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M. PIRANI
GASEOUS ELECTRIC DISCHARGE DEVICE

1,930,149

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Fig. 1

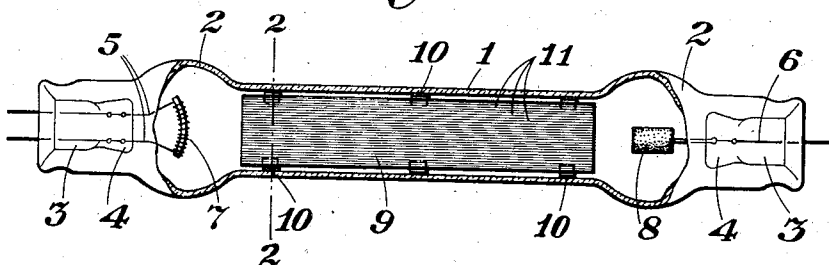
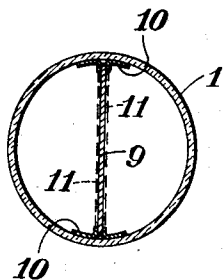


Fig. 2



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UNITED STATES PATENT OFFICE

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GASEOUS ELECTRIC DISCHARGE DEVICE

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Application January 7, 1932, Serial No. 585,323,
 and in Germany January 13, 1931

3 Claims. (Cl. 176-122)

The present invention relates to gaseous electric discharge devices generally and more particularly the invention relates to means for improving the efficiency of such devices.

5 The object of the invention is to improve the efficiency of an electric discharge device by providing internal means whereby the invisible light radiations emanating from the electric discharge in the gaseous atmosphere in said device are
 10 changed to visible light radiations in the container of said device. Another object of the invention is to provide means whereby practically all the visible light radiations emanating from the electric discharge in the gaseous filling in said
 15 device are transmitted through the container of said device for utilization external thereto. A further object of the invention is to provide such a device of simple structure. Still further objects and advantages attaching to the device and to
 20 its use and operation will be apparent from the following particular description.

In accordance with these objects the invention comprises a wall coated with or consisting of a
 25 fluorescent material having a highly polished surface said wall extends the full length of the container surrounding the luminous portion of the discharge path, for example, the positive column, between the electrodes of said device. The fluorescent material of said wall changes the in-
 30 visible light radiations, such as the ultraviolet and infrared radiations into visible light radiations and the highly polished surface of said wall sends out the visible light in the interior of the luminous portion of the discharge path in
 35 a direction perpendicular to the longitudinal axis of the container of said device so that practically all the light radiations both visible and invisible, emanating from the electric discharge in the gaseous atmosphere in said device are sent out
 40 through the walls of the container of the device as visible light for external utilization to give great efficiency to said device.

In the drawing accompanying and forming part of this specification an embodiment of the invention is shown, in which

Fig. 1 is a side elevational view partly in section of the new and novel electric discharge device, and

Fig. 2 is a sectional view along the line 2-2 of Fig. 1.

Like numbers denote like parts in both views of the device.

Referring to Fig. 1 of the drawing the new and novel gaseous discharge device comprises a container 1 having a filling of a discharge conduct-

ing gas such as rare gas, common gas, metal vapor or a mixture of these and having electrode chambers 2 at each end thereof, each of said chambers 2 is provided with a stem 3. Current leads 5 and 6 of the electrodes 7 and 8 respectively are sealed into pinch-parts 4 of said stems 3. Electrode 7 consists of a rod of electron emitting material such as barium oxide and has a metal heating filament wrapped around it, said filament being heated during the starting of the device by a special heating current if desired. Electrode 8 consists of a sintered mixture of metal and oxide such as tungsten and barium oxide, said electrode 8 may be heated during the starting of the device by applying the starting current thereto. Both electrodes of the device may be of the type represented by electrode 8, or said electrodes may be of the type represented by electrode 7, or cold electrodes may be used, as desired.

A wall 9 is provided in said container 1, said wall 9 is co-extensive with that part of container 1 surrounding the luminous portion of the discharge path, for example, the positive column, between said electrodes 7 and 8 and consists, for example, of glass, metal, metal mesh, or fluorescent material capable of resisting the heat of the gaseous electric discharge in said device. Flexible metal supports 10 are used to maintain said wall 9 in a fixed position in said container 1 though any other suitable support may be used as desired.

Said wall 9, where it consists of material other than fluorescent material, has a coating 11 of fluorescent material such as, for example, zinc sulphite, calcium tungstate, or scandium oxide. The fluorescent material of said wall 9 translates the invisible light radiations such as the ultraviolet and infrared radiations emanating from the electric discharge in said gaseous atmosphere into visible light radiations to increase the visible light output of said electric discharge device to make it a very efficient light source.

The fluorescent coating 11 is applied to said wall 9 in the form of a glaze and the fluorescent surface of said wall 9 is highly polished, so that the visible light radiations in the middle of the discharge are reflected by such highly polished surface and are sent out perpendicular to the longitudinal axis of the elongated container 1 which gives greater efficiency to the gaseous electric discharge device and creates a greater concentration of the emitted light in a particular direction. Having these characteristics the new and novel gaseous electric discharge device may be used without a reflector, or as a beacon or for

any purpose for which it is desirable to have a concentration of light in a given direction.

While a particular embodiment of the invention has been shown in the accompanying drawing and described in the foregoing specification it will be understood, of course, that numerous substitutions, modifications and changes may be made by those skilled in the art in the form and details of the device without departure from the broad spirit and scope of the invention.

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

1. In an electric discharge device a tubular container, electrodes sealed therein, a gaseous atmosphere therein, and a fluorescent flat wall extending the full length of that part of the container surrounding the luminous portion of the discharge path between said electrodes, said wall being located in the longitudinal axis of said tubular container.

2. In an electric discharge lamp device an elongated container, electrodes sealed therein, a gaseous atmosphere therein, and a fluorescent solid wall extending the full length of that part of the container surrounding the luminous portion of the discharge path between said electrodes, said wall being located in the longitudinal axis of said tubular container.

3. In an electric discharge device a tubular container, electrodes sealed therein, a gaseous atmosphere therein, and a highly polished fluorescent flat wall extending the full length of that part of the container surrounding the luminous portion of the discharge path between said electrodes, said wall being located in the longitudinal axis of said tubular container.

MARCELLO PIRANI.

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