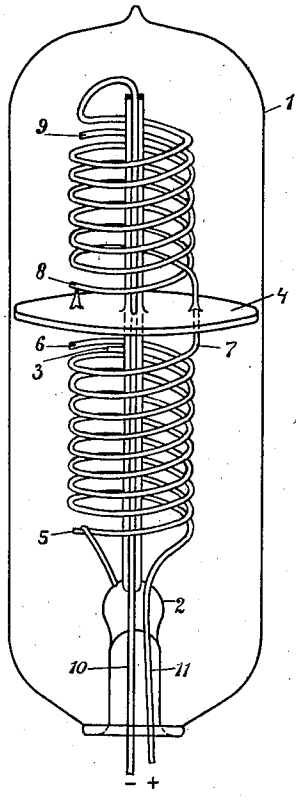
Feb. 15, 1927. 1,617,684

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ELECTRIC GAS FILLED DISCHARGE DEVICE

Filed Feb. 8, 1922



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Patented Feb. 15, 1927. 1,617,684

UNITED STATES PATENT OFFICE.

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ELECTRIC GAS-FILLED DISCHARGE DEVICE.

Application filed February 8, 1922, Serial No. 534,982, and in the Netherlands February 9, 1921.

The invention relates to gas filled discharge devices and particularly to those discharge tubes in which a luminous glow discharge is made use of for illumination purposes.

For regulating and limiting the current in such glow discharge devices a resistance is generally connected in series with the path of discharge. Obviously a great deal of the energy used by the device is lost in this series-resistance and it is the object of the invention to reduce this loss of energy and to provide a more efficient device.

As is apparent from earlier applications, we have succeeded in materially reducing the ignition tension of glow discharge devices but though this invention is very useful for facilitating the ignition of the device it does not increase the efficiency of the device.

According to this invention two or more paths of glow discharge are connected in series in the same device. It will be apparent that with such lamps the dimensions of the series-resistance are materially reduced or even such resistances may be wholly omitted.

In the accompanying drawing an embodiment of the invention is diagrammatically represented.

The drawing represents a glow discharge device in view in which two paths of discharge are connected together in series.

The glass bulb is represented by 1 and may be filled with a suitable filling of rare gas, e. g. neon or a mixture of rare gases. The electrodes 5, 6, 8 and 9 are made of the ordinary electrode material such as iron and wound in the form of spirals. The electrodes 6 and 8 are connected to current leads 10 and 11, whereas the electrodes 5 and 9 are connected together by means of the metallic wire 7. The current leads or terminals 10 and 11 are sealed into a glass stem 2; terminal 10 is led through a hollow glass tube in order to prevent discharges between this terminal and the electrode 6. For preventing a discharge between the electrodes 6 and 8 a plate 4 of glass, mica or like material is sealed or fastened to the tube and the metallic wire 7 is sealed through this plate 4.

The terminals 10 and 11 are connected to a suitable source of alternting or direct current and with or without the insertion of a series-resistance.

Though according to the drawing only two paths of discharge are connected in series, we have been able to so far reduce the ignition tension of each pair of electrodes that even three pairs of electrodes may be connected in series on an alternating current circuit of 220 volts. A glow discharge is thus formed on three cathodes at once, and the efficiency of the lamp is thrice as great as the efficiency of an ordinary glow discharge lamp.

What we claim is:

1. An electric device with independent glow discharge comprising a gas-filled container, at least two pairs of electrodes within said container, the electrodes of each pair extended parallel and of contrary polarity to constitute each a discharge gap, said discharge gaps being connected in series, and means for preventing initiation of a glow discharge between electrodes belonging to different gaps.

2. An electric device with independent glow discharge comprising a gas-filled container, at least two pairs of electrodes within said container, the electrodes of each pair extended parallel and of contrary polarity to constitute each a discharge gap, said discharge gaps being connected in series, and a discharge insulating separator within the tube between adjacent electrodes of the respective pairs, whereby to prevent a discharge short-circuiting said gaps.

3. An electric device with independent glow discharge comprising a gas-filled container, at least two pairs of electrodes within said container, each of which pairs constitutes a discharge gap, said discharge gaps being connected in series, and a screen disposed between each pair of adjacent discharge gaps which substantially divides the inner room of the container into sections.

4. An electric device with independent glow discharge comprising a sealed container, opposite leading-in wires entering the same end of said container, and one of them

extended through toward the other end thereof, the container having an insulating tube enclosing the latter wire, at least two pairs of electrodes within said container, each of which pairs serves as a discharge gap, said discharge gaps being connected in series, and means for preventing the initiation of a glow discharge between electrodes belonging to different gaps.

In testimony whereof we affix our signatures.

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