July 22, 1947. J. W. FULTON ET AL 2,424,446

ELECTRIC LAMP OR THE LIKE

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Fig. 1.

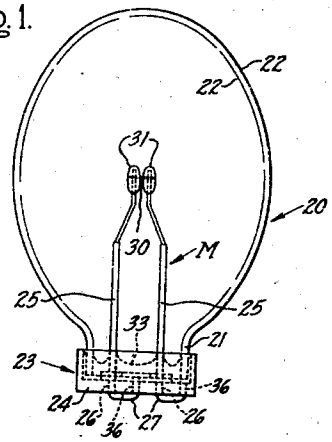


Fig. 2.

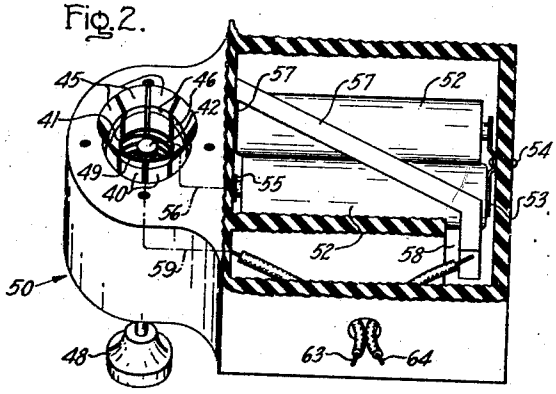


Fig. 5.

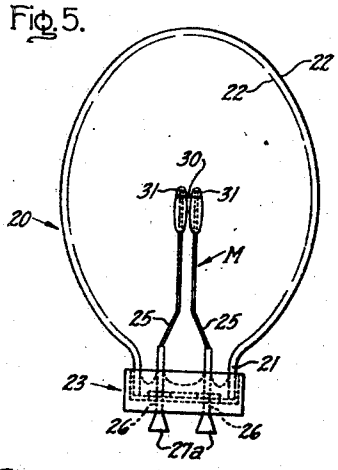


Fig. 6.

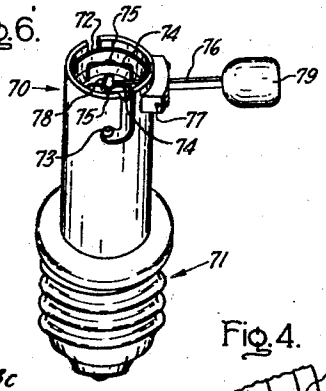


Fig. 16.

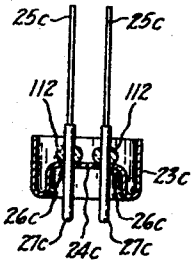


Fig. 4.

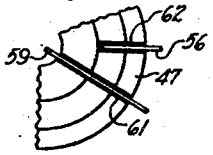


Fig. 7.

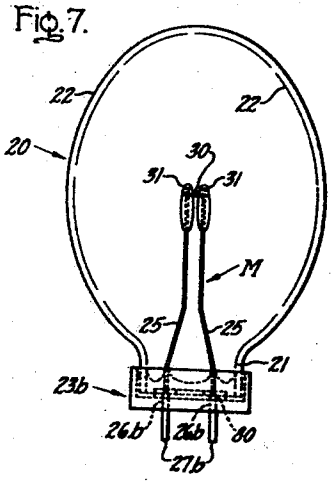


Fig. 8.

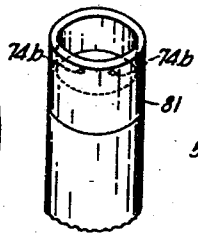
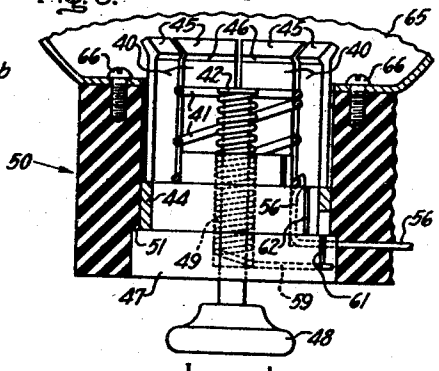


Fig. 3.



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Fig. 9.

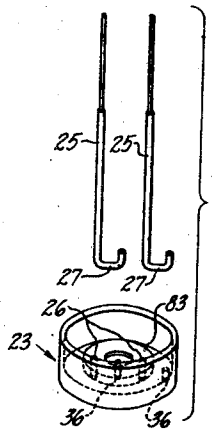


Fig. 10.

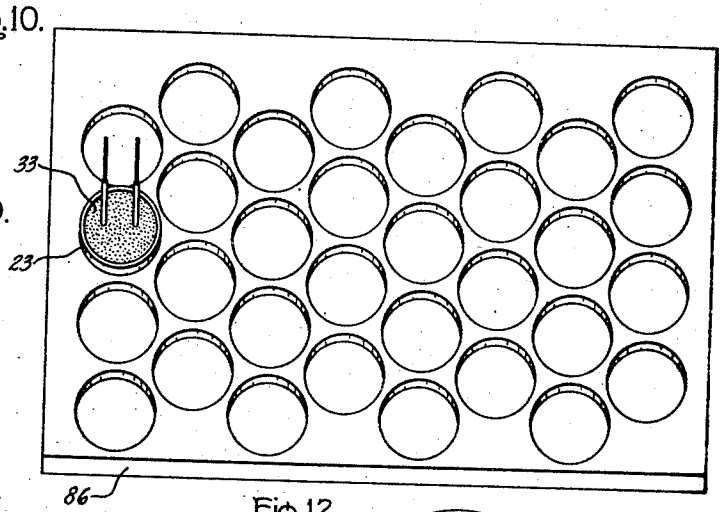


Fig. 11.

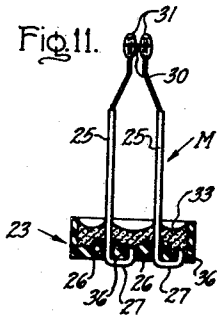


Fig. 15.

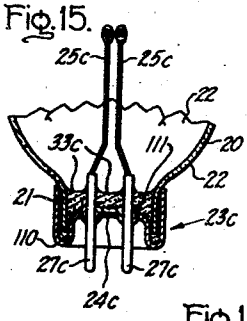


Fig. 12.

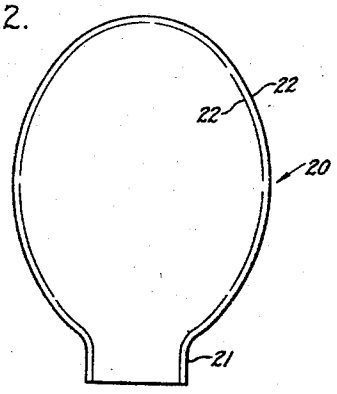


Fig. 14.

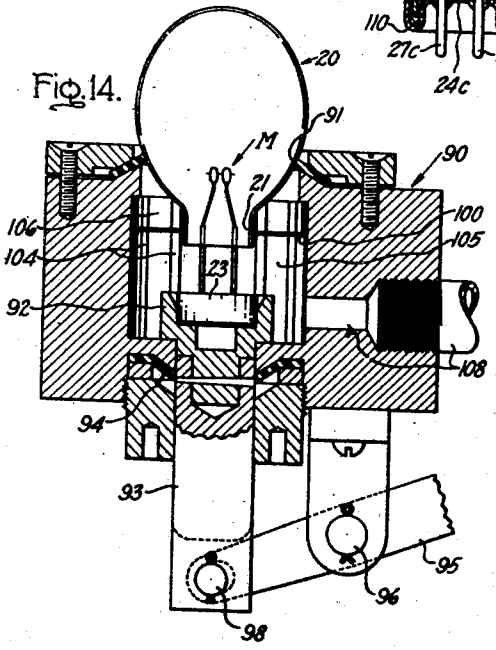
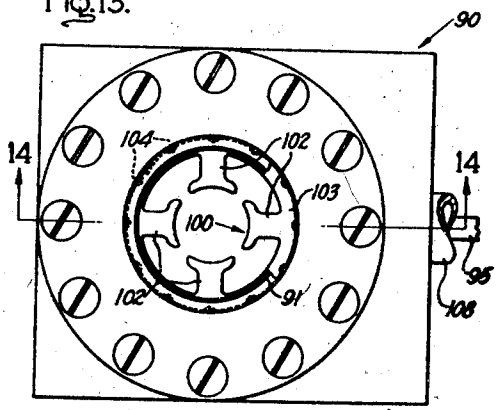


Fig. 13.



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2,424,446

UNITED STATES PATENT OFFICE

2,424,446

ELECTRIC LAMP OR THE LIKE

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Application October 10, 1942, Serial No. 461,578

7 Claims. (Cl. 67—31)

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This invention relates to electric translation devices, and is concerned with the envelope and base construction of such devices, and also with holding and connecting means or sockets for them. The invention is especially adaptable and advantageous for photoflash lamps, as they are called, comprising a combustible fuel charge with associated oxidizing means and igniting means, and is explained hereinafter with particular reference to translation devices of the photoflash type.

Photoflash lamps have heretofore been built on the general incandescent lamp model, comprising hermetic glass envelopes or bulbs equipped with bases like some of those used on small incandescent lamps. The glass bulbs used have necks into which are sealed mounts of glass stem-press and flare construction, including lead wires between which are connected fine bridge-wires or filaments for igniting the fuel used. The fuel may consist of very thin aluminum foil or the like, or of finely divided zirconium. For foil or the like, the bulb is filled with an atmosphere of oxygen; while finely divided zirconium is mixed with an oxidizing compound such as sodium perchlorate. In the latter case, the whole ignition charge consists of this combustion mixture, which is coated on the current leads in contact with the fine bridge-wire, to be heated and ignited by heating current passed through the latter; while when foil or wire is used, only a small primer or ignition charge of such combustion mixture is applied to the leads.

To protect the photoflash bulb from the possibility of being cracked and even shattered when large or very hot particles from the flash strike it, the bulb is internally lacquered, and sometimes externally too. As the presence of lacquer on the bulb neck where it is sealed to the stem would interfere with making this seal, it is necessary to avoid having the lacquer on this portion of the bulb; and this makes the operation of coating the bulb with lacquer more difficult than would otherwise be the case. Indeed, a considerable area at the bulb end has to be left unlacquered, since otherwise the lacquer over a substantial zone at and near the bulb neck would be burned during the sealing-in, destroying its protective value and producing an unsightly scorched appearance. Furthermore, failure of the bulb neck seal may result if particles of the ignition charge fall into this seal while it is being formed by fusion of the bulb neck and the stem flare.

The present invention permits of overcoming these difficulties with a bulb and base construction that is simpler and cheaper to manufacture

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than those heretofore used. This construction permits of doing away with the usual stem-press and flare by mounting the leads and bridge-wire or filament directly on the part which serves as base. Thus fusion of glass parts for sealing-in purposes is dispensed with; the sealing-in and basing operations are in effect merged into a single operation, which can be simplified as compared with the former basing operation; and the fabrication of the base-attached mount can be made a very simple matter as compared with fabricating a mount of the old stem-press and flare type. Moreover, the lacquering of the bulb right to the very end of its neck no longer offers any difficulties. The base itself is also preferably different from bases heretofore used, and coacts with a correlated novel socket. The light-center length of the lamp can be considerably shortened, as compared with prior constructions.

The use of a base structure which also forms part of the lamp envelope wall has already been suggested in various prior patents, as exemplified in Patents 628,973 to Wierre, 2,264,043 to Ledig and Helwig, and 2,272,059 to de Margitta. These, however, are all essentially different from the present invention.

Various features and advantages of my invention (besides those mentioned) will appear from the description of species and forms of embodiment of the invention, and from the drawings.

In the drawings, Fig. 1 is a side view of a photo-flash lamp conveniently embodying the present invention; Fig. 2 is a tilted view of a corresponding socket and holder device; Fig. 3 shows an axial section through this socket and holder, with a portion of an associated reflector, on a larger scale than Fig. 2; and Fig. 4 is a fragmentary end view of one of the socket parts.

Figs. 5 and 6 are views similar to Figs. 1 and 2 illustrating somewhat different lamp and socket devices.

Figs. 7 and 8 are views similar to Figs. 1 and 2 illustrating yet other lamp and socket constructions.

Fig. 9 is an exploded tilted view of the component parts of a mount assembly for the lamp shown in Fig. 1; Fig. 10 is a tilted view illustrating a stage in the manufacture of this mount assembly; Fig. 11 is a side view, partly sectional, of the completed mount assembly; and Fig. 12 is a side view of a corresponding lamp bulb.

Fig. 13 is a plan view of an apparatus for exhausting, basing, and sealing off the lamp; and Fig. 14 shows a horizontal section therethrough, taken as indicated by the line and arrows 14—14 in Fig. 13.

Fig. 15 is a fragmentary sectional view illustrating another form of lamp construction; and Fig. 16 is a similar view illustrating a stage in the fabrication of the mount shown in Fig. 15.

Fig. 1 illustrates a simple form of device constructed in accordance with the invention. As shown, this device comprises as its envelope a light-transmitting bulb 20, of ovoid shape, having a short reduced cylindrical end or neck portion 21, and coated with the usual protective lacquer 22 both internally and externally. For example, the internal lacquer may be a vinyl acetate resin of the "A" series, while the external lacquer may be a cellulose acetate lacquer. On the bulb neck 21 is secured a circular base cap disc 23 that forms part of the air-excluding envelope wall, and comprises a bottom web 24 with a cylindrical rim extending laterally therefrom, Figs. 1, 7, and 9. Current leads 25, 25 extend into the interior of the bulb 20 and out through apertures or holes 26, 26 in the base web 24, and their outer ends 27, 27 are exposed at the outer side or bottom of the cap 23 as contact terminals for connecting the device in circuit. Besides the base cap 23 and the leads 25, 25, the lamp mount M comprises a bridge-wire or filament 30 connected between the inner ends of the leads 25, 25. Rather heavy deposits 31, 31 of the combustion mixture are coated on the lead ends, in direct contact with the bridge-wire 30 adjacent the leads. The bulb 20 may have a filling of oxidizing gas at ordinary atmospheric pressure, or lower, preferably oxygen rather than air.

As shown in Fig. 1, the bulb neck 21 and the current lead wires 25, 25 are secured and sealed to the base cap 23 by means of organic plastic 33 fused and adherent to all these parts, and thus sealing their joints gas-tight. The plastic 33 seals the passage of the current connections 25, 25 into the disc or cap apertures. There may be a substantial amount of the plastic 33 fused to the interior of the base cap 23 as a thick coating, completely filling the clearance between the inside of the cap rim and the exterior of the bulb neck 21, extending up inside of the neck 21 about level with the upper edge of the rim, and also extending some distance up each of the leads 25, 25. This ample area of union between the sealing plastic 33 and the parts 23, 21, 25, 25 is the result of the "wetting" and adherence of the plastic, when fused, on the materials of the several parts, as well as of the quantity of plastic used, and assures ample strength of the joints. The presence of the lacquer coating 22 on the glass does not impair the adhesion of the plastic thereto, since the plastic wets and adheres to the lacquer, or even interfuses with or dissolves the lacquer so as to stick directly to the glass. Accordingly, the whole interior of the bulb 20 is effectively protected against the shattering effect of heated matter thrown out from the flash. While the quantity of plastic 33 is not very critical, a volume of it about equal (after fusion) to half the internal capacity of the cap 23 answers very well.

As shown in Fig. 1, the projecting end portions 27, 27 of the current connections or lead wires 25, 25 are bent aside from the apertures 26, 26 to lie against the outer side of the cap web. To prevent turning of the leads 25, 25 even before they are secured by the plastic 33, these leads may be antiturningly engaged or interlocked with the cap. To engage the ends of the leads 25, 25 for this purpose, the cap web may have external recesses 36, 36 which may be formed as holes piercing the web, and the lead ends may be retroverted to extend into these recesses, as shown in Fig. 1. As also best shown in Fig. 1, the holes 26, 36, 26, 36 are arranged in that order diametrally of the cap 23, one hole 36 at its center and the other near its rim 24, while the holes 26 are equidistant to either side of the center hole 36. Thus one contact 27 is very much more eccentric than the other contact 27 with reference to the center or axis of the base 23, which allows these contacts to be engaged by socket contacts in any angular position of the device in the socket, as explained hereinafter. Preferably, the pairs of holes 26, 36 for the two leads 25, 25 are spaced equally, so that these leads are counterparts of one another, and interchangeable. The fused plastic 33 fills the clearances around the leads 25, 25 in the holes 36, 36, and these fused seals render the joints gas-tight, just as in the case of the holes 26, 26, besides securing and fixing the lead ends firmly.

The base cap 23 may preferably be molded out of thermo-setting plastic with a suitable finely divided fibrous filler, such as a phenol-formaldehyde plastic with a filler of wood flour. The plastic of this character that is marketed under the name of "Textolite molding compound 2154" gives good results; but other molding plastics may also be used, or even materials of altogether different character, such as die-pressed sheet metal (preferably nickel-plated), or molded glass. The lead wires 25, 25 may be of iron or other suitable metal, with their portions outside the cap 23 preferably nickel-plated to prevent rusting.

The properties that are desirable for the sealing plastic 33 are that it should adhere to the materials used for the base or cap 23 and the leads 25, 25, as well as to the glass or to the lacquer coating the bulb neck 21, so as to seal the joints gas-tight; that it should be sufficiently flexible to accommodate differences in thermal expansion and contraction of these parts over the temperature range met with in fabrication, as well as in service; that it should at the same time be sufficiently rigid at temperatures over this range to resist relative displacement of the parts, as well as gas flow through their joints under the pressure differences encountered in manufacture and in service; that it should not be deteriorated by temporary high temperatures met with in fabrication or in service, nor subject to deleterious aging at more ordinary temperatures, or by prolonged exposure to light; and that under the relatively high temperatures of fabrication, especially, it should have a low vapor tension. These requirements are in general less rigorous for photoflash lamps than for incandescent lamps or for electric discharge devices. For the method of manufacture hereinafter described, it is desirable that the resin 33 be thermoplastic rather than thermosetting. Plastics that have met the requirements very satisfactorily in photoflash lamps are the vinylite acetate resins of the "A" series, in the form of molding powder, and particularly the grade marketed as "AYAF" by the National Carbon Company.

A socket suitable for the lamp and base illustrated in Fig. 1 is shown in Figs. 2 and 3 as comprising a multiplicity of resiliently separable parallel fingers 40 for embracing and peripherally gripping the base 23, and also resiliently yielding contacts 41, 42 for engaging endwise against the contact portions 27, 27 of the leads 25, 25 exposed at the outer side of said base. The group of fingers 40 are shown as annularly ar-

ranged leaf springs formed by slotting the cylindrical wall of a sheet metal shell **44**, and as having their free ends that form the shell mouth bent and bevelled outward at **45**, so that they can readily be forced outward by the base **23** when the base is pushed in amongst them. On their inner sides just behind the bevelled ends **45**, Fig. 3, the fingers **40** are reduced on a bevel outward to afford sloping shoulders **46** for snapping and locking over the edge of the base **23** to retain it. As shown, the contact **41** is a ring formed by the end convolution of a helical wire spring mounted on the reduced end of the shouldered insulative part **47**. This annular contact **41** is of such radius as to engage the more eccentric contact **27** in any angular position of the base **23** in the socket. The contact **42** is shown as the head of a pin whose shank extends rearward through the insulation **47**, and is provided with a button-head or handle **48** behind the socket structure. This contact **42** is urged outward by a helical spring **49** acting between its head, and the bottom of a central bore in the part **47**. The contact **42** is of such size as to engage the more central contact **27** in all possible angular positions of the base in the socket. The contact **42** may serve as a lamp ejector, and its shank and the button **48** as the operator for actuating it at the outside of the socket.

As shown in Figs. 2 and 3, the socket shell **44** is housed and accommodated in a bore of an insulative part **50** (which may conveniently be referred to as a holder), with its flaring mouth **45** projecting in front of said part. The rear end of the holder bore is enlarged at a shoulder **51**. The unslotted rear end of the shell **44** fits into the holder bore in front of the shoulder **51**, while the enlarged rear end of the insulative part **47** fits into the holder bore behind and against the shoulder **51**, and is fixed and secured by any suitable means.

While any suitable means may be used for energizing the contacts **41**, **42** to flash a lamp in the socket, it is convenient to mount such means partly on or in the holder **50** itself. As shown in Fig. 2, the main body of the holder adjacent the socket shell **44** is hollow, and houses a battery of two dry cells **52**, **52** which are shown oppositely arranged, each with contacts of opposite polarity at its opposite ends as usual. At one end of the battery compartment or cavity, remote from the socket, the adjacent dry cell ends (of opposite polarity) engage the ends of a resilient contact strip **53** that is centrally secured to the cavity wall, as by screws **54**. At the other end of the battery compartment, one of the dry cell ends engages a contact **55** that is mounted on the cavity wall and is connected by a lead **56** to the spring contact **41**, while the other dry cell engages a contact portion of a metal strip connector **57** which extends diagonally across the battery compartment and through an opening **58** into one end of an adjacent wiring compartment. From the center contact **42** or its spring **49**, a connector lead **59** extends into the other end of the wiring compartment. As shown in Figs. 3 and 4, the leads **56**, **59** lie in radial slots **61**, **62** in the insulating plug part **47**. Lamp-flashing circuit leads **63**, **64** which may form a suitable cable are connected to the connectors **57**, **59** in the wiring compartment and extend out through an opening in one side thereof to any suitable switch means (not shown) for flashing a lamp in the socket shell **44**, when desired. A sheet metal reflector **65** for suitably directing and

distributing the light of the flash is indicated by a central fragmentary portion thereof secured to the holder **50** around the shell **44**, by means of screws **66**.

After the lamp has been flashed, the button-head **48** may be pressed forward to push the contact **42** forward and eject the lamp from the socket.

Fig. 5 shows a form of construction in which the leads **25**, **25** extend through the base holes **26**, **26** as stout pins that terminate in conically undercut enlarged heads **27***a*, **27***a* outside the bottom of the base **23**. As shown, these contacts **27***a*, **27***a* are symmetrically located at opposite sides of the axis of the base **23***a*, the holes **36**, **36** of Fig. 1 being omitted. The enlargement of the conical heads **27***a*, **27***a* outside the base cap **23***a* assists the fused seals or joints at **26**, **26** in resisting inward displacement of the leads **25**, **25** through the base **23***a*. While this device may be used in a socket essentially like that shown in Fig. 2, the undercutting of the contact heads **27***a*, **27***a* adapts them for directly retaining the device in a socket, besides making the electrical connections. For this purpose, Fig. 6 illustrates a device comprising a bayonet socket **70** on an Edison screw plug **71**. In the bayonet socket **70** is an adapter shell **72** that is secured by external bayonet pins **73** fixed in the shell **72**, and is provided with resilient contact and securing members **74**, **74** for interlocking engagement with the base contact heads **27***a*, **27***a* when the base **23** is inserted in the socket **70** far enough to bottom against the shoulder afforded by the edge of the shell **72**. As shown, the contacts **74**, **74** consist of staple-like springy wires having their ends insulatively fixed to the bottom of the adapter shell **72**, while their intermediate portions extend eccentrically (like chords) part way across the interior of the shell **72**, and are oppositely notched or bowed apart at **75**, **75**. When the base **23***a* is inserted in the socket **70** as above mentioned, the conical contact heads **27***a*, **27***a* lie between the members **74**, **74**; and when the lamp is then turned about 90° either way, the heads **27***a*, **27***a* bend the resilient members **74**, **74** apart and then snap into the notches **75**, **75**. When this happens, the contact heads **27***a*, **27***a* interlock behind and between the members **74**, **74**, which thus hold the lamp firmly fixed in the socket.

As shown in Fig. 6, there is a separate ejector and operator for ejecting the lamp from the socket **70**, consisting of a lever **76** that is fulcrumed on an axis **77** in a block attached to the socket **70** and extends through slots in said block and in the socket wall to the center of the socket, where it has a head **78** for engaging the bottom of the base **23** directly between the contact heads **27***a*, **27***a*. On the outer end of the lever **76** is shown a handle knob **79**. By pressing down on this handle **79**, the inner lever-end **78** is pressed up against the base **23** to lift it out of the socket **70**, and the members **74**, **74** are concurrently forced apart by the sloping surfaces of the heads **27***a*, **27***a* to release these heads.

Fig. 7 shows a form of construction in which the leads **25**, **25** extend through the base holes **26***b*, **26***b* as stout pins whose outer ends form straight cylindrical contacts **27***b*, **27***b* of uniform size, which are symmetrically located at opposite sides of the axis of the base **23***b*, the holes **36**, **36** of Fig. 1 being omitted. The reduction in size of the contacts **27***b*, **27***b* occurs at shoulders **80**, **80** which abut against corresponding shoulders formed by reduction of the base holes **26***b*, **26***b*

and assist the fused seals or joints in resisting inward displacement of the members 27b, 27b through the base 23b. For this type of base 23b, a very simple socket is shown in Fig. 8, comprising an insulative member 81 whose recessed end receives the base 23b and has openings at the bottom of the recess in which are mounted resilient contact clamps 74b, 74b that receive and grip the contact pins 27b, 27b. This socket 81 may have an Edison screw plug (not shown) similar to that in Fig. 6.

There are now to be described more fully the component parts and the fabrication of the mount illustrated in Fig. 1, and also the sealing in of this mount into a bulb 20 and the related operations. This description will enable those skilled in the art to carry out the corresponding operations for the modified devices illustrated in Figs. 5 and 7 very easily.

As shown in Fig. 9, the principal components of the mount are the base cap 23 and the lead wires 25, 25. The cap disc 23 is shown as hollowed out to a shallow cup or pan with a relatively thick bottom wall or web that is further thickened locally as indicated by an internal flat-topped annular ridge 83. In other words, the end disc 23 is annularly grooved around the central protuberance or ridge 83 to accommodate the envelope end or neck 21. The lead-holes 26, 26 extend through the thickness of the ridge 83, being symmetrically located with respect to the center or axis of the cap, where it is relatively thin and has the central hole 36. The other hole 36 is shown in the relatively thin zone of the cap bottom around the ridge 83. The location of the lead-holes 26, 26 in the augmented thickness of the cap bottom at the ridge 83 affords ample bore lengths around the leads 25, 25, while the ridge edges are favorable for the adherents of the sealing plastic. The base cap 23 may be molded out of thermo-setting plastic, such as Bakelite, or "Textolite molding compound 2154"; or it may be of wood impregnated with thermo-setting synthetic resin or plastic, such as Bakelite; or it may even be of molded glass or other material.

Prior to insertion into the base-cap 23, the leads 25, 25 may have their lower ends bent into right-angled hooks 27, 27 like those in Fig. 9. As shown, the lower portions of these leads 25, 25 are thicker, and may be of nickel-plated iron wire, while the upper portions, which are thinner wires butt-welded to the lower portions, may be of unplated iron. After inserting the lead wires 25, 25 through the cap holes 26, 26 and inserting their ends into the cap holes 36, 36, these parts may be permanently secured and sealed together with thermoplastic as illustrated in Fig. 10. For this purpose, the assembly may be placed in a conformable socket depression of a multisocketed refractory plate 86 (made of an asbestos and cement composition), and the base cap 23 may be charged with sealing plastic 33 such as vinylite resin "A," in its usual commercial form of molding powder, about level with the top edge of the cap. The other sockets of the plate 86 having been similarly loaded, the loaded plate may be placed in an electrically heated oven (not shown) and kept at a temperature sufficient to fuse the resin (e. g., about 170° C.) for about 12 hours, so as to degas the resin thoroughly, after which the heating current may be shut off and the oven and its contents allowed to cool. After cooling, the thin upper portions of the leads 25, 25 may be bent closer together, a tungsten filament 30 may be welded across them, and the joints may be coated with deposits 31, 31 of the combustion mixture above referred to, all as heretofore usually done in the manufacture of photoflash lamps. The result is the completed mount M as shown in Fig. 11.

The bulb 20 shown in Fig. 12 having previously been coated inside and out with lacquer 22 (such as above indicated) right down to the bottom edge of its neck 21, by methods well understood in the art, the lamp may be completed by assembling the lacquered bulb with the amount M, exhausting the bulb and charging it with the desired gaseous atmosphere, and re-fusing the plastic 33 in the cap 23 and forcing the bulb neck 21 into it against the bottom of the cap, thus sealing in the mount and sealing off the lamp. It is convenient to do the necessary heating of the parts preliminarily and separately, by placing the mount cap 23 and the bulb neck 21 is socketed metal heating plates (not shown) somewhat similar to the plate 66, Fig. 10, preferably electrically heated. The mount cap 23 may be heated to about 170° C., as before, and the bulb neck 21 some 15° to 20° hotter. Only a brief heating of about 1½ minutes is necessary.

For the exhausting, gas-charging, and actual sealing operations may be used an apparatus comprising a hollow metal exhaust head or block 90 having an upward-open mouth lipped with an elastic (rubber) sealing ring 91, and having in its internal cavity a thermoinsulative socket piece 92 (as of molded asbestos composition) to receive the mount base 23. As shown, the socket 92 is mounted on the upper end of an upright rod 93 that is longitudinally movable (vacuum and fluid-tight) through an elastic packing 94 at the bottom of the head 90, and may be operated to shift the socket up and down by means of a lever 95 fulcrumed at 96 on a support extending downward from the head, and having a pin and slot connection 98 to the lower end of the rod 93. At an intermediate level in the interior of the exhaust head 90, there may be provided an aligning guide 100 for the neck 21 of a bulb 20 inserted neck-down into the exhaust head mouth and seated on its sealing lip 91, which makes a fluid-tight seal with the lower portion of the bulb. As shown in Figs. 13 and 14, this guide 100 has a circular opening of a normal size conformable to the bulb neck 21, but is expansible to a sufficient diameter to pass the base cap 23 when the latter is inserted in the socket 92 or removed. For this purpose, the bulb-neck engaging portion of the guide 100 is divided into a number of arcuate segments carried by flat spring fingers 102 extending inward from a ring 103 adjacent the internal circumference of the exhaust head 90. Thus constructed, the guide 100 can readily be stamped out of springy sheet metal. As shown, the ring 103 rests on internal shoulders 104 of a split liner 105 in the cavity of the head 90, adjacent the upper edge of this liner, and is held in place by an upper split liner 106 resting on its outer margin. A gas duct 108 opens into one side of the head 90, and may be connected and shut off at pleasure to and from either a high-vacuum exhaust system, or a supply of desired gas (such as oxygen) at about atmospheric pressure or lower, by any suitable valve and conduit means, not shown.

When the bulb neck 21 and the mount cap 23 have been suitably heated, as described above the thermoinsulative socket 92 is raised sufficiently to deflect the guide fingers 102 upward and force the guide segments 100 apart, allowing

the cap 23 of a mount M to be placed in the socket. The socket 92 is depressed again to its position in Fig. 14, and a bulb 20 is placed in the exhaust head 90 with its neck 21 in the guide 100 in alignment with the opening of the cap 23. The duct 108 is first connected to exhaust to draw the air out of the bulb 20, and then to the gas supply to charge the bulb with oxygen, for example; and these connections may be interchanged as often as necessary to wash out the bulb 20 thoroughly and to charge it with the gas in a sufficiently pure state. Then the socket 92 may be raised to push the base cap 23 up around the bulb neck 21 until the latter bottoms in the cap and is sealed therein by the softened plastic 33. When the parts have cooled sufficiently to set the plastic 33, and the duct 108 has been opened to the atmosphere so as to equalize pressure on the bulb 20, the completed lamp may be removed, the socket 92 being preferably raised to expand the guide 100 and obviate any resistance which it might offer to passage of the base-cap 23 therethrough.

Figs. 15 and 16 illustrate another particular form of lamp construction and its manufacture, comprising a base 23c with pin contact terminals 27c, 27c, adapted for use in a socket generally similar to that illustrated in Fig. 8.

The bulb 20 shown in Fig. 15 may be like that already described, and may be similarly coated with protective lacquer 22. The base cap 23c is shown as of slightly different form, and may be fabricated out of sheet metal by die-pressing: it may preferably be made of soft iron or mild steel about 0.03 inch thick. Its bottom web 24c is shown reversely cupped, with an annular round-bottomed groove 110 therein adapted to take the edge of the bulb neck 21 with ample clearance, inside as well as outside. Within the groove, the web 24c has a pair of holes 26c, 26c (Fig. 16) for the stout contact terminal pins 27c, 27c forming the lower ends of the current leads 25c, 25c, these holes being large enough to afford ample clearance around the pins. The leads 25c, 25c may be fixed in the cap holes 26c, 26c and insulated from the cap by means of insulative cementing material 111, preferably vitreous, which may consist of enamel glass fused around the leads and to the cap web 24c in and around the openings 26c, 26c. The seals for the two holes 26c, 26c are shown as merged inside the cap 23c into a single vitreous mass 111. The bulb neck 21 is secured to the base cap 23c by means of organic plastic 33c fused and adherent to these parts, and shown as also coating over the vitreous mass 111 and fused and adherent to the leads 25c, 25c at the inside of this mass. The fused vitreous seals at 111 attach the leads 25c, 25c firmly and rigidly to the cap 23c, and may also seal them therethrough gas and vacuum tight; but any want of hermetic tightness of the vitreous joints can be remedied by applying the plastic 33c so as to coat over the vitreous mass and adhere to the leads 25c, 25c, as shown.

In manufacture, the leads 25c, 25c may each be coated with a vitreous bead 112 fused thereabout, and may then be placed in the holes 26c, 26c as shown in Fig. 16 and fixed by fusing down these beads to form the seal 111 of Fig. 15 while the leads are both suitably held in proper relation to the cap 23c, out of contact therewith. After completing the mount M and fusing the plastic 33c into the cap 23c substantially as already described in connection with Fig. 10, the bulb neck 21 may be sealed into the base cap 23c (as shown in Fig. 15) and the lamp completed, all substantially as already described in connection with Figs. 13 and 14.

In order to dispense with repetitive description, various parts and features in Figs. 5, 7, 15, and 16 are marked with the same reference numerals as the corresponding ones in Figs. 1, 9, and 11, a distinctive letter being added where such distinction appears necessary.

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

1. In an electrical device, the combination with an envelope having an otherwise open end, of a one-piece cup-shaped base of insulating material circumposed about the envelope end, and having a plurality of apertures in its bottom wall; current connections for electric translation means in the envelope extending through said apertures and having end portions exposed at the outer side of the base as contact terminals; and a coating of vinyl acetate in the interior of said base fused and adherent thereto and to said envelope end and current connections, thus securing the base to the envelope and sealing the passage of the current connections into the base apertures.

2. In an electric photoflash lamp, the combination with an envelope internally coated with adherent shatter-preventive lacquer and having an otherwise open end and containing a charge of combustible flash-emitting material, of a one-piece cup-shaped base on the envelope end having a plurality of apertures in its bottom wall; current leads for electric translation means in the envelope extending through the said apertures and having end portions exposed at the outer side of the base as contact terminals; and a coating of organic plastic fused and adherent to the interior of said base and to said leads and said envelope end and also merging with the aforesaid lacquer therein, whereby the envelope is fully protected from shattering due to impact of heated matter from the flash.

3. A mount for an electrical device having an envelope with an otherwise open end, said mount comprising a one-piece cup-shaped base of insulating material for said open envelope end having a plurality of apertures in its bottom wall; electric translation means with current leads therefor extending through the said apertures and having end portions exposed at the outer side of the base as contact terminals, and embodying shoulders externally engaging against the base to prevent inward displacement of the leads through the base; and a coating of organic plastic fused and adherent to the interior of said base and to said leads, and forming fused seals securing said leads in the base apertures and constituting the sole attachment of said leads to said base.

4. A mount for an electrical device having an envelope with an otherwise open end, said mount comprising a cup-shaped base of insulating material for said open envelope end having a plurality of apertures in its bottom wall, and also having recesses therein adjacent the apertures; electric translation means with current leads therefor extending through the said apertures and bent aside and laterally exposed at the outer side of the base as contact terminals, and also having their ends engaged in the recesses aforesaid, and thereby locked against turning in the apertures; and a coating of organic plastic fused and adherent to the interior of said base and to said leads, and forming fused seals securing the

latter to the base and sealing up the base apertures.

5. A mount for an electrical device having an envelope with an otherwise open end, said mount comprising a cup-shaped base of insulating material for said open envelope end having pairs of holes through its bottom wall; electric translation means with current leads therefor each extending out through one hole of each pair and retroverted back into the other hole of the pair, and thereby locked against turning relative to the base, with the portions between holes exposed at the outer side of the base as contact terminals; and a coating of vinyl acetate fused and adherent to the interior of said base and to said leads, and forming fused seals securing the latter to the base and sealing up the aforesaid holes.

6. A mount for an electrical device having an envelope with an otherwise open end, said mount comprising a one-piece cup-shaped base of insulating material circumposed about the envelope end, and having a plurality of apertures in its bottom wall; electric translation means with current leads therefor extending through said apertures and having undercut ends projecting at the outer side of the base as contact terminals; and a coating of organic plastic in the interior of said base fused and adherent thereto and to said leads, and forming fused seals securing said leads in the base apertures and constituting the sole attachment of said leads to said base.

7. In an electrical device, the combination with an envelope having an otherwise open end, of a one-piece cup-shaped base of insulating material circumposed about the envelope end, and having a plurality of apertures in its bottom wall; current connections for electric translation means in the envelope extending through said apertures and having end portions exposed at the outer side of the base as contact terminals; and a coating of organic plastic in the interior of said base fused and adherent thereto and to said envelope end and current connections, thus securing the base to the envelope and sealing the passage of the current connections into the base apertures.

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