

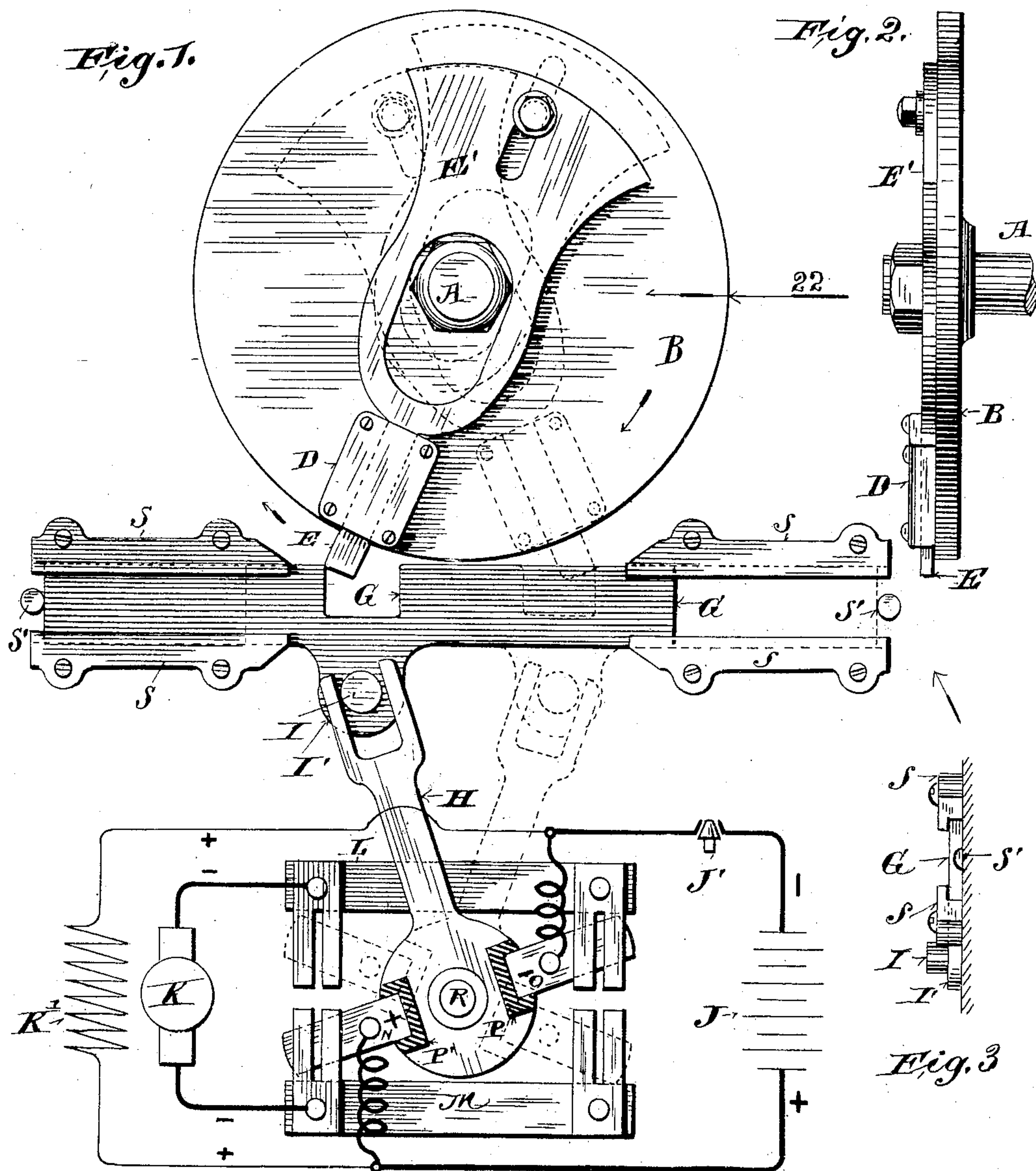
No. 706,084.

Patented Aug. 5, 1902.

M. MOSKOWITZ.  
AUTOMATIC SWITCH.

(Application filed Sept. 28, 1901.)

(No Model.)



WITNESSES  
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# UNITED STATES PATENT OFFICE.

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## AUTOMATIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 706,084, dated August 5, 1902.

Application filed September 28, 1901. Serial No. 76,843. (No model.)

*To all whom it may concern:*

Be it known that I, MORRIS MOSKOWITZ, a resident of the borough of Brooklyn, in the city and State of New York, have invented certain new and useful Improvements in Automatic Switches, of which the following is a specification accompanied by drawings.

The invention was devised particularly for actuating the pole-changer or reversing-switch of a car-lighting system in which the generator was driven from the car-axle and was consequently subject to reversals in direction of rotation and to variations in speed. Under such conditions the connections of a generator—as, for example, the connections between the armature and the work-circuit and battery-circuit—had to be reversed when the direction of rotation of the generator was reversed.

The invention provides a mechanically-operated switch which is actuated by the movement of one of the rotary parts of the apparatus with which it is employed and after being thrown in one direction so remains until the reversal of the rotation causes it to be again actuated and thrown in the opposite direction.

Under the present invention the switch includes a rotary part carrying a retractable dog or tooth, which actuates the switch and which is subsequently retracted by centrifugal force, so as to be drawn out of engagement as the speed of the rotary part increases. When the rotary part stops and reverses its direction of rotation, the dog is again brought into play either by gravity or by a spring to throw the switch in the other direction, and then as the speed again increases the dog is again retracted.

In the drawings, Figure 1 is an end view of the rotary mechanism and the connections for actuating the switch, the electrical connections being diagrammatically shown. Fig. 2 is a side elevation of some of the parts as seen looking in the direction of the arrow 22 on Fig. 1. Fig. 3 is an end view of the slide-bar and its mounting.

In the drawings I have selected for illustration a switch adapted to reverse the connections between the armature and the external circuit of a generator.

K is the generator-armature; K', the field-coils.

J is a storage battery adapted to be charged from the generator.

J' is a switch for closing the circuit when the voltage of the generator is sufficient to charge the battery, and N and O are the movable switch-contacts mounted to turn upon the center or pivot R and suitably insulated.

The terminals of the generator-armature may be connected to the fixed double switch-contacts L and M. The movement of the switch upon the center R in either direction brings the respective movable contacts into engagement with the respective switch-contacts, while the reverse movement of the switch of course reverses the connections. The switch is provided with the forked arm H for turning it. A slide-bar G, sliding in suitable guides S, carries a pin I, which engages the forked arm H. The slide-bar is shown at the left-hand limit of its movement, S' being pins for limiting the movement in either direction. When the slide-bar is thrown to the right-hand limit of its movement, it carries the arm H to the right, reversing the switch connections, as shown in dotted lines. The slide-bar G has a notch which is engaged by the actuating-dog E, that actuates it in one direction or the other.

The details of the apparatus described up to the present point are not peculiar to or characteristic of the invention. The novel improvement which constitutes the actuating device for the switch comprises in the preferred form shown in the drawings a rotary part B, mounted on a shaft A, which is subject to the reversals of rotation by which it is desired to control the switch. It may, for instance, be the armature-shaft of the generator. Mounted upon the rotary part B is a centrifugal retracting device for the dog E. This retracting device in its simplest form is a slide E', suitably guided—as, for example, by a pin and slot at one end and a box or guide D at its other end. It is shown with a central opening designed to afford clearance for the nut on the end of the shaft A. The rotary part B is so mounted that the dog E projects in position to engage the bar G and actuate it in either direction. The retract-



ing device E' is so weighted that when revolving rapidly it will be thrown out by centrifugal force in a direction to retract the dog E.

5 The operation of the device illustrated is as follows: Let us suppose that the rotary part B has just started to rotate right-handedly, as seen in Fig. 1, and that the dog has been caused to protrude into engagement with the  
10 notch in the slide-bar G by the force of gravity acting on the slide or retracting device E'. As the rotary part B turns further the dog E leaves the slide-bar G. In revolving slowly it is brought around and again strikes the  
15 bar G; but as the dog is free to be forced upward as it comes into slanting engagement with the smooth upper surface of the bar G as long as the rotary part B is slowly rotating no harm is done. As the rotary body in-  
20 creases in speed the centrifugal force keeps the dog retracted and prevents it making engagement with the bar G until the rotation again nearly stops. If the parts are turned in the opposite direction—that is to say, left-  
25 handedly—the dog E will engage and carry the bar G to the right, as will be clear from the position of the parts shown in Fig. 1.

From the foregoing it will be seen that the invention provides rotary mechanism for en-  
30 gaging and actuating a switch in one direction or the other, as required, and also provides means for retracting the engaging part when a certain speed is exceeded. If the invention is connected so that its changes in  
35 rotation correspond to those of the generator, supposing it is used to actuate the reversing-switch of a generator, it follows that whenever the direction of the generator rotation reverses the electrical connections will be re-  
40 versed.

What I claim, and desire to secure as the

distinguishing and characteristic features of the invention, is the following:

1. In combination with an electrical switch and as a means for actuating the switch when  
45 the direction of rotation of a rotary part reverses, a rotary mechanism and connections for positively, in contradistinction to frictionally, engaging and actuating the switch in a direction corresponding to the direction of  
50 rotation, and means for retracting the engaging part when a predetermined speed of rotation is exceeded.

2. In combination with an electrical switch and as a means for actuating the switch when  
55 the direction of rotation of a rotary body reverses, a rotary part suitably mounted and subject to such reversals of rotation, and a retractable engaging device movably mounted upon the said rotary part for engaging and  
60 actuating the switch in either direction, the said retractable engaging device being provided with a weight for centrifugally retracting it.

3. In combination with an electrical switch  
65 and as a means for actuating the switch when the direction of rotation of a rotary body reverses, a rotary part suitably mounted and subject to such reversals of rotation, a dog provided with a centrifugal retracting device  
70 and suitably mounted in guides upon the said rotary part, and a slide-bar connected to actuate the switch and situate in position to be engaged and actuated by the said dog in either direction, substantially as set forth.  
75

Signed this 27th day of September, 1901, at New York, N. Y.

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Witnesses:

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