

May 20, 1969

D. N. BROOKS ET AL

3,445,646

PROJECTOR LAMP ASSEMBLY

Filed July 5, 1966

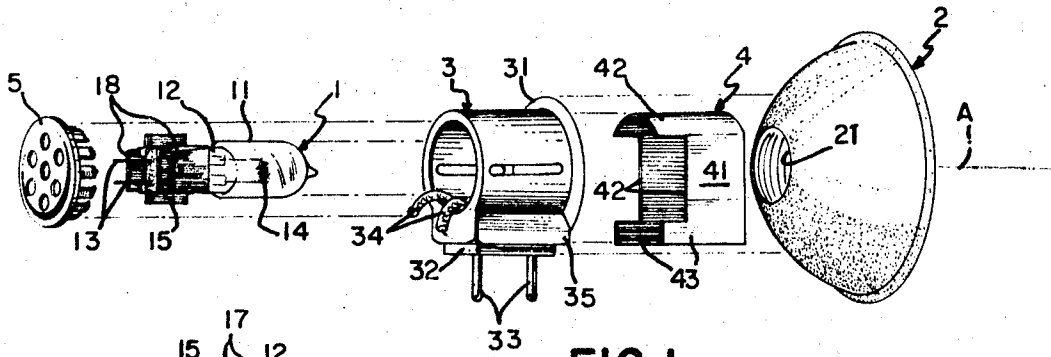


FIG. 1

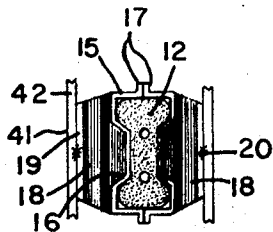


FIG. 5

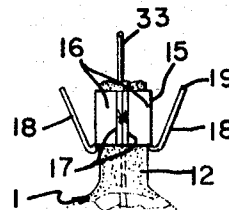


FIG. 6

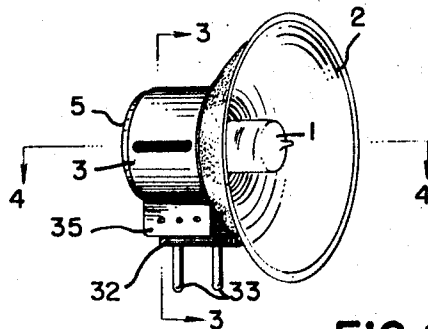


FIG. 2

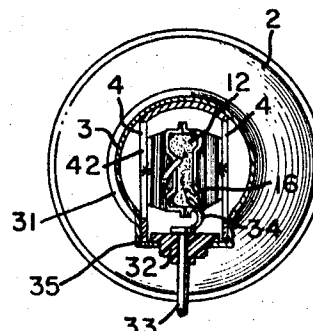


FIG. 3

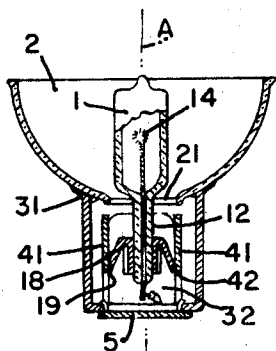


FIG. 4

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PROJECTOR LAMP ASSEMBLY

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Filed July 5, 1966, Ser. No. 562,737

Int. Cl. F21v 19/02

U.S. Cl. 240—44.2

9 Claims

ABSTRACT OF THE DISCLOSURE

A reflector and projector lamp assembly includes a pair of spring fingers fixed directly on the stem of a projector lamp envelope. The fingers slide between a pair of opposed walls in the reflector mounting base allowing axial and universal movement of the lamp in adjusting the filament of the lamp relative to the reflector focal point prior to spot welding the spring fingers to the walls.

Recently, iodine-quartz lamps of extremely high intensity and small size have been developed. Such a lamp is described in U.S. Patent No. 3,063,778, and comprises a quartz envelope with one or more pressed stems through which leads are connected to a concentrated tungsten filament within the envelope. A quantity of iodine within the envelope enters a cyclic reaction with the tungsten filament in which the tungsten continuously replays the filament rather than blackening the walls of the envelope. Consequently the lamp may be operated at high power throughout a long life.

Such lamps, however, raise problems of assembly in bases, particularly in bases having reflectors with which the filament must be carefully aligned. Hitherto, the pressed stem of the lamp has been encased in a ceramic or like cementitious body and a candelabra base attached to the body. Such an assembly is expensive, excessive time is consumed in curing the cement, and the body insulates the hot lamp preventing dissipation of its high operating heat. Not infrequently the excessive heat damages the seal with which the pressed stem excludes the atmosphere.

Objects of the present invention are to provide a lamp-reflector assembly which can be made at greater speed and lower cost, in which the lamp can be more easily and accurately aligned with the reflector, and in which provision is made for dissipation of the lamp heat and protection of the stem in which the filament leads are sealed.

According to the invention a projector lamp assembly comprises a curved reflector having an axis and a focal point and opening on said axis, a base attached to the reflector at said opening, a lamp having a stem, an envelope and a concentrated filament in said envelope, support means on the stem, and anchoring means on said base slidably receiving said support means for axial and universal angular adjustment relative to the reflector axis to locate said filament with respect to said reflector focal point, said support means being adapted to be fixed to said anchoring means when said lamp is in adjusted position.

For the purpose of illustration a typical embodiment of the invention is shown in the accompanying drawing in which:

FIG. 1 is an exploded isometric view of a projector lamp assembly;

FIG. 2 is an isometric view of the assembly;

FIG. 3 is a section on line 3—3 of FIG. 2;

FIG. 4 is a section on line 4—4 of FIG. 2;

FIG. 5 is an enlarged end elevation of a lamp sub-assembly of FIG. 1; and

FIG. 6 is a plan view of the subassembly of FIG. 5.

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As shown in FIGS. 1 to 4, an iodine-quartz projector lamp assembly comprises a lamp 1, a parabolic or like curved reflector 2, and a ventilated base 3 for holding the lamp attached to the reflector. The lamp comprises an envelope 11 having a pressed stem 12 in which are sealed leads 13 connected to a tungsten filament 14. Within the envelope is a fill of inert gas and iodine. The lamp forms a subassembly with a collar 15 described later in more detail. The reflector 2 is curved around an axis A on which is a focal point and a circular opening 21. The base 3 has a flange 31 cemented to the reflector. Within the base are a yoke 4, and an insulating piece 32 carrying jacks 33 respectively connected by insulating wires 34 to the lamp leads 13. A ventilated cap 5 covers a rear opening on the base.

The yoke 4 is formed of sheet metal and comprises two parallel side walls 41 having rear edges 42 and joined by a top 42 having the same curve as the top of the base 3. The bottoms 43 of the side walls are welded to parallel sides 35 at the bottom of the base 3, straddling the insulating piece 32.

The collar 15 comprises two sheet metal clips having walls 16 shape to fit the lamp stem 12, and tabs 17 at each end of the walls, the tabs being welded together to clamp the collar on the stem. Extending at an angle from opposite sides of the collar are integral leaf spring fingers 18 terminating in outer parallel edges 19. The fingers are stiffly springy, and the outer edges 19 are spaced to fit resiliently against the inside of the yoke walls 41. In this position the collar-lamp subassembly may be adjusted along the yoke walls 41 and, because the height of the walls is greater than the length of the edges, the yoke and lamp can be adjusted angularly on three axes, i.e. by universal movement. The yoke and collar are designed so that the lamp filament 14 is approximately at the reflector focal or related point when the finger edges 19 are next to the yoke edges 42. But owing to variations of the filament location in the lamp envelope the precise optical alignment of the filament in a focussing jig at the desired reflector point may not correspond with juxtaposition of the collar and yoke edges. Nevertheless, the thin yoke and finger walls will permit spot welding 20 of the fingers to the yoke walls although they are not coincident. The metal to metal engagement of the fingers and yoke not only affords ideal welding conditions but also provides a thermally conductive metal path from the hot envelope to the ventilated metal base, particularly at the pressed stem where prior cements insulated the envelope and caused failure of the press seal.

While one desirable embodiment of the invention has herein been disclosed by way of example, it is to be understood that the invention is broadly inclusive of any and all modifications falling within the terms of the appended claims.

We claim:

1. A projector lamp assembly comprising:

a curved reflector having an axis and a focal point and opening on said axis,

a base attached to the reflector at said opening,

a lamp having a stem, an envelope and a concentrated filament in said envelope,

spring support means on the stem, and

anchoring means on said base slidably receiving said support means for axial and universal angular adjustment relative to the reflector axis to locate said filament with respect to said reflector focal point, said support means being adapted to be fixed to said anchoring means when said lamp is in adjusted position.

2. An assembly according to claim 1 wherein said spring means comprises a plurality of spring fingers.

3. An assembly according to claim 2 wherein said anchoring means has a plurality of abutments opposed to said fingers respectively.

4. An assembly according to claim 3 wherein said abutments have flat surfaces engaging said fingers.

5. An assembly according to claim 3 wherein said abutments and fingers are distributed uniformly around said axis.

6. An assembly according to claim 2 wherein said fingers extend rearwardly and their free ends are welded to the anchoring means.

7. An assembly according to claim 1 wherein said anchoring means comprises a pair of opposed metal walls parallel to each other and said reflector axis, and said support means comprises a metal collar clamped on said lamp stem and having a pair of leaf spring fingers extending outwardly from said collar at an angle to each other and terminating in outer parallel edges adapted to frictionally engage said walls yieldingly, thereby optically to locate the filament and thermally connect said stem to said anchoring means.

8. An assembly according to claim 7 wherein said

walls and finger edges are of thickness to be joined by a spot weld.

9. An assembly according to claim 1 wherein said spring support means and anchoring means are of metal to provide a substantial thermally conductive metal path from the lamp stem to said base.

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U.S. Cl. X.R.

240—41.35