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[54] **FLOODLIGHT AND HEAT DISSIPATING DEVICE**
 4 Claims, 8 Drawing Figs.

[52] U.S. Cl. 240/3
[51] Int. Cl. F21p 5/00
[50] Field of Search 240/3, 47,
 11.2, 11.4, 7.1

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ABSTRACT: This invention is concerned with a floodlight assembly provided with an apparatus for dissipating heat from the vicinity of a high wattage iodine quartz lamp enclosed therein; the floodlight housing being of relatively small dimensions in comparison to floodlight housings heretofore employed. The invention contemplates a mass of metal bored to receive a high wattage iodine quartz lamp and provided with a shaped surface remote from the said lamp and means for dissipating heat from the vicinity of the said lamp by forming a heat dissipating mass adaptable to enclose the lamp without contacting it.

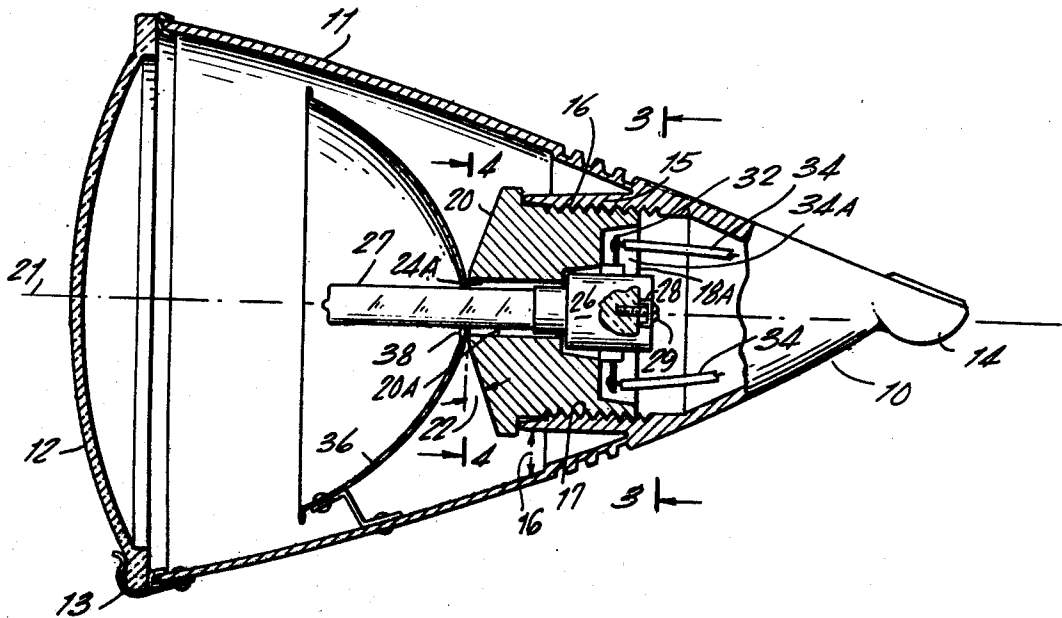


FIG. 1

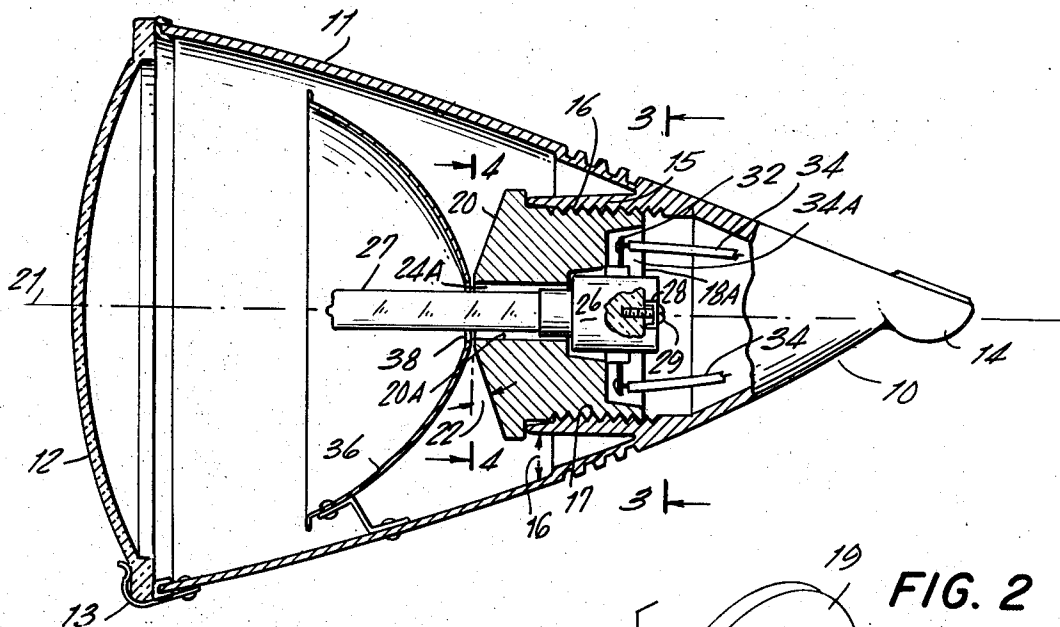


FIG. 2

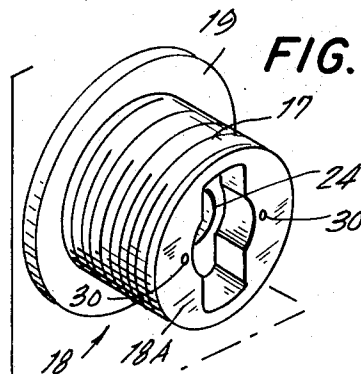


FIG. 3

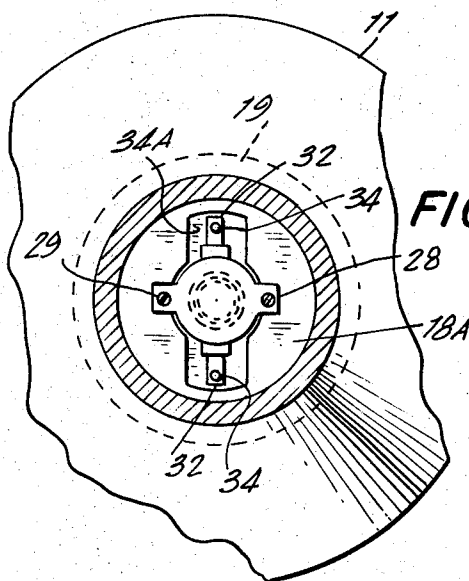
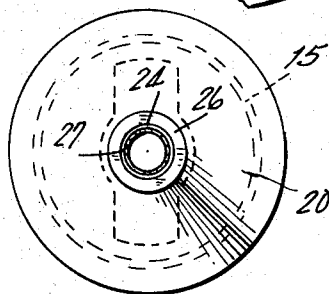


FIG. 4



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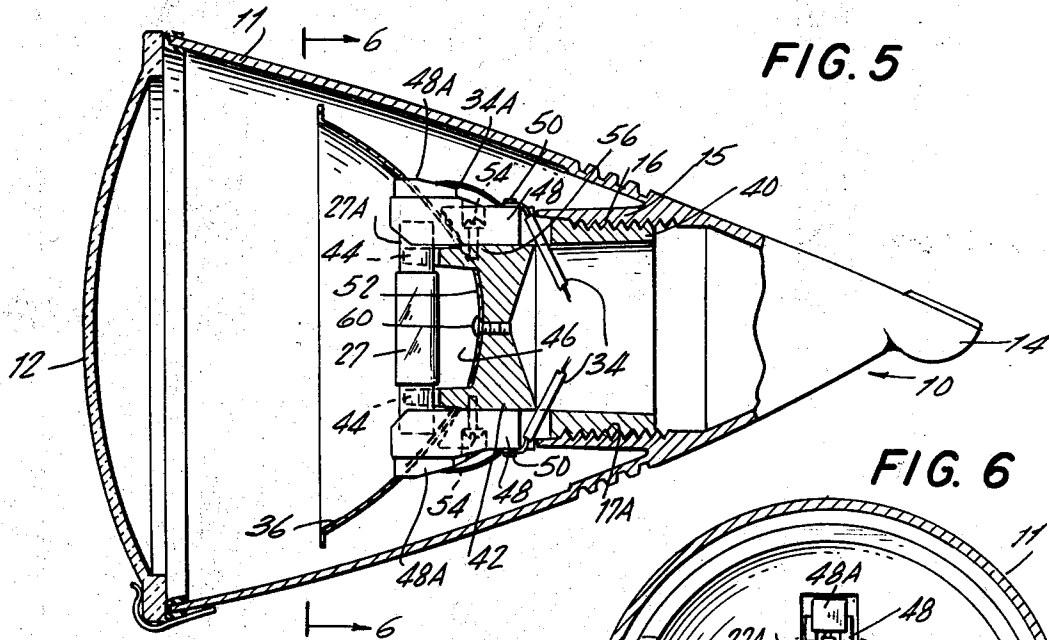


FIG. 5

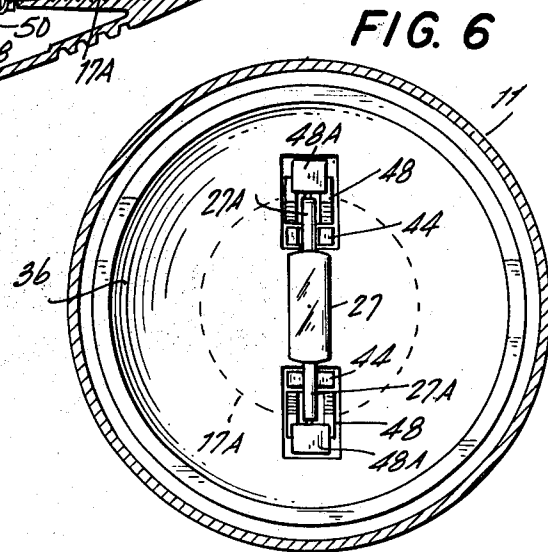


FIG. 6

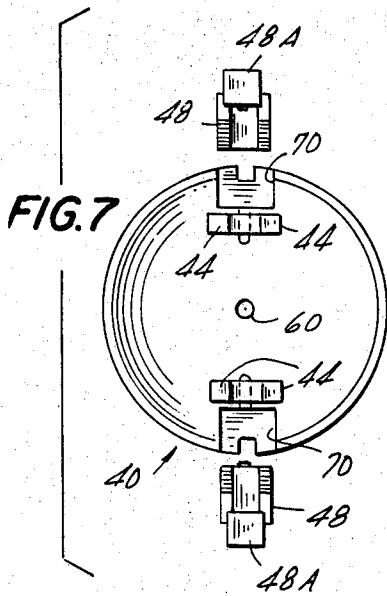


FIG. 7

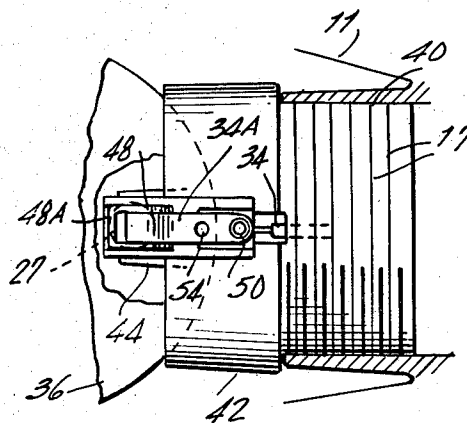


FIG. 8

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FLOODLIGHT AND HEAT DISSIPATING DEVICE

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to a floodlight and a heat dissipating device therefor. More particularly, the invention relates to a heat dissipating device adapted to be disposed in a floodlight housing of relatively small dimensions.

2. Description of the Prior Art

High intensity iodine quartz lamps generate heat of such high temperatures that it must be dissipated from the vicinity of the lamp. If such heat is not properly or otherwise dissipated the lamp can be destroyed as well as the associated structure and wiring. Therefore some means must be provided in order to prevent this self-destructive force of the lamp, the socket, and the floodlight housing. The prior art has attempted to solve this problem by providing floodlight housing of relatively large dimension in the hope that such added space would help dissipate some of the heat generated. However, obviously, this has resulted in floodlight assemblies of large, unwieldy and inefficient size requirements.

SUMMARY OF THE INVENTION

It is towards this objective that this invention is directed, and that is to provide a heat dissipating device and associated structure adapted so as to result in the employment of floodlight housings of relatively small dimensions in comparison to floodlight housings heretofore employed by the prior art.

In accordance with the present invention, there has now been devised a heat dissipating device adaptable to a floodlight housing having a reflective arrangement incorporated therein, said device comprising an annular mass of metal having an inner wall which defines an aperture formed therein and an outer wall having an end face and a side face with the end face being formed at an angle with respect to the horizontal axis of the said annular mass and merging into the side face with the side face adapted to be supported in a suitable floodlight housing in combination with a reflective element. More specifically, a mass of metal is provided with a bore adapted to receive a high wattage iodine quartz lamp, the shaped surface of the metal being remote from the lamp. The heat is dissipated from the vicinity of the high wattage iodine quartz lamp which produces it by forming a heat dissipating mass adapted to enclose the lamp element without contacting the same and allowing the heat to dissipate therein.

BRIEF DESCRIPTION OF THE DRAWING

The invention will be hereinafter more fully understood with reference to the description thereof in the accompanying drawing, in which:

FIG. 1 is a cross-sectional view of a floodlight incorporating a heat dissipating arrangement in accordance with the present invention;

FIG. 2 is an exploded view, in perspective, of the heat dissipating element and a lamp and socket therefor;

FIG. 3 is a sectional view, partly broken away, taken along line 3—3 of FIG. 1;

FIG. 4 is a sectional view taken along line 4—4 of FIG. 1;

FIG. 5 is a cross-sectional view of another embodiment of the invention generally shown as adapted to be a double-ended lamp unit;

FIG. 6 is a sectional view of FIG. 5 taken along line 6—6 of FIG. 5;

FIG. 7 is an exploded front elevational view of the heat dissipating element as shown in FIGS. 5, 6 and 8; and

FIG. 8 is a fragmentary top plan view, partly in section, showing the heat dissipating element as mounted in the floodlight assembly.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

There is shown in FIG. 1 a floodlight assembly wherein the heat dissipating element forming part of the instant invention is incorporated. The floodlight assembly is designated generally by the numeral 10. The floodlight assembly comprises a hollow housing 11 which is advantageously of conical conformation and preferably formed as an aluminum casting. The enlarged end of the housing is provided with a removable glass end face 12 which is retained in position by means of a retaining clip 13; the reduced end or neck portion being provided with a mounting head 14 through which electrical leads are extended from the housing for connection to a source of electrical supply for energizing the lamp. A cylindrical collar 15 is integrally cast with the housing in the neck portion thereof and is disposed concentrically therewith. It will be noted that there is thus formed an annular V-shaped space 16 between the outer peripheral surface of collar and the diverging internal surface of the conical portion of the housing wall which is disposed in confronting relation therewith. The collar 15 is internally threaded as shown at 16 to receive the complementary threaded body portion 17 of the outer sidewall of the heat dissipating element designated generally by the numeral 18 as will more clearly appear hereafter.

The heat dissipating element 18 comprises an annular or cylindrical mass of metal having good heat conduction characteristics, preferably aluminum, provided with an outer wall which is comprised of said threaded sidewall portion 17 and a flange portion 19. The outer wall of the heat dissipating element 18 is further provided with a front end face 20 which is formed at a slope with respect to the axis 21 thereof, thereby presenting an enlarged surface area having a slope angle 22 defined by a line normal to the axis 21 thereof.

The heat dissipating element 18 is also formed with an inner wall defined by an axial aperture or bore 24 which extends therethrough and is provided with an enlarged portion for receiving a lamp socket or mounting means 26 of conventional form for the type of lamp involved herein.

As may be more clearly seen from FIGS. 2—4, the heat dissipating element supports an assembly comprising of the lamp support or socket 26 which in turn removably carried the lamp 27. The lamp socket 26 is provided with diametrically opposed aperture mounting ears 28 and is secured in position by means of screws 29 which are secured in complementary screw holes 30 formed in the rear end face 18A of the element 18. The socket 26 is further provided with diametrically opposed electrical connecting posts 32 for connection to electrical leads 34 for the energization thereof.

It will be noted that the axial bore extending through the body of the heat dissipating element 18 including the recessed portion thereof is dimensioned with respect to the lamp and socket so that it surrounds the lamp base portion and except for the mounting ears no physical contact is made, an intermediate air space 34A being formed therebetween. A light reflector 36 is disposed at the front face of element 18 and provided with an aperture 38 through which the main body of the lamp extends and is positioned.

It is seen in FIG. 1 that the inner wall 20A surrounding bore 24 which defines the aperture formed through this embodiment of the heat dissipating mass surrounds a portion of the lamp 27. In this preferred embodiment the lamp is surrounded by the said inner wall 20A without contacting the same, to the end that heat initially radiated from the lamp is dissipated from the vicinity of the lamp as it is radiated upon the inner wall. A most favorable environment for the lamp is obtained when the base of the lamp does not contact the heat dissipation mass. Still further in this embodiment an overlap between the lamp and heat dissipation mass, again without contact therebetween, has been found to be desirable. So, for example, as shown in FIG. 1 the transparent envelope of the lamp is shown surrounded by the heat dissipating mass without contacting the same. This construction provides an air venting area 24A around the lamp between the lamp and heat dissipating mass for the free motion of masses of air therethrough.

Referring now to another embodiment of the invention as shown in FIGS. 5—8, wherein like reference characters designate like or corresponding parts as described in FIGS. 1—4, there is shown a device according to the invention adapted to be a double-ended lamp unit.

FIG. 5 depicts a floodlight assembly 10, identical to the one described in FIG. 1, with the collar 15 being internally threaded as shown at 16 to receive the complementarily threaded body portion 17A of the outer sidewall of the heat dissipating element designated generally by the numeral 40, in this specific embodiment.

The heat dissipating element 40 also comprises a cylindrical mass of metal having good heat conduction characteristics, preferably aluminum, and provided with an outer wall which is comprised of said sidewall portion 17A and a head portion 42 integrally connected thereto. Head portion 42 has flanges 44 which extend outwardly towards end face 12 from the upper and lower ends of said head portion 42, forming a cavity 46 for receiving the lamp 27 partially therein, so that a space is provided behind a said lamp. Said flanges 44 are bifurcated to provide for the insertion of said lamp 27, at its base 27A. The lamp supporting means 48 is provided with electrical terminals 50 adapted to be energized by a source of current. The lamp supporting means 48 is also provided with electrical conducting means, well known in the art, which are adapted to energize lamps, generally represented by the lamp 27, from the electrical terminals 50 connected to leads 34. The lamp 27 is supported by the supporting means 48 and energizable through the conducting means 34 connected to the lamp 27. In this preferred embodiment the end face 52 and cavity 46 surround the base of the lamp without contacting the same, to the end that heat initially absorbed by the base is dissipated from the vicinity of the lamp as it is radiated upon the end face 52. Again, the most favorable environment for the lamp is obtained when the base of the lamp does not contact the heat dissipation mass. Connecting means 34A run from terminal 50 to support element 48A. Still further, the arcuately sloped or dished portion of the end face 52 has been determined to be a favorable configuration for increasing the heat dissipation of this embodiment either alone or in combination with providing the bifurcated members 44 and/or the threaded surface 17A as hereinbefore described in the discussion of the embodiment shown in FIG. 1. The lamp supporting means 48 are attached to head portion 42 by means of screw 54 threaded into apertures 56 of said portion 42 and seat in a recess 70 in element 40 at its face end.

Referring again to FIG. 5, another screw 60 connects end face 52 to head portion 42. FIGS. 6, 7 and 8 show various views of the modified embodiment as shown in FIG. 5 of the heat dissipating element 40, which reference numerals have been described with relation to FIG. 5 and correspond thereto.

It will also be noted that conical walls 11 shown in FIGS. 1 and 5 are also in similar threaded relation to threads 15 of the inner surface of said assembly 10, at threads 15A. These said threads 15A also aid in the dissipation of the heat.

It is believed that the method herein disclosed of dissipating heat from the vicinity of a heat radiating lamp by forming a mass having dimensions large enough to fit around the heat

radiating lamp and disposing the mass of metal such that the structure surrounds a portion of the lamp in intimate relation with respect thereto and is further disposed in heat radiation relation with respect thereto, as distinguished from heat conduction relation with respect thereto, is itself conceptionally inventive. Heat radiated upon the mass is dissipated therethrough by means of conduction and from the faces of the mass remote from the lamp by means of radiation, convection or conduction, depending upon the media disposed immediately adjacent to the surfaces remote from the lamp. In addition, it is a feature of the invention to include forming threads in the outer wall of the mass to increase the outer wall area thereof to stimulate heat transfer from the mass into the media adjacent thereto and, as shown in FIGS. 1—4 it is a further feature of the method to include forming the end face sloped with respect to the axis of the aperture as hereinbefore described to increase the end face area of the mass.

I claim:

1. In a floodlight assembly having a hollow housing with a lamp supporting means in one end and a light reflecting means in the other end, said lamp supporting means having electrical terminals adapted to be energized by a source of current and means to energize a lamp supportable thereby from said electrical terminals to cause the lamp to emit light and radiate heat, the improvement comprising a heat dissipating means mounted on the housing intermediate the reflecting means and lamp supporting means, said heat dissipating means having an inner wall which defines an aperture formed therein through which a portion of a lamp may be inserted and be surrounded by said wall without contacting said wall and wherein said heat dissipating means comprise a mass having a pair of bifurcated members formed to surround the base of said lamp without contacting said base, said bifurcated members defining an end face on said heat dissipating means, and said end face also comprising an arcuately sloped portion terminating in said bifurcated members.

2. In a floodlight assembly having a hollow housing with a lamp supporting means in one end and a light reflecting means in the other end, said lamp supporting means having electrical terminals adapted to be energized by a source of current and means to energize a lamp supportable thereby from said electrical terminals to cause the lamp to emit light and radiate heat, the improvement comprising a heat dissipating means mounted on the housing intermediate the reflecting means and lamp supporting means, said heat dissipating means having an inner wall which defines an aperture formed therein through which a portion of a lamp may be inserted and be surrounded by said wall without contacting said wall, said heat dissipating means comprising an annular mass having an outer wall which includes an end face and a side face, said end face being formed at an angle with respect to the axis of the annular mass and merging into said side face, and said side face being adapted to being supported in said floodlight housing.

3. The device according to claim 4, said end face flaring inwardly toward said side face and merging thereinto.

4. The device according to claim 5, said inner wall being formed substantially parallel with respect to the axis of said annular mass and said side face being formed substantially parallel with respect to said inner wall.

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