

A. A. WOHLAUER.
ELECTRIC LIGHTING APPARATUS.
APPLICATION FILED JULY 16, 1907.

985,486.

Patented Feb. 28, 1911.

Fig. 2.

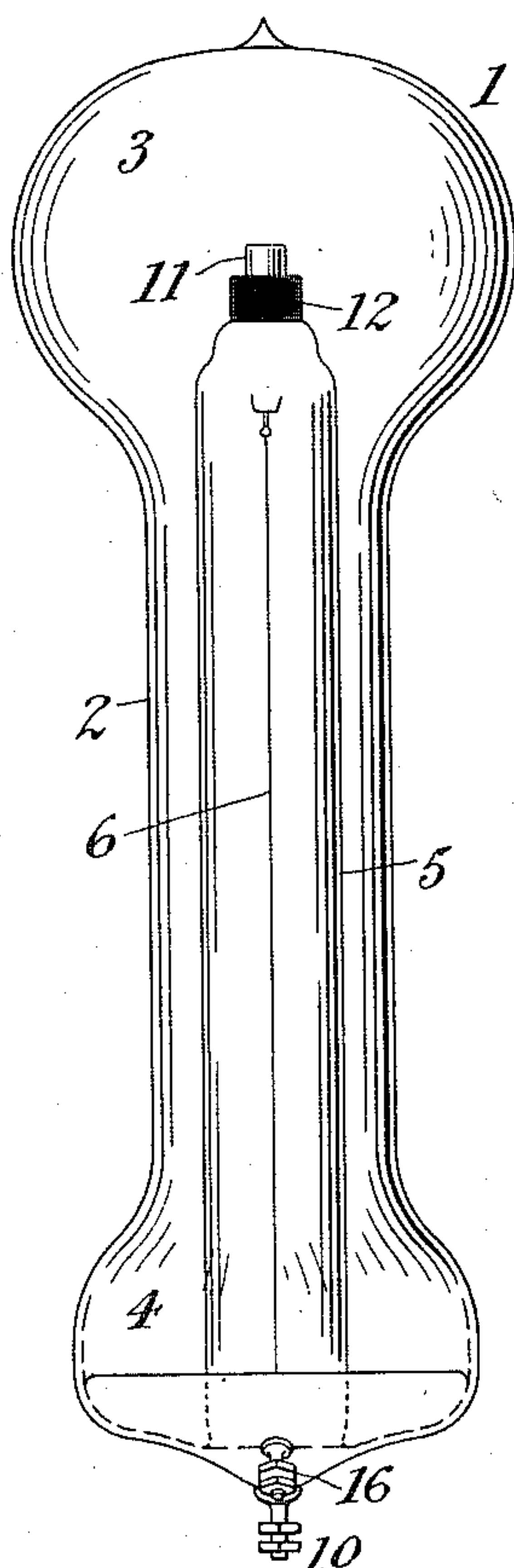


Fig. 1.

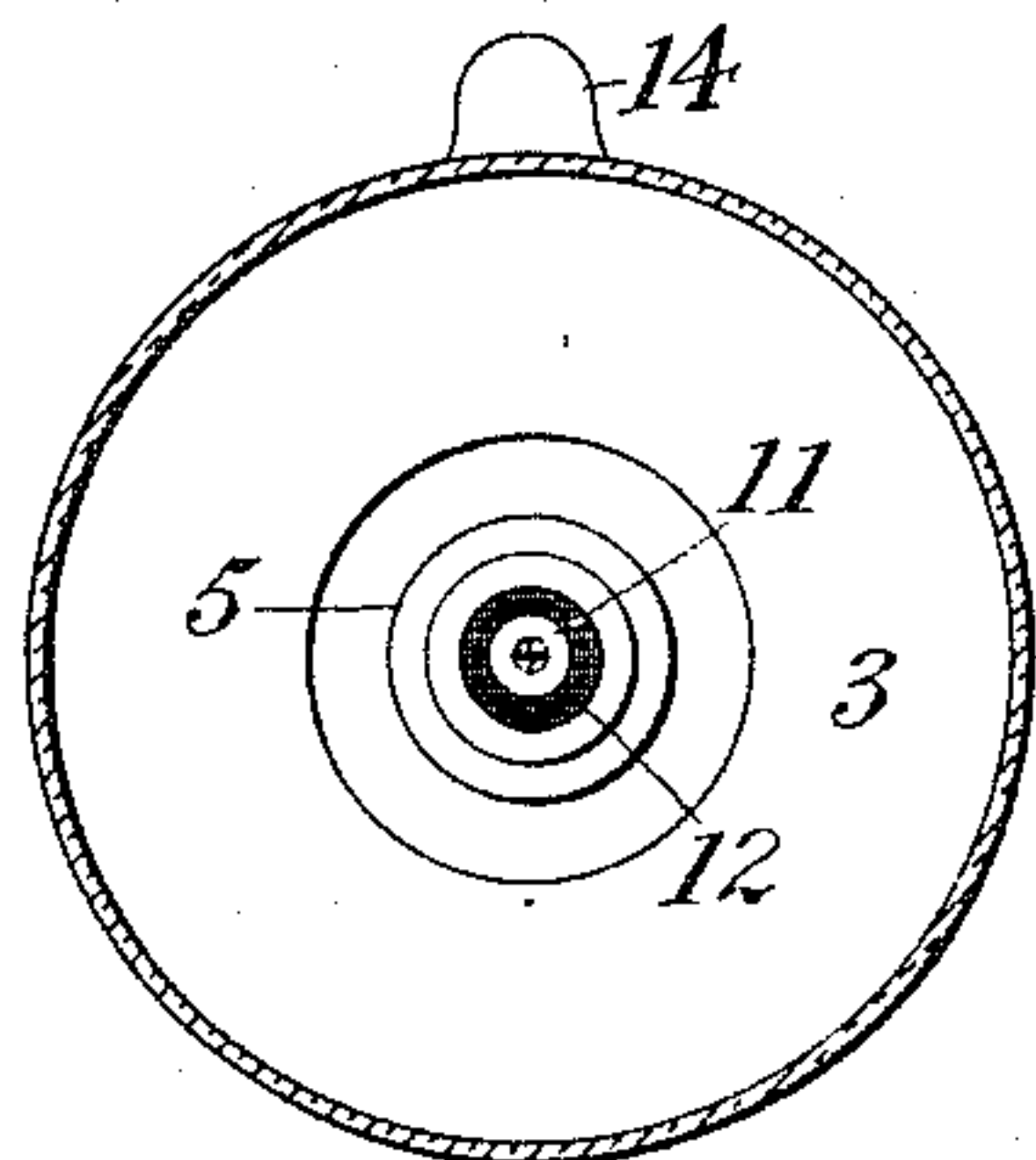
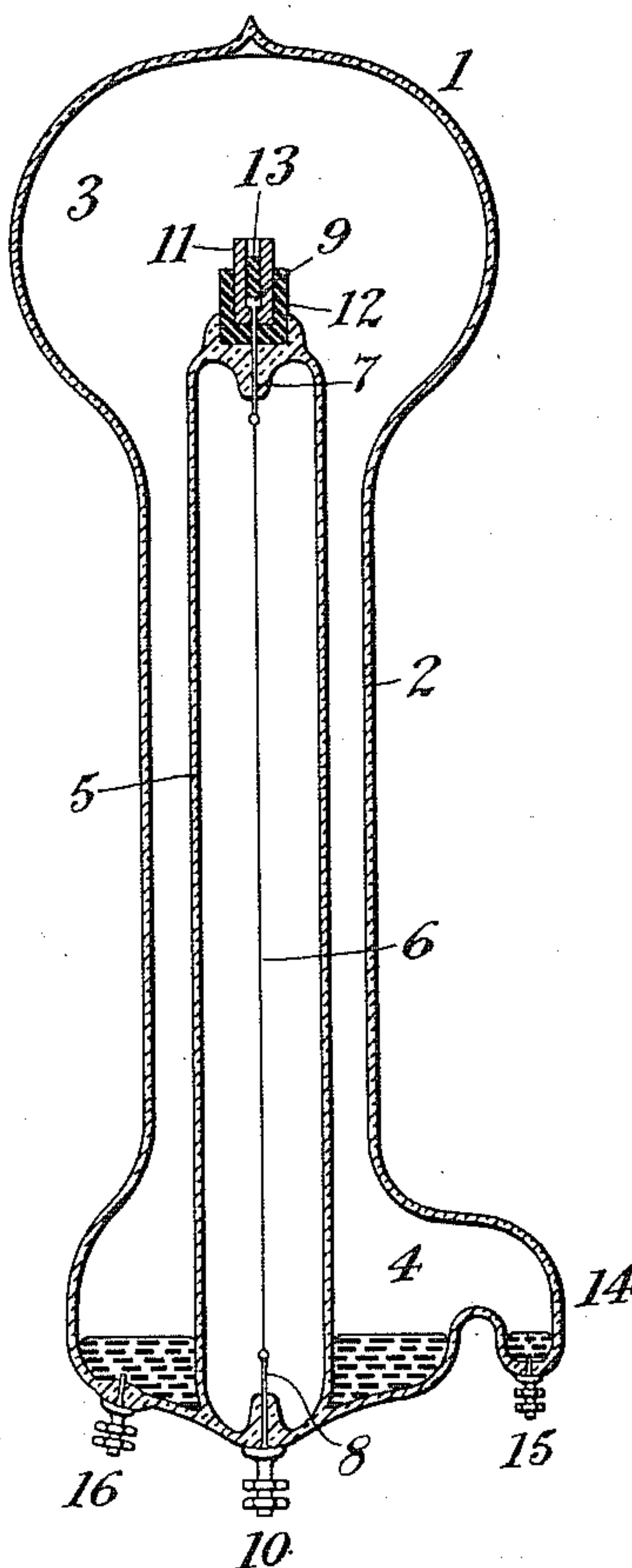


Fig. 3

Witnesses:

Gertrude K. Brennan
Willard Schwarz

Inventor:

Alfred A. Wohlaue

by

Robert W. Dillenhofer
Attorney.

UNITED STATES PATENT OFFICE.

ALFRED A. WOHLAUER, OF NEW YORK, N. Y.

ELECTRIC-LIGHTING APPARATUS.

985,486.

Specification of Letters Patent. Patented Feb. 28, 1911.

Application filed July 16, 1907. Serial No. 384,036.

To all whom it may concern:

Be it known that I, ALFRED A. WOHLAUER, a citizen of the German Empire, and a resident of the city of New York, county of New York, State of New York, have invented certain new and useful Improvements in Electric-Lighting Apparatus, of which the following is a specification.

My invention relates to improvements in vapor electric lamps and has for its object to produce an electric lamp in which the light emitted from an incandescent filament and the vapor arc are properly intermingled so as to produce an illumination which is agreeable to the eyes.

The accompanying drawings illustrate my invention.

Figure 1 is a front elevation of the lamp in section. Fig. 2 shows the side view of the lamp. Fig. 3 shows a section through the condensing chamber (3).

Similar figures refer to similar parts throughout the several views.

The lamp consists of an outer tube (1) made of glass or other suitable material, having a tubular portion (2) and enlarged ends (3—4). The upper end (3) serves as a cooling chamber, and the lower end (4) as a receptacle for mercury. The electrode (16) is hermetically sealed to the lower end of the tube and is in direct contact with the mercury. The form shown in the drawing is that ordinarily adapted for the tubes of vertical mercury vapor lamps. When the lamp is desired to be burned in a horizontal position, the form of the outer tube is modified. The outer tube may be subjected to various changes of form and proportion of its parts to adapt it for use with other light-emitting vapors.

Inclosed in the outer tube (1), and fastened or sealed to it at its lower end, is the inner tube (5). This tube is preferably cylindrical in shape and made of glass or other suitable material. The tube (5) contains a filament (6) made of carbon, tungsten or other suitable material, of such diameter as to become incandescent when the current passes through it, which filament is fastened at its ends through the leading-in wires (7—8) to the terminals (9—10) respectively. The upper end of the inner tube and of the filament terminates in the anode proper (11) of the vapor arc. This anode proper (11) is made of graphite, tungsten, or other suitable material, and forms one of the poles of

the vapor discharge. It is made with a diameter sufficiently large to allow it to readily conduct the current without melting or disintegrating.

In the drawing I have shown the anode in the form of a hollow cylinder open at the top and having a small opening at the bottom, through which is inserted and fastened the terminal (9) of the incandescent filament.

It is necessary for the successful operation of the lamp that the leading-in wire (7) and the terminal (9) be completely protected from direct contact with the vapor arc. This result may be accomplished by any of the customary methods of protection. In the drawing illustrating my invention, I have shown the anode with the leading-in wire and terminal attached thereto embedded or set in a bushing (12) made of lava or other suitable material. This bushing is hermetically sealed and fastened to the upper end of the inner tube (5) by means of blue glass or other suitable material. The upper end of the terminal (9) is protected from the influence of the arc by means of a plug (13) of graphite or other suitable material inserted in the core of the anode.

The air is exhausted from both the outer tube (1) and the inner tube (5) so that each tube forms a separate vacuum. The air may be exhausted from both tubes simultaneously or from each separately.

In Fig. 1 of the annexed drawings the lower end of the outer tube is shown with the side branch (14) projecting therefrom. This side branch contains mercury and has a leading-in wire (15) in contact therewith. The side branch acts as a starting device to vaporize the mercury in the lower end (4) of the outer tube, and is similar to that used in the customary mercury vapor lamp. This side branch may be dispensed with, however, and some other suitable starting device substituted therefor.

The manner in which the lamp works is as follows: The current is turned on and the lamp slightly tilted so that the mercury just bridges the space between the chamber (4) and the side branch (14). The current now flows between the terminals (15—16) and through the mercury. The lamp is then restored to its normal position thereby breaking the circuit and forming an arc across the space between the chamber (4) and the side branch (14). The action of this arc vapor-

izes the mercury in the lower end (4) of the tube (1), causing the tube to contain a conducting mercury vapor and producing a vapor arc or path between the mercury cathode and the anode. The side branch (14) is then cut out and a complete circuit is formed between the terminals or poles (16—10) and the vapor and filament thereupon become luminous simultaneously.

10 What I claim as my invention, and desire to secure by Letters Patent, is:

1. In a vapor electric lamp the combination with a vapor tube, of; a filament incandescent lamp arranged within the vapor tube, and; an anode mounted on the incandescent lamp and connected to the filament thereof.

2. In a vapor electric lamp the combination with a vapor tube, of; a linear filament incandescent lamp axially arranged within the vapor tube; an anode mounted on and supported by the incandescent lamp, and connected to the filament thereof.

3. An electric lamp of duplex construction comprising an outer vapor tube adapted to form the seat of a vapor arc, and an inner tube adapted to inclose a filament and to support at its top the anode of the vapor arc, said tubes being sealed together at their bottom ends.

4. A vapor electric lamp having double

tubes or bulbs, one arranged within the other, in combination with a filament contained in the inner tube or bulb, and connected to an enlarged terminal forming the anode of the vapor arc or discharge, and means for starting the vapor arc or discharge in the outer tube or envelop.

5. A vapor electric lamp having double tubes or bulbs, one arranged within the other, in combination with a filament contained in the inner tube or bulb, and connected through a leading in wire, protected from direct contact with the vapor arc or discharge, to an enlarged terminal forming the anode of the vapor arc or discharge and means for starting the vapor arc or discharge in the outer tube or envelop.

6. A vapor electric lamp comprising a vapor tube; an inner tube sealed to one end of the vapor tube; an anode mounted on the opposite end of and supported by said inner tube; and a filament inclosed in said inner tube and directly connected to the anode.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALFRED A. WOHLAUER.

Witnesses:

WILLARD SCHWARTZ,
LESTER F. DITTENHOEFER.