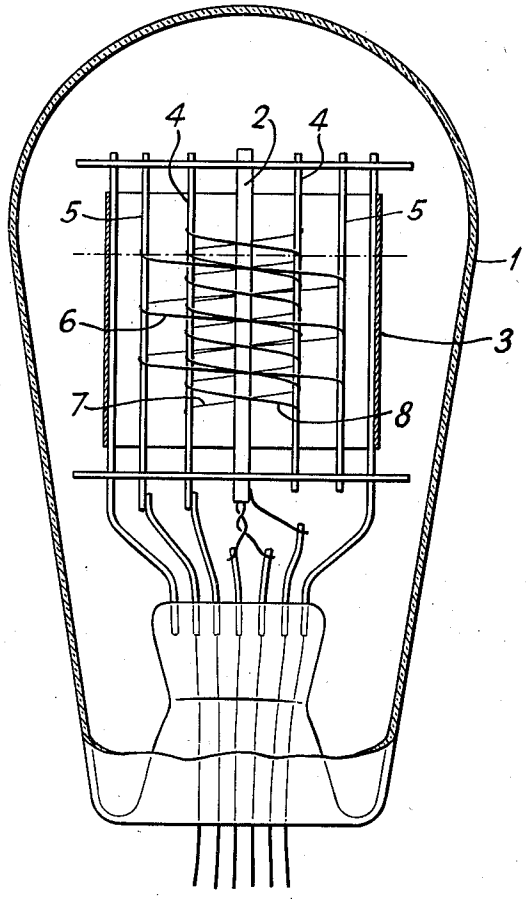
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GRID

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GRID

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3 Claims. (Cl. 250—27.5)

This invention relates to grids for electron discharge devices or tubes.

In tubes containing a plurality of grids such as tetrodes or pentodes, the screen grid which is interposed between the anode or plate and the control grid and which is operated at a positive potential, absorbs primary electrons from the cathode and consumes considerable current. The current taken by the screen grid is proportional to the total surface or area of the wires of this grid presented to or viewed from the cathode. The energy which is thus dissipated by the screen grid proves rather troublesome, especially in power tubes and causes difficulties in the construction of the tubes.

It is feasible to diminish the current consumption and energy dissipation of grids by making the grids of helical windings of identical pitch and mounting the grids in such a way that the wires or turns thereof as well as their supporting side rods come to cover one another or are placed in registering relation. The screen grid, for example, may be disposed so as to be electronically shadowed or sheltered by the turns of the control grid.

However, to align the turns of two grids, the turns must be wound with the same pitch. With wire wound grids of conventional construction it then becomes impossible to provide two concentric and aligned grids with different turns per inch.

The arrangement here disclosed overcomes the difficulty of aligning two or more grids with different numbers of turns per inch. It consists in using for one of the grids helicoidal spiraling of several wires or threads of like pitch on one pair of side rods. The turns of one wire is wound to cover or register with the turns of the next adjacent grid. Preferably, the supporting side rods of both these grids are in registry. According to this invention two concentric grids of an electron discharge device may have registering helices, one of the grids having one or more additional helices disposed between the turns of the one grid which register with the other grid and wound in the surface of said turns of the one grid.

In the appended drawing is shown one tube embodying the invention with an envelope 1 enclosing a mount with a cathode 2, anode 3, control grid 4 and screen grid 5 supported as a unitary assembly on the press. The screen grid wire 6 is wound with the same pitch as and is positioned radially opposite the wire 7 of the control grid. A straight line normal to the cathode can be drawn in any radial direction through the axis of the cathode and the wires 6 and 7 of the two grids. The screen grid is thus shadowed electronically by the control grid. If a larger number of turns is desired on the control grid than on the screen grid, for example, one or more wires 8 may be wound on the control grid side rods interleaved or between the turns 7 to give the desired number of wires on the control grid.

The pitch of the two grids and the number of turns of wires of the control grid may be chosen in accordance with the characteristic of the tube to be secured. With the pitch and number of turns variable design for given electrical characteristics is easy in manufacture. The arrangement will be found useful for no matter what form of grid and regardless of the particular function to be played by the different grids the invention may be applied to tubes with two or more grids.

I claim:

1. An electron discharge device comprising a cathode and anode, two helically wound grids of different diameters concentrically about said cathode, the wire of one grid being of the same pitch and in radial alignment at all points with one wire on the other grid, a second wire wound on said other grid, its turns being disposed between the turns of said one wire.

2. An electron discharge device comprising a cathode, and anode, and two concentric wire wound grids around the cathode and between the cathode and anode, one grid having a plurality of helices on a common metal support and the other grid having one helix, the pitch of the helix of the second mentioned grid being equal to the pitch of the helices of the first mentioned grid and the helix of the second mentioned grid being in radial alignment with one of the helices of the first mentioned grid.

3. An electron discharge device comprising an envelope, an anode, a cathode and at least two concentric helically wound grids around the cathode within said anode, one grid having a helix with the same pitch and in radial alignment at all points with a winding on the other grid and a second helix wound in the surface of the helix of one grid and between the turns of said one grid, said second helix and the turns of said one grid being supported upon a common metal support.

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