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ELECTRON DISCHARGE DEVICE
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Fig. 1

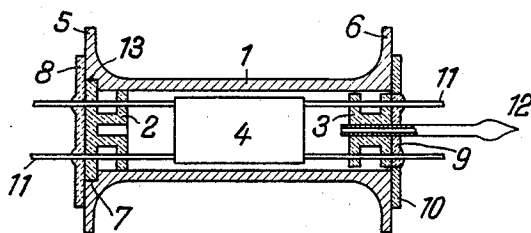
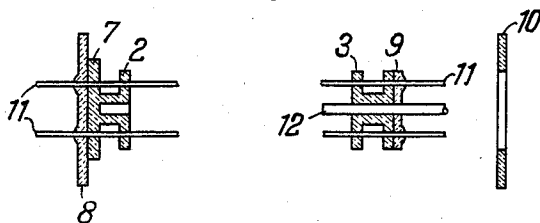


Fig. 2



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ELECTRON DISCHARGE DEVICE

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3 Claims. (Cl. 250—27.5)

This invention relates to electron discharge devices, and more particularly to methods of manufacturing electron discharge devices in which the electrode system is arranged in a cylindrical envelope of metal and in which the lead-in conductors to the electrode system are disposed at both ends of the envelope.

It is a well known expedient in the manufacture of electron discharge devices having a metallic envelope to assemble the electrode system and the requisite number of lead-in conductors on a supporting member of ceramic and glass and then to attach this support to the metallic envelope in a sealing operation.

Under certain circumstances, particularly in manufacturing electron discharge devices for ultra high frequency operation, a separation between the various lead-ins will be found advisable. Accordingly, it has been proposed to dispose the filament lead-in conductors at one end and those of the grid and of the anode at the other end of the envelope since the deleterious grid-to-anode capacity might be reduced by such arrangement.

It is an object of this invention to provide possibilities for manufacturing electron discharge devices with a metallic envelope and, moreover, to furnish such devices with lead-in conductors of minimum length which is of great importance in ultra high frequency operation. The electron discharge device according to my invention comprises a metallic tube having flanged end portions and ceramic members disposed at the ends of the metallic tube as supports for the electrode lead-ins and the electrode system, each ceramic supporting member being sealed to the respective end of the metallic tube by means of a glass disc.

In the manufacture of electron discharge devices according to this invention, the electrodes of the electrode system are first attached to their appertaining lead-in conductors, whereupon the latter are fixed in the respective ceramic supporting members and sealed in their correct positions by a glass disc. On inserting the resulting assembly into the metallic envelope, the ceramic supports serve to maintain the electrode system in the center of the tube.

My invention will be more readily understood from the following description taken in conjunction with the accompanying drawing, in which

Fig. 1 is a cross section through an electron discharge device according to this invention, while Fig. 2 shows details of the ceramic supporting means forming part of the design as illustrated in Fig. 1.

The electron discharge device illustrated in

Fig. 1 consist of a metallic tube 1 acting as the anode, the two ceramic supports 2 and 3 and a unitary electrode system 4 which for the sake of simplicity has been shown merely as a block. Each end of the metallic tube or envelope is formed with a flange 5 and 6, respectively, perpendicular to the axis of the tube. The inner edge of the flange 5 has an annular recess 13. The ceramic support 2 is provided with a radially extended portion 7 adapted to fit in the annular recess 13 of the envelope 1. The electrode leads 11 are sealed in their supporting member 2 by a glass disc 8 intimately joined with the surface 7 thereof. The diameter of the glass disc 8 is larger than that of the surface 7 so as to form an annular salient. The design of the supporting member 3 and the glass disc 9 carrying the lead-in conductors at the opposite end of the tube or envelope 1 differs from that of the supporting member 2 and the glass disc 8 in that the whole assembly is of uniform diameter in order to permit this part of the device to be freely slid through the interior of the tube 1. Consequently, when the electrode system has been finally mounted between and rigidly fixed in the two supporting members 2 and 3 the completed assembly is inserted in the tube 1 from the left end as shown in the embodiment according to Fig. 1 until the glass salient 8 abuts with the flange 5 whereupon these two parts are sealed together, preferably by the agency of high frequency alternating currents in order to avoid superfluous heat conduction to the electrode system.

At the remote end the glass disc 9 now projects above the surface of the flange 6. In order to make the corresponding seal at this end, an annular disc 10 of glass is placed coaxially around the glass disc 9 and in contact with the flange 6 whereupon also this end is sealed in a similar manner as heretofore explained. The supporting member 3 carries an evacuation pipe 12 sealed therein.

What is claimed is:

1. The method of manufacturing electron discharge devices comprising, forming a number of electrodes to a cylindrical electrode system, attaching partly from one end partly from the other end of the electrode system parallel related lead-in conductors to the electrodes of the electrode system, sealing one group of parallel lead-in conductors in a first support comprising a member of ceramic of given diameter sealed to a disc of glass of equal diameter, sealing the other group of parallel lead-in conductors in a second support comprising a member of ceramic of given diam-

eter sealed to a glass disc of larger diameter co-
axial therewith, sliding the resulting assembly
through the interior of a flange-ended metallic
tube until the glass disc of larger diameter abuts
5 with one of the flanged ends and the glass disc
of given diameter projects beyond the other
flanged end of the tube, sealing together the abut-
ting glass disc and flange, placing an annular disc
of glass around the glass disc of the first support
10 and in contact with the other flanged end of the
tube and sealing the annular disc to the last men-
tioned glass disc and flange of the tube.

2. The method of manufacturing electron dis-
charge devices which comprises forming a unitary
15 electrode structure, attaching lead-in conductors
for electrodes of said structure to a first member

of insulating material of predetermined diameter,
attaching further lead-in conductors for elec-
trodes of said structure to a second member of
insulating material of smaller diameter than said
first member, sliding the resulting assembly into
5 a cylindrical tube of substantially the same inner
diameter as said second member, and sealing said
members to said tube.

3. The method of manufacturing electron dis-
charge devices according to claim 2, further com- 10
prising forming an annular recess of substantially
the same diameter as said first member in one
end of said tube and positioning said first mem-
ber therein.

RUDOLF SCHARFNAGEL. 15