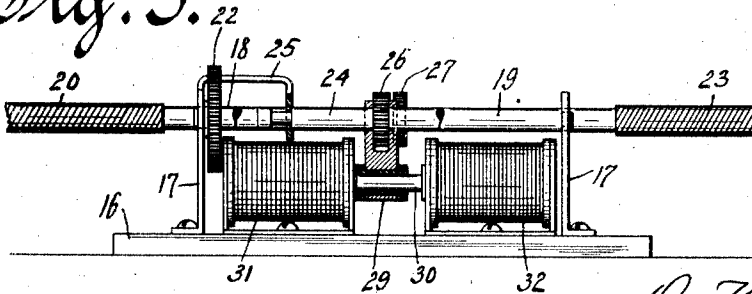


Fig. 3.



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Fig. 4.

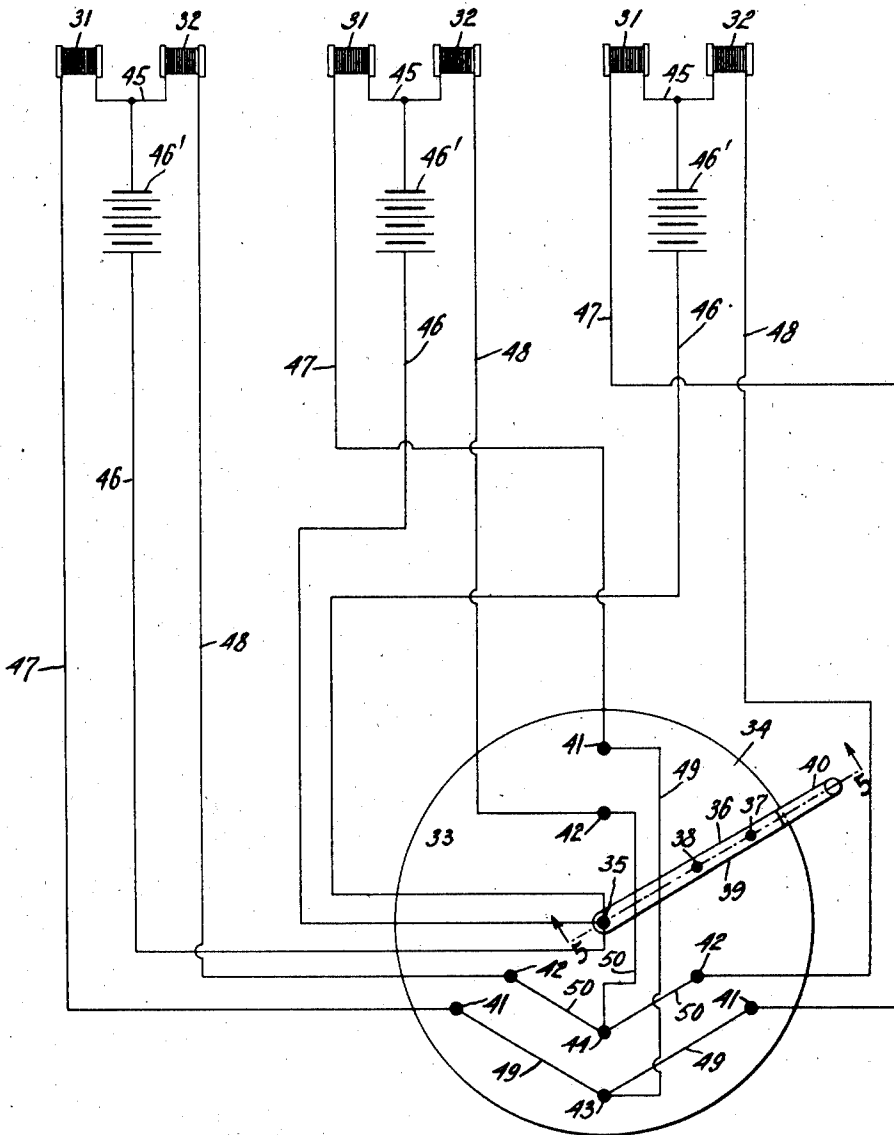
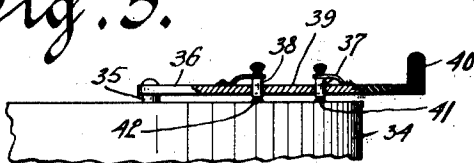


Fig. 5.



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UNITED STATES PATENT OFFICE.

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1,341,237.

Specification of Letters Patent.

Patented May 25, 1920.

Application filed April 10, 1919. Serial No. 288,939.

To all whom it may concern:

Be it known that I, OSCAR KOLLER, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Gearings, of which the following is a specification.

The present invention relates to a gearing, adapted, for instance, for raising and lowering window-shades and the like.

The main object of the invention is to provide a simple and efficient electrically controlled mechanism for winding the shade or curtain upon or unwinding the same from its supporting roll, said mechanism being so constructed that it can be applied to already existing structures without necessitating material changes therein.

A further object of the invention is to provide a device of the character mentioned which can be manufactured on a commercial scale or, in other words, one which is not so difficult to make as to be beyond the reasonable cost of such a contrivance.

With these and other objects in view, which will more fully appear as the nature of the invention is better understood, the same consists in the combination, arrangement and construction of parts hereinafter described, pointed out in the appended claims and illustrated in the accompanying drawings, it being understood that many changes may be made in the size and proportion of the several parts and details of construction within the scope of the appended claims without departing from the spirit or sacrificing any of the advantages of the invention.

One of the many possible embodiments of the invention is illustrated in the accompanying drawings, in which:—

Figure 1 is a front elevation of a plurality of window-shades showing diagrammatically the application of the winding and unwinding mechanism applied thereto; Fig. 2 is a top plan view of a power transmitting apparatus and an electric gear-shifting mechanism, forming part of the device; Fig. 3 is a front elevation of the same; Fig. 4 is a diagrammatic view illustrating the manner of connecting a plurality of these power transmitting devices; and Fig. 5 is a section taken on line 5—5 of Fig. 4.

In the drawings a plurality of window-

shades are shown, three in number, controlled from a single switchboard. It is obvious that any other suitable number may be provided, according to the requirements. The winding and unwinding mechanism of each of these shades is alike in construction, so that only one of the same need be described herein.

In the drawings, the numeral 10 indicates a supporting roller, that is mounted to revolve in brackets 11, the latter being mounted upon the window-frame over which the shade 12 on the said roller is adapted to be extended. One of the journals 13 of the roller 10 is connected with an electric motor 14, there being interposed between these two elements a power transmitting apparatus 15, that is provided with means for reversing, at will, the direction of rotation of the roll 10, while maintaining the direction of rotation of the motor.

The power transmitting apparatus is shown in detail in Figs. 2 and 3 of the drawings, and comprises a base 16, from which rise standards 17, in which are rotatably mounted two parallel spindles 18 and 19. The spindle 18 is connected with the journal 13 by a flexible shaft 20, and is also geared to the spindle 19, there being fixed to the spindle 18 a gear 21, in mesh with a gear 22, the latter being fixed to the spindle 19. The motor-shaft is connected by a flexible shaft 23 with a shaft 24, the latter being disposed between the spindles 18 and 19 and rotatably mounted in one of the standards 17 and in a bearing-lug 25, that is fixed to the other standard. The shaft 24 is mounted parallel to the spindles 18 and 19, and is shiftable in its bearings in the direction of its longitudinal axis. To the shaft 24 is rigidly secured a pinion 26, that is adapted to mesh with either one of two pinions 27 and 28, fixed to the spindles 18 and 19, respectively. The pinions 27 and 28 are out of alinement, so that the pinion 26 may be unmeshed with either one of the same and brought to mesh with the other one.

On the shaft 24 is mounted a downwardly extending lug 29, the lower end of which is shiftable upon a bar 30, while its upper end is fork-shaped, its prongs straddling the pinion 26. The lug 29 is so mounted on the spindle 24 that it does not interfere with the rotation of the latter, and forms the armature of an electro-magnet. Two electro-

magnets 31 and 32 are mounted upon the base plate 16 immediately below and in parallel relation to the spindle 24. The bar 30 is attached to these electro-magnets and is disposed in parallel relation to the spindle 24.

The windings of the electro-magnets are included in an electric circuit, a diagram of which is shown in Fig. 4 of the drawings. From this diagram it appears that the six electro-magnets of the three window-shade operating mechanisms, shown in Fig. 1 of the drawings, are connected by electric conductors to a switchboard 33. This switchboard comprises a base plate 34, for instance of disk-shape, to the center 35 of which is pivoted a switch lever 36, carrying two spring-pressed contact points 37 and 38. The switch lever includes a portion 39 made of electric conducting material, and a handle 40 made of insulating material. For each pair of magnets there are mounted on the switchboard two contact points 41 and 42, which are disposed in the path of the contact points 37 and 38 on the switch lever, the point 37 being adapted to contact with the points 41 and the point 38 with the points 42. There are furthermore two contact points 43 and 44 on the base plate 34, the latter pair of points being also adapted to contact with the contact points on the switch lever.

Two of the terminals of each pair of electro-magnets 31 and 32 are connected by a conductor 45, and from each of these conductors leads a connection 46 to the pivot point 35 of the switch lever. In each conductor 46 is inserted an electric battery 46'. The other terminal of each electro-magnet 31 is connected by a conductor 47 with a contact point 41, and the other terminal of each electro-magnet 32 by a conductor 48 with a contact point 42. Each contact point 41 is connected by a conductor 49 with the contact point 43 on the switch-board, and from each contact point 42 leads a conductor 50 to the contact point 44.

The brushes of each electric motor are connected through the switchboard with the respective battery 46'. These connections, however, have not been shown as they do not form part of the present invention.

The operation of the device is as follows:—When it is intended to unwind any one of the window-shades, the switch-lever 36 is shifted to bring its contact points in alinement with the respective contact points 41 and 42 on the switchboard. By forcing then the contact 37 against the contact 41, the electric circuit, in which the respective electro-magnet 31 is inserted, is closed, whereby the said magnet is ener-

gized, attracting thus the respective armature. The shaft 24 is thus shifted so as to bring the pinion 26 into mesh with the gear 28 on the spindle 19. At the same time the motor circuit is closed, whereby the rotation of its shaft is transmitted by the intermediary of the gears 22 and 21 to the roller journal 13, rotating the same so as to unwind the shade.

If it is intended to raise the shade, the switch lever is shifted into registering position with the respective contact points 41 and 42, and the contact 38 on the said lever depressed, whereby the circuit of the respective electro-magnet 32 is closed. The pinion 26 is thus shifted into mesh with the pinion 27 on the spindle 18. The rotation of the shaft 24 is thus directly transmitted to the spindle 18, rotating the same in the direction so as to wind up the shade.

If the entire row of window shades is to be unwound simultaneously, the switch lever is shifted into registering position with the contacts 43 and 44 on the switchboard. By depressing the contact 37, the circuits of all electro-magnets 31 are closed, with the result that all of the roller journals rotate simultaneously in unwinding direction. If all the shades are to be wound up simultaneously, the contact 38 is depressed, thereby closing the circuits of all electro-magnets 32.

It is obvious that, while herein the device has been described for raising and lowering window-shades, it may be used in connection with curtains or in any situation calling for reversible rotary motion.

What I claim is:—

1. The combination with a rotatably mounted roller, of a motor, and a power transmitting device interposed between said motor and roller, comprising two spindles geared together and having each fixed thereto a pinion, said two pinions being out of alinement and one of said spindles being connected with said roller, a longitudinally shiftable shaft carrying a pinion adapted to mesh with either one of said first-mentioned pinions, said shaft being connected to the motor shaft, and electrically controlled means for shifting said first-mentioned shaft in either direction, at will.

2. In a device according to claim 1, said electrically controlled shifting means comprising two electro-magnets, each in an electric circuit, and an armature common to both electro-magnets carried by said shiftable shaft.

Signed at New York, in the county of New York, and State of New York, this 7th day of April, A. D. 1919.

OSCAR KOLLER.