

[54] **WATERPROOF FLASHLIGHT**

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[22] Filed: **May 5, 1972**

[21] Appl. No.: **250,678**

[52] U.S. Cl. **240/10.63, 240/10.6 R, 240/10.66, 240/26, 240/41.55**

[51] Int. Cl. **F21v 31/02, F21l 7/00**

[58] Field of Search **240/10.6 R, 10.63, 10.66, 10.67, 240/10.69, 26, 41.55**

[56] **References Cited**

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[57] **ABSTRACT**

A waterproof flashlight which includes a cast aluminum housing having as its only opening the lens support. The lens is sealed to the flashlight by compression against an O-ring with the lens being secured in place by a snap ring. A magnetic device actuates a reed switch to turn the light on and off without requiring openings through the housing.

2 Claims, 6 Drawing Figures

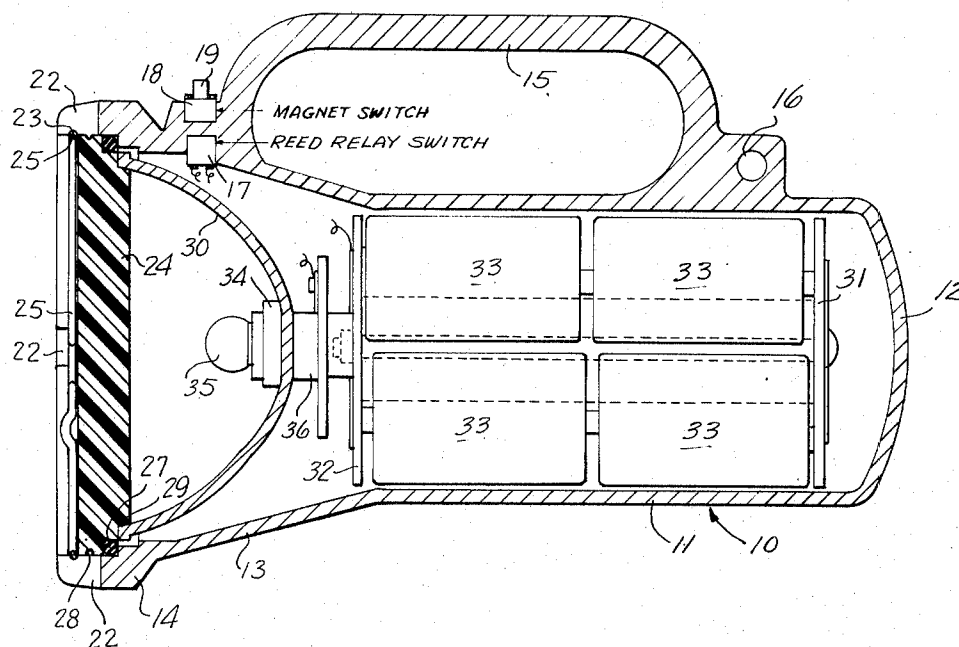


FIG. 1.

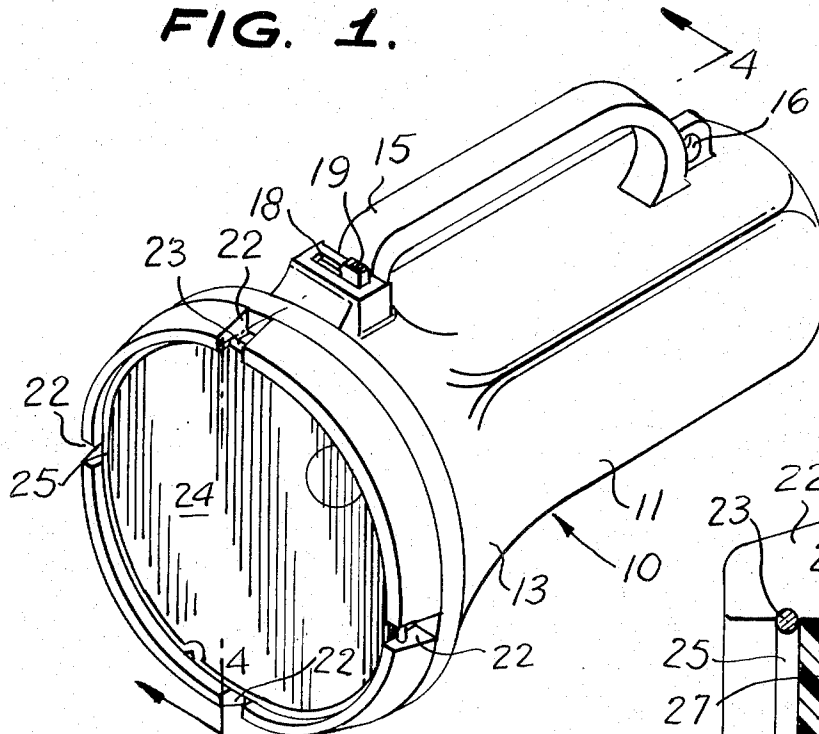


FIG. 2.

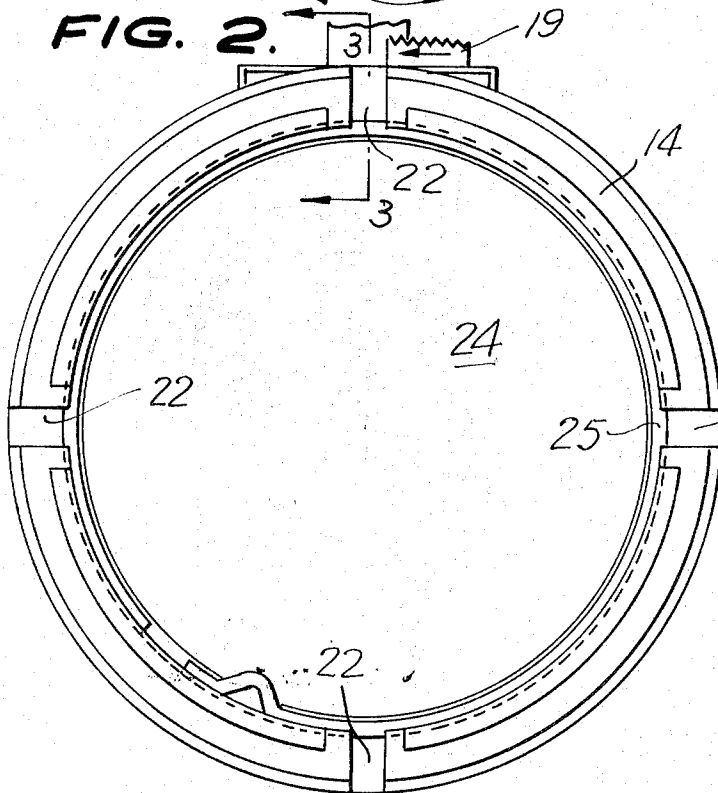
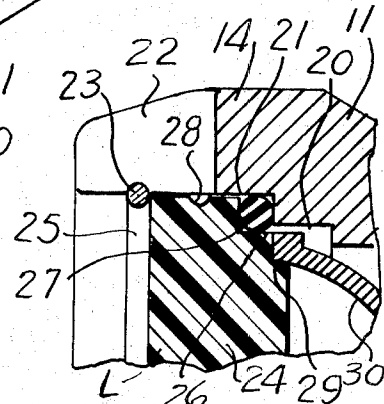


FIG. 3.

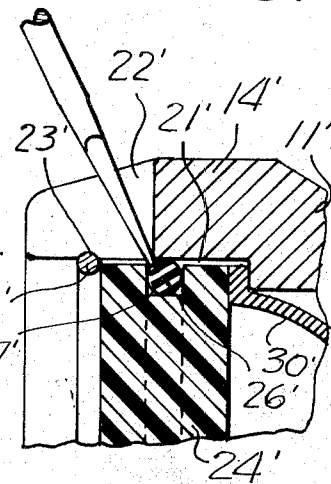


FIG. 6.

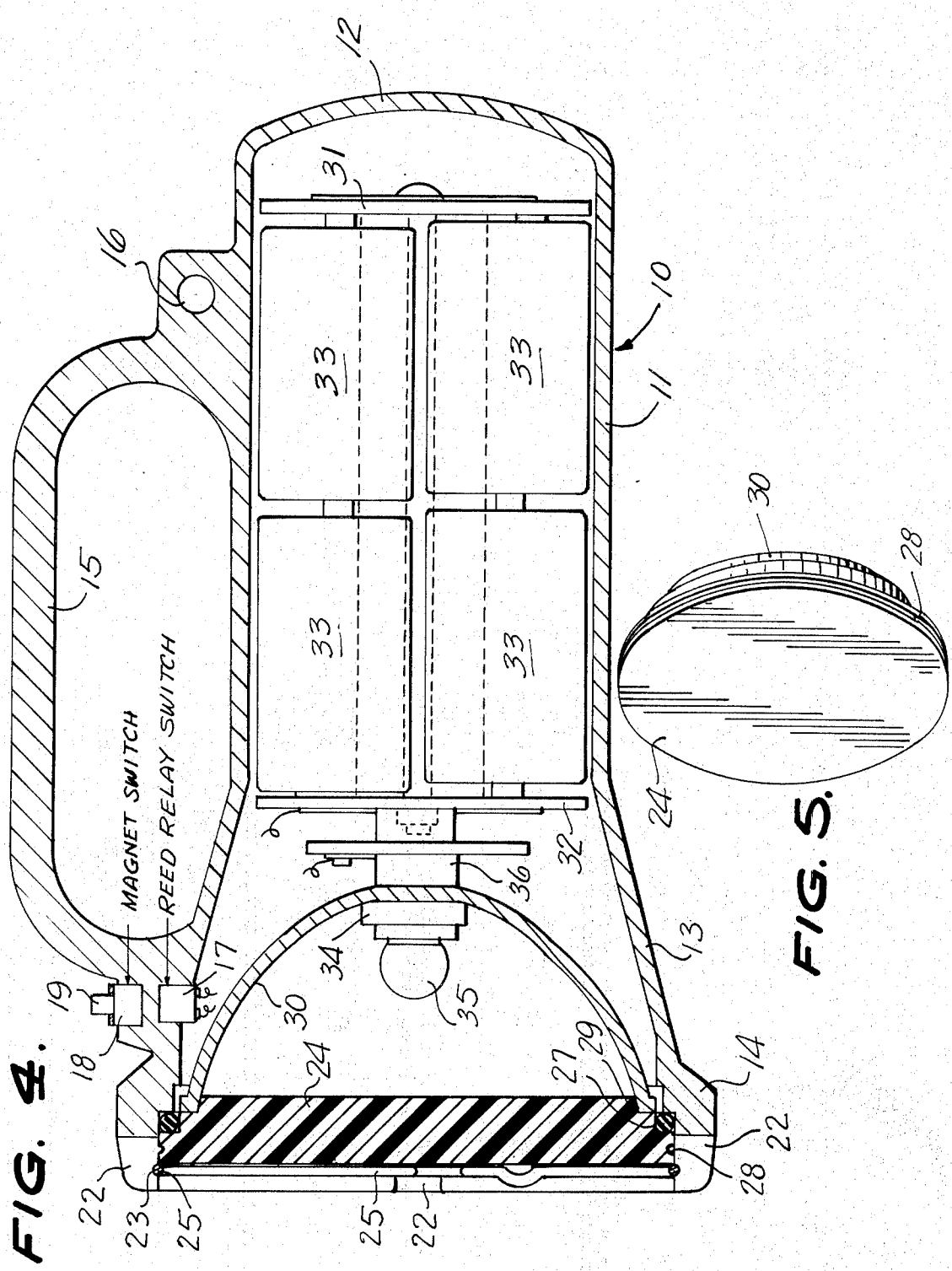


FIG. 4.

FIG. 5.

WATERPROOF FLASHLIGHT

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to waterproof flashlights which are sealed to prevent the entry of water therein.

2. Summary of the Invention

The waterproof flashlight includes a cast housing having its only opening filled with a sealed lens with the lens held in sealing position by a snap ring. A magnetically actuated switch provides control for the light without the necessity of piercing the housing.

The primary object of the invention is to provide a waterproof flashlight in which the O-ring seal is compressed and held in compressed position by a lock ring engaging the lens.

Other objects and advantages will become apparent in the following specification when considered in light of the attached drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the invention;

FIG. 2 is a front elevation of the invention shown partially broken away for convenience of illustration;

FIG. 3 is an enlarged fragmentary vertical sectional view taken along the line 3—3 of FIG. 2, looking in the direction of the arrows;

FIG. 4 is an enlarged longitudinal sectional view taken along the line 4—4 of FIG. 1, looking in the direction of the arrows;

FIG. 5 is a perspective view of the lens element removed from the light; and

FIG. 6 is a view similar to FIG. 3 of a modified form of the invention.

Referring now to the drawings in detail wherein like reference characters indicate like parts throughout the several figures, the reference numeral 10 indicates generally a water-proof flashlight constructed in accordance with the invention.

The waterproof flashlight 10 includes an elongate generally rectangular housing 11 formed of cast aluminum or other desired material. The housing 11 is completely closed by an end wall 12 at one end thereof. The housing 11 flows outwardly in a conical portion 13 at the end thereof opposite the end wall 12. A lens mounting ring 14 circular in shape is integrally secured to the outer end of the conical portion 13.

A loop handle 15 has one end integrally joined to the housing 11 and the opposite end integrally joined to the conical portion 13 with the handle 15 extending substantially parallel to the axis of the housing 11. An eye 16 is formed in the handle 11 at the end thereof secured to the housing 11 near the end wall 12 to permit the connection of a safety cord to prevent the loss of the flashlight 10. A magnet-actuated relay switch 17 is mounted in the conical portion 13 of the flashlight 10 adjacent the forward end of the handle 15. A movable magnet element 18 is mounted to overlie the switch 17 and is adapted to be reciprocated by a thumb button 19 so as to actuate the relay switch without requiring direct circuit connectors therebetween. The ring 14 has an annular recess 20 formed therein intersected by a second annular recess 21 with the circumference somewhat greater than the annular recess 20. A plurality of

slots 22 open into the ring 14 terminating forwardly of the annular recess 21.

An annular locking ring groove 23 is formed in the ring 14 forwardly of the annular recess 21 for reasons to be assigned.

A generally circular lens 24, formed of transparent material, is adapted to be seated in the ring 14 and secured therein by a locking ring 25, as can best be seen in FIG. 3. A flexible sealing O-ring engages in the annular recess 21 abutting against the shoulder formed between the annular recess 20 and the annular recess 21. An annular recess 27 is formed in the circumference of the lens 24 to receive the O-ring seal 26, as can be seen in FIG. 3. An annular groove 28 is formed in the circumference of the lens 24 for reasons to be assigned.

An annular recess 29 is formed on the back edge of the lens 24 to receive the forward edge of a reflector 30.

A pair of battery contact plates 31, 32 are positioned in the housing 11 with batteries 30, 30 positioned therebetween and electrically connected thereto. The batteries 33 may be replaced with a single lantern battery if desired. A bulb socket 34 is mounted in the reflector 30 and carries an electric bulb 35 therein. The socket 34 is carried by a mounting 36 electrically connected to the plate 32.

In the use and operation of the invention set forth in FIGS. 1 through 5, the notches 22 provide space for receipt of a tool for disengaging the lock ring 25 from its recess 23 and for engaging in the recess 28 to pry the lens 24 out of its sealed condition within the ring 14 when replacement of the bulb 35 or batteries 33 is required. In replacing the lens 24, pressure is applied thereto to compress the O-ring 26 and permit the locking ring 25 to be engaged in the annular recess 23. The compression of the O-ring 26, as set forth above, completely seals the lens 24 against the housing 11. The reed relay switch 17 and the magnetic actuator 18 are of conventional construction and are hence not disclosed in detail.

In FIG. 6, a modified form of the invention is illustrated wherein the housing 11' carries an annular ring 14' on its outer end having a single annular recess 21' formed therein. A transparent lens 24' is provided with an annular recess 27' to receive a sealing O-ring 26'. The reflector 30' engages in the inner end of the recess 21' with the lens 24' thereagainst.

A locking ring 25' engages in an annular groove 23' to hold the lens 24' in the recess 21'. Notches 22', formed in the ring 14', permit the easy removal of the locking ring 25' and the lens 24', as described in the form of the invention illustrated in FIGS. 1 through 5.

Having thus described the preferred embodiments of the invention, it should be understood that numerous structural modifications and adaptations might be resorted to without departing from the spirit of the invention.

What is claimed is:

1. A waterproof flashlight comprising a cast aluminum housing open at one end and closed at the opposite end, a ring integrally formed on said housing and surrounding the open end thereof, an annular recess formed internally of said ring and opening outwardly away from said housing, a circular transparent lens having an annular recess formed in the inner portion of the circumferential edge thereof, an O-ring seal engaged in the recess in said ring and the recess in said lens to seal

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said lens to said ring, an annular groove formed interiorly in said ring on said housing and a snap ring engaged in said groove holding said lens in engagement with said O-ring seal with said O-ring seal under compression, said ring on said housing having a plurality of notches opening from the outer edge of said ring and terminating outwardly of the internal annular recess in said ring to provide access for easy removal of said locking ring when removing said lens, said lens having

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an annular recess formed in the peripheral edge thereof for engagement by a prying tool inserted through one of said notches for removing said lens from said flashlight.

2. A device as claimed in claim 1, wherein a reed relay switch and a magnetic actuator therefor are mounted in said housing for controlling said flashlight in a waterproof manner.

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