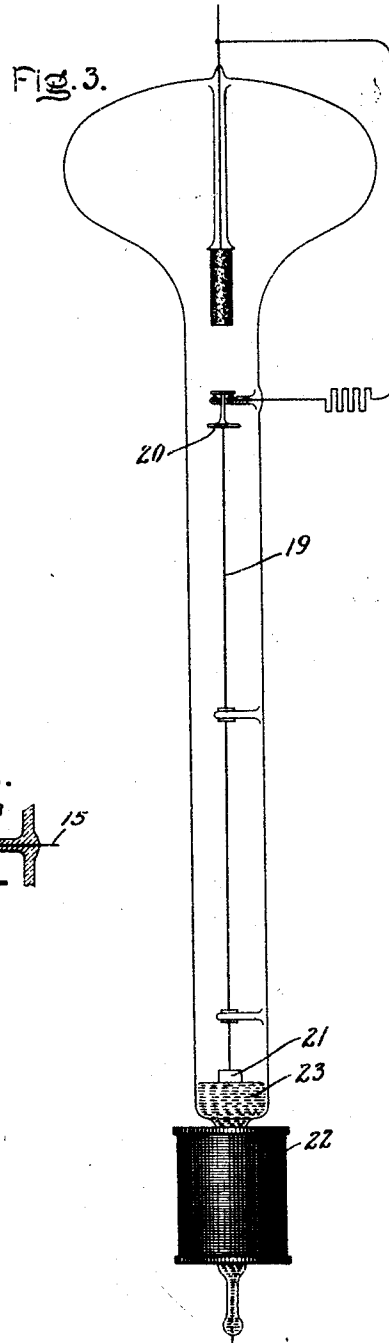
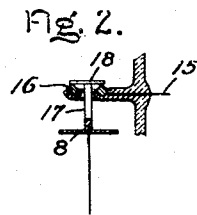
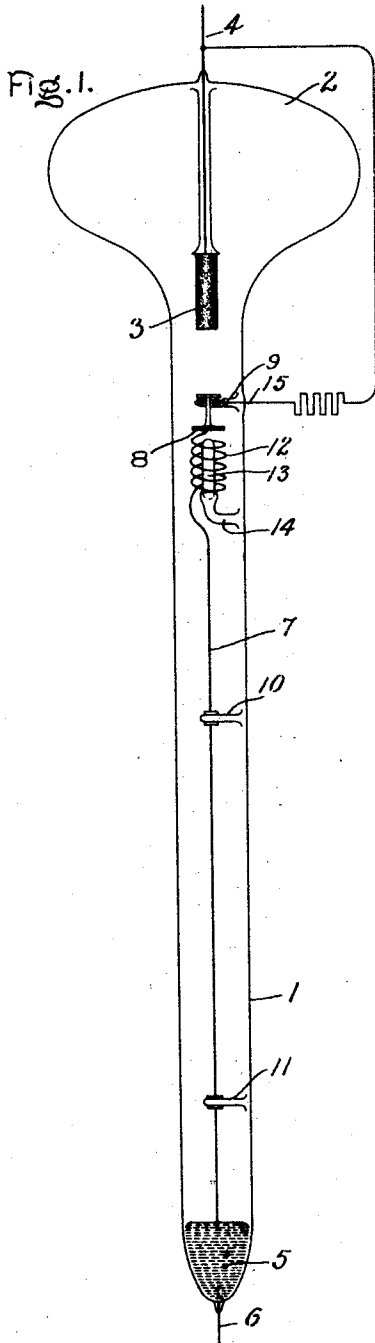


J. T. H. DEMPSTER.
VAPOR ELECTRIC APPARATUS.
APPLICATION FILED APR. 21, 1904.

996,979.

Patented July 4, 1911.



WITNESSES:

George A. Thornton.
Allen Clifford

INVENTOR.

John T. H. Dempster,
By Allen H. Smith
Att'y.

UNITED STATES PATENT OFFICE.

JOHN T. H. DEMPSTER, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

VAPOR ELECTRIC APPARATUS.

996,979

Specification of Letters Patent.

Patented July 4, 1911.

Application filed April 21, 1904. Serial No. 204,178.

To all whom it may concern:

Be it known that I, JOHN T. H. DEMPSTER, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Vapor Electric Apparatus, of which the following is a specification.

My present invention relates to certain improvements in the construction and operation of vapor electric apparatus, and makes use of the dynamic action or force exerted by the vapor particles or ions in their passage along the arc path. The kinetic energy of these particles, ions, or whatever else there may be, is utilized in the present instance as a circuit controlling means.

The novel features characteristic of the invention I have pointed out with particularity in the appended claims. The invention itself, however, will be better understood by reference to the following description taken in connection with the accompanying drawings in which—

Figure 1 represents one embodiment of my invention, Fig. 2 a detail, and Fig. 3 a modified form.

My invention may be embodied in various types of apparatus, such, for example, as vapor lamps, rectifiers or the like. As illustrative of one of the numerous embodiments which my invention may assume I represent in Fig. 1 a mercury vapor lamp. The exhausted envelop or container of the lamp consists as shown, of a tube 1, of indefinite length, surmounted by an enlargement or bulb 2 constituting the condensing chamber. A graphite, iron, or other anode 3 is supported in a usual manner at the mouth of the condensing chamber and is connected electrically to a supply lead 4. A body of mercury 5 contained in the lower end of the tube 1 serves as a cathode and is electrically connected to the external circuit of the lamp by means of a leading-in conductor 6. For the purpose of starting the lamp I provide a filament 7 of carbon or other suitable material, the lower end of which, before the lamp is started, dips into the mercury 5. This filament is supported from a sort of platform or disk 8 which in turn is supported from a lateral projection 9 carried by the wall of the tube 1. The filament is prevented from lateral displacement by means of anchoring devices or guides 10 and 11 pro-

vided with openings through which the filament loosely passes. The upper end of the filament 7 is provided with a coiled portion 12 which loosely surrounds a stationary piece of iron 13 supported by a bracket 14 from the wall of the lamp. Electrical connection is made from the positive lead 4 through a leading-in conductor 15 to the upper end of the filament 7. The manner of making this connection will be somewhat clearer upon reference to Fig. 2. This leading-in conductor 15 is joined to a metal ring 16 which, with the exception of its upper surface, is entirely inclosed by insulating material, either glass, enamel, or the like. The shank 17, which carries the platform 8, is of metal, and is provided with a head 18 which rests, in the position shown, upon the surface of the ring 16. In this position it will be clear that when current is applied to the lamp it will flow from the lead 4 through the filament 7 to the lower electrode 5. The current flowing in the filament then causes the helix 12 to contract. This contraction, which is greatly assisted by the presence of the iron 13, causes the lower end of the filament to be lifted out of engagement with the mercury 5. An incipient arc is then formed which extends immediately up the tube to the anode 3. The arc or discharge is somewhat similar, in one of its properties, to a draft or blast of air or other fluid, and acts upon the platform 8 to force the same upward. The head 18 then moves out of engagement with the ring 16 and thus cuts the filament out of circuit. The parts may be constructed so that at the same time the lower end of the filament is lifted out of the mercury, 5, though this is not necessary.

The lamp shown in Fig. 3 differs from that of Fig. 1 in having a different starting device. In this case the filament 19 is straight throughout its length and is supported directly from the device 20 of practically the same construction as that shown in Fig. 2. The lower end of the filament 19 dips in a mercury cup formed in the top of a floating armature or core 21. This core is within the magnetic influence of a solenoid 22 and, when the solenoid is energized by turning current on to the lamp, is drawn down beneath the surface of the mercury electrode 23. This movement breaks contact with the lower end of the filament 19 and, by reason of the incipient arc thus produced,

starts the lamp. The draft of the vapor up the tube, or perhaps the bombardment by charged particles, acting on the disk 20, lifts the filament and cuts it out of circuit at both ends.

It is evident that numerous modifications may be made in the embodiments of my invention for which reason I do not wish to be limited to the exact device shown and described.

What I claim as new and desire to secure by Letters Patent of the United States, is:

1. In a vapor electric apparatus, the combination of a container, electrodes therefor, and circuit controlling means in the container actuated by the draft or bombardment produced by the vapor particles in the arc path.

2. In a vapor electric apparatus, means for producing an arc or vapor path between the electrodes of the apparatus, and circuit controlling means actuated by kinetic energy derived from the arc.

3. In a vapor electric apparatus, the combination of a container, electrodes therefor, a filament extending along the path between said electrodes, and means actuated by the force of the arc or vapor discharge for cutting said filament out of circuit.

4. In a vapor electric apparatus, the combination of a container, electrodes therefor, starting means for said apparatus and a movable device cooperating with said start-

ing means and actuated by the draft or bombardment of vapor particles in the arc stream.

5. The combination of a container, working electrodes therefor, one at least of which is mercury, an arc starting device dipping into the mercury having a contractile member serving when traversed by current to withdraw said device from contact with the mercury, and means within said container for cutting said arc starting device out of circuit.

6. The combination of a container, electrodes therefor, a filament within the container, electrically connected with both electrodes, means for striking an arc between the electrodes and means actuated by said arc for electrically disconnecting the filament when said arc is established.

7. The combination of a container, electrodes therefor, a filament in contact with one of the electrodes, a portion of the length of the filament being coiled, and means actuated by kinetic energy of the arc between the electrodes for cutting the filament out of circuit.

In witness whereof I have hereunto set my hand this 19th day of April, 1904.

JOHN T. H. DEMPSTER.

Witnesses:

BENJAMIN B. HULL,
HELEN ORFORD.