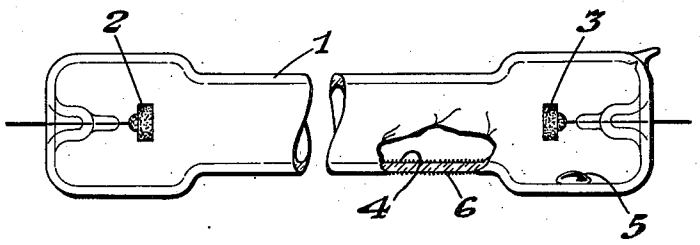
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GASEOUS ELECTRIC DISCHARGE LAMP

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GASEOUS ELECTRIC DISCHARGE LAMP

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1 Claim. (Cl. 176—122)

The present invention relates to gaseous electric discharge lamps generally and more particularly the invention relates to mercury vapor lamps having a fluorescent material associated therewith which material transforms rays of certain wave length emitted by the gaseous electric discharge in the lamp into rays of other wave length to complement and supplement the light emitted by said discharge.

Certain types of fluorescent materials while emitting light of a color complementary to the light emitted by the mercury vapor discharge are not fully excited by the ultra-violet light emitted by said discharge and hence the intensity of the fluorescent light is too weak to complement the visible light emitted by said discharge. Such a fluorescent material is rhodamin, for example, which emits red light.

The object of the present invention is to provide a lamp of the above type which is more efficient and more effective than those now known in the art. 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.

The present invention attains its object by interposing between the gaseous electric discharge in the lamp and the body of rhodamin a body of another fluorescent material which transforms substantially all of the effective ultra-violet rays emitted by the said mercury vapor discharge into rays which fully excite the rhodamin. The red rays emitted by the rhodamin are then of high intensity to complement the visible light emitted by the discharge.

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

Referring to the drawing the lamp comprises an elongated, tubular container 1 having electrodes 2 and 3 sealed into the ends thereof and a gaseous atmosphere therein comprising a starting gas, such as argon, and a quantity 5 of vaporizable material, such as mercury, the vapor of which is light emitting during the operation of the device. Said electrodes 2 and 3 are sintered mixtures of electron emitting material, such as barium oxide, and high melting point material, such as tungsten, are electron emitting when at an elevated temperature and are heated to the operating, electron emitting temperature thereof by the voltage drop thereat and current flow therethrough. When desired, cold, sheet metal electrodes are used.

Said container 1 has a coating of fluorescent material, such as zinc silicate or zinc sulfide, which transforms the ultra-violet light emitted by the mercury vapor discharge between said electrodes 2 and 3 into yellow or green colored light, respectively. The coating 4 is applied to the inner surface of said container 1 by methods now known in the art, such as by heating the container 1 to the softening temperature and propelling particles of the fluorescent material toward the softened inner surface of said container 1 so that the particles are partially embedded in said surface, as disclosed in co-pending application, Serial Number 758,514, filed December 20, 1934 or by partially embedding the fluorescent material in a layer of light transmitting enamel applied to the inner surface of said container 1 and having a lower softening temperature than said container 1, as disclosed in co-pending application Serial Number 758,028, filed December 18, 1934. A coating 6 of material which is strongly excited by the light emitted by the fluorescent coating 4 is applied to the outer surface of said container 1. Said coating 6 consists of rhodamin, for example, which when excited by the light emitted by the coating 4 emits red rays of sufficient intensity to complement the spectrum of the light emitted by the mercury vapor discharge in said lamp.

When the lamp is to be used for illumination the thickness of said coatings 4 and 6 is such that substantially all the visible light emitted by the luminous discharge is transmitted thereby. The coating 4 should be of sufficient thickness to transform substantially all the ultra-violet rays emitted by the discharge into visible light. When the lamp is to be used for advertising purposes it is effective to apply both the coating 4 and the coating 6 on the outer surface of the container 1 the coating 4 completely covering said surface and the coating 6 being applied to said coating 4 in the form of a design, or a character, or symbol. In this case the container 1 must be made of an ultra-violet transmitting material, such as quartz, and the coating 4 is preferably of such thickness that only the yellow or green lines emitted by the discharge are transmitted thereby. The lamp then has glowing red characters on a glowing yellow or green surface and is very effective for advertising purposes.

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 lamp comprising a container, electrodes sealed therein, a gaseous atmosphere therein capable of emitting visible light and ultra-violet light when excited by an electric discharge between said electrodes, a body of luminescent material which is weakly excited by the rays emitted by said discharge and another body of material which transforms the ultra-violet rays emitted by said discharge into visible light which strongly excites the material of said first named body and causes it to emit light different in color from that emitted by said first named body and by said discharge, said last named body being interposed between said first named body and said discharge.

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