United States Patent [19]

Wurster

[11] **3,891,885**

[45] **June 24, 1975**

[54] **HALOGEN INCANDESCENT LAMP**

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[22] Filed: **Jan. 16, 1974**

[21] Appl. No.: **433,726**

[30] **Foreign Application Priority Data**

Feb. 7, 1973 Germany 2305960

[52] **U.S. Cl.** **313/178**; 313/222; 313/273; 313/275; 313/279

[51] **Int. Cl.**[2] **H01R 1/24**; H01R 1/54

[58] **Field of Search** 313/279, 273, 278, 178, 313/222, 275, 315

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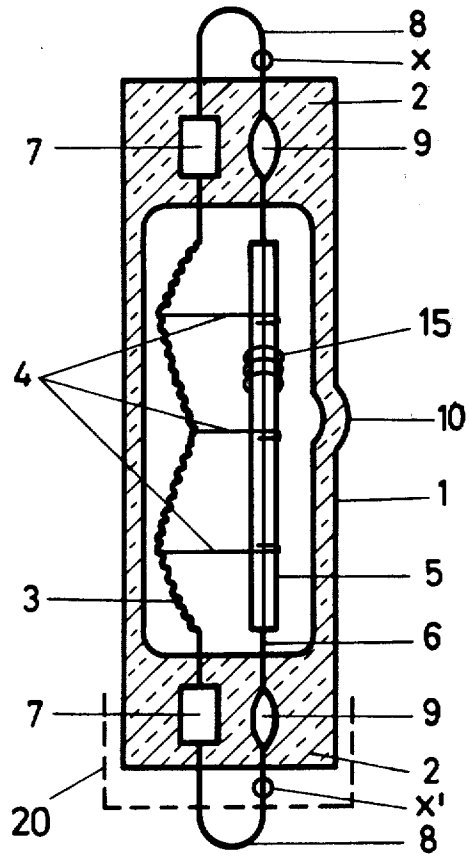
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[57] **ABSTRACT**

The lamp filament is supported in zig-zag arrangement in a mount which is composed of a glass support tube with a molybdenum wire threaded therethrough. Support wires are affixed to the glass tube in torsion-resistant manner. The molybdenum wire has flat-rolled portions, is bent with its ends to U-shape, connected to sealing foils which are attached to the ends of the filament, and press sealed together with the latter, or the support tube can be utilized as exhaust tube and, for this purpose, is press sealed at one end while the molybdenum wire is cut open and removed.

11 Claims, 2 Drawing Figures



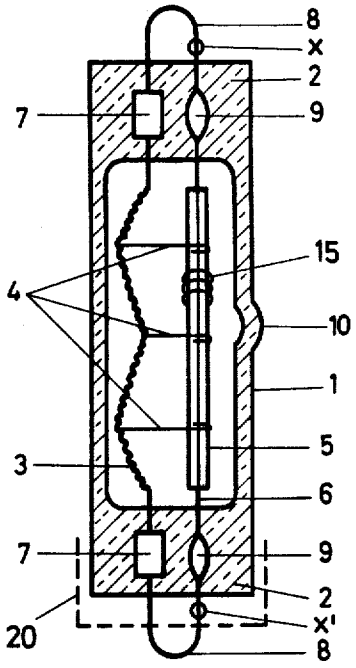


FIG. 1

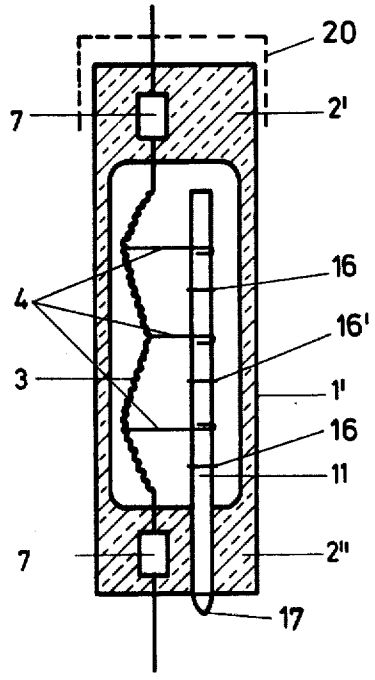


FIG. 2

HALOGEN INCANDESCENT LAMP

The invention relates to halogen incandescent lamps, for operation from a mains supply. Such a lamp may have a tubular envelope closed at each end by a press stem with a foil seal each, and a double-coiled tungsten filament therein. A gettering substance is disposed inside the envelope. To allow utilization of the halogen incandescent lamp as a general service lamp, it must be operable in all operating positions, i.e., the filament may not be freely suspended in any operating position.

It is an object of the present invention to provide a lamp having a support for the filament in a halogen incandescent lamp with double-ended press seals which prevents free hanging thereof.

SUBJECT MATTER OF THE INVENTION

Briefly the filament is supported in zig-zag position by a plurality of support wires which are affixed to a support tube of fused silica or some other suitable material. The wires and tube preferably form a subassembly located inside the envelope to be torsion-resistant and electrically insulated. The support tube may be slipped over a molybdenum wire whose ends, protruding from the tube, are bent into U-shape and sealed to the sealing foils which in their turn are welded to the ends of the zig-zag shaped filament affixed to the support tube. The molybdenum wire is rolled flat e.g. at the level of the sealing foil to permit sealing. The support tube is of square or triangular cross-section in the places of attachment to impart torsional strength to the support wires carrying the filament. The amount thus formed can be press sealed at each end such that the foils together with the flat-rolled portions of the molybdenum wire are sealed in side-by-side relationship into one press stem each and that the U-shaped portions of the molybdenum wire protrude out of the press stem.

Alternatively, the mount may be sealed such that the support tube is sealed into one of the press stems with its normal cross-section maintained, and freely extending into the envelope space. After one of the press stems is made the molybdenum wire may be removed from the support tube and the second press stem can be press sealed with the foil seal. The support tube, freely extending into the envelope space, is simultaneously used as the exhaust tube and is closed when filling has been accomplished. In addition, the support tube is well suited to receive the gettering substance required inside the envelope and disposed on the support tube, e.g., in the form of a tangle of wire, as disks or foils. For use of the halogen incandescent lamp as a general service lamp mounting the lamp in an outer envelope or jacket provided with a screw or bayonettype base is desirable.

The halogen incandescent lamp in accordance with the invention is described by way of the accompanying drawings, wherein

FIG. 1 is a sectional view of a halogen incandescent lamp according to the invention, and

FIG. 2 is a sectional view of another embodiment of the halogen incandescent lamp according to the invention.

FIG. 1 shows a halogen incandescent lamp comprising a tubular envelope 1 of fused silica or quartz glass, which is sealed at each end by a press stem 2. A double-coiled tungsten filament 3 is supported in zig-zag position by a plurality of support wires 4 whose number is determined by the length of the lamp, so that the filament is sufficiently supported in every operating position without sagging. The support wires 4 are provided at their ends with loops in which the filament 3 is suspended and which are affixed to a support tube 5 of quartz glass or fused silica. In order to secure the support wires against rotation with respect to tube 5, the support tube 5 is formed to have square or triangular cross-section where wires 4 pass therearound. The support tube 5 is slipped onto a wire 6 of molybdenum whose ends are bent to U-shape. Sealing foils 7 are affixed to the ends of filament 3 which ensure a hermetic glass-to-metal seal in press stem 2. The U-shaped ends 8 are welded to the respective sealing foils 7. Molybdenum wire 6 has flat-rolled portions 9 at the level of the sealing foils 7 to permit hermetical sealing, and flat-rolling to a thickness of 40 – 50μ is sufficient. This mount forms a sub-assembly and is composed of filament 3, support wires 4, support tube 5 and wire 6. It is inherently stable and facilitates lamp manufacture considerably, because the mount can be preassembled and thus press sealing into the lamp envelope is facilitated. The U-shaped ends 8 protruding from the lamp may be cut open at each end at X, X'; when utilizing the lamp as a single-ended lamp, only one end 8 needs to be cut open e.g., at X. The lamp is filled with gas through an exhaust tube (not shown) laterally affixed to envelope 1, and the exhaust tube is then tipped off to form tip 10. The gettering substances required inside the envelope such as, e.g., phosphorus gettering substances, zirconium or other metallic gettering substances, may be disposed on the support tube in the form of a tangle of wire 15, as disks 16 (FIG.2) or foils as schematically shown only.

The halogen incandescent lamp as shown in FIG. 2 has a tubular envelope 1' closed at each end by a press stem 2', 2''. The coiled-coil filament is supported in zig-zag position, similar to the lamp shown in FIG. 1, by support wires 4 affixed in torsion- resistant manner to a support tube 11. Support tube 11 together with a sealing foil 7 is sealed into press stem 2'' such that its crossection is maintained and that is extends freely into the envelope space. Manufacture of the present lamp starts from a stable filament mount sub-assembly somewhat different from the above described mount, wherein the support tube 11 is unilaterally extended and the molybdenum wire 6 passed through support tube 11 has no flat-rolled portions 9. The molybdenum wire must, however, be removed from the support tube after the first press sealing operation. Envelope 1' is closed by the second press stem 2' into which the second sealing foil 7 is sealed. The support tube is simultaneously used as exhaust tube and is hermetically sealed at 17 by fusion after exhausting and filling have been accomplished.

The aforesaid lamp is particularly suited for operation from a mains supply and for general lighting service. It is preferred to mount the lamp in an outer envelope or jacket 20, preferably directly provided with a screw or bayonet-type base, and shown schematically, fragmentarily only.

Various changes and modifications can be made within the scope of the inventive concept.

I claim:

1. In a halogen incandescent lamp comprising a tubular envelope (1) closed at each end by a press stem (2)

with foil seals (7), each, a double-coiled tungsten filament (3), a gettering substance (15) inside the envelope and means (5, 11) supporting the filament inside the envelope,

wherein the filament extends transversely across the tubular envelope, from one end of the press stem (2) to the other;

the filament support means comprises a support tube (5, 11) of fused silica secured to at least one of the press stems (2) and located inside the envelope, and a plurality of support wires (4) secured in torsion-resistant manner to the silica tube, the support wires being spaced from each other along the length of the tube and having, alternatingly, different lengths, the support wires supporting the filament extending between said press stems in zig-zag position in the lamp envelope.

2. Lamp as claimed in claim 1, wherein the support tube (11) is sealed into a press stem (2'') and freely extends into the envelope space.

3. Lamp as claimed in claim 2, wherein the support tube (11) extends to the outside of the press stem (2'') and simultaneously forms the exhaust-and-fill tube.

4. Lamp as claimed in claim 1, wherein a wire (6) is provided which is sealed at each end into the respective press stem (2), the support tube (5) being located over the wire (6).

5. Lamp as claimed in claim 4, wherein the wire (6) has flat-rolled portions (9) at the level of the foil seals (7) of the filament end portions.

6. Lamp as claimed in claim 5, wherein the wire (6) is a molybdenum wire.

7. Lamp as claimed in claim 4, wherein the ends of the wire (6) are bent to U-shape and are welded to the foil seals (7).

8. Lamp as claimed in claim 7, wherein the U-shaped ends (8) of the wire (6) protrude from the press stems (2) and are severed (X, X') at one or both ends.

9. Lamp as claimed in claim 1, wherein the support tube (5, 11) is of square or triangular cross-section at least in the location of attachment of the support wires (4).

10. Lamp as claimed in claim 1, wherein the gettering substance (15) is applied to the support tube (5, 11) in the form of a tangle of wire, as disks or foils.

11. Lamp as claimed in claim 1, wherein the lamp is mounted in an outer envelope or jacket (20).

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