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G. GAIDIES ET AL

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GASEOUS ELECTRIC DISCHARGE DEVICE

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Fig. 1

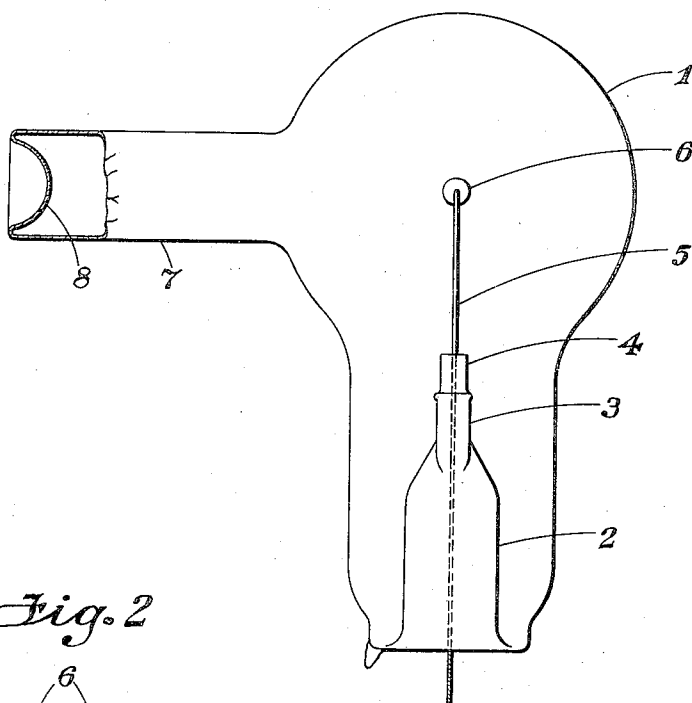
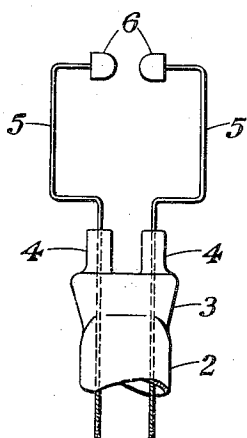


Fig. 2



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GASEOUS ELECTRIC DISCHARGE DEVICE

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In Germany December 21, 1931

3 Claims. (Cl. 176—123)

The present invention relates to gaseous electric discharge devices generally and more particularly the invention relates to such devices useful in the act of spectrometry.

5 It is the practice in the spectrometry art to employ an electric discharge arc lamp having iron electrodes in order to obtain an iron arc which is of particular value in this art for measuring purposes.

10 The object of the present invention is to provide an electric discharge arc lamp useful in the arts generally and particularly in the art of spectrometry. 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 its use and operation will be apparent to those skilled in the art and from the following particular description and from the appended claims.

20 In accordance with these objects the invention comprises a bulb-like container in which the electrodes of the arc lamp are sealed. An elongated tubular appendage is fused to the wall of the container adjacent said electrodes and said appendage extends outwardly from said container. Said appendage has at the external end thereof an observation window having desired light transmitting characteristics. As the window is at a greater distance from the electrodes of the device than the range of the sputtered particles from the electrodes, said window is not coated with a deposit of such sputtered material and the device is useful even though the walls of the bulb-like container have an opaque coating of sputtered electrode material thereon.

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

40 Fig. 1 is a side elevational view of the new and novel gaseous electric discharge arc lamp device, and

Fig. 2 is a detail view of the electrodes for said device.

Referring to the drawing the new and novel arc lamp device comprises a bulb-like container 1 having a stem 2 fused therein. Electrode leads 5 for the electrodes 6 are sealed into the pinch-part 3 of said stem 2 and said leads are led through the tubular projections 4 of said stem 2. Said electrodes 6 are separated a slight distance from each other as shown. A tubular appendage 7 is fused to the wall of said container 1. The longitudinal axis of said appendage 7 is at right angles to the arc discharge path between said electrodes 6. Said appendage 7 is closed by

a cup shaped window 8. Said window 8 is of quartz or other light transmitting material having desired light transmitting characteristics and said window is set into said appendage 7 by fusion, or by means of a ground joint, or by cementing, as desired. The curved, or cupped shape of said window 8 facilitates the fusing in operation where that method of attaching said window 8 to said appendage 7 is used and permits glasses of slight structural strength to be used where any method of attachment is used. It will be understood, of course, that more than one appendage 7 can be attached to said container 1.

Said electrodes 6 are made of a pressed, sintered mass of iron, or iron compound and electron emitting material. A mixture consisting of 50 parts iron oxide and 50 parts barium oxide, or a mixture of 90 parts iron powder and 10 parts calcium oxide is suitable for making the electrodes 6. These materials are first pulverized, mixed, pressed and then sintered at a high temperature which makes said electrodes 6 of high structural strength to reduce the rate of sputtering thereof to a minimum to prolong the life of the arc lamp device.

The container 1 has a gaseous filling therein comprising a rare gas, an inert common gas, or a metal vapor, or mixtures of the foregoing, as desired, at a desired pressure.

The arc lamp device is startable by means well known in the art as by auxiliary electrodes, induction coils, or electrode heaters, but it is preferable to space the electrodes 6 in such manner that the arc discharge starts between them on the voltage of the current source for the device, such as 110 or 220 volts.

The above described device has a long useful operating life, is stable in operation, and produces a sharply defined iron spectrum as we have demonstrated by actual use.

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

1. An electric discharge iron arc lamp device comprising a bulb-like container, electrodes sealed therein, a gaseous atmosphere therein, a tubular appendage attached to said container, the longitudinal axis of said appendage being at right angles to the discharge path between said electrodes, said appendage being closed at its exterior end by a window, said electrodes consisting of a mixture of iron and electron emitting material.

2. An electric discharge iron arc lamp device comprising a bulb-like container, electrodes sealed therein, a gaseous atmosphere therein, a

tubular appendage attached to said container, the longitudinal axis of said appendage being at right angles to the discharge path between said electrodes, said appendage being closed at its exterior end by a cup-shaped window, said electrodes consisting of a mixture of 50 parts iron oxide and 50 parts barium oxide.

3. An electric discharge iron arc lamp device comprising a bulb-like container, electrodes sealed therein, a gaseous atmosphere therein, a

tubular appendage attached to said container, the longitudinal axis of said appendage being at right angles to the discharge path between said electrodes, said appendage being closed at its exterior end by a cup-shaped quartz window, said electrodes consisting of a mixture of 90 parts iron powder and 10 parts calcium oxide.

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