Dec. 30, 1952 E. B. NOEL ET AL 2,624,023

LAMP UNIT

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Fig. 1.

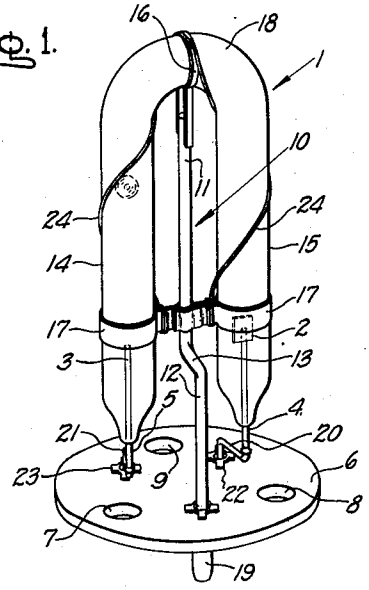
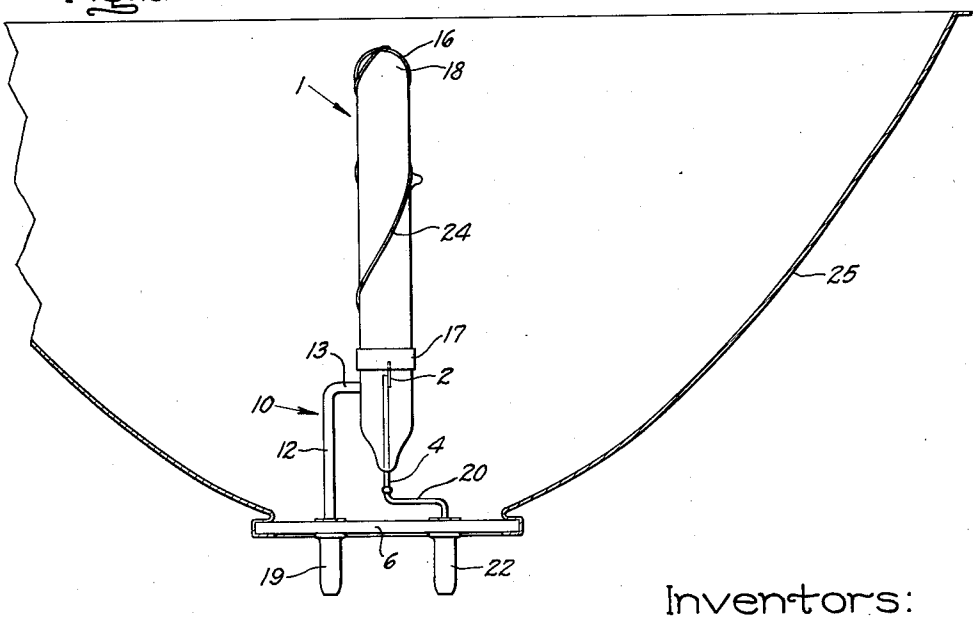


Fig. 2.



Inventors:
Edward B. Noel,
Paul B. Davis,
by Vernet C. Kauffman
His Attorney.

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LAMP UNIT

Edward B. Noel, Cleveland Heights, and Paul B. Davis, East Cleveland, Ohio, assignors to General Electric Company, a corporation of New York

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2 Claims. (Cl. 313—197)

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The present invention relates to gaseous electric discharge lamps and particularly to such lamps capable of emitting a brilliant flash of actinic radiation useful in photography. Lamps of this type are known in the trade as flashtubes and comprise a tubular vitreous container having an ionizable gaseous atmosphere therein, electrodes sealed into its ends and a triggering electrode engaging the outside of the envelope for facilitating the ignition of the lamp. Usually the tubular envelope is coiled helically but it may be of U-shape and it is the principal object of the present invention to provide a lamp unit including a flashtube of U-shape and a simple, rugged mount for the flashtube and which mount may also serve as the triggering electrode. Further objects and advantages of the invention will appear from the following detailed description of species thereof and from the accompanying drawing in which, Fig. 1 is a perspective view taken from above the lamp unit including a U-shaped flashtube and a mount therefor, and Fig. 2 is a side elevational view of the lamp unit shown in Fig. 1 and showing a reflector for the flashtube in section.

Referring to the drawing, the flashtube of the lamp unit comprises a U-shaped vitreous envelope 1 having a cathode 2 sealed into one of its ends and an anode 3 sealed into the other end. The cathode 2 is mounted on a current inlead wire 4 passing through the end of the envelope 1 and the anode 3 is constituted by the inner end of a similar inlead wire 5. The envelope 1 has a filling of gas therein, preferably xenon, at a suitable pressure, such as 300 mm. The mount for the flashtube comprises a base in the form of a disc 6 of electrically insulating material which has three spaced perforations 7, 8, and 9 therein for accommodating screws or bolts by which the lamp unit may be attached to a suitable support. The plane including the envelope 1 is perpendicular to the plane of disc 6 and the envelope 1 is supported in this position mainly by one stiff metal wire support 10 which has two straight parallel portions 11 and 12 offset from each other and connected by a bent portion 13. The part 11 of the wire 10 extends between the legs 14 and 15 of the U-shaped envelope 1 and two clamps 16 and 17 are welded thereto. The clamp 16 is in the form of a narrow metal strap welded to the free end of the wire 10 and encircles and engages the bent portion 18 of the U-shaped envelope 1. The clamp 17 is also in the form of a strap welded to the part 11 of support wire 10 adjacent the curved portion 13 thereof, is transverse to the part 10 and encircles and engages both legs 14 and 15 of the U-shaped envelope 1 adjacent the electrodes 2 and 3. The end of part 12 of the support wire 10 is firmly attached to the disc 6 by a hollow electrical contact pin member 19

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mechanically crimped on the disc 6 and into which the end portion of part 12 of the support wire is fastened by crimping, welding, or soldering.

The support wire 10 and its clamps 16 and 17 welded thereto are inside the part of the legs 14 and 15 enclosing the discharge path between the electrodes 2 and 3 except for the portion of the clamps around the envelope and therefore offer minimum obstruction to the passage of light from the flashtube. This is highly advantageous in securing a high utilization of light output with a minimum of shadow casting obstructions to the emitted light.

The lamp unit also comprises a pair of current lead wires 20 and 21 welded to the inleads 4 and 5, respectively. Said lead wires 20 and 21 are fastened to disc 6 by electrical contact pin numbers 22 and 23, respectively, which are of the same structure as pin 19. The wires 20 and 21 are semi-rigid to give additional rigidity to the structure particularly against torsional forces. It is important, however, that the lead wires 20 and 21 have sufficient flexibility so that physical shocks to the equipment will not be transmitted to the glass surrounding the inleads 4 and 5. Such shocks tend to fracture the seal between the envelope 1 and the current inleads 4 and 5.

The lamp unit described above may be inserted in a suitable socket connected to a suitable power source for energizing the flashtube. Such sources are commercially available and apply a high potential to the wire support 10 and its clamps 16 and 17 which serve as a triggering electrode to ignite the flashtube. The wide spacing of the support wire 10 and the current leads 20 and 21 of the mount is advantageous in preventing flashovers between the conducting elements of the unit outside the vitreous envelope 1. In order to increase the effectiveness of the wire support 10 and the clamps 16 and 17 for igniting the flashtube, a fine metal wire 24 is wound around the flashtube and electrically and physically connected to the clamps 16 and 17 by wrapping its ends around the lower clamp 17 and welding the turns thereto. The wire 24 rests against the clamp 16. When the flashtube does not require a triggering electrode, the wire 24 may be omitted with the power connection to the support wire 10.

In Fig. 2 of the drawing, the lamp unit is illustrated with a metal reflector 25 of suitable shape, such as a parabolic reflector, mounted on the disc 6 by spinning the edge of the reflector 25 over the periphery of the disc 6 so that the disc is clamped within the reflector as shown. The lamp unit, with or without the reflector 25 may be inserted readily in a socket comprising spring fingers to grip the contact pins 19, 22 and 23. Obviously, leads from the power source may be soldered to the pins or the pins 19, 22 and 23 may

be omitted and the power leads soldered directly to the leads 20 and 21 and the support wire 10. When the pins 19, 22 and 23 are omitted, staked eyelets may be used for fastening the support wire 10 and the lead wires 20 and 21 to the disc 6. Bolts passing through the openings 7, 8 and 9 may be used to fasten the disc 6 to a support whether the pins 19, 22 and 23 are present or not. Also the mount comprising the support wire 10 and its clamps 16 and 17 may be used with a radio tube type of base or any other suitable type of base may be substituted for the disc 6. However the disc 6 is preferred because of its simplicity and its versatility in providing a number of ways in which the lamp unit may be attached to the supporting structure.

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

1. In combination, a U-shaped light-transmitting gaseous electric discharge lamp having electrodes at the ends thereof, and a mounting and terminal structure therefor comprising a rigid disc-shaped base of insulating material adjacent to but spaced from the ends of said lamp in a plane transverse to the axis of the U-shaped lamp, a plurality of rigid terminal pins secured to said disc and extending outwardly therefrom on the side of the disc opposite said lamp, a rigid conductive support wire anchored at one end to one of said terminal pins and extending axially of said U-shaped lamp and between the leg portions thereof to a point adjacent the bend of the U-shaped lamp, a clamp member clamped around the said bend of the lamp and secured to the adjacent end of said support wire, a second clamp member secured to an intermediate portion of said support wire and clamped around both legs of the U-shaped lamp adjacent the ends thereof, a triggering electrode wire encircling said lamp and electrically connected at its ends to the said support wire, and semi-rigid inlead wires connecting the electrodes at the ends of said lamp to respective terminal pins other than said one pin.

2. In combination, a U-shaped light-transmitting gaseous electric discharge lamp having electrodes at the ends thereof, and a mounting and terminal structure therefor comprising a rigid disc-shaped base of insulating material adjacent to but spaced from the ends of said lamp in a plane transverse to the axis of the U-shaped lamp, a plurality of rigid terminal pins secured to said disc in a triangular pattern at widely spaced points about the center of the disc and extending outwardly therefrom on the side of the disc opposite said lamp, a rigid conductive support wire anchored at one end to one of said terminal pins and extending, in part, normally to the disc at the center of the disc and axially of said U-shaped lamp and between the leg portions thereof to a point adjacent the bend of the U-shaped lamp, a clamp member clamped around the said bend of the lamp and secured to the adjacent end of said support wire, a second clamp member secured to an intermediate portion of said support wire and clamped around both legs of the U-shaped lamp adjacent the ends thereof, a triggering electrode wire encircling said lamp and electrically connected at its ends to the said support wire, and semi-rigid inlead wires extending from the ends of the lamp in a direction generally away from said support wire and connecting the electrodes at the ends of said lamp to respective terminal pins other than said one pin.

EDWARD B. NOEL.
PAUL B. DAVIS.

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