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1,921,620

GLOW TUBE APPARATUS

Filed June 4, 1928

FIG. 1.

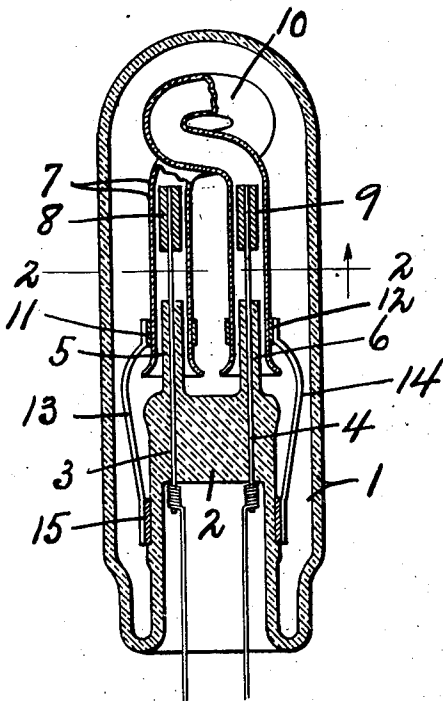
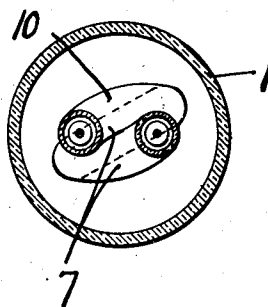


FIG. 2.



WITNESS.

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UNITED STATES PATENT OFFICE

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GLOW TUBE APPARATUS

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7 Claims. (Cl. 176—122)

This invention relates to certain new and useful improvements in glow tube devices, for example, glow tubes such as are used in advertising signs and signaling devices.

The device of this invention is suitable for use in a much wider field than former devices of this nature in that a discharge of high light intensity may be produced by a substantially lower voltage.

The present invention comprises various structural features of novelty which cooperate to increase the range and capacity of a device of this type. For example, in accordance with this invention the glow is confined in a glass tube so shaped that its configuration at the dome of the enclosing envelope or bulb forms an intense button or spot of light when a discharge is caused to pass between the electrodes.

The construction of the device is such that the line or path of the intense discharge is confined to the space enclosed by the formed glass tube, which tube in turn is enclosed by the outer envelope or bulb.

Other objects and advantages relate to the details of the structure and the form and relation of the parts thereof, all as will more fully appear from the following description taken in connection with the accompanying drawing, in which:

Figure 1 is a view partially in section of a glow tube of this invention.

Figure 2 is a section on line 2—2, Figure 1.

The device as here illustrated comprises an enclosing bulb —1— having a stem —2— sealed therein. These parts are preferably formed of glass and the lead-in wires or conductors —3— and —4— are sealed through the stem —2— and preferably the stem is formed with spaced projections —5— and —6— which surround and enclose the lead-in wires to points above the lower ends of the glow tube —7—.

The electrodes —8— and —9— are enclosed in the opposed legs of the glow tube and are spaced a sufficient distance above the lower open ends of the legs of the tube so that the distance through the closed upper end of the tube —7— between the electrodes is shorter than the distance between the electrodes on a path leading through the lower open ends of the legs of the tube so that the discharge between the electrodes will always take place through the closed end of the tube. The closed end —10— of the glow tube is formed in a coil so that when the discharge takes place between the electrodes through the closed end of the tube there will be produced a button or spot of intense light.

The tube —7— may be supported in desired position in any suitable manner, as by clips or surrounding bands —11— and —12— supported on arms —13— and —14— preferably of a somewhat resilient nature, the arms in turn being supported in any suitable manner as by a band —15— surrounding the stem of the device.

The bulb —1— is evacuated and is then filled with a rare gas or atmosphere, such as neon, the nature of the gas being, however, subject to the color of the glow desired, and it will be apparent that the pressure of the gas within the formed tube —7— is always the same as the pressure of the gas within the bulb —1— which surrounds the tube —7—.

As stated, the shortest path of ionization between the two electrodes —8— and —9— should be through the closed end —10— of the tube —7— so that the discharge takes place through the coiled end —10—.

Altho I have shown and described a specific form and construction of device as constituting an embodiment of the invention, I do not desire to restrict myself to the details of form, construction or arrangement, as various changes and modifications may be made within the scope of the appended claims.

I claim:

1. A glow tube comprising an enclosing bulb, a pair of spaced electrodes within the bulb, a tube having its opposed legs enclosing the electrodes and opening into the bulb and having its intermediate portion formed in a coil through which the low voltage discharge between the electrodes takes place, conductors sealed through the bulb and connected to the electrodes, and insulation surrounding the conductors to a point above the lower open ends of the legs of the tube.

2. A formed tube enclosed by an envelope, a conducting gas within said envelope, said tube having a short central twisted portion and two substantially straight portions, the ends of which open into said envelope, an electrode in each of said straight portions adjacent said twisted portion, connections through said envelope extending through said open tube ends to said electrodes and insulation surrounding said connections to a point above the lower ends of said tube.

3. A formed tube enclosed by an envelope, a conducting gas within said envelope, said tube having a short central twisted portion and two substantially straight portions, the ends of which open into said envelope, an electrode in each of said straight portions adjacent said twisted

- portion, connections through said envelope extending through said open tube ends to said electrodes and insulation surrounding said connections to a point above the lower open ends of said tube, the path between electrodes through said twisted portion of said tube being shorter than the path between electrodes through the straight portions of the tube.
4. A gas-filled glow lamp comprising an enclosing bulb having a stem, a pair of electrodes within the bulb, a formed tube having two substantially straight parallel portions enclosing said electrodes, and an intermediate portion connecting said parallel portions through which the low voltage discharge between electrodes takes place, a band about said stem having a plurality of supporting arms, and a supporting band about each parallel tube portion fastened to said supporting arms.
5. A gas-filled glow lamp comprising an enclosing bulb having a stem, a pair of lead-in wires fused in said stem, a pair of electrodes supported by said lead-in wires, glass projections extending from said stem and surrounding said lead-in wires, a formed tube having two substantially straight parallel portions enclosing said electrodes and in part enclosing said glass projections and an intermediate portion through which the low voltage discharge between electrodes takes place, a band encircling said stem having a plurality of supporting arms, and a band about each straight parallel tube portion fastened to said supporting arms for supporting the formed tube.
6. A gas-filled glow lamp comprising an enclosing bulb having a stem, a pair of lead-in wires fused in said stem, a pair of electrodes supported by said lead-in wires, glass projections extending from said stem and surrounding said lead-in wires, a formed tube having two substantially straight parallel portions enclosing said electrodes and in part enclosing said glass projections and an intermediate portion through which the low voltage discharge between electrodes takes place, the path between electrodes through said intermediate portion being shorter than the path between electrodes through said straight parallel portions, and means for supporting said formed tube from said stem.
7. A gas-filled glow lamp comprising an enclosing bulb having a stem, a pair of lead-in wires sealed in said stem, a pair of electrodes supported by said lead-in wires, insulating projections extending from said stem and surrounding said lead-in wires, a formed tube having two substantially straight parallel portions encircling said electrodes and in part enclosing said insulating projections, and an intermediate portion through which the low voltage discharge between electrodes takes place, the path between electrodes through said intermediate portion being shorter than the path between electrodes through said straight parallel portions, and means for supporting said formed tube from said stem.
- CHAS. J. KAYKO.