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PATENTED MAR. 20, 1906.

T. J. BULL.
LAMP RHEOSTAT.
APPLICATION FILED JUNE 15, 1903.

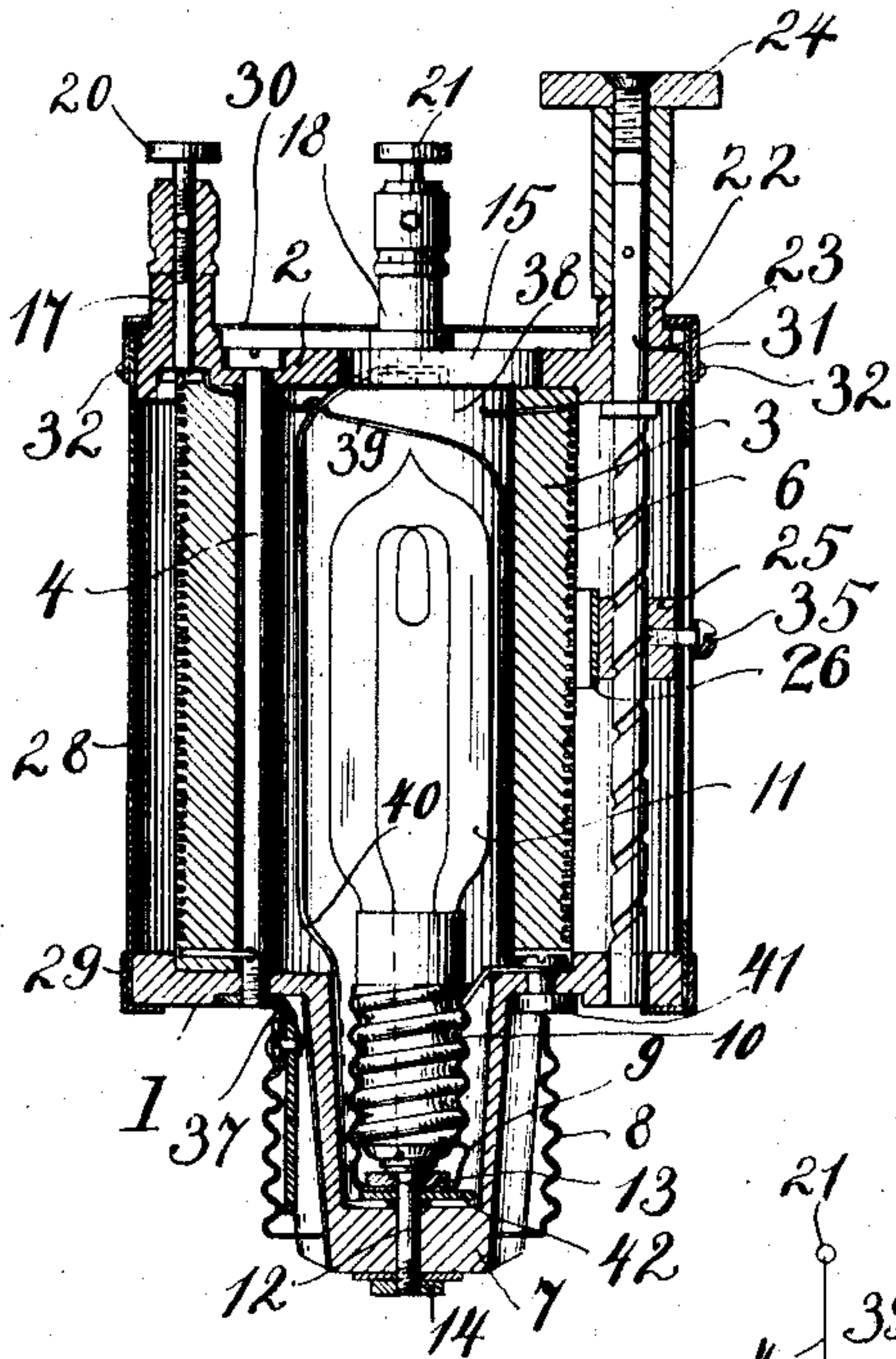


Fig: 1,

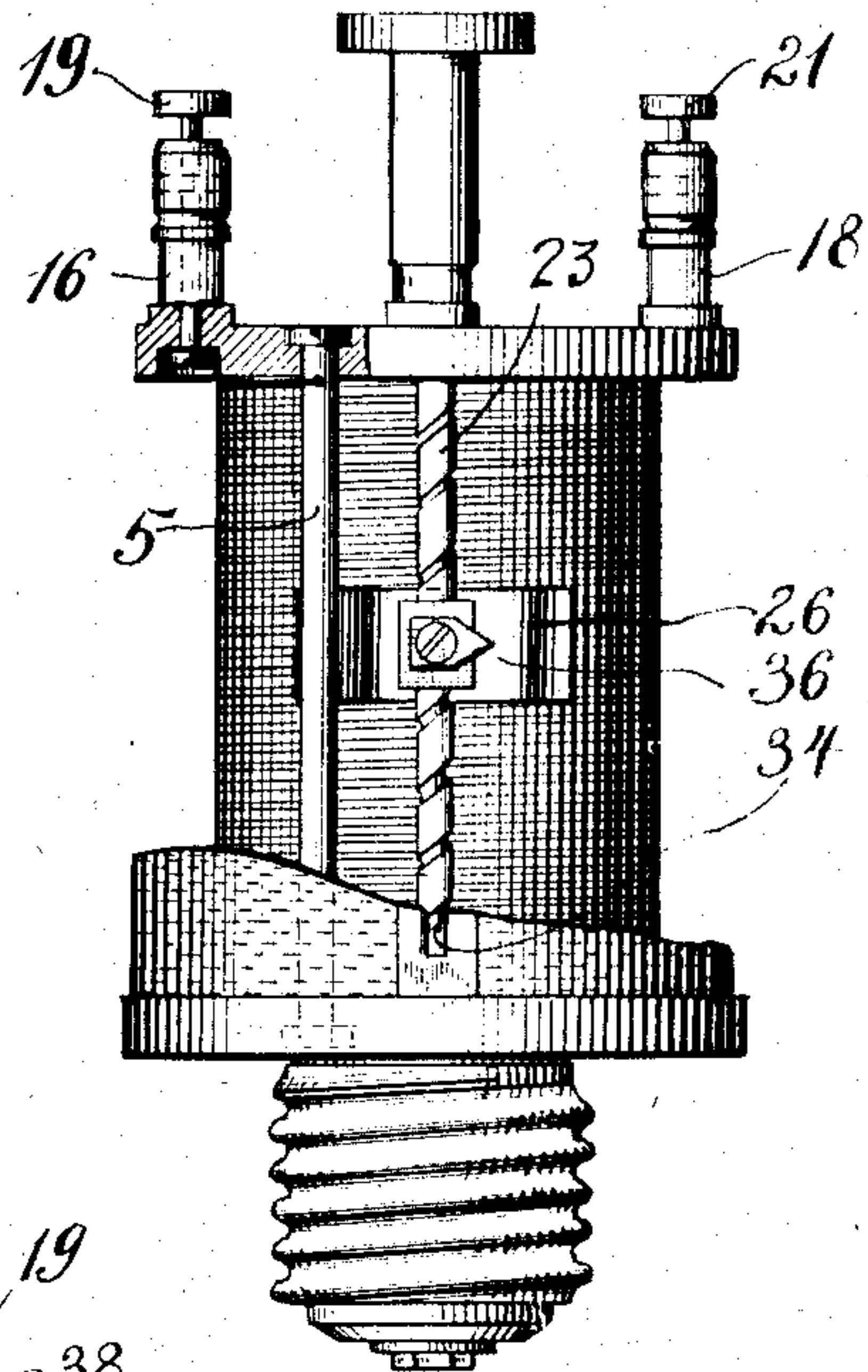


Fig: 2,

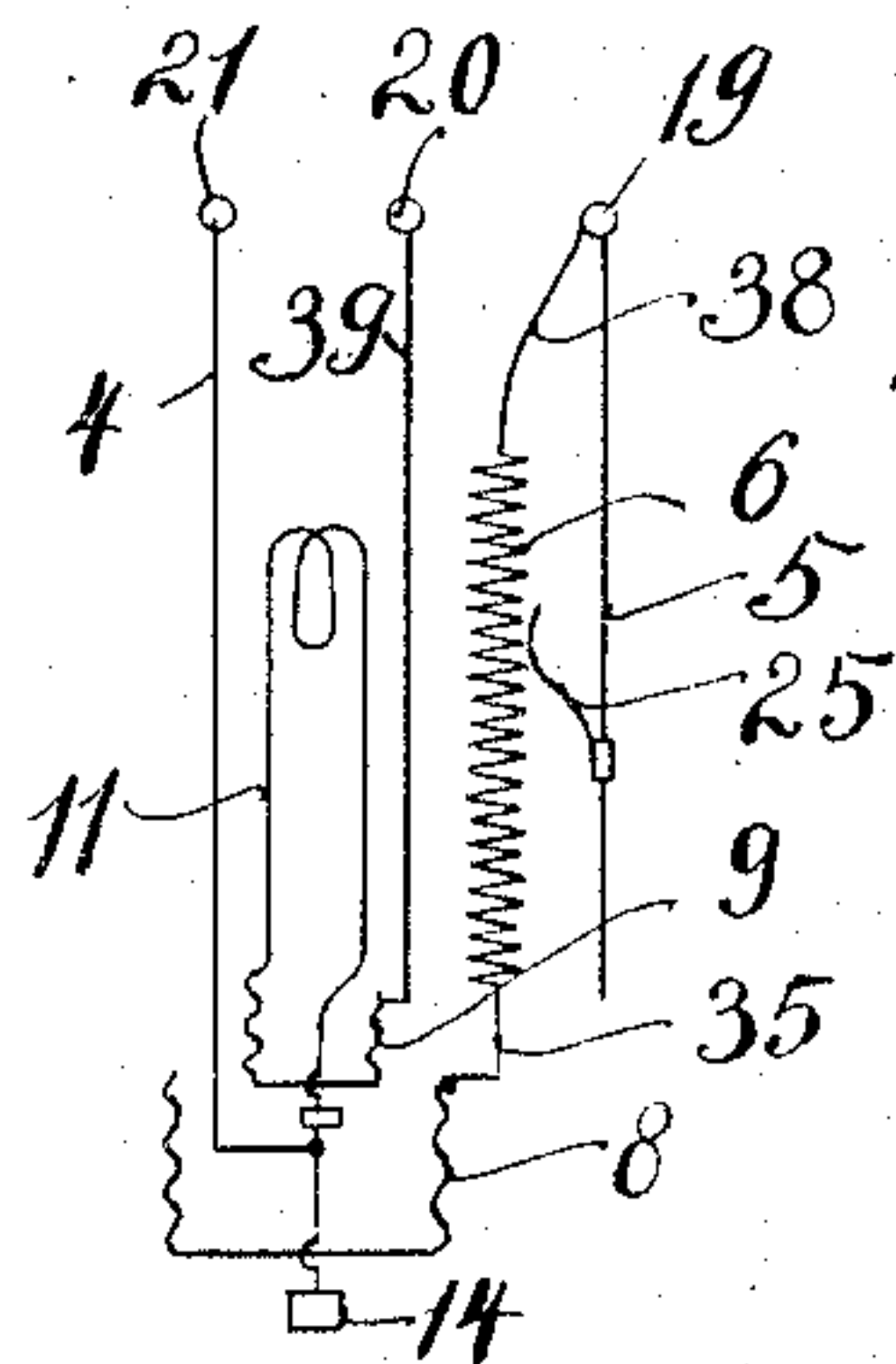


Fig: 5.

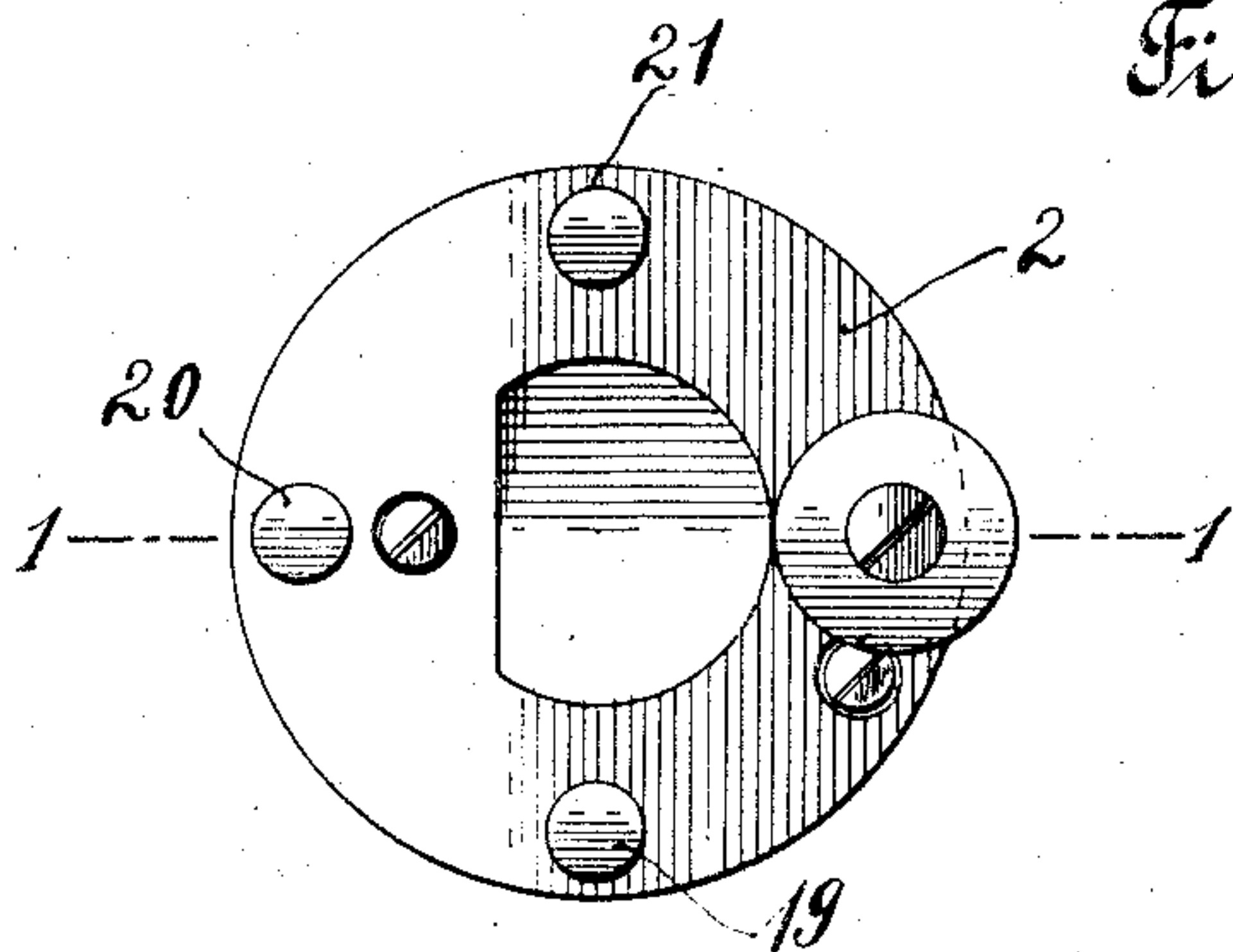


Fig: 3,

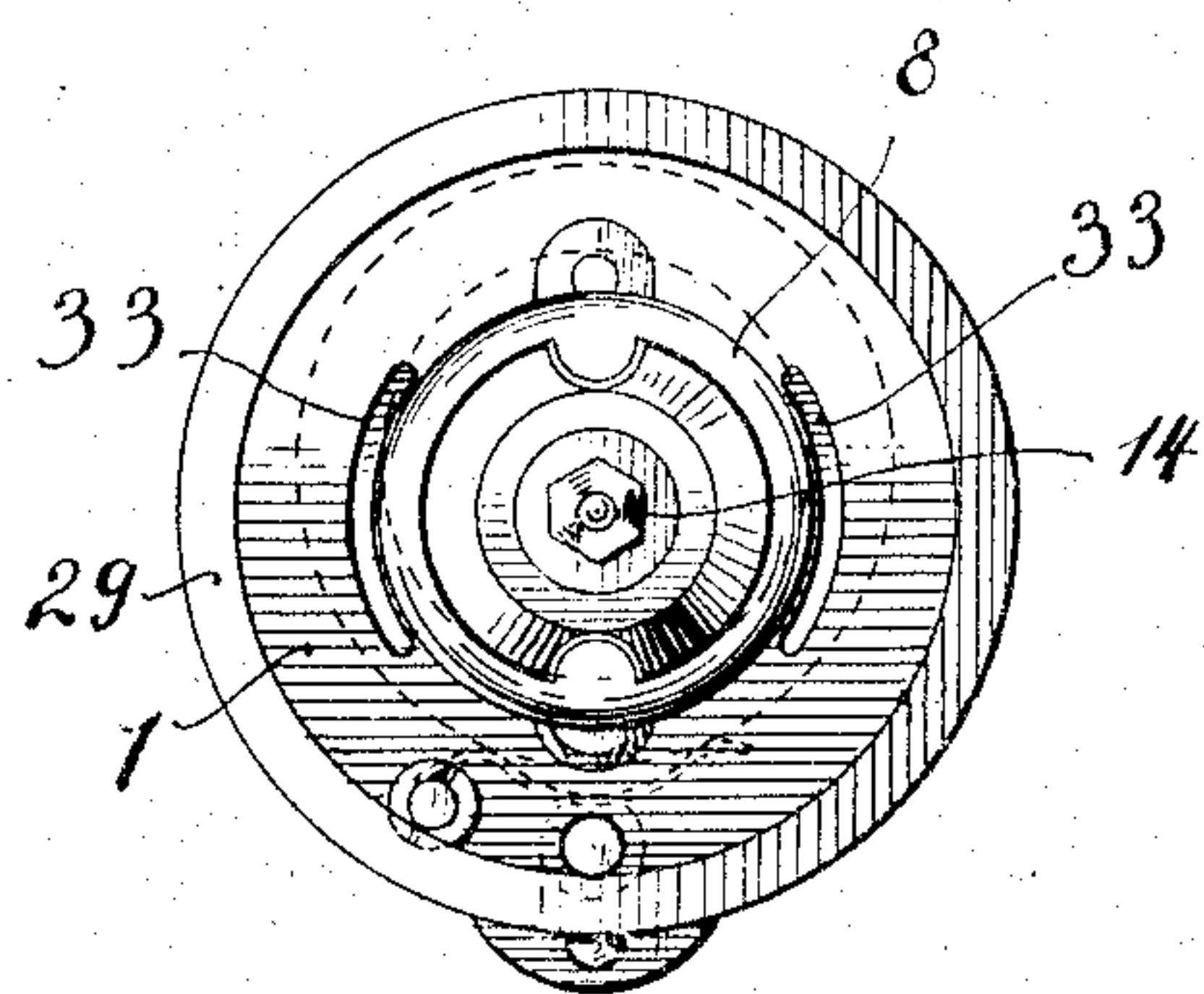


Fig: 4.

Witnesses
John O. Gumples
John M. Stelleher

Thomas J. Bull,
Inventor

By his Attorneys
Kemp & Kemp

UNITED STATES PATENT OFFICE.

THOMAS J. BULL, OF NEW YORK, N. Y.

LAMP-RHEOSTAT.

No. 815,330.

Specification of Letters Patent.

Patented March 20, 1906.

Application filed June 15, 1903. Serial No. 161,439.

To all whom it may concern:

Be it known that I, THOMAS J. BULL, a citizen of the United States, and a resident of the city, county, and State of New York, have invented certain new and useful Improvements in Lamp-Rheostats, of which the following is a specification.

My invention relates to lamp-rheostats; and it has for an object to provide a rheostat adapted for use in connection with ordinary electric-lighting currents.

A special object of my invention is to provide a rheostat for reducing the potential of an electric-lighting circuit to that adapted for use in a miniature incandescent lamp and at the same time to provide means for adjusting the potential as required to compensate for variations of potential at different points along the lighting-circuit.

My invention also has for an object to provide a rheostat whereby the potential of an electric circuit may be reduced to different steps and the potential of each step accurately adjusted.

My invention also has for an object to provide a rheostat including an incandescent lamp as one element of the high-resistance medium, the construction being such that the lamp is inclosed within a substantially light-proof casing without unduly enlarging the apparatus and at the same time without producing a structure which will become unduly heated when in use.

These and other objects of my invention will more fully appear from the following description.

My invention consists in the novel parts, improvements, and combinations herein shown and described.

The accompanying drawings, which are referred to herein and form a part hereof, illustrate one embodiment of my invention and serve in connection with the description herein to explain the principles thereof and the best mode contemplated by me of carrying the invention into effect.

Of the drawings, Figure 1 is a longitudinal central section of a rheostat constructed in accordance with my invention, taken on the line 1 1 of Fig. 3. Fig. 2 is a side elevation of the device, part of the casing being broken away and certain parts shown in section to more clearly illustrate the construction. Fig. 3 is an end view of the device as seen from the top in Figs. 1 and 2, the casing being removed. Fig. 4 is an end view of the device

as seen from the bottom of Figs. 1 and 2, and Fig. 5 is a diagrammatic view illustrating the electric connections involved in the construction of the device.

A rheostat constructed in accordance with one feature of my invention comprises a high-resistance coil and an incandescent lamp inclosed within said coil and arranged to be connected in series therewith. In the best embodiment of the invention means are also provided for shunting the current around more or less of the resistance-coil, whereby the potential of the circuit may be varied. Where the device is to be used to reduce the potential of an electric circuit to different steps, means are also provided whereby the working circuit may include the incandescent lamp and the resistance-coil in series or may include the resistance-coil alone. In accordance with the best embodiment of this feature of the invention three terminals or binding-posts are provided for establishing the auxiliary or working circuit, one of these posts being connected with one pole of the supply-circuit through the resistance-coil alone, another being connected with the other pole of the supply-circuit through the incandescent lamp, and the other being connected directly with the last-mentioned pole of the supply-circuit. When an incandescent lamp is used as one element of the resistance medium and is inclosed within the resistance-coil, the frame and casing of the device are preferably so constructed as to permit a free circulation of the air around the lamp.

Referring now to the particular embodiment of my invention illustrated in the drawings, the numerals 1 and 2 represent oppositely-arranged disk-like supports or frame-pieces between which a cylinder 3 is clamped, said frame-pieces 1 and 2 being connected by means of the binding-screws 4 and 5. The frame-pieces 1 and 2 are formed of suitable insulating material, preferably porcelain, and the cylinder 3, on the outer surface of which is wound the high-resistance coil 6, is also made of insulating material. The material which I have found to serve best for this purpose is a material known as "lavarite." The frame-piece 1 is provided with a central projection 7, constructed to receive a sheet-metal piece or sleeve 8, which, as shown, is threaded to fit the ordinary incandescent-lamp socket. This piece 8 may of course be given the required shape to adapt it to any form of socket. The projection 7 is prefer-

ably and, as shown, provided with an inner recess adapted to receive a socket 9, which is constructed to receive the pole-piece 10 of a suitable incandescent lamp 11. The socket 5 9 is retained in the recess of the projection 7 by means of a binding-screw 12, which is insulated from the socket-piece 9 by the insulator 13 and is adapted to make contact with the end pole of the lamp 11, the nut 14 for the 10 screw 12 serving at the same time to form one of the poles of the rheostat, the other pole of which is formed by the sleeve 8. The frame-piece 2 of the device is provided with a central opening 15 and with three lugs 16, 17, 15 and 18 and adapted to support the three binding-posts 19, 20, and 21. The frame-piece 2 is also provided with an integral lug 22, through which a shaft 23 passes and finds its bearing. The shaft 23 is arranged parallel 20 with the resistance-coil 6 and, as shown, is given a bearing at its opposite end in a suitable opening in the frame-piece 1. The shaft is provided at the end which projects through the lug 22 with a thumb-wheel 24, and it is 25 constructed along the part between the frame-pieces 1 and 2 with a thread, preferably of high pitch, substantially as shown. Fitted on the threaded portion of the shaft 23 is a slide 25, which is provided with a spring contact-plate 26, adapted to make contact with 30 a suitable bared portion of the coil 6. The plate 26 preferably, also, is turned out slightly at one of its ends, as shown in dotted lines in Fig. 4, so as to make sliding contact with the 35 binding-screw 5. For the purpose of making the device compact the coil-supporting cylinder 3 is preferably eccentrically arranged with relation to the frame-pieces 1 and 2, said pieces being to this end provided with eccentric recesses adapted to receive the ends of 40 the cylinder 3.

The device is inclosed in a casing which preferably and as shown comprises a cylindrical portion 28, which has a flanged end 29 45 adapted to embrace the periphery of the frame-piece 1, and a circular end portion 30, which is provided with a flange-piece 31, adapted to overlie the frame-piece 2 and embrace the end of the cylinder 28. The sections 28 and 30 of the casing are preferably 50 removably secured together by means of suitable screws 32. For the purpose of providing a free circulation of air through the device to prevent the same from becoming hot 55 while in operation the sections 28 and 30 of the casing are preferably perforated, and the frame-piece 1 is also preferably provided with suitable openings 33. The part 28 is preferably provided with a longitudinal slit 34, arranged in parallel relation with the shaft 23, 60 so that a screw 35, projecting from the slide 25, may project through the casing, whereby it may be provided with a pointer 36 to indicate the position of the slide. In accordance 65 with the preferred construction the screw 35

is arranged to engage the thread in the shaft 23, so as to cause the slide to be moved by the revolution of that shaft.

The electrical connections of the device are diagrammatically represented in Fig. 5. Referring to this figure, it will be seen that the 70 coil 6 is connected with the sleeve 8 by means of a connection 37 and with the binding-post 19 by means of a connection 38. The contact-plate 25 is also connected with the binding-post 19 by means of a connection which 75 for convenience is made to constitute the binding-screw 5. The socket 9 of the lamp 11 is connected with the binding-post 20 by means of the connection 39, and the pole 14 80 of the device is connected with the binding-post 21 by means of the connection 40. Referring now to the particular construction illustrated, the connection 37 will be seen to 85 consist of a plate which is suitably secured to the sleeve 8 and forms a nut for the end of the binding-screw 4, one end of the coil 6 being electrically connected with said binding-screw. The connection 38 consists of a wire 90 which practically forms a continuation of the coil 6. The connection 39 consists of a wire which is secured at one end to the clamp-screw of the binding-post 20 and at the other end to a clamp-screw 41, which also clamps 95 an arm extending from the socket 9. The connection 40 consists of an insulated wire which is connected to the clamp-screw of the binding-post 21 at one end and is electrically 100 connected with the binding-screw 12, being clamped between the end of the extension 7 and an insulating-piece 42, upon which the socket 9 rests.

It will be seen that by connecting the auxiliary circuit or working circuit with the binding-posts 19 and 20 both the resistance-coil 105 6 and the lamp 11 will be included in series in the working circuit. If, on the other hand, the auxiliary circuit is connected with the binding-posts 19 and 21, only the resistance-coil 6 will be included in the working circuit, 110 the lamp 11 being cut out. The first connection is particularly useful for reducing the lighting-circuit to a potential suitable for burning miniature electric lamps, such as are 115 used, for instance, by physicians in making examinations, performing operations, &c. The second circuit is particularly adapted for heating the cautery used by physicians in making certain operations. The device as a 120 whole is particularly adapted for use by physicians by reason of the fact that the incandescent lamp forming a part thereof is entirely housed, so that there is no objectionable light resulting from the use of the apparatus in a dark room. 125

My invention in its broader aspects is not limited to the precise construction shown nor to the particular construction by which it has been or may be carried into effect, as many 130 changes may be made in the construction

without departing from the main principles of the invention and without sacrificing its chief advantages.

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

1. The combination in a rheostat of a resistance-coil and an incandescent lamp located within said coil and adapted to be connected in series therewith.

2. The combination in a rheostat of a resistance-coil, an incandescent lamp located within said coil and adapted to be connected in series therewith, and means for varying the effective length of the resistance-coil.

3. The combination in a rheostat of a high-resistance coil, an incandescent lamp, means whereby the circuit through the device may be caused to include both the coil and the lamp in series or to include the coil only, substantially as described.

4. The combination in a rheostat of a resistance-coil, an incandescent lamp located within said coil and adapted to be connected in series therewith, and a support for said lamp and coil including a part adapted to be secured in an incandescent-lamp socket and having pole-pieces adapted to connect the device with the lamp-circuit.

5. The combination in a rheostat of a resistance-coil, a hollow cylindrical support for said coil, and a lamp located within said cylinder and adapted to be connected in series with said coil.

6. The combination in a rheostat of a resistance-coil, a hollow cylindrical support for said coil, and an incandescent lamp located within said cylinder and adapted to be connected in series with said coil, and frame-pieces between which said cylinder is secured,

said frame-pieces having openings communicating with the interior of said cylinder.

7. The combination in a rheostat of a resistance-coil, a hollow cylindrical support for said coil, frame-pieces between which said cylindrical support is secured, means on one side of said cylinder for adjusting the effective length of said coil, said cylinder being eccentrically arranged with relation to the frame-pieces whereby space is provided for the said adjusting means.

8. The combination in a rheostat of a resistance-coil, a hollow cylindrical support for said coil, and an incandescent lamp located within said cylinder and adapted to be connected in series with said coil, and frame-pieces between which said cylinder is secured, said frame-pieces having openings communicating with the interior of said cylinder and a perforated casing inclosing said parts.

9. The combination in a rheostat of a resistance-coil, a hollow cylindrical support for said coil, an incandescent lamp located within said cylinder and adapted to be connected in series with said coil, and frame-pieces between which said cylinder is secured, said frame-pieces having openings communicating with the interior of said cylinder, and one of said frame-pieces having a part adapted to be secured in an incandescent-lamp socket and having contact-pieces adapted to connect the device with the lamp-circuit.

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

THOMAS J. BULL.

Witnesses:

JOHN O. GEMPLER,
EDWIN SEGER.