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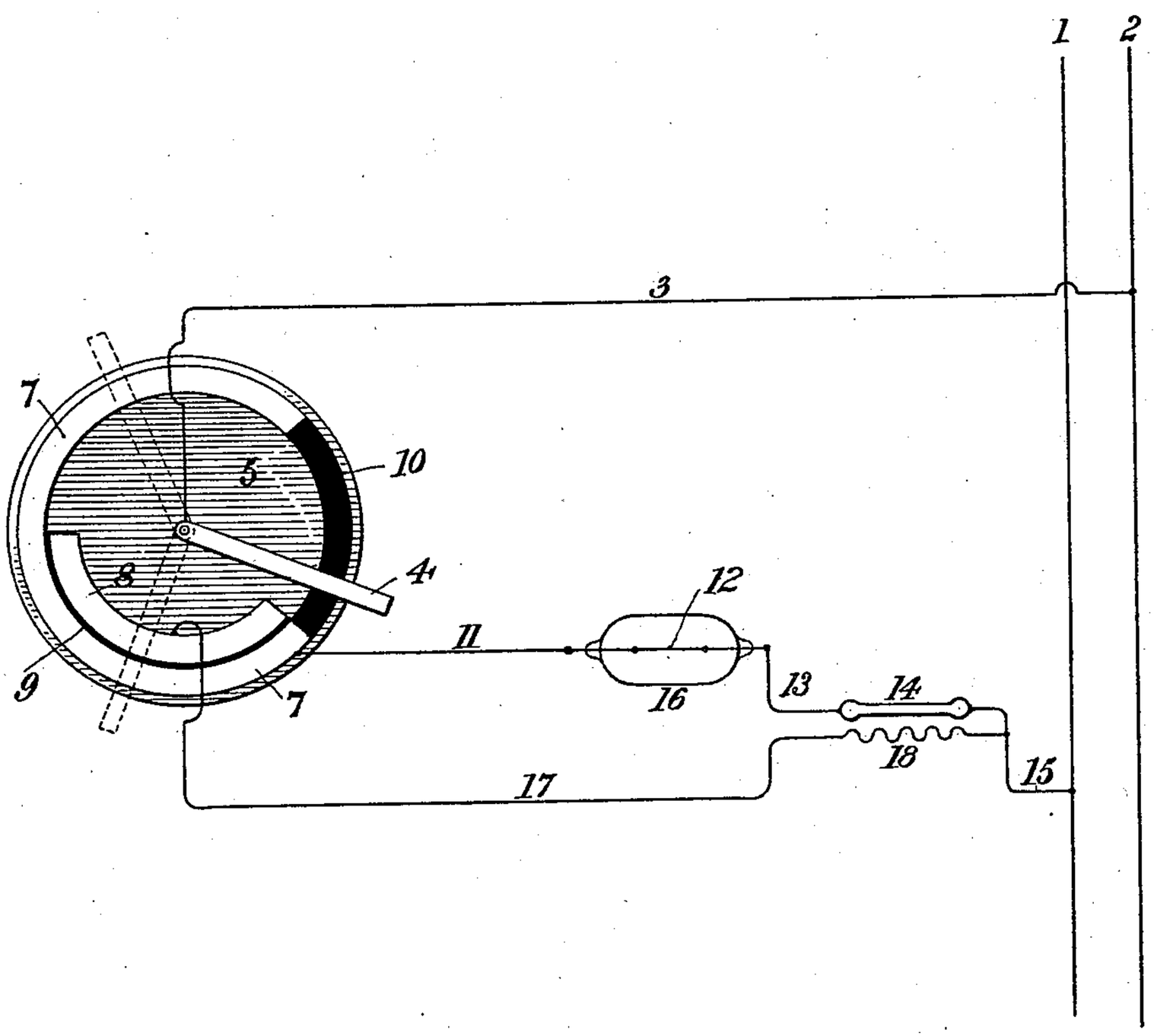
F. M. GODDARD.

CIRCUIT BREAKER FOR ELECTRIC LAMP GLOWERS.

(Application filed July 20, 1899.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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CIRCUIT-BREAKER FOR ELECTRIC-LAMP GLOWERS.

SPECIFICATION forming part of Letters Patent No. 710,356, dated September 30, 1902.

Application filed July 20, 1899. Serial No. 724,453. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK M. GODDARD, a citizen of the United States of America, and a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Circuit-Breakers for Electric-Lamp Glowers, of which the following is a specification.

In the art of electrical illumination through the medium of glowers which require to become heated before they conduct sufficient current to maintain incandesence it is sometimes desirable to cheapen the manufacture of the lamps by dispensing with the automatic cut-out devices for the heater and substituting therefor hand cut-outs, which are under the control of the operator who starts the lamps burning. I have devised such a hand-operated cut-out for this purpose, and I have embodied it in the form of a switch requiring for its various positions that the operating part shall always be moved in the same direction, as is common with electric switches.

My invention is illustrated in the accompanying drawing, which represents the circuit and apparatus merely in diagram.

In the drawing 1 and 2 are mains leading from a source of electric current. From the main 2 a conductor 3 proceeds to the arm 4 of my cut-out apparatus. This arm is pivoted upon a suitable base 5 of insulating material. On this said base in such a position that the arm 4 will make contact therewith as it is moved to the right are metallic strips 7 and 8, insulated from each other, as shown at 9. The strip 7 extends beyond the strip 8, and it abuts against insulating material 10, which is affixed to or formed in one piece with the base 5. The strip 7 is connected by a conductor 11 to the terminal of a ballast-conductor 12, beyond which a conductor 13 extends to the terminal of the glower 14, the opposite end of which is connected by a conductor 15 to the main 1. The ballast-conductor 12 will usually be a length of iron wire inclosed in a sealed chamber 16, containing an inert gas.

The function of the ballast-conductor is to prevent an undue flow of current as the resistance of the glower decreases under the influence of heat. The ballast-conductor, therefore, is formed of some material the effective opposition of which to the flow of current will increase with increments of current flowing to such an extent as to compensate for the decreasing resistance of the glower.

The strip 8 is joined by a conductor 17 to one terminal of a heating-conductor 18. The opposite terminal of the said conductor is joined to the conductor 15, and thus to the main 1.

The glower 14, the heater 18, and the ballast-conductor 12 will usually all be united in a single lighting device or lamp.

The normal position of the switch 4, when the lamp is out of the circuit, will be that in which it rests upon the insulating-piece 10. When it is desired to start the lamp into operation, the said arm will be turned to the right, so as to bring it into contact with the strips 7 and 8. The circuit will then be formed through the heater 18, from the conductor 2, over the conductor 3, arm 4, strip 8, conductor 17, heater 18, and conductor 15 back to the main 1. As soon as the heater has raised the temperature of the glower 14 to a sufficient degree, the glower-circuit will also carry current from the main 2, conductor 3, arm 4, strip 7, conductor 11, ballast-conductor 12, conductor 13, glower 14, and conductor 15 back to the main 1.

The third position of the switch is that which the arm 4 occupies when it has been carried beyond the terminus of the strip 8 and rests on the strip 7 alone. In this position the heater is cut out of the circuit and the glower remains in circuit. The operator at the switch will allow the arm 4 to remain upon both strips 7 and 8 until the increase of light at the lamp shows him that the glower is in operation. He will then turn the switch-arm one step farther and cut out the heater, as above described. When the lamp is to be put out again, the operator turns the switch to the right into contact with the insulating-piece 10, whereupon the lamp-circuit is completely ruptured and the lamp goes out.

I have illustrated a single lighting device or lamp controlled by a hand-switch. I may employ such a switch to control a group of lighting devices or lamps with equal advan-

tage. I have adopted this style of switch simply because this particular feature is already known in the art of incandescent lighting. Whether the switch-handle shall move in the same direction or reverse directions has no bearing upon my present invention, broadly considered.

I claim as my invention—

1. In an electric-lighting system, the combination with a supply-circuit, a series-connected glower and ballast device and a heater connected to one side of said supply-circuit, of a controlling-switch having a member connected to the other side of the supply-circuit and a relatively movable member comprising a short contact-terminal connected to the heater and a long contact-terminal connected to the ballast device, whereby the movement of one of said members relatively to the other serves to connect the glower, ballast device and heater in circuit simultaneously and to maintain the glower and ballast device in circuit after the heater is cut out.

2. The combination with a glower of the type described, a ballast device in series therewith, and an electric heater in a shunt to the said glower and ballast device, of a hand-operated switch-arm permanently connected to one of the main conductors, two contact-plates in the path of the said switch-arm, connected respectively to the opposite main through the glower and the heater circuits, the said contact-plate for the heater-circuit being shorter than the contact-plate for the glower-circuit.

Signed by me, at New York city, New York, this 26th day of June, 1899.

FREDERICK M. GODDARD.

Witnesses:
J. L. JONES,
L. C. CARUANA.