April 1, 1958 H. F. A. TE GUDE 2,829,298

GRID FOR USE IN ELECTRIC DISCHARGE TUBES

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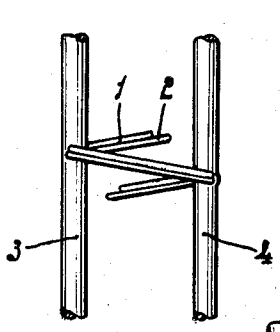


Fig.1

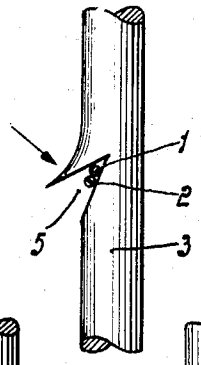


Fig.2

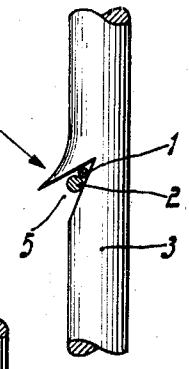


Fig.3

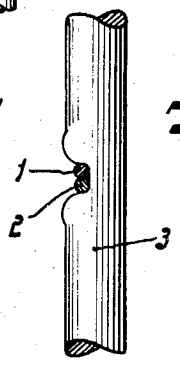


Fig.4

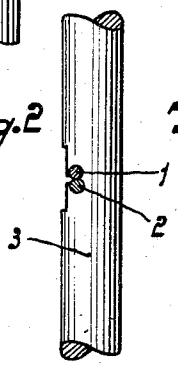


Fig.5

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GRID FOR USE IN ELECTRIC DISCHARGE TUBES

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Claims priority, application Germany April 14, 1954

2 Claims. (Cl. 313—350)

It is known that changes in the geometry of electric discharge tubes may act upon the electric values such as current, capacitances, amplification and so on due to microphonic phenomena. Slight variations in the position of the control grid or its windings may, for example, adversely affect the anode current. The grid-shaped electrodes of the usual construction in which the helical grid is supported from two supports, tend to natural vibrations the frequency of which depends upon the geometry of the half grid winding and on the properties of the material.

The invention obviates the described disadvantage to a sufficient extent for practical purposes by the use of simple measures which aim at damping any natural vibrations of the grid or of the grid-wires.

According to the invention for this purpose in a grid for use in electric discharge tubes the grid wire consists of at least two closely adjacent winding wires.

The winding wires may have equal or different diameters and may consist of the same or of different materials.

The invention will now be described more fully with reference to the accompanying drawing in which some embodiments thereof are shown by way of example.

Figs. 1 to 5 show for the sake of simplicity only parts of a grid in accordance with the invention, since even from this simplified representation the substance of the invention and its embodiments will follow.

In Fig. 1 reference numerals 3 and 4 designate the grid supports. The winding wire consists of two closely adjacent wires 1 and 2. As may be seen from the figure the wires 1 and 2 have equal diameters. However, frequently it will be of advantage to arrange the diameters of the wires 1 and 2 to be different, as may be seen from Fig. 3. The wires may alternatively be arranged one on top of the other, as is shown in Figs. 4 and 5. Fig. 3

shows the wires 1 and 2 when mounted and Fig. 5 shows a junction between the support 3 and the grid wires 1 and 2 after flattening. As an alternative, the individual winding wires may be made of different materials, that is to say different metals or metal alloys which are suitable from the point of view of the vacuum and with regard to strength. Suitable metals are, for example, nickel and molybdenum.

Fig. 2 shows the way in which the winding wires 1 and 2 may be arranged in notches 5, which usually are formed in the coil winding head of the grid coiling machine and preferably are subsequently closed again by pinching.

As will be seen from Fig. 3, if winding wires of different diameters are used it is preferable for the wires to be arranged in the notches 5 of the grid supports 3 in a manner such that the larger diameter wire is situated on the outside.

In all these cases the grid wire may obviously also be secured to the supports by welding.

It has been found that grids in accordance with the invention damp any natural vibrations of grid-shaped electrodes of the usual construction to a sufficient extent. The invention can be used to particular advantage in screen grids the natural frequency of which lies within the audible range.

What is claimed is:

1. A self-damping grid structure for electron discharge devices, said grid structure comprising a support rod and a pair of helically arranged grid wires supported at a point in each turn by said rod with vibratory portions of said wires between said points of contact, said wires being parallel to each other and contiguous with each other substantially throughout their length, the frequency of mechanical resonance of said vibratory portions of one of said wires being different from the frequency of mechanical resonance of contiguous portions of the other of said wires whereby incipient mechanical vibration of said vibratory portions of said grid wires is damped out by mutual mechanical interference therebetween.

2. The self-damping grid structure of claim 1 in which one of said wires has a larger cross sectional arrangement than the other of said wires.

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