No. 751,413. PATENTED FEB. 2, 1904.

H. N. POTTER.

SYSTEM OF LIGHTING BY GAS OR VAPOR ELECTRIC LAMPS.

APPLICATION FILED APR. 30, 1903.

NO MODEL.

Fig. 1

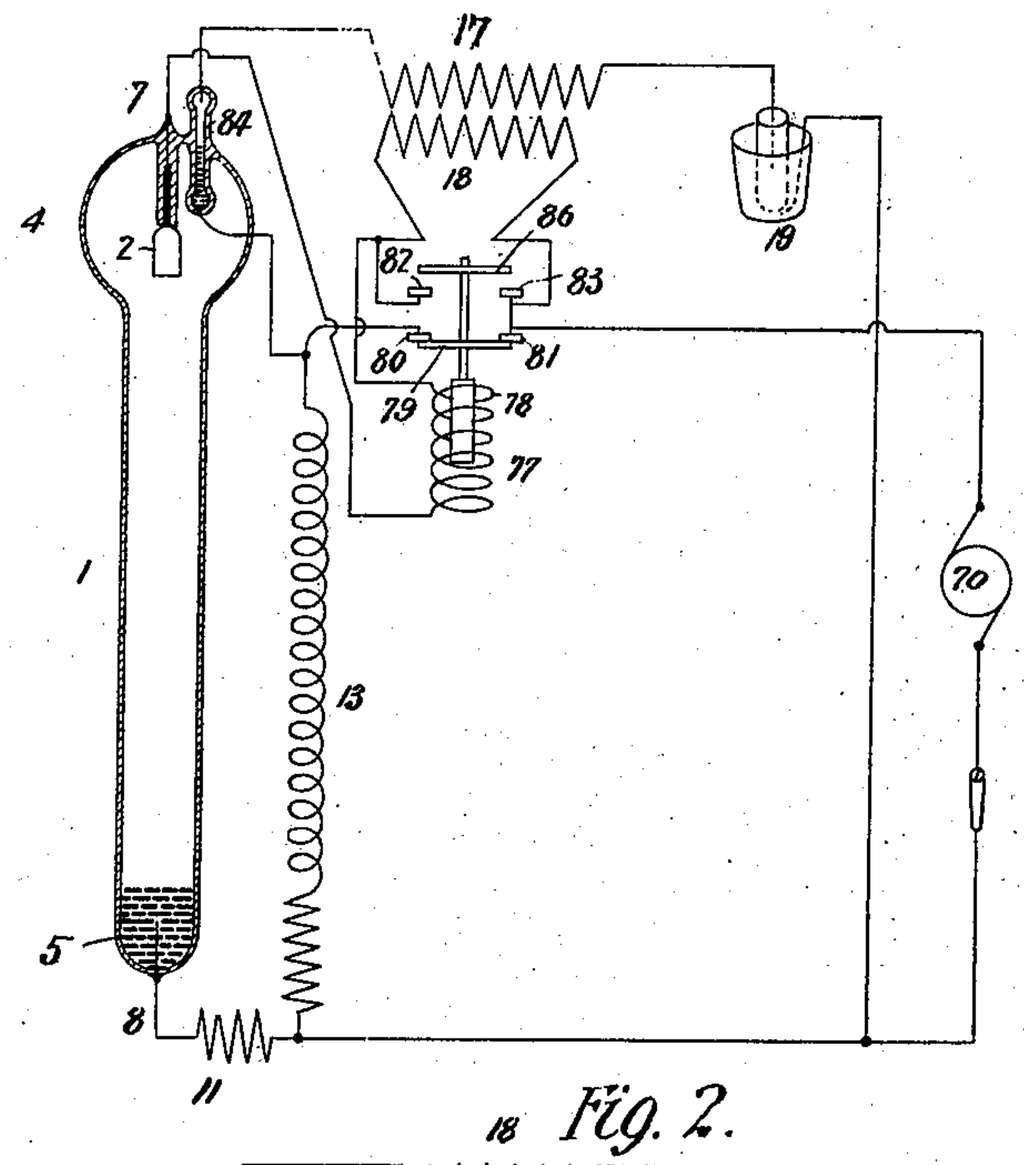
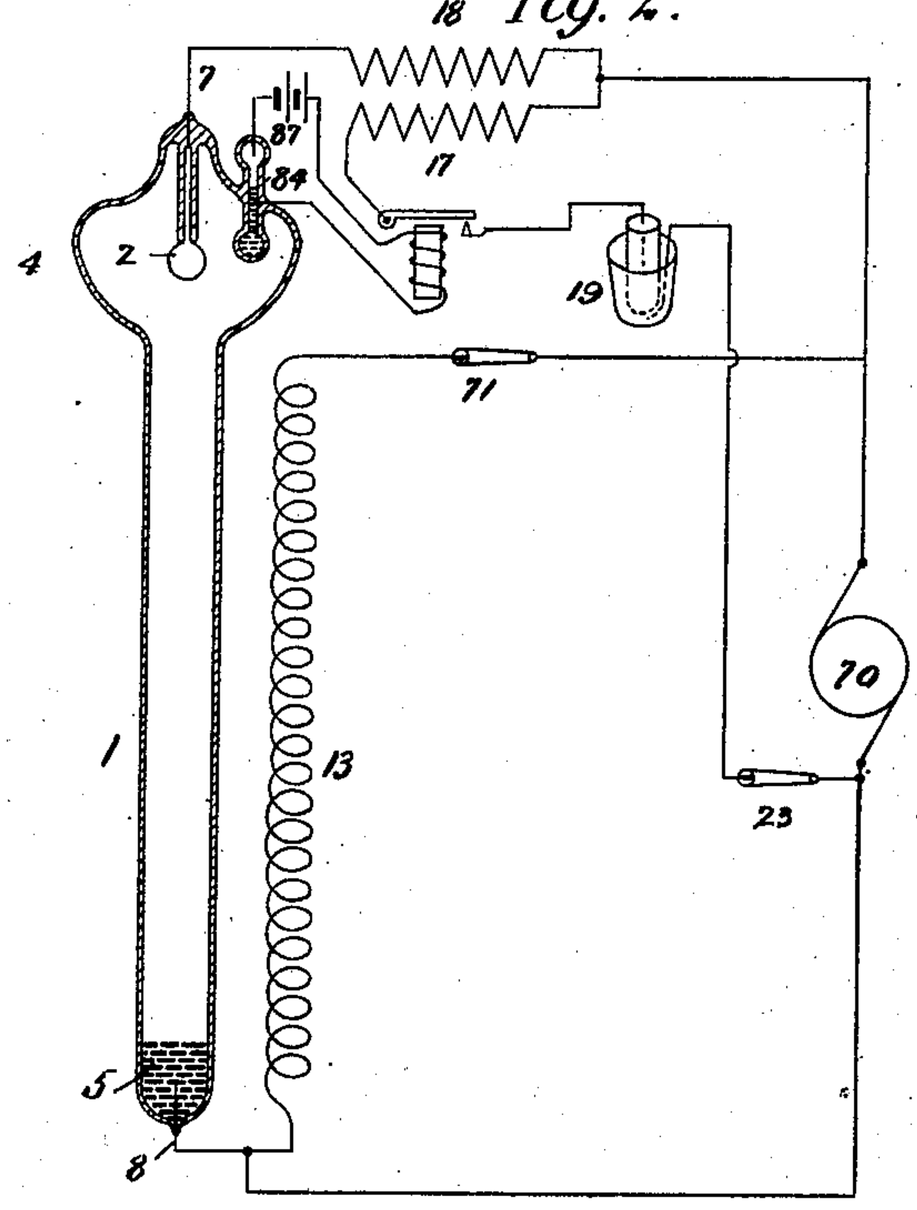


Fig. 2.



Witnesses
Frank D. Ober
Wm. H. Capel

Inventor
By his Attorney Henry Noel Potter
Charles A. Terry.

No. 751,413. Patented February 2, 1904.

UNITED STATES PATENT OFFICE.

HENRY NOEL POTTER, OF NEW ROCHELLE, NEW YORK, ASSIGNOR TO COOPER HEWITT ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

SYSTEM OF LIGHTING BY GAS OR VAPOR ELECTRIC LAMPS.

SPECIFICATION forming part of Letters Patent No. 751,413, dated February 2, 1904.

Original application filed May 28, 1901, Serial No. 62,182. Divided and this application filed April 30, 1903. Serial No. 154,910.
(No model.)

To all whom it may concern:

Be it known that I, HENRY NOEL POTTER, a citizen of the United States, and a resident of New Rochelle, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Systems of Lighting by Gas or Vapor Electric Lamps, of which the following is a specification.

My invention relates to circuits and apparatus which may be used in operating gas or vapor electrical devices, and it also includes an improved heating arrangement for apparatus of this class, as will fully appear in the following specification.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a diagram of a system of circuits adapted to the above-named purposes, together with a detail view of a single gas or vapor electric lamp and my heating arrangement associated therewith; and Fig. 2 illustrates a modification of the system shown in Fig. 1.

The present application is a division of an application filed by me on the 28th day of May, 1901, Serial No. 62,182. In another division of the same original application, such division being numbered 145,173, dated February 26, 1903, claims are made upon the vapor apparatus in its direct relations to the heater without regard to the system of circuits including the same.

In the first figure of the drawings, 1 represents a transparent tube—say of glass—constituting the main portion of the container for a suitable conducting gas or vapor. In the present instance I have illustrated a lamp in which the cathode (shown at 5) is a mass or puddle of mercury, while the anode (appearing at 2) is of iron. A bulb or enlargement 4 is formed at the upper end of the tube 1 to serve as a cooling-chamber. Leading-in wires 7 and 8 are connected, respectively, to the anode 2 and the cathode 5. I surround the body of the lamp or a suitable portion thereof with a heater-wire 13, which will generally be a German-silver wire wound upon the outside of the tube. For the sake of clearness I have here shown the heater-wire apart from the tube 1. I generally wind such a wire more closely where it is outside the mercury cathode, as the latter, owing to its large specific heat, can absorb considerable heat, and unless extra heat is provided the duration of starting of the lamp will be unnecessarily prolonged.

In the system illustrated in Fig. 1 the lamp itself and the heater-wire are arranged in separate parallel circuits supplied by a suitable generator 70, a branch from the heater-wire circuit including also an electrolytic or other interrupter 19 and the primary 17 of a suitable starting-transformer, the secondary 18 of which is in the lamp-circuit. The said lamp-circuit also includes or may include a ballast resistance 11. In the lamp-circuit is also included the actuating-coil 77 of an automatic switch, the core 78 of which is connected to contact-pieces 79 and 86, the former of which in the position illustrated in the drawings bridges two contact-terminals 80 and 81, while the latter is adapted when in the proper position to bridge two other stationary contact-terminals 82 and 83. In this figure I have shown in the open portion of the lamp near the anode a small thermostat 84 of the usual mercury thermostat type, whose function it is to close the primary circuit of the starting-transformer when the lamp has been heated up to a point where it will certainly start. Thus the circuit containing the interrupter and the starter primary will be inactive until the necessity for its action intervenes. I provide a switch 71 in the common circuit, by means of which the initial operation of starting the lamp can be performed. When this switch is closed, there is a circuit from the generator 70 through the contacts 81, 79, and 80 and thence through the heater-wire 13 back to the generator. The heater immediately begins to do its work, whereupon the thermostat 84 is gradually affected until contact is made

between the rising mercury in the thermostat and the wire which leads into the thermostat. When this contact is actually established, a new circuit is formed from the generator 70 through the interrupter 19, the primary 17, the thermostat 84, and the contact already mentioned. In this way the interrupter is started into operation and electrical impulses are created in the primary 17, which in turn cause impulses in the secondary 18 and in the lamp-circuit. The action of the thermostat having been so timed as to bring about a closure of the circuit in which it is included only after or as soon as the lamp has been heated to a proper condition for starting, the impulses from the secondary will at once set the lamp into operation, and the lamp-circuit will be closed. Thereupon the core 78 will be drawn down, the heater-wire circuit will be broken, and the secondary 18 is short-circuited by the bridging of the contacts 82 and 83 through the contact-piece 86.

In Fig. 2 I have shown another arrangement embodying the same feature of thermostatic control; but I here operate the controlling-switch of the starter primary by means of a local circuit, including a battery 87. In this figure I show manually-operated switches 23 and 71, although these switches might obviously be made automatic in their operation. As soon as contact is established between the rising mercury in the thermostat and the wire leading into the same the magnet in the thermostat-circuit is affected, thereby closing the circuit of the interrupter 19 and starting the interrupter into operation. This action takes place after the switches 23 21 have been closed. As before, the impulses from the secondary of the transformer 17 18 will set the lamp into operation.

I claim as my invention—

1. In a system of lighting by gas or vapor electric lamps, a lamp of the class described, a transformer whose secondary is in series with the lamp, a normally open circuit including the transformer primary and a suitable interrupter, and thermostatic means for closing the said open circuit when the lamp has been heated sufficiently to become conductive.

2. In a system of lighting by gas or vapor electric lamps, a lamp of the class described, a transformer whose secondary is in series with the lamp, a normally open circuit including the transformer primary and a suitable automatic interrupter, thermostatic devices for closing the open circuit when the lamp has become sufficiently heated, and means for opening the said circuit, and thus cutting out the primary and the automatic interrupter.

3. In a system of lighting by gas or vapor electric lamps, a lamp of the class described, a transformer whose secondary is in series therewith, an automatic interrupter, and the transformer primary in normally open circuit in shunt to the lamp, a heater in a normally closed circuit, thermostatic devices for closing the normally open circuit when the lamp has become sufficiently heated, and means brought into operation by the passage of current through the lamp for breaking the heater-circuit and the circuit which includes the automatic interrupter and the transformer primary.

Signed at New York, in the county of New York and State of New York, this 24th day of April, A. D. 1903.

HENRY NOEL POTTER.

Witnesses:

WM. H. CAPEL,

GEORGE H. STOCKBRIDGE.