

GASEOUS ELECTRIC DISCHARGE DEVICE

Filed Jan. 23, 1934

Fig. 1

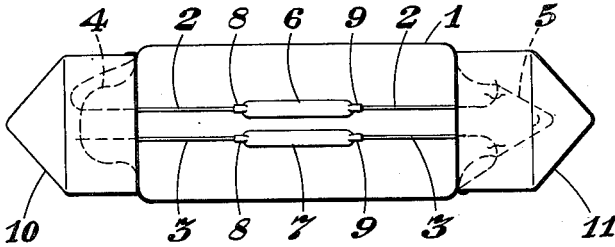


Fig. 2

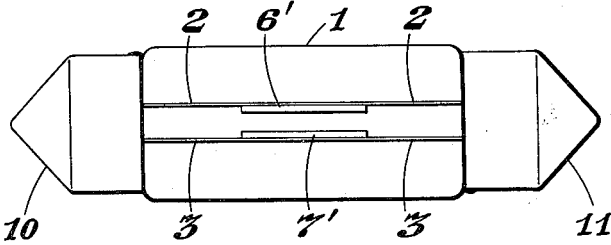
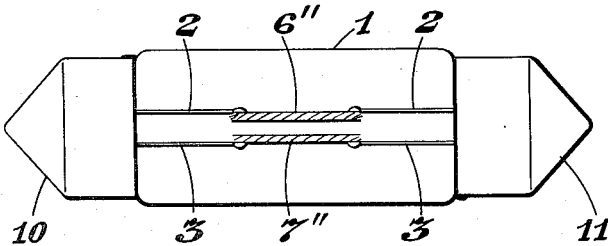


Fig. 3



Inventor:

Peter Herre, Deceased,

By. Margarete Herre, née Erpel,

Gerda Herre,

Ursula Herre, Heirs.

BY *Harry E. Dunham*

ATTORNEY

UNITED STATES PATENT OFFICE

1,994,312

GASEOUS ELECTRIC DISCHARGE DEVICE

Peter Herre, deceased, late of Berlin-Fichtenau, Kreis Niederbarnim, Germany, by Margarete Herre, née Erpel, Gerda Herre and Ursula Herre, heirs, Berlin-Fichtenau, Kreis Niederbarnim, Germany, assignors to General Electric Company, a corporation of New York

Application January 23, 1934, Serial No. 707,984
In Germany February 2, 1933

4 Claims. (Cl. 176—122)

The present invention relates to gaseous electric discharge devices generally and more particularly the invention relates to such devices of the negative glow type commonly known in the art as cathode glow lamps.

The object of the present invention is to provide a cathode glow lamp of small size and of simple and sturdy structure, the manufacturing cost of which is reduced to a minimum. 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.

In accordance with these objects of the new and novel cathode glow lamp comprises a tubular container and electrodes mounted on support wires sealed into the opposite ends of said tubular container. Each of said support wires is parallel to the longitudinal axis of said tubular container and the electrodes are mounted on the central portion of said support wires. One end of each of said support wires is broken off close to the point where it emerges from the end of said container and the other end thereof is connected to a base attached to said container as by being cemented thereto.

In the drawing accompanying and forming part of this specification three embodiments of this invention are illustrated, in which

Fig. 1 is a side elevational view of one embodiment of the invention,

Fig. 2 is a similar view of another embodiment of the invention, and

Fig. 3 is a similar view of still another embodiment of the invention.

Like numbers denote like parts in all the figures.

Referring to Fig. 1 of the drawing the new and novel cathode glow lamp comprises a tubular container 1 having a gaseous filling therein comprising neon, argon, helium, krypton, or xenon, or mixtures of these gases with each other or with a metal vapor, such as mercury vapor. Electrically conducting support wires 2 and 3 are mounted in said container 1 by sealing the ends thereof in the ends 4 and 5 of said container 1. Said wires 2 and 3 are parallel to each other in said container 1. Two cylindrical electrodes 6 and 7 of aluminum, iron, or nickel, for example, are mounted on the mid-portion of said wires 2 and 3 respectively and are clamped thereon by pinching the end parts 8 and 9 of both said electrodes 6 and 7. Said wires 2 and 3 consist of a conducting material, such as iron, nickel, copper, or the like and can also be a composite wire consisting

of an iron-nickel core having a copper sheath commonly used as current leads in gaseous electric discharge devices due to its excellent sealing qualities with various glasses, such as lead glass.

Cylindrical bases 10 and 11 are attached to ends 4 and 5 respectively of said container 1. One end of said wire 2 extends beyond the outer wall of the end 4 of said container 1 and is connected to the base 10, as by welding or soldering these parts together. Similarly, one end of wire 3 extends beyond the outer wall of the end part 5 of said container 1 and is connected to the base 11.

The structure of the embodiment of the invention illustrated in Fig. 2 is similar in all respects to that illustrated in Fig. 1 except that in this embodiment the electrodes 6' and 7' are of plate shape and are soldered or welded to said wires 2 and 3.

In the embodiment of the invention illustrated in Fig. 3 the electrodes 6'' and 7'' consist of twisted, stranded wires shaped in the form of a single wire and are welded or soldered into the mid-section of said wires 2 and 3 respectively in such manner that said electrodes 6'' and 7'' form the mid-section of said wires 2 and 3 respectively. In other respects the structure of this embodiment is the same as that illustrated in Figs. 1 and 2 of the drawing.

The electrodes in all three of the embodiments of the invention are coated with an electron emitting material, such as the earth alkali metals or combinations of these metals, particularly barium oxide, when desired. The form of the electrodes illustrated in Fig. 3 is particularly well suited for the application of electron emitting material thereto as such material penetrates the interstices between the stranded wires to form a reservoir of electron emitting material to replenish the coating of said material on the discharge supporting surface of said electrodes 6'' and 7''.

The container 1 is exhausted through the nipple shaped end 5 thereof which end 5 is sealed-off after the container 1 has first been exhausted and filled with the desired gaseous atmosphere, such as neon. The new and novel cathode glow lamp lends itself readily to manufacture by automatic or semi-automatic machinery due to its simple structure which reduces the manufacturing cost thereof to a minimum and the sturdy structure thereof simplifies the transportation problems in connection with such devices. The cathode glow lamp can have very small dimensions which is of great advantage in mounting the lamp.

While there have been shown and described and

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 is claimed as new and desired to secure by Letters Patent of the United States is:—

1. A cathode glow lamp comprising a tubular container having a base mounted on each of its ends, electrodes and electrode leads sealed therein, a gaseous atmosphere therein, said electrode leads extending the full length of said tubular container parallel to the longitudinal axis of said container, the ends of said leads being sealed into the ends of said container, each of said leads being attached to one of said bases other than that to which the other of said leads is attached, said electrodes being mounted in opposite, parallel positions on said leads, the distance between said electrodes being less than the distance between said leads.

2. A cathode glow lamp comprising a tubular container having a base mounted on each of its ends, electrodes and electrode leads sealed therein, a gaseous atmosphere therein, said electrode leads extending the full length of said tubular container parallel to the longitudinal axis of said container, the ends of said leads being sealed into the ends of said container, each of said leads being attached to one of said bases

other than that to which the other of said leads is attached, said electrodes being hollow tubes clamped in opposite, parallel positions on said leads.

3. A cathode glow lamp comprising a tubular container having a base mounted on each of its ends, electrodes and electrode leads sealed therein, a gaseous atmosphere therein, said electrode leads extending the full length of said tubular container parallel to the longitudinal axis of said container, the ends of said leads being sealed into the ends of said container, each of said leads being attached to one of said bases other than that to which the other of said leads is attached, said electrodes being plates attached in opposite, parallel positions on said leads.

4. A cathode glow lamp comprising a tubular container having a base mounted on each of its ends, electrodes and electrode leads sealed therein, a gaseous atmosphere therein, said electrode leads extending the full length of said tubular container parallel to the longitudinal axis of said container, the ends of said leads being sealed into the ends of said container, each of said leads being attached to one of said bases other than that to which the other of said leads is attached, said electrodes being stranded wires forming the mid-sections of said leads.

MARGARETE HERRE, NÉE ERPEL,
GERDA HERRE,
URSULA HERRE,

Heirs of the Estate of Peter Herre, Deceased.