

No. 685,486.

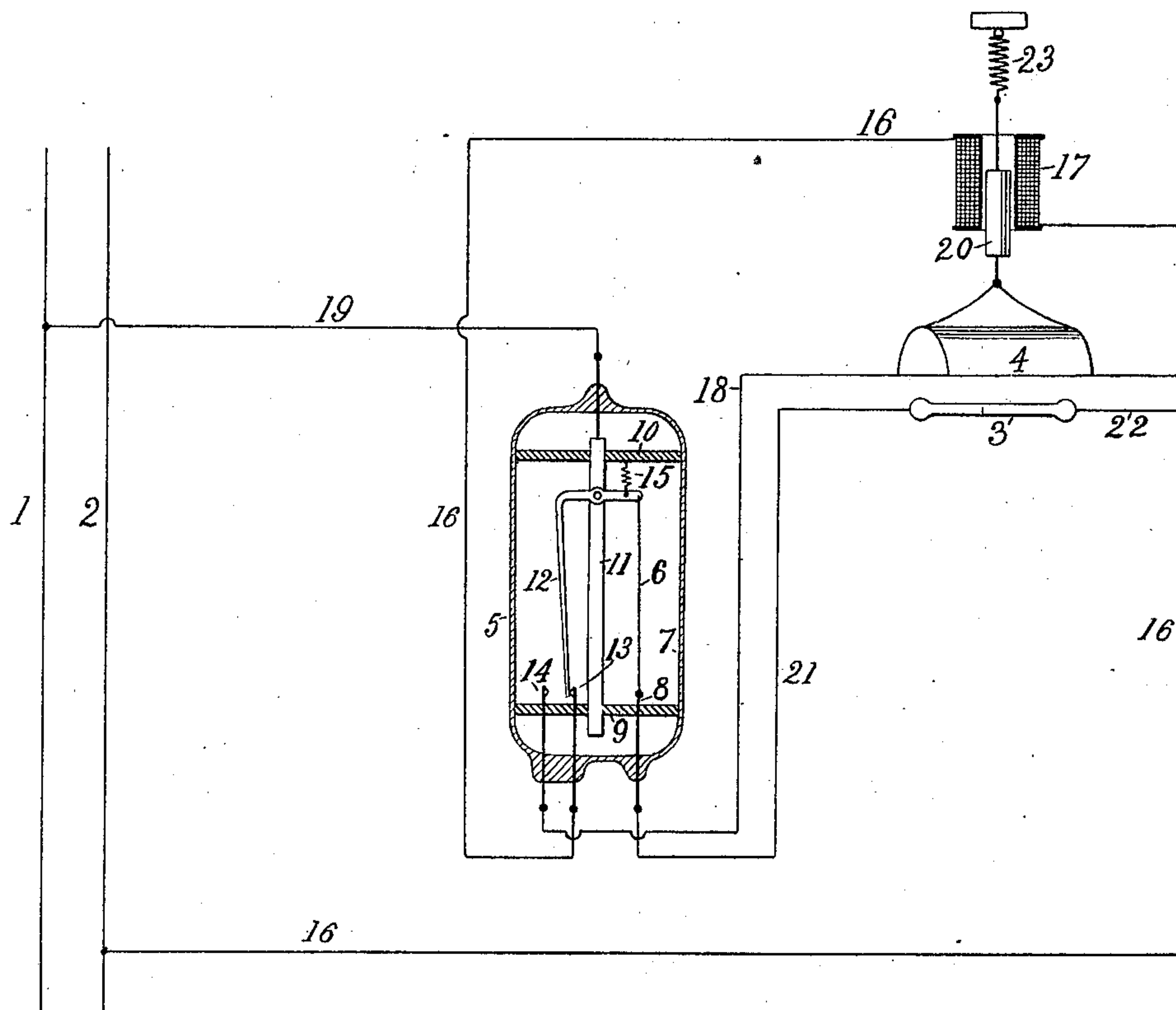
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H. N. POTTER.

CONTROLLING SYSTEM FOR ELECTRIC LAMP HEATERS.

(Application filed Aug. 9, 1899. Renewed Apr. 27, 1900.)

(No Model.)



Witnesses:
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UNITED STATES PATENT OFFICE.

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CONTROLLING SYSTEM FOR ELECTRIC LAMP-HEATERS.

SPECIFICATION forming part of Letters Patent No. 685,486, dated October 29, 1901.

Application filed August 9, 1899. Renewed April 27, 1900, Serial No. 14,599. (No model.)

To all whom it may concern:

Be it known that I, HENRY NOEL POTTER, a citizen of the United States of America, residing in Göttingen, Germany, have invented certain new and useful Improvements in Controlling Systems for Electric Lamp-Heaters, of which the following is a specification.

I have described and shown in other applications means for controlling the movements of lamp-heaters by magnetic or thermostatic devices in series with the heater and in shunt to the heater.

My present invention relates to the operation of such a heater by means of magnetic or thermostatic devices included in a shunt-circuit to the glower.

My invention will be understood by reference to the accompanying drawing, which is a diagram of the circuits and apparatus employed in carrying out my invention.

The main conductors are shown at 1 and 2, a glower at 3, and a heating device at 4. The glower is connected up in circuit with a ballast cut-out 5, consisting mainly of a conductor 6, of iron or other suitable material, inclosed in a sealed chamber 7, containing an inert gas. Lamps of this class as they are usually constructed require the presence in series with the glower of some form of restraining resistance or balancing device, the resistance of which will increase with increments of current flowing, for otherwise the decreasing resistance of the glower under increments of heat would on a constant-potential circuit permit the passage of an excessive current, and thus destroy the glower. Such a conductor may be appropriately termed a "ballast-conductor." The conductor 6 is joined by one end to a wire 8, of nickel or platinum, sealed into a disk or arm 9 within the chamber 7. The disk or arm 9 is preferably of glass and together with a corresponding disk or arm 10 at the upper end of the chamber holds the parts within the chamber in position. In the center of the disks 9 and 10 a metallic rod 11 is supported, and to the said rod is pivoted an angular lever 12, one end of which is connected to an end of the ballast-conductor 6. The said ballast-conductor serves to hold the farther end of the angular lever 12 against the stationary

terminal 14, supported by the disk 9. Another stationary terminal 13, supported by the same disk, stands in the path of movement of the outer end of the angular lever 12 whenever the latter is free to move inward under the influence of a spring 15, connected to the disk 10 and to the inner end of the said angular lever. There are, accordingly, two positions for the angular lever 12, one being that in which its end is in contact with the stationary terminal 13 and the other being that in which it makes contact with the stationary terminal 14. The passage from one to the other is made when the ballast-conductor 6 is expanded by the heat caused by the current in the glower-circuit, as will appear later on. The stationary terminal 13 is connected with the main 2 by a conductor 16, which includes the coils of a solenoid 17. The stationary terminal 14 is connected to the return-circuit through the heater 4 by a conductor 18. The rod 11 is joined to the other main conductor 1 and a conductor 19. The solenoid 17 has a core 20, which is connected to the heater 4 and by which the movement of the heater is controlled. Normally the heater is in proximity to the glower; but on the passage of the current through the solenoid 17 the heater is lifted into the position illustrated in the diagram. In the original position of the parts before the lamp-circuit has been closed the angular lever 12 is in contact with the terminal 14—that is to say, when the heater-circuit is closed there is also a circuit connected with each terminal of the glower 3, which circuit becomes energized after the heater has made the said glower conductive. This glower-circuit includes the conductor 19, rod 11, angular lever 12, ballast-conductor 6, conductors 8, 21, and glower 3, and conductors 22 and 16. The described circuit having become energized, the ballast-conductor 6 becomes heated, and under the expansion resulting from such heat the angular lever 12 is released into the power of the spring 15, whereby the heater-circuit is broken at the point 14 and a new circuit is made between the angular lever 12 and the contact-terminal 13. In this way a shunt-circuit of the glower is formed, which circuit includes the solenoid 17. In the diagram this

circuit is represented as in operative condition or as having acted to lift the heater out of proximity to the glower.

The spring shown at 23 is designed to counterbalance in part the weight of the core 20 and the heater 4 and may be replaced by a weight or other suitable device.

In the diagram illustrating my invention the magnetic controlling device for the heater is located in a shunt to the glower. For the magnetic controlling device I may substitute a thermostatic device adapted to exercise the same control over the position of the heater. It is not necessary to use the particular form of cut-out illustrated in the diagram. I may dispense with the ballast cut-out and make use of a magnetic cut-out. I may also employ a double-movement heater, such as I have shown and described in another application for Letters Patent.

I make no claim herein to the ballast device shown and described, since this constitutes the subject-matter of another pending application, Serial No. 726,617, filed August 9, 1899.

I claim as my invention—

1. In an electric-lighting device, the combination of a glower of the type described, an electric heater therefor, a controller for determining the position of the heater located in a shunt-circuit around the glower, means for closing said shunt-circuit when the glower is in operation and opening the circuit when the glower is not in operation.

2. In an electric-lighting device, the combination of a glower of the type described, a heater therefor, the said glower and heater being located in parallel circuits an automatic controlling device for the heater located in shunt to the glower and means for closing the circuit of the controlling device by the influence of currents traversing the glower and opening the circuit of the heating device before the closing of the circuit of the automatic controlling device.

3. In an electric-lighting device, a glower of the type described, an electric heater therefor, and a ballast-conductor in series with the glower, in combination with an automatic controlling device for the said heater located in a shunt to the glower.

4. In an electric-lighting device, a glower of the type described, an electric heater therefor connected to the core of a solenoid, in combination with the coils of said solenoid located in shunt around the glower, and a thermostatic circuit-controlling device controlling the circuit connections of the heater and of the shunt-circuit and for opening one of the said circuits before closing the other, substantially as described.

Signed by me at Hanover, Germany, this 14th day of July, 1899.

HENRY NOEL POTTER.

Witnesses:

W. K. ANDERSON,
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