May 1, 1945. G. C. SINGER 2,374,709

ELECTRIC LAMP

Filed May 13, 1943

FIG. 1

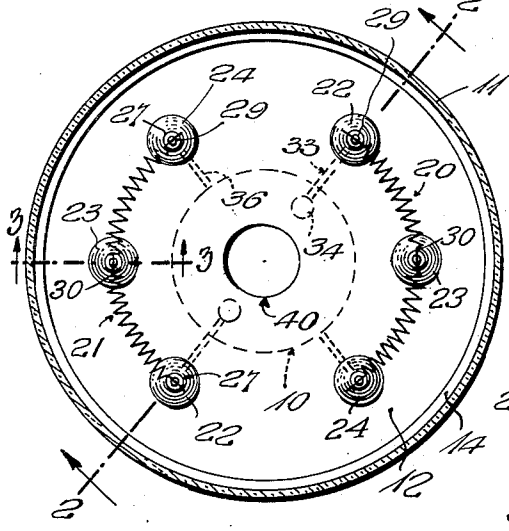


FIG. 2

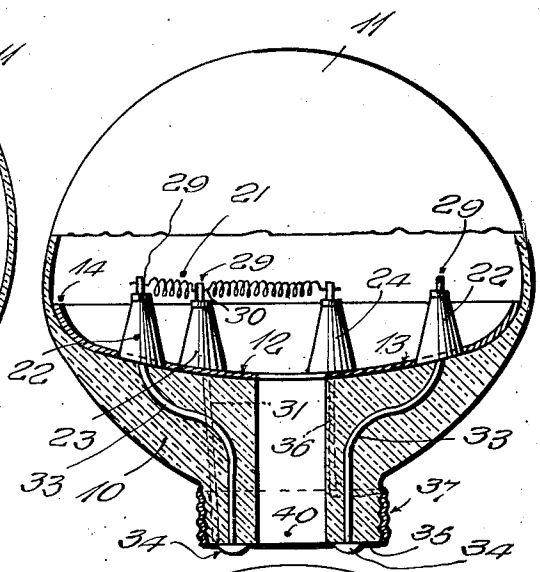


FIG. 3

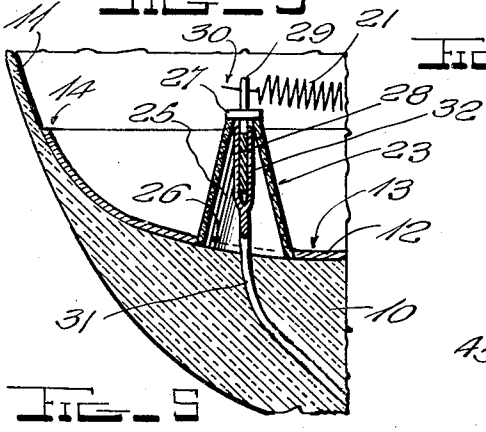


FIG. 4

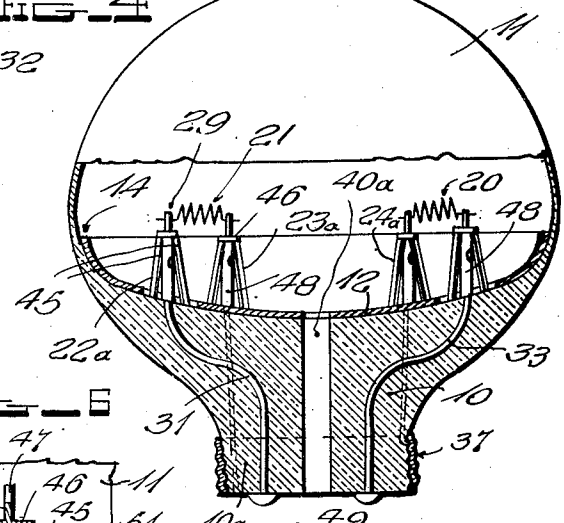


FIG. 5

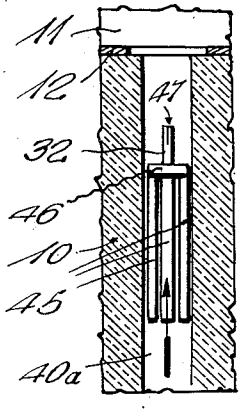


FIG. 6

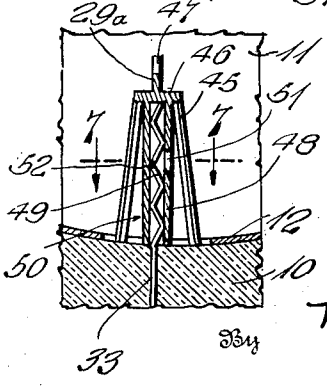
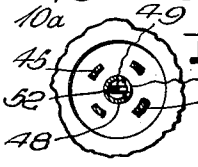


FIG. 7



Inventor

GROVER C. SINGER,

By Munn, Liddy & Glascock

Attorneys

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ELECTRIC LAMP

Grover C. Singer, Brownsville, Tex.

Application May 13, 1943, Serial No. 486,873

11 Claims. (Cl. 176—32)

This invention relates to electric lamps.

An object of the invention is the provision of an electric lamp in which the base portion is formed integrally with the globe, the construction being such that the filaments may be readily removed and replaced when desired.

Another object of the invention is the provision of an electric lamp in which the base portion and globe are formed integrally with each other and preferably made of translucent or transparent material, with a passage in the base portion through which supports for filaments may be inserted or withdrawn by a suitable tool, and in which the supports may or may not be removably connected to the inner projecting ends of contacts which are adapted to be connected with the usual house current for energizing the filaments.

A further object of the invention is the provision of a lamp bulb in which the base portion carrying the usual contacts for completing a circuit through the filaments of the bulb is provided with a longitudinal passage for the insertion or removal of filaments and their supports, which may or may not be removably connected to the inner projecting ends of said contacts, said supports being formed of resilient material, so that the support can be compressed when inserted through the passage, or said supports being formed of insulated material and small enough to be inserted through the passage, said passage being closed after the air is exhausted from the bulb.

This invention will be best understood from a consideration of the following detailed description, in view of the accompanying drawing forming a part of the specification; nevertheless, it is to be understood that the invention is not confined to the disclosure, being susceptible of such changes and modifications as define no material departure from the salient features of the invention as expressed in the appended claims.

In the drawing:

Fig. 1 is a horizontal section through the bulb of an electric lamp constructed according to the principles of my invention.

Fig. 2 is a vertical section of the lamp, taken along the line 2—2 of Fig. 1.

Fig. 3 is a fragmentary enlarged section showing one form of removable support for a filament employed in Figs. 1 and 2.

Fig. 4 is a vertical section of an electric lamp showing another form of the filament support.

Fig. 5 is a fragmentary vertical section of a passage in the base portion of the form illustrated in Fig. 4 showing a filament support being inserted through said passage.

Fig. 6 is an enlarged fragmentary vertical section of the lamp illustrated in Figs. 4 and 5, showing the modified form of support in operative position.

Fig. 7 is a horizontal section taken along the lines 7—7 of Fig. 6.

Referring more particularly to the drawing 10 designates a base member which may be formed of glass and from which rises in integral formation a bulb 11 from which the air is exhausted, and which houses the filaments and their supports. The bottom wall 12 of the bulb 11 is curved to provide a concave surface for the inner end of the base member 10, and this concave surface is substantially covered with a reflecting material, as shown at 13. The method of applying this material is described in my co-pending application, Serial #461,978, filed October 14, 1942. However, a brief description of this method will be set forth.

It will also be noted that the reflecting surface 13 extends upwardly for a short distance along the inner side walls of the bulb 11, as shown at 14.

Filaments 20 and 21 of the usual type are placed in semi-circles at diametrically opposite points within the bulb 11, and are supported above the bottom of the bulb or above the inner face of the base portion 10 by a plurality of connectors, generally designated by the numerals 22, 23 and 24. As shown more particularly in Fig. 3, each connector consists of a conically shaped member 25, which is formed of glass or other insulating material, or these conically shaped members may be formed of metal with the base portion 26 of each member being seated upon the inner surface 12 of the base portion 10. A metal cap 27 is secured in any approved manner to the top or inner reduced end of each connector. Depending from each cap is a pin or rod 28, which is located within the conically shaped member 25. A post 29 extends upwardly or outwardly from the cap 27 and is either split at its end or perforated to receive a straight portion 30 of the filament 20 or 21. Where the post 29 is split the split ends are forced together so they will clamp upon the wire 30 for retaining the filament at this point in position.

The connector or support 23 shown in Figs. 1 and 3 may or may not have electrical connections with the circuits. This connector may merely act as a support for the intermediate portion of the filament 20 or 21. In view of this a wire 31 is embedded in the material of the base

portion 10, and this wire extends outwardly from the base portion and into the bulb 11. The inner end of the wire may be split or it may be formed into a sleeve as shown at 32 to frictionally receive the depending member 28 in order to retain the support 23 in position within the globe.

Referring more particularly to Fig. 2 it will be seen that the connector 22 is identical in construction with the connector 23, except that the depending member 28 is received by the split end of a wire 33 which extends downwardly and is connected to a contact member 34 formed at the outer end 35 of the base portion 10. The posts 29 of the two connectors 22 and 24 receive the free ends of the filament 21 located on one-half of the bottom wall 12, while the post 29 of the connector or support 23 receives the intermediate portion 30 of said filament. On the other hand, the filament 20 is similarly supported by the posts 29 of the respective connectors 22, 23 and 24 on the other half of wall 12.

The connector 24 is identical in construction with the connectors 22 and 23 but the depending member 28 of this connector receives the inner end of a wire 36, while the outer end of said wire extends through the base portion 10, and is connected with the threaded metal sleeve 37, which forms the other contact of the circuit.

It will be noted that the filament 21 and its supports and electric connectors have been described so that a complete circuit through the filament 21 is had by the contact wire 33 and the electric connections between the post 29 of the member 22 and the post on the connector or support 24, thence through the wire 36 to the metal sleeve 37. Since the same construction is employed for supporting the filament 20 for providing electrical connections with a socket which receives the threaded sleeve 37 the same reference numerals are therefore applied to similarly disposed elements in the arrangement associated with the filament 20.

The post 23, as has been explained, may not have electrical connections with the circuit, since the outer end of the wire 31 may terminate at the base portion 10 and have no electrical contact. In that event it will merely act as a support to maintain the filaments in the form of an arc, as shown in Fig. 1, so that the filaments 20 and 21 will spread over a wide area within the globe 11. However, it may end in a contact 34 as does the wire 33.

It will be noted from Figs. 2 and 3 that those portions of the inner surface of the base portion 10 where the wires 31, 33 and 36, project into the globe 11, are free of the reflecting surface 13 in order to prevent short circuiting of the filaments.

In order to prevent the reflecting surface from adhering to these portions, such portions are given a coating of melted wax by inserting an instrument through the longitudinal passage 40 formed in the base portion 10 with the passage extending from the outer end and through the outer end 35 of the base portion into the chamber within the globe 11. After the inner surface of the base portion has been treated with a reflecting material as shown at 12 and 14, the wax may be removed by a suitable solvent which will not affect the reflecting surface, as described in my co-pending application, Serial No. 461,978, filed October 14, 1942.

The passage 40 has a diameter sufficiently great for passing the supports 22, 23 and 24 through the same by means of a suitable tool, after which they are forced downwardly so that the depending member 28 will frictionally receive the split end or tubular end 32 of the wires 31, 33 and 36. After these members are in place the filaments 20 and 21 are then positioned by a suitable tool on the post 29, and the split posts are then pressed together on the ends and intermediate portions of the filaments 20 and 21 for securely holding the filaments in position. After the filaments are in position the air from the bulb is then exhausted and the passage 40 is sealed.

The passage 40 is closed by a paste consisting of 25 parts of sodium silicate, 10 parts of celotex, a glue made from cotton, 25 parts of fine powdered aluminum and 40 parts of distilled water.

It may be necessary to slightly reconstruct the usual socket for receiving this type of lamp in view of the fact that two contact points 34 are employed on the outer end 35 of the base portion 10. On the other hand, if desired, the two wires 33 may be brought together and joined with a single contact member 34.

The construction shown in Figs. 4 to 7 inclusive is slightly modified and instead of the conically shaped support 25 being formed of glass or other insulating material resilient metal legs 45 support the metal cap portion 46. The post 29^a, however, is substantially the same as the post 29 in Figs. 1 to 3 inclusive, and this post has a split portion as shown at 47 to receive an end of a portion of the filament 20 or 21 as the case may be.

Another modification in this construction is shown in the tubular member 48 which receives the inner end of a wire 33 so that when the tubular member 48 is forced downwardly over the corrugated end 49 of the wire 33 the support generally designated by the numeral 50 is held in place. The tubular member is provided with an opening 51 through which may be inserted a welding tool for welding a portion 52 of the corrugated portion 49 of the wire 33 to the tube in order to securely attach the support 50 to its respective wire 31, 33 or 36 as the case may be.

The base portion 10^a in Figs. 4 to 7 inclusive has a central passage 40^a through which the supports 22^a, 23^a and 24^a are inserted. Since the legs 45 of the support are formed of spring material they will be compressed when they are forced through the passage 40^a. All the other elements of the lamp in the modified form are substantially the same as those employed in Figs. 1 to 3 inclusive, and therefore no further description will be required.

I claim:

1. A lamp having a base portion formed integrally with a globe, said base portion having a longitudinal passage connecting the interior of the globe with the outside, said base portion having at least a pair of lead wires extending through the base portion and projecting into the globe, a detachable filament connector mounted on the inner projecting end of each lead wire and a filament attached between the connectors.

2. A lamp having a base portion and a globe rising therefrom, said base portion having a longitudinal passage connecting the interior of the globe with the exterior, said base portion having at least a pair of lead wires extending through the base portion with the inner ends thereof projecting into the interior of the globe, a detachable filament connector mounted on the inner end of each wire and having a width less than the diameter of the passage so that said connector may be inserted through the passage, each connector including a head provided with means attaching

one end of a filament to the head, a pair of legs formed of spring material, and means depending from the head for neatly receiving the inner end of the adjacent wire.

3. A lamp having a base portion and a globe rising therefrom, said base portion having a longitudinal passage connecting the interior of the bulb with the exterior, said base portion having at least a pair of lead wires embedded therein with one end projecting into the globe, a detachable filament connector mounted on the inner end of each wire, each connector including a head having means thereon securing one end of a filament to the head, supporting legs projecting from said head and movable toward each other when inserted through the passage and means depending from the head and located between the legs for attaching the connector to the inner end of the adjacent lead wire.

4. In a lamp, a base portion from which rises an integrally formed glass globe, said base portion having a longitudinal passage opening into the interior of the globe and at least a pair of lead wires embedded in said base portion, one end of each wire projecting into the interior of the globe, a filament connector associated with each wire, each connector being cone-shaped and having means at the smaller end connected to an end of a filament, the opposite end of the connector being seated on the inner surface of the base member, and a projection depending from the smaller end, and attached to the free inner end of the adjacent lead wire.

5. In a lamp, a base portion from which rises an integrally formed glass globe, said base portion having a longitudinal passage opening into the interior of the globe and at least a pair of lead wires embedded in said base portion, one end of each wire projecting into the interior of the globe, a filament connector associated with each wire, each connector being cone-shaped and having means at the smaller end connected to an end of a filament, the opposite end of the connector being seated on the inner surface of the base member, and a projection depending from the smaller end, within the cone-shaped connector, and attached to the free inner end of the adjacent lead wire.

6. In a lamp, a base portion from which rises an integrally formed glass globe, said base portion having a longitudinal passage opening into the interior of the globe and at least a pair of lead wires embedded in said base portion, one end of each wire projecting into the interior of the globe, a filament connector associated with each wire, each connector being cone-shaped and having means at the smaller end connected to an end of a filament, the opposite end of the connector being seated on the inner surface of the base member, and a projection depending from the smaller end, and attached to the free inner end of the adjacent lead wire, said cone-shaped connector being formed of insulating material.

7. A lamp having a base portion and a globe rising therefrom, said base portion having a longitudinal passage connecting the interior of the bulb with the exterior, said base portion having at least a pair of lead wires embedded therein with one end projecting into the globe, a pair of filament connectors inserted through the passage and removably connected to the inner ends of the lead wires, each connector including a head having means thereon for securing one end of a filament to the head, resilient legs depending from the head having the free ends thereof spread apart and movable towards each other when inserted through the passage, the free ends of the legs resting on the inner face of the base member and supporting the filament outwardly of said base member and means attaching the connector to the associated lead wire.

8. A lamp having a base portion and a globe rising therefrom, said base portion having a longitudinal passage connecting the interior of the bulb with the exterior, said base portion having at least a pair of lead wires embedded therein with one end projecting into the globe, a pair of filament connectors inserted through the passage and detachably connected to the inner ends of the lead wires, each connector including a head having means thereon for securing one end of a filament to the head, said free end of each lead wire being angularly and serially bent, said connector having a depending tube frictionally receiving the bent portion of said lead wire for attaching the connector to said contact and means supporting the head and tube outwardly of the inner surface of the base portion.

9. A lamp having a base portion and a globe rising therefrom, said base portion having a longitudinal passage connecting the interior of the bulb with the exterior, said base portion having at least a pair of lead wires embedded therein with one end projecting into the globe, a pair of filament connectors inserted through the passage and detachably connected to the inner ends of the lead wires, each connector including a head having means thereon securing one end of a filament to the head, said free end of each wire being angularly and serially bent, a tube depending from the head and frictionally receiving the bent free end of the wire, and legs formed of resilient material extending from the head and supporting the head and tube outwardly from the inner end of the base portion.

10. A lamp having a base portion formed of insulating material and a bulb, lead wires embedded in said base portion with free ends projecting into the interior of the bulb, filament supports attached to the free ends and a filament having the ends thereof connected between a pair of the supports and so arranged as to form substantially a semi-circle, said lead wires adapted to be connected with a source of current, said supports having means electrically connecting the filaments with the lead wires.

11. A lamp having a base portion formed of insulating material and a bulb, lead wires embedded in said base portion with free ends projecting into the interior of the bulb, filament supports attached to the free ends and a filament having the ends thereof connected between a pair of the supports, and an intermediate filament support so positioned relative to the pair of supports that the filament will form substantially a semi-circle, said pair of lead wires adapted to be connected with a source of current, said pair of supports having means electrically connecting the ends of the filament with the lead wire.

GROVER C. SINGER.