May 28, 1946. E. B. NOEL 2,401,228

BASE FOR ELECTRIC LAMPS AND SIMILAR DEVICES

Filed Feb. 12, 1945

FIG. 1

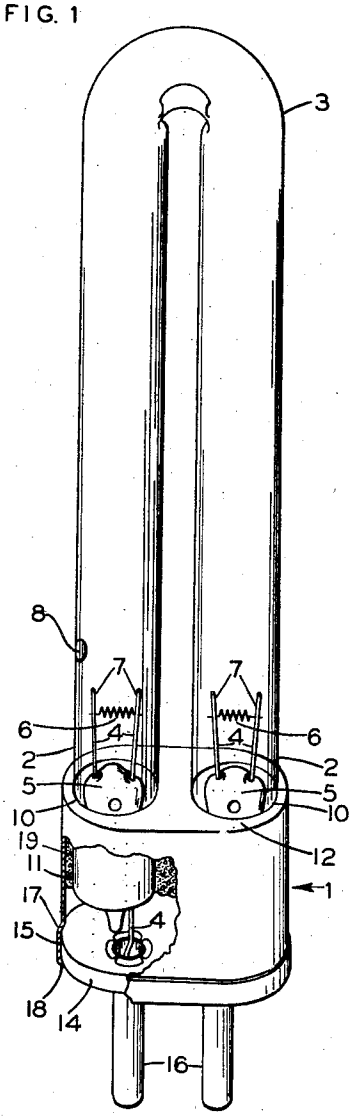


FIG. 5

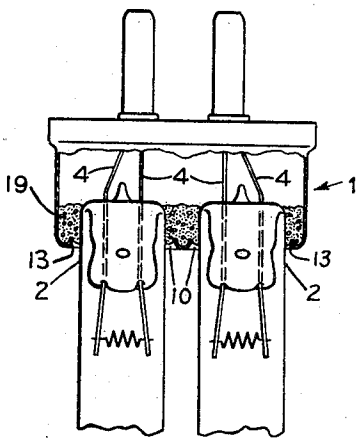


FIG. 6

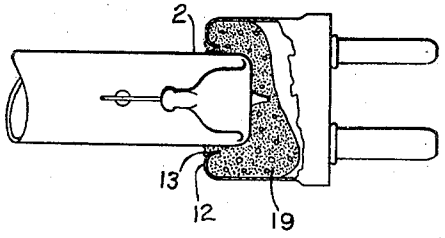


FIG. 2

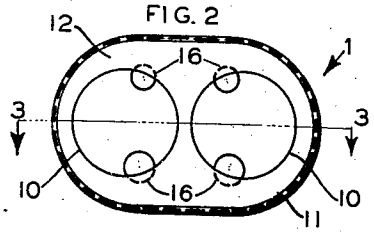


FIG. 3

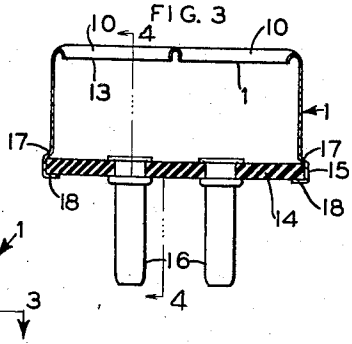
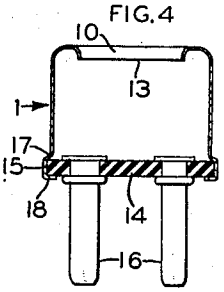


FIG. 4



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BASE FOR ELECTRIC LAMPS AND SIMILAR DEVICES

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Application February 12, 1945, Serial No. 577,519

3 Claims. (Cl. 176—32)

This invention relates to the basing of juxtaposed ends of electric tubes, and especially tube ends extending side by side. Tubes to which a common base according to my invention is applicable include both tubular electric incandescent lamps and electric discharge tubes, which are commonly made of vitreous materials. An electric lighting tube of glass bent to a U-form offers a particular example of a bunch or cluster of parallel tube ends which may advantageously be provided with such a base. The aim of the invention is to provide a simple and convenient base that can be applied quickly and economically, and presents a good appearance. Various other features and advantages of the invention will appear from the description of a species and form of embodiment, and from the drawing.

In the drawing, Fig. 1 is a tilted side view of a vitreous U-bent electric discharge tube equipped with a base embodying the invention, which is shown partly broken away and in section; Fig. 2 is a plan view of the base by itself; Figs. 3 and 4 are sectional views of the base by itself, at right angles to one another, taken as indicated by the lines and arrows 3—3 and 4—4 in Figs. 2 and 3, respectively; Fig. 5 is a fragmentary sectional view of the base and associated tube ends, illustrating a stage of the basing operation; and Fig. 6 is a similar view illustrating a variation in the basing operation.

Fig. 1 shows a base 1 applied to adjacent tube ends 2, 2 lying side by side, being the ends of a U-bent vitreous tube 3 whose legs are approximately parallel. A U-tube is one form suitable for the envelope of a discharge lamp producing ultraviolet radiation of germicidal wave-length such as 2537 A., and for this purpose is of course made of glass permeable to such radiation, exemplified by the glass known commercially as "Corning 9741". As shown in Fig. 1, each of the tube ends 2 is of ordinary stem flare and pressed seal construction, with current leads 4, 4 extending through the seal 5 inward into the tube, and with a filamentary electrode or "cathode" 6 connected between the inleads. This electrode may consist of a coil or coiled coil of fine tungsten wire activated with a coating or filling of alkaline earth oxides such as a mixture including barium and strontium oxides. The inner ends 7, 7 of the leadwires 4, 4 beyond their attachment to the filament 6 may serve as auxiliary anodes. The tube 3 may contain a filling of starting gas such as one of the inert rare gases, like argon at a pressure of 3½ mm., and a charge of vaporizable and ionizable working substance like mercury is also indicated by a droplet 8. The amount of mercury is preferably less than will vaporize during operation, thus assuring an unsaturated operating atmosphere of limited pressure.

As shown in Figs. 1 to 4, one main structural element of the base 1 corresponds to a cup of sheet material turned bottom-up and having in its bottom or end web holes 10, 10 to accommodate the tube ends 2, 2. Such a cup-like part 11 can easily be formed out of sheet metal by die-pressing and punching. Differently described, the element 11 comprises a single base shell shaped to an appropriate cross section to accommodate the cluster or pair of tube ends 2, 2 with some clearance, and also, across the shell end that is uppermost in Figs. 1 and 2, a web 12 pierced with holes 10, 10 conformable to the tube ends in shape and, approximately, in size. As shown, the holes 10, 10 are circular and of a diameter just over the maximum limit of tolerance for variation of the tube ends 2, 2, and have lips or edge flanges 13, 13 inturned into the interior of the shell. The other main structural element of the base 1 is a diaphragm or end wall 14 secured across and closing the otherwise open end or mouth 15 of the shell or cup 11 and carrying insulatively separated contact terminals for the tube ends 2, 2, here shown as projecting hollow contact pins 16 having their upper ends fixed in the diaphragm, and exposed at the outer side of the diaphragm. As shown, there are two pairs of the pins 16 of different sizes, centered on a circle in positions that adapt them to known standard electric sockets. Such insulation of the contacts 16 may most simply be provided by making the whole diaphragm 14 of insulating material such as plastic or vulcanized fiber and riveting the contacts 16 into holes in this diaphragm.

As shown in Figs. 1, 3, and 4, the end wall or diaphragm 14 is peripherally seated at and in the shell mouth 15 with a shouldered engagement. It is simplest to provide the shoulder in the mouth 15, rather than on the edge of the diaphragm 14, as by an internal rabbett 17 formed by expanding the shell mouth somewhat. The diaphragm 14 may be secured in its seat by inward deformation of the shell wall, which as shown in Figs. 1, 3, and 4 is turned or flanged inward all around at 18.

As shown in Fig. 1, the tube ends 2, 2 may be secured in the base 1 by means of cement 19, such as a body of ordinary, standard, thermosetting incandescent lamp basing cement adherent to the interior of the shell 11 as well as to the several tube ends 2, 2. In practice, this

cement 18 may be smeared into the interior of the base through the holes 10, 10 before inserting and pushing home the tube ends 2, 2 and attaching their leads 4, 4 to the base contacts 16 as shown. The amount of cement 18 need be only enough to insure its adhesion to the tube ends 2, 2 adequately, without filling the interior of the base completely.

It is convenient to heat the base 1 to cure or set the cement 18 with the assembly in base-up position as shown in Fig. 5, or on its side as in Fig. 6, rather than base-down as in Fig. 1. In this connection, the lips 13, 13 are of great service in preventing appreciable leakage of cement out through the holes 10, 10 around the tube ends 2, 2, even when the base 1 is inverted as in Fig 5, and even when the basing cement is used at its freshest, when it is most fluid and has the lowest viscosity. I have found that notwithstanding the clearances around the tube ends 2, 2 when they are at the smallest limit of tolerance, the adhesion of the cement to the juxtaposed surfaces 2, 12 and its surface tension prevent its flowing out through the clearances, even when its fluidity is at the maximum of the practical range of variation. As illustrative of good practice, I may mention that for tube ends 2, 2 of nominal ½ inch external diameter, which may actually vary from .500 inch to .550 inch, holes 10 of substantially 0.57 inch diameter with lips 12 having an inward projection or height of $\frac{1}{16}$ inch are satisfactory with the ordinary basing cement above mentioned.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. The combination of electric lamp tube ends disposed side by side; a single sheet metal base shell having across one end thereof an integral web with holes therein conformable to the several tube ends, which extend into the interior of said shell through said holes; a diaphragm closing the other end of said shell, with insulatively separated contact terminals for said tube ends carried by said diaphragm; and a body of cement in said base shell adherent both to its interior and to the several tube ends.

2. A base for a plurality of electric lamp tube ends disposed side by side, said base comprising a sheet metal cup shaped to accommodate the tube ends and having in its bottom web holes corresponding and conformable to said tube ends; and a diaphragm secured across and closing the mouth of said cup, with insulatively separated contact terminals for the tube ends carried by said diaphram.

3. A base for a plurality of electric lamp tube ends disposed side by side, said base comprising a sheet metal cup shaped to accommodate the tube ends and having in its bottom web holes corresponding and conformable to said tube ends, with inturned lips around said holes; an insulative diaphragm seated with shouldered engagement in the mouth of said cup; and insulatively separated contact pins for the tube ends fixed in said diaphragm and exposed at its outer side.

EDWARD B. NOEL.