

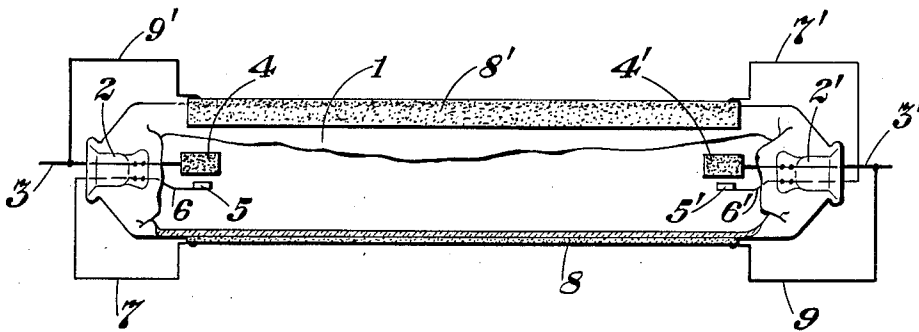
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H. EWEST ET AL

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GASEOUS ELECTRIC DISCHARGE DEVICE

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UNITED STATES PATENT OFFICE

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GASEOUS ELECTRIC DISCHARGE DEVICE

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The present invention relates to gaseous electric discharge devices generally and more particularly the invention relates to methods and means for starting such devices into operation.

It is now known in the art that the starting of gaseous electric discharge devices is facilitated by arranging an auxiliary electrode adjacent the main electrode and connecting such auxiliary electrode through a resistance to the main electrode opposite that main electrode to which said auxiliary electrode is adjacent. The starting of such devices is not absolutely certain for although the auxiliary discharge between each of the main electrodes and its adjacent auxiliary electrode ionizes the gaseous filling in the region of the electrodes the entire gaseous discharge path between said main electrodes is not completely ionized this being true particularly in those devices having a long gaseous discharge path.

The object of the present invention is to completely ionize the gaseous discharge path between the main electrodes of a gaseous electric discharge device provided with auxiliary electrodes. Further objects and advantages attaching to the invention and to its use and operation will be apparent to those skilled in the art from the following particular description and from the appended claims.

The invention attains its object by providing an external electrically conducting body on the container. Said body extends along the discharge path between the main discharge supporting electrodes and serves as the resistance for the auxiliary electrodes. As in previous devices of this type an electric discharge takes place between the main electrodes and the auxiliary electrodes adjacent thereto which ionizes the gas in the region of the electrodes and another extended discharge takes place between the external strips and the main electrodes which ionizes the gas in the discharge path between said main electrodes. The gaseous electric discharge device is thus quickly and positively started into operation.

In the drawing accompanying and form-

ing part of this specification an embodiment of the invention is shown in the side elevational view, part of said container being broken away to show the arrangement of the electrodes.

Referring to the drawing the gaseous electric discharge device comprises a container 1 filled with a discharge conducting gaseous atmosphere such as a rare gas, a common gas, a metal vapor, or a mixture of these such as a mixture of argon and mercury vapor. Said container 1 has stems 2 and 2' sealed therein one at each end thereof. Electrode leads 3 and 3' carrying said electrodes 4 and 4' are sealed into said stems 2 and 2' respectively. Said electrodes 4 and 4' are self-heating, electron emitting electrodes made of a sintered mixture of high melting point metal, such as tungsten, and electron emissive material, such as barium oxide, known in the art as Pirani electrodes, or any other suitable type of thermionic or cold electrode is used as desired. Auxiliary electrodes 5 and 5' are adjacent said main electrodes 4 and 4' respectively and said electrodes 5 and 5' consist of the same material as said electrodes 4 and 4'. Electrode leads 6 and 6' of said electrodes 5 and 5' are sealed into said stems 2 and 2' respectively. Said lead 6 is connected by lead 7 to an electrically conducting strip 8 on the outer wall of said container 1. Said strip 8 is of graphite or metal particles fused into the outer wall of said container 1 and extending along said container 1 between said main discharge supporting electrodes 4 and 4'. Lead 3' of said electrode 4' is connected to said strip 8 by lead 9. Auxiliary electrode 5' is connected by lead 6' and 7' to another strip 8' similar in all respects to said strip 8. Main electrode 4 is connected to said strip 8' by leads 3 and 9'.

When a potential of approximately 110 or 220 volts is applied across the terminals of the new and novel gaseous electric discharge device disclosed above an intense arc discharge takes place between the main electrodes 4 and 4' and the auxiliary electrodes 5 and 5' respectively which ionizes the gas in the region of said electrodes. An electric

discharge likewise takes place between said strip 8 and said main electrode 4 and between said strip 8' and said electrode 4' and each of said discharges extends along the length of the discharge path between said electrodes 4 and 4' to ionize the gas in said path which facilitates the starting of the positive column discharge in said device. The electric discharge device is thus started into operation quickly and positively.

While we have shown and described and have 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, for example, said strips 8 and 8' have, when desired, a highly polished surface to serve as reflectors and are separated but a slight distance from each other and said strips 8 and 8' are located on the inner walls of said container 1 where desired.

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

1. A gaseous electric discharge device comprising a container, electrodes sealed therein, a gaseous atmosphere therein, at least two of said electrodes being main discharge supporting electrodes, another of said electrodes being an auxiliary electrode located adjacent one of said main discharge supporting electrodes and connected to the other of said main electrodes through a resistance comprising an electrically conducting strip applied to the wall of said container and extending along the discharge path in said device.

2. A gaseous electric discharge device comprising a container, electrodes sealed therein, a gaseous atmosphere therein, at least two of said electrodes being main discharge supporting electrodes, two other of said electrodes being auxiliary electrodes, each of said auxiliary electrodes being adjacent one of said main discharge supporting electrodes and connected to the other of said main electrodes through a resistance comprising an electrically conducting strip applied to the wall of said container and extending along the discharge path in said device.

3. A gaseous electric discharge device comprising a container, electrodes sealed therein a gaseous atmosphere therein, at least two of said electrodes being main discharge supporting electrodes, another of said electrodes being an auxiliary electrode located adjacent one of said main discharge supporting electrodes and connected to the other of said main electrodes through a resistance comprising an electrically conducting graphite strip applied to the wall of said container and

extending along the discharge path in said device.

In witness whereof, we have hereunto set our hands this 9th day of August 1932.

HANS EWEST.

GEORG GAIDIES.

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