J. L. CREVELING.

ELECTRIC SWITCH.

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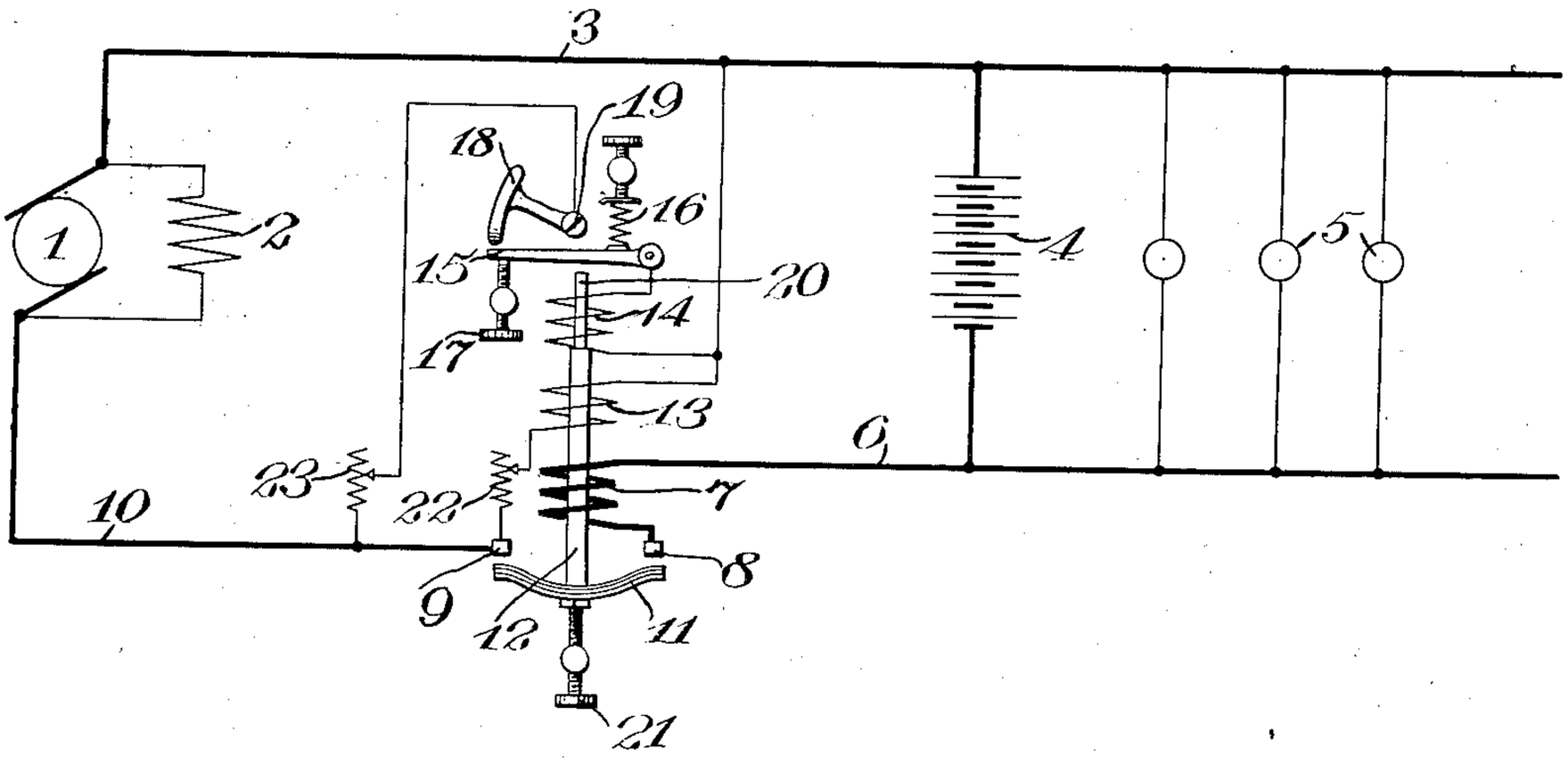
1,298,464.

Patented Mar. 25, 1919.



WITNESSES

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ELECTRIC SWITCH.

1,298,464. Specification of Letters Patent. Patented Mar. 25, 1919.

Application filed December 29, 1911. Serial No. 668,501.

To all whom it may concern:

Be it known that I, JOHN L. CREVELING, a resident of New York, in the county and State of New York, have invented certain new and useful Improvements in Electric Switches, as set forth in the annexed specification and drawing, forming a part thereof.

My invention pertains to that type of electric switches adapted to automatically close and open an electric circuit under predetermined conditions.

As my switch is particularly applicable to electric systems wherein a generator is used to charge storage batteries and operate lamps or other translating devices, it will be described with reference to such a system.

The drawing is a diagrammatic representation of a system comprehending my invention.

In the drawing 1 represents a dynamo or generator provided with the usual field coil 2. The positive lead 3 is carried from the generator to one side of the storage battery 4 and lamps or other translating devices indicated at 5. Return from the battery and translating devices is made through the wire 6 having in series therewith a coil 7 connected with one terminal 8 of my improved switch, the opposite terminal 9 of which is connected as by the lead 10 with the generator. 11 represents a flexible contacting member adapted to complete the circuit between the contacts 8 and 9 and is carried by the core of magnetic material 12 surrounded by the fine coil 13 in shunt across the generator as indicated and by the coil 14 having one terminal in electrical communication with the lead 3 and the other terminal connected with the lever 15 normally pressed in a downward direction by the adjustable spring 16, and having its downward movement limited as by adjustable screw 17. 18 is a contact member adjustably supported as by a screw 19 and so arranged that the lever 15, when raised by the member 20 upon raising of the core 12 as upon closing of the switch, will make a sweeping contact across the face of the member 18, which latter is in electrical connection with the wire 10 as indicated. 21 is an adjustable stop for adjusting the motion that may be given to the core 12 and contact member 11 in opening the switch. 22 and 23 represent adjustable resistances which may be placed in series with the coils 13 and 14 respectively for the purpose of adjustment.

An operation of my invention is substantially as follows:—

If the generator be at rest the switch will be open and current may be supplied to the translating devices by the battery but will not flow back through the generator owing to the contact 8—11—9 being broken. If the generator now be started its field will build up in a well-known manner and current will flow through the lifting coil 13 and tend to lift the core 12 and close the contact 8—11—9, and I so adjust the screw 21 and the adjustable resistance 22 that when the generator voltage reaches that point that it is substantially equal to the normal voltage of the battery, coil 13 will raise the core 12 and complete the circuit through the member 11, and then any current flowing from the generator through the battery and translating devices will flow through the coil 7, which is wound in such manner as to assist the coil 13 in holding the switch firmly closed. It is obvious that inasmuch as work had to be performed to close the switch a lesser magneto motive force will be able to hold the switch closed than was required to lift the members 12 and 11 and close the same, and as I desire this switch to open at very closely the same voltage required to close it, I so arrange the lever 15 and contact 18 that the member 20, upon striking the lever 15, causes the circuit, under predetermined conditions, to be closed through the coil 14, which will then oppose the coil 13; and I so adjust the resistance 23 that when the generator voltage is very nearly equal to that upon the battery, a slight back discharge through the coil 7 will cause the switch to open, whereas without the coil 14 a considerable back discharge would ordinarily be required to cause the switch to be opened. The opening of the switch cuts out the coil 14 at a predetermined time, depending upon the adjustment of the lever 15 and contact 18, and the full power of lifting coil 13 is now available to close the switch when the generator voltage is substantially equal to that for which the switch is set to close.

I do not wish in any way to limit myself to the details of construction nor to the exact mode of operation herein given, as the same are given merely to illustrate one type of system embodying the essentials of my

invention, which is as set forth in the following claims.

I claim—

1. In apparatus of the class described, the combination with a supply circuit, of a circuit-closing device, a coil in shunt with said circuit for closing said device, a second shunt coil in operative relation to said first shunt coil, means for making said second shunt coil operative upon the closure of said device to lessen the effect of said first shunt coil, and a series coil to maintain said device closed.

2. In apparatus of the class described, the combination with a supply circuit, of a circuit-closing device, a coil in shunt with said circuit for closing said device, a second shunt coil in operative relation to and wound to act differentially with respect to said first shunt coil, a switch for closing the circuit of said second shunt coil upon the actuation of said circuit-closing device, means for varying the degree of differential action of the one coil upon the other, and a series coil to control the further operation of said device.

3. In apparatus of the class described, the combination with a supply circuit adapted to connect a generator to a battery, of a circuit-closing device, a coil in shunt with said circuit for closing said device, a second coil in operative relation to said first coil and energized while the device is closed and having no opposing effect on the first coil when the generator voltage exceeds the battery voltage with the device open, and a series coil to maintain said device closed when current is passing from generator to battery.

4. In apparatus of the class described, the combination with a supply circuit adapted to connect a generator to a battery, of a circuit-closing device, a coil in shunt with said circuit for closing said device, a second coil in operative relation to said first coil, and energized while the device is closed and having no opposing effect on the first coil when the generator voltage exceeds the battery voltage with the device open, said second coil acting upon the passage of reverse current through said device to lessen the effect of said first coil, and a series coil to maintain said device closed when current is passing from generator to battery.

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Witnesses:
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