Sept. 27, 1932. S. SCOGNAMILLO ET AL 1,879,544

ELECTRON DISCHARGE DEVICE

Original Filed April 9, 1928

Fig. 1.

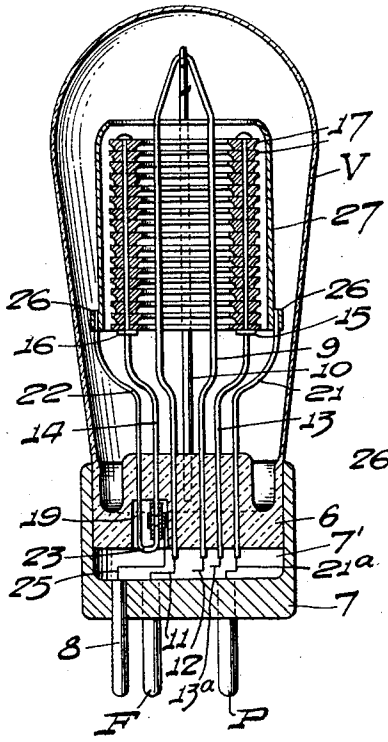



Fig. 3.

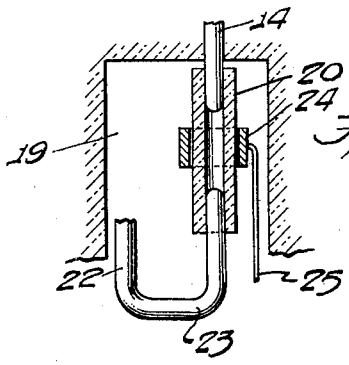



Fig. 2.

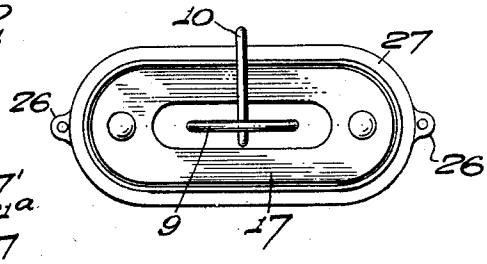



Fig. 4.

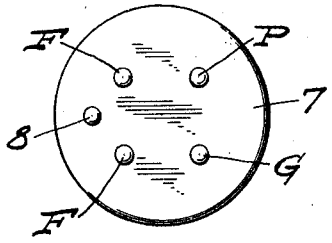
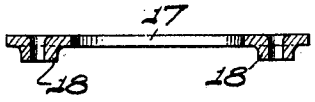



Fig. 5.




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# UNITED STATES PATENT OFFICE

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## ELECTRON DISCHARGE DEVICE

Original application filed April 9, 1928, Serial No. 268,705. Divided and this application filed July 21, 1931. Serial No. 552,257.

This invention relates to improvements in electron discharge devices such as those adapted for use in radio telephony and telegraphy and embodying a cathode, a grid and a plate, it being a division of our prior application, Serial No. 268,705, filed April 9, 1928.

The primary object of this invention is the provision of an electron discharge device in which one terminal each of the grid and plate is connected through a condenser and to an additional prong or pin upon the base of the device, the condenser supplementing the inherent capacity existing between the grid and plate, the electrostatic capacity of the condenser being such that tubes equipped therewith can be made more exactly alike, and enabling improved operation of the device to be obtained.

In the accompanying drawing:

Fig. 1 is a sectional view through the evacuated vessel and the base of an electron discharge device embodying the present invention;

Fig. 2 is a top plan view of the electrodes of the device;

Fig. 3 is an enlarged detail sectional view of the condenser connection between the terminals of the grid and plate;

Fig. 4 is a bottom plan view of the device; and

Fig. 5 is a longitudinal sectional view through one of the grid parts.

The present invention is shown in the present instance applied to an electron discharge device wherein, as shown in the drawing, the numeral 6 designates the base portion of the tube V which is adapted to seat within the socket member 7 so as to provide a cavity 7′ therein. This member is provided with the respective prongs or terminals P, G, F and 8, there being two of the prongs F as usual, and one each of the prongs P and G. The purpose of the prong 8 will appear as the description proceeds.

The filament or cathode 9 is supported by the standard 10 mounted in the base 6, the terminals 11 and 12 of the filament being connected, respectively, to the pins or prongs F, as is usual.

The two rods 13 and 14 of the grid are mounted in the base 6 and project upwardly and are bent outwardly, there being provided upon them the limiting disks 15 and 16, respectively, which receive the various elongated annular rings or plates 17 throughout the length and in spaced relation, as illustrated in Fig. 1, the apertured bosses 18 of each plate acting as a supporting and spacing means for the same. The open portion of these rings permits the proper disposition of the cathode or filament 9 and the positioning of the superposed and spaced plates or parts of the grid develops a greater and higher amplification due to the given space between each plate or part, thus increasing the area of the grid considerably.

The terminal $13^a$ is adapted to be connected to the pin G while the end of the terminal 14 projects within the cavity 19 in the underface of the base 6 and is enclosed in the glass tube 20 which forms part of a condenser, as will presently appear.

Also mounted in the base 6 and projecting within the vacuum tube V are the two rods 21 and 22, the rod 21 being connected to the pin P by the connection $21^a$, while the lower end of the rod 22 is bent, as at 23, and projected into the lower end of the tube 20, which, with the annular ring 24 surrounding the same, with the terminal 14, forms a condenser for the grid and plate or two cold electrodes, a conductor 25 connecting the ring 24 to the pin 8. The condenser will thus act to supplement the inherent capacity existing between the grid and plate, and will thus permit the making of tubes more nearly alike and thus insure better operation. The pin 8 is connected in the circuit so that the ring 24 inductively affects the condenser and produces a sensitive tube without any humming or undue oscillation.

The outer electrode or plate 27 is made in the form of an open elliptical sleeve or cylinder slightly curved at the top and provided with the supporting apertured lugs 26 for receiving, respectively, the free ends of the rods 21 and 22.

From the foregoing description, taken in connection with the drawing, it is evident

that with an electron discharge device constructed according to and embodying the present invention, with the condenser arrangement disposed in the base 6, a device of improved operating qualities and higher amplification is provided and one which is also rugged in construction, and, therefore, is not easily put out of order.

We claim as our invention:—

1. An electron discharge device including a base, an evacuated vessel carried thereby, a cathode and two electrodes, a condenser, one of the respective terminals of the two electrodes being connected to said condenser, a metal ring disposed in inductive relation to the condenser, and five prongs connected to the base and connected two to the cathode, one each to the electrodes, and one to the ring.

2. An electron discharge device including an evacuated vessel, a cathode and two electrodes, a condenser, one of the respective terminals of each of the two electrodes being connected to said condenser, said condenser including a tubular insulator for receiving terminals of the respective electrodes and in spaced relation, and a metal ring surrounding the insulator in inductive relation to both of said terminals.

3. An electron discharge device including a base, an evacuated vessel, five prongs carried by the base, a cathode and two electrodes, a condenser, one of the respective terminals of each of the two electrodes being connected to said condenser, said condenser including a tubular insulator for receiving terminals of the respective electrodes and in spaced relation, and a metal ring surrounding the insulator in inductive relation to both of said terminals, two of the prongs being connected to the cathode, one to each electrode, and one to the metal ring.

In testimony whereof we have hereunto set our hands.

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PAUL ARNDT.