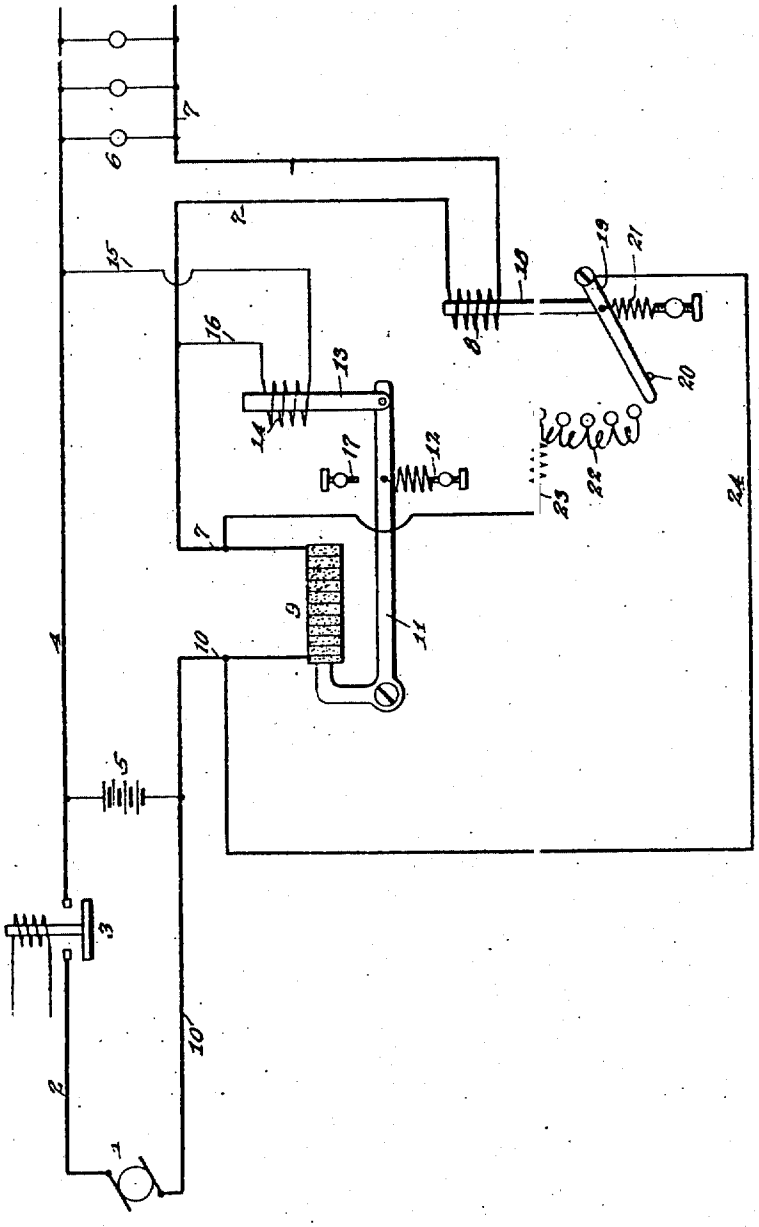
J. L. CREVELING.

ELECTRIC REGULATION.

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1,223,313. Patented Apr. 17, 1917



WITNESSES

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ELECTRIC REGULATION.

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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 Regulation, as set forth in the annexed specification and drawing, forming a part thereof.

My invention pertains to that class of electric regulation in which it is desired to automatically govern an electric circuit.

My invention has for its particular object to provide a means whereby the voltage upon a translation circuit may be held constant throughout variations in voltage at the source from which the said circuit is fed and throughout wide changes in load.

A further object of my invention is to provide means whereby an automatic regulating device may have its capacity greatly increased.

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

In the drawing 1 represents a dynamo or generator of any suitable type from the positive terminal of which the lead 2 is carried to one side of the automatic switch 3, the other side of which is connected with the main 4 which is in connection with the storage battery 5 and one side of the lamps or translating devices 6. The other side of the lamps or translating devices is connected to the main 7 which is carried to one side of the coil 8 from the other side of which 7 continues to one terminal of the resistance device 9 the opposite terminal of which is carried by the lead 10 to one side of the storage battery 5 and the negative brush of the generator. The resistance device 9 is preferably of the carbon disk variety having its resistance controlled by the lever 11 normally drawn downwardly by the adjustable spring 12 in such manner as to tend to compress the carbons 9 and lower the resistance thereof. The lever 11 is provided with a core of magnetizable material 13 surrounded by the winding 14 in shunt across the translation circuit as by wires 15 and 16. 17 is an adjustable screw to limit the travel of the lever 11. The coil 8 is provided with the core 18 attached to the pivoted lever 19 normally drawn against the stop 20 as by adjustable spring 21 and adapted when swung in an upward direction to sweep across the contacts of the resistance device 22 so as to reduce the resistance thereof. The resistance device 22 is in shunt across the resistance device 9 as by means of wires 23 and 24, and if desired a permanent resistance may be placed in either of these wires as is indicated in wire 23.

The operation of my improvement is substantially as follows:

If the generator be at rest current will be supplied to the translating devices from the battery 5 through main 4, translating devices 6, main 7, coil 8, main 7, resistance device 9 and lead 10 to the battery. If now the generator be started and brought up to the voltage at which the switch 3 is set to close and if this voltage be in excess of that of the storage battery 5, current will flow from the generator to the translating devices and lessen the amount drawn from the battery. If the generator output be brought up to where the same is supplying the total load to the translating devices and charging the battery, the voltage across the translation circuit will tend to rise in a well-known manner. This will tend to cause the current flowing from the main 4 through wire 15, coil 14, wire 16 to increase and lift the core 13 against the action of spring 12 in such manner as to decrease the pressure upon the carbons 9 and increase the resistance thereof. By properly designing this portion of the apparatus and properly adjusting the spring 12, the resistance 9 will be so manipulated as to hold the voltage upon the translation circuit practically constant in an obvious manner throughout a certain range limited by the carrying capacity and also by the resistance varying capacity of the carbon pile 9. I so construct the carbon pile 9 and the apparatus for operating the same that the resistance across 9 may, under certain conditions, be caused to be considerable—in fact, I so adjust this portion of the apparatus that the pressure upon the disks 9 may be relieved so as to increase the resistance thereof and increase the range in this direction as much as practicable. Current flowing through the translation circuit and passing through the coil 8 tends to lift the core 18 against the action of spring 21 and throw the shunt in circuit around the resistance 9 through resistance 22 and I so arrange the coil 8 and parts moved thereby and so adjust the

spring 21 that when the maximum current desired to be carried through the resistance 9 is flowing through the coil 8, the same will lift the lever 18 and shunt part of the current away from the resistance 9 through resistance 22. As the load upon the translation circuit is increased the action of the coil 8 is to decrease the resistance 22 and shunt away more and more current from the resistance 9 tending at all times to keep the current passing through the resistance 9 as near as possible the normal amount desired to have regulated by the said resistance which is capable of producing the drop required upon the line. Therefore, if the current in the translating devices fall below the maximum desired to be carried by the resistance 9, the shunt around the resistance 9 will be broken at 22 as shown in the drawing and the pressure upon the carbons 9 will be manipulated through the instrumentality of coil 14 to hold the voltage upon the translation circuit constant. If now considerable more load be thrown upon the translation circuit, for example, twice as much current passed through the coil 8 as is desired to be carried in the carbon pile 9, the coil 8 will cause the lever 19 to take such position that substantially one-half of this current will be shunted around the resistance 9 so as to lessen the current necessarily carried by the said resistance. Then changes in voltage across the translation circuit will be rectified as above through the instrumentality of coil 14 and carbon resistance 9. If the load on the translation circuit be again increased more resistance will be cut out at 22 and more of the load carried around the variable resistance 9. If now the load decrease the reverse operation will take place and the resistance 22 will be increased so as to throw more and more of the diminishing load upon the resistance 9. It will be obvious that my invention produces a translation circuit regulator capable of carrying a certain current and regulating the same so as to hold the voltage constant and means whereby when this current exceeds a certain amount—that is, the amount desired to be carried by the regulator proper, this excess will be shunted away so as to relieve the regulator proper of carrying this amount while the voltage changes will still be produced in the regulator as desired.

In the drawing I have shown in diagram the simplest form of means for regulating the carbon resistance 9 and for manipulating the resistance 22 and it will be obvious that I may use any of the preferred types of apparatus for this purpose.

I do not wish to limit myself to any exact constructions shown in the drawing as the same is merely a diagram intended to indicate a system embodying my invention and it will be obvious that many changes in construction may be made without departing from the spirit of said invention which is as set forth in the following claim:

An electric system comprising a work circuit, a generator for supplying the same, a resistance in series in the circuit, means for acting upon said resistance, means in shunt to the translation circuit for controlling the action of the last named means with a tendency to hold the voltage constant on the translation circuit, by increasing said resistance, a circuit in shunt to the said resistance including a variable resistance, means for closing the latter circuit and simultaneously inserting its resistance, and current controlled means for actuating said circuit closing means and operating to cause said shunt resistance to vary according to the load on the translation circuit.

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Witnesses:
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