

[54] **DECOY FLARE**

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[51] Int. Cl. **F42b 13/38, C06d 1/10**

[58] Field of Search **102/7, 31, 35.6, 102/37.4, 37.8, 70 R, 37.6; 250/84, 85**

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Primary Examiner—Benjamin A. Borchelt

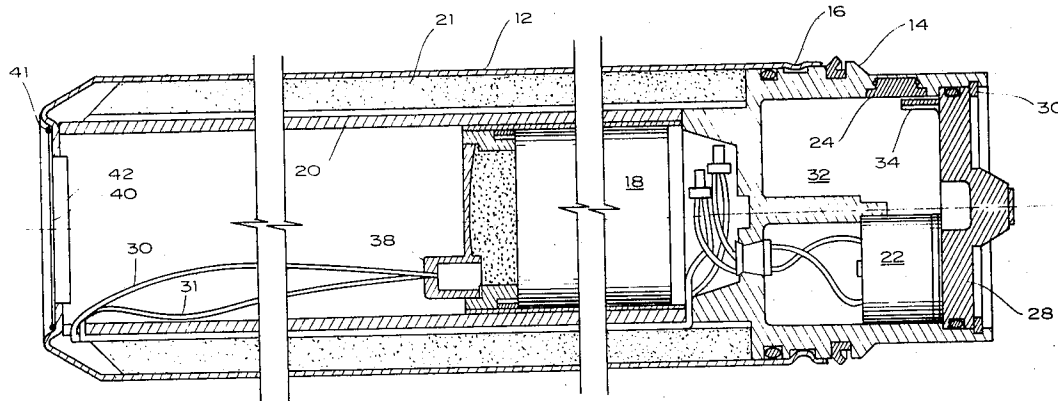
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[57] ABSTRACT

A safety flare for sea going craft which is designed to be stored in a SAFE or UNARMED condition and which may be placed in an ARMED position by rotating a base member. Actuation of the flare is possible only after sea water has entered the base member and activated the battery.

2 Claims, 2 Drawing Figures



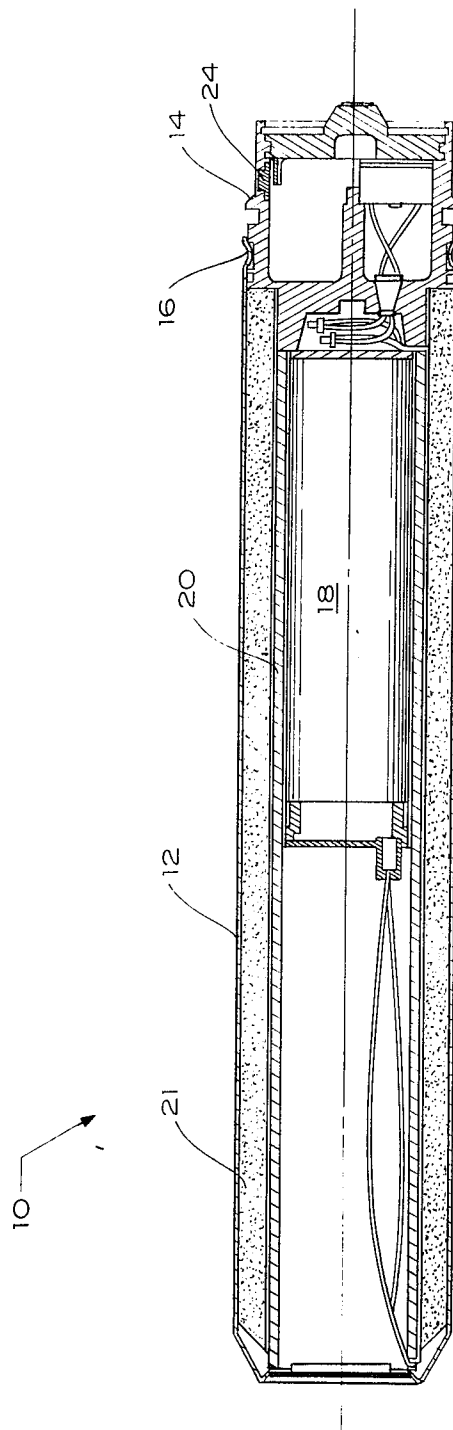


FIG. 1.

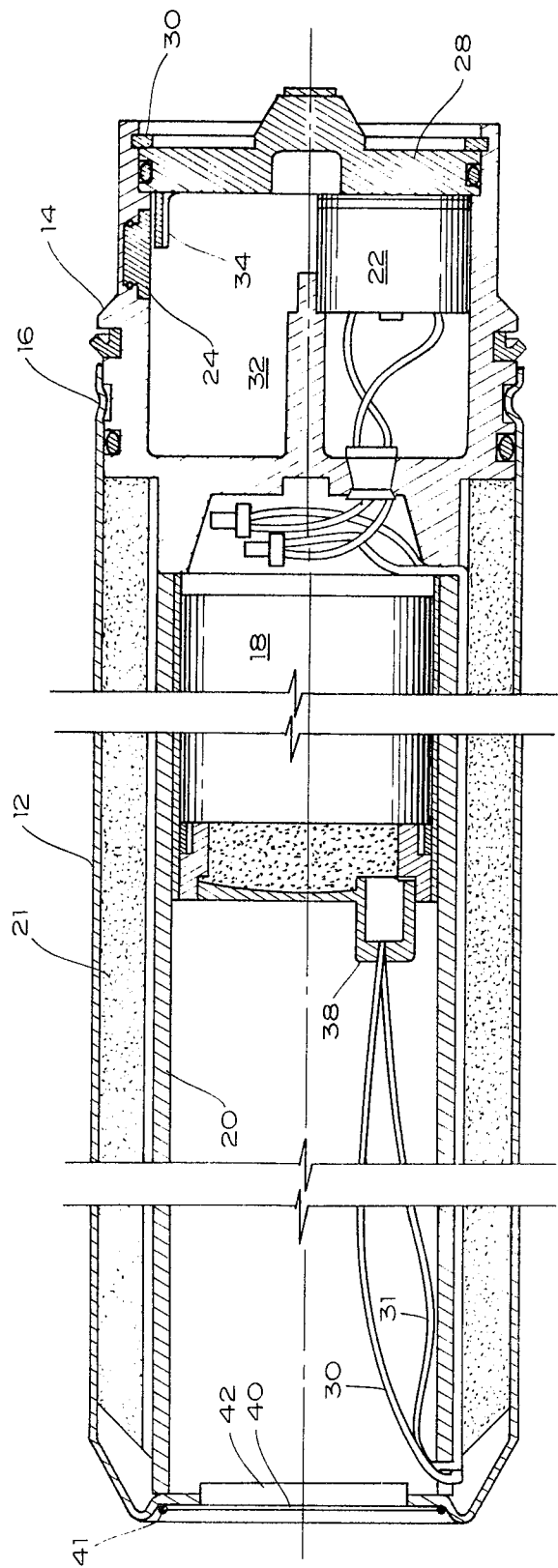


FIG. 2.

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DECOY FLARE

BACKGROUND OF THE INVENTION

The present invention relates generally to flares for use at sea and more particularly to a flare which will give off an intense heat when launched into a body of salt water.

With the advent of heat-seeking missiles, it became advisable for counter measures to be established for inducing hostile heat seeking missiles to stray from their intended target. When the approach of a missile is detected, one method of diverting the missile would be to throw a flare overboard and hope the missile would "home" on the infrared energy emitted by the flare rather than the infrared energy emitted by the smoke-stack, for example. None of the prior art flares such as signaling flares or illuminating flares, however, were found to produce enough infrared energy to fool the present day sophisticated missiles.

Ancillary to the problem of providing a hotter flare was the problem of providing such flares with safety features which would allow them to be stored on shipboard under greatly varying atmospheric conditions for long periods of time and still maintain reliability in operation.

According to the present invention, a flare with a high infrared energy output is provided which has safety features adequate for shipboard storage and which is reliable in operation even after long periods of storage. The flare uses a boron-barium chromate ignition powder and the ignition system comprises a salt-water-activated battery. The battery is sealed off by a base plug arrangement until ready for use and then may be armed by rotating a base member to allow water to reach the battery.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

FIG. 1 is a longitudinal view partly in section of one embodiment of the invention; and

FIG. 2 is an enlarged detail of the device of FIG. 1.

DETAILED DESCRIPTION OF THE INVENTION

The device generally indicated at 10 in FIG. 1 comprises an outer tube 12 crimped to a flare base 14 as shown at 16. The flare grain 18 occupies roughly one-half of the interior of the flare and is encased in tube 20 of fiberglass-melamine or the like which acts as a heat shield. Between the heat shield 20 and the outer tube 12 is a spacer 21 of styrofoam or the like.

The ignition system consists of a salt-water-activated battery 22 which is mounted within the flare base 14. The battery is protected from water contact by two base plugs 24 fitted into holes on opposite sides of the flare base 14. The base cover 28 is recessed into the flare base 14 and is held in place, for example, by a retaining ring 30. In addition to functioning as an enclosure, the cover serves as part of the arm device as hereinafter described.

The cover 28 may be rotated in flare base 14 to render the flare either SAFE or ARMED, by aligning an arrow (see FIG. 2) with either the word "SAFE" or "ARMED" on the flare base. A notch or detent may also be provided in the flare base for tactile positioning, for example, for nighttime use.

The base plugs may be pushed into the battery cavity 32 only after the base cover 28 has been rotated to a

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position wherein the base cover lugs 34 are out of alignment with the base plugs.

When sea water enters the battery cavity through the base plug holes, the battery 22 is activated and provides current to fire a squib 38 through conductors 30, 31. The squib in turn ignites the flare grain 18. A burst diaphragm 42 is fitted into the muzzle end of the flare but is easily displaced with the build-up of pressure within tube 20.

Outer tube 12 is crimped at the forward end to provide a flat surface with a circular opening of large diameter. The tube is sealed by a diaphragm 42 which fills the circular opening and is fastened in place by an integral plate 40 which is welded to tube 12 at 41 with a continuous weld.

From the foregoing description and the accompanying drawings it may be seen that a high heat decoy flare has been provided which may be easily manufactured, safely stored and simply deployed and which is highly reliable in operation.

What is claimed is:

1. A marine pyrotechnic device having a high infrared output for decoying hostile heat-seeking missiles from seagoing craft comprising:
 - A. a relatively heavy base member; and
 - B. a relatively light forward casing;
 1. said base member comprising:
 - a. a cup-shaped housing defining a hollow chamber and closed by a circular end piece;
 - b. at least one sea-water-activated energy cell in said chamber; and
 - c. electrical conductors connected to said energy cell and passing through said end piece into said forward casing;
 2. said forward casing comprising:
 - a. an elongated hollow tube fastened to said end piece and defining a cylindrical chamber;
 - b. a cylindrical combustion charge assembly in said chamber;
 3. said assembly comprising:
 - a. a cylindrical heat shield coextensive with and spaced from the inner wall of said cylindrical chamber;
 - b. a flare grain; and
 - c. ignition means of the forward end of said grain;
 - d. said flare grain being fixed within said heat shield at the aft end thereof;
 - e. said ignition means comprising electrical actuating means connected to said energy cell by said conductors;
 4. the parts of said device being dimensioned and situated such that the center of gravity of the assembled device is far enough aft so that the device will assume an upright position when deployed in a marine environment;
 5. said casing having a forward opening closed by a blowout plug comprising:
 - a. a thin outer plate;
 - b. an inner stopper;
 - c. the forward end of said casing being crimped to present a flat circular area with a smaller circular opening;
 - d. said plug fitting snugly within said opening; and said outer plate being welded to the outer periphery of said circular area by a continuous weld.

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6. said opening being less than the diameter of said grain and greater than half the diameter of said grain.
2. The device of claim 1 wherein said heat shield is

fabricated from fiberglass-melamine and said flare grain and ignition means occupy roughly one-half the length of said shield.

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