

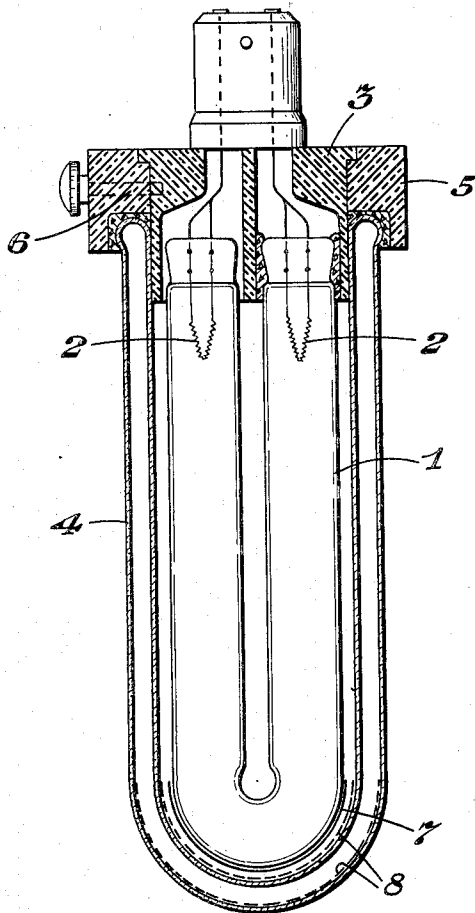
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GASEOUS ELECTRIC DISCHARGE LAMP DEVICE

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GASEOUS ELECTRIC DISCHARGE LAMP DEVICE

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The present invention relates to gaseous elec-
tric discharge lamp devices generally and more
particularly the invention relates to such devices
the gaseous atmosphere of which consists of or
comprises the vapor of a difficultly vaporizable
metal i. e. a metal having a vapor pressure of
less than 1 mm. at a temperature of 200° C., such
as sodium, cadmium, thallium, or zinc.

Heat conservators, such as an evacuated en-
velope enclosing the lamp container, or a double
walled jacket having the space between the inner
and outer walls thereof evacuated and in which
the lamp container is mounted, which reduce
the transfer of heat from the lamp container to
the ambient atmosphere and thus maintain the
container at an elevated temperature are useful
in obtaining an effective vapor pressure in such
devices, that is a vapor pressure such that the
spectrum of the light emitted by the device is
rich in rays characteristic of the metal vapor
during the operation of the device.

The vapor pressure in vapor lamps generally
is determined by the lowest temperature in the
lamp and the heating of parts of the lamp above
the temperature of the part thereof having the
lowest temperature has no effect on the vapor
pressure. Indeed in a lamp having difficultly
vaporizable material therein excess heating of
parts of the container may be harmful to
the lamp device since even the part of the con-
tainer which is at the lowest temperature during
the operation of the lamp must have an elevated
temperature in order to have an effective vapor
pressure in the lamp and when other parts of the
lamp container are heated greatly above this
temperature there is danger of the metal vapor
attacking the glass chemically or of the glass
becoming soft and the container collapsing. An
appreciable amount of energy is also wasted in
such useless heating of parts of the lamp con-
tainer.

In a lamp device having a container made up
of straight sections connected by a curved sec-
tion or sections, such as a U-shaped container,
the curved section is usually at a lower tempera-
ture than the straight sections during the opera-
tion of the device due to the larger heat radiating
area thereof.

The object of the present invention is to pro-
vide a lamp unit comprising a gaseous electric
discharge lamp device having a container con-
sisting of straight portions and curved portions
and a heat conservator in which all parts of the
lamp container are at approximately the same
temperature during the operation of the device,

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 this object the invention
comprises a coating which is a good heat inter-
ceptor either by virtue of its good reflecting qual-
ities or by virtue of its poor heat conductivity
characteristics, which coating is in operative re-
lation to the curved part of the container to
reduce the dissipation of heat therefrom. In
one embodiment of the invention the coating is
applied to the curved part of the container. In
another embodiment of the invention the coat-
ing is applied to the part of the walls of the
conservator adjacent the curved part of the lamp
container. By reducing the dissipation of heat
from the curved portion of said container the
temperature of said curved portion is made ap-
proximately that of the straight portions of said
container during the operation of the device.

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 device having a U-shaped container 1 and
a double walled jacket 4 having the space be-
tween the inner and outer walls thereof evacu-
ated. Said container 1 has an electrode 2 sealed
therein at each end thereof, a starting, rare gas
therein, such as argon or neon, at a pressure of
approximately 1 to 10 mm. and a quantity of
vaporizable material therein, such as sodium.
Said electrodes 2 are electron emitting when
heated and consist of a metal filament, such as
a tungsten filament, having another filament,
such as a tungsten or a nickel filament, wrapped
around said first named filament and a coating
of electron emitting material, such as barium
oxide, applied to said filaments. Said electrodes
2 are heated to an electron emitting temperature
by the discharge current. Said container 1 has
a bayonet base 3 cemented to one end thereof
and the other end of said container 1 is covered
by said base 3 but is free to move therein. Said
container 1 thus can contract and expand freely
during the life of the lamp device without danger
of fracturing the walls thereof.

The jacket 4 has a ring-base 5 of insulating
material cemented thereto and said base 5 fric-
tionally engages with said base 3 and is locked in
position thereon by the pin 6.

The outer surface of the curved, lower portion

of container 1 has a thin coating 7 of reflecting material, such as silver, thereon which coating 7 reflects the heat of said curved part and thus reduces the dissipation of heat from said curved part so that the temperature of said curved part is made approximately that of the straight parts of said container 1 during the operation of said lamp unit.

When desired, the coating 7 is omitted from the curved part of the container 1 and a similar coating 8 (indicated in dotted lines) is applied to one or both of the walls of the rounded, end part of the jacket 4 adjacent the curved part of the container 1 and on the side of said walls facing said curved container part. In this case the coatings 8 reflect back to the container 1 an appreciable part of the heat radiated by the container 1 with the result pointed out above. It is also effective to apply a reflecting coating similar to the coatings 8 to the inner surface of the inner wall of the jacket, that is, the surface facing the outer wall of said jacket 4, which reduces the radiation of heat from said inner wall.

We prefer that the silver coating be a dust-like deposit, or a very thin film which transmits all the visible light emitted by the lamp device but which reflects all the infra-red, or heat rays emitted by the device. Such a coating is applied to the lamp container, or the heat conservator, by methods well known in the art, such as by chemical deposition or cathode sputtering.

When desired the coatings 7 and 8 consist of a material having poor heat conductivity characteristics, such as a thin layer of asbestos, which likewise reduces the dissipation of heat from said curved container part.

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.

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

1. A lamp unit comprising a gaseous electric discharge lamp device having a container consisting of two straight parts and a curved part connecting said straight parts, electrodes sealed into said container and a vaporizable material in said container, a heat conservator in which said lamp device is mounted and a heat interceptor interposed between the curved part of said container and the ambient atmosphere.

2. A lamp unit comprising a gaseous electric discharge lamp device having a container con-

sisting of two straight parts and a curved part connecting said straight parts, electrodes sealed into said container and a vaporizable material in said container, a double walled jacket having the space between the inner and outer walls thereof evacuated and in which said lamp device is mounted and a heat interceptor interposed between the curved part of said container and the ambient atmosphere.

3. A lamp unit comprising a gaseous electric discharge lamp device having a container consisting of two straight parts and a curved part connecting said straight parts, electrodes sealed into said container and a vaporizable material in said container, a double walled jacket having the space between the inner and outer walls thereof evacuated and in which said lamp device is mounted and a reflecting coating on the curved part of said container to reduce the dissipation of heat from said curved part.

4. A lamp unit comprising a gaseous electric discharge lamp device having a container consisting of two straight parts and a curved part connecting said straight parts, electrodes sealed into said container and a vaporizable material in said container, a double walled jacket having the space between the inner and outer walls thereof evacuated and in which said lamp device is mounted and a reflecting coating on the part of said jacket adjacent the curved part of said container.

5. A lamp unit comprising a gaseous electric discharge lamp device having a container consisting of two straight parts and a curved part connecting said straight parts, electrodes sealed into said container and a vaporizable material in said container, a double walled jacket having the space between the inner and outer walls thereof evacuated and in which said lamp device is mounted and a coating of material having poor heat conducting characteristics on the curved part of said container.

6. A lamp unit comprising a gaseous electric discharge lamp device having a container consisting of two straight parts and a curved part connecting said straight parts, electrodes sealed into said container and a vaporizable material in said container, a double walled jacket having the space between the inner and outer walls thereof evacuated and in which said lamp device is mounted and a coating of material having poor heat conducting characteristics on the part of said jacket adjacent the curved part of said container.

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