

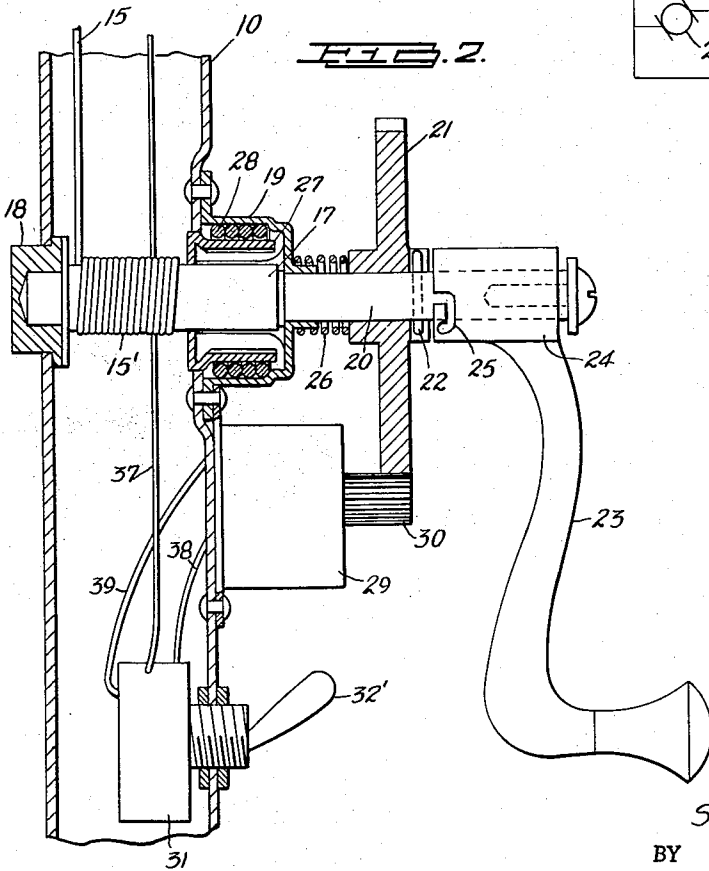
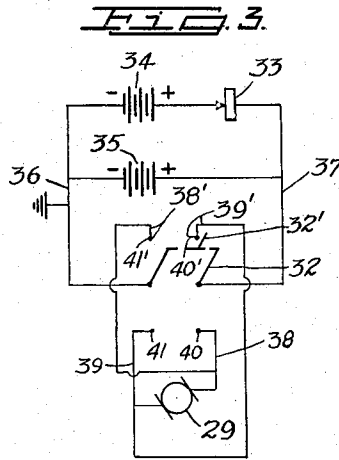
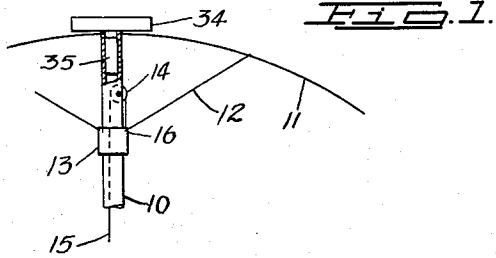
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S. N. SMALL

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SOLAR ACTUATED UMBRELLA RAISING MECHANISM

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INVENTOR.
SAMUEL N. SMALL

BY
Howard C. Thompson
ATTORNEY

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SOLAR ACTUATED UMBRELLA RAISING MECHANISM

Samuel N. Small, Valley Stream, N.Y., assignor to Alfred G. Cohen and Paul Weiss, both of Flushing, N.Y.

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3 Claims. (Cl. 135—22)

This invention relates to what are generally referred to as lawn and beach umbrellas usually employing a manually operated mechanical lift for moving the umbrella into open position. More particularly, the invention deals with an umbrella of the character defined of the solar actuated type, that is to say, employing a conventional battery in combination with a solar battery arranged upon the top of the umbrella, providing an electrical source of supply for actuating a drive motor for moving the umbrella into open position.

Still more particularly, the invention deals with a structure of the character described, employing manually actuated means for operating the umbrella, which means automatically moves the electrical drive means into inoperative position when in use.

The novel features of the invention will be best understood from the following description, when taken together with the accompanying drawing, in which certain embodiments of the invention are disclosed and, in which, the separate parts are designated by suitable reference character in each of the views and, in which:

Fig. 1 is a small diagrammatic illustration of an upper portion of an umbrella indicating the arrangement of batteries thereon and diagrammatically showing part of the umbrella in open position.

Fig. 2 is an enlarged sectional detail view of the lower post or shaft of the umbrella illustrating the electric motor drive in operative position and the manual drive in inoperative position, parts of the construction being shown in elevation; and

Fig. 3 is a diagrammatic diagram of the wiring system employed.

Considering Figs. 1 and 2 jointly, 10 represents the tubular post or pole of the umbrella having a conventional collapsible top 11 with the brace stays or rods 12 coupled with the runner 13. In the upper end portion of the tubular post is supported a pulley 14 around which the lift or operating cord or cable 15 passes with one end fixed to the runner 13, as diagrammatically seen at 16. The lower end of the cord or cable 15 is secured to a drive shaft 17 and wound thereon, as indicated at 15' in Fig. 2 of the drawing.

Mounted in one side of the post 10 is a bearing block 18 for one end of the shaft 17. Mounted in the opposed wall of the post 10 is a break box or housing 19 through which the shaft 17 passes. The shaft 17 has a reduced protruding end 20 on which is slidably mounted a large drive gear 21 having a pin coupling with the shaft 20, as indicated by the pin 22, the gear being shown in coupled or clutched engagement with the shaft in Fig. 2 of the drawing. Mounted on the outer end portion of the extension 20 is a manually operable crank 23 normally free on the shaft extension 20 and the hub portion 24 of which has bayonet slot couplings 25 at opposed sides adapted to engage the pin 22 in providing a drive con-

gear 21 against the action of a spring 26 disposed between the gear and the housing 19. It will thus be apparent that upon detaching or uncoupling the drive through the crank 23, the gear 21 will automatically be moved into operative position by the spring 26.

Arranged within the housing 19 is a break drum 27 including spring means 28 which normally supports the break drum in operative position retaining the shaft 17 against rotation. No detailed reference will be made to the break mechanism as in itself it forms no specific parts of the present conception.

Supported on the post 10 adjacent the housing 19 is a motor, diagrammatically shown at 29, and the shaft of this motor has a protruding elongated pinion 30 meshing with the gear 21, as diagrammatically noted. The pinion 30 is sufficiently long to permit the sliding movement of the gear 21 on the shaft extension 20 for the purposes previously described, and it might be noted at this time that when the gear 21 is in non-driving position the end 20 of the shaft 17 is free to be rotated by the crank 23.

Suitably supported on the post 10 is a box or casing 31 containing a double pole switch, as diagrammatically seen at 32 in Fig. 3 of the drawing, and an electric automatic cutout 33, also diagrammatically shown in Fig. 3. In Fig. 2 of the drawing, 32' illustrates the switch lever by means of which the switch 32 can be manually operated.

Now considering Fig. 1 of the drawing, at the top center of the umbrella, and preferably supported on the upper end of the post 10, is a solar battery, diagrammatically shown at 34, and at 35 is illustrated a storage battery. The position of this latter battery may be anywhere along the post as its association adjacent the solar battery 34 is not essential and it can be arranged externally of the post rather than internally, as diagrammatically shown in Fig. 1.

The circuit as diagrammatically seen in Fig. 3 of the drawing is a circuit including a grounded side noted at 36. The circuit wires from the battery extending to one pole of the switch, as indicated at 37, the ground side extending to the other pole of the switch.

The switch controls circuit wires 38, 39 extending to switch contacting terminals 40, 41, respectively, the wires 38, 39 having branches 38', 39', extending to another pair of switch contacting terminals 41', 40', respectively.

This construction provides a reverse drive of the motor 29 so as to provide operation of the umbrella in movement into open and closed positions. It will be understood, in this connection, that upon the completion of each operation of the umbrella the switch 32 will be thrown into its off position or, in other words, the position diagrammatically illustrated in Fig. 3 of the drawing.

With a structure of the type and kind under consideration, it will be apparent that when the umbrella is in use, particularly on a sunny day, the solar battery 34 will be automatically charged to in turn charge the battery 35, and in this operation the cutout 33 is in operative position. However, when the solar battery is not in operation the circuit through the cutout 33 is automatically broken, thus obviating the drainage of power from the storage battery and at all times providing a reserve power for initial movement of the umbrella into operative position, the solar battery serving to maintain this storage supply in the battery 35.

If at any time the umbrella should remain out of use for a long period of time and the power of the storage battery is insufficient to operate the umbrella through the reduction gearing diagrammatically shown, then the crank 23 can be put into operation to mechanically open the umbrella and after a reasonable length of use the

I claim:

1. In umbrellas of the character described employ-
 ing a tubular post, an umbrella top, a runner slidably
 engaging the post, a shaft mounted in connection with
 the lower portion of the post, an operating strand wound
 on said shaft and coupled with said runner for move-
 ment of the top into open and closed positions with
 respect to the post, a combination manual and elec-
 trical drive for said shaft, said electrical drive compris-
 ing a forward and reverse drive electric motor and switch
 both mounted on said post and a gear slidably mounted
 on said shaft and keyed thereto in one position, said
 gear being in operative engagement with a pinion driven
 by said electric motor, tensional means normally sup-
 porting said gear in keyed position with said shaft, said
 switch controlling operation of said electric motor, a
 manually operated crank on said shaft, and said crank
 in manual operation of said umbrella being adapted
 to move said gear into inoperative position in coupling
 the crank with the means keying the gear to said shaft.

2. In umbrellas of the character described employing
 a tubular post, an umbrella top, a runner slidably en-
 gaging the post, a shaft mounted in connection with
 the lower portion of the post, an operating strand wound
 on said shaft and coupled with said runner for movement
 of the top into open and closed positions with respect
 to the post, a combination manual and electrical drive
 for said shaft, said electrical drive comprising a forward
 and reverse drive electric motor and switch both mount-
 ed on said post and a gear slidably mounted on said shaft
 and keyed thereto in one position, said gear being in
 operative engagement with a pinion driven by said elec-
 tric motor, tensional means normally supporting said

gear in keyed position with said shaft, said switch con-
 trolling operation of said electric motor, a manually op-
 erated crank on said shaft, said crank in manual opera-
 tion of said umbrella being adapted to move said gear
 into inoperative position in coupling the crank with the
 means keying the gear to said shaft, a battery supported
 on the post for driving said electric motor, and means
 at the top of said post for charging said battery.

3. In umbrellas of the character described employ-
 ing a tubular post, an umbrella top, a runner slidably
 engaging the post, a shaft mounted in connection with
 the lower portion of the post, an operating strand wound
 on said shaft and coupled with said runner for move-
 ment of the top into open and closed positions with re-
 spect to the post, a drive for said shaft comprising a
 forward and reverse drive electric motor and switch both
 mounted on said post adjacent said shaft, said motor be-
 ing in operative engagement with the shaft for rotating
 the shaft in forward and reverse directions in operation
 of the umbrella top, a battery supported on the post for
 actuating said electric motor, and means on the post
 outwardly of the umbrella top for charging said battery.

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