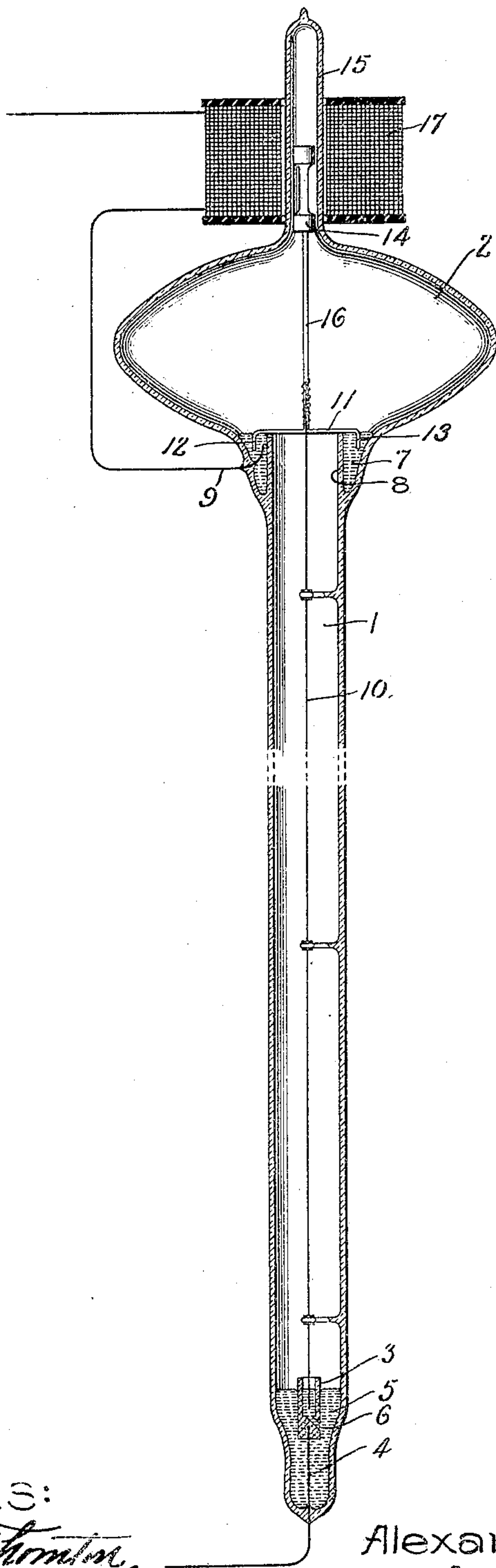


No. 808,753.

PATENTED JAN. 2, 1906.

A. M. JACKSON.  
VAPOR ELECTRIC APPARATUS.  
APPLICATION FILED JUNE 24, 1904.



WITNESSES:

*George A. Thornton.*  
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ATTY.



# UNITED STATES PATENT OFFICE.

ALEXANDER M. JACKSON, OF SCHENECTADY, NEW YORK, ASSIGNOR TO  
GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

## VAPOR ELECTRIC APPARATUS.

No. 808,753.

Specification of Letters Patent.

Patented Jan. 2, 1906.

Application filed June 24, 1904. Serial No. 213,930.

*To all whom it may concern:*

Be it known that I, ALEXANDER M. JACKSON, a subject of the King of Great Britain, residing at Schenectady, in the county of Schenectady and 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 improvements in vapor electric devices, such as mercury-vapor lamps, rectifiers, or the like. In devices of the character mentioned it is a common practice to make use of anodes not only of mercury, but also of graphite, iron, or similar non-vaporizable material. During normal operation these non-vaporizable anodes frequently run at a red heat, and thus are subject to slow disintegration. I have found that this difficulty may be overcome and certain additional advantages secured by surrounding the anode or anodes with a body of mercury. This mercury prevents an undue rise in temperature of the anode without interfering with the attainment of the advantages characteristic of anodes of non-vaporizable material.

The features of novelty which characterize my invention are 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 drawing, which represents a mercury-vapor lamp illustrative of my invention.

The envelop or container of the lamp consists of a tube 1, of glass or other suitable material, which tube may be of indefinite length and is surmounted by a bulb 2, constituting a condensing-chamber for the mercury vapor produced during normal operation. The anode or positive electrode is in the present instance located at the lower end of the lamp. It consists of a cylinder 3, of graphite, preferably hollowed out, as shown, supported from the upper end of a leading-in conductor 4, the lower end of which is sealed through the lower end of the tube 1, as shown. This cylinder of graphite, which constitutes the anode, is partially submerged in a body of mercury 5. When the anode is hollowed out as indicated, access to the hollowed-out portion of the anode is provided for the mercury by some suitable opening in the walls of the electrode—as, for example, by the hole 6. The

level of the mercury in the hollow of the anode is thus the same as that of the mercury surrounding the anode.

The upper electrode of the lamp, in this case the cathode or negative electrode, consists of an annular body of mercury 7, contained in the space formed between the walls of the condensing-chamber 2 and the adjacent extension 8 of the tube 1. Electrical connection with this electrode is afforded by means of a leading-in conductor 9, sealed through the walls of the envelop or container, as indicated.

For the purpose of starting the lamp a filament of carbon or similar high-resistance material 10 is arranged so as electrically to connect the two electrodes before the starting operation takes place. In order to start, this filament is lifted or moved so as to break the electrical connection first with one electrode and then with the other. In the construction indicated this filament dips at its lower end into the cup in the anode 3 and is supported at its upper end from a cross-arm 11, resting across the extension 8. This cross-arm 11 is provided with downwardly-extending ends 12 and 13, dipping into the mercury 7. An armature 14, of iron or other magnetic material, slides in a tubular extension 15 of the condensing-chamber 2 and is connected by a rod 16 to the cross-arm 11. This armature is acted upon by means of a solenoid 17, surrounding the extension 15, and when lifted through the instrumentality of the solenoid carries with it the cross-arm 11 and the filament 10 supported therefrom. The parts are arranged so that upon the occurrence of this movement the projections 12 and 13 first break contact with the mercury 7 and are followed by a breaking of contact of the lower end of the filament 10 with the mercury in the lower end of the tube. The current which is sent through the lamp in series with the solenoid, the electrodes, and the interposed filament thus gives rise first to an arc at the points of disengagement at the surface of the cathode 7. This incipient arc follows immediately down the tube 1 to the anode 3, in which operation it is greatly assisted by the presence of the filament 10. The lamp is now in operation so far as the establishment of the arc is concerned. It is desirable, however, that the filament 10 should be entirely cut out of circuit, and for this reason

steadiness of the arc, and the small radiating capacity required in the lamp are produced without the disadvantages present with a  
20 vaporizable anode.

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, an anode of non-vap-  
25 orizable material, and a body of vaporizable material in the container in which the anode is nearly submerged.

to connect said electrodes electrically and to break connection therewith dissimultane- 45  
ously, and fluid material surrounding a portion of the solid electrode.

In witness whereof I have hereunto set my hand this 22d day of June, 1904.

ALEXANDER M. JACKSON.

Witnesses:

BENJAMIN B. HULL,  
HELEN ORFORD.