Feb. 8, 1938. J. L. H. JONKER 2,107,333

ELECTRON DISCHARGE DEVICE

Filed July 30, 1936

Fig. 1

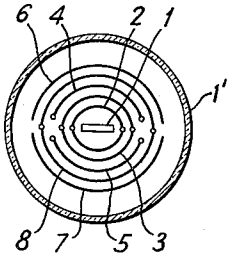
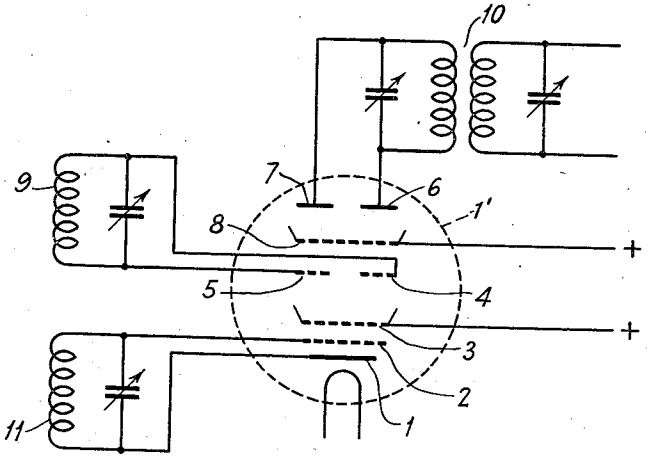


Fig. 2



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ELECTRON DISCHARGE DEVICE

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4 Claims. (Cl. 250—27.5)

This invention relates to multi-grid electric discharge tubes having combined functions and to a circuit arrangement including such a tube. The tubes of the type involved are most commonly known as the pentode, hexode, pentagrid and octode.

Tubes of this kind are generally satisfactory, but it has been found that these tubes sometimes do not satisfy all requirements. Thus, the use of, for example, a hexode or an octode as a mixing tube has been found to be unsatisfactory due to the fact that the local oscillations generated by this valve become manifest in the antenna, or else that the oscillations retained in the antenna are received directly on the intermediate frequency wave.

It is the principal object of my invention to provide an improved electron discharge tube of the multi-grid type particularly suitable for use as a converter or mixer tube and circuit therefore.

It has been found that in the above case and also in other cases these difficulties may be avoided by the use of a multi-grid discharge tube made according to the invention in which at least one grid and the anode are formed by two or more parts electrically separated from each other, each of them being connected to separate supply conductors.

This tube construction offers the advantage of removing in a simple manner various difficulties occurring heretofore. Thus, for example, it is possible to avoid instabilities, the reaction in the antenna and direct reception on the medium frequency wave by providing the separate parts of the grid and of the anode with separate leadins connected to separate sources of current supply and causing them to counteract each other in a push-pull arrangement.

In order that the invention may be clearly understood and readily carried into effect it will now be described more fully with reference to the accompanying drawing, in which—

Figure 1 is a diagrammatic sectional view of one embodiment of a discharge tube according to the invention, and

Figure 2 shows a circuit arrangement including such a tube.

Referring to Figure 1, mounted within an evacuated envelope 1' is a cathode 1, in the present case an indirectly heated cathode, surrounded in the usual manner by two grids 2 and 3. The following grid is formed of two parts 4 and 5 electrically separated from each other to form a pair of semi-cylindrical grid segments and the anode is also formed by two parts 6 and 7 of semi-cylindrical shape. The split-up grid and the split-up anode have in addition arranged between them a grid 8.

Referring to Figure 2 the cathode, grids and anode parts are designated by 1 to 8 respectively. The grids 3 and 8 serve as screen grids and have placed upon them a positive potential. The grid parts 4 and 5 have arranged between them a local oscillator 9 and the anode segments or parts 6 and 7 are connected to the intermediate frequency circuit 10. The input circuit 11 is connected between the cathode 1 and the signal grid 2.

While I have indicated the preferred embodiments of my invention of which I am now aware and have also indicated only one specific application for which my invention may be employed, it will be apparent that my invention is by no means limited to the exact forms illustrated or the use indicated, but that many variations may be made in the particuar structure used and the purpose for which it is employed without departing from the scope of my invention as set forth in the appended claims.

What I claim as new is—

1. An electron discharge tube having an envelope containing a thermionic cathode surrounded by a signal grid and a screen grid, a pair of oppositely disposed anode sections surrounding said cathode and grids, a pair of oppositely disposed oscillator grids between said anode sections and the screen grid, and a second screen grid between said oscillator grids and said anode sections.

2. An electron discharge tube having an envelope containing a thermionic cathode and a pair of semi-cylindrical anode segments on opposite sides of and surrounding said cathode, a signal grid and a pair of screen grids interposed between said cathode and said anode segments and a pair of semi-cylindrical oscillator grids interposed between the two screen grids and registering with the anode segments.

3. An electron discharge tube having an envelope containing a cathode surrounded by a signal grid and a pair of screen grids, a pair of semi-cylindrical electrically separate grid segments between said screen grids and a pair of semi-cylindrical anode segments surrounding said cathode and grids and grid segments, and registering with the semi-cylindrical grid segments.

4. An electron discharge tube having an envelope containing a thermionic cathode, a signal grid and screen grid surrounding said thermionic cathode, a pair of grids on opposite sides of said cathode outside said screen grid and electrically separated from each other, a second screen grid surrounding said cathode and other grids and a pair of anode segments electrically separated and positioned on opposite sides of said cathode on the outside of said second screen grid.

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