Feb. 6, 1945. G. C. SINGER 2,368,685

MULTIPLE FILAMENT LAMP

Filed Dec. 31, 1943

FIG. 1.

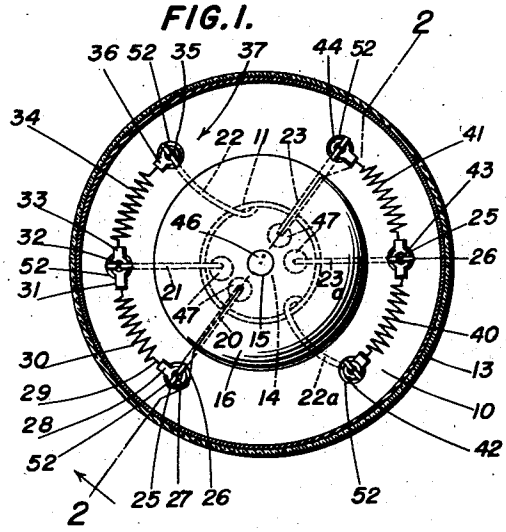


FIG. 2.

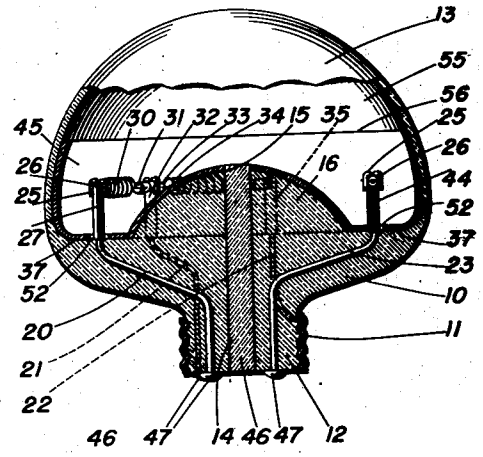


FIG. 3.

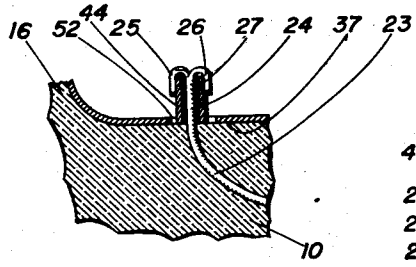


FIG. 4.

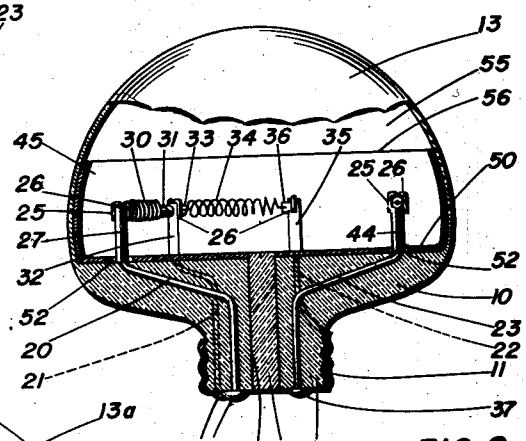


FIG. 5.

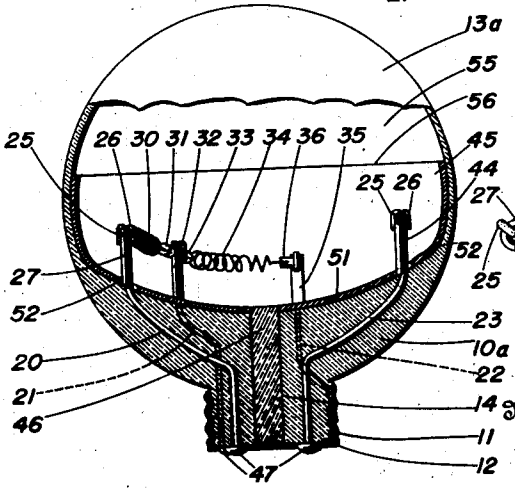
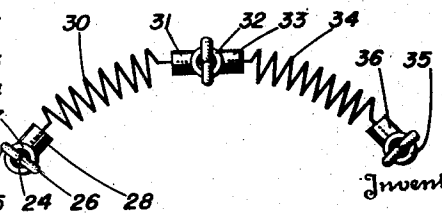


FIG. 6.



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2,368,685

MULTIPLE FILAMENT LAMP

Grover C. Singer, Brownsville, Tex.

Application December 31, 1943, Serial No. 516,457

6 Claims. (Cl. 176—34)

This invention relates to an electric lamp and a method of constructing the same.

An object of the invention is the provision of an electric lamp and the method of making the same, in which the lamp has a solid base member formed integrally with the globe, with both being formed of transparent materials, with the inner surface of the base member, and likewise the bottom of the globe being provided with a reflector, the base member having a longitudinal passage through which are adapted to be inserted filaments and specially constructed supports for the filaments, said supports being secured in place by lead-in wires projecting above the inner surface of the base member.

Another object of the invention is the provision of an electric lamp having a base member formed of the same transparent materials as the globe, with a passage through the base member for the insertion of specially constructed supports and filaments, the inner surface of the base member, which also forms the bottom of the globe, being covered with reflecting materials, said inner surface being concave, convex, or flat.

A further object of the invention is the provision of an electric lamp in which the base and bulb are formed integrally of the same transparent materials, said base member having embedded therein wires to which are connected supports for filaments arranged in the arcs of a circle, said supports being in the form of a sleeve adapted to be received by the inner ends of the lead-in wires, with the ends of the lead-in wires bent to secure the sleeves in place, the inner ends of the sleeves being provided with a lateral split projection to receive an end of a filament, said supports and filaments being insertable through a longitudinal passage in the base member, and fixed in place by suitable tools which are insertable through the passage for properly positioning the supports.

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.

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

Figure 2 is a vertical section taken along the line 2—2 of Figure 1.

Figure 3 is an enlarged fragmentary vertical section showing the method of securing a support in place on a lead-in wire.

Figure 4 is a section similar to that shown in Figure 1, but showing a modified form of reflecting surface.

Figure 5 is a vertical section of another modified form of the lamp disclosing another form of reflecting surface.

Figure 6 is an enlarged plan view of one section of the filaments and their supports.

Referring more particularly to the drawing, 10 designates a base member formed of transparent material such as glass, and this base member forms the bottom, which has the usual threaded sleeve 11 attached to a reduced portion 12 so that the lamp can be screwed into the usual lamp socket. It will be noted that the base member is integrally formed with the bulb 13 so that it is necessary to insert the filaments and their supports through a central longitudinal passage 14, extending entirely through the base member and opening at 15 to the inner end of a convex portion 16 of the base member.

Lead-in wires 20, 21, 22 and 23 are embedded in the material of the base member 10, and project upwardly as shown at 24 in Fig. 3, with the inner free ends of said wires split to form securing elements 25 and 26. In other words, a sleeve 27 is inserted on the inner projecting end 24 of a wire and split ends 25 and 26 are placed downwardly over the upper end of the sleeve. If desired, these ends may be twisted to form an enlargement for retaining the sleeve 27 in place.

Sleeve 27 (Figs. 1 and 2) has a lateral extension 28 at its upper end and this extension, as is the sleeve 27, is formed of metal, and is split to receive one end 29 of a filament 30. The other end of the filament is received by a split end 31 of a lateral extension at the upper end of a sleeve 32. A second lateral extension 33 is located diametrically opposite the extension 31 and is split to receive one end of a filament 34.

A third sleeve 35 is received by a wire 22 and has a split extension 36 at its upper end to receive the other end of the filament 34. The posts or sleeves 27, 32 and 35 are so arranged around the inner surface 37 of the member 10 that the filaments 30 and 34 are located in an arc of a circle at one side of the central passage 14 in the base member 10.

A group of filaments 40 and 41 are supported by hollow posts 42, 43 and 44 at the other side of the passage 14, with the filaments being arranged in the arc of a circle.

In each case the lead-in wires extend above the surface 37 sufficiently to pass through the various hollow posts with the inner ends of the wires being split and bent over or twisted over the top of the posts for maintaining the posts in position.

After the globe and the integrally formed base member have been completed, the hollow posts and their connected filaments are inserted through the passage 14 of the base member and the posts are inserted over the inner ends of the lead-in wires by a suitable tool and the split ends of the lead-in wires are then twisted or bent down over the posts. After the silvering materials which form a reflector 45 have been applied to the inner surface of the globe 13, and the base member 10, the lamp is ready for exhaustion of the air through the passage 14. This passage is then closed by the usual cement to form a sealing plug 46.

Each of the wires 20, 21, 23 and 23a is provided with a contact 47 at the outer end of the base member 10 for engagement with a contact in the usual socket of the lamp. Wires 22 and 22a extend to the threaded metal collar or sleeve 11. Thus, it will be seen that the current passes through the wires 20 and 21, also wires 23 and 23a, to the filaments, while wires 22 and 22a complete the circuits to the filaments.

The lamp shown in Fig. 4 is identical in construction with that shown in Figs. 1 and 2, except that the inner surface 50 of the base member 10 is flat instead of convex as shown in Figs. 1 and 2.

The lamp shown in Fig. 5 is substantially identical in construction as that shown in Figs. 1, 2 and 4, except that the inner surface 51 of the base member 10a is convex. The globe 13a is slightly different in shape, although the same shape of globe may be employed as illustrated in Figs. 2 and 4.

The method of applying the silvering materials to form the reflector 45 is described in my co-pending application, S. N. 461,978, filed October 14, 1942, for Incandescent electric lamps and method of making the same.

Before the silvering materials are applied to the inner surface of the globe and the base member, melted wax, a solution of beeswax or molasses is applied to the bottoms of the various hollow posts, and also to the inner surface of the base member 10, surrounding the bottom of the posts, so that when the silvering material is applied, such material may be removed, together with the beeswax or molasses, in order to leave a space 52 free of silvering material to prevent short circuiting of the current between the posts. The beeswax or the molasses is applied as defined by an instrument suitable for the purpose.

Furthermore, molten beeswax, a solution of beeswax or molasses is placed in the outer end of the bulb 13, and the bulb is then revolved to cover the inner surface 55 of the globe 13 to the circular line indicated by the numeral 56.

Etching materials of a well known type are then placed within the bulb and the same is revolved to cover the inner surface located between the inner surface 37 of the base member 10 and the circular line 56. The etching materials are then removed and the inner surface is washed, after which the protective materials, including the portions 55 and 52, are removed.

The composition which is a solution of the etching materials contains the following ingredients by volume:

Ammonium fluoride	parts	10
Hot water	do	18
Molasses	do	20
Hydrofluoric acid	percent	60

The silvering materials consist of nitrate of silver, with a suitable reducing agent.

It will be appreciated that the etchings may be done before the application of the filaments and their supports. In this case, the liquid wax is applied to the inner projecting ends of the lead-in wires and around the bottoms of the lead-in wires adjacent the inner surface of the base and partially surrounding the inner surface in order to protect the projecting ends of the lead-in wires from the etching materials.

Where the filaments and their supports have been positioned before the etching materials are applied to the surface 55 and the surface 37, said supports and filaments are thoroughly coated with the wax to protect them against the etching materials.

I claim:

1. An electric lamp, comprising a base, a bulb formed integrally with said base, lead-in wires embedded in the base and having split ends extending into the bulb, a vertical sleeve mounted on each split end, the split ends of the wires being arranged to secure the sleeves in position, said sleeves arranged along an arc of a circle, each sleeve at the ends of the arc having a split lateral projection, the intermediate sleeve having a pair of diametrically disposed split lateral projections, and a filament located between each end sleeve and the intermediate sleeves, the ends of the filaments being clamped between the adjacent split projections of the sleeves.

2. An electric lamp, comprising a base, a bulb formed integrally with said base, lead-in wires embedded in the base and having split ends extending into the bulb, the inner surface of the base and a portion of the sidewalls of the bulb having a reflecting surface thereon, that portion of the inner surface of the base surrounding the extended ends of the lead-in wires being free of the reflecting surface, a vertical sleeve mounted on each split end, the split ends of the wires being arranged to secure the sleeves in position, said sleeves arranged along an arc of a circle, each sleeve at the ends of the arc having a split lateral projection, the intermediate sleeve having a pair of diametrically disposed split lateral projections, and a filament located between each end sleeve and the intermediate sleeve, the ends of the filaments being clamped between the adjacent split projections of the sleeves.

3. An electric lamp, comprising a base, a bulb formed integrally with said base, lead-in wires embedded in the base and having split ends extending into the bulb, two of the wires being placed in circuit with one side of a source of current, the other wire being connected to the other side of the source, a vertical sleeve mounted on each split end, the split ends of the wires being arranged to secure the sleeves in position, said sleeves arranged along an arc of a circle, each sleeve at the ends of the arc having a filament-gripping means, the intermediate sleeve having diametrically disposed filament-gripping means, and a filament located between each end sleeve and the intermediate sleeves, the ends of

the filaments being secured in place by the filament gripping means on the sleeves.

4. An electric lamp, comprising a base, a bulb extending outwardly from said base, a group of three wires embedded in the base at each side of a plane passing through the longitudinal axis of the lamp and having ends projecting into the bulb, said ends being arranged in a circle, a vertical sleeve on each projecting end, the free ends of the wires having means thereon for retaining the sleeves in position, the upper ends of the sleeves having lateral projections, and a filament located between each pair of sleeves at one side of the longitudinal plane and having the ends secured to adjacent lateral projections on the sleeves, the filaments being bent to conform to the curvature of the circle.

5. An electric lamp, comprising a base, a bulb extending outwardly from said base, a group of three wires embedded in the base at each side of a plane passing through the longitudinal axis of the lamp and having ends projecting into the bulb, said ends being arranged in a circle, two adjacent wires of each group adapted to be placed in circuit with one side of a source of current, the other wires of each group adapted to be placed in circuit with the other side of said source, a vertical sleeve on each projecting end, the free ends of the wires having means thereon for retaining the sleeves in position, the upper ends of the sleeves having lateral projections, and a filament located between each pair of sleeves at one side of the longitudinal plane and having the ends secured to adjacent lateral projections on the sleeves, the filaments being bent to conform to the curvature of the circle.

6. An electric lamp, comprising a base, a bulb extending outwardly from said base, a group of three wires embedded in the base at each side of a plane passing through the longitudinal axis of the lamp, and having ends projecting into the bulb, said ends being arranged in a circle, the inner surface of the base and a portion of the inner walls of the bulb being provided with a reflecting surface, those portions of the surface of the base surrounding the inner projecting ends of the wires being free of the reflecting surface, said base having a convex surface with the projecting ends of said wires arranged around the periphery of the convex surface, a vertical sleeve on each projecting end, the free ends of the wires having means thereon for retaining the sleeves in position, the upper ends of the sleeves having lateral projections, and a filament located between each pair of sleeves at one side of the longitudinal plane, and having the ends secured to adjacent lateral projections on the sleeves, the filaments being bent to conform to the curvature of the circle.

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