

**No. 652,702.**

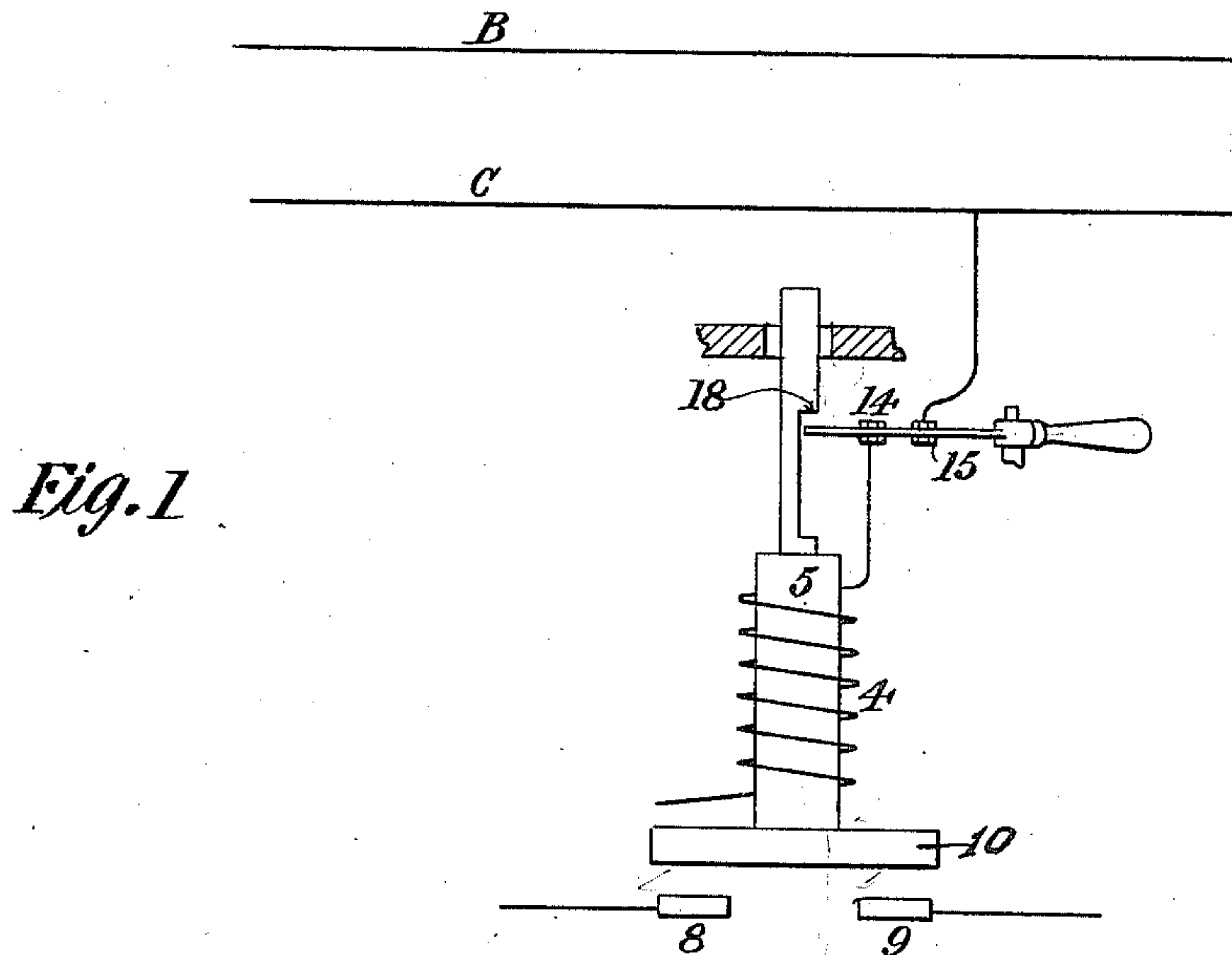
Patented June 26, 1900.

**A. J. WURTS**

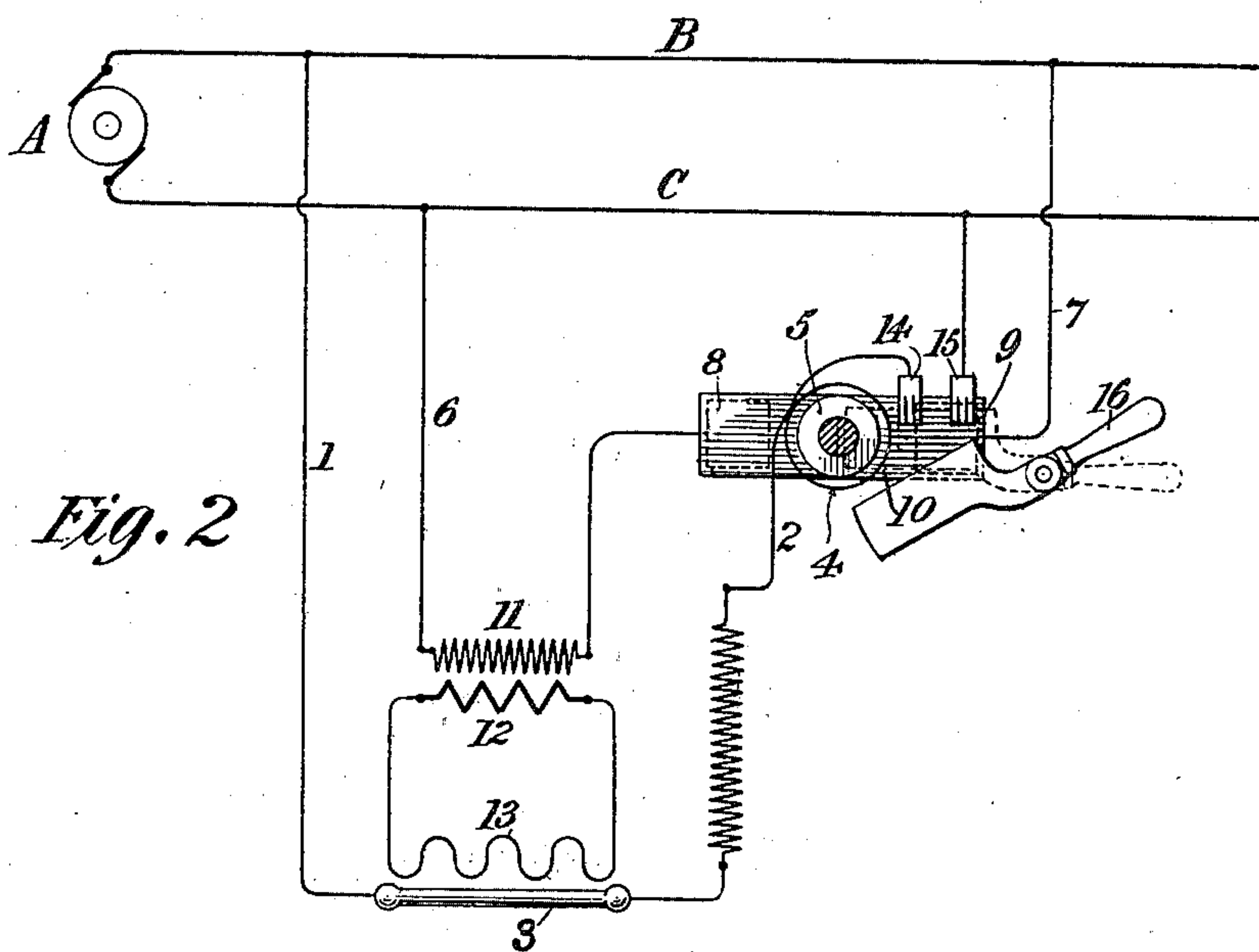
## CIRCUIT BREAKER FOR GLOWER LAMPS.

(Application filed June 9, 1899.)

(No Model.)



*Fig. 1*



*Fig. 2*

*Witnesses:*

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Alexander J. Wentz  
by Charles A. Perry. Atty.

# UNITED STATES PATENT OFFICE.

ALEXANDER JAY WURTS, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO  
GEORGE WESTINGHOUSE, OF SAME PLACE.

## CIRCUIT-BREAKER FOR GLOWER-LAMPS.

SPECIFICATION forming part of Letters Patent No. 652,702, dated June 26, 1900.

Application filed June 9, 1899. Serial No. 719,886. (No model.)

*To all whom it may concern:*

Be it known that I, ALEXANDER JAY WURTS, 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 Glower-Lamps, of which the following is a specification.

In electric lamps wherein the incandescing elements are formed from materials which are non-conductors when cold, but become conductors when brought to a sufficiently-high temperature, the practice has been to employ an electrical heating device the circuit of which is controlled by a solenoid or other electromagnetic appliance which is adapted to break the circuit of the heater automatically when the glowers have become sufficiently heated to conduct current themselves. The arrangement has been such that the solenoid or other electromagnetic appliance has been operated by the current which passed through the incandescing elements after they have become sufficiently heated. The failure for any reason of one or more of the glowers or incandescing elements to convey current after having once come into operation would act to lessen and perhaps wholly interrupt the current passing through the solenoid, on which account there might be danger in such a case of the solenoid releasing its core and re-establishing the heater-circuit. The result would be that the heater might be caused to generate heat to no purpose and might burn out and become inoperative without serving any useful end. My present invention is designed to make it impossible for the heater thus to burn out, and, in fact, it prevents the heater-circuit from becoming closed even though all or nearly all of the glowers should be extinguished. I accomplish this result by providing in the lamp a switch which when first operated in order to close the circuit and bring the lamp into action carries a stop or detent into such a position that when the solenoid-core is once raised to open the heater-circuit it will stand in the way of a hook or catch connected with the said core and will prevent the latter from descending and again closing the heater-circuit until the lamp is switched off. In systems where lamps of the

type described are used the invention which I herein disclose lessens the need of frequent inspection, while if it is assumed that inspection is necessarily infrequent or likely to be so the present invention is even more important.

I have illustrated my invention in the accompanying drawings, in which—

Figure 1 is a side elevation of a solenoid controlling a lamp system, and Fig. 2 is a plan of the same.

In the drawings, A is a generator of electricity, and B and C are the mains leading therefrom. From these mains proceed wires 1 and 2, which constitute the circuit in which the glower 3 is included. The circuit described includes the coils of a solenoid 4, which is provided with a vertically-movable core 5. From the mains are also led off wires 6 and 7, which are joined to the stationary terminals 8 and 9 of a switch, the movable terminal 10 of which is connected to the core 5 of the solenoid 4. The circuit 6 7 includes the primary 11 of a converter, the secondary 12 of which is in circuit with a heater 13, placed near the glower 3.

The circuit 1 2 is interrupted at the switch-terminals 14 and 15, as shown, these terminals being bridged when desired by the switch 16, controlled by a handle. The glower-circuit is not completed until the switch 16 is turned so as to bridge the contact-terminals 14 and 15. The heater-circuit is, however, closed and ready for operation whenever the contact-terminal 10 is in contact with the terminals 8 and 9. When it is desired to light the lamp, the switch 16 is operated by means of the handle, so as to close the circuit 1 2. The heater-circuit being in operative condition, the heater 13 will soon raise the temperature of the glower 3 until the said glower becomes itself a conductor. Thereupon the circuit 1 2 will be made operative, the solenoid 4 will be energized, and its core 5 will be lifted, thereby breaking the heater-circuit. Should the glower 3 burn out or for any reason cease to conduct the current, the core might under ordinary conditions return to its original condition and put the heater into action. This is sometimes undesirable because of the danger of the heater



itself becoming burned out from excessive use. For that reason I have provided a hook or catch 18 on the core 5 of the solenoid 4 and have so arranged this catch with relation to the switch 16 that when the latter is moved into position for closing the glower-circuit, as already described, its end will stand beneath the said hook or catch and prevent the descent of the core 5 beyond a certain limit. Accordingly the terminal 10 cannot go back into contact with the terminals 8 and 9, and thus the danger of burning out the heater-circuit is avoided. On the other hand, as soon as the glower 3 is thrown out of circuit by the operation of the switch 16 the end of the said switch is removed from beneath the catch 18, and the core 5 is free to descend into its original position.

It is not necessary that the retaining device should be in the form of a catch or detent such as is shown. Instead of that the core of the solenoid might in its movement for breaking the heater-circuit be brought into contact with a permanent magnet, which would hold it in its retracted position until it was positively restored to its original place.

I claim as my invention—

1. In a lamp wherein a glower of material which is a non-conductor when cold and a con-

ductor when hot is employed, a heater-circuit including a heater in proximity to the glower, a switch in the said heater-circuit, a solenoid or other electromagnetic appliance having its core or armature connected to the movable part of the said switch, and a catch or detent engaging the said core or armature after its initial operation, and adapted to be tripped by the opening of the switch.

2. In a lamp wherein a glower of material which is a non-conductor when cold, and a conductor when hot is employed, a heater-circuit including a heater in proximity to the glower, an automatic circuit-breaker for the said heater-circuit, a circuit for the said glower, the said glower-circuit including a suitable switch, the said switch when closed serving as a catch or detent for preventing the restoration of the automatic circuit-breaker and being adapted to trip the said circuit-breaker when opened.

Signed by me at Pittsburg, Pennsylvania, United States of America, this 6th day of June, 1899.

ALEXANDER JAY WURTS.

Witnesses:

WESLEY G. CARR,  
H. C. TENER.