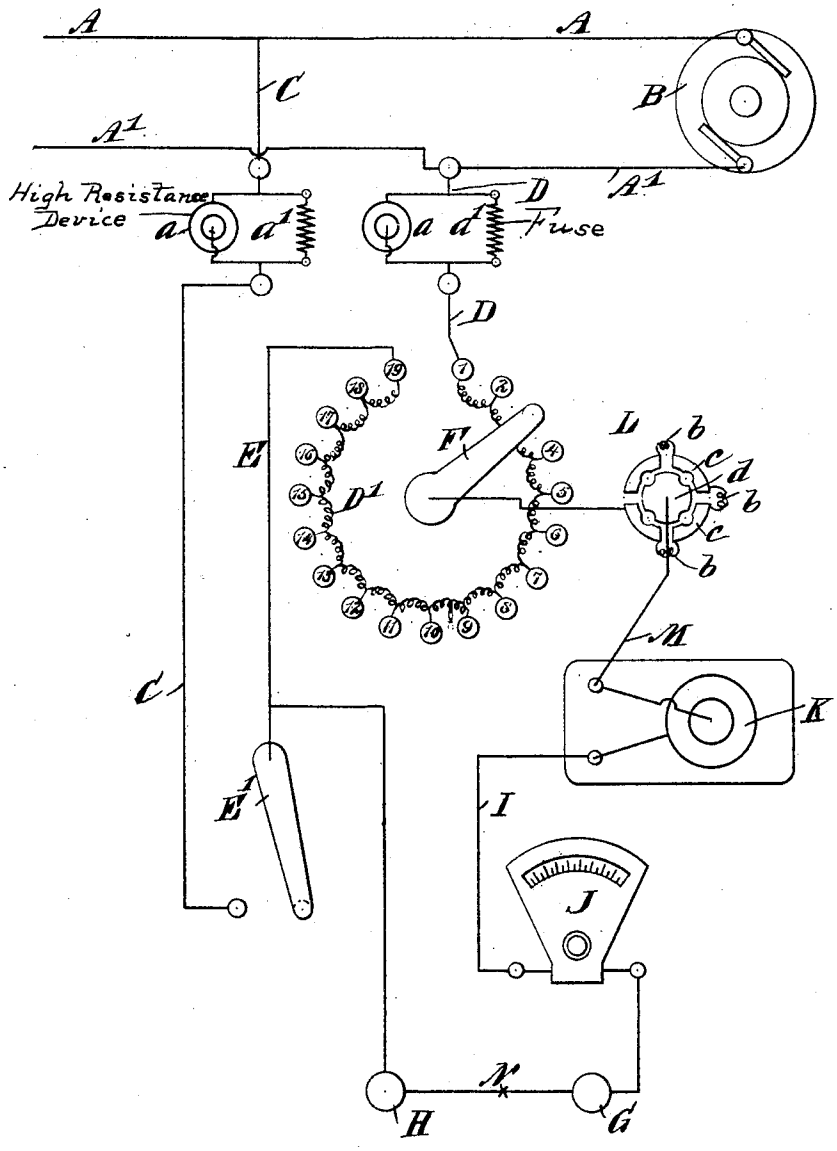
(No Model.) 2 Sheets—Sheet 1.

A. F. VETTER.

APPARATUS FOR REDUCING ELECTRIC CURRENTS AND VOLTAGE.

No. 602,709. Patented Apr. 19, 1898.

Fig. 1.



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(No Model.) 2 Sheets—Sheet 2.

A. F. VETTER.

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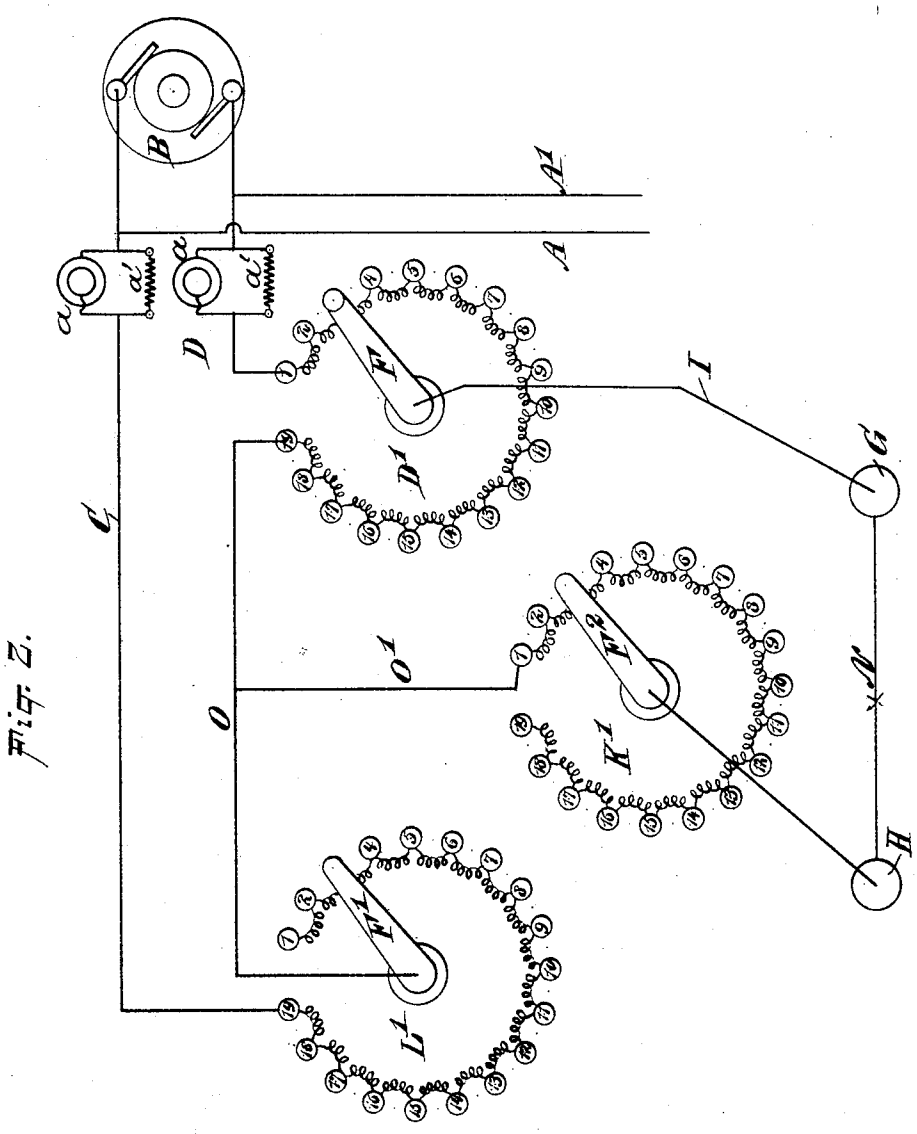

Fig. 2.

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UNITED STATES PATENT OFFICE.

ALEXANDER F. VETTER, OF LONG ISLAND CITY, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE MEYROWITZ MANUFACTURING COMPANY, OF RIDGEFIELD, NEW JERSEY.

APPARATUS FOR REDUCING ELECTRIC CURRENTS AND VOLTAGE.

SPECIFICATION forming part of Letters Patent No. 602,709, dated April 19, 1898.

Application filed September 3, 1895. Renewed November 13, 1897. Serial No. 658,436. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER F. VETTER, of Long Island City, in the county of Queens and State of New York, have invented a new and Improved Apparatus for Reducing Electric Currents and Voltage, of which the following is a full, clear, and exact description.

The object of my invention is to provide a simple and effective apparatus for reducing large electric currents with high voltage to small currents with low voltage to adapt the current to uses heretofore employing batteries or special generators.

My invention consists in the combination, with the main circuit or a branch thereof, of two resistances placed in the circuit, one for reducing the current and another for reducing the voltage, a shunt-circuit including a variable amount of the second or voltage-reducing resistance, and translating devices, all as will be hereinafter more fully described.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a diagram illustrating one form of my invention, and Fig. 2 is a similar view of another arrangement of parts.

Similar characters of reference indicate corresponding parts in both the figures.

As illustrated in Fig. 1, the main-circuit wires A A′ in the present case take the current from the dynamo B, and branch wires C D are connected with the main conductors A A′. The branch wire D is connected with one end of a volt-controller D′, consisting of a series of resistances 1 2 3 4, &c., the other end of the series being connected by the wire E with a switch E′, controlling the connection with the wire C. In practice there are as many resistance-coils 1 2 3, &c., as there are volts. In the present case there are nineteen coils, representing a pressure in the main circuit of nineteen volts; but I do not limit or confine myself to any particular proportion between the resistances 1 2 3, &c., and the voltage.

At the end of the series of resistances 1 2 3 4, &c., and between all the resistance-coils of the series are placed contact-points in electrical connection with the terminals of the adjacent coils, and these contact-points are preferably arranged in a circle, as shown. In the center of the circle is pivoted an arm F, which is capable of touching either of the contact-points in the series. The pivot of the arm F is connected with an ampere-controller L, which consists of a series of resistance-coils *b*, a series of insulated contact-plates *c*, and a central contact-plate *d*, from which a wire M leads to a rheostat K. The contact-plates *c* and *d* are recessed in the well-known manner, as shown, to receive a connecting-plug. From the rheostat K a wire I leads to a terminal G, and the said wire may include an ammeter or milliammeter J, as shown. It will be understood, however, that the ammeter and the rheostat may be dispensed with in many cases. The wire E is also connected to a terminal H, and between the terminals G and H is placed a working circuit containing a cautery-wire, an electrochemical or electrotherapeutical apparatus, or the like.

I prefer to place in each of the wires C and D a fuse *a′* and a device *a*, acting as an arrester for high-tension discharges, as in such a case the fuse *a′* will burn out and the entire current will pass through the high resistance *a*. Said resistance may consist of any suitable material—for instance, carbon.

In the present case the wire N, connecting the posts G H, represents the cautery-wire or other translating devices. It will thus be seen that the wire N, the milliammeter J, and the rheostat K are included in the shunt and that with the arrangement of the arm F on the third of the series of contacts, as shown, a part of the current is caused to flow through the conductor D, the resistances 1 2, the arm F, the ampere-controller L, wire M, the rheostat K, the conductor I, the ammeter J, the wire N, the wire E, the switch E′, and back to the conductor A through the wire C. Another part of the current will flow through all the resistances of the volt-controller and back to the conductor A through the switch E′ and wire C. By turning the arm F so as to include more or fewer resistance-coils between the arm F and the wire D the pressure in the

shunt-circuit can be varied, the resistance of each coil in the volt-controller being, for instance, one ohm.

I prefer to so arrange the resistances that the shifting of the arm F from one contact-point to the next will correspond to a change of pressure of one volt.

The amount of current in amperes is controlled by the ampere-controller L, according to the position of the connecting-plug, while the voltage is controlled in the manner described by cutting in the resistances 1 2 3, &c., of the volt-controller, as may be required. The amount of current may be further regulated in the shunt-circuit by the rheostat K, which in the present case is a powdered-carbon rheostat of well-known construction. The milliammeter J is also of well-known construction and will therefore need no special description.

The arrangement shown in Fig. 2 comprises the volt-controller D′, connected to the wire D and provided with a rotatable arm F, connected by the wire I to the terminal or binding post G. An ammeter may be included in the conductor I, if desired, as in the construction illustrated by Fig. 1. The wire C is connected to one end of an ampere-controller L′, constructed like the volt-controller D′, it being understood that this construction is an equivalent of the ampere-controller L. (Shown in Fig. 1.) The ampere-controller L′ is provided with a rotatable arm F′, which is connected by a wire O with the opposite end of the volt-controller D′ to that connected with the wire D. From the wire O a branch wire O′ leads to the rheostat K′, having a series of resistance-coils and contacts, (marked 1 2 3, &c.,) with which the rotatable arm F^2 is adapted to come in contact. Said arm F^2 is connected by means of a wire O^2 to the terminal H, between which and the terminal G is located the working circuit N.

My improved apparatus is used for medical and surgical operations and is especially designed to permit the use of the street-current for such purposes; but it will be understood that the apparatus may be employed in any other case where it is desired to control the voltage or amperage.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In apparatus for reducing currents and voltage, the combination with the supply-circuit, of resistance controlling the current strength, a second resistance placed in the supply-circuit, a shunt-circuit including translating devices, and means for transferring a portion of the second resistance of the supply-circuit to the shunt-circuit, substantially as specified.

2. In apparatus for reducing currents and voltage, the combination with the supply-circuit, of a current-reducing resistance, a sectional resistance placed in the supply-circuit, a shunt, including translating devices, and means for transferring one or more of the sectional resistances in the supply-circuit to the shunt-circuit, substantially as specified.

3. In an apparatus for reducing currents and voltage, the combination with the supply-circuit, of a current-reducing resistance and a sectional resistance placed in the supply-circuit, a shunt including the translating devices, means for transferring one or more sections of the sectional resistance of the supply-circuit to the shunt-circuit, and a rheostat and measuring instrument placed in the shunt-circuit, substantially as specified.

4. In an apparatus for controlling the voltage and amperage of currents, the combination of a volt-controller comprising a series of resistances, and means for putting one or more of the said resistances into the circuit, a rheostat connected in series with the said volt-controller, means whereby various points or resistances of the said rheostat and volt-controller may be connected with the working circuit, and a supply-circuit connected to both ends of the volt-controller and to one end of the rheostat, substantially as described.

5. In an apparatus for controlling the voltage and amperage of currents, the combination of a supply-circuit, a volt-controller comprising a series of resistances, the ends of the volt-controller being connected to the supply-circuit, an ampere-controller likewise consisting of a series of resistances, means whereby one end of one of the said controllers may be connected with any point or resistance of the other controller, and a working circuit located in a shunt and arranged so as to be in series with the ampere-controller and in parallel with the volt-controller, substantially as described.

ALEXANDER F. VETTER.

Witnesses:
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