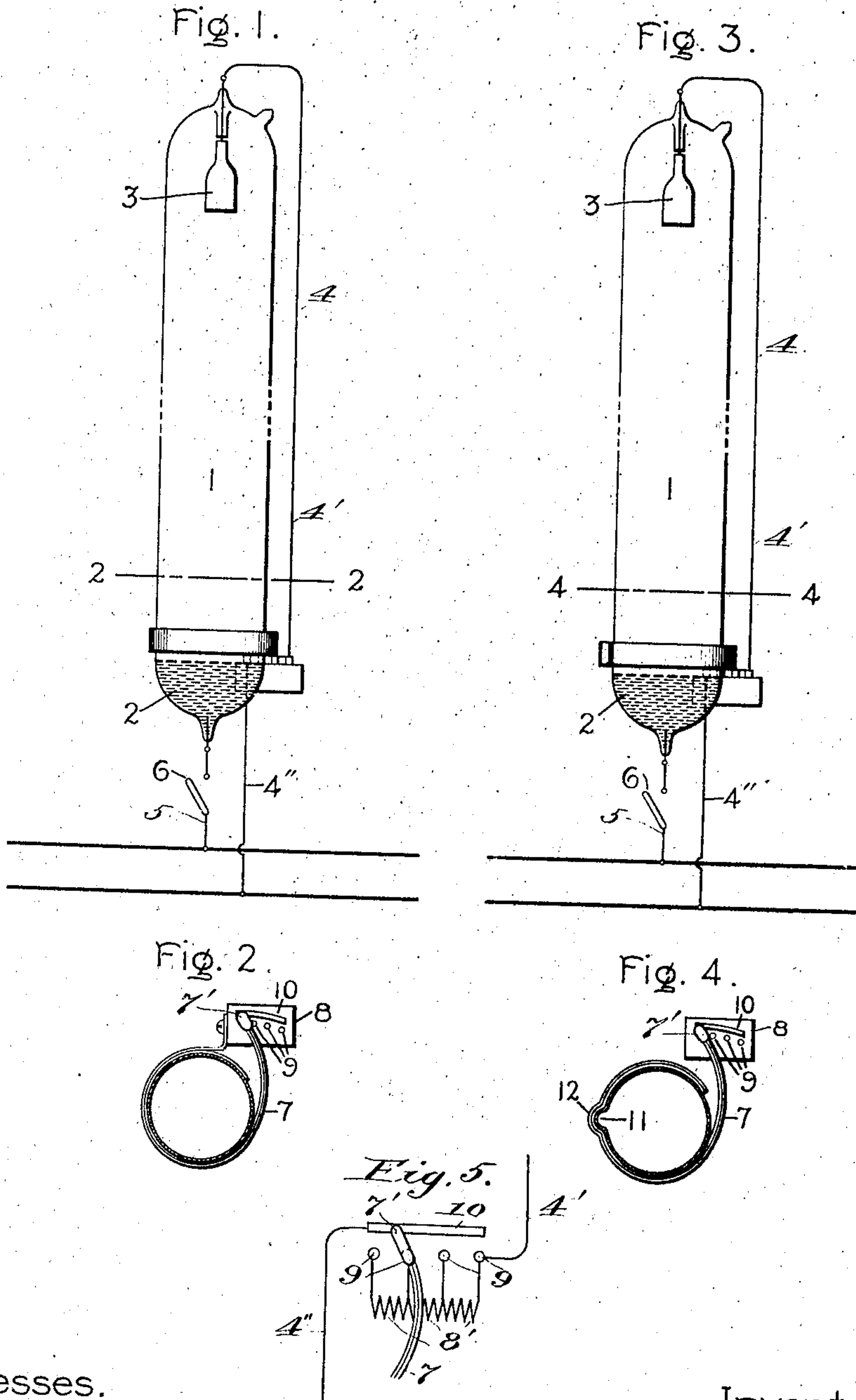


No. 791,253.

PATENTED MAY 30, 1905.

A. G. DAVIS.
REGULATING MEANS FOR ELECTRIC LAMPS.
APPLICATION FILED SEPT. 18, 1902.



Witnesses.

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REGULATING MEANS FOR ELECTRIC LAMPS.

SPECIFICATION forming part of Letters Patent No. 791,253, dated May 30, 1905.

Application filed September 18, 1902. Serial No. 123,808.

To all whom it may concern:

Be it known that I, ALBERT G. DAVIS, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Regulating Means for Electric Lamps, of which the following is a specification.

My invention relates to means for the automatic regulation of electric lamps of that type of which the mercury arc-lamp is the best-known example. It has been found that with lamps of this character changes in the temperature of the lamp affects the passage of current between the terminals thereof. The effect produced by a change in temperature of the lamp depends upon its structure and arrangement; but in general the effect of an increase of temperature is to increase the resistance between the terminals. If no means for regulating the lamp are provided, the lamp frequently goes out under the influence of variations in temperature. It has been proposed to regulate the temperature of the lamp by means of an inclosing jacket which controls the radiation from the lamp and prevents it from being affected by sudden changes of the outside temperature or by draft or the like. This, however, is somewhat objectionable, as the construction of the lamp is thereby complicated and as the necessity for some regulating means, such as a valve or damper, for controlling the passage of air through the inclosing jacket still remains. In order to regulate a lamp of this character, I have provided a thermostatic arrangement for controlling a rheostat in the external circuit of the lamp. By this means a change of temperature of the lamp due to any cause operates the rheostat to regulate the current flowing through the lamp, and thus the tendency of the lamp to go out upon any change in its temperature is automatically guarded against.

For a fuller understanding of my invention reference is made to drawings and descriptions forming part of this specification.

In the drawings, Figure 1 is a view, partly in elevation and partly diagrammatic, showing a lamp to which my invention is applied.

Fig. 2 is a section taken on the line 2-2 of

Fig. 1. Fig. 3 is a view similar to Fig. 1, showing a slightly-modified form of my invention. Fig. 4 is a view taken on the line 4-4 of Fig. 3. Fig. 5 is a diagrammatic view illustrating the rheostat circuits and connections.

I have conventionally shown at 1 the inclosing casing of a mercury arc-lamp. A mass of mercury 2 at the bottom of the tube forms one electrode, a solid electrode 3 being placed at the top of the tube. Lines 5 and 4 connect these electrodes with suitable means. A switch 6 is placed on the line 5.

Surrounding the tube 1 and tightly embracing the same is a curved band or bar 7. This band or bar 7 consists of two layers of different metals one within the other and having their contacting faces soldered together to form a thermostatic couple. The coefficient of thermal expansion of the inner layer is greater than that of the outer layer, so that any increase in temperature to which this band is exposed causes the band to unbend or to bend in the opposite direction from that in which it is shown.

In the construction shown in Fig. 2 I have shown the two metals separated at one end, the outer one being turned outward and at an angle to itself and secured by a screw to a rheostat 8. The other end of the band is extended out so as to sweep across the top of the rheostat 8 when the temperature of the lamp varies. The rheostat 8 carries on its upper face a plurality of studs or contacts 9, which are connected to one another through suitable resistances 8', carried by the rheostat. The right-hand contact is connected to the part 4' of the line 4 which leads to the terminal 3. Adjacent to the contacts 9 is a contact-bar 10, to which the part 4'' of the line 4 which runs to the main is connected. The band 7 is shaped at the end passing over the rheostat 8 so that it forms a current-carrying bridge 7' between the studs 8 and the bar 10. I have not considered it necessary to illustrate any method for starting the lamp, as that forms no part of my invention.

The operation of the device is as follows: When in use, current passes from one supply-main through line 5, mercury terminal 2,

through the tube to the terminal 3, part 4' of line 4, right-hand contact or stud 9, thence through more or less of the resistance 8' to the stud 9 in contact with the bridge 7', thence to contact-bar 10 and part 4'' of the line 4, to the other supply-main. An increase in temperature of the lamp above the normal temperature causes the band 7 to uncurl, so that its outer end moves to the right, thus cutting out some of the resistance of the rheostat 8, and hence increasing the voltage impressed upon the terminals of the lamp.

In the construction shown in Fig. 3 a somewhat different means for retaining the band or couple 7 in place is provided. In this construction there is formed on the surface of the tube a projection 11, and a corresponding bend 12 is formed in the member 7, which engages with the projection 11 and prevents any displacement of the band 7. The operation of the device shown in Fig. 3 is the same as that shown in Fig. 1.

While I have shown and described the best form of my invention which is now known to me, I do not intend to be limited to the construction shown and described, as I consider my invention to be broader than the mere details of construction here set forth.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In combination, an electric lamp comprising an exhausted envelop, means for causing a current-flow in said envelop, and automatic means for regulating said current-flow responsive to temperature changes in said lamp.

2. In combination, an electric lamp comprising an exhausted envelop, terminal conductors passing into said envelop, means for connecting said conductors in an electric circuit, and automatic means for regulating the voltage applied to said terminal conductors in response to temperature changes in the lamp.

3. In combination, an electric lamp in which an arc of fixed length is maintained, a source of electricity therefor, and thermostatic means for varying the voltage impressed on the lamp as the temperature of the lamp varies.

4. In combination, an electric circuit, a mercury arc-lamp therein, a rheostat for controlling the passage of current through the lamp also located in said circuit, and a thermostat for operating the rheostat as the temperature of the lamp varies.

5. In combination, a mercury-vapor lamp comprising an exhausted envelop and terminal conductors leading into said envelop, an external electric circuit connected to said terminal conductors, a rheostat inserted in the circuit, and a thermostat located outside of the envelop and operatively connected to said rheostat.

6. In combination, a vapor-lamp comprising an exhausted envelop and terminal conductors passing into said envelop, means for connecting said conductors in a constant-potential electric circuit, and automatic means for regulating the voltage impressed upon the terminal conductors.

7. In combination, an electric lamp comprising an exhausted envelop, a bimetallic thermostat member coiled about said envelop, and means controlled thereby for regulating the current-flow through said envelop.

8. In combination, an electric lamp comprising an exhausted envelop, a thermostat member coiled about said envelop, and means controlled thereby for regulating the current-flow through said envelop.

9. In combination, an electric lamp, a resistance in series with said lamp, and means for automatically decreasing the resistance as the temperature of the lamp increases.

10. In combination, an electric lamp, a resistance in series therewith, means for connecting said lamp and resistance in the constant-potential circuit, and means for automatically decreasing the resistance as the temperature of the lamp increases.

In witness whereof I have hereunto set my hand this 16th day of September, 1902.

ALBERT G. DAVIS.

Witnesses:

E. C. HOLLISTER,
HELEN ORFORD.