

July 27, 1965

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3,197,668

LAMP WITH RESILIENT CONTACT TERMINALS

Original Filed April 11, 1960

2 Sheets-Sheet 1

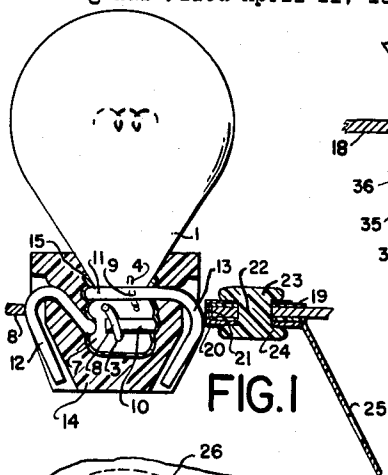


FIG. 1

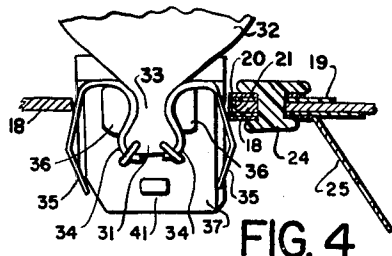


FIG. 4

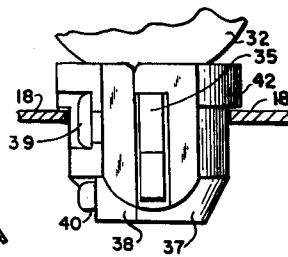


FIG. 5

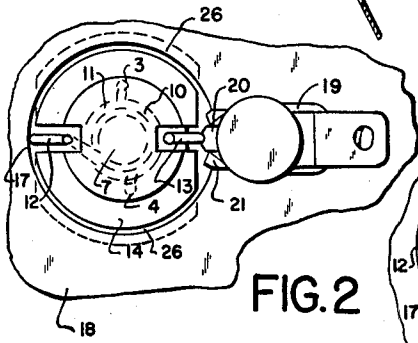


FIG. 2

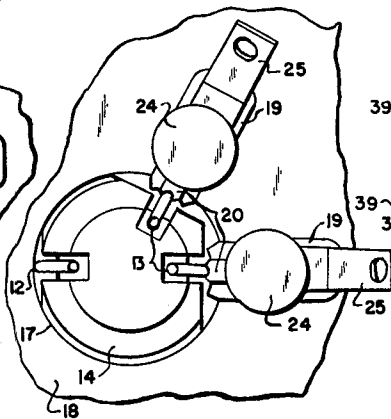


FIG. 3

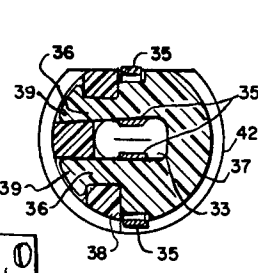


FIG. 6

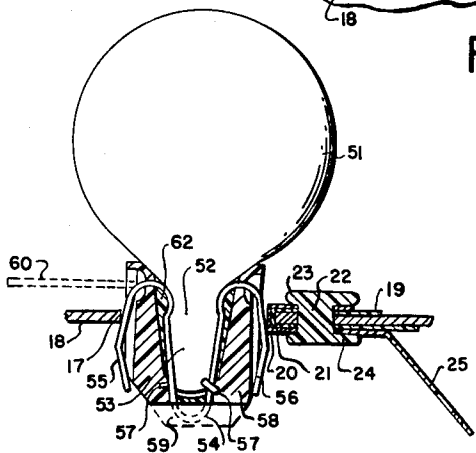


FIG. 7

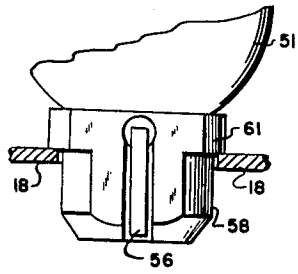


FIG. 8

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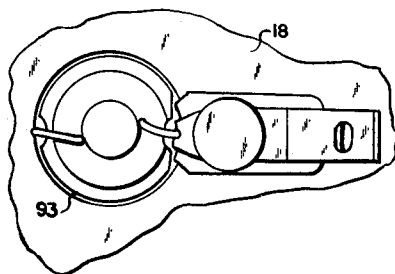
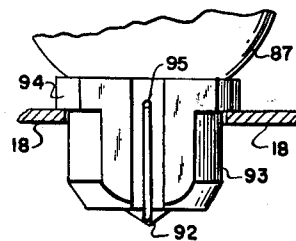
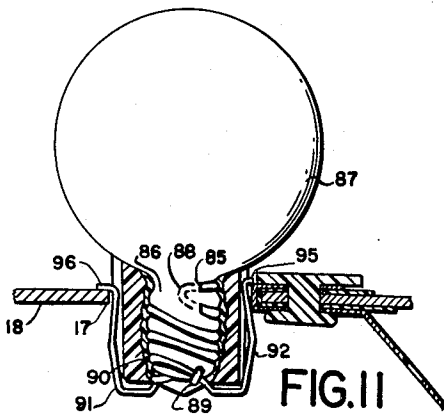
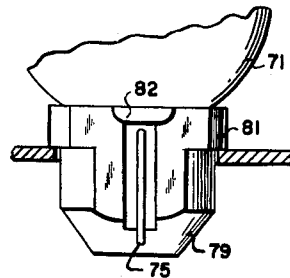
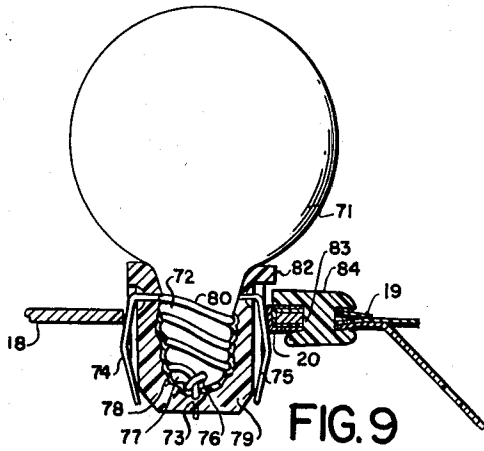
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LAMP WITH RESILIENT CONTACT TERMINALS
 John J. Horan, 420 Quigley Ave., Willow Grove, Pa.
 Original application Apr. 11, 1960, Ser. No. 21,408, now
 Patent No. 3,118,717, dated Jan. 21, 1964. Divided
 and this application Mar. 21, 1962, Ser. No. 181,399
 5 Claims. (Cl. 313-318)

This application is submitted in compliance with a requirement for restriction of my prior application No. 21,408, now Patent Number 3,118,717. This application is divisional therefrom; and it covers the lamps of the prior application, which is now restricted to the adapters also disclosed therein. Application No. 21,408, in turn, was a continuation in part of a still earlier application, S.N. 791,907, on related subject matter, now issued as Patent No. 3,020,437, in which the concept of elastic lamps was first introduced and disclosed. As the name implies, elastic lamps, unlike the rigid lamps of the prior art, have in them the necessary coacting compliance to mate with rigid receptacles.

An object of this application is to disclose further exploitation of the basic concepts of elastic lamp mounting and construction beyond those shown in the issued patent, with particular emphasis upon opposed mechanical orientation of the electrodes. An object of this invention is to eliminate the structure, bulk, and expense of sockets. Other objects of the prior disclosures are part of this invention. Still other objects and novel features of this invention will become apparent in the balance of this application, in the claims, and in the drawings, in which:

FIG. 1 is a partially sectioned view of a lamp and contact adapter during installation. The lamp is not fully advanced into terminal position;

FIG. 2 is a view of the lamp and contact adapter from below the panel;

FIG. 3 is a view from below of the base and contact arrangement of a similar lamp containing 2 radiant energy producing devices having a common ground;

FIG. 4 is a view of a third form of this invention, the base cover not having been assembled and the mounting panel being sectioned;

FIG. 5 is an elevation of the base of the lamp of FIG. 4 at a right angle to the plane of FIG. 4, the base cover being in place;

FIG. 6 is a sectional view of the base of the lamp of FIG. 4, the plane of the view intersecting the upper rivets;

FIG. 7 is a partly sectioned view of a fourth form of elastic lamp, as installed;

FIG. 8 is an elevation of the lamp of FIG. 7, at a right angle to FIG. 7;

FIG. 9 is a partly sectioned view of a fifth form of elastic lamp as installed;

FIG. 10 is an elevation of the lamp of FIG. 9 at a right angle to FIG. 9;

FIG. 11 is a partly sectioned view of a sixth form of elastic lamp;

FIG. 12 is an elevation of the lamp of FIG. 11 at a right angle to FIG. 11;

FIG. 13 is a view of the installed lamp of FIG. 11 from below.

Referring now to FIGS. 1, 2, and 3, there is shown a glass bulb 1, having therein a radiant energy producing device, such as a filament. Two electrodes 3, 4, communicating with the device inside, emerge from the bulb base 7 and are soldered or spotwelded 8, 9 to the inner ring-shaped ends 10, 11 of contact projections 12, 13. A base or pedestal 14, preferably containing oxide-type minerals of low thermal expansion, together with a suitable binder is molded or cast upon the bulb base after a thin binding coating 15, which may be of similar mate-

rial with less filler, has first been applied to secure the parts against movement during processing. The free resilient portion or contact projection 12 grounds on edge 17 of the hole in panel 18 into which the lamp is inserted. The outer and free resilient portion or contact projection 13 wipes and mates with the contact adapter, next described. The contact adapter comprises an insulating strip 19 bonded to a contact strip 20 and looped over the edge 21 of the hole in the panel 18 and secured in place with thermoplastic rivet 22, the head 23 of which is uppermost in FIG. 1. The end 24 of the rivet 22 is heat-swaged or mushroomed to hold the insulating strip 19 and contact strip 20 permanently in place. The contact strip 20 has a tabular extension 25 to accommodate soldering of the live lead.

As seen in FIG. 2, the presence of a circular hole with a contact adapter therein leaves a D-shaped opening. Since the lamp base or pedestal may also be of D-shaped construction, the lamp installation is polarized and cannot be made incorrectly. Flange 26, which does not show in FIG. 1 but is indicated by the dotted line in FIG. 2, serves as an insertion stop, as will any lateral projection located at the correct axial distance from the contact projections. The insertion stops in my elastic lamps prevent them from being inserted beyond the areas of electrical contact with thin plates or panel receptacle; and they eliminate the former necessity for deep sockets or other means to perform this mechanical function.

The elasticity and profile configurations of the contact projections 12, 13 insure good electrical contact. The fact that both relatively narrow projections wipe the corresponding surfaces of the hole edge and the contact adapter removes one of the most common causes of failure of lamps to light properly if at all, owing to accumulations of oxide on bayonet pins and on the center contacts of conventional lamps and sockets. The contour and elasticity of the projections serves also to insure that the lamp will stay in place and in contact despite vibration. To withdraw the lamp, sufficient pull must be exerted to deflect the contact projection, just as force was needed to effect its insertion.

Obviously, polarized multi-leemnt devices are quite possible, FIG. 3, now of reference, containing one arrangement.

Referring now to FIGS. 4, 5, and 6, there is shown a third form of lamp according to this invention. The press portion 31 of the glass envelope 32 is necked flat at 33 to accommodate itself between the curved inner ends 34 of contact members 35. These members 35 have in turn been contoured to be confined between the neck 33 and the inner surfaces of the plastic rivets 36 which project from and are integral with base body 37. Before assembly of base cover 38 (not shown in FIG. 4) to the base body 37, the electrodes projecting from press 31 are spotwelded to inner ends 34 of contact members 35. Base cover 38 is secured by heat-swaging heads 39 on the ends of the rivets 36 and head 40 on rivet 41. Flange 42 serves as an insertion stop. The contact adapter is the same one previously described.

Referring now to FIGS. 7 and 8, there is shown a fourth form of elastic lamp. The glass body 51 is necked 52 at the press 53 to permit the contact assembly 54, 55, 56, initially fabricated in one piece for easy handling, to be snapped in place and to permit electrical leads 57, which project from the end of the press 53, to be spotwelded to the contact assembly 54, 55, 56. A binding coating 62 is next put on. Base body 58 is then molded in situ; and lower junction portion 54 of contact assembly 54, 55, 56, together with the lower portion (dotted lines) of pedestal 59, is cut off to prevent shunting of current via the now-useless junction 54. Contact portions 55, 56 may optional-

ly not be fully formed before molding. For example, contact portion 55 may be left in accordance with the dotted outline 60 during and prior to molding, and then bent to the final outline after the pedestal 58 has been taken from the mold. Note that the clearance between the contact portions 55 and 56 and the wall of the pedestal is greatest where the outwardly sloping contact portions project farthest outward to peak bulges. Flange 61 serves as an insertion stop.

Referring now to FIGS. 9 and 10, there is shown a fifth form of elastic lamp, in which the glass body 71 has a threaded base press 72 of double pitch. Both contact projections 74, 75 are initially part of a double-coiled spring 73, 74, 75, 80, having a crossover junction as shown by the dotted outline 73. Thus, alternate coils of the double spring lead to opposite sides of the filament, one spring half terminating in the right resilient contact portion 75 and one in left resilient contact portion 74. The electrodes leading from the radiant energy producing device inside the bulb emerge on opposite sides from the bottom 77 of base press 72. One of these electrodes 76 is spotwelded to the bottom convolution on the near side, providing continuity to the right contact 75. The other electrode, hidden, is spotwelded to the bottom convolution on the hidden side and gives continuity to left contact 74. After spotwelding, the base press 72 is dipped into a binding composition, leaving a hard coating 78 over the base press 72 and the spring portion 80 and permitting cutoff of the junction 73 prior to molding on the lamp base 79. As before, the contacts 74, 75 may be finish-bent after molding. Flange 81, serving as an insertion stop, has an integral projection 82 which hides the live contact strip 20 of the contact adapter from view from the front of the panel 18.

In FIG. 9 the hole for receiving the lamp is so near the edge of the panel that there is no room for the usual small hole shown in prior figures for receiving the insulating rivet of the contact adapter. Instead the rivet 84, which preferably has an oblong stem cross section, one edge of which lies close along the edge 83 of panel 18, squeezes the contact strip 20 and the insulating strip 19, asymmetrically cocking the rivet 84 somewhat, as shown.

Referring now to FIGS. 11, 12 and 13, there is shown a sixth form of elastic lamp of this invention. Like the prior embodiment, this one also employs a double-coiled spring 85, snapped in place or wound upon the thread-molded base 86 of glass envelope 87. Juncture 88, shown dotted, between the two sets of spring convolutions had been bent up and away from the base 86, permitting it to be sheared off after the electrodes 89 have been spotwelded to the nearest respective convolutions of spring 85 and after binding coat 90 has been applied. The remote electrode and corresponding half-convolution are necessarily hidden in FIG. 11. In this lamp, unlike prior embodiments, contact projections 91, 92 emerge from the bottom and are contoured upwardly toward the top of the base 93. The flange 94 may serve as insertion stop. The bent-over tips 95, 96 of the resilient contact portions 91, 92 may serve instead.

It will be obvious that various combinations of features I have shown can be made and that the principles of my lamps may be combined with various types of conventional lamps and installations. Such modifications and combinations will become obvious to those skilled in the art without departing from the true scope of my invention; and it is, accordingly, intended in the appended claims to cover such equivalents as may fall within the true scope of my invention and without the prior art. I wish it to be understood that my invention is not to be limited to the specific forms or arrangements of parts which I have described or shown or specifically covered by claims.

Therefore, I claim:

1. An electric lamp comprising:
 - a radiant energy producing device;

- a hermetically sealed enclosure containing said device; said enclosure having a press portion at the lower end thereof;
 - a pedestal enclosing said press portion and having an outside wall;
 - a plurality of electrical leads extending from said energy producing device out of said enclosure and into said pedestal via said press portion, said press portion being sealed around each of said leads;
 - a plurality of metallic members contained within said pedestal;
 - each of said members being a connection to a respective one of said leads;
 - said members having resilient contact portions thereof projecting out of said pedestal and flanking said wall along their respective lengths toward their termini; at least one of said resilient contact portions sloping outwardly from above and below toward a radial bulge thereon spaced outwardly from said wall;
 - said lamp having a radial projection axially spaced slightly beyond said bulge;
 - whereby, after the said bulge on the said resilient contact portion has been passed resiliently through a constricting hole in an extraneous thin-walled receptacle, the edge of said hole may be resiliently held between said bulge and said projection.
2. An electric lamp as in claim 1, said projection being integral with one of said enclosure and said pedestal.
 3. An electric lamp as in claim 1, said projection being located on one of said contact portions beyond said bulge.
 4. An electric lamp as in claim 1, having a second contact portion also sloping outwardly from opposite directions toward a radial bulge thereon spaced outwardly from said wall.
 5. An electric lamp installation containing:
 - (a) an electric lamp that comprises:
 - a radiant energy producing device;
 - a hermetically sealed enclosure containing said device;
 - said enclosure having a press portion at the end thereof opposite said energy producing device;
 - a pedestal enclosing said press portion and having an outside wall;
 - a plurality of electrical leads extending from said radiant energy producing device out of said enclosure and into said pedestal via said press portion;
 - said press portion being sealed around each of said leads;
 - a plurality of metallic members contained within said pedestal;
 - each of said members being a connection to a respective one of said leads;
 - said members having resilient contact portions thereof projecting out of said pedestal and flanking said wall along their respective lengths toward their termini,
 - at least one of said resilient contact portions having thereon sloped surfaces tapering from above and below toward a radial bulge thereon spaced outwardly from said wall;
 - said lamp also having a radial projection thereon spaced slightly beyond said bulge;
 - (b) a plate having an opening therein surrounded by an edge; and
 - (c) a contact adapter secured to said plate over a portion of said edge and insulated therefrom;
- said contact adapter being connected to a source of electric power and said plate being connected to the ground side of said source;
 - said lamp being inserted into said opening until said radial projection encounters one of said plate and said contact adapter;
 - whereby the said radial projection coacts with the

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tapered surface beyond said bulge to exert a gripping thrust against said edge.

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DAVID J. GALVIN, *Primary Examiner.*

JAMES D. KALLAM, *Examiner.*