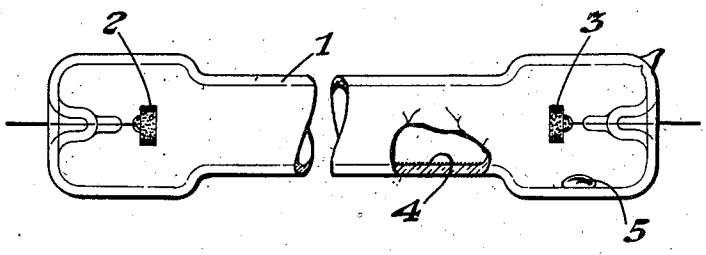
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GASEOUS ELECTRIC DISCHARGE LAMP

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GASEOUS ELECTRIC DISCHARGE LAMP

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2 Claims. (Cl. 176—122)

The present invention relates to gaseous electric discharge lamps generally and more particularly the invention relates to such devices having luminescent material associated therewith which material is excited to luminescence by the rays emitted by the discharge in the lamp to complement and supplement the light emitted by said discharge.

The object of the invention is to provide a gaseous electric discharge lamp device which emits white light. A further object of the invention is to provide such a device having fluorescent material associated therewith which material is non-disintegrating and retains its light emitting qualities unchanged during the useful life of the gaseous electric discharge lamp. 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.

I have discovered that a gaseous electric discharge lamp having a fluorescent coating consisting of a mixture of from 90 to 97% of the yellowish-white form of zinc silicate and from 10 to 3% of a blue fluorescent material, such as calcium tungstate, emits a white light and that this coating does not disintegrate nor change its light emitting characteristics during the operating life of the gaseous electric discharge lamp. The quantity of the blue fluorescent material, such as calcium tungstate, added to the zinc silicate depends upon the thickness of the coating of the fluorescent material on the lamp container. It is desirable to have the fluorescent coating of such depth that substantially all of the ultra-violet rays emitted by the gaseous electric discharge are absorbed thereby and transformed into visible light and substantially all the visible light rays emitted by said discharge are transmitted thereby. Usually about 7% of calcium tungstate is effective.

Lamps made in accordance with the present invention are useful for illuminating purposes and the attractive white appearance thereof is useful in advertising, as in signs.

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 fluorescent coating 4 on the inner surface thereof which coating consists of the mixture of fluorescent materials disclosed above. 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, Serlai 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.

As pointed out above the fluorescent coating should be of sufficient thickness to transform substantially all of the effective ultra-violet rays emitted by the gaseous electric discharge in the lamp to visible light rays and yet should be thin enough to transmit all the visible light emitted by said discharge. A lamp having the above structure appears white and emits a substantially white light during the operation thereof.

It will be understood, of course, that numerous changes in the form and details of the device and in its use and operation may be made by those skilled in the art without departure from the spirit and scope of the invention, for example, the coating 4 is applied to the outer surface of said container 1, when desired, or the fluorescent material is applied to a light transmitting screen mounted separate from but in ultra-violet light receiving relation to the lamp, when desired. In these modifications of the invention the container 1 must be made of an ultra-violet transmitting material such as quartz.

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

1. A gaseous electric discharge lamp comprising a container, electrodes sealed therein, a gaseous atmosphere therein capable of emitting vis-

ible rays and ultra-violet rays when excited by an electric discharge between said electrodes, a coating of fluorescent material associated therewith, said coating consisting of a mixture of from 90 to 97% of the yellowish-white form of zinc silicate and from 10 to 3% of calcium tungstate.

2. A gaseous electric discharge lamp comprising a container, electrodes sealed therein, a gaseous atmosphere therein capable of emitting visible rays and ultra-violet rays when excited by an electric discharge between said electrodes, a coating of fluorescent material associated therewith, said coating consisting of a mixture of from 90 to 97% of the yellowish-white form of zinc silicate and 7% calcium tungstate.

ALFRED RÜTTENAUER.