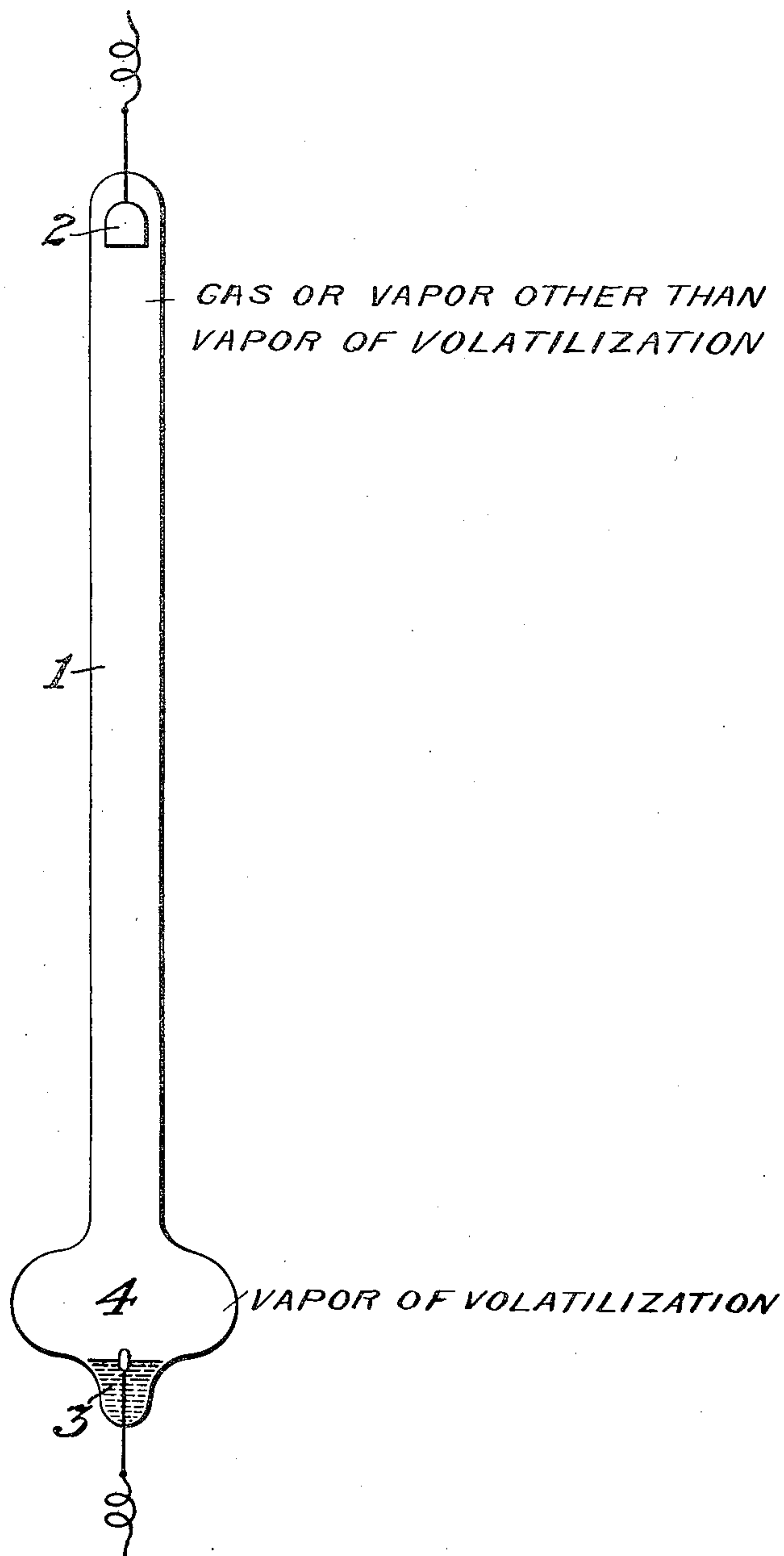


No. 814,695.

PATENTED MAR. 13, 1906.

P. C. HEWITT.  
VAPOR ELECTRIC LAMP.  
APPLICATION FILED JULY 7, 1904.



Witnesses  
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# UNITED STATES PATENT OFFICE.

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## VAPOR ELECTRIC LAMP.

No. 814,695.

Specification of Letters Patent.

Patented March 13, 1906.

Application filed July 7, 1904. Serial No. 215,578.

*To all whom it may concern:*

Be it known that I, PETER COOPER HEWITT, a citizen of the United States, and a resident of New York, county of New York, State of New York, have invented certain new and useful Improvements in Vapor Electric Lamps, of which the following is a specification.

The object of this invention is to produce light by means of a vapor apparatus generally similar to the lamp disclosed in certain patents issued to me on the 17th day of September, 1901, wherein, however, the light generated will yield color other than that of the spectrum of the material constituting the negative electrode. It has been found convenient in practice heretofore in lamps of this character to use mercury as the material of the negative electrode, the light emitted being that of mercury-vapor.

The present invention contemplates the use of mercury or other suitable material for the substance of the negative electrode, and it also contemplates the association with the vapors which are naturally developed from the substance of the negative electrode during the operation of the lamp of some other gas, acting together with the generated vapor to form the vapor-conducting column or light-giving body, whereby the spectrum or light effect given off by the fixed gas or other selected gas or vapor will modify the light given off by the lamp if the said gas or vapor were not present in the container. This added gas or vapor may be caused to act as a conductor and to give out its characteristic color or spectrum under the influence of electric current if means are provided for condensing the vapor volatilized at the negative electrode in the vicinity of the said electrode, thus preventing the vapors developed at the negative electrode from acting as the sole conductor through the entire body of the container. Such a condensation of the vapors in the vicinity of the negative electrode may be caused by providing a suitable cooling space or chamber at or near the negative electrode. The lamp will then operate with a "dual" light, so to speak, the current leaving the positive electrode at a point within the fixed gas or vapor or other selected gas or vapor and being carried by means of the said gas or vapor radiating the spectrum of the se-

lected gas or vapor for a certain distance. The current will then transfer itself to the vapor developed at the negative electrode and be carried thereby to the negative electrode, which it will enter and traverse in the usual manner.

Various gases may be used for the purpose indicated; but I prefer neon or one of the recently-discovered inert gases or a gas that is not chemically active.

I do not wish to limit myself to the use of mercury as the material of the negative electrode; but I may use any conductor which is vaporizable and capable of being returned to the electrode—in other words, a vaporizable self-restoring conductor, whether mercury alone or mercury combined with some other substance, or some other substance that will fulfil the requirements of the present invention so far as the material of the negative electrode is concerned.

I have illustrated my invention in the accompanying drawing, in which—

1 is a tubular glass container constituting the inclosing substance of a gas or vapor electric lamp. A positive electrode for the lamp is shown at 2, and this may be of iron or other suitable solid material. The negative electrode in this instance, appearing at 3, is of mercury having about it an enlargement or chamber 4, which is sufficient in size to cause a quick or approximately instantaneous condensation of the mercury-vapors as they are developed from the negative electrode in the operation of the lamp.

In the container we may assume in the present instance that neon is inclosed, although nitrogen, argon, or other fixed or combined gas or vapor may be substituted for the neon assumed in the present instance.

A lamp such as the one above described may be started in the same way as the well-known mercury-vapor lamps of commerce; but under the conditions described the main source of light would be the illuminated column of gas or vapor extending through the main portion of the container 1. Under certain conditions of working the lower part of the container might show the characteristic mercury-vapor light; but this can be extended or limited, as the case may be, by regulating the characteristics of the condensing-chamber 4 so as to control the total lumi-



nous effect of the lamp according to wish or the requirements of a particular service.

In a divisional application filed October 19, 1904, Serial No. 229,054, claims are made upon the method of operation described herein.

I claim as my invention—

1. A volatile negative electrode, and means for condensing approximately all the vapors of the negative electrode at or near the same, in combination with a gas or vapor differing from the vapor developed from the negative electrode, the said other gas or vapor acting as a conducting medium through a portion of the vapor apparatus.

2. In a gas or vapor electric apparatus comprising a container, electrodes therein, at least one of which is of a material which is capable of being volatilized and again con-

densed, a gas or vapor other than that developed from the said electrode, and means for condensing approximately all the vapors developed from said electrode at or near the electrode itself.

3. In a gas or vapor electric apparatus comprising a container, electrodes therein, at least one of which is of mercury, a gas or vapor other than mercury-vapor, and means for condensing approximately all the vapor of mercury developed from said electrode at or near the electrode itself.

Signed at New York, in the county of New York and State of New York, this 30th day of June, A. D. 1904.

PETER COOPER HEWITT.

Witnesses:

WM. H. CAPEL,

GEORGE H. STOCKBRIDGE