

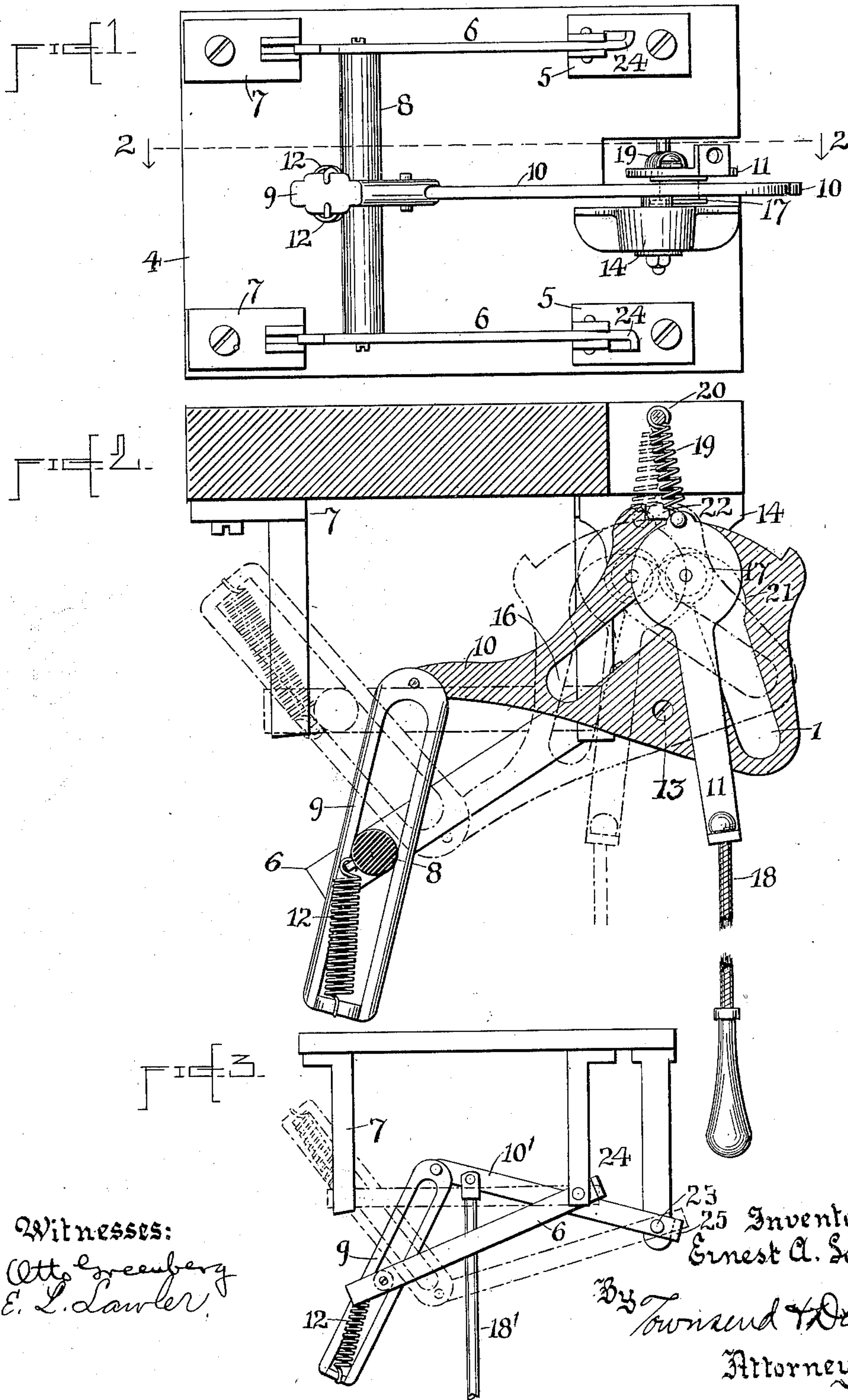
No. 662,570.

Patented Nov. 27, 1900.

E. A. LOWE.  
CEILING SWITCH.

(Application filed June 4, 1900.)

(No Model.)



Witnesses:

Otto Greenberg  
E. L. Lawler

Inventor  
Ernest A. Lowe

By Townsend & Decker  
Attorneys.



# UNITED STATES PATENT OFFICE.

ERNEST A. LOWE, OF NORTH PLAINFIELD, NEW JERSEY, ASSIGNOR OF ONE-HALF TO CHARLES W. LEVERIDGE, OF PLAINFIELD, NEW JERSEY.

## CEILING-SWITCH.

SPECIFICATION forming part of Letters Patent No. 662,570, dated November 27, 1900.

Application filed June 4, 1900. Serial No. 18,995. (No model.)

*To all whom it may concern:*

Be it known that I, ERNEST A. LOWE, a citizen of the United States, and a resident of North Plainfield, in the county of Union and State of New Jersey, (with post-office address No. 67 Fairview avenue,) have invented a certain new and useful Improvement in Ceiling-Switches, of which the following is a specification.

10 The invention relates to electric switches, and in particular to that class of electric switches for use on the ceiling in close proximity to a light or other electrical fixture attached to or suspended from the ceiling.

15 The principal object of the invention is to construct a switch for this purpose in such a manner that it can only stop in a completely-opened or a completely-closed position.

20 Another object of the invention is to so construct a switch that the operation of the actuating mechanism thereof in a certain direction will alternately close and open the switch, the organization being such that any effectual operation of the switch can only be in the right direction.

25 Another object of the invention is the construction of a switch having the functions and advantages above stated in a simple and economical manner.

30 With these objects in view the invention consists in the formation, construction, and combination of parts hereinafter described and claimed.

35 In the accompanying drawings, which form a part of this specification, Figure 1 represents in plan view a hinged switch embodying the invention. Fig. 2 represents the switch in vertical transverse section, said section being taken in the plane indicated by the line 2 2, Fig. 1. Fig. 3 represents in side elevation a modified form of switch embodying the invention in part.

40 It is now the common practice where arc-lamps or banks of incandescent lamps are attached to or suspended from high ceilings to lead a pair of conductors across the ceiling and down the wall to a switch within reach of a person on the floor. This entails a considerable expense and often disfigures the room. This objection is overcome by placing the switch near the ceiling at the point of at-

tachment or suspension of the lamp or group of lamps to be controlled and suspending a cord from the actuating portion of the switch to within the reach of a person on the floor. 55 Such is the position for which the switch forming the subject of the present invention is intended.

In the drawings an ordinary double-knife switch is illustrated, it being mounted upon 60 the block 4 and consisting of the posts 5, to which the movable parts of the switch—to wit, the knives 6—are pivoted, and the fixed portions of the switch—to wit, the posts 7—with which the knives engage when the switch is 65 closed to complete the circuit or circuits thereof. In the present form of switch the knives 6 are shown as connected by a bar of insulation 8.

The actuating mechanism of the switch consists of the knuckled joint formed by the 70 slotted link 9, the lever 10, and the tripping device 11. The slotted link 9 embraces the bar 8 and is joined thereto by means of one or more spiral springs 12, which are connected to 75 the outer end of the link 9 and to suitable eyes in the bar 8. The lever 10 is hinged to the opposite end of the link 9 and forms with it the knuckle. Said lever is pivoted, as at 13, to a post 14, attached to the base 4. This 80 lever is provided with divergent ways, which start from a point above and diverge to either side of the pivot 13. These ways may be formed in any suitable manner, but preferably consist of slots, as 15 16. The tripping 85 device 11 is constructed to engage by a portion thereof with said ways.

In the construction illustrated a spool, as 17, is preferably pivoted upon the body portion of the tripping device. The middle portion of the spool engages the edges of the slots 15 16, while the flanges thereof keep said portion in such engagement. From the tripping device, for the operation thereof, is suspended a suitable cord or wire, (indicated at 18,) and 95 to the upper end of the tripping device there is attached a spring, as 19, whose upper end is fixed to the base of the switch, as by a pin 20. This spring returns and normally maintains the spool 17 at the junction of the ways 100 15 and 16, or, strictly speaking, a little to one side of said junction, so that a vertical pull on



the cord 18 will immediately cause the spool of the tripping device to run down that particular way favored by the position of said spool. This is determined by expanding the intersection of the ways 15 and 16 in substantially the manner illustrated, such expansion being effected by arching the outer wall, as seen at 21, the spring 19 normally holding the spool of the tripping device against this arched portion. The lever 10 is limited in its movement by means of a suitable stop, as 22, here shown as projecting from the post 14 and engaging with projections upon the lever 10. The location of these projections with respect to the intersection of the ways 15 and 16 assists in determining the position that the spool 17 of the tripping device shall take at this intersection.

In the drawings the switch is shown by full lines in its open-circuit position and is indicated in its closed-circuit position by broken lines, while the spool 17 and the junction of the ways 15 and 16 are represented in dotted lines. It will be noted that in the open-circuit position said spool automatically takes a position such that when the cord 18 is pulled the spool will run down the way 16, and by tilting the lever 10 it moves the parts of the knuckle-joint past the dead-center, whereupon the springs 12 will immediately bend the joint in the opposite direction and throw the knives into engagement with the jaws of posts 7 by a snap action. With the switch in its closed position it will be noted that the spool 17 is to the right of the intersection of the ways 15 and 16, so that a vertical pull on the cord 18 will cause said spool to run down the way 15 and trip the lever 10, so that the pivot at the knuckle will pass the dead-center, when the springs 12 will immediately operate to throw the switch open with a snap action. Should an inexperienced person or, in fact, any person pull the cord 18 in a careless manner, so as to force the spool 17 into the wrong way, it can do no harm. The switch will not be moved at all, and immediately when the spool is forced into right way the switch will be operated to its full extent, it being impossible to stop it partly open or partly closed, since before it can move at all in either direction the pivot of the knuckle has passed the dead-center and the springs 12 will throw the switch wide open or completely shut. This application of the knuckle-joint to an electric switch is of great importance, since it obviates any possibility of a switch stopping when partly open or partly closed, at which time it affords an opportunity for arcing and either freezing the contacts together or destroying the switch. The application of the knuckle-joint in its simplest form is illustrated in Fig. 3. Therein the lever 10' is a simple bar and to it a stiff rod, as 18', may be attached on either side of its pivot 23. To close this switch, the rod 18' is pulled down until the pivot of the knuckle passes the dead-center, when the springs 12

immediately throw the knives 6 into the jaws 7. To open the switch, an upward push of the rod 18' will cause the pivot of the knuckle to pass the dead-center in the opposite direction, whereupon the springs 12 will immediately operate to throw the switch wide open.

Any suitable stop for the knives 6 may be employed—such, for instance, as those which would be formed by turning outwardly the pivoted ends of said knives, as indicated at 24 in Figs. 1 and 3. A similar stop may be provided on the end of the lever 10' in Fig. 3, as indicated at 25.

Obviously the movable part of any form of electric switch may be operated by the mechanism above described, and obviously the formation and construction of the operating parts of the switch may be varied in ways other than those specified without departing from the spirit of the invention.

I claim as my invention—

1. In an electric switch, the combination with a movable contact, of a lever provided with a knuckle-joint connection with said contact, and means connected to said lever which when operated in one direction will move said joint past its center and cause the switch to close and which when operated again in the same direction will move said joint past its center in a direction opposite to its first movement and thereby cause the switch to open.

2. In an electric switch, the combination with a movable contact, of a lever connected thereto and provided with divergent ways, a knuckle-joint connection between said contact and lever, an actuating device engaging said ways in a manner such that when moved in a certain direction it will traverse one of said ways and actuate the lever to close the switch, and when again operated in the same direction it will traverse the other one of said ways and actuate the lever to open the switch.

3. The combination with a movable contact in an electric switch, of a lever for operating said contact, a spring-flexed knuckle-joint connecting said contact and lever, a suspended tripping device for said lever, and means for guiding said device alternately to opposite sides of the pivot of said lever, whereby the lever is thrown successively in opposite directions.

4. The combination with a movable contact in an electric switch, of a pivoted lever provided with diverging slots, a tripping device suspended by a spring and having a projection entering said slots and a spring connection between said lever and said contact, substantially as and for the purpose set forth.

5. In an electric switch, the combination with a movable contact thereof, of an actuating-lever, a tripping device therefor, a slotted link hinged to said lever and connected to said movable contact, and springs connecting said contact to the end of the slotted link as and for the purpose set forth.



6. The combination with a movable contact in an electric switch, of a pivoted lever provided with slots diverging to opposite sides of the pivot, a suspended tripping device having a projection entering said slots, a stop for the lever so located as to determine the slot in which said projection shall come to rest, and a spring-flexed knuckle-joint connection between said lever and said movable contact of the switch.

7. A snap-action device consisting in the combination of a part to be moved, the pivoted lever provided with divergent slots, a

tripping device having a spool thereon located in said slots, a spring suspension for said tripping device, a stop for limiting the motion of said lever in either direction, and a knuckle-joint connection between said lever and the part to be moved.

Signed at New York, in the county of New York and State of New York, this 19th day of May, A. D. 1900.

ERNEST A. LOWE.

Witnesses:

DELBERT H. DECKER,  
ETHEL L. LAWLER.