April 4, 1939. G. HOLST 2,152,995

GLOW DISCHARGE DEVICE

Filed Feb. 9, 1937

Fig. 1.

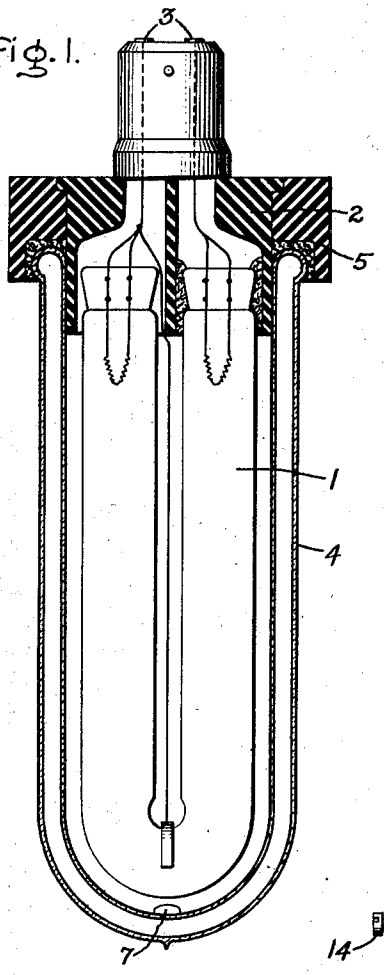


Fig. 2.

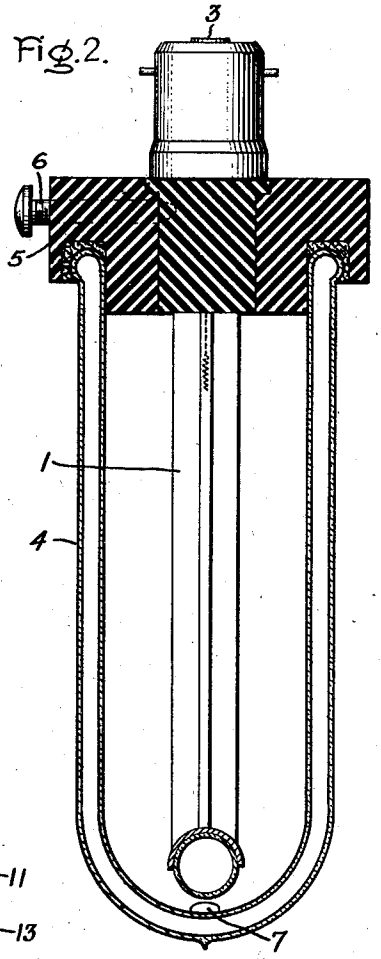
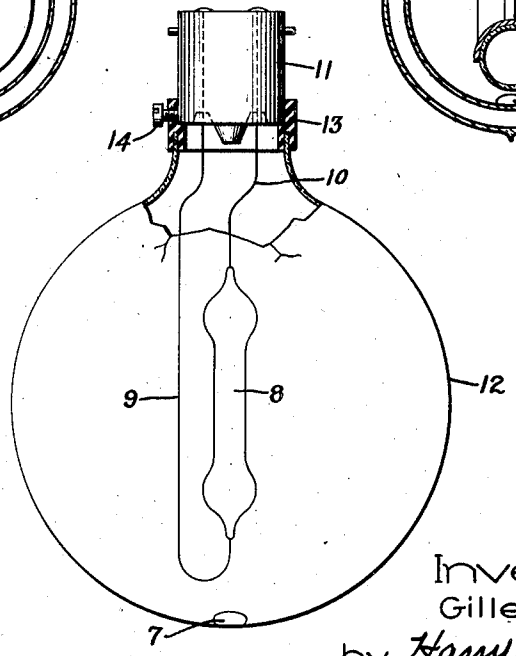


Fig. 3.



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UNITED STATES PATENT OFFICE

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GLOW DISCHARGE DEVICE

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6 Claims. (Cl. 240—11.4)

It is known to enclose electric discharge tubes having a gas or vapor or combination of gas and vapor filling in a container or enclosure which is separate from the discharge tube and is secured to the tube in a removable manner. Sodium-vapor discharge tubes or lamps are, for instance, used frequently in combination with a double-walled, evacuated container which is placed around the discharge tube in such a way that the container and the tube can easily be removed and so that each can be transported and interchanged. The container may, for instance, be connected to the discharge tube by means of a screw connection or other form of connection which can be readily loosened. Furthermore, discharge tubes, such as high-pressure mercury-vapor discharge tubes, are known which are arranged within a single-walled container and are secured thereto, not permanently, but in such a way that they can be taken apart.

In these constructions, air or other form of deleterious gas or vapor is present between the discharge tube and the container, and the space between the tube and the container is sealed as well as possible in order to separate this space from the surroundings.

The present invention relates to electric discharge tubes with a gas or vapor filling and which are enclosed in a container secured to the tube in a nonpermanent, removable manner; the invention has the purpose of improving this construction.

According to the invention, a material which attracts water is placed in the closed space between the discharge tube and the container. It has been found that in spite of the fact that this space is substantially closed, under certain conditions of the surroundings, such a large quantity of water vapor can penetrate into this space that the ingition of the discharge tube is made difficult. Sodium-vapor lamps which were placed in a Dewar vessel ignite without trouble in the case of dry weather, while they do not ignite when the same voltage is applied in foggy weather. By placing a material which attracts water to a high degree in the space between the discharge tube and the container, the increase in the ignition voltage, caused by the water vapor which has penetrated into this space, can be avoided.

It is possible to use the hygroscopic materials, calcium oxide or calcium chloride for absorbing the water but it is preferable to utilize a material which, at the temperature at which it is heated during the operation of the discharge tube, again liberates the absorbed water vapor. The air in the space between the tube and the container is heated during operation and then creates an excess in pressure. As a result, a part of this air with a part of the water vapor which is again liberated from the material, is forced to the outside through the removable connection. In this case, the material utilized can consist, to advantage, of active carbon or silica gel.

The drawing shows two physical embodiments according to the invention.

Figs. 1 and 2 show a discharge tube which is enclosed by a double-walled container, while Fig. 3 shows a discharge tube which is surrounded by a single-walled container.

In Figs. 1 and 2, 1 is a U-shaped discharge tube which is provided with a gas filling that contains sodium vapor and which is utilized for the emission of light rays. This discharge tube is provided with a base 2 on which the contacts 3 are located. The discharge tube is surrounded by a double-walled container 4 which is evacuated and which is fastened to the ring 5 consisting of insulating material. This ring fits the base 2 as tightly as possible so that the best possible seal is obtained of the air-filled space between the tube 1 and the container 4. The ring 5 and the base 2 are secured together by the screw 6.

In the indicated space, there is located at the bottom of the inside wall of the container 4 a tablet or pellet 7 which consists of highly active carbon and which strongly attracts water vapor. This pellet can be placed on the bottom of the container.

It is apparent that it is also possible to secure the hygroscopic material in such a manner that it cannot move even when the discharge tube or the container is placed in a different position. For example, it is possible to place this material in a small basket of metal screening and secure this basket to one of the current-supply wires.

In Fig. 3, 8 shows a high-pressure mercury-vapor discharge tube which, during operation, has a very high mercury-vapor pressure of, for example, 25 atmospheres. The discharge tube is secured to the base 11 of insulating material with the aid of the current-supply wires 9 and 10. The tube is surrounded by a single-walled container 12 to which the ring 13 consisting of insulating material is secured. This ring encloses a portion of the base 11 and is connected thereto by means of the screw 14. In the lower

part of the glass covering 12, a tablet or pellet 7 consisting of active carbon is placed.

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

1. In combination, a gaseous discharge device, a gas pervious enclosure for said device and means for absorbing deleterious gases in the space between said device and said enclosure to avoid changes in the starting voltage of said discharge device.

2. In combination, a gaseous discharge device, a gaseous pervious container surrounding said device and spaced therefrom, means for absorbing water vapor in the space and for releasing the vapor when heated to operating temperatures, said means being positioned between said device and said container to avoid changes in the starting voltage of said discharge device.

3. In combination, a gaseous electric discharge lamp device, a removable and transparent container therefor, and a quantity of carbon in the space between the lamp device and said container to avoid changes in the starting voltage of said discharge device.

4. In combination, a gaseous electric discharge lamp device, a removable container for said lamp device, and hygroscopic material in the space between said lamp device and said container to avoid changes in the starting voltage of said discharge device.

5. In combination, a gaseous electric discharge lamp device, a removable container therefor, and a pellet of a compound containing calcium positioned between the lamp device and the container for absorbing water vapor to avoid changes in the starting voltage of said discharge device.

6. In combination, an electric discharge device, a gas pervious enclosure for said device and means for absorbing deleterious gases in the space between said device and said enclosure to avoid changes in the starting voltage of said discharge device.

GILLES HOLST.