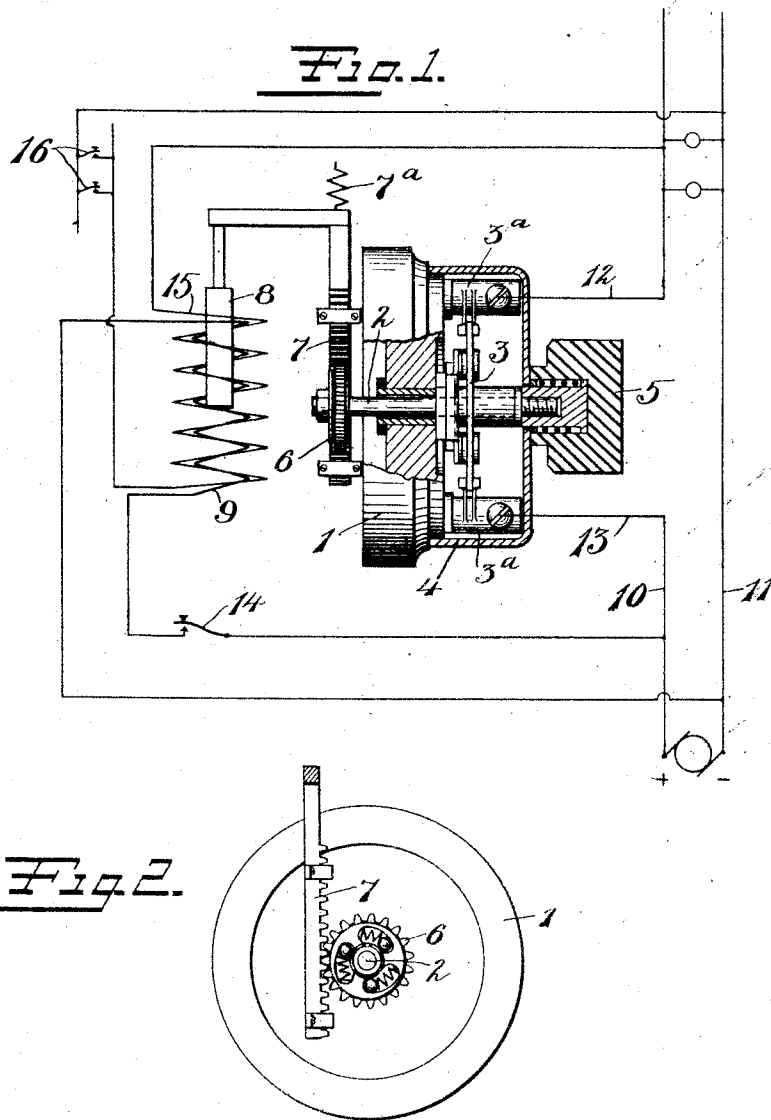


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CIRCUIT CONTROLLING APPARATUS.
APPLICATION FILED APR. 5, 1907.

985,943.

Patented Mar. 7, 1911.



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UNITED STATES PATENT OFFICE.

JOSEPH SACHS, OF HARTFORD, CONNECTICUT, ASSIGNOR OF ONE-HALF TO THE HART MANUFACTURING COMPANY, OF HARTFORD, CONNECTICUT, A CORPORATION OF NEW JERSEY.

CIRCUIT-CONTROLLING APPARATUS.

985,943.

Specification of Letters Patent.

Patented Mar. 7, 1911.

Application filed April 5, 1907. Serial No. 366,606.

To all whom it may concern:

Be it known that I, JOSEPH SACHS, a citizen of the United States, residing at Hartford, Hartford county, Connecticut, have invented certain new and useful Improvements in Circuit-Controlling Apparatus, of which the following is a full, clear, and exact description.

My invention relates to improvements in switch apparatus, the object of the invention being to provide a switch which can be controlled from a point remote from, as well as adjacent to the switch proper, the said invention comprehending both direct mechanical operation and remote operation through the medium of electromagnetic apparatus.

It further has for its object to provide a switch controlled by an electromagnetic device by which it can be thrown to either on or off position at one point, and can be thrown to one of said positions but not to the other from another point.

The following is a description of the apparatus embodying my invention, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation, partly in section, and showing circuits in diagram. Fig. 2 is a view of certain details of construction.

1 represents the base of a rotary switch.

2 represents a rotatable controlling spindle, by which the switch proper is actuated.

3 represents the switch blade which, together with the usual terminals 3^a may be contained in a suitable box-like receptacle 4.

Externally located is a manually operable handle 5 suitably secured to the spindle or main operating member 2, whereby the blade may be turned to throw the switch on or off at will, by hand.

6 is a gear or pinion mounted on the rear of the spindle and provided with ratchet mechanism arranged so as to be clutched therewith when rotated in one direction, and to be free thereof when rotated in the opposite direction, being operatively disconnected from said switch when said switch is actuated by the handle, so that the handle is movable independently thereof and being operatively connected to the switch only when energized, its operative connection being thus intermittent.

7 is a rack suitably guided and having teeth meshing with said gear 6 and re-

tracted by a spring 7^a. 8 is a core of a solenoid, 9 representing one solenoid winding connected to any convenient source of current. In the form shown, the solenoid circuit 9 is a shunt from the main line circuit wires 10—11, between the switch and the main source of current.

12—13 represent terminals of the main line, leading to the contacts 3^a for the switch blades 3.

14 is a circuit closer in the solenoid circuit 9. The ends of the solenoid circuit 9 are suitably connected at all times with the main circuit, so that by closing the circuit closer 14, which may be located at any desired point remote from the switch proper, the solenoid is energized, thus causing the rack 7 to move in a direction to actuate the pinion 6 in a direction to rotate spindle 2 and operate the switch proper. The result is that while the switch may be operated directly by the handle shown, it may also be operated indirectly through the medium of the solenoid brought into play by closing the circuit at any remote point. In order that the switch may be thrown off from a point at which it cannot also be thrown on, I provide a second winding 15 for the solenoid in shunt to the main conductors 10—11 on the translating device side of the main switch. This winding is controlled by any one of the several circuit closers 16. When the circuit is closed at 16, the switch, if already on, will be thrown off. If the switch is in the off position the closing of the shunt at 16 will have no effect, since the connection with the main source is interrupted at the main switch.

The handle 5 is secured to the spindle 2 by a screw-thread, so that if the handle is held against turning and the switches 16, or either of them, are actuated so as to close their respective circuits, the spindle 2 can nevertheless be revolved electromagnetically, the handle being unscrewed by the movement. This makes it impossible for any one to actuate the switches 16 and hold the handle so as to prevent the circuit controlled thereby from being opened, since that circuit is controlled by the main electromagnetically actuated switch as well as by the switches 16, and will be broken by that switch whenever either of the switches 16 is actuated, even if the handle 5 is held from turning. The electro-magnetic means

operates the switch positively, as distinguished from releasing it, and when controlled by the switches 16 is free from control by the actuating handle. If it were not for this freedom from control by the manual operating means, the main switch might be manually restrained from moving when the switches 16 were actuated to close their circuit, resulting in the overheating and possible burning out of the coil 15. The switch is therefore guarded against accidents which might result from careless manipulation by ignorant or mischievous persons.

Apparatus embodying my invention will be found useful wherever it is desirable to employ an apparatus wherein one can, at any time, open or close the main line circuit while at the main line switch, or at some point remote from the main line switch, or where it is desired to have full control at one point and partial control at the other points.

The solenoid, or other magnetic control, may be located to the rear of the switch proper, so that so far as appearances indicate, the only means for operating the switch is the ordinary turn-button or handle. To those acquainted, however, it is within their knowledge that the switch may be operated at various remote points. The switch is preferably a snap switch, having a definite and quick throw for a given movement of its spindle.

What I claim is—

1. The combination of a main circuit, a switch for controlling the same, manual operating means and electro-magnetic operating means, each of said operating means being movable independently of the other to operate said switch, said electro-magnetic means being electrically connected to the main circuit on the translating device side of said switch, and a local circuit controller for said electro-magnetic means.

2. The combination of a circuit, a switch for controlling the same having a main actuating member, a manual actuating means connected to said member, an electro-magnetic means having an intermittent operative connection with said member, said electro-magnetic means being operatively connected only when said electro-magnetic means is energized, and means for retracting said electro-magnetic means when de-energized, said electro-magnetic means being electrically connected to the circuit on the translating device side of said switch, and a local circuit controller for said electro-magnetic means.

3. The combination of a main circuit, a switch for controlling the same, a core and solenoid for operating said switch, a controlling circuit for said solenoid connected to said main circuit on the translating device side of said switch, a local circuit con-

troller in said controlling circuit, and manual means for operating said switch so as to close or open the solenoid circuit at the switch, thereby enabling the solenoid circuit to be completed by the local circuit controller or preventing it from being so completed.

4. The combination of a main circuit, a switch for controlling the same, a core and solenoid for operating said switch, a controlling circuit for said solenoid connected to said main circuit on the translating device side of said switch, a local circuit controller in said controlling circuit, and a manual means for operating said switch so as to close or open the solenoid circuit at the switch, thereby enabling the solenoid circuit to be completed by the local circuit controller or preventing it from being so completed, said core having a ratchet connection with said switch.

5. The combination of a source of current, translating devices, a main circuit connecting the two, a switch therefor, an armature and solenoid producing, when said solenoid is successively energized, movements in one direction only for both opening and closing said switch, two branch circuits for said solenoid, one connected to the main circuit at a point between the switch and the source of supply and the other connected to the main circuit between said switch and the translating devices, and local circuit controllers in each of said branch circuits.

6. The combination of a source of current, translating devices, a main circuit connecting the two, a switch therefor, a solenoid and core for actuating said switch in one direction only, two branch circuits for said solenoid, one connected to the main circuit at a point between the switch and the source of supply and the other connected to the main circuit between said switch and the translating devices, and local circuit controllers in each of said branch circuits.

7. The combination of a switch, manual means for operating the same, electromagnetic means for operating the same, said electromagnetic means having a circuit containing an auxiliary circuit closer connected through the main switch to a source of supply said electro-magnetic means being unrestrained by said manual means.

8. The combination of a main switch, electromagnetic means for actuating the same, said electromagnetic means having two actuating coils, one being in a circuit connected in shunt to the circuit controlled by said switch at a point between the switch and the source of supply, and the other being in a circuit connected in shunt to the circuit controlled by said switch at a point on the translating side of said switch, and in-

dependent circuit closers in said shunt circuits and manual operating means, the electro-magnetic means being unrestrained by said manual means.

- 5 9. The combination of a rotary switch having an actuating spindle, electromagnetic means for causing said spindle to move step by step in but one direction, two actuating coils for said electromagnetic means, one of
10 which is in a circuit always connected to a

source of supply, while the other is always in a circuit connected in shunt to the mains controlled by said switch at a point on the translating side of said switch, and independent circuit closers in said circuits.

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