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(No Model.)

R. H. & F. H. WAPPLER.

RHEOSTAT FOR ELECTRIC LAMPS.

No. 604,949. Patented May 31, 1898.

Fig. 1.

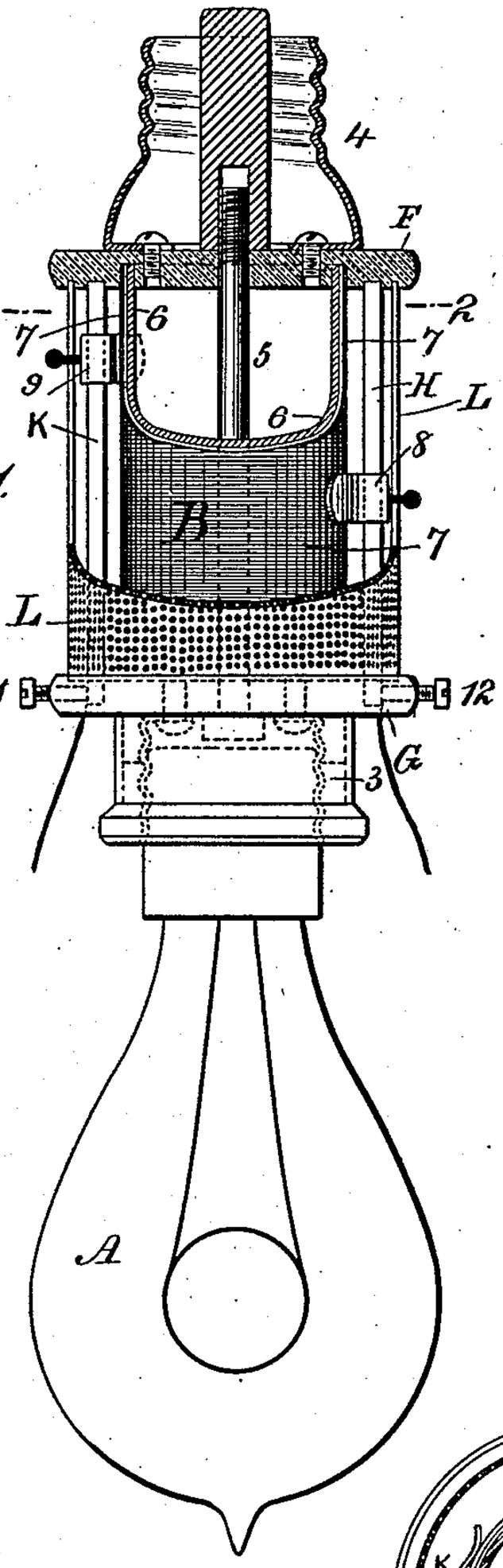


Fig. 4.

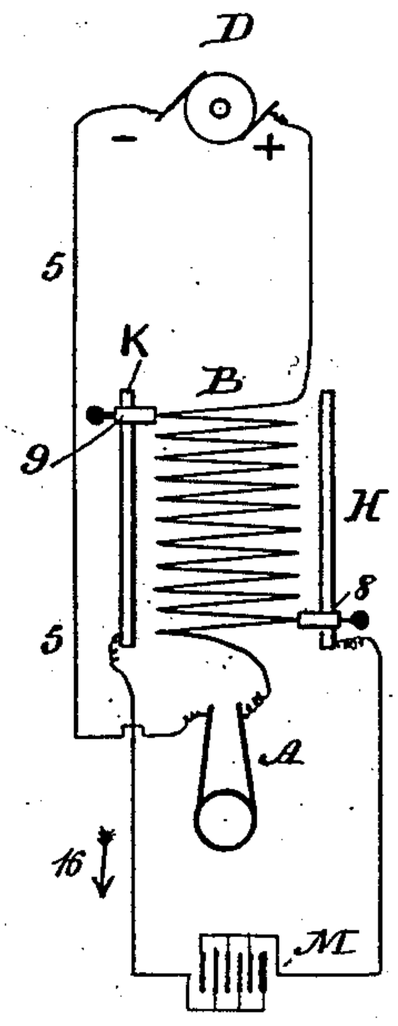
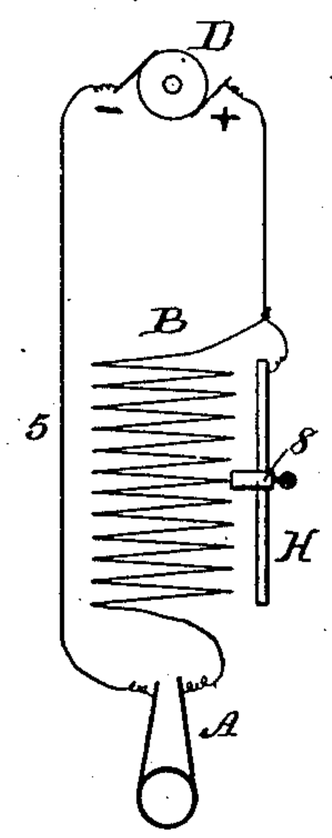


Fig. 3.



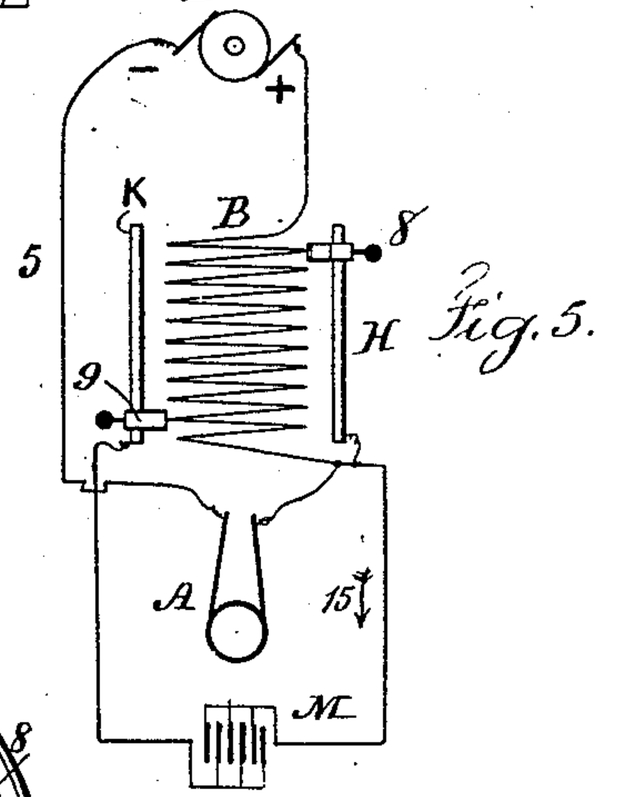
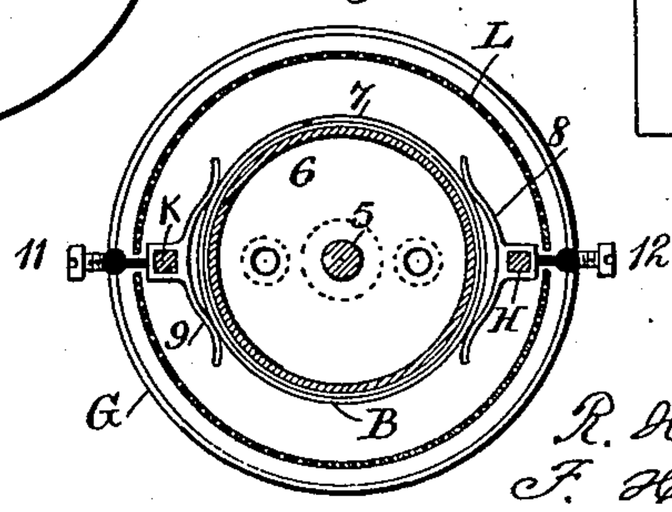


Fig. 5.

Fig. 2.



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UNITED STATES PATENT OFFICE.

REINHOLD H. WAPPLER AND FREDRICK H. WAPPLER, OF NEW YORK, N. Y.

RHEOSTAT FOR ELECTRIC LAMPS

SPECIFICATION forming part of Letters Patent No. 604,949, dated May 31, 1898.

Application filed September 20, 1897. Serial No. 652,266. (No model.)

To all whom it may concern:

Be it known that we, REINHOLD H. WAPPLER and FREDRICK H. WAPPLER, citizens of the United States, residing in the city and State of New York, have invented an Improvement in Rheostats for Electric Lamps and other Transforming Devices, of which the following is a specification.

Difficulty has heretofore been experienced in turning down or reducing the luminosity of incandescent electric lamps, and when a resistance or rheostat is thrown into the circuit to lessen the current the parts often become dangerously heated.

In addition to the foregoing a branch or derived circuit is sometimes desired in connection with an electric lamp—such, for instance, a circuit for charging a secondary battery r heating water, curling-irons, or similar s, or for plating.

present invention relates to a peculy in the rheostat whereby a large resistnce is concentrated into a small space and the risk of heating or injuring is reduced to a minimum, and we arrange the circuit connections with reference to diverting any desired proportion of current into a shunt or derived circuit and for regulating the current flowing through the incandescent electric lamp, and thereby determining the luminosity of the same.

In the drawings, Figure 1 is an elevation, partially in section, showing our improved rheostat as applied to a lamp. Fig. 2 is a sectional plan view at the line 2 2, and Figs. 3, 4, and 5 are diagrams of the circuit connections.

When this improvement is applied with an electric lamp, as illustrated at A, we make use of a rheostat B, introduced between the socket 3 for the lamp and the socket 4, that is screwed to the ceiling rose or fixture, and this rheostat B is between the heads F and G of insulating material, and one terminal of the lamp is connected with the socket 3 and the other with the central bolt 5, and the current is supplied through the fixture to the central bolt 5 and fixture-socket 4.

The rheostat B is made of a tube 6, preferably of brass, supported between the heads F and G, and this tube 6 is coated with insulating material in the form of a varnish, such as that usually known as "enamel," and this is adapted to being softened by heat, but is an insulator of electricity, and the wire 7 is wound upon this enamel surface, the convolutions setting close to each other, but not pressed into contact, and we find that by heating the wire sufficiently to oxidize the surface the convolutions may be wound close together and the oxidation will form a sufficient insulation, and after the wire has been closely wound upon the enameled surface of the tube 6 the parts are heated sufficiently to cause the wire and enamel to adhere, and thereby hold the wire and prevent the same slipping laterally by the rubbing contacts hereinafter spoken of, and we find it generally preferable to coat the surface of the wire of the rheostat with suitable enamel or varnish, except at the sides, where the contacts 8 and 9 are employed. These contacts 8 and 9 are upon slider-bars H and K, supported at their ends by the heads F and G, and the contacts upon the slider-bars are usually in the form of springs, the outer ends resting upon and rubbing against the convolutions of the wire of the rheostat as the contacts may be moved toward one head or the other, and in order to protect the rheostat and to prevent the risk of fire should the rheostat-wire become heated we employ a casing L, of perforated sheet metal, the same surrounding the rheostat at a suitable distance and being supported at its ends by the heads F and G, and the insulating heads or buttons, by which the contacts 8 and 9 are moved, project through slots in the casing L. This casing allows air to circulate through the perforations.

One end of the electric-lamp filament is connected with one end of the rheostat-wire 7, and the other end of this rheostat-wire is connected with the source of electric energy advantageously through the screw-socket 4, and one of the circuit-wires supplying the current may also be connected to the slider-bar H.

It will now be understood, especially by reference to Fig. 3, that the luminosity of the lamp can be regulated by moving the contact 8 so as to throw into the circuit of the electric lamp more or less of the rheostat B, because when the contact 8 is at the end of the rheostat nearest the lamp the current will be short-circuited through the slider-bar H and

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contact 8 and pass to the lamp without being lessened by the resistance, and by moving the contact 8 away from the lamp resistance will be thrown in to any desired extent to reduce the luminosity of the lamp. We usually make use of the two bars H and K, and in this instance a shunt, branch, or derived circuit M can be connected to the lamp, and in this shunt-circuit a secondary battery, motor, heater, or other transforming device can be made use of, as indicated at M′, and the ends of this shunt-circuit are connected with the bars H and K, respectively, at the clamps or binding-posts 11 and 12.

Let D illustrate a dynamo or other source of electric energy, and it will be apparent that one circuit connection—say the negative—passes therefrom through the central bolt 5 and forms the return from the electric lamp, and the other circuit connection—say the positive—is to the rheostat.

Referring now to the diagram Figs. 3, 4, and 5, it will be seen that the electric lamp is in a constantly-closed circuit through the rheostat B to the source of electric energy, and that by moving the contacts 8 and 9, Figs. 4 and 5, the current diverted into the shunt M can be regulated. If the contact 9 is in the position illustrated in Fig. 4 and near the end of the rheostat distant from the lamp and the contact 8 is near the lamp, the resistance of the rheostat will be added to the resistance of the lamp and a current will be diverted through 9 into the shunt-circuit M in proportion to the resistance in that circuit and the return will be through the lamp and by 5 to the negative of the supply. If, on the other hand, the contact 9 is near the lamp and the contact 8 distant therefrom, as in Fig. 5, the current will pass from the positive by 8 and H to the lamp and return by 5 to the negative and but a slight current will pass into the shunt-circuit M through the rheostat B and contact 9, returning through the lamp.

When the circuit connections are made as indicated in Fig. 4, the rheostat B remains as a constant resistance in the lamp-circuit, and by moving the contacts 8 and 9 more or less current can be diverted into the shunt-circuit and the polarity or direction of current reversed—that is to say, when 9 is near the lamp and 8 distant from the lamp the resistance of the rheostat B will cause the current to pass through the shunt-circuit M in the direction of the arrow 15, the current returning by K and 9 through the lamp.

If, on the other hand, the contact 8 is near the lamp and the contact 9 distant from the lamp, the current will pass by 9 through M in the direction of the arrow 16 and return by 8 through the lamp, and by placing the contacts 8 and 9 in the proper positions the proportion of current or the direction of current diverted through the shunt can be regulated, and the same being a branch from the main circuit and the lamp connected in series the luminosity of the lamp will not be materially varied by the current through M.

The present improvement allows the rheostat to occupy but a small space and also provides for a shunt or derived circuit to be established and regulated from the lamp and the direction of current to be changed, if desired or rendered necessary in supplying a secondary battery.

We claim as our invention—

1. In combination with the ordinary incandescent electric lamp, two heads of insulating material, a socket connection upon one head for the incandescent lamp, and a socket connection on the other head for the socket or electric-lamp fixture, a rheostat-coil between the insulating-heads, a bar also between the heads, a sliding contact in the electric circuit and upon the bar and resting upon the rheostat-coil and having a knob or head by which it is adapted to be moved toward one head or the other for varying the resistance in the lamp-circuit, and a casing of sheet metal multiperforated and surrounding the rheostat and bar to protect the same and allow a free circulation of air, the casing being slotted for the knob or head of the sliding contact, substantially as set forth.

2. The combination in an electric circuit of a rheostat composed of a metal tube [illegible] enamel or similar insulating material upon the surface thereof, and naked wire having an oxidized surface closely wound upon the insulating-surface of the metal tube, and a sliding contact in the electric circuit resting on the convolutions of the wire, for varying the resistance in the circuit, substantially as set forth.

3. The combination with a source of electric energy and with an incandescent electric lamp, of a rheostat composed of a coil of wire in the closed circuit containing the lamp, two stationary bars each having a slider thereupon in contact with the rheostat-coil, and a shunt or derived circuit connected with the slider-bars and containing a transforming device, for varying the resistance in the lamp-circuit and the current diverted into the shunt-circuit, substantially as set forth.

Signed by us this 17th day of September, 1897.

REINHOLD H. WAPPLER.
FREDRICK H. WAPPLER.

Witnesses:
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