

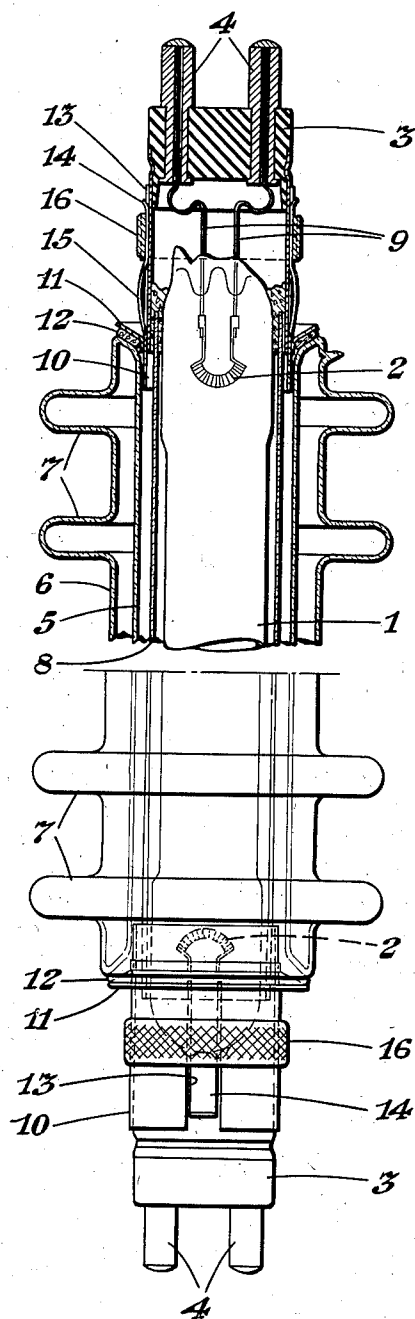
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GASEOUS ELECTRIC DISCHARGE DEVICE

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## UNITED STATES PATENT OFFICE

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## GASEOUS ELECTRIC DISCHARGE DEVICE

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5 Claims. (Cl. 240—11.4)

The present invention relates to gaseous electric discharge devices generally and more particularly the invention relates to gaseous electric discharge lamps the gaseous atmosphere of which consists of or comprises a metal vapor and the container of which is at an elevated temperature during the operation of the device to maintain the vapor therein at an effective pressure.

A heat conservator to reduce the heat losses from the lamp container to a minimum is useful in connection with lamps of this type. The object of the present invention is to provide an effective heat conservator for gaseous electric discharge lamps. Another object of the invention is to provide a lamp unit comprising a gaseous electric discharge lamp and a heat conservator therefor which lamp unit is easily assembled and taken apart. Still further objects and advantages attaching to the device and to its use and operation will be apparent to those skilled in the art from the following particular description.

In accordance with these objects the lamp unit comprises an elongated, metal vapor discharge lamp and an elongated, tubular, double walled heat conservator open at both ends. The heat conservator and the lamp are fastened together by removable means attached to bases fastened to the ends of the lamp and pressing against and closing the ends of the heat conservator. The closed ends of the heat conservator prevent harmful convection currents in said heat conservator. The heat conservator has a plurality of flexible ring-like protuberances in the outer wall thereof adjacent the ends of said heat conservator which equalize the physical strains over the walls of said heat conservator during the operation of the lamp. These strains are caused by the inner wall of the heat conservator being heated to a higher temperature by the heat emitted by the discharge in the lamp than the outer wall of said conservator. The two walls of the container thus expand to a different degree and at different rates which results in physical strains being set up in said walls. The ring-like protuberances in the outer wall of the heat conservator being flexible permit the uneven expansion of said inner and outer walls without fractures occurring in said walls. A glass tube is interposed between the inner wall of said heat conservator and the container of said lamp. Heat losses from the lamp unit are reduced to a minimum and the lamp container is at an elevated temperature during the operation of the lamp.

In the drawing accompanying and forming

part of this specification an embodiment of the invention is shown in a front elevational, partly sectional view.

Referring to the drawing the new and novel lamp unit comprises a gaseous electric discharge lamp having an elongated, tubular container 1 having an electrode 2 sealed therein at each end thereof and having a gaseous atmosphere therein comprising a starting, rare gas and a metal vapor, such as argon and mercury vapor, or neon and sodium vapor. Said electrodes 2 are electron emitting when heated and consist of a curved rod or bar of electron emitting material, such as barium oxide, and a heater filament, such as a tungsten filament, wrapped around said bar. A base 3 having a pair of contact pins 4 is cemented to each end of said container 1 and a pair of current leads 9 sealed into said container 1 are connected to the contacts 4 and to the ends of the heating filament of the electrodes 2.

The heat conservator of the lamp unit is an elongated, open ended, evacuated, double-walled tubular body 5, 6 surrounding said lamp container 1. The outer wall 6 of said conservator has a pair of circular protruding parts 7 therein near the point of fusion between said outer wall 6 and the inner wall 5. Said parts 7 equalize heat strains in the glass walls of said conservator 5, 6 to prevent cracking of said walls under the uneven heating thereof from the discharge between said electrodes 2 in the container 1.

The new and novel lamp unit also comprises a single walled tube 8 surrounding the lamp container 1 and interposed between said lamp container 1 and the inner wall 5 of said heat conservator 5, 6. The ends of said single walled tube 8 are embedded in the body of cement which fasten each of the bases 3 to said container 1.

The lamp unit is assembled by inserting the lamp container 1 into said tube 8, inserting said leads 9 into the contacts 4 of said bases 3 and soldering said leads 9 to the outer end of said contacts 4. The bases 3, the ends of said tube 8 and the lamp container 1 are then cemented together. These elements are then inserted in the double walled heat conservator 5, 6. A slitted, flexible sleeve 10 is then slipped onto each of said bases 3. Each of said sleeves 10 has welded thereto near the inner end thereof an annular member 11 which forms a shoulder thereon. Said members 11 clamp the heat conservator 5, 6 therebetween and a ring of heat insulating material, such as an asbestos ring, is interposed between each of said members 11 and the respective end of said heat conservator 5, 6. The space between the in-

ner wall 5 of the heat conservator and the tube 8 is closed off from the outer atmosphere. Said sleeves 10 have two or more tongues 14 which bulge outwardly at the midpart thereof, (see the end of the lamp unit shown in section). Rings 16 are slipped over the sleeves 10 and when said rings 16 are moved toward the center of the lamp unit the heat conservator 5, 6 and the lamp container 1 are firmly locked together. The lamp unit is easily taken apart, when desired, by moving rings 16 toward the outer end of the bases 3 and removing the sleeves 10.

While we have shown and described and have pointed out in the annexed claims certain novel features of the invention, it will be understood that various omissions, substitutions and changes in the forms and details of the device illustrated and in its use and operation may be made by those skilled in the art without departing from the spirit and scope of the invention, for example, the heat conservator 5, 6 is filled with a gas having poor heat conducting characteristics, when desired, and the heat conservator 5, 6, or any part thereof, and the tube 8 is made of a colored or a clouded glass to filter or diffuse the light emitted by the luminous gaseous electric discharge between said electrodes 2.

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

1. A lamp unit comprising in combination a gaseous electric discharge lamp, a heat conservator therefor, said conservator being a double-walled jacket surrounding said lamp and having a flexible expansion member in the walls thereof, and means to fasten said lamp and said conservator together.

2. A lamp unit comprising in combination a gaseous electric discharge lamp comprising an elongated container, electrodes sealed therein at each end thereof, a gaseous atmosphere therein comprising a metal vapor, a heat conservator for said lamp, said conservator being an elongated, open ended, double-walled jacket surrounding said lamp and having a plurality of flexible expansion members in the outer wall thereof, and removable means to fasten said lamp and said conservator together, said means closing the open ends of said conservator.

3. A lamp unit comprising in combination a gaseous electric discharge lamp comprising an elongated container, electrodes sealed therein at each end thereof, a gaseous atmosphere therein comprising a metal vapor, a heat conservator for said lamp, said conservator being an elongated, open ended, double-walled jacket surrounding said lamp and having a plurality of flexible expansion members adjacent each end of the outer wall thereof, removable means to fasten said lamp and said conservator together, said means closing the open ends of said conservator, and a single walled tube interposed between the inner wall of said conservator and said lamp container.

4. A lamp unit comprising in combination a gaseous electric discharge lamp device, a heat conservator surrounding said lamp device, said heat conservator being a double-walled jacket having the space between the walls thereof evacuated, a baffle interposed between and spaced apart from said lamp device and said heat conservator, and means to fasten said lamp device and said baffle and said jacket together.

5. A lamp unit comprising in combination a gaseous electric discharge lamp device comprising an hermetically sealed, elongated container, electrodes mounted therein at each end thereof, a gaseous atmosphere therein comprising a metal vapor, a heat conservator surrounding said lamp, said conservator being an elongated, double-walled jacket having the space between the walls thereof evacuated, a tube interposed between the inner wall of said conservator and said lamp container, means to close said jacket and means to fasten said lamp device, said tube and said conservator together.

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