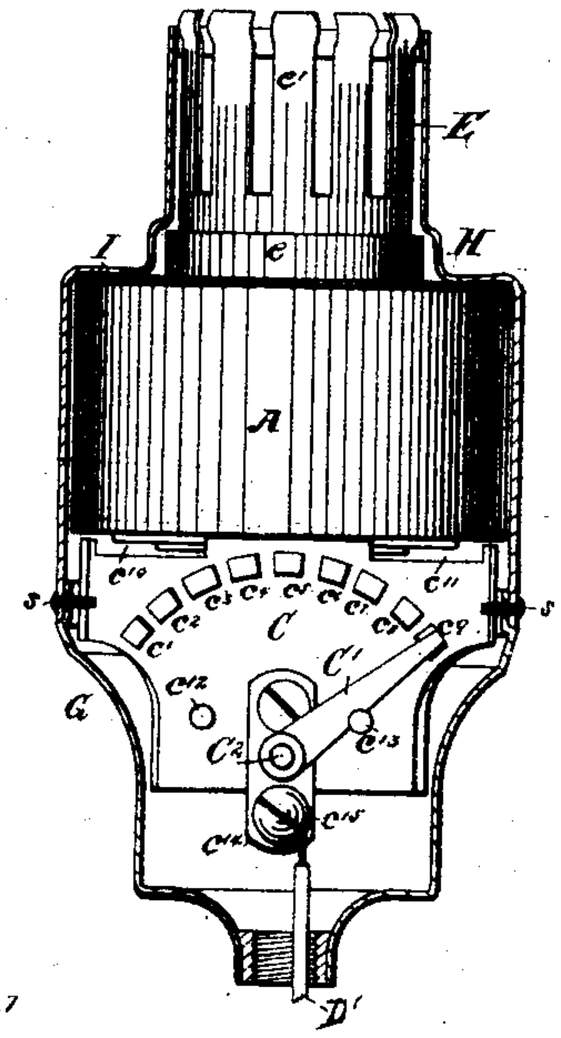
(No Model.)

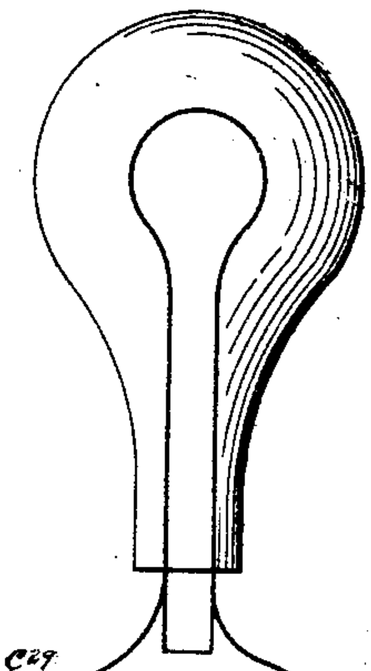
C. A. HUSSEY.

RHEOSTAT.

No. 502,040. Patented July 25, 1893.

Fig. 1.





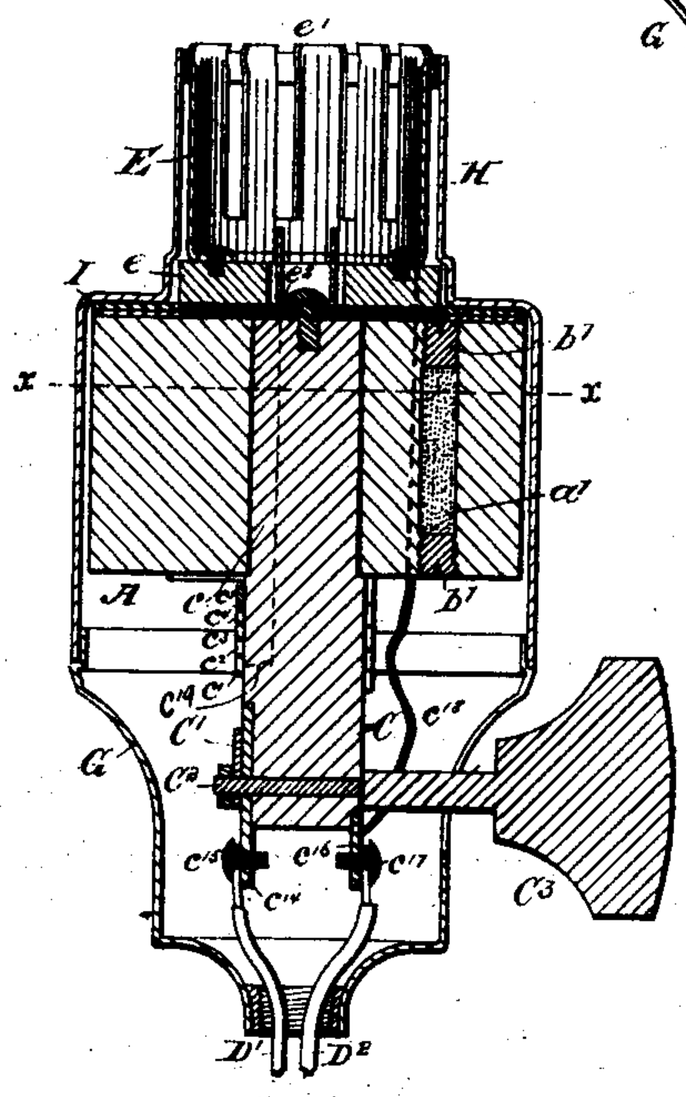


Fig. 2.

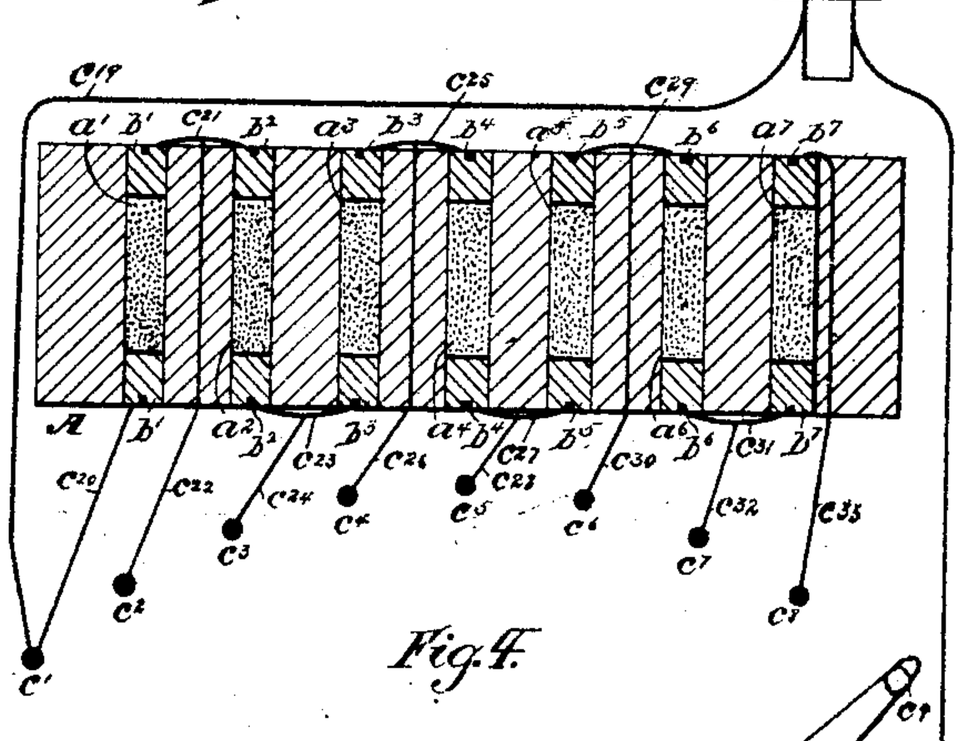
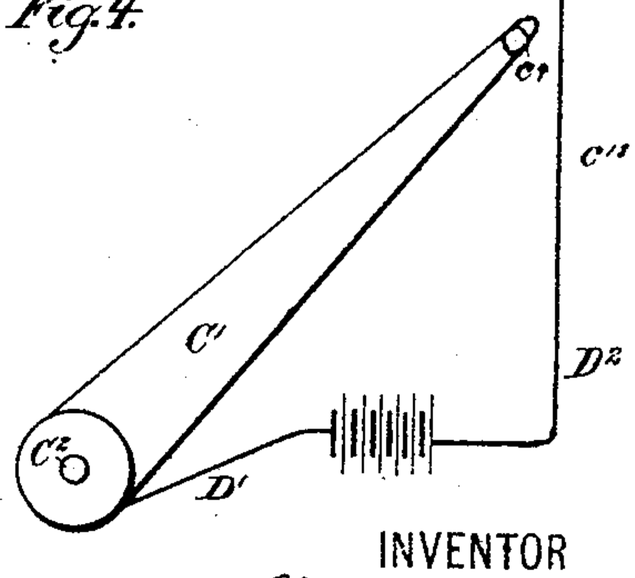


Fig. 4.



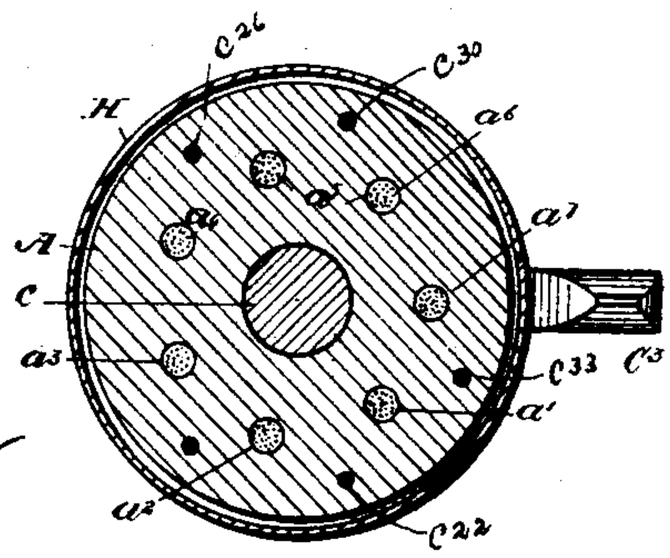


Fig. 3.

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UNITED STATES PATENT OFFICE.

CHARLES A. HUSSEY, OF NEW YORK, N. Y.

RHEOSTAT.

SPECIFICATION forming part of Letters Patent No. 502,040, dated July 25, 1893.

Application filed May 23, 1892. Serial No. 434,085. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. HUSSEY, of 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 object of my improvement is to provide a simple, cheap, efficient and withal compact rheostat. An important use contemplated for my rheostat is that of a regulator for varying the illuminating power of an incandescent electric lamp.

I will describe a rheostat embodying my improvement and then point out the novel features in the claims.

In the accompanying drawings, I have illustrated my improvement in connection with the socket of an incandescent electric lamp.

Figure 1 is a side view of the socket of an incandescent electric lamp, also a side view of a rheostat combined therewith and a vertical section of a shell inclosing the rheostat and socket. Fig. 2 is a vertical section of all the parts. Fig. 3 is a horizontal section of the rheostat taken at the plane of the dotted line $x\ x$ Fig. 2. Fig. 4 is a diagram illustrating my improvement.

Similar letters of reference designate corresponding parts in all the figures.

A designates a block of insulating material, preferably soapstone. It is shown as made of cylindric form. In it are a number of cavities a', &c. As here shown, there are seven similar cavities $a'\ a^2\ a^3\ a^4\ a^5\ a^6\ a^7$. They are arranged in a circular row and extend entirely through the block A. The cavities $a'\ a^2\ a^3\ a^4\ a^5\ a^6\ a^7$ are supplied with poor conducting material. I may use for this purpose a mixture of pulverized carbon and peroxide of manganese. The proportions of the materials will vary with the amount of resistance required. I do not wish to be confined to any combination of materials or to any single material, and obviously there are many that I can use either alone or in combination. The extremities of the cavities may be closed in any suitable manner. In the present example of my improvement, I have for this purpose employed screws entering the cavities and engaging with screw threads formed therein. Metal screws $b'\ b^2\ b^3\ b^4\ b^5\ b^6\ b^7$ form an advantageous closure, as they enable me to vary the pressure of the contents of the cavities and consequently of the resistance offered by the material in the cavities.

C designates a block of insulating material arranged mainly below the block A, but having a central shank c, which extends up into a central cavity of the block A nearly if not quite to the top of the latter. The main part of this block C at each side of its shank c is constructed to form recesses $c^{10}\ c^{11}$, which will afford space for the screws $b'\ b^2\ b^3\ b^4\ b^5\ b^6\ b^7$ and certain connections which are made with these screws. The lower part of the block C is shown as reduced in size.

On one side of the block C a number of plates $c'\ c^2\ c^3\ c^4\ c^5\ c^6\ c^7\ c^8\ c^9$ are arranged. They are separate and consequently are insulated from each other. These plates are intended to co-operate with the conducting material in the cavities $b'\ b^2\ b^3\ b^4\ b^5\ b^6\ b^7$.

C′ designates a metal switch finger mounted upon a shaft C^2, which is journaled in the lower part of the block C in such position that by rotating it the switch finger may be made to impinge upon the plates $c'\ c^2\ c^3\ c^4\ c^5\ c^6\ c^7\ c^8\ c^9$ one at a time. I have shown two stop pins c^{12} c^{13} inserted in the lower part of the block C to limit the movements of the switch finger, so that it will never be adjusted beyond the series of plate $c'\ c^2\ c^3\ c^4\ c^5\ c^6\ c^7\ c^8\ c^9$.

On the shaft C^2 is a hand piece C^3 which is located outside of the entire instrument so as to be accessible.

On one side of the block C a metal plate c^{14} is mounted. It may be secured in place in any suitable manner, as, for instance, by screws. The shaft C^2 extends through it and the spring finger is in electrical communication with it. A circuit wire D′ leads to the plate c^{14} and is put in electrical communication therewith in any suitable manner as, for example, by being clamped to the plate under the head of a screw c^{15} whose shank engages with a tapped hole in the plate. A similar plate c^{16} is applied to the other side of the block C and fastened thereto in any suitable manner as for instance by screws. With this plate a circuit wire D^2 is electrically connected in any suitable manner as for instance by being clamped to the plate behind the head of a screw c^{17} whose shank engages with a tapped hole in said plate. From the plate c^{16}

a wire c^{18} extends. It is electrically connected with the plate by being soldered thereto or otherwise and extends up through a hole in the block A. The upper end of this wire c^{18} extends to a socket E, which is mounted upon the top of the block A. The socket E may be of any construction suitable for engaging with an incandescent lamp. As here shown, it consists of a base block e of insulating material, a cylindric metallic shell e' mounted thereon and a plate e^2 fitted to the underside of the base block and having contact fingers extending up through a central hole in the block. The wire c^{18} is in electrical communication with the shell e'. The plate e^2 is electrically connected with a wire c^{19} that extends down through a hole in the block A and connects with the plate c'. From the plate c' a wire c^{20} extends through a hole in the block A to the lower screw b' of the cavity a'. From this screw b' the circuit may extend through the contents of the cavity a'. The upper screw b' of the cavity a' is connected by a wire c^{21} with the upper screw b^2 of the cavity a^2. From the wire c^{21} a wire c^{22} extends through a hole in the block A to the plate c^2. From the upper screw b^2 the circuit may continue through the contents of the cavity a^2 to the lower screw b^2. A wire c^{23} extends from the lower screw b^2 to the lower screw b^3 belonging to the cavity a^3, and this wire c^{23} is connected by a wire c^{24} with the plate c^3. The circuit may continue from the lower screw b^3 to the upper screw b^3 of the cavity a^3 and thence along a wire c^{25} which extends from the upper screw b^3 to the upper screw b^4 belonging to the cavity a^4. From the wire c^{25} a wire c^{26} extends through a hole in the block A to the plate c^4. The circuit may continue from the upper screw b^4 through the contents of the cavity a^4 to the lower screw b^4 of the latter. The lower screw b^4 is connected by a wire c^{27} with the lower screw b^5 of the cavity a^5 and this wire c^{27} is connected by a wire c^{28} with the plate c^5. The circuit may continue from the lower screw b^5 through the contents of the cavity a^5 to the upper screw b^5. The latter is connected by a wire c^{29} with the upper screw b^6 of the cavity a^6, and the wire c^{29} is connected by a wire c^{30} with the plate c^6. The wire c^{30} passes through a hole in the block A. The circuit may continue from the upper screw b^6 through the contents of the cavity a^6 to the lower screw b^7 of the cavity a^7, and this wire c^{31} is connected by a wire c^{32} with the plate c^7. The circuit may continue from the lower screw b^7 through the contents of the cavity a^7 to the upper screw b^7. The latter is connected by a wire c^{33} with the plate c^8. The wire c^{33} is represented as extending through a hole in the block A. The plate c^9 is not connected in circuit.

The construction and operation of the device may best be understood by reference to the diagram Fig. 4. From this diagram it will readily be understood that when the switch finger C′ is adjusted so as to impinge upon the plate c^9, the lamp will be out. If the switch finger is adjusted onto the plate c^8, the resistance of the contents of all the cavities a' a^2 a^3 a^4 a^5 a^6 a^7 will be in circuit and the light will be dim. By adjusting the switch finger from the plate c^8 to the plate c^7 the contents of the cavity a^7 will cut out of circuit. An adjustment of the switch finger from the plate c^7 to the plate c^6 will additionally cut out the resistance of the contents of the cavity a^6. By changing the switch finger of the plate c^6 to the plate c^5 the resistance of the contents of the cavity a^5 will be additionally cut out. If the switch finger is shifted from the plate c^5 to the plate c^4 the resistance of the contents of the cavity a^4 will be additionally cut out. By changing the switch finger from the plate c^4 to the plate c^3 the resistance of the contents of the cavity a^3 will be cut out. By shifting the switch finger onto the plate c^2 the resistance of the contents of the cavity a^2 will be eliminated. If the switch finger is shifted onto the plate c' the entire resistance comprised in the rheostat will be cut out, as the current will then flow directly through the switch finger to the lamp. The movement of the switch finger in the reverse direction will then produce more or less resistance according to the plate upon which the switch finger is allowed to remain. In passing from one plate to another, the switch finger will bridge over two plates at a time and consequently obviate arcing. The only point at which the circuit will be broken will be during the passage of the switch finger from the plate c^8 to the plate c^9, and, as there will at this time be very great resistance in the circuit, the danger of arcing will be practically eliminated.

I have shown the main part of the block C as surrounded by a sheet metal shell G and the lamp socket E and block A as surrounded by a sheet metal shell H. These shells may be together fastened in place by screws s passing through them and entering the block C.

It will be seen that the shell H is shouldered at the junction of the block A of the lamp socket. To prevent this shoulder portion from establishing an electrical connection between any of the upper screws b' b^2 b^3 b^4 b^5 b^6 b^7, I preferably insert an annular piece of mica I, or other suitable insulating material between the top of the block A and the shoulder portion of the shell H.

It will be seen that by my improvement I produce an extremely simple and cheap rheostat and one withal possessing the very great advantage of compactness due to the possibility it affords of arranging a very large amount of resistance in a very small space. Not only does it obviate the expense of wire, but it saves the cost of keeping such wire in order, which is very great, owing to the fact that the insulation is apt to be burned off.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a rheostat, the combination of a block

of insulating material provided with a cavity or cavities and a conducting material therein composed of powdered material of good conductivity and peroxide of manganese substantially as described, and means whereby said material may be thrown into or out of the circuit, substantially as specified.

2. In a rheostat, the combination of a block of insulating material provided with a cavity or cavities, granular or pulverized material therein, a screw or its equivalent for varying the compression of the said material consisting of a conducting material and pulverized peroxide of manganese and means whereby more or less of such material may be thrown in or out of circuit, substantially as specified.

3. In a rheostat, the combination of an electric lamp socket or holder with a block of insulating material provided with cavities containing conducting material mixed with powdered peroxide of manganese and so arranged that more or less of the material may be thrown into or out of the circuit to vary or extinguish the light, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES A. HUSSEY.

Witnesses:
S. O. EDMONDS,
WM. A. POLLOCK.