April 19, 1938. R. K. LEE 2,114,350

LAMP

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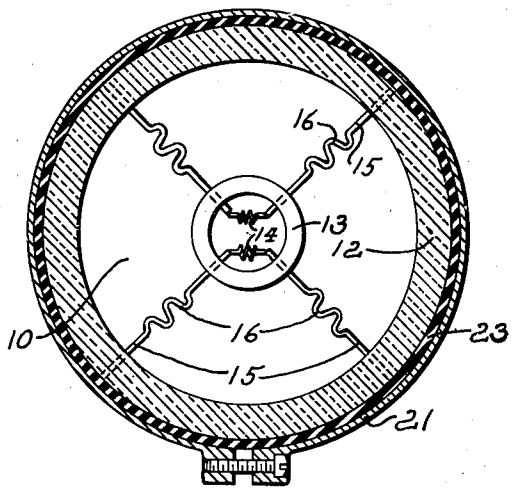

Fig. 2.

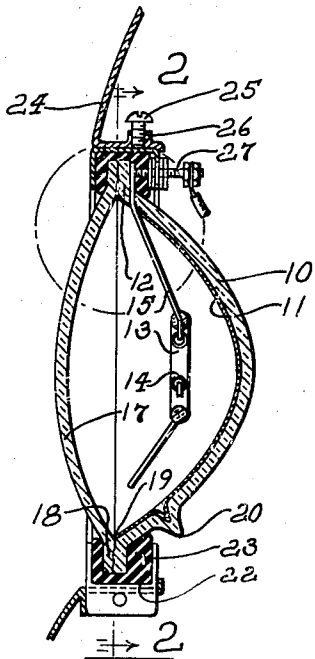

Fig. 1.

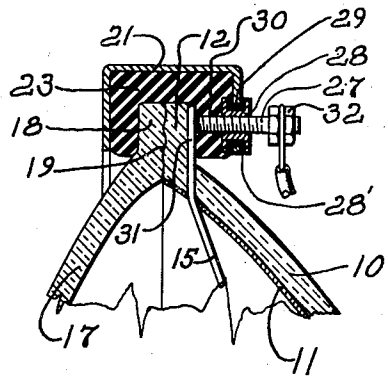

Fig. 3.

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11 Claims. (Cl. 176—34)

This invention relates to improvements in an electric light bulb.

More particularly, the invention pertains to improvements in permanently fixed focal length, light beam projecting incandescent bulbs of the type which include hermetically sealed together lens and reflector portions between which a filament is enveloped.

One of the main objects of the invention is to provide in a lamp bulb of the foregoing character, improved means for supporting one or more filaments thereof which is adapted to be so adjusted, during the manufacture of the bulb, as to accurately place the filament at a predetermined location, preferably at the center of focus of the reflector portion of the bulb.

Another object of the invention is to provide filament supporting means of this kind which does not obstruct passage of light rays to the central part of the reflector portion of the bulb and which is so constructed and arranged as to occupy substantially little space.

A further object of the invention is to provide a filament supporting member which serves as a terminal wire for the filament.

A still further object of the invention is to provide a yieldable mounting for a unitary reflector and lens comprising electric light bulb of this character in which rubber may be employed as cushioning and sealing means without endangering the reflecting surface to tarnishing.

Additional objects of the invention are to provide a mounting for an incandescent light bulb of the foregoing character which coacts with the bulb at locations of its maximum dimensions so as to facilitate firm securement of the bulb against displacement by the application of relatively low unit pressure; to provide bulb mounting means of this character which yield sufficiently to accommodate adjustment of the bulb so as to facilitate directing of the light beam emitted thereby; and to provide means for adjusting the bulb for this purpose which cooperate with the combined filament supporting and current supply means so as to serve as electrical contacts in feeding electrical current to the filament.

An illustrative embodiment of the invention is shown in the accompanying drawing, in which:

Fig. 1 is a vertical central sectional view of an incandescent bulb embodying the invention.

Fig. 2 is a vertical sectional view taken on the line 2—2 of Fig. 1.

Fig. 3 is a fragmentary, enlarged sectional view of the portion in Fig. 1 encompassed by the circle in this figure.

In the form of the invention illustrated in the drawing, the improved incandescent bulb includes a reflector portion 10 comprising glass and having a reflecting surface 11 on its interior side. The reflector portion 10 is of generally concaved shape and is provided with an annular ring-like flange section 12 around its outer periphery. Adjustably mounted near the center of focus of the reflector portion 10 is a filament supporting ring 13, preferably comprising transparent, electrical insulating material, such as glass. Within the interior of the ring 13 is provided one or more filaments 14 having their end portions anchored in the material of the ring and preferably electrically connected to filament supporting and current supplying wires 15. The wires 15 comprise yieldable, ductile metal having a good electric current carrying capacity and they extend outwardly from the ring 13 and are anchored in the wall structure of the reflector portion 10. The wires 15 may be of ribbon-like construction and arranged edgewise in the path of the light rays which are reflected by the surface 11 of the reflector portion 10 so as to avoid obstructing the projection of such light rays outwardly from the bulb.

In order to facilitate accurate locating of the filament in a predetermined position within the interior of the reflector portion 10, the wires 15 are provided with reversely bent portions, or kinks 16, which accommodate movement of the filaments and their supporting rings 13 during manufacture of the incandescent bulb. Such adjustment may be made by gripping the wires 15 with the aid of a pair of pliers or other suitable tool and adding more kinks thereto or straightening out those kinks with which a particular wire is provided in order to accurately position the filament at a desired location.

When only one filament is employed, two of the wires 15, shown in Fig. 2, need not be electrically connected with the end of the filament. These wires may be merely anchored in the glass ring 13 in order to assist in supporting the latter and each of the remaining wires 15 may be electrically connected to one end of the filament 14, respectively.

After the filament 14 has been properly positioned in the interior of the reflector portion 10 of the bulb, a transparent lens portion 17, preferably comprising glass and having a flange section 18 substantially conforming in shape and dimension with the flange 12 of the reflector portion 10, is hermetically sealed to the flange section 12, as illustrated in Fig. 3. These flange sec-

tions, which preferably comprise glass, may be fused together along the line designated by the numeral 19 in Fig. 3. The interior of the bulb may then be evacuated in a conventional manner through a teat 20, preferably located in spaced relation to the central portion of the reflector 10. If desired, the interior of the incandescent bulb may be filled with an inert gas, such as nitrogen, by admitting the latter through the teat 20 which may then be sealed to prevent the escape of nitrogen.

In Figs. 1 and 3 of the drawing, is illustrated an improved mounting for a lamp of the foregoing character. This mounting preferably comprises a split, channel-shaped sheet metal ring 21 having a channel 22 in which is received the bead formed by the flange sections 12 and 18 of the reflector and lens portions 10 and 17, respectively. Mounted on the flange sections 12 and 18 is a channel-shaped yieldable ring 23 which preferably comprises rubber and which may be bonded to the external surfaces of the flange sections by cement or other suitable means. The rubber ring 23 serves as a sealing member to prevent the admission of dirt and water into the interior of the housing structure in which the bulb is mounted. In the form illustrated, the sheet metal channel member 21 is detachably secured in a casing 24 which may comprise either the outer housing of a lamp or a portion of the structure of a vehicle, for example, in which the bulb is mounted. Screws 25 threaded in bosses 26 on the housing 24 engage the sheet metal channel 21 for detachably holding the incandescent bulb mounting in a predetermined position in the housing structure.

The rubber ring 23 is preferably sufficiently yieldable to accommodate movement of the incandescent bulb in order to direct the light beam emitted therefrom. The position of the bulb may be adjustably varied by screws 27 threaded in nuts 28 mounted in apertures 29 in one of the side walls of the metal channel 21. When the adjustment screws 27 are employed as electrical contact members, the nuts 28 are insulated from the channel by insulating material 28' and the inner end portions of the screws 27 are extended through apertures 30 formed in the rubber ring 23 and permitted to contact with the end portions 31 of the filament supporting and current supplying wires 15. The end portions 31 of the wires 15 extend externally of the lamp bulb and are exposed adjacent the side face of the flange section 12 of the reflector portion of the bulb. By employing three adjustment screws 27 in circumferentially spaced relation about the metal channel 21, the incandescent bulb may be varied sufficiently in any desired direction to suitably direct the beam emitted therefrom. A lock nut 32 is provided on those set screws 27 which are employed as electrical contacts for the filament in order to facilitate the attachment of lead wires thereto.

Rubber sealing means may be successfully used in combination with an incandescent bulb of the foregoing type which has hermetically sealed together reflector and lens portions for the chemical constituents of the rubber composition are not accessible to the reflecting surface of the reflector portion and therefore, this surface is not subjected to tarnishing by the rubber. By suspending the filaments within the interior of the bulb with the aid of a web-like wire structure of the foregoing type, none of the central portions of the reflecting surface are rendered inoperative by the obstruction of the passage of light rays to and from the reflector. Inasmuch as this portion of the reflecting surface is so located as to efficiently reflect light rays, a substantial increase in the intensity of the resulting beam is obtained.

Although but one specific embodiment of the invention is herein shown and described, it will be understood that various changes in the size, shape and arrangement of parts may be made without departing from the spirit of my invention.

What I claim is:

1. A lamp bulb comprising hermetically sealed together lens and reflector portions, a filament enveloped by said lens and reflector portions, and means for supporting said filament comprising a web structure extending across the interior of said reflector portion in unobstructing relationship with respect to the central portion of its reflecting surface.

2. A lamp bulb comprising hermetically sealed together lens and reflector portions, a filament enveloped by said lens and reflector portions, and means for supporting said filament and supplying a current thereto including a web structure extending across the interior of said reflector portion in spaced relation to the central part of its reflecting surface and comprising conductor strands having external end portions for electrical connection with a source of current.

3. A lamp bulb comprising hermetically sealed together lens and reflector portions, a filament enveloped by said lens and reflector portions, and means for supporting said filament and supplying a current thereto including current conductor strands extending across the interior of said reflector portion in spaced relation to the central part of its reflecting surface and having external end portions for electrical connection with a source of current.

4. A lamp bulb comprising a reflector portion, a filament in said lamp bulb, means for supporting said filament including metal ribbons extending outwardly in different directions from said filament and having end portions anchored in said lamp bulb adjacent the outer marginal portions thereof, said ribbons being ductile and having kinks therein for accommodating movement of said filament into a predetermined position during assembly of said bulb, and a lens portion hermetically sealed to said reflector portion and together therewith enveloping said filament.

5. A lamp bulb comprising a glass reflector portion, a filament in said lamp bulb, means for supporting said filament and supplying current thereto including conductor wires extending outwardly in different directions from said filament and having end portions anchored in and projecting externally of the outer wall of said lamp bulb, said wires being ductile and having kinks therein for accommodating movement of said filament into a predetermined position during assembly of said lamp bulb, and a glass lens portion hermetically sealed to said reflector portion and together therewith enveloping said filament.

6. A light beam projecting lamp comprising a casing having an open extremity and having a channel element surrounding the latter, an electric light bulb in said casing including permanently hermetically sealed together lens and reflector portions and a filament enveloped therebetween, said bulb having a flange extending around its substantially maximum circumference and disposed in said channel element and spaced from the internal surfaces thereof, a sealing element comprising yieldable material between said flange and the internal surfaces of said channel

element adapted to accommodate adjusting movement of said bulb relative to said casing for facilitating adjustable directing of light rays by said reflector portion, and adjusting members coacting between said channel element and said flange for varying the position of said bulb with respect to said casing and for adjustably directing the light beam emitted from said bulb and reflected by said reflector portion.

7. A lamp comprising a casing having an open extremity, a lens portion closing said open extremity, a reflector portion hermetically sealed to said lens portion and disposed in said casing, a filament between said lens and reflector portions, filament supporting and current supplying wires extending across the interior of the space between said lens and reflector portions and having end portions projecting externally thereof, and means for adjustably mounting said sealed reflector and lens in said casing comprising adjusting members contacting with said wires and adapted to serve as terminal contacts for said filament.

8. An electric light bulb comprising unitary hermetically sealed lens and reflector portions, a pair of filaments enveloped thereby, a ring comprising insulating material surrounding said filaments and supporting the latter, and combined supporting and filament current supply wires extending outwardly from said ring across said space and having inner end portions electrically connected with said filament wires and outer end portions anchored in said reflecting portion and projecting externally thereof.

9. A light beam projecting lamp comprising a casing having an open extremity and having a channel element surrounding the latter, an electric light bulb having a lens portion closing said open extremity and a reflector portion in said casing hermetically sealed to said lens portion and having an outwardly projecting flange at the junction of said lens and reflector portions extending into said channel, said bulb including a filament between said lens and reflector portions and filament supporting and current supplying wires having end portion anchored in the wall of said bulb and projecting externally thereof adjacent said flange, a sealing element comprising yieldable material between the internal surfaces of said channel and said flange adapted to accommodate adjusting movement of said bulb relative to said channel, and adjusting members coacting between said channel element and said flange and electrically contacting with said wires and adapted to serve as electric terminals for said filament.

10. A light beam projecting lamp comprising a casing having an open extremity, a light bulb lens, a light bulb reflector, said lens and reflector being integrally sealed together and having a bead extending along the junction of said lens and said reflector, a filament enveloped by said lens and reflector, a ring comprising insulating material surrounding said filament and supporting the latter, combined supporting and filament current supply wires extending outwardly from said ring across said space and having inner end portions electrically connected with said filament wire and outer edge portions anchored in said reflecting portion and projecting externally thereof, and means coacting between said casing and said bead for yieldably holding in sealed engagement said bead and at least one of said wires for supplying an electric current to said filament.

11. A light beam projecting lamp comprising a casing having an open extremity, a light bulb lens, a light bulb reflector, said lens and reflector being integrally sealed together and having a flange extending along the junction of said lens and said reflector at substantially their maximum circumference, a filament enveloped by said lens and reflector, a ring comprising insulating material surrounding said filament and supporting the latter, combined supporting and filament current supply wires extending outwardly from said ring across said space and having inner end portions electrically connected with said filament wire and outer edge portions anchored in said reflecting portion and projecting externally thereof, and yieldable and adjustable means coacting between said casing and said flange for yieldably holding in sealed engagement said flange and at least one of said wires for supplying an electric current to said filament, and for adjustably varying the position of said lens and said reflector with respect to said casing.

ROGER K. LEE.