

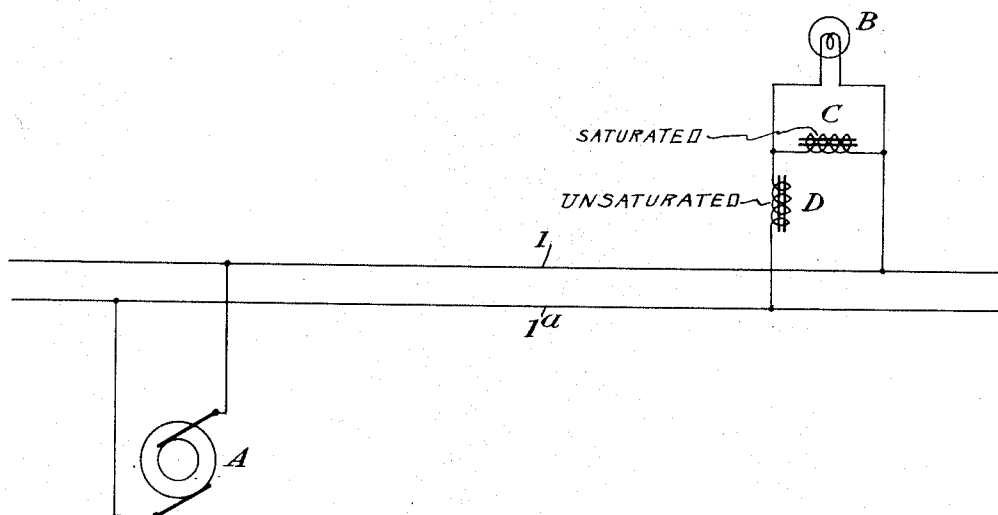
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C. R. BEALL

VOLTAGE REGULATING APPARATUS

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INVENTOR :

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UNITED STATES PATENT OFFICE.

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VOLTAGE-REGULATING APPARATUS.

Application filed May 26, 1923. Serial No. 641,683.

To all whom it may concern:

Be it known that I, CHARLES R. BEALL, a citizen of the United States, residing at Swissvale, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Voltage-Regulating Apparatus, of which the following is a specification.

My invention relates to voltage regulating apparatus, and particularly to apparatus adapted for use between a source of energy and a current consuming device for regulating the voltage applied to such device.

I will describe one form and arrangement of apparatus embodying my invention, and will then point out the novel features thereof in claims.

The accompanying drawing is a diagrammatic view showing one form and arrangement of apparatus embodying my invention.

Referring to the drawing, the reference character B designates a current consuming device, and as here shown is an electric lamp. This lamp is supplied with alternating current from a generator A over line wires 1 and 1^a. In actual practice the electromotive force applied to lamp B may vary through a wide range due to a number of reasons such as poor regulation of the generator, changes in other loads not shown in the drawing but which may be supplied from generator A, etc. Under some conditions of operation this voltage fluctuation is undesirable and in my present invention I reduce this fluctuation as follows: A device C is connected across the terminals of lamp B. As shown in the drawing this device C comprises a reactor having an iron core and is so designed that at normal voltages the flux density of the iron is approximately at saturation. If the voltage across lamp B and device C increases, the impedance of the device C decreases and the device will draw a correspondingly increased proportion of the total current. Interposed between one terminal of device C and one of the line wires 1^a is a second device D the impedance of which increases as

the current through this device increases, and which may therefore be termed a "ballast" impedance. As here shown this device comprises a reactor having an iron core and the parts are so designed that normally the flux density of this core is very low. If the current through the reactor D increases, there will also be an increase in the impedance of the reactor as the flux density is increased. An alternative structure for this purpose is a tungsten ballast lamp.

The parts are so adjusted that at normal voltage, the lamp B draws normal current. Under these conditions a small current passes through device C while the current through device D is of course the sum of the currents through lamp B and device C. If the voltage between line wires 1 and 1^a increases, the increased current through device D will cause a corresponding increase in the impedance of that device, thus reducing the voltage increase applied to the terminals of the lamp and the device C connected in multiple therewith. This increased voltage, though smaller than the total increase in line voltage, causes the impedance of device C to decrease, and as a result, this device draws a larger proportion of current, thus further reducing the voltage increase applied to the terminals of lamp B.

It will be clear from the foregoing that for a given increase in line voltage, a considerably smaller increase occurs in the voltage at the lamp terminals.

Although I have herein shown and described only one form and arrangement of apparatus embodying my invention, it is understood that various changes and modifications may be made therein within the scope of the appended claims without departing from the spirit and scope of my invention.

Having thus described my invention what I claim is:

1. In combination, a current consuming device, a circuit for said device comprising a source of electrical energy and means having the characteristic of increasing in impedance in response to increase in the electromotive force of said source, and a re-

actor connected in parallel with said device and having an iron core the flux density of which is normally such that the iron is practically saturated.

- 5 2. In combination, a current consuming device, a circuit for said device comprising a source of electrical energy and a reactor having an iron core the flux density of

which is normally very low, and a reactor connected in parallel with said device and 10 having an iron core the flux density of which is normally such that the iron is practically saturated.

In testimony whereof I affix my signature.

CHARLES R. BEALL.