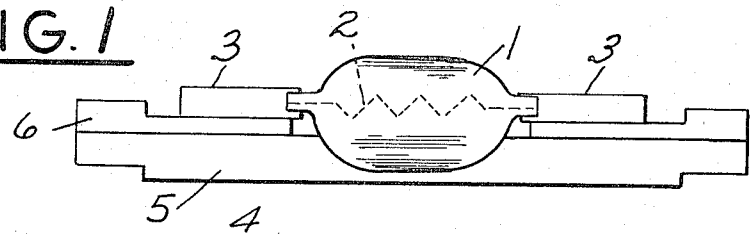
May 7, 1968 R. R. PETERSON 3,382,477

HEAT-DISSIPATING CONNECTOR

Filed May 24, 1965

FIG. 1



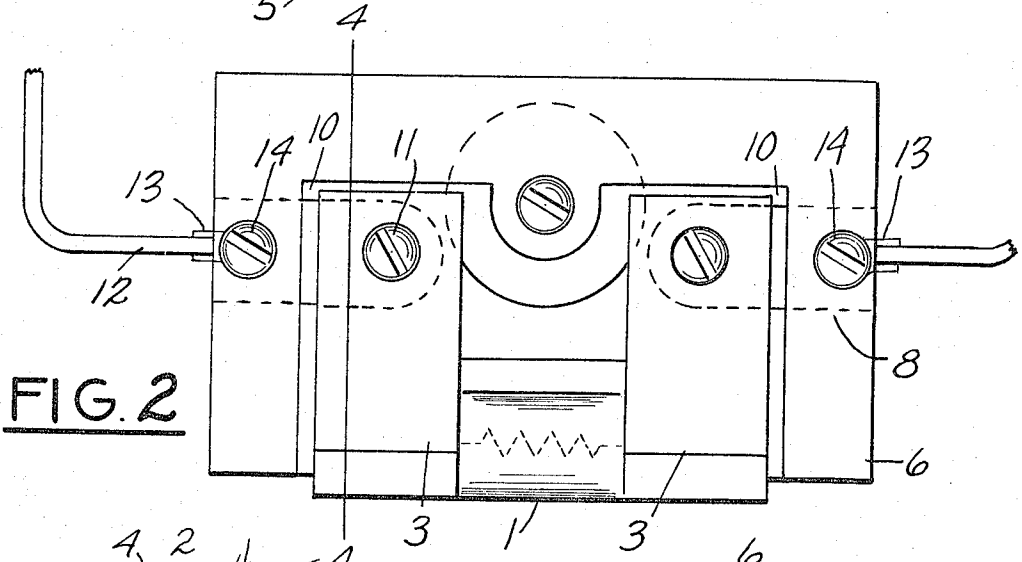


FIG. 2

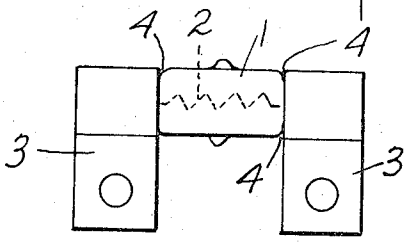


FIG. 3

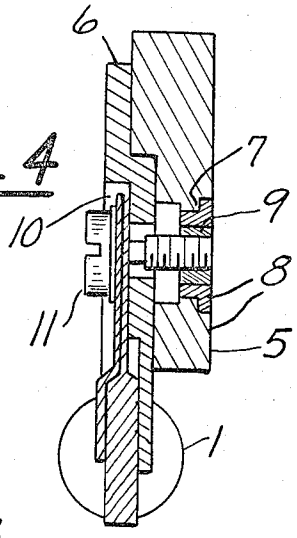


FIG. 4

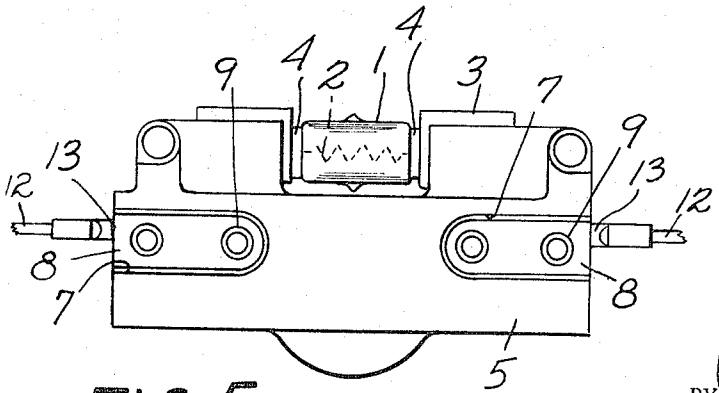


FIG. 5

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3,382,477

Patented May 7, 1968

3,382,477

HEAT-DISSIPATING CONNECTOR

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Filed May 24, 1965, Ser. No. 458,229
3 Claims. (Cl. 339—112)

ABSTRACT OF THE DISCLOSURE

A high-intensity lamp having metal terminals sealed into a quartz envelope is supported on a metal body having hard anodized aluminum surfaces in contact with the lamp terminals to form an insulating coating and to conduct heat away and thereby prolong the life of the lamp.

This invention is a connector for lamps and the like having a film of hard anodized aluminum for electrical insulation and heat conduction. A hard anodized film 1 mil thick will provide good electrical insulation for 400 volts. At the same time, this thickness of film provides excellent heat conductivity. This makes possible heat conduction equivalent to direct metal-to-metal contact while maintaining the required electrical insulation. One use is in lamp sockets where the elimination of the usual insulation around the socket terminals materially reduces the lamp operating temperature and thereby prolongs the operating life.

In the drawing, FIG. 1 is a front elevation of a high intensity lamp and the associated connectors; FIG. 2 is a top plan view of FIG. 1; FIG. 3 is a top plan view of the high intensity lamp; FIG. 4 is a section on line 4—4 of FIG. 2; and FIG. 5 is a bottom plan view of FIG. 1.

FIGS. 1 to 5 inclusive show a high intensity incandescent quartz lamp **1** such as used for the aircraft wing lights described in application Serial No. 345,139 and now Patent 3,270,193. This lamp has a filament **2** within a quartz envelope and terminals **3** at each end of the envelope. Difficulty has been experienced in breakdown of the seals between the terminals **3** and the quartz envelope in the regions indicated by the numeral **4** due to high temperatures. This has materially reduced the useful operating life of the lamp.

By the structure to be described, the temperature in the critical region of the seals **4** is reduced by from 20% to 30% and the useful operating life is accordingly materially increased. The structure for accomplishing this comprises a lamp support of hard anodized upper and lower aluminum plates **5** and **6**. The hard anodized aluminum coating need only have a thickness of a fraction of a mil in order to stand the operating voltage of the lamp, but to provide a suitable factor of safety is ordinarily from 2 to 3 mils thick. The hard anodized aluminum coating is essentially aluminum oxide formed in situ on the surface of the aluminum. It is a refractory of "file" or abrasive hardness which is intimately united with the surface of the aluminum, providing an extremely wear resistant surface which is unaffected by thermal and mechanical shocks. The color of the hard anodized aluminum coating is dark grey. It can be dyed if other colors are desired. The coating has excellent heat emissivity, approaching that of a complete radiator. The coating has excellent electrical insulation value. The coating 1 mil in thickness will stand from 400 to 500 volts. The 2 to 3 mil thickness usually

used is more than ample for the commercially available incandescent lamps. The hard anodized coating need not cover all the surfaces of the aluminum bodies **5** and **6**. Any surfaces in which the coating is not desired may be masked off during the coating operation.

FIGS. 2, 4 and 5 show the electrical connections to the lamp terminals and to the power supply. On the under side of the aluminum member **5** are recesses **7** each containing a metallic terminal member **8** having fixed therein two nuts **9**. Each of the lamp terminals **3** is received in a recess **10** in the aluminum member **6** and is electrically connected to the underlying terminal strip **8** by a screw **11** threaded into one of the nuts **9**. Each of the power supply conductors **12** has a terminal **13** resting on top of the aluminum member **6** and similarly electrically connected to the terminal strip **8** by a screw **14** threaded into another of the nuts **9**. From FIGS. 2, 4 and 5 it would appear that the power supply conductors **12** and the lamp terminals **3** were short circuited by direct metal to metal contact. However, the hard anodized coating on the aluminum parts **5** and **6** provides electrical insulation which prevents such short circuiting. While the lamp terminals **3** are electrically insulated from each other and from the metal parts **5** and **6**, they are in excellent heat transfer relation to the metal parts which provide extended radiating surfaces dissipating heat and lowering the operating temperatures of the seals. Because of the extreme thinness of the hard anodized coatings, the coatings are not shown in FIGS. 1–5 inclusive.

What is claimed as new is:

1. A lamp having an envelope with terminals sealed into and extending from the envelope, a metal body for supporting the lamp having hard anodized aluminum surfaces, power terminal means, and means for clamping the lamp terminals against said anodized surfaces of the body and for connecting the power terminal means to the lamp terminals, the anodized surfaces in contact with the lamp terminals providing electrical insulation and good heat transfer whereby the metal body becomes part of the heat dissipating surface of said lamp.

2. A lamp having an envelope with terminals sealed into and extending from the envelope, a metal body for supporting the lamp, power terminals, fastening means for clamping the body between the lamp and power terminals, the body having hard anodized aluminum surfaces in contact with the lamp and power terminals, the anodized surfaces providing electrical insulation and good heat transfer whereby the metal body becomes part of the heat dissipating surface of said lamp.

3. A lamp having an envelope with terminals sealed into and extending from opposite ends of the envelope, power terminal strips spaced from and in opposed relation to the lamp terminals, a metal body spaced from the envelope for supporting the lamp, said body being between the lamp terminals and the power terminal strips and having hard anodized aluminum surfaces engaging the lamp terminals and a clearance opening for screw connecting means extending between the lamp terminals and the power terminal strips for clamping the lamp terminals against said anodized surfaces, the anodized surfaces in contact with the lamp terminals providing electrical insulation and good heat transfer whereby the metal body becomes part of the heat dissipating surface of said lamp.

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