Feb. 13, 1945. F. B. EMBURY 2,369,288

EMERGENCY LIGHTING UNIT

Filed April 19, 1943

Fig. 1

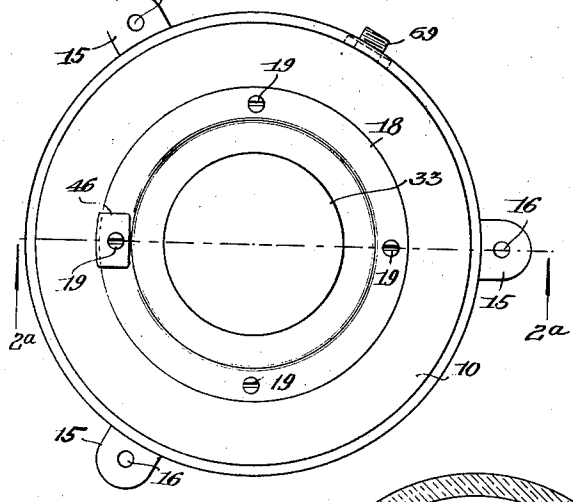



Fig. 4

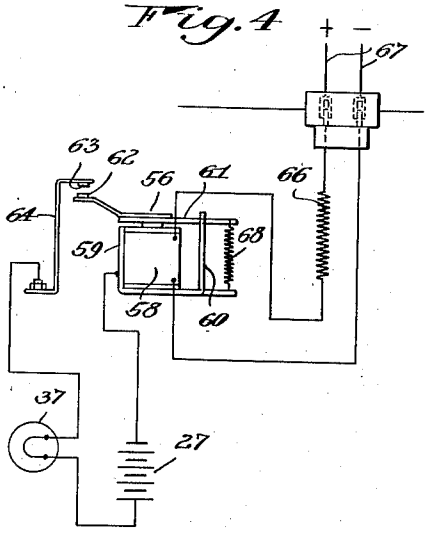



Fig. 3

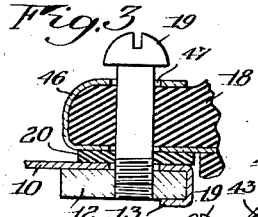



Fig. 2




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2,369,288

## EMERGENCY LIGHTING UNIT

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6 Claims. (Cl. 240—1)

This invention relates to emergency lighting units of the variety adapted to be energized upon failure of a normal or main lighting circuit, for indicating and illuminating exits and other locations during an emergency. One object of the invention is to provide an improved unit of the above character having a more simple, economical and practical form of construction.

Another object is to provide such a unit in a water tight form of construction particularly adapted for indicating escape passageways on ships, when the ship's main lighting system is disabled.

Still another object is to provide a lighting unit such as described having battery and lamp compartments compactly molded of plastic or other known non-conducting and non-corrosive material particularly adapted for marine work.

To these and other ends the invention resides in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawing:

Fig. 1 is a plan view of a unit embodying the present invention;

Fig. 2 is an enlarged cross sectional view on the line 2*a*—2*a* in Fig. 1;

Fig. 3 is a further enlargement of a detail shown in Fig. 2, and

Fig. 4 is a diagrammatic illustration of the electric circuit.

The invention is embodied in the present instance, by way of illustration, in a unit comprising a metal casing 10 (Fig. 2) of substantially cylindrical shape, as shown, having a closed water tight construction, except for an opening 11 in one of its ends. The edges of the casing about this opening are preferably reinforced and stiffened by a metal ring 12 and the casing edges are preferably rolled around the inner circumference of the ring, to afford a strong, finished casing flange, as indicated at 13. The opposite end of the casing has fixed on the outside thereof a ring 14 of substantial thickness and rigidity having radially extending lugs 15 formed with openings 16 to receive screws or the like for attaching the unit to a wall or other support.

Casing 10 contains a relay and some of the electrical connections, as hereafter described, and serves as an outer housing for an inner container which is molded of non-conductive and non-corrosive material, such as the known plastic or rubber materials, to provide compartments for the battery and lamp. This inner container is positioned in and forms the closure for the opening 11 of the casing. It comprises, preferably, a head portion 17 (Fig. 2) from which projects a circular lateral flange 18 in overlapping relation with the casing flange 13. A plurality of screws 19 are passed through openings in flange 18 and threaded into the casing flange, to draw the same tightly together, with an interposed gasket 20, so as to form a water tight closure for the casing.

Container head 17 comprises also a partition 21 for separating the battery and lamp compartments of the container, and partition 21 has formed integrally therewith, and projecting from one side thereof into the casing, a substantially cylindrical wall 22 for the battery compartment 23, having its outer end closed by a detachable cover 24 threadedly connected thereto, as at 25, with an interposed gasket 26, to insure water tight sealing of the compartment. The battery, indicated at 27, may be of any known or suitable variety, preferably of the known commercial type having compression spring terminals 28 and 29. Partition 21 carries at its center a conducting plate contact 30 for engagement by the central battery contact 28 and also a concentric conducting ring 31 for engagement by the lateral battery contact 29. It will be seen from this arrangement that the battery contacts will engage properly with the complementary contacts on partition 21 in any position of rotary adjustment in which the battery may be inserted in the compartment. The battery is thus protected with a high degree of safety by two water tight housings, one within another, the inner housing or container 22 being of corrosion-resisting material not subject to attack by battery chemicals.

The lamp compartment is formed by partition 21 and a circular flange 32 projecting from the side of the partition opposite the battery compartment, together with an enclosing lens 33. The lamp parts preferably comprise a suitably curved and polished metallic reflector 34 formed centrally with an integral threaded socket 35 for the threaded base 36 of the lamp 37. The lamp may have any known or suitable construction, being preferably of the known type having its base 36 of conducting metal to serve as one terminal of the lamp in electrical contact with socket 35 and reflector 34. The other or central terminal 38 of the lamp is engaged by a contact pin 39 preferably having a close sliding fit in an opening in partition 21 and fixed at its opposite end to the contact plate 30, so that the battery

spring 26 tends to press the pin into engagement with the lamp terminal.

The lens 33, which closes the lamp compartment 40, is made of glass, or one of the known translucent plastics, preferably in dome shape, as shown, and provided around the outside of its base with a screw thread 41 cooperating with a mating thread on the inner surface of the flange 32. Reflector 34 is advantageously constructed with an outwardly bent, marginal flange 42 positioned for anchoring engagement by the edge of lens 33, with a sealing gasket 43 between the reflector flange and partition 21. The lens may be conveniently unscrewed for access to the lamp compartment, and it provides, when screwed home, a simple way of holding the lamp parts in place, as well as a water tight closure for the lamp compartment.

The construction of the inner container of molded material has the further advantages that the associated electrical conductors may be integrally molded in the walls of the container and so strongly supported, with sealed passage from one part to another, and electrically insulated. Thus the lamp reflector 34 is electrically connected and grounded on the casing 10 by means of an angular conducting metal clip 44, integrally molded in and insulated by the container material, as shown. One end of the clip is extended into the lamp compartment to provide a spring contact finger 45, positioned for engagement with the lamp reflector 34, as shown. The other end of the clip is extended through the wall of the battery compartment to the outside of the head 17, above gasket 20 and bent around flange 18 adjacent one of the screws 19. This end 46 of the clip has an opening 47, Fig. 3, at which it embraces the shank of the screw, but the opening is larger than the screw from which the clip is insulated until brought into contact with the screw head when the screw is turned home in the casing flange. The screw thus serves as an inconspicuous and substantially concealed, external switch by which the unit may be rendered inoperative by backing off the screw, as shown in Fig. 3, whenever the main lighting circuit, for example, is purposely disabled, so as to avoid wastage of battery power. A switch of this character provides a quick and convenient means for temporarily disabling the unit, with the use of a screw driver, without detachment of any of the parts, while the concealed nature of the switch obviates unauthorized tampering with the unit.

The other battery terminal 29 and its cooperating contact ring 31 are likewise connected in circuit by means of a metal conductor 48 fixed at one end to ring 31 and integrally molded in the material of the container. The conductor passes through the container wall 22 to its outer side where it is electrically connected to an annular metal contact 49, also preferably molded in the container material. Contact 49 is thus arranged for cooperation with a spring contact finger 50 fixed in the casing 10, in any position of rotary adjustment of container head 17 relative to the casing. Contact 50 is preferably fixed to a bar 51 of insulating material which, in turn, is supported by a bracket 52 fixed on the casing wall. Contact 50 is connected by a conducting metal strip 53 with a binding post 54 on a block of insulating material 55 by means of which the relay 56 is mounted on and insulated from the casing. Binding post 54 is connected by a conductor 57 with one of the switch contacts controlled by the relay, as hereafter described.

The relay device may be of any known or suitable character comprising normally open switch contacts which are closed to energize the emergency unit circuit whenever the relay is deenergized by failure of the main circuit in which it is connected. The relay employed in the present invention, for example, preferably comprises a solenoid 58 mounted on and insulated from a conducting metal frame 59. Frame 59 is supported on insulating block 55 and comprises a post 60 on which is pivotally supported an armature arm 61. Fixed on this arm is a contact 62 for engagement with a stationary contact 63 on an arm 64 fixed on the insulating block 55 and grounded by a conductor 65 connected with the casing 10. Solenoid 58 is connected, through a resistance 66, with the main power line 67, as shown and well understood in the art, and while solenoid 58 is so energized, it tends to pull arm 61 downwardly and separate the contacts 62 and 63. However, a tension spring 68 connected to frame 59 and the other end of arm 61 acts, when solenoid 58 is deenergized, to swing arm 61 to engage the contacts 62 and 63 and close the emergency unit circuit until solenoid 58 is again energized. For connecting the relay solenoid with the main power line, casing 10 has an opening equipped with a nipple fitting 69 (Fig. 1) of any known or suitable design for transmitting the external solenoid connections through the casing wall and maintaining the wall substantially sealed against ingress of moisture.

The emergency unit circuit thus includes battery terminal 28, pin 39, lamp 37, reflector 34, clip 44 and its associated screw 19, which is grounded on the casing 10. Casing 10 is connected by conductor 65 to the fixed contact 63. The cooperating contact 62 is connected through frame 59 and conductors 57 and 53 with contact finger 50, conductor 48 and the other terminal 29 of the battery.

It is apparent from the above description that the invention accomplishes its objects. The invention provides, in simple, economical and practical form, a water tight character of construction in which the battery and lamp compartments are molded of insulating and corrosion-resisting material, with the important advantages described for supporting, sealing, insulating and housing the electrical and chemical battery parts. The invention affords a compact, rugged and durable emergency unit, particularly adapted to meet the severe requirements of marine usage.

While the invention has been hereinabove described in connection with the details of a preferred embodiment, it is to be understood that such disclosure is intended to be illustrative, rather than limiting in sense, as it is contemplated that various modifications in the construction and arrangement of the parts will readily occur to those skilled in the art, within the spirit of the invention and the scope of the appended claims.

I claim:

1. An emergency lighting unit comprising a water tight metal casing having an opening, a container of non-conducting and non-corrosive material positioned in said opening and having a connection with said casing forming a water tight closure for said opening, said container having a portion housed in said casing in spaced relation with the walls thereof and formed to provide a battery compartment with a detach-

able water tight closure and said container having also a portion outside said casing formed to provide a lamp compartment, a lens connected with said lamp compartment to form a water tight closure therefor, a relay in said casing for connection with an external source of power and having normally open switch contacts provided with means for closing the same on failure of said power, and an electrical circuit including conducting means extending through and supported by said container material for connecting a battery, lamp and switch contacts in circuit with one another.

2. An emergency lighting unit comprising a metal casing having an opening in a wall thereof provided with a flange, a container of plastic material positioned in said opening and having thereon a flange connected with said casing flange and forming a water tight closure for said opening, said container having a portion housed in said casing in spaced relation with the walls thereof and formed to provide a battery compartment with a threadedly attached, water tight closure and also a portion outside said casing formed to provide a lamp compartment, a lens having a threaded connection with said lamp compartment and forming a water tight closure therefor, a relay in said casing for connection with an external source of power and having normally open switch contacts provided with means for closing the same on failure of said power, and an electrical circuit including conducting means extending through and supported by said container material for connecting a battery, lamp and said switch contacts in circuit with one another.

3. An emergency lighting unit comprising a water tight metal casing having an opening, a container of plastic material positioned in said opening and having a connection with said casing forming a water tight closure for said opening, said container having a portion housed in said casing in spaced relation with the walls thereof and formed to provide a water tight battery compartment and also a portion outside said casing formed to provide a lamp compartment, a substantially hemispherical lens having at its edge a threaded connection with said lamp compartment to form a water tight closure therefor, a metallic reflector in said lamp compartment formed with a threaded socket and with a portion engaged and anchored by said lens, a lamp mounted in and electrically connected with said reflector socket, a relay in said casing for connection with an external source of power and having normally open switch contacts provided with means for closing the same on failure of said power, and an electrical circuit including conducting means extending through and sealed in said container material for connecting a battery, lamp and said reflector and switch contacts in circuit with one another.

4. An emergency lighting unit comprising a metallic casing having an opening, a container of plastic material positioned in said opening and having a connection with said casing forming a water tight closure for said opening, said container having a portion housed in said casing in spaced relation therewith and formed to provide a battery compartment and also a portion outside said casing formed to provide a lamp compartment, a lens having a threaded connection with said lamp compartment to form a water tight closure therefor, a metallic reflector in said lamp compartment formed with a threaded socket and with a portion for anchoring engagement by said lens, a lamp mounted in and electrically connected with said reflector socket, a conductor formed in said container material with a spring contact at one end in engagement with said reflector and with its other end connected with said casing, a relay in said casing for connection with an external source of power and having normally open switch contacts provided with means for closing the same on failure of said power, a conductor connecting one of said switch contacts with said casing, and conductors extending through and sealed in said container material for connecting a battery and lamp and with the other of said switch contacts.

5. An emergency lighting unit comprising a casing, a container of plastic material housed at least in part in said casing and formed to provide lamp and battery compartments, a relay in said casing for connection with an external source of power and having normally open switch contacts provided with means for closing the same on failure of said power, a conducting ring on the exterior of said container in said casing, a spring contact on said casing for engaging said ring in various positions of said container in said casing and having a connection with one of said switch contacts, and a circuit for connecting a battery and lamp in said compartments with the other of said switch contacts including conducting means extending through and sealed in the material of said container compartments.

6. An emergency lighting unit comprising a water tight metal casing of substantially cylindrical shape having one end thereof formed with an opening provided thereabout with a flange, a container of substantially cylindrical shape formed of plastic material provided adjacent one end thereof with a circumferential flange secured to said casing flange to form a water tight closure for said opening, said container having a portion housed in said casing in spaced relation with the walls thereof and arranged to provide a battery compartment with a detachable water tight closure, said container having also a cylindrical flange outside said casing formed to provide a lamp compartment and a transverse partition separating said battery and lamp compartments, a lens secured to said cylindrical flange to form a water tight closure for said lamp compartment, a relay in said casing for connection with an external source of power and having normally open switch contacts provided with means for closing the same on failure of said power, and an electrical circuit including conducting means extending through and insulated by said container material for connecting a battery, lamp and said switch contacts in circuit with one another.

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