Sept. 3, 1946. F. D. GOODCHILD 2,406,827

ELECTRON DISCHARGE DEVICE

Filed Oct. 28, 1942

Fig. 3.

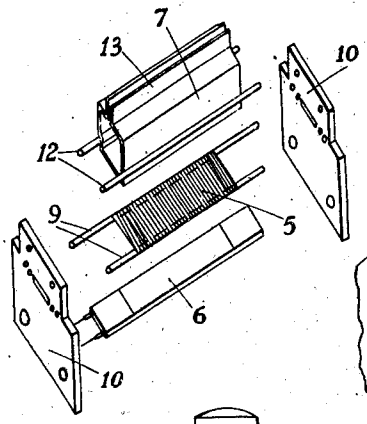


Fig. 2.

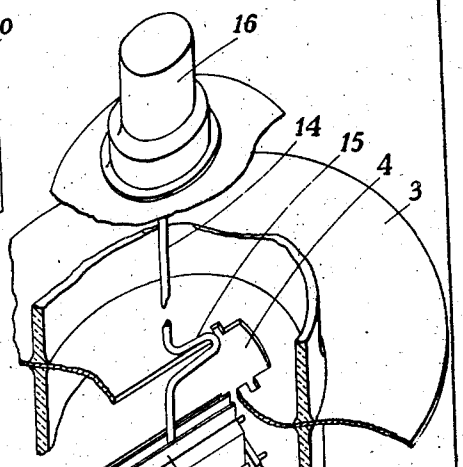
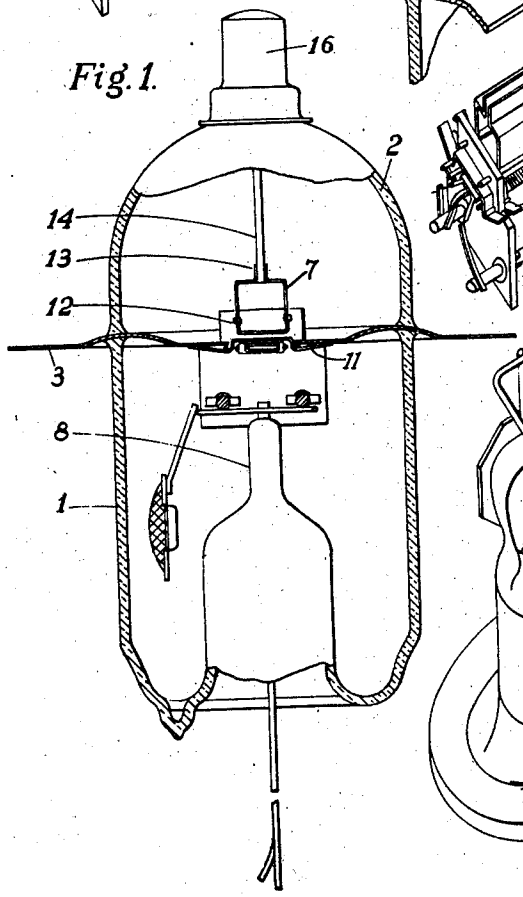
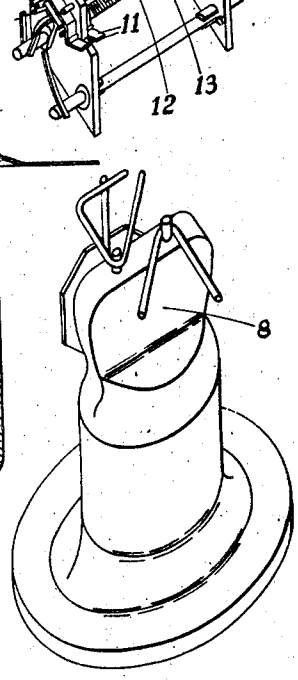


Fig. 1.





INVENTOR
F. D. Goodchild

BY
Loyd Hall Sutton
ATTORNEY

Patented Sept. 3, 1946

2,406,827

UNITED STATES PATENT OFFICE

2,406,827

ELECTRON DISCHARGE DEVICE

Frank Douglas Goodchild, London W. C. 2, England, assignor to Standard Telephones and Cables Limited, London, England, a British company

Application October 28, 1942, Serial No. 463,697
In Great Britain December 2, 1941

3 Claims. (Cl. 250—27.5)

1

This invention relates to electron discharge tubes for high frequencies and is a modification of the invention described in United States application Serial No. 457,790.

In that application there is disclosed a disc-seal type of tube in which the complete assembly of anode, cathode and grid are mounted on a stem which is then sealed into the envelope so that the two electrodes which it is necessary to shield, namely the anode and cathode, appear on opposite sides of the disc. The anode stem in that case was in the form of a tubular copper member which was previously sealed into the other end of the bulb to provide an open-ended tube for connection to the anode.

I have now found that for somewhat longer wave-lengths an ordinary carbonised nickel anode may be employed and in accordance with this invention the anode together with its lead wire is assembled as a unitary structure with the cathode-grid assembly, which is mounted on the stem sealed in one envelope portion on one side of the screening disc, and the anode lead is sealed into the other envelope portion as the final operation in assembly.

The invention will be better understood with reference to the accompanying drawing, in which

Fig. 1 is a sectional elevation of the complete tube;

Fig. 2 is an exploded view thereof; and

Fig. 3 is an exploded view of the cathode, grid and anode assembly.

In the drawing, 1 and 2 represent the cylindrical glass envelope portions and 3 the copper screening disc which is sealed between them and which projects well beyond the glass envelope portions to form an effective screen between the two halves of the tube, and also to provide a mounting device for connecting the tube directly in the grid circuit. The centre of the disc is provided with an aperture 4 to accommodate the grid 5. This grid 5, together with the cathode 6 and the anode 7 is mounted on the pinch 8 in the envelope portion 1. The grid is wound around two spaced grid supporting rods indicated at 9, carried by mica end plates 10 and provided with contant springs 11 to make contact with the screening disc on assembly.

The anode 7 is formed of carbonised nickel sheet which, in the assembly shown, is bent to a box-like form and provided with two rods 12 welded to the sides, whereby the anode is assembled to and properly located in the mica end-pieces 10. Between the pair of upwardly-extending flange portions 13 is welded the anode lead 14 which consists of a wire suitable for sealing into

2

glass and which may be provided with a loop portion 15 for resilience.

Thus the complete cathode, grid and anode assembly are mounted on the pinch 8 which is sealed into the envelope portion 1 so that the grid springs 11 make contact with the copper disc 3 and the cathode and anode thus appear on opposite sides of the disc. The anode lead 14 is then sealed into the envelope portion 2 as a final operation in assembly, and the valve may be terminated with a small metal top cap 16 to which the anode lead is connected in normal manner.

What is claimed is:

1. An electron discharge tube comprising an envelope, a metallic screening disc sealed across and extending outside said envelope whereby the input and output sides of the tube are effectively screened, said screening disc having an aperture, a grid across said aperture and electrically connected with said screening disc, a cathode on one side of said grid and an anode on the other side thereof, and means on one side of said screening disc supporting said grid, cathode and anode together with an anode lead as a unitary structure in said envelope, said anode lead being sealed through the envelope on the opposite side of said screening disc.

2. An electron discharge tube comprising an envelope with an apertured metallic screening disc sealed across and extending outside said envelope whereby the input and output sides of the tube are effectively screened, a grid, cathode, anode and anode lead mounted together as a unitary structure, a stem member on which said unitary structure is mounted and sealed into the envelope on one side of the screening disc, the anode lead being sealed through the envelope on the opposite side of screening disc and means electrically connecting said grid and said screening disc.

3. An electron discharge tube comprising a metallic screening disc having an aperture therein, a glass envelope portion sealed to one side of said disc, a second glass envelope portion sealed to the other side of said disc, an anode grid and cathode mounted together as a unitary structure, a stem on which said unitary structure is supported, said anode being passable through the aperture in said screening disc, spring contact means making electrical contact between said grid and said screening disc when the stem is sealed into said first mentioned glass envelope portion, and a resilient wire lead connected to the anode and sealed through said second glass envelope portion.

FRANK DOUGLAS GOODCHILD.