

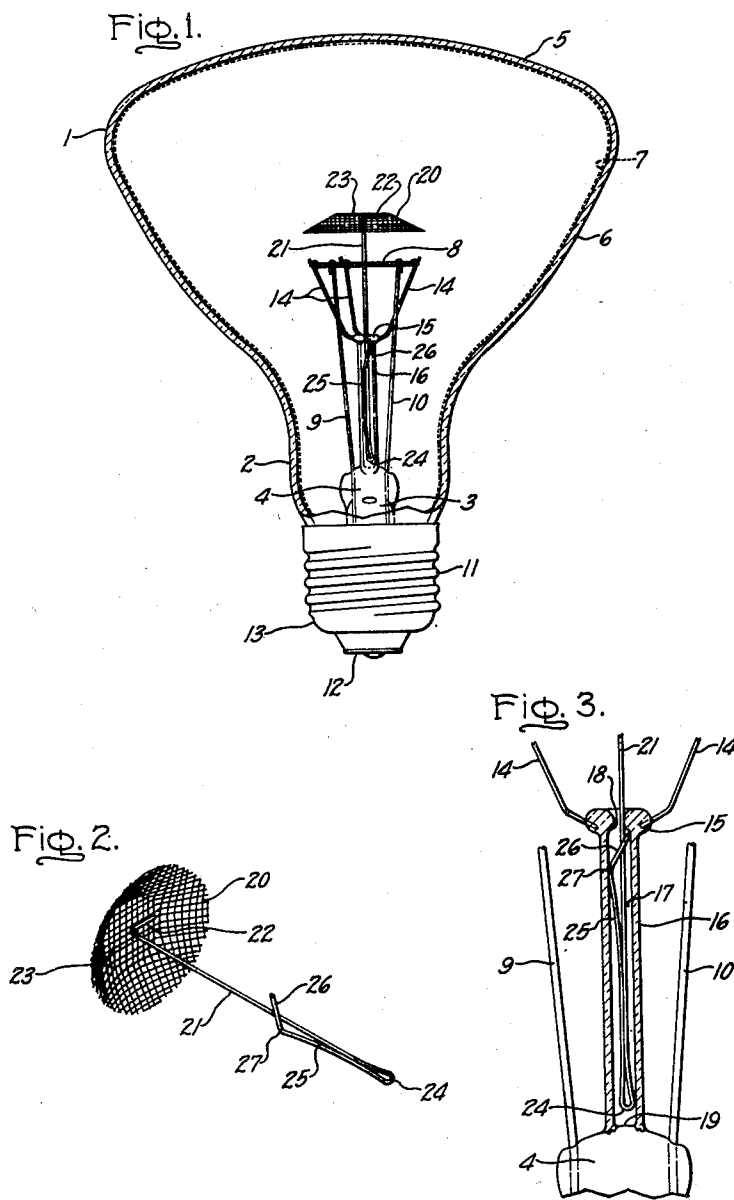
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ELECTRIC LAMP WITH BLACKENING COLLECTOR

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ELECTRIC LAMP WITH BLACKENING
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My invention relates in general to electric incandescent lamps and more particularly to a mount structure therefor. Still more particularly, my invention relates to blackening collector means for such lamps and to a supporting arrangement therefor.

In gas-filled electric lamps having a filament of refractory metal such as tungsten, vaporized particles of the filament metal are carried by the convection currents within the lamp bulb and are deposited on the walls of the bulb in the form of a dark coating which absorbs some of the light radiations from the filament and thereby reduces the luminous efficiency and the useful life of the lamp. Such bulb blackening, as it is commonly termed, is particularly objectionable in lamps designed for base down operation and wherein the light passing through the upper end of the bulb is to be used for indirect lighting purposes, since the blackening particles in such case are deposited by the rising convection currents principally on the upper bowl end of the bulb where it absorbs and reduces the amount of light available for indirect lighting.

It is one object of my invention to provide an electric incandescent lamp having means mounted therein for collecting the metal particles vaporized from the filament in order to reduce bulb blackening.

Another object of my invention is to provide a lamp mount structure having blackening collector means of simple form and which can be quickly and easily mounted in place on the lamp mount.

Further objects and advantages of my invention will appear from the following description of a species thereof and from the accompanying drawing in which:

Fig. 1 is an elevation, partly in section, of a gas-filled electric incandescent lamp comprising my invention; Fig. 2 is an enlarged fragmentary view of the mount structure of the lamp shown in Fig. 1; and Fig. 3 is a detailed perspective view of the blackening collector device according to the invention.

Referring to the drawing, the lamp there shown comprises a sealed glass bulb 1 containing a gas filling, preferably consisting of argon with a small admixture of nitrogen, and having a neck portion 2 provided with a reentrant stem 3 having a seal or press portion 4. The particular bulb illustrated is provided with a flattened top portion 5 having a curvature of relatively large radius, and a flaring side wall portion 6 shaped to conform to a surface of any desired optical

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reflecting shape such as, for instance, a paraboloid. The bulb 1 is preferably inside frosted and is provided with an internal light-diffusing coating 7 of the type disclosed in co-pending U. S. application Serial No. 878 of Marvin Pipkin, filed January 7, 1948, and comprising a layer of extremely fine particles of substantially pure silica deposited on the bulb wall by the combustion of an inflammable silicon compound within the bulb. The silica coating on the flattened top or end wall 5 of the bulb is preferably of lesser density than that on the flaring side wall portion 6.

Mounted within the bulb 1 more or less symmetrically about the bulb axis is an electric energy translation element or filament 8 of a refractory metal, such as tungsten. The filament 8 illustrated comprises a coiled wire formed into horseshoe shape with the plane of the filament extending transversely of the bulb axis. The said filament is of relatively high wattage such as, for instance, 150 watts or higher, and it is supported at its ends by a pair of lead-in wires 9, 10. The said lead-in wires 9, 10 are sealed in the press portion 4 of the stem 3, and outwardly of the bulb are soldered or otherwise secured to the shell 11 and eyelet 12 of a base 13 secured to the neck end of the bulb, as by cementing. The horseshoe-shaped filament 8 is further supported at intermediate points along its length by one or more anchor wires 14 the lower ends of which are embedded in a ring-shaped glass button 15 formed at the upper end of a tubular glass extension or hollow arbor 16 extending upwardly from the stem press 4 in more or less alignment with the bulb axis. As shown more particularly in Fig. 2, the hollow interior 17 of the glass arbor 16 forms a chamber which opens into the interior of the bulb. At its upper end, the glass arbor 16 is formed with an interned annular lip 18 which, together with the portion 19 of the stem press closing the base end of the hollow arbor, provides spaced stop shoulders within the hollow interior of the arbor.

Mounted within the bulb 1 directly above the filament 8 is a blackening collector 20 of suitable form which, in the particular case illustrated, comprises a disc-shaped perforate body, such as the wire screen element shown or a perforated metal sheet, disposed transversely of the bulb axis and completely overlying or capping the filament 8. The said perforate body 20 is made of a suitable material, such as nickel, for instance, that will not contaminate the lamp and which will withstand the heat of the filament during

operation. As shown in Fig. 1, the perforated body 20 is preferably of slightly dished or shallow frusto-conical form, with its under or concave side facing downwardly towards the filament 8.

In accordance with the invention, the blackening collector body 20 is supported in place within the bulb by a support member 21 comprising a length of wire of springy character, such as molybdenum wire for instance, suitably fastened at one end to the blackening collector, as by welding or pinching, and supported at its other end within the glass arbor 16. In the particular case shown, the wire support 21 is formed at its upper end with a right-angle bent end portion 22 which is welded to the flat portion 23 of the wire screen element 20, with the wire support 21 extending perpendicularly from the said flat portion 23 of, and more or less centrally or axially from, the disc-shaped screen element 20. At its other end, the wire support 21 is bent back upon itself to form a U-bend 24 therein and to provide a retroverted portion 25. The upper or free end of the said retroverted portion 25 of the wire support is bent at a slight angle less than 90°, for instance 45° or thereabouts, to provide a spring finger 26 the free height of which (i. e., the projected distance between the bend 27 in the retroverted wire portion 25 and the free end of the spring finger 26, measured laterally of the wire support 21) is greater than the inside diameter of the hollow glass arbor 16. Also, the distance between the U-bend 24 in the wire support 21 and the free end of the spring finger 26 is made slightly less than the distance between the stop shoulders 18, 19 within the hollow glass arbor 16.

The blackening collector unit, comprising the wire screen element 20 and its support wire 21, is assembled in place on the stem 3 simply by inserting the doubled-back end of the support wire 21 into the open end of the glass arbor 16 and pushing it through the arbor until the free end of the spring finger 26 passes beyond and snaps over the intumed lip or stop shoulder 18 on the arbor. In such position, the retroverted wire portion 25 of the support wire 21 is locked within the arbor, between the stop shoulders 18, 19 therein, whereby withdrawal of the support wire 21 from the arbor is effectively restrained. Since the free height of the spring finger 26 is greater than the inside diameter of the glass arbor 16, the spring finger, upon entering the hollow interior of the arbor, is compressed or flexed between the opposite sides of the inner wall of the arbor, thus yieldingly pressing the support wire 21 laterally against the inner wall of the arbor so as to firmly hold the support wire 21 and the wire screen element 20 in position within the bulb.

It will be obvious that the shape of that portion of the support member 21 extending between the end of the arbor 16 and the blackening collector 20 will depend on the shape of the particular filament employed. Thus, while the said intervening portion of the support member 21 may extend substantially straight up from the end of the arbor 16 where the filament, as in the case of the particular horseshoe-shaped filament 8 shown, does not intersect or lie closely adjacent the bulb axis, it may be necessary to bend or otherwise offset the support member 21 outwardly of the arbor 16 where the filament intersects or extends closely adjacent the bulb axis.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. An electric incandescent lamp comprising a sealed glass bulb having a reentrant stem provided with a tubular chamber open to the interior of the bulb, a pair of lead-in wires sealed through said stem and extending into the bulb, a filament in said bulb connected to said lead-in wires, a blackening collector in said bulb adjacent said filament, and support means secured at one end to said blackening collector and having its other end extending into said tubular chamber and resiliently engaging the walls of said chamber to hold the support means in place therein.

2. An electric incandescent lamp comprising a sealed glass bulb having a reentrant stem provided with a tubular chamber open to the interior of the bulb, a pair of lead-in wires sealed through said stem and extending into the bulb, a filament in said bulb connected to said lead-in wires, a blackening collector in said bulb adjacent said filament, and a support member fastened to said blackening collector and having a straight end portion extending into said chamber and provided with a spring finger yieldingly engaging opposite sides of the chamber wall to resiliently hold the said end portion firmly against the chamber wall.

3. An electric incandescent lamp comprising a sealed glass bulb having a reentrant stem provided with a tubular glass extension projecting inwardly of the bulb, a pair of lead-in wires sealed through said stem and extending into the bulb, a filament in said bulb connected to said lead-in wires, a blackening collector in said bulb adjacent said filament, and a support member fastened to said blackening collector and having a straight end portion extending into said tubular stem extension and provided with a spring finger yieldingly engaging opposite sides of the inner wall of said extension to resiliently hold the said end portion of the support member firmly against the said inner wall of the extension.

4. An electric incandescent lamp comprising a sealed glass bulb having a reentrant stem provided with a tubular chamber open to the interior of the bulb and having shoulders therein spaced longitudinally thereof, a pair of lead-in wires sealed through said stem and extending into the bulb, a filament in said bulb connected to said lead-in wires, a blackening collector in said bulb adjacent said filament, and a support member fastened to said blackening collector and having a straight end portion extending into said chamber and provided with a spring finger yieldingly engaging opposite sides of the chamber wall to resiliently hold the said end portion firmly against the chamber wall, said end portion further having stop means spaced longitudinally thereof and engageable with the said shoulders in said chamber to limit movement of the support member longitudinally of the chamber.

5. An electric incandescent lamp comprising a sealed glass bulb having a reentrant stem provided with a tubular chamber open to the interior of the bulb and having shoulders therein spaced longitudinally thereof, a pair of lead-in wires sealed through said stem and extending into the bulb, a filament in said bulb connected to said lead-in wires, a blackening collector in said bulb adjacent said filament, and a support member fastened to said blackening collector and having a straight end portion extending into said chamber and provided with a spring finger yieldingly engaging opposite sides of the chamber wall to resiliently hold the said end portion firmly against the chamber wall, said spring finger to-

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gether with the end of said support member innermost of said chamber providing spaced limiting stops engageable with the said shoulders in said chamber to limit movement of the support member longitudinally of the chamber.

6. An electric incandescent lamp comprising a sealed glass bulb having a reentrant stem provided with a tubular chamber open to the interior of the bulb, a pair of lead-in wires sealed through said stem and extending into the bulb, a filament in said bulb connected to said lead-in wires, a blackening collector in said bulb adjacent said filament, and a support member fastened to said blackening collector and having an extension of spring material extending into said chamber and bent back upon itself to provide a retroverted portion, the free end of said retroverted portion being bent at an angle to provide a spring finger yieldingly engaging opposite sides of the chamber wall to resiliently hold the said extension firmly against the chamber wall.

7. An electric incandescent lamp comprising a sealed glass bulb having a reentrant stem provided with a tubular chamber open to the interior of the bulb and having shoulders therein spaced longitudinally thereof, a pair of lead-in wires sealed through said stem and extending into the bulb, a filament in said bulb connected to said lead-in wires, a blackening collector in said bulb adjacent said filament, and a support member fastened to said blackening collector and having a spring wire extension projecting into said chamber and bent back upon itself to form a U-bend and provide a retroverted portion the free end of which is bent at an angle less than 90° to provide a spring finger yieldingly engaging opposite sides of the chamber wall to resiliently hold the said wire extension firmly against the chamber wall, the free end of said spring finger and the U-bend in said wire extension constituting spaced limiting stops engageable with the said shoulders in said chamber to limit movement of the support member longitudinally of and restrain its withdrawal from said chamber.

8. An electric incandescent lamp comprising a sealed glass bulb having a reentrant stem provided with a tubular chamber open to the interior of the bulb, a pair of lead-in wires sealed

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through said stem and extending into the bulb, a filament in said bulb connected to said lead-in wires, a blackening collector in said bulb adjacent said filament, and a spring wire support fastened at one end to said blackening collector and having its other end extending into said chamber and bent back upon itself to provide a retroverted portion, the free end of said retroverted portion being bent at an angle to provide a spring finger yieldingly engaging opposite sides of the wall to resiliently hold the spring wire support firmly against the chamber wall.

9. An electric incandescent lamp comprising a sealed glass bulb having a reentrant stem provided with a press portion, a hollow glass arbor extending from said stem press portion inwardly of the bulb and having an inturned lip at its free end, a pair of lead-in wires sealed through the said press portion of the stem and extending into the bulb, a filament in said bulb connected to said lead-in wires, a blackening collector comprising a wire screen member in said bulb overlying said filament, and a spring wire support fastened at one end to said wire screen member and having its other end extending into said arbor and bent back upon itself to form a U-bend and provide a retroverted portion the free end of which is bent at an angle less than 90° to provide a spring finger yieldingly engaging opposite sides of the arbor wall to resiliently hold the wire support firmly against the arbor wall, the free end of said spring finger and the U-bend in said wire support constituting spaced limiting stops engageable respectively with the said inturned lip and the press portion of the stem to limit movement of the wire support longitudinally of and restrain its withdrawal from the arbor.

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