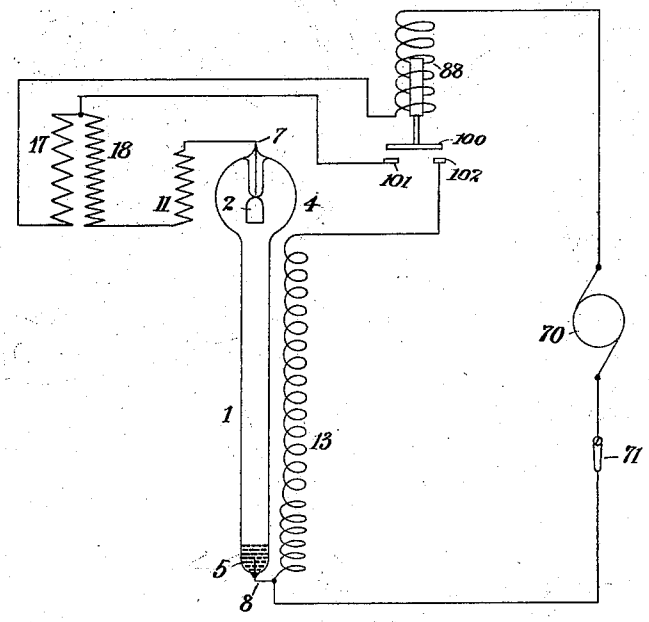
No. 751,412. PATENTED FEB. 2, 1904.

H. N. POTTER.

SYSTEM OF LIGHTING BY GAS OR VAPOR ELECTRIC LAMPS.

APPLICATION FILED FEB. 26, 1903.

NO MODEL.




Witnesses
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 751,412. 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. 751,412, dated February 2, 1904.

Original application filed May 28, 1901, Serial No. 62,182. Divided and this application filed February 26, 1903. Serial No. 145,175. (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 be fully set forth in the following specification.

The drawing 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.

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 serially 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 drawing, 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. 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.

The lamp itself and the heater-wire are arranged in separate parallel circuits supplied by a suitable generator 70, the heater-wire circuit including an interrupter (shown at 88) and the primary 17 of a suitable starting-transformer, the secondary 18 of which is in the lamp-circuit. The said lamp-circuit may also include a ballast resistance 11.

The interrupter 88 consists of a coil and a core, the latter being connected to a contact-piece 100, adapted to break two stationary contacts 101 and 102. The form illustrated is diagrammatic of a combined cut-out and interrupter, many variations of such devices being possible. The contacts are shown apart, the heater-wire circuit being interrupted. Normally before the lamp starts or the system is set in operation the contact-piece 100 bridges the contacts 101 and 102, and when the controlling-switch, shown at 71, is closed there is a complete circuit from the dynamo through the coil 88, the starter primary 17, the contacts 101, 100, and 102, the heater-wire 13, and thence back to the dynamo. The passage of current through this circuit ruptures it by lifting the contact-piece 100; but it is immediately restored by gravity and a rapid automatic interruption and closure of the circuit takes place. The heater receives current whenever the circuit is closed, and the starter secondary 18 receives an impulse every time the circuit is broken, so that the lamp-tube is heated directly by whatever secondary discharge occurs and also indirectly by the heater-wire 13, the combined action being eventually sufficient to start the tube, whereupon the coil 88 holds the interrupter-contacts apart. The primary and secondary of the starter are so proportioned and disposed that they may operate as the ballast for the lamp, although I have shown in the drawing an extra ballast 11 in series with the starter.

I claim as my invention—

1. In a system of lighting by gas or vapor electric lamps, a lamp of the class described,

a heater in proximity thereto, a transformer having both its primary and its secondary in series with the lamp and its primary in series with the heater, an electromagnetic coil common to the lamp and heater circuits, and a combined switch and circuit-interrupter adapted to be operated by the said coil, whereby the last-named apparatus will be operated intermittently during the starting period of the lamp, and will afterward permanently open the heater-circuit when the lamp begins to operate.

2. In a system of lighting by gas or vapor electric lamps, a lamp of the class described, a heater in proximity thereto, a transformer having both its primary and its secondary in series with the lamp and its primary in series with the heater, an extra ballast in the lamp-circuit, an electromagnetic coil common to the lamp and heater circuits, and a combined switch and circuit-interrupter adapted to be operated by the said coil, whereby the combined switch and circuit-interrupter will be operated intermittently during the starting period of the lamp and will permanently open the heater-circuit while the lamp is in operation.

Signed at New York, in the county of New York and State of New York, this 20th day of February, A. D. 1903.

HENRY NOEL POTTER.

Witnesses:

WM. H. CAPEL,

THOS. HALDENBY BROWN, Jr.