

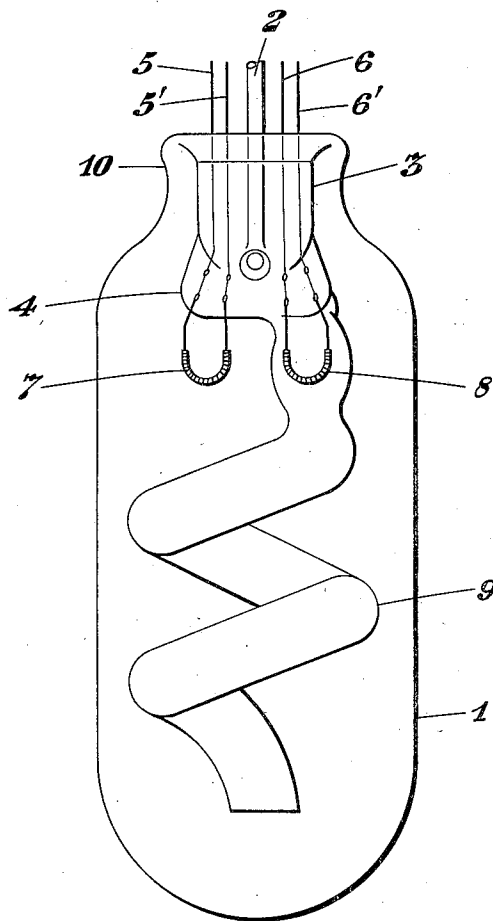
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GASEOUS ELECTRIC DISCHARGE DEVICE

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GASEOUS ELECTRIC DISCHARGE DEVICE

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1 Claim. (Cl. 176—123)

The present invention relates to gaseous electric discharge devices generally and more particularly the invention relates to such devices the gaseous atmosphere of which consists of or comprises a metal vapor, such as sodium or mercury vapor.

The object of the invention is to provide a gaseous electric discharge vapor lamp of simple structure and compact dimensions having a discharge path longer than the straight line distance between the electrodes of said lamp. Another object of the invention is to provide a lamp device in which the discharge path between the electrodes is of such length that a very small ballast is sufficient when operating the lamp on current supply lines of the voltages of commerce, such as 110 or 220 volts. A further object of the invention is to provide a gaseous electric discharge lamp device of great efficiency and of compact dimensions which lamp is a source of high intensity light. Still further objects and advantages attaching to the device and to its use and operation will be apparent to those skilled in the art from the following particular description.

In accordance with these objects the invention comprises a gaseous electric discharge lamp device having a container, a single stem fused to said container, two thermionic electrodes sealed into said stem and a tube of smaller diameter than said container mounted on said stem and extending toward the other end of said container, said tube surrounding one of said electrodes. The discharge path in the device thus extends along the inside of the tube and back along the outside of the tube. The use of thermionic electrodes in the lamp permits the use of high current densities which increases the intensity of the light emitted by the lamp. The gas in the tube as well as the gas in the container is thus excited to luminescence by the passage of a discharge between said electrodes and the lamp is an efficient, concentrated source of high intensity light operable on 110 or 220 volt current sources with a small series resistance.

In the drawing accompanying and forming part of this specification an embodiment of the invention is shown in a front elevational view.

Referring to the drawing the new and novel gaseous electric discharge lamp device comprises a tubular container 1 having a stem 3 at one end thereof. Two pairs of electrode leads 5 and 5', 6 and 6' having electrodes 7 and 8 mounted on the interior ends thereof respectively are sealed into the pinch part 4 of said stem 3.

Said electrodes 7 and 8 are mounted in a plane substantially at right angles to the longitudinal axis of said container. The container 1 is exhausted through the exhaust tube 2 during the manufacture of the device. Said electrodes 7 and 8 are electron emitting when heated and consist of a bent rod of electron emitting material, such as a rod consisting of a pressed, sintered mixture of finely divided electron emitting material, such as barium oxide, and a high melting point metal, such as tungsten or molybdenum, and a heating coil, such as a coil of tungsten wire, surrounds said rod and is affixed to the electrode leads for said electrodes. Said container 1 has a gaseous atmosphere therein consisting of a starting gas, such as neon and/or argon, and a vaporizable material, such as sodium.

The electrode 8 is surrounded by a light transmitting tube 9 which is shaped in the form of a helix. Said tube 9 is fused to the pinched part 4 of said stem 3 and extends along said container 1, the open end thereof being adjacent the end of said container opposite that end into which said stem 3 is fused. The discharge path between said electrodes 7 and 8 is through the tube 9 and back along said container 1. As the discharge path between said electrodes 7 and 8 is of long length the voltage drop therein is high and the lamp is operable on the 110 or 220 volt current sources of commerce with the provision of a small ballast resistance in series with said lamp. The lamp is of compact dimensions and is a very efficient source of high intensity light.

The lamp device is provided with a base cemented thereto when desired. Said electrodes 7 and 8 comprise a rod consisting of alkali earth metals or their compounds, when desired. A heat conservator, such as a double walled jacket having the space between the walls evacuated, surrounds said lamp device to increase the efficiency thereof, when desired. The lamp starts as a gas lamp and operates as a vapor lamp when the heat of the discharge has vaporized the vaporizable material.

While we have shown and described and have pointed out in the annexed claims certain novel features of the invention, it will be understood that various omissions, substitutions and changes in the forms and details of the device illustrated and in its use and operation may be made by those skilled in the art without departing from the broad spirit and scope of the invention.

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

A gaseous electric discharge device comprising

an elongated, tubular container having substantially the same diameter throughout the length thereof, one end of said container being hemispherical and a stem at the other end of said container, a gaseous atmosphere in said container comprising a vaporizable material, a pair of thermionic electrodes sealed into said stem, said electrodes being adjacent each other and a helically shaped, light transmitting tube fused to said stem

and surrounding one of said electrodes, the inside diameter of said tube being substantially smaller than the inside diameter of said container and opening adjacent the spherical end of said container, the outside of the helix formed by said tube closely approaching the wall of said container. 5

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