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ELECTRODE SYSTEMS FOR ELECTRONIC VALVES

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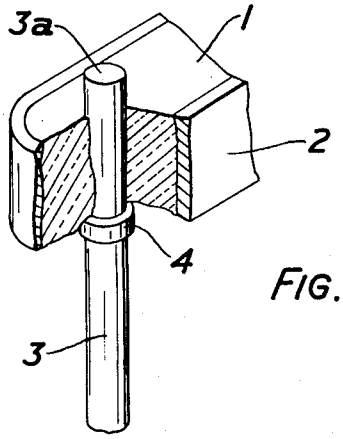

FIG. 1.

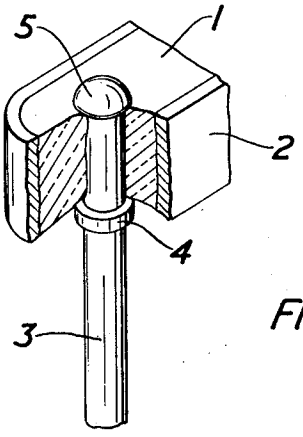

FIG. 2.

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ELECTRODE SYSTEMS FOR ELECTRONIC VALVES

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4 Claims. (Cl. 219—127)

This invention relates to electronic valves. The various electrodes of an electronic valve are generally held in position with the help of a member, herein referred to as valve support, which is suspended in the evacuated envelope by holding wires, the holding and electrode wires being located in holes extending through the valve support.

In the complete specification of our co-pending application No. 649,932 we have described and claimed an improved valve support which consists of sintered ceramic material enclosed in a heat-resistant metal frame, and while also applicable to other kinds of valve support, for example to perforated mica sheets, the present invention has been developed with a particular view to its use in connection with valve supports according to the said specification.

The invention has for an object to provide an improved connection between the valve support and a wire, for example a holder wire or grid-support rod extending through a hole in the support.

According to the invention, the wire or rod is provided with a shoulder against which one surface of the perforated support rests when the free end has been inserted into the hole, and the free end of the wire or rod at the opposite or outer surface of the support is heated when the wire or rod has been thus inserted and caused when thus heated to form a head in close contact with the said outer surface when the melted metal subsequently solidifies. Preferably the wire or rod consists of a metal having a positive thermal expansion coefficient. In this case the further cooling after solidification results in longitudinal contraction of the distance between the head and shoulder and consequently in a particularly rigid and rattle-proof connection provided the expansion coefficient is suitably chosen. The shoulder on the wire or rod is conveniently formed by longitudinal upsetting, and while it is generally most convenient to form the head by merely applying heat to the projecting end to melt the same, for example by applying an electric arc or a flame, an alternative consists in heating the end only to a high degree of softness and then forming the head by suitable mechanical action.

The invention is illustrated in the drawing accompanying the provisional specification, in which Figs. 1 and 2 are perspective views showing a support, part of which is broken away, with a grid-support rod shown, respectively, before and after formation of the head.

Referring now to the drawings, a ceramic support 1 has a metal frame or shell 2, and may be constructed according to the said co-pending specification. A holding or grid-support wire 3 of nickel or a nickel alloy having an upset shoulder-forming flange 4 extends through a hole in the ceramic support with its end 3*a* projecting at the upper side. To secure the support 1 on the wire 3, the projecting end 3*a* of the wire is heated to melting temperature, which causes it to contract due to its surface tension and form a head 5, as shown in Fig. 2. Alternatively the end 3*a* may be heated only to a high degree of softness, whereafter a set tool having a suitably shaped recess is applied to the softened end portion 3*a* to form the head 5.

When the assembly is now allowed to cool, the thermal contraction of the metal between the flange 4 and the head 5 will result in reliably clamping the support 1 between the flange and the head.

What I claim is:

1. A method of securing on a holding wire a sintered ceramic electrode support member for electronic tubes, said support member having a through perforation of a diameter substantially fitting on said holding wire, which comprises the steps of providing a holding wire having a flange in the vicinity of one end of the wire and spaced from said end by a distance exceeding the thickness of the ceramic support member adjacent to the perforation, feeding said end of the wire through the ceramic support member along said perforation to produce abutment of said shoulder with the surface of said ceramic member at one end of the perforation, applying, without mechanical contact, to the portion of the wire end projecting beyond the surface of the ceramic member at the other end of the perforation heat localised to said projecting portion to melt the projecting portion, and allowing surface tension to form the melted portion into a head which is integral with the wire and which is supported on and projects from said surface of the ceramic body at the said other end of the perforation.

2. A method as claimed in claim 1, wherein a flame is applied to the projecting wire end to heat and melt the same.

3. A method as claimed in claim 1, wherein the projecting wire end is heated by forming an electric arc in which said end forms one of the arc electrodes.

4. In a method as claimed in claim 1, the use of a holding wire having a positive coefficient of thermal expansion so as to ensure a tight fit of the ceramic body between the shoulder and the head formed on the wire.

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