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C. T. BAXTER

2,385,340

ELECTRICAL DEVICE

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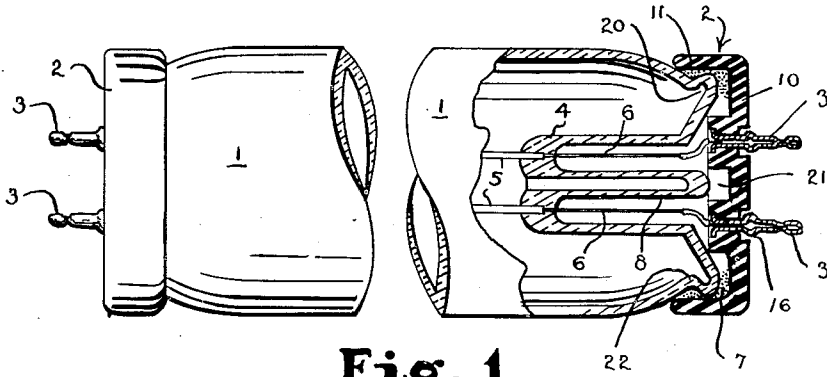


Fig. 1

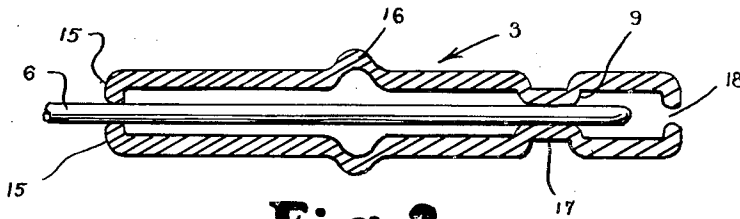


Fig. 2

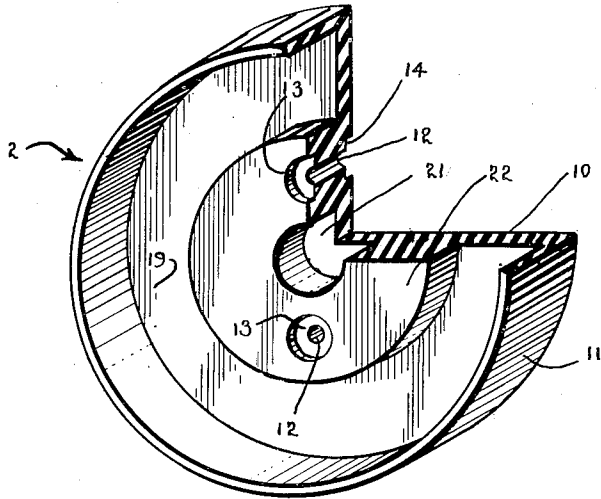


Fig. 3 Clement T. Baxter INVENTOR.

BY *Lawrence Brown*

UNITED STATES PATENT OFFICE

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ELECTRICAL DEVICE

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1 Claim. (Cl. 176—126)

This invention relates to electrical devices and connections thereof.

An object of this invention is to provide improved assembly of electrical devices and method of producing same.

Another object is to provide improved means and method of connecting wires in electrical devices.

Another object is to provide improved base assemblies in electrical devices such as tubes and lamps, for example, luminescent or fluorescent lamps.

Another object is to provide improved base assemblies in electrical devices such as tubes or lamps in which the wire connections are formed by clamping or crimping means rather than soldering, welding or the like.

Other and further objects will be apparent from the following specification and claim taken in conjunction with the drawing in which:

Figure 1 is an elevation in partial section of an illustrative embodiment of this invention;

Figure 2 is an enlargement of a contact pin of the structure of Figure 1, with a pin illustrated in its pre-assembly contour; and

Figure 3 is an enlarged, isometric view, in partial section of a base of the structure of Figure 1.

Similar reference characters refer to similar parts in the several views of the drawing and in the following specification.

In electrical connections involving the connection of a wire to a contact or other member, it is customary and helpful to assemble a contact button or pin on the end of the wire to form rigid and uniform contact ends for the wire. In radio tubes or light bulbs and similar devices this is accomplished by mounting a contact button or pin in the base of the tube or lamps and securing a lead wire from inside the tube, to the button or pin.

This securing action ordinarily is done by soldering or welding.

This invention provides improved means and method of so securing wires, and in particular, provides an improved lamp base assembly.

As an illustration of an embodiment of this invention, the disclosures of the drawing are directed to the formation of an electric gaseous discharge lamp with particular reference to its end and base assemblies.

As in Figure 1, this illustration comprises mainly a glass lamp envelope 1 having bases 2, and hollow contact pins 3 mounted in the bases 2.

A glass end portion 4 is sealed to the envelope

1, and has mounted therein a filament 5, not completely shown, and filament leads 6 secured to the filament 5 in the glass end portion 4 and also to the contact pins 3, mounted in the base 2. The base 2 is secured to the envelope 1 and the glass end 4 by Bakelite cement 7, or other suitable binding means.

The glass end 4 is so formed as to extend into the envelope in a hollow elongation and the filament 5 is mounted therein substantially at the inner extremity of the elongation. A hollow tongue of glass 8, within the elongation, extends back toward the base 2, thereby forming a separator for the two filament leads 6 which lie within the hollow cylinder of the glass end 4.

As in Figure 2, the lead wires 6 extend within the hollow contact pins 3 and are clamped therein by annular, inner beads 9 of the pins 3.

The base 2, Figures 1 and 3, is preferably formed of a plastic, Bakelite, for example. The base is cup-shaped, with a base wall 10 and cylindrical side wall 11. The base wall 10 is provided with a pair of openings 12 in each of the contact pins 3 is located.

Each of the openings 12 has an inner countersunk portion 13 and an outer countersunk portion 14. The countersink 13 receives the fingers 15, see Figure 2, of the contact pin 3, when they are rolled or bent outwardly to aid in securing the pin 3 to the base 2.

Figure 2 illustrates the contour of the pin 3 prior to its assembly with the base 10. The fingers 15 are bent inward so that the pin may be pushed through the opening 12 as an assembly step. The lead wire 6 is not normally positioned within the pin 3 while the fingers 15 are turned inward. It is so shown merely as an illustration of how the lead wire 6 is assembled within the pin 3 and clamped therein by the inner lead 9.

The outer bead 16 of the pin 3 is positioned and formed to overlie the outer countersink 14 of the base opening 12 as shown in assembly in Figure 1. The bead 16 has an important function in that in the assembly as in Figure 1, it prevents pin 3 from being pushed through the opening 12 by pressure, for example such as may be applied to the pin 3 in the assembly or disassembly of the lamp with its socket. If desired, a very tight assembly of the pin 3 to the base 2 may be made by positioning the outer bead 16 within the countersink 14 so that rolling or bending the fingers 15 will pull the bead 16 against the bottom of the countersink 14. This in addition to having a close, binding fit between the pin 3 and the opening 12, provides a tight assembly.

The bead 16 may be located completely outside, or partially or completely within the countersink 14. When it is completely within, the assembly has the advantage that the means of holding the pin 3 in the opening 12 is substantially hidden, and the overall thickness of the base assembly may be less.

The bead 16 is useful as providing an outwardly facing riser surface against which a contact spring of a lamp socket may bear to keep the outer face of the base wall 10 from engaging the socket. Further, the bead may be used as a locator or grip portion over which a forming or holding tool may be placed. The only requirement in this instance is that there be tool clearance about the bead 16. The countersink 14 is dimensioned with such a clearance.

Formation in the pin 3 of the inner bead 9 provides an outer annular recess 17 which may be useful, in combination with the outer bead 16, or by itself, as a locating or holding device in connection with the springs of a lamp socket.

The pin 3 as shown in Figure 2 is in its pre-assembly formation, with the bead 9 all formed and in fairly close fitting relation with the lead wire 6 and ready for the final crimping to strongly bind the pin 3 to the wire 6. If desired, however, the pin 3 may be assembled without the bead 9 or the annular recess 17 and crimped into binding relation with the wire 6 from a cylindrical formation. This crimping may be at one or more points about the periphery of the pin 3, or it may take the recess and bead form as in the pre-formed pin of Figure 2.

The pin 3 has an outer end opening 18 in its pre-assembly formation. After the final assembly crimping of the pin 3 to the wire 6, this opening is substantially closed and the outer end of the pin 3 then becomes a blunt but rounded point which aids in the positioning of the pin 3 in a lamp socket.

A desirable feature is accomplished in this invention in that the base 2 is formed and assembled so as to present a relatively small addition to the length of the lamps beyond the extent of the glass envelope 1. An annular recess 19 is provided inside the base 2 to receive the annular peripheral end 20 of the envelope 1 in its joinder with the glass end portion 4. A central recess 21 is provided to afford clearance for the separator tongue 8. The necessary thickness for the accommodation of the pins 3 is provided by the raised portion 22 which takes advantage of the inwardly extending tapered contour of the base of the glass end 4.

The side wall 11 extends over the annular end 20 of the envelope 1. The envelope 1 is tapered to a reduced diameter at its ends so that the outer surface of the base wall 11 may be substantially

flush with the outer surface of the envelope 1. An annular groove as at 22 is formed in the envelope 1 and this is filled with the binder 7 as an aid to securing the base 2 to the envelope 1.

The plastic base 2 has the advantage that the pins 3 are effectively insulated from each other without the necessity of using insulation sleeves or the like in the mounting of the pins 3 to the base 2.

The assembly of the device as shown in the drawing is as follows:

The glass end portion 4 with the filament 5 and filament leads 6 mounted thereon, is fused or otherwise joined with the glass envelope 1. As a subassembly the pins 3, as shown in Figure 2 without the wire 6, are mounted in the openings 12 of the base wall 10 and the fingers 15 turned or bent over to flare outwardly and lie in the countersinks 13.

Bakelite cement 7 is placed in grooves 22 and 19 and the base 2 and envelope 1 are assembled. Heat to the order of 200 degrees centigrade is applied to the base 2 about its periphery to instigate the gripping action of the cement 7 on the envelope 1 and base 2.

If the device used is a fluorescent lamp, the envelope 1 would have a coating of fluorescent material as in the usual construction of such lamps.

What I claim is:

An end cap assembly for a substantially cylindrical gaseous discharge lamp envelope comprising a frangible reentrant stem portion sealed upon the end of said envelope, lead wires extending through and sealed in said stem portion, a unitary cup-shaped end cap of insulating material adapted to be secured upon the end of said envelope the peripheral portion of the bottom wall thereof being relatively thin and its central portion being relatively thick, a plurality of apertures in the thick portion of the bottom wall of the cup adapted to extend longitudinally of the lamp envelope and being counterbored at both ends, a plurality of contact members received in and extending outwardly from said apertures having the form of a hollow cylinder and within which said lead wires are received, an annular integral shoulder on said contact members upset outwardly therefrom and received in the outer counterbore of said apertures, the inner ends of said contact members being expanded into the inner counterbore of the apertures thereby rigidly anchoring the pins in the end cap, and a narrow section of the outwardly extending portion of said contact members being inwardly swaged into contact with said lead wires to form a continuous annular depressed bead.

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