April 27, 1965 I. Y. MORRISON 3,180,980

EXPLOSION-PROOF FLOODLIGHT

Filed Nov. 28, 1962

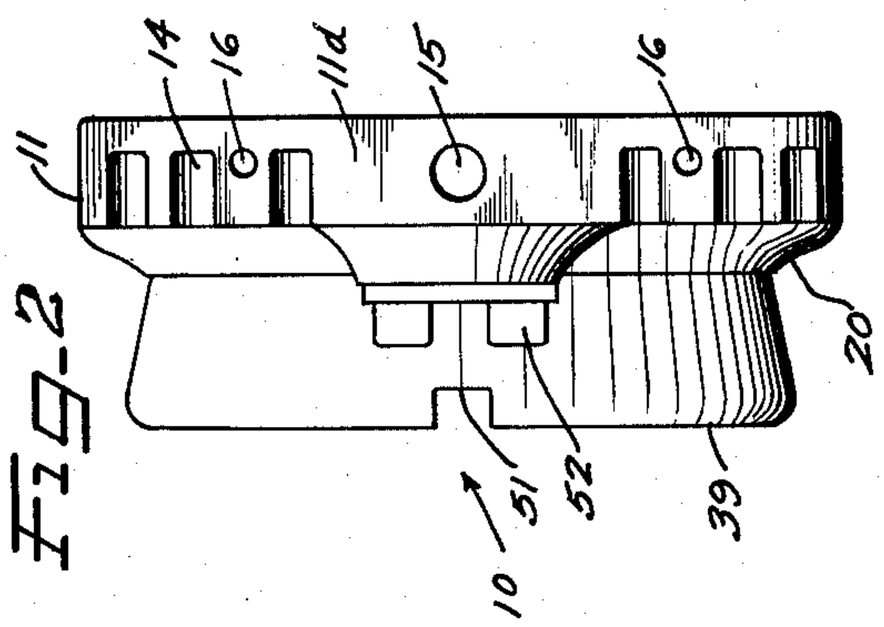

Fig-2

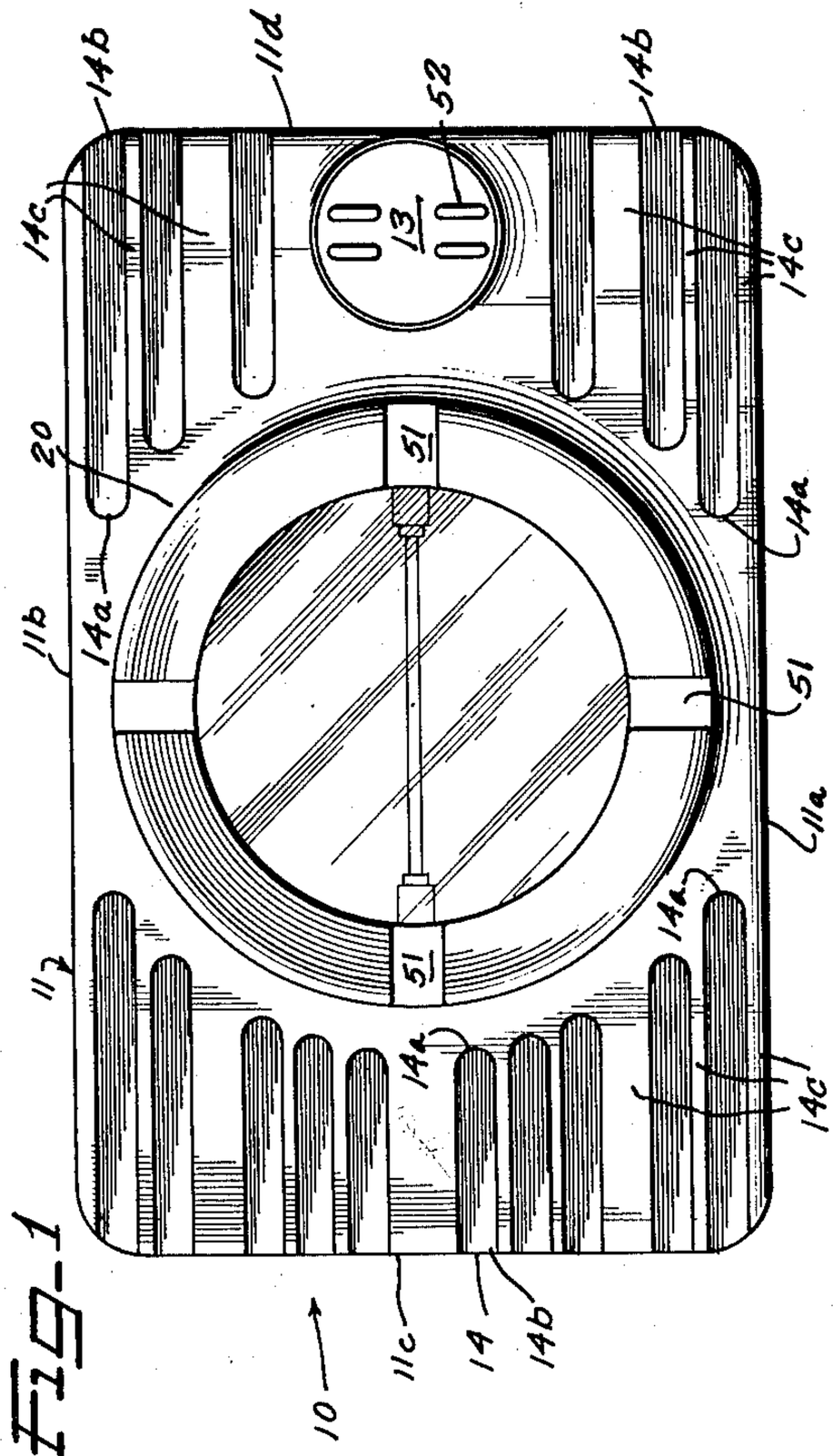

Fig-1

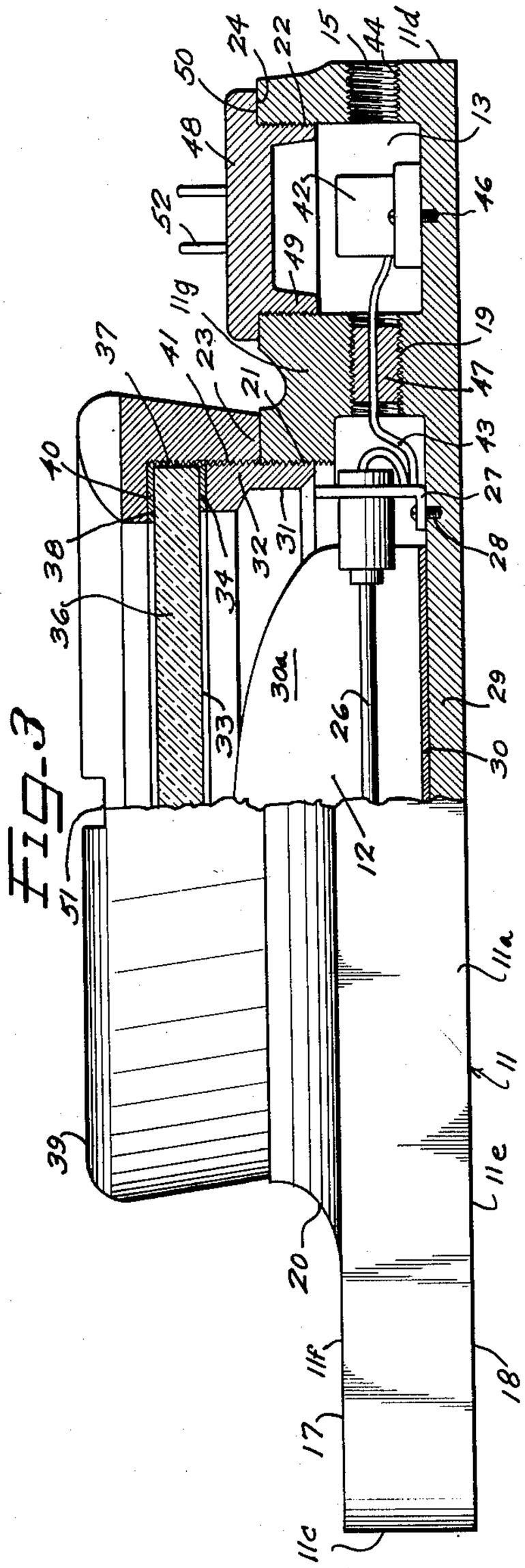

Fig-3

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EXPLOSION-PROOF FLOODLIGHT

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This invention relates generally to electric light fixtures and more particularly to an explosion-proof light fixture which can be used in a hazardous environment. The light fixture of this invention is rugged, can be easily serviced, has the lamp compartment isolated from the terminal block compartment with both compartments accessible from the lighting face of the fixture, has excellent heat transfer and dissipation properties, has an all threaded cover construction, is watertight and leakproof and is especially useful in locations having low head room.

The use of a quartz-iodine incandescent lamp as a source of light is contemplated, although other light sources could be used within the concept of this invention.

It is, therefore, an object of the present invention to provide an explosion-proof, watertight light fixture especially adapted for use in locations having low head room.

Another object of the invention is to provide a light fixture having a completely threaded cover construction to eliminate bolts and facilitate maintenance.

Another object of the invention is to provide a lamp compartment and a terminal block compartment having both compartments accessible from the lighting face of the fixture and sealed off and isolated from each other.

Another object of the invention is to provide a fixture having sealed wiring from a lamp to a terminal block separated from the lamp in explosion proof relation.

Yet another object of the invention is to provide means to easily unscrew the cover of the lamp compartment and the cover of the terminal block compartment.

A further object of the invention is to provide a fixture having excellent heat transfer and heat dissipation properties.

Many other features, advantages, and additional objects will become manifest to those versed in the art from the detailed description of the invention which follows and the accompanying sheets of drawings in which a preferred embodiment of a light fixture incorporating the principles of the present invention is shown by way of illustrative example.

On the drawings:

FIGURE 1 is a top plan view of a complete light fixture assembly in accordance with my invention;

FIGURE 2 is a side elevational view of the fixture of FIGURE 1; and

FIGURE 3 is a front elevational view of the fixture of FIGURE 1 showing a part of the fixture in section.

As shown on the drawings:

A complete fixture embodying the principles of the present invention is shown generally at **10** in FIGURES 1 and 2 wherein is illustrated a base or body portion **11** having formed therein a lamp compartment **12** and a terminal block and wiring compartment **13**.

The body portion **11** is essentially an elongated, rectangularly-shaped unitary structure and as can best be illustrated by a comparison of FIGURES 1 and 2, the depth of the body portion is relatively shallow in relation to its length and width thus providing for a minimal protrusion in operating environments requiring minimum head room. Thus the body **11** has parallel longitudinal walls 11_a and 11_b and parallel end walls 11_c and 11_d.

The body **11** is further characterized by a flat bottom wall 11_e and a top wall 11_f.

Internally of the body **11**, there is formed a partition 11_g which extends between the side walls 11_c and 11_d to partition the hollow interior of the body **11** into a major area forming the lamp compartment **12** and a minor area forming the block and wiring compartment **13**.

Externally, the body is characterized by a centrally disposed boss or collar **20** of generally circular configuration. A series of heat dissipation grooves **14** are formed in the latent face of the body portion. Each groove **14** begins at a point as at 14_a lying in a circular path spaced radially outwardly of the boss **20** and extends longitudinally, opening through an end wall 11_c or 11_d as at 14_b. The grooves **14** provide alternate fins 14_c and recess areas for rapid dissipation of heat generated by the fixture by making more of the body portion surface accessible to the surrounding heat absorbing media, such as air, water or the like. The fixture itself, therefore, can be sized compactly and still form a radiation means having an enlarged diffusion area to remove sufficient heat to remain within tolerable heat dissipation limits.

Both end walls 11_c and 11_d of the body portion **11** have a pair of mounting holes **16** drilled and tapped therein. Since screws or other fastening means (not shown) can therefore be inserted from the side of the fixture for mounting purposes, it becomes unnecessary to provide means for mounting the fixture from the face of the body portion opposite the lighting face. A threaded opening for conduits as shown at **15** also opens to the end wall 11_d of the body portion **11** and affords full flush mounting on the surface to which it is to be affixed. This is an important advantage when the fixture is to be installed in locations having limited head room.

Referring to FIGURE 1, the lamp compartment **12** is located adjacent the terminal block compartment **13** and the covers of both compartments can be removed from the lighting face of the fixture to improve the serviceability of the fixture by making all parts accessible from the lighting face.

As best illustrated in FIGURE 3, the side of the body portion opening into the lamp and terminal block compartments is designated as the front side **17**, and the side opposite the front side is designated as the back side **18**. Although the terms "front side" and "back side" are used, it is understood that the fixture of the present invention is equally adapted for mounting on a horizontal surface as well as a vertical surface or at any other angle. Generally, when a quartz-iodine lamp is used in the fixture, the lamp itself should be positioned within 4° of horizontal to keep the iodine vaporized. The quartz-iodine lamp is an incandescent light source characterized by the provision of an envelope containing iodine which produces a restoring action on the filament resulting in a longer lamp life at a constant lamp output since no darkening of the lamp occurs.

Referring to FIGURE 3, a threaded port **19** connects the lamp compartment **12** and the terminal block compartment **13** of the body portion **11**. A raised boss or collar **20** extends from the body portion **11** and includes a threaded circular side wall **21** of the lamp compartment **12** and a threaded circular side wall **22** of the terminal block compartment **13**. The upper surface of the counter **20** forms a flat shoulder **23** around the lamp compartment and another shoulder **24** around the terminal block compartment.

In order to provide a light source, a quartz-iodine lamp **26** is mounted on the bracket **27** which is secured by screws as shown at **28** to the bottom wall **29** of the body portion **11**. The lamp **26** is positioned above a reflector **30** which, in the illustrated form of the invention, is

made of sheet form aluminum and is electro-chemically finished to form a reflective surface 30_a of permanently high reflectivity, although other types of reflectors can be used.

An annularly-shaped inner ring **31** having a threaded exterior side wall **32** is shown in mating engagement with the side wall **21** of the collar **20**. A portion of the ring **31** extends above the shoulder **23** of the collar **20** and terminates in a flat, radial surface **33** carrying a thin, annular gasket **34** on which rests a front glass lens **36**. The glass lens **36** is circularly-shaped and in the preferred form is tempered heat and impact resisting plate glass having maximum mechanical and shock resisting characteristics as well as having high light transmission qualities. It is understood, of course, that different types of glass or other transparent or translucent materials could be used within the concept of the present invention.

Additional gasketing material surrounds the edge of the glass lens as at **37** as well as the marginal surface of the top of the glass lens as at **38**. The cover **39** of the lamp compartment has an abutting surface **40** which engages the gasket **38** in sealing relation, and a threaded interior side wall **41** which is shown in mating engagement with the threaded upper portion of the inner ring **31**. Thus, when the fixture is properly assembled the lower surface of the cover **39** will be in abutting engagement with the shoulder **23** of the collar **20**. The cover surface **40** will sealingly engage the gasket **38**, assuring a substantially leak-proof enclosure of the lamp compartment.

A terminal block **42** is mounted in the terminal block compartment **13**. This terminal block forms a junction for an electrical conductor means **43**, connected to the lamp **26**, and electric power wiring means (not shown), connected to a suitable electrical source, can be inserted into the terminal block compartment through the threaded conduit feeding port **15**. The terminal block is secured to the bottom wall **29** of the body portion **11** by means of mounting screws as shown at **46**. A molded, externally threaded sealing plug **47** is shown surrounding and engaging the conductor means **43** in leak-proof and explosion-proof relation and is threadedly inserted into the complementarily threaded port **19**, thereby effectively isolating the lamp compartment **12** from the terminal block compartment **13**. A cover cap **48** having an externally threaded depending flange **49** is shown in threaded engagement with the side wall **22** so that an offset **50** of the cover cap is in sealing engagement with the shoulder **24** of the collar **20**, providing a leak-proof and explosion-proof seal thereby.

When electric power conduit means is connected at the port **44** using leak-proof connector fittings (not shown) the entire terminal block compartment is leak-proof. The leak-proof capabilities of both the lamp compartment and the terminal block compartment are independent of each other because of the interconnecting sealing protection offered by the plug **47** and either compartment may be opened without interferring with the leak-proof capabilities of the other.

The cover **39** has transversely arranged tightening slots **51** formed therein for providing a means for effectively unscrewing and removing the cover **39** without the use of a large wrench. Any elongated instrument that will extend across the face of the cover **39** and fit into the slots **51** can be used to remove the cover **39**. The cover cap **48** has a plurality of parallel spaced protuberances or bosses **52** which can be gripped by hand for removal of the cap **48**. However, any tool that will fit between the bosses can effectively be used to provide additional leverage.

Although minor modifications of the present invention might be suggested by those versed in the art, it should be understood that I wish to embody within the scope of the patent warranted hereon all such modifications as reasonably come within the scope of my contribution to the art.

I claim as my invention:

1. An explosion proof floodlight comprising
an elongated shallow body portion having a front side and a back side,
a cylindrically-shaped large compartment formed in said body portion and opening to said front side, said large compartment having a threaded side wall,
an electric lamp mounted in said large compartment,
an annular inner ring having a flat marginal surface and having a top portion threaded complementarily to said side wall of said large compartment and threadedly secured thereto,
a substantially flat front glass shouldered on said marginal surface of said inner ring,
a centrally apertured cover having a flat marginal surface overlying said front glass and having a side wall threaded complementarily to said top portion of said inner ring and threadedly secured thereto,
a pair of thin flat gaskets separating said front glass from said inner ring and said cover, respectively,
a cylindrically-shaped small compartment formed in said body portion adjacent said large compartment and opening to said front side,
a terminal block mounted in said small compartment,
a cover cap fixedly secured to said body portion covering said opening of said small compartment, and
electric circuit means connecting said lamp and said terminal block.

2. An explosion-proof floodlight comprising
an elongated shallow body portion having a front side and a back side,
a cylindrically-shaped large compartment formed in said body portion and opening to said front side, said large compartment having a threaded side wall extending substantially perpendicularly to the plane of said front side,
an annular inner ring having a threaded outside wall in threaded engagement with said side wall of said large compartment and having a flat portion and a top portion,
gasket flat means overlying said flat portion of said inner ring,
a substantially flat circular front glass mounted on said gasket means, a second flat gasket means marginally overlying the periphery of said front glass,
a centrally apertured circular cover having a flat portion shouldered on said second gasket means and having a threaded inner side wall connected in threaded assembly to said top portion of said inner ring
said cover having a plurality of transverse tightening slots formed therein,
an electric lamp mounted in said large compartment,
a cylindrically-shaped small compartment formed in said body portion and opening to said front side and having a threaded inner wall,
a cover cap having a threaded flange depending therefrom threadedly connected to said side wall of said small compartment,
a terminal block mounted in said small compartment, and electric circuit means connecting said lamp and said terminal block.

3. A compact explosion proof light fixture for use in hazardous and underwater locations comprising
a relatively shallow elongated rectangularly-shaped body portion having a side wall and a bottom wall,
a lamp compartment formed in said body portion and opening to one side thereof opposite said bottom wall,
a lamp mounted in said lamp compartment,
means to secure said lamp to said bottom wall and insertable from said one side of said body portion,
means to cover said opening of said lamp compartment,
a terminal block compartment formed in said body

portion adjacent said lamp compartment and opening to said one side of said body portion,
a terminal block mounted in said terminal block compartment,
means to secure said terminal block to said bottom wall and insertable from said one side of said body portion,
means to cover said opening of said terminal block compartment,
a threaded port formed in said body portion connecting said lamp compartment and said terminal block compartment, electric circuit means extending through said port connecting said lamp and said terminal block,
a threaded sealing plug threadedly inserted into said port and snugly engaging and surrounding said circuit means for effectively isolating said lamp compartment and said terminal block compartment, and
a conduit port extending through said side wall into said terminal block compartment for receiving electric conduit,
whereby said lamp can be affixed flush with a mounting surface without interfering with the accessibility of said lamp and said terminal block and said securing means and said conduit port.

4. An explosion-proof floodlight comprising an elongated shallow body portion having a front side and a back side,
a cylindrically-shaped large compartment formed in said body portion and opening to said front side,
said large compartment having a threaded side wall,
an electric lamp mounted in said large compartment,
an annular inner ring having a flat marginal surface and having a top portion threaded complementarily to said side wall of said large compartment and threadedly secured thereto,
a substantially flat front glass shouldered on said marginal surface of said inner ring,

a centrally apertured cover having a flat marginal surface overlying said front glass and having a side wall threaded complementarily to said top portion of said inner ring and threadedly secured thereto,
a pair of thin flat gaskets separating said front glass from said inner ring and said cover, respectively,
a cylindrically-shaped small compartment formed in said body portion adjacent said large compartment and opening to said front side,
a terminal block mounted in said small compartment,
a cover cap fixedly secured to said body portion covering said opening of said small compartment,
electric circuit means connecting said lamp and said terminal block,
a port formed in said body portion connecting said large and said small compartments, and
a sealing plug in said port for isolating said large and said small compartments from each other,
said electric circuit means extending through said plug between said lamp and said terminal block.

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