

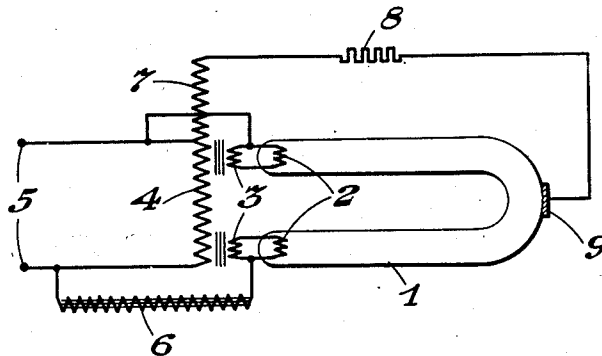
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GASEOUS ELECTRIC DISCHARGE DEVICE

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GASEOUS ELECTRIC DISCHARGE DEVICE

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2 Claims. (Cl. 176—124)

The present invention relates to gaseous electric discharge devices generally and more particularly the invention relates to the starting and operating circuits for such devices.

5 Gaseous electric discharge lamp devices having thermionic electrodes which electrodes are connected to a transformer to supply the heating current therefor are operable on low voltage circuits, such as 110 or 220 volts, and can be
10 started into operation by an auxiliary electrode. The length of discharge devices which can be started successfully on a particular voltage of the current source can be increased by applying a
15 higher voltage to the auxiliary electrode than the voltage of the current source for said device.

The object of the present invention is to provide a simple, efficient, practical starting and operating circuit for a gaseous electric discharge device having thermionic electrodes and an auxiliary, starting electrode. Still further objects
20 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.

25 In accordance with this object the new and novel circuit comprises a gaseous electric discharge device having electrodes which are electron emitting when heated and an auxiliary electrode along the discharge path between said
30 electron emitting electrodes, a current source for said device and a transformer connected across the terminals of said current source to supply the heating current for said electron emitting electrodes which transformer has a special coil
35 to supply a higher voltage to the auxiliary electrode of the device than that supplied to the gaseous electric discharge device by said current source. Said auxiliary electrode is connected to said special transformer coil through an im-
40 pedance, when desired.

In the drawing accompanying and forming part of this specification an embodiment of the invention is shown schematically.

Referring to the drawing the new and novel
45 apparatus comprises a gaseous electric discharge lamp device comprising a U-shaped container 1 having an electron emitting electrode 2 sealed into each end thereof, a gaseous filling therein, such as neon and having an external, auxiliary
50 electrode 9 mounted at the curved part thereof. Each of said electrodes 2 consists of a coiled metal filament, such as a tungsten or a nickel filament, coated or impregnated with an electron emitting material, such as barium oxide.

55 Each of said electrodes 2 are connected across

the terminals of a secondary 3 of the transformer 3, 4 the primary 4 of which is connected across the terminals 5 of an alternating current source of 220 volts. Said transformer 3, 4 supplies the heating current to rapidly raise to and maintain
5 said electrodes 2 at an electron emitting, discharge supporting temperature. Said current source supplies the discharge current for the main discharge between said electrodes 2 in said
10 container 1 and said discharge device is connected across the terminals 5 of said current source through the choke-coil 6 which is in series with said device.

Said transformer 3, 4 has a special winding 7 in which a higher voltage than the voltage of
15 said current source 5 is induced. For example, the voltage supplied by the winding 7 is 400 volts when the voltage of the current source 5 is 220 volts. One end of said winding 7 is connected
20 to one end of the transformer 4 and the other end thereof is connected to the auxiliary electrode 9 through the resistance 8. The auxiliary electrode 9 is mounted on the outside of the container 1 and has a capacitive effect on the discharge. In this case the resistance 8 is omitted,
25 when desired. Said auxiliary electrode 9 is sealed in the container 1, when desired, and in this case current flow through said auxiliary electrode 9 is limited by the resistance 8 which has a value of approximately 100,000 to 1,000,000
30 ohms, when desired. The gaseous electric discharge lamp device in the above described circuit is quickly started into operation.

While I have shown and described and have pointed out in the annexed claims certain novel
35 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
40 the broad spirit and scope of the invention, for example, the winding 7 is of comparatively thin wire, when desired, since the current carried thereby is very small; other types of electron emitting electrodes, such as the Hull cathode,
45 are used in place of those shown and described, when desired, and the gaseous atmosphere consists of or comprises a metal vapor, such as mercury, sodium, magnesium, cadmium or zinc vapor; a mixture of gases, a mixture of metal
50 vapors or a mixture of a starting gas and metal vapor, such as a mixture of argon and mercury vapor, or neon and sodium vapor, when desired.

What I claim as new and desire to secure by Letters Patent of the United States is:—
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1. A starting and operating circuit for a gaseous electric discharge device comprising a container, a gaseous atmosphere therein, thermionic electrodes sealed therein, an auxiliary electrode associated therewith, said circuit comprising an alternating current source, a transformer connected across the terminals of said current source to supply the heating current for said thermionic electrodes, a special winding on said transformer to supply a higher voltage than that supplied by said current source, said auxiliary electrode being connected to said special winding, said discharge device being connected across the terminals of said current source.
2. A starting and operating circuit for a gaseous electric discharge device comprising a container, a gaseous atmosphere therein, thermionic electrodes sealed therein, an auxiliary electrode sealed therein, said circuit comprising an alternating current source, a transformer connected across the terminals of said current source to supply the heating current for said thermionic electrodes, a special winding on said transformer to supply a higher voltage than that supplied by said current source, said auxiliary electrode being connected to said special winding through a resistance, said discharge device being connected across the terminals of said current source.

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