June 5, 1956 A. W. GAST 2,749,527

ELECTRIC LIGHT BULB HAVING INSULATION PIERCING CONTACTS

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Fig. 4

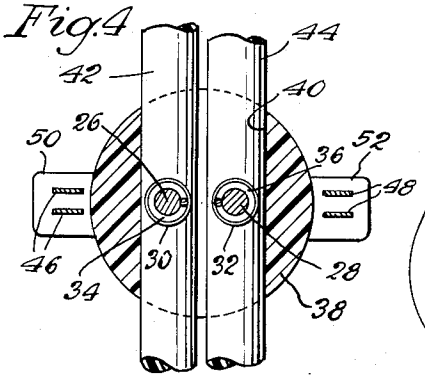


Fig. 1

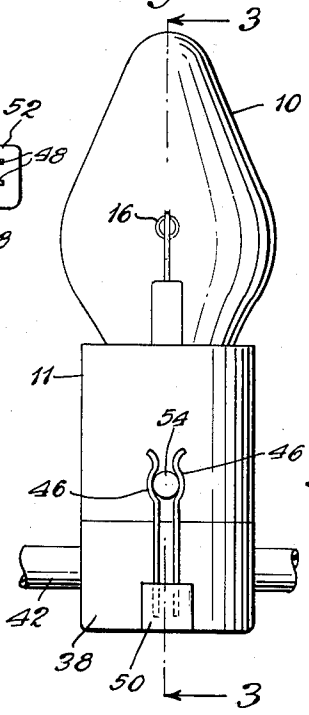


Fig. 2

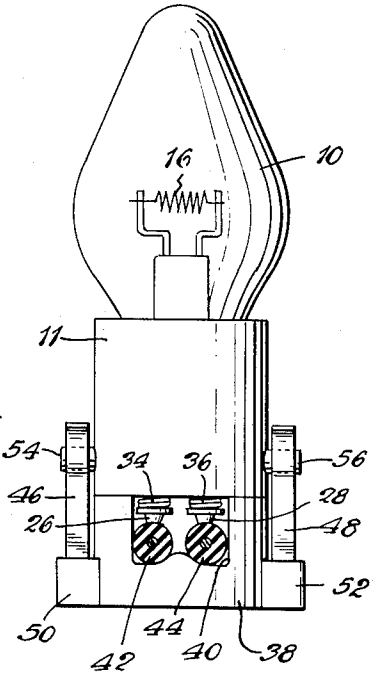


Fig. 3

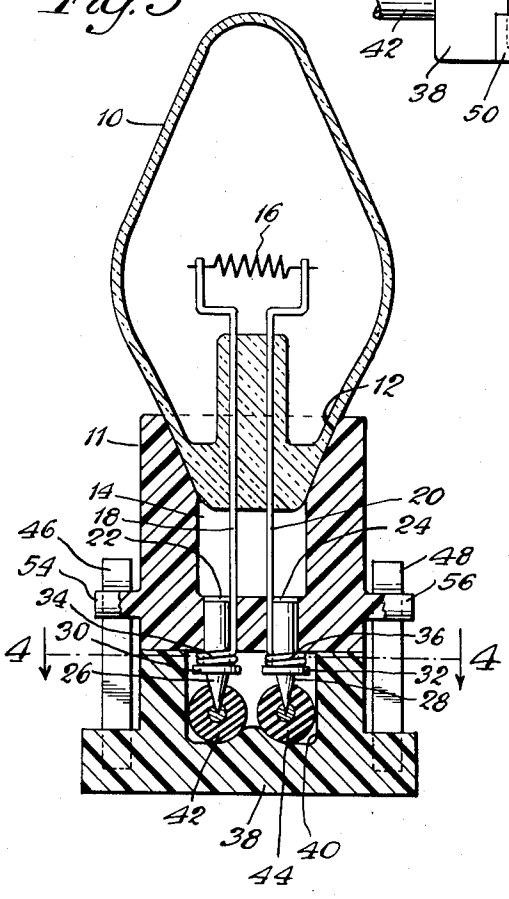
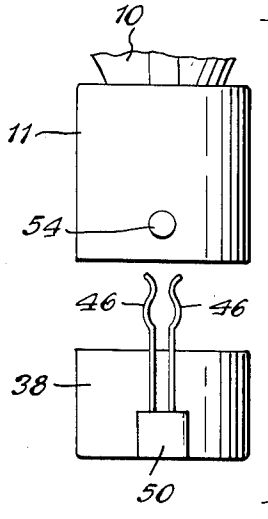


Fig. 5



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Fig. 10

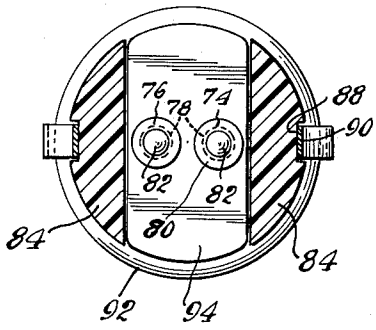


Fig. 6

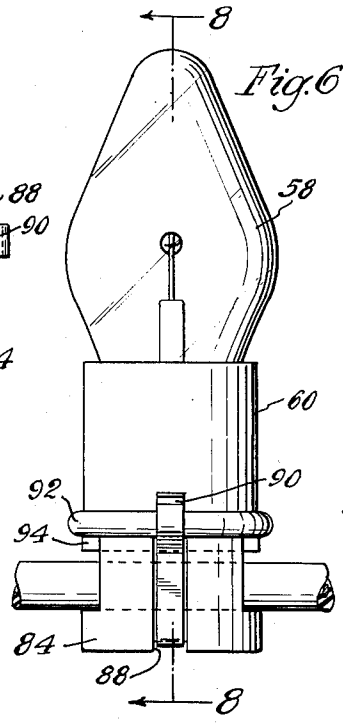


Fig. 7

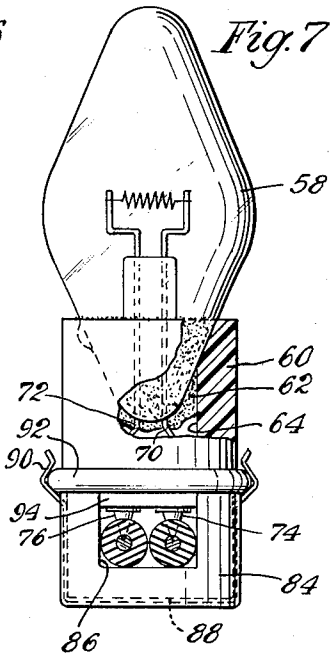
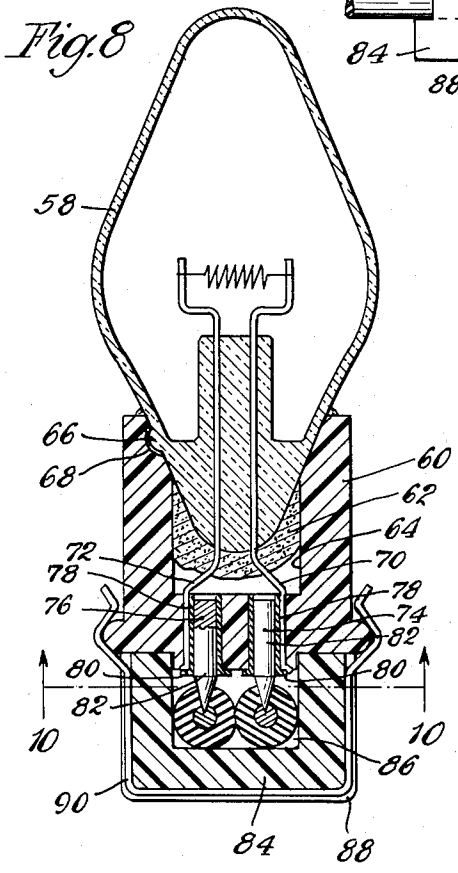


Fig. 8



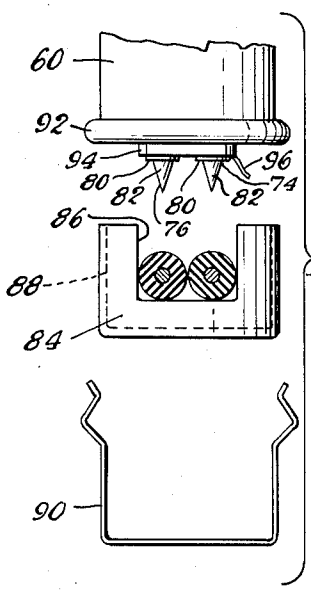


Fig. 9

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ELECTRIC LIGHT BULB HAVING INSULATION PIERCING CONTACTS

Adolph W. Gast, Evanston, Ill.

Application September 21, 1953, Serial No. 381,321

3 Claims. (Cl. 339—99)

My invention resides in the field of electric illuminating lamps and constitutes an improvement on prior lamps of the type adapted to be removably attached to any portion of a pair of parallel electric wires. My novel type of lamp includes a pair of prongs or prods which, when forced through the insulation, contact the metal electric wires and establish an electrical connection between the filament of the lamp and a source of current.

More specifically, my invention relates to a lamp of the above type having a bulb attached to an insulated base with a removable cap and an improved mechanism for attaching the removable cap to its insulated base of the lamp in such a manner as to force the prongs or prods in the base through the insulation of the wires with a single quick thrust to establish a firm electrical connection.

Therefore, a primary object of my invention is a new and improved insulated base and cap for an incandescent lamp of the above type, with the cap and base constructed so that they can be snapped together with the electric insulated wires disposed between them and separated so that the lamp can be connected to or removed from the wires in a quick, efficient manner.

Another object of my invention is a connecting means for use with a lamp of the above type, designed to insure an efficient electrical connection between the prods on the base and the insulated electric wires.

Another object of my invention is a new and improved lamp structure whereby the filament of the lamp through its extended terminal wires is connected to the pointed prods in a manner such that the connection has a self-locking effect if the lamp became loosened from the base.

Other objects and adantages of my invention will appear from time to time as the following description proceeds.

My invention will best be understood by reference to the accompanying drawings, in which:

Figure 1 is a side view of my lamp;

Figure 2 is a front view of the lamp shown in Figure 1;

Figure 3 is a sectional view along line 3—3 in Figure 1;

Figure 4 is a sectional view along line 4—4 in Figure 3;

Figure 5 is a side view similar to Figure 1 showing the cap just before it is snapped on the base of the lamp;

Figure 6 is a side view of a modification of the lamp shown in Figure 1;

Figure 7 is a front view, partly in section, of the lamp shown in Figure 6;

Figure 8 is a sectional view along the lines 8—8 of Figure 6;

Figure 9 is an exploded view of the base and cap structure shown in Figure 6;

Figure 10 is a sectional view taken along the line 10—10 of Figure 8.

In Figure 1, the bulb of my incandescent lamp is indicated generally at 10 and is a hermetically sealed glass envelope, well known and in extensive use. Attached to the bulb is a base 11, made of any suitable insulating material but preferably of plastic or the like. The base is attached to the bulb in any one of a number of well-known

manners. I have shown a ring of cement at 12 between the bulb and a conical portion of the base. It will be understood that the base is conventionally cylindrical, although it could have any desired shape, and has an interior portion 14 into which the lower end of the bulb is inserted. A conventional filament element 16 is positioned in any well-known manner in the bulb and a pair of terminal wires 18 and 20 depend from the lower end of the bulb, these wires forming the connection to the filament.

The end or bottom of the base is provided with a pair of openings 22 and 24 through which the terminal wires extend. As shown in Figure 3, a pair of metal prods 26 and 28 are inserted into the openings in the base. The upper end of each prod constitutes a shank which is forced into its opening and tightly wedges the terminal wire in place. The lower end of each prod is pointed and a cylindrical flange, 30 and 32 respectively, is positioned between the upper shank portion and the lower pointed portion. The parts, meaning the shank portion of the prod and the openings in the base, are dimensioned so that, when the forced fit has been effected, the cylindrical flange on each prod will be slightly spaced from the bottom of the base. The lower ends of the terminal wires are wrapped around the shank portion of the prod between the base and the cylindrical flange, as shown at 34 and 36, and the end of each terminal wire is secured in any conventional manner; for example, by soldering or the like.

A cap, indicated generally at 38, fits on the bottom of the base and has a transverse slot 40 through it. A pair of parallel insulated electric wires 42 and 44 fit through the slot. When the cap is attached to the bottom of the base 11, the prods are forced through the insulation of the wires and into the metal of the electric wires.

The cap is removably connected to the end of the base by a pair of leaf springs 46 and 48 on opposite sides of the cap, each of the pairs of springs being molded in lugs, such as at 50 and 52, on the sides of the cap. The springs extend above the upper edge of the cap and coact with lugs 54 and 56 which project from the sides of the base. As shown in Figure 1, the springs are shaped at their upper ends so as to provide an easy snapping action over the lugs with an outwardly bowed portion so that the cap will be firmly seated on the end of the base.

While I have stated and shown only two pairs of connecting springs and lugs, it should be understood that any number could be used. Additionally, they could be spaced in any desired manner. However, at present, I have found that two pairs are sufficient.

With the cap removed, the prods extend beyond the end of the base, and I have found that the prods can be easily cleaned when the cap is removed and will not readily collect dirt and dust, and this is an important factor in establishing an efficient electrical connection.

The size and shape of the transverse slot or groove 40 through the cap can be such that the electric wires, when placed in the cap, will be directly under the prods and they will not have a tendency to shift or slip slightly from under the prods when pressure is applied to force the prods through the insulation.

In connecting the bulb to a pair of parallel insulated wires, I have found that the cap should be placed under the wires with the wires disposed through the groove 40 and then the base 11 can be easily pressed down on the cap until the prods contact the insulation of the wires. The size of the parts is such that, when the prods initially contact the insulation of the wires, the lugs 54 and 56 on the sides of the base will contact the outwardly flared portion of the ends of the springs 46 and 48. Then, by a quick, smooth thrust, the prods can be made to pierce the insulation and contact the metal wires and, at the same

time, the lugs will snap between the springs on each side of the cap and will be firmly held thereby.

When the prods first contact the insulation prior to the thrust and piercing action, there is no chance of the prods coming out of the cap and injuring the operator. The prods are disposed within the base in relation to the lugs **54** and **56** and the leaf springs **50** and **52** are positioned on the cap in relation to the transverse groove so that, when the cap is snapped on, the prods will be properly aligned with the insulated electric wires.

The shank portion of the upper end of the prods, as inserted in the openings in the end of the base, effects a forced fit and is particularly advantageous since this eliminates the necessity of relying upon any soldering as the main securing means. If the bulb **10** should become loosened for any reason and any tension is placed on the terminal wires **18** or **20**, the tension will be against the prods and will tend to more firmly seat them in the openings in the end of the base. By the formation of the shoulder on the prod, the extended portion of the terminal wires can be tightly wrapped between the base and the shoulder, and the end of the wire can be secured in any manner and does not necessarily require soldering.

A modified form of the lamp shown in Figures 1 through 5 is shown in Figures 6 through 10. The lamp, shown at **58** in Figure 6, is cemented to the base **60** in slightly different manner from the method employed in the species of Figures 1 through 5. The entire lower end of the lamp is coated with cement, as shown at **62** in Figure 7, and this end is forced into the cylindrical cavity **64** in the base. This excess cement flows around the wires on the lower end of the lamp and permanently seats the lamp in the base. The excess cement that is squeezed out above the top of the base can be easily scraped off. Enough cement could be applied to the lower end of the base so that the entire cylindrical cavity **64** in the base would be filled with cement. I have only shown it as partly filled in Figure 8.

The surface of the lamp is provided with a small projection **66** which mates with a corresponding groove **68**. When the lamp is firmly seated in the base, this projection and groove form a key or lock so that, in the event the cement does not properly hold the lamp in the base, the lamp will not rotate slightly after it has become loosened.

The terminal wires **70** and **72** are passed through openings in the bottom of the base and prod units **74** and **76** are inserted. Each of the prod units has a sleeve **78** with an outwardly extending flange **80** about its lower edge. A prod or pin **82** is inserted in the central opening of the sleeve and snugly fits therein. A unit is inserted in the opening in the base and tightly wedges the terminal wire in the opening.

A cap **84** is designed to snap on to the bottom of the base in a manner similar to the structure of Figures 1 through 5. This cap has a transverse slot **86** into which the electric wires are adapted to be positioned. A U-shaped groove **88** passes about three sides of the cap and a U-shaped metal spring **90** snaps into this groove. The upper ends of the legs of the spring are appropriately shaped to snap over a ledge **92** which is formed on and encircles

the bottom of the base. A rectangular boss **94** extends slightly below the plane of the lower edge of the base and is adapted to fit into the groove **86** in the cap so that the cap will be properly guided on to the prods.

When the terminal wires are inserted through the opening in the bottom of the base and are wedged tightly therein by the prod units, they extend to one side, as shown at **96** in Figure 9, and they can be easily cut off.

While I have shown and described two forms of my invention with various details of each, it should be understood that numerous alterations, modifications and substitutions can be made without departing from the essential theme, and I wish that the invention be unrestricted except by the appended claims.

I claim:

1. An electric lamp of the incandescent filament type adapted for attachment to a pair of parallel insulated wires, including a lamp bulb with a glass envelope having a filament therein, with terminal wires sealed in the envelope and extending to the outside, an insulated lamp base permanently secured to the bulb and having openings through which the terminal wires extend, pointed metal prods in the openings in contact with the terminal wires and extending beyond the end of the base, each including a metal spike fitted in a metal sleeve, the wires being compressed between the outside of the sleeves and the walls of the openings, the spikes projecting beyond the end surface of the base, a cap positionable on the end of the base and having a groove disposed transversely through it on the side adjacent the base for receiving the pair of parallel insulated electric wires, the spikes projecting into the groove in the cap when it is mounted on the end surface of the base, and means on the base and cap for removably snapping the cap on the end of the base, including a bead around the base adjacent its end surface, and a U-shaped spring mounted in a U-shaped groove around the cap, the spring having ends projecting beyond the upper surface of the cap and formed to snap over the bead on the base.

2. The structure of claim 1 in which the end surface of the base has a depending die projection adapted to penetrate and coact with the groove in the cap.

3. The structure of claim 1 in which the metal spike is forcefully fitted in its metal sleeve, and the sleeve is forcefully fitted in its opening in the base.

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