United States Patent

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[54] **EMERGENCY SIGNAL ASSEMBLY**
8 Claims, 5 Drawing Figs.

[52] **U.S. Cl.** **116/124,** 9/9
[51] **Int. Cl.** **G09f 9/00**
[50] **Field of Search** 116/124, 124.9; 9/9; 46/90; 222/5

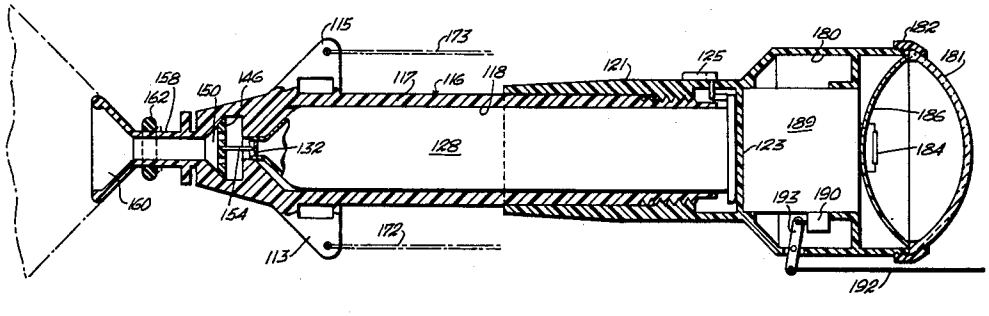
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ABSTRACT: A carrier assembly for attachment to a signal balloon preferably of luminescent, International orange color in which the balloon when inflated with a gas such as helium, hydrogen etc. will suspend the carrier, and in which the carrier includes a gas reservoir communicable with a discharge nozzle to which the balloon is sealingly connected, and in which a manually operable firing pin is engageable with a frangible seal, of the reservoir and in which an electrically operated supplemental signal assembly is controlled by an operating cord beneath the assembly when aloft whereby a repetitive signal can be transmitted.



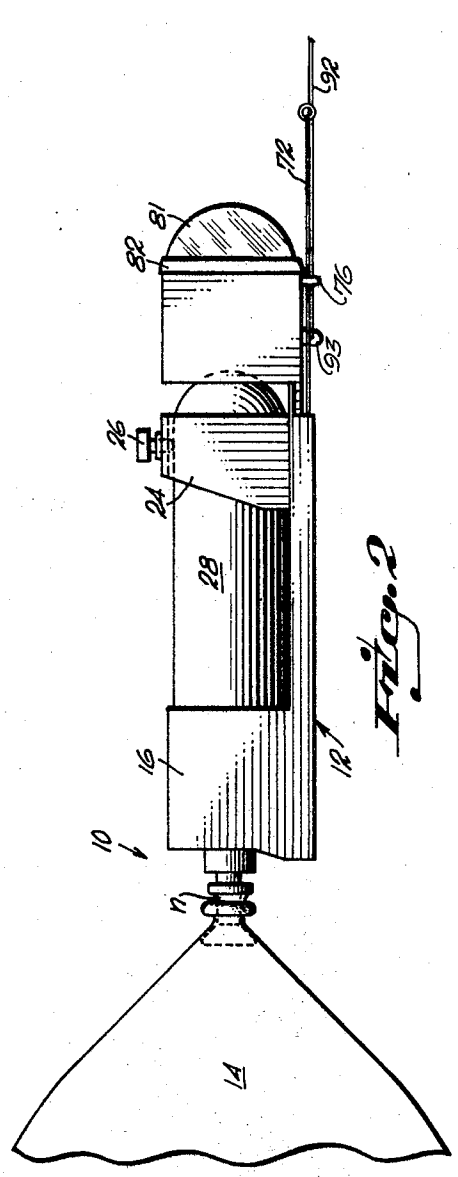


Fig. 2

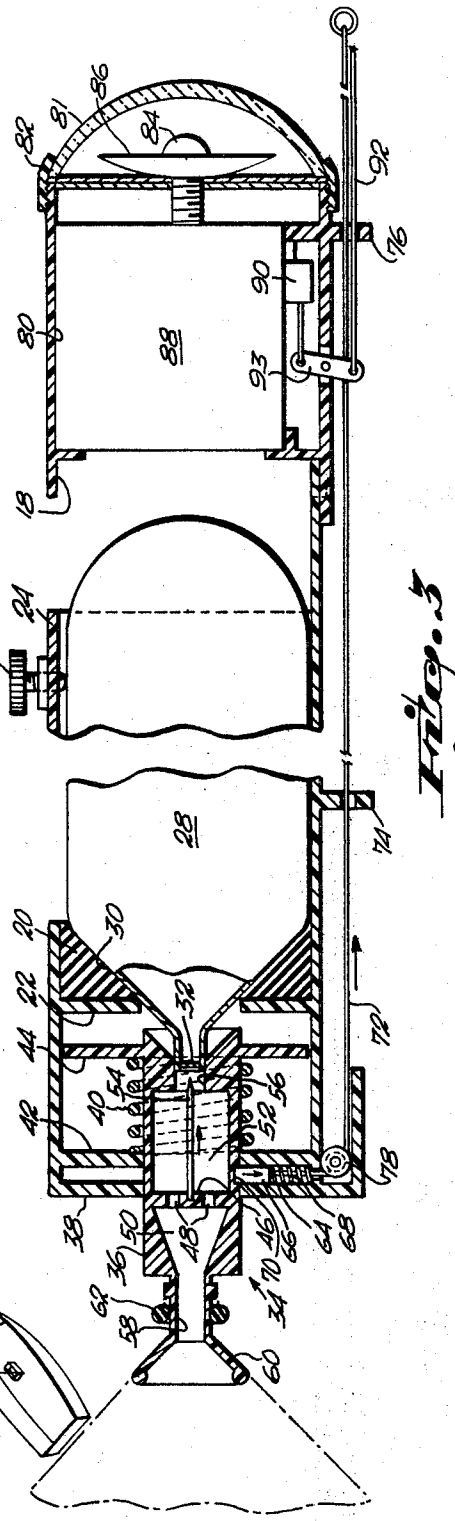


Fig. 3

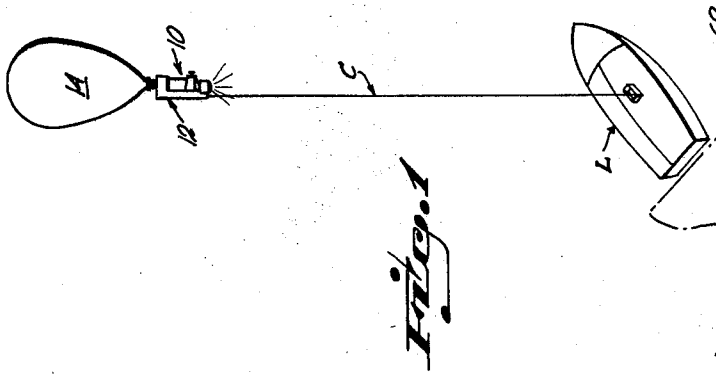


Fig. 1

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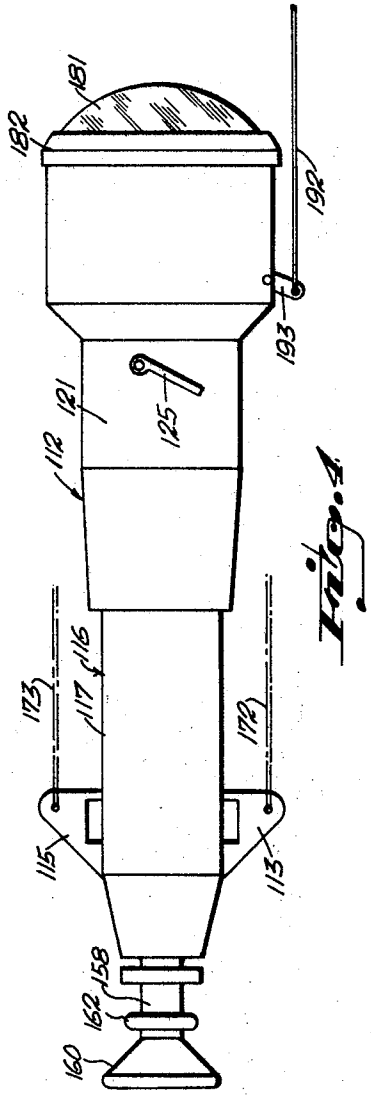


Fig. 4

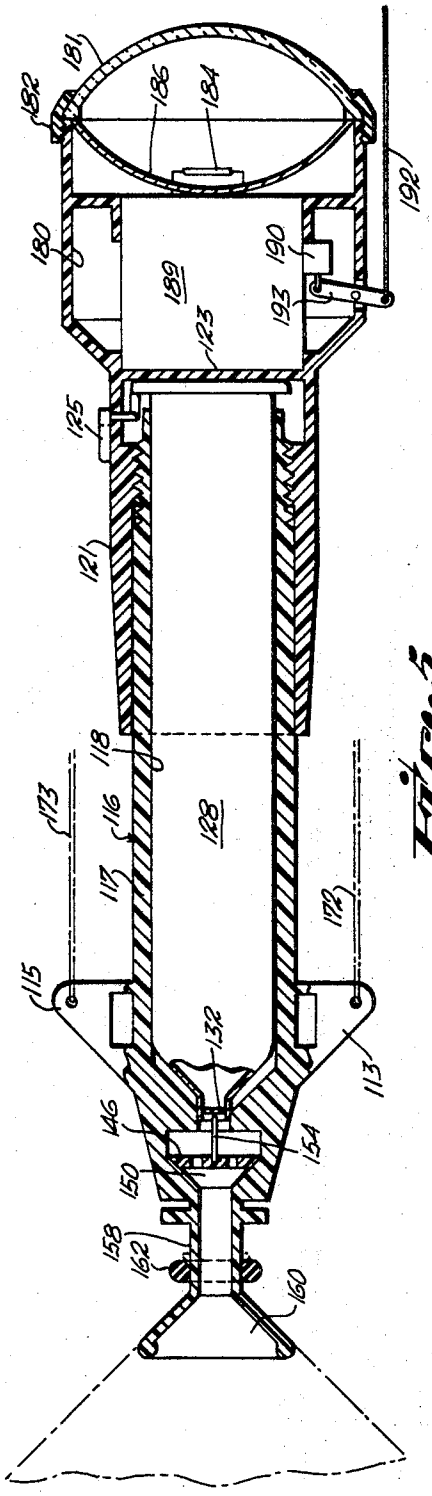


Fig. 5

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EMERGENCY SIGNAL ASSEMBLY

BACKGROUND OF THE INVENTION

When moving through undeveloped terrain, flying across uncharted terrain or across great expanses of water, or when sailing unknown waters, although one may be in constant contact with various bases by radio, for example, it is extremely difficult, at times, to locate one under emergency conditions.

Many visual signal means have been suggested in the past including inflated balloons of a visible color, kites, smoke signals, flags etc. In addition to launching signal apparatus aloft a sufficient height to be observed by aircraft or ships, because of the limitations of visual observation, it is important that the signals be interrupted to reorient the normally reflected light rays to attract a searcher's attention, and at night, to provide a visual signal that can be controlled in a repetitive fashion to send international codes emergency signals, and in any event, to attract a searcher's attention. Further, modern radar equipment enables searchers to discern even the current flow where a switch is opened or closed.

SUMMARY

Primary objects of the present invention are:

To provide a novel carrier assembly to which an inflatable signal balloon is sealingly attached and inflated with gas to afford buoyancy, and means for tethering the balloon and oscillating the balloon to provide signals by changing the incidence of light being reflected;

To provide a novel carrier in which firing pins are operatively inserted through frangible seals of a gas reservoir cartridge;

To provide a carrier which includes supplemental signal means preferably an electrically operated light controlled by a switch operated by a flexible cord whereby repetitive signals can be transmitted.

These together with other and more specific objects and advantages will become apparent from a consideration of the following description when taken in conjunction with the drawing forming a part thereof, in which:

IN THE DRAWING

FIG. 1 is a diagrammatic perspective view illustrating the emergency signal device in a condition of use;

FIG. 2 is a side elevational view, on an enlarged scale, showing the carrier assembly of the invention in relation to an inflated balloon;

FIG. 3 is a view, similar to FIG. 2, on a further enlarged scale, illustrating structural details;

FIG. 4 is a side elevational view similar to FIG. 2, illustrating another embodiment; and

FIG. 5 is a section similar to FIG. 3, illustrating structural details of FIG. 4.

DESCRIPTION OF PREFERRED EMBODIMENTS

Referring to FIG. 1, a boat is illustrated at **L** and has the lower end of a tethering line **C** attached to an emergency signal device **10** which includes a carrier assembly **12** and inflatable buoyant balloon **14** preferably colored International, luminescent orange which will be particularly visible to a searcher's eye. The carrier assembly **12** is preferably produced from a relatively stable, non-corrosive material such as plastic which can be readily molded. The assembly includes a frame **16** having a laterally-opening chamber **18** having an annular, conical seal **20** at one end in engagement with a transverse, apertured portion **22**. The chamber **18** is surrounded by a retention band **24**, integral with the frame **16**, and a thumb-manipulable screw **26** is extendible into the chamber **18**.

Retained in chamber **18** is a reservoir **28** clampingly engaged by the terminal end of screw **26** and including a forwardly tapered portion **30** sealingly engaging seal **20** and including an outlet tube incorporating a transverse, flangible seal **32** therein. Helium, for example, is charged into the cartridge **28** i.e. under a reduced temperature, for example, and

will be of sufficient quantity to inflate the balloon **14** to its full capacity. A firing pin assembly, integral with a discharge nozzle is indicated generally at **34**, and comprises a tubular body element **36** reciprocably supported in an apertured end wall **38** of the frame **16**. A compression spring **40** is circumposed about body element **36** and abuts the inner surface of a partition element **42** and urges the element **36** toward the right in FIG. **3** by engaging a disc element **44** secured to the element **36**.

The element **36** is tubular and includes an intermediate transverse, partition **46** which has apertures **48** communicating with chambers **50** and **52** on opposite sides of the partition. Partition **48** has an axial, terminally sharpened pin **54** projecting toward a reduced-diameter bore **56** into which the reduced diameter end of the reservoir **30** containing seal **32** projects. Chamber **50** communicates with a tubular neck **58** communicating with a diverging nozzle **60** about which the resilient neck—*n* of the balloon **14** is sealingly disposed. To insure against leakage, an elastic band **62**, see FIG. **2**, is circumposed about the neck of the balloon.

Integral with the frame **16** is a lateral passage **64** in which a lock pin **66** is urged by spring **68** toward a notch **70** in body element **36**. A flexible lanyard **72** is secured to pin **66**; extending through spring **68**, and extends through spaced guides **74** and **76**, and over a forward roller element **78**. The lanyard **72** comprises the means for tethering the assembly from a boat etc. and it will be noted that it is attached laterally with respect to the longitudinal axis of the frame **16**. This arrangement will cause the assembly, when aloft, to oscillate and thus when aloft in the day light, and when reflecting the sun's rays, short tugs on the lanyard **72** will reorient the incidence of reflection to attract a viewer's eye.

The frame **16** includes a rear or nominally lower chamber **80** receiving thereover a lens **81** and retention collar **82**. An electrically energized bulb **84** is disposed above a reflector **86** operatively connected to a power source or batteries in a sealed chamber **88** (not shown in detail), and a control switch **90** is connected through the medium of apertured lever **93** to a flexible control line **92** accessible in the boat **L** or at the ground. The control line **92** can be periodically tugged in a repetitive pattern to energize and deenergize the bulb **84** and send signals in International code etc. to attract the attention of searchers, at night, for example.

Referring to FIGS. **4** and **5**, a carrier assembly having the same general structure and function as the embodiment of FIGS. **1** to **3**, is indicated generally at **112**, and applicable where feasible will identify similarly functioning parts with **100** series reference characters duplicating those of the previously described embodiment. This embodiment functions with a balloon **14** (as in that previously described) and the neck of the balloon is retained on a funnel-shaped discharge nozzle **160** by means of a resilient band **162**.

A frame **116** comprises a tubular sleeve **117** defining a chamber **118** which receives therein a reservoir or cartridge **128**, and the element **116** includes an apertured, transverse wall **146** from which projects an axial, sharpened pin **154** which is normally spaced from seal **132**. The frame **116** includes a forward chamber **150** communicating with the tubular neck **158** of the diverging nozzle **160**. The rear end of the cartridge **128** is spaced from the adjacent end of a rear sealing wall **123** of sleeve **121**.

The cartridge **128** can be moved toward the pin **154** by (1) screwing sleeve **121** forwardly onto sleeve **117** or (2) an eccentric lift lever **123** extends into the sleeve **121** beneath the cartridge, and an exteriorly disposed lever **125** is accessible outside the sleeve **121** whereby rotation of lever **125** to the position illustrated imposes an axial force onto cartridge **128** and provides a safety to prevent the seal **132** from being punctured by pin **154**. When the lever is rotated to a position whereby said axial force is released and the sleeve **121** is screwed forwardly as described inflating gas under pressure passes through the apertured wall **146** and into a balloon **14** on nozzle **160**.

The sleeve **121** has formed integrally therewith a rear enlarged chamber **180** receiving therein a battery pack **189** and a retention collar **182** retains a reflector **186** and lens **181** in position. A manually operable switch **190** is operatively connected in a circuit to the battery pack **189** and an electrically energized element **184**, and the switch is connected to an operating lever **193** connected to a control line **192**. Signals can be sent with the embodiment of FIGS. **4** and **5**, just as in the previously described embodiment.

The sleeve **117** has projecting from an intermediate portion thereof outriggers **113**, **115** to which are connected tethering lines **172** and **173**, and thus the carrier, while aloft, can be oscillated during light or dark hours to attract a searcher's attention.

The enlarged housing **180** tends to stabilize the carrier when aloft, and on the other hand when the outriggers **113**, **115** are engaged by the wind, the carrier oscillates the tethered emergency signal device.

OPERATION

Each embodiment can be used at sea in the manner shown in FIG. **1** or the assemblies can be used on land in dense jungles, mountainous country etc. In each embodiment, there is provided an inflating gas reservoir for sealingly inflating a suitably colored and readily visible signal balloon. The carriers **12** and **112** each incorporate a battery-operated signal optionally controlled where the balloon is anchored.

We claim:

1. An emergency signal device for use with an inflatable signal balloon capable of floating aloft when inflated with a buoyant gas such as helium or the like, comprising:

a carrier assembly including a pressurized charge of buoyant gas;

a discharge nozzle connected at one end to said reservoir and its other end sealingly connected to a balloon, means for selectively establishing fluid communication between said discharge nozzle and said reservoir for inflating a balloon; and tethering means attached to said carrier assembly for anchoring said carrier assembly while aloft with an inflated balloon, said tethering means including eccentric connections on said carrier assembly for oscillating said assembly and the incidence of light reflection on the balloon while aloft, said carrier assembly comprising a frame work; said reservoir comprising a cartridge retained in said framework and having a frangible seal disposed towards said discharge nozzle, said discharge nozzle including a piercing pin, spring-urged towards said frangible seal, a lock pin engaged with said piercing pin and normally preventing the pin from perforating said frangible seal, said means for selectively establishing fluid communication including a lanyard accessible exteriorly of said framework and operatively connected to said piercing pin, said eccentric connections comprising an outrigger extending from opposite sides of said carrier assembly and cords connected to outer ends of said outrigger whereby manipulation of one or both of said cords, when the assembly is aloft, causes various reflection angles when the balloon is oscillated.

2. The structure as claimed in claim **1** in which said nozzle comprising a tubular member terminating in a diverging funnel-like end, and a resilient band circumposed about said nozzle for engaging about the neck of a balloon telescoped thereon.

3. An emergency signal device for use with an inflatable, signal balloon capable of floating aloft when inflated with a buoyant gas such as helium or the like, comprising:

a carrier assembly including a reservoir for containing a pressurized charge of buoyant gas, a discharge nozzle connected at one end to said reservoir and its other end sealingly connected to a balloon, means for selectively establishing fluid communication between said discharge nozzle and said reservoir for inflating a balloon; and tethering means attached to said carrier assembly for anchoring said carrier assembly while aloft with an inflated balloon, said tethering means including eccentric connections on said carrier assembly for oscillating said assembly and the incidence of light reflection on the balloon while aloft, said carrier assembly comprising a longitudinal chamber, said reservoir comprising a cartridge contained in said chamber and having a frangible seal disposed adjacent said discharge nozzle, a piercing pin in said discharge nozzle normally spaced from said frangible seal and subject to penetrating said seal when the cartridge is urged towards said pin.

4. The structure as claimed in claim **3** in which said chamber comprises threadedly engaged sleeve elements.

5. The structure as claimed in claim **4** in which said chamber includes an exteriorly disposed force transmitting element pivoted on a shaft extending diametrically beneath said chamber, and an eccentric force-transmitting portion connected to said lever and disposed beneath said cartridge for urging the cartridge toward the piercing pin.

6. The structure as claimed in claim **1** including supplemental signal means on said carrier assembly, said supplemental signal means comprising means for emitting light rays.

7. The structure as claimed in claim **6** in which said means for emitting light rays comprises a source of electrical energy, switch means, and an electrically illuminated element operatively connected to the source of electrical energy and said switch means.

8. The structure as claimed in claim **7** in which said switch means includes a manual control portion connected to a flexible operating cord suspended from the carrier assembly when the assembly is aloft whereby the electrically illuminated element can be controlled to produce a repetitive signal or the like.