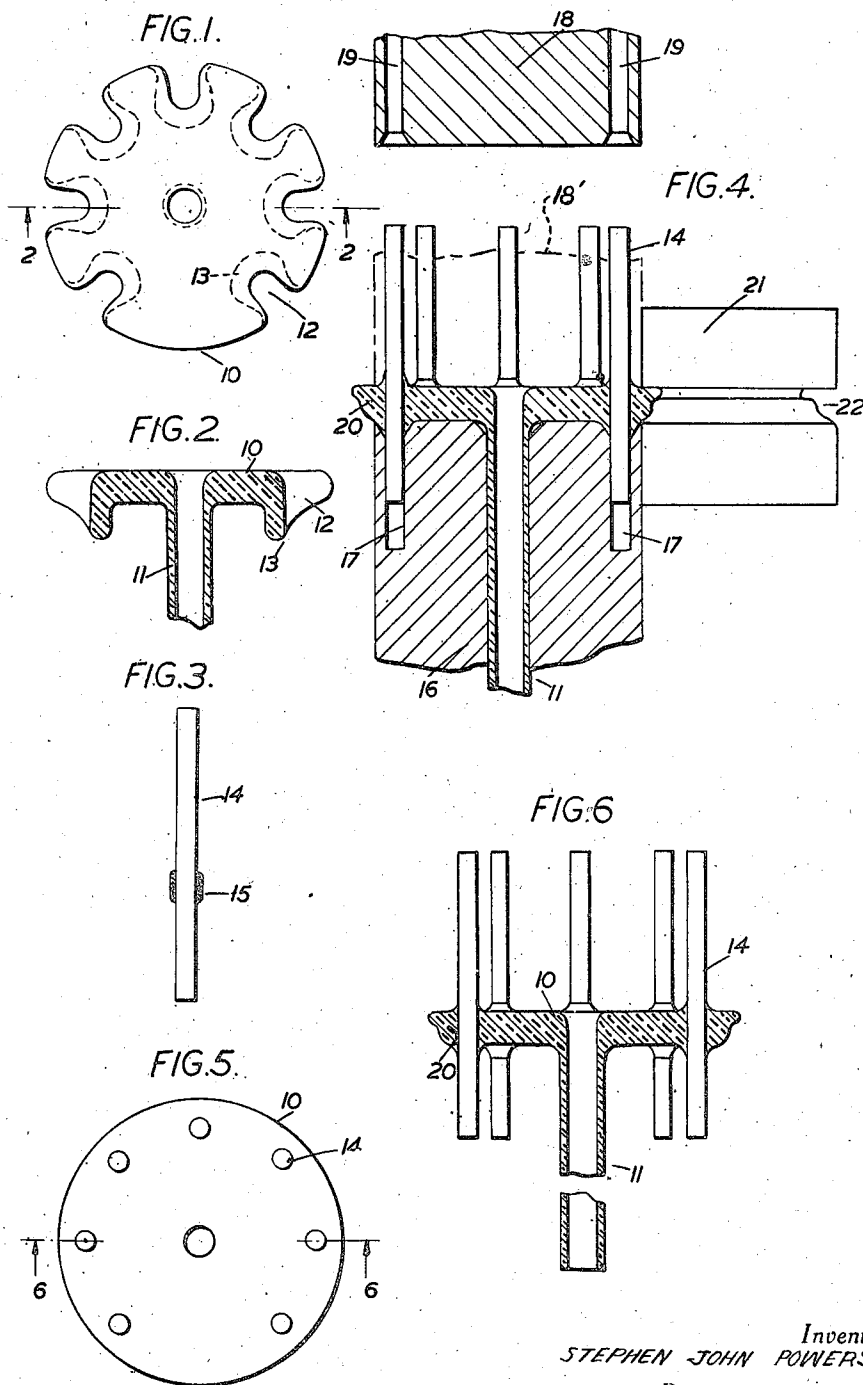


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MANUFACTURE OF BASE ASSEMBLIES FOR
ELECTRIC DISCHARGE TUBES
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MANUFACTURE OF BASE ASSEMBLIES FOR
ELECTRIC DISCHARGE TUBES

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The present invention concerns improved methods of sealing the electrode leads through the envelope of an electric vacuum or gas-filled tube of any type.

It is applicable to any device or tube such as a cathode ray tube, for example, or a thermionic valve having electrodes mounted inside an envelope, which envelope may be exhausted or filled with gas at any pressure. It has previously been common practice in such tubes to seal the leads for the electrodes through a stem or press of glass, or ceramic material, or the like, or through a substantially flat base, the stem or base being then sealed to the envelope.

It is proposed to use a flat disc or base of glass provided with a central exhaust tube and formed with U-shaped radial slots around the periphery. The electrode conductors comprise short wires or rods each carrying a small glass bead. The wires are placed with the beads in the slots, and the base is inserted into the neck of the envelope of the device, and the wires are sealed into the base and the base to the envelope in one operation.

One of the advantages of the arrangement is that it enables the electrode conductors to be spread apart as widely as possible, so that they may lie in a circle not much smaller than the cross-section of the neck of the tube. The present invention employs another method of sealing the leads through a disc of similar type which does not involve sealing the disc to the envelope of the tube in the same operation. The advantage of having the conductors spread out by the maximum amount is retained.

The invention accordingly consists in the method of making a base assembly for an electric vacuum or gas filled tube which comprises locating conductor wires in peripheral slots of a disc of fusible material, softening the disc by heat, squeezing it between a pair of dies, and rolling a tool around the edge of the disc in such a manner as to close the slots on the wires so that they are hermetically sealed through the disc.

The invention will be described with reference to the accompanying drawings in which:

Figure 1 is a top view of a glass disc or base for a vacuum tube;

Figure 2 is a section taken on line 2—2 of Figure 1;

Figure 3 is a side elevation of a wire electrode conductor carrying a glass bead;

Figure 4 is a longitudinal section of the base and conductor wires assembled in a die to show how the wires are fused to the disc;

Figure 5 is a top view of the finished base as-

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sembly with the conductor wires sealed to the disc; and

Figure 6 is a section taken on line 6—6 of Figure 5.

Referring to Figures 1 and 2, the glass disc or base comprises a circular disc 10, to the centre of which is sealed an exhaust tube 11. Around the periphery of the disc are a number of rounded slots 12 having depressed edges or rims 13. This form may be produced, for example, by taking a plain circular disc, heating it sufficiently to soften the glass, and then pressing suitable wires (or the like) inwards and downwards from the edge of the disc. This produces rounded slots of the kind shown. The disc may, however, be formed in other ways, such as in a moulding tool.

Figure 3 shows one of the electrode conductors. It comprises a metal wire or rod 14 having fused thereon a small glass bead 15.

The method of sealing the wires to the disc according to the invention is shown in Figure 4. A lower die 16 is provided with a central channel for the exhaust tube 11 and with a number of smaller blind holes 17 arranged around a circle, and located so as to correspond with the slots 12 in the disc 10.

The disc 10 is placed on the lower die 16 with the exhaust tube 11 inserted into the central channel of the die, the slots 12 registering with the holes 17. The wires 14 are then inserted in the holes 17 with the beads 15 located in the slots 12. An upper die 18 having holes 19 corresponding to the holes 17 is provided. Heat is applied in any convenient manner to melt the glass of the disc, and the upper die is brought down onto the disc, as shown in dot-dash lines 18', with the upper ends of the wires 14 in the holes 19. The glass is pressed into contact with the beads 15 and fuses thereto, and some is expelled sideways forming a ridge or beading 20. During this operation a roller tool 21 with an appropriately shaped groove 22, is run around the edge of the base 10 to form the beading 20, and to ensure that the slots are closed up and that the melted glass flows all around the beads 15, so that there is formed a complete circular disc with the wires sealed through it, as shown in Figures 5 and 6.

The base assembly so formed is suitable for any electric device having electrodes inside an envelope. The electrodes may be mounted on the wires 14, and the disc may then be sealed around the beaded edge to an appropriate envelope in any convenient way, and the envelope may be exhausted or filled with gas through the

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tube 11, which is subsequently sealed off in the usual way.

Although glass is preferably the material to be used for the base assembly, any other fusible insulating material such as quartz, for example, or hard rubber, could be used if desired, the method of sealing the conductor wires being substantially the same in all such cases. The bead 15 on each of the electrode conductors 14 should, of course, be of fusible material appropriate for sealing to the material of the disc 10.

Furthermore, the exhaust tube is not essential and could be omitted if a suitable tube is provided somewhere else in the envelope of the device. In such a case the central channel of the lower die would not be necessary.

What is claimed is:

1. The method of making a base assembly for an electric discharge tube which comprises locating conductor wires in peripheral slots of a disc of fusible material, softening the disc by heat, squeezing the disc to press the disc into contact with the wires, and applying a rolling action around the edge of the disc in such a manner as to close the slots around the wires so that the wires are hermetically sealed in the disc.

2. The method of making a base assembly for an electric discharge tube, which comprises locating a number of conductor wires each provided with a fusible bead in spaced peripheral slots in a disc of fusible insulating material so that the beads register within the slots, applying heat to melt the fusible material, pressing the disc into contact with the beads and to expel a peripheral ridge of the fusible material, and applying a rolling action around the ridge of the disc to form the ridge and to press the molten insulating material inwards so as to close the slots around the beads.

3. The method of making a base assembly for an electric discharge tube which comprises forming a plurality of spaced slots around the periphery of a disc of fusible material, holding a plurality of conductor wires in fixed relation to each other and to the disc with the wires extending

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through the slots, heating the disc to fusing temperature, and squeezing the disc to press the fusible material around the wires in the slots and simultaneously rolling the rim of the disc to force the fusible material around the wires and to produce a uniform rim around said disc.

4. The method of making a base assembly for an electric discharge tube which comprises fusing spaced slots with depressed rims into the periphery of a disc; holding a plurality of conductor wires in spaced fixed relation with each wire extending through one of the slots of said disc; heating said disc to fusing temperature, and pressing said disc and simultaneously rolling the fusible material around the rim of said disc to force such material around said wires and produce a uniform circular rim.

5. The method of making a base assembly for an electric discharge tube comprising placing a number of conductor wires in peripheral depressions located in a disc of insulating material, heating the disc and applying pressure on the disc to force the insulating material into contact with the wires, and applying pressure around the peripheral edge of the disc to force the insulating material into sealed contact with the wires.

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