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W. S. BRIAN

1,968,280

CATHODE STRUCTURE

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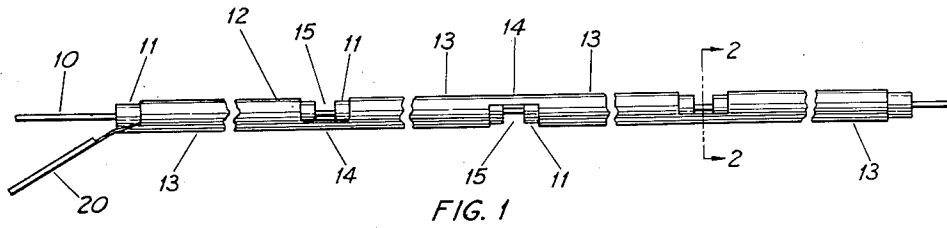


FIG. 1

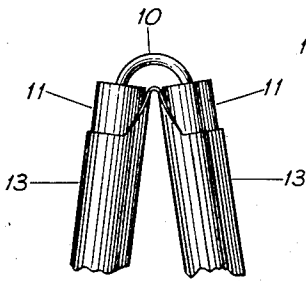


FIG. 3

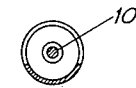


FIG. 2

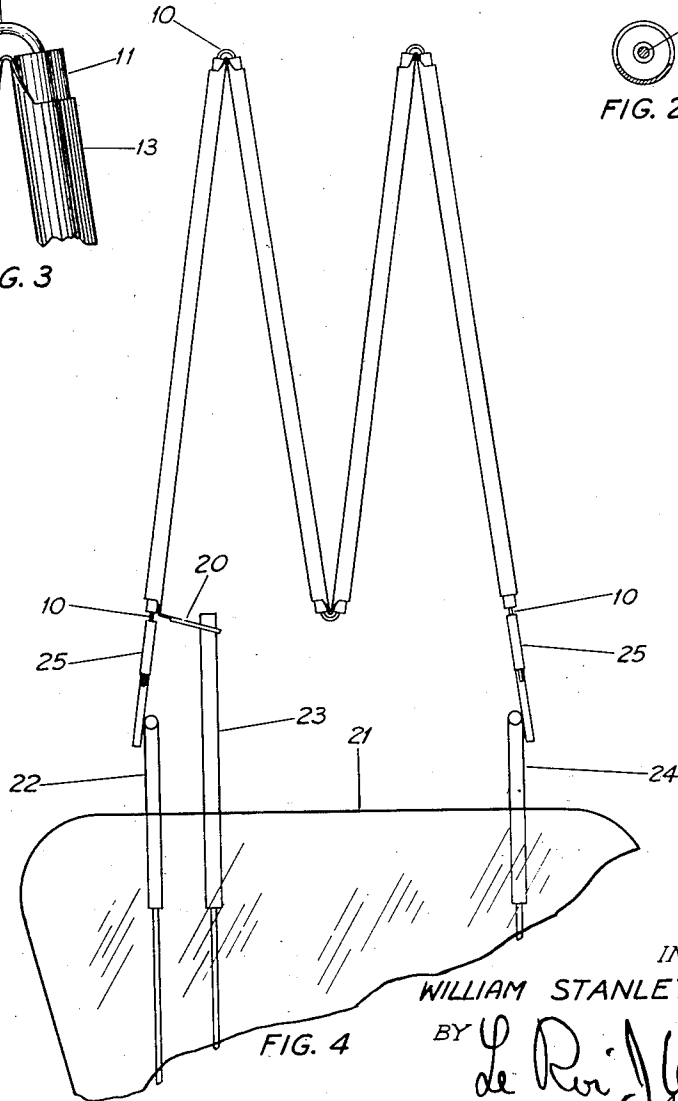


FIG. 4

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CATHODE STRUCTURE

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5 Claims. (Cl. 250—27.5)

This invention relates to a cathode structure, particularly to an indirect heater cathode, which may be bent into a plurality of sections.

In certain types of tubes, because of the large cathode area required, it is necessary to bend the cathode, usually a filament, so that its vertical dimension lies within conventional limits. Such cathodes have usually been in the form of flat filaments with the heating current flowing in the filament.

An object of this invention is to devise a cathode structure, which may be shaped in the usual V or W formation and which will be of the indirectly heated type.

An additional object is to carry out the above object in a simple and economical manner.

Referring to the drawing, Fig. 1 is a view, showing a cathode structure prior to the shaping operation.

Fig. 2 is a section on line 2—2 of Fig. 1.

Fig. 3 is a detail, showing the cathode structure near the bend.

Fig. 4 shows a press with the cathode structure mounted thereon.

The cathode structure comprises a heater wire 10 of tungsten or similar material. Disposed over this heater wire, at spaced intervals, are a plurality of cylindrical insulators 11, preferably of ceramic material. Over insulators 11 is a metallic sheath 12, preferably of nickel or other suitable material, which has a suitable electron emissive cathode coating. Sheath 12 is composed of a plurality of cylindrical portions 13, joined by connecting strips 14. The entire sheath 12 may be fabricated from a single length of metallic tubing with cut-outs 15 at spaced intervals. As is evident from Fig. 1, insulators 11 and cylindrical sections 13 of sheath 12 have their lengths so related to each other that insulators 11 project a short distance beyond each end of cylindrical sections 13. With the elements in position as shown in Fig. 1, adjacent cylindrical sections 13 may be bent along an intermediate connecting strip 14, as shown in Fig. 3.

One end of sheath 12 is preferably shaped as a tab 20. The entire cathode structure, when suitably shaped, may be assembled on a press as shown in Fig. 4. The press comprises a glass support 21 into which are sealed arbors 22 to 24 inclusive. The ends of heater wire 10 are welded to arbors 22 and 24 respectively, while tab 20 is welded to arbor 23. In order to prevent insulators 11 from slipping down, metallic tabs 25 are preferably disposed over the free ends of heater wire 10.

Obviously any number of sections may be provided.

I claim:

1. An indirect heater cathode structure, comprising a centrally disposed continuous heater, a plurality of insulators disposed on said wire with adjacent ends in spaced relationship, and a metallic sheath disposed over said insulators and adapted to have an electron emissive coating thereon, said sheath having portions cut out at spaced intervals corresponding to the spaces between adjacent insulator ends, whereby adjacent cathode sections may be bent along the intermediate connecting sheath portion.

2. An indirect heater cathode structure, comprising a continuous heater wire, a plurality of insulators disposed on said wire, adjacent insulators having their ends spaced from each other to expose a portion of said heater wire, a metallic sheath having an electron emissive coating disposed over said insulators, said metallic sheath having spaced cut-out portions at the regions where said heater wire is exposed, said cut-outs being such as to leave a small portion of said sheath as a connecting medium between adjacent sections, whereby adjacent cathode sections may be bent along connecting sheath portions.

3. An indirect heater cathode structure, comprising at least one heater wire, a plurality of insulators disposed along said heater wire with ends of adjacent insulators in spaced relationship to each other to expose a portion of said heater wire, and a metallic sheath disposed over said insulators, said sheath being adapted to have an electron emissive coating thereon, said sheath having a plurality of spaced cut-out regions coinciding with the exposed heater portions, said cut-out regions being of sufficient extent so that portions of the ends of said insulators are exposed, whereby said structure may be shaped by bending along the sheath at the cut-out region.

4. The structure of claim 3, in which one end of said sheath is formed as a tab for connection to a cathode lead.

5. The structure of claim 3 wherein tabs are provided on the heater wire adjacent the outer ends of the end insulator to maintain the assembly intact.

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