(No Model.)

J. VAN VLECK.

RHEOSTAT.

No. 456,280. Patented July 21, 1891.

Fig. 1.

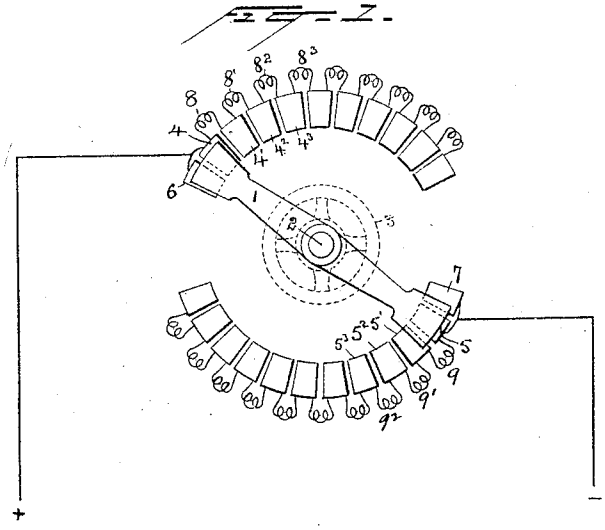


Fig. 2.

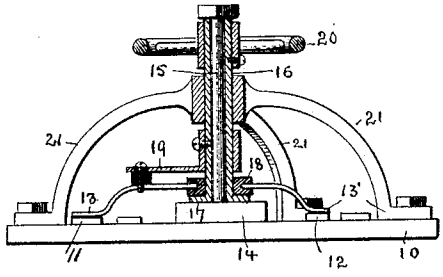
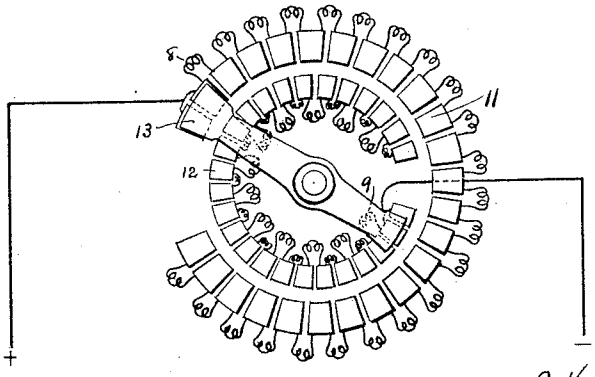


Fig. 3.



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UNITED STATES PATENT OFFICE.

JOHN VAN VLECK, OF NEW YORK, N. Y., ASSIGNOR TO LUTHER STIERINGER, OF SAME PLACE.

RHEOSTAT.

SPECIFICATION forming part of Letters Patent No. 456,280, dated July 21, 1891.

Application filed January 19, 1891. Serial No. 378,276. (No model.)

To all whom it may concern:

Be it known that I, JOHN VAN VLECK, a citizen of the United States, residing at New York, in the county and State of New York, have invented a certain new and useful Improvement in Rheostats, of which the following is a specification.

The present invention relates to an apparatus for throwing resistances into or out of electrical circuits for controlling or regulating the current flowing in said circuits.

The object of the invention is to provide improved means for throwing resistance coils or devices into or out of circuit by a small movement of the handle of the rheostat; and the invention consists in the rheostat and in the several combinations hereinafter described and claimed.

In the drawings, Figure 1 is a view, partly diagrammatic, showing one form of rheostat in which my improvement is embodied. Fig. 2 is a central section of a second form of rheostat embodying the invention, and Fig. 3 is a diagram showing the circuit connections of the latter rheostat.

In Fig. 1, 1 is an arm pivoted at 2 and having a handle 3. Arranged in a circle around the center 2 is a series of contact-plates 4 4′ 4^2 and a second series of contact-plates 5 5′ 5^2, the contact-plates being connected through resistances 8 8′ 8^2 9 9′ 9^2. One end of the switch-arm bears on the contact-plates of one series and the opposite end bears on the other series. The plates of the upper series are not diametrically opposite the plates of the lower series, (provided the switch-arm is straight,) but are arranged slightly out of line—that is to say, a line drawn through the center of a plate 4 and the center 2 will not strike the center of a plate 5, but will pass to one side thereof, preferably through the space between two plates. In other words, the plates of the two series are staggered. The ends of arm 1 are preferably as wide as two contact-plates and the intervening space between two plates, so that said ends are always in contact with two and sometimes with three plates, and contact is made with an advance plate before the arm passes from the rear plate on which it was resting. No resistances are connected to the two end plates 6 7. The terminals + and − of the rheostat are connected to the end plates, as shown. It will be seen that the plates of one series are connected in pairs by resistances beginning at the left, where the terminal of the instrument is connected, and extending toward the right, while the plates of the other series are connected in a similar manner, beginning at the right and passing toward the left.

In the position illustrated in Fig. 1 the circuit is as follows: + terminal to plates 4 and 6, arm 1, plates 5 and 7 to terminal −, and no resistance-coil is in circuit. By moving the arm 1 so that its upper end rests on plates 4 4′ 4^2 and its lower end on 5′ 5^2 the circuit becomes terminal +, plate 4, arm 1, plate 5′, coil 9 to terminal −, thus putting one coil into the circuit. Now by moving the switch-arm one step—that is, a distance equal or about equal to the width of one-half of a contact-plate and one space—the upper end passes onto 4′ 4^2 and the lower end onto 5′ 5^2 5^3, and the circuit becomes terminal +, coil 8, arm 1, coil 9 to terminal −. With this arrangement a small range of movement is sufficient to throw a large number of resistances into the circuit and at the same time makes it possible to use large contact-plates.

The rheostat illustrated in Figs. 2 and 3 is provided with two series of contacts arranged in concentric circles. 10 is a suitable base. 11 is the outer circle of contact-plates, and 12 the inner circle of plates. 13 13′ is a switch-arm, the end 13 bearing on contact 11 and the end 13′ bearing on the contacts 12. 14 is a metal plate secured to the base and having a shank or pin 15. 16 is a sleeve on said pin, and has at its lower end a flange 17. 18 is a ring, preferably of insulating material, on the sleeve and supports the switch-arm 13 13′. 19 is an arm connected to the sleeve 16 and to the arm 13 13′, and is preferably insulated from said arm. The arm 19 is for the purpose of taking strain from 13 when the handle 20 is turned to change the amount of resistance in the circuit. 21 is a frame or spider supported on the base and forming an arch over the contact-plates and switch-arm and serves to form a bearing for the vertical spin-

dle. The frame preferably has four legs. The circuit connections of this rheostat are indicated in Fig. 3, and will be clear without further description. The operation is the same as described in connection with Fig. 1.

Having thus described the invention, what I claim is—

1. The combination, in a rheostat, of a series of contacts connected by resistances, another series of contacts also connected by resistances, and a switch arm or device co-operating with both series of contacts and arranged to throw a resistance of one series into circuit by movement of the switch one step and then to throw a resistance of the other series by movement of the switch a second step, substantially as described.

2. The combination, in a rheostat, of two series of contacts connected by resistances and staggered, and a switch device co-operating with both series to throw a resistance of one series and of the other series alternately into circuit, substantially as described.

3. The combination, in a rheostat, of two concentric series of contacts, the contacts of each series being connected in pairs through resistances, and a switch arm or device co-operating with the contacts of both series and arranged to throw one resistance into circuit by movement of the switch-arm through a single step, substantially as described.

4. The combination, in a rheostat, of a series of contacts connected in pairs by resistances from left to right, another series of contacts connected by resistances from right to left, and a switch arm or device simultaneously co-operating with both series of contacts, substantially as described.

5. The combination, with a single circuit, of a rheostat having a series of contacts connected by resistances from left to right, another series of contacts connected by resistances from right to left, and a switch arm or device simultaneously co-operating with both series of contacts, substantially as described.

This specification signed and witnessed this 16th day of January, 1891.

JOHN VAN VLECK.

Witnesses:
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