United States Patent [19]

Beatty et al.

[11] **3,908,550**

[45] **Sept. 30, 1975**

[54] **ONE HAND OPERABLE DISTRESS SIGNAL**

[75] Inventors: **Bobby D. Beatty,** Bloomington; **Stanley J. Herold,** Switz City; **Donald E. LaGrange,** Washington; **David K. Sanders,** Bloomington, all of Ind.

[73] Assignee: **The United States of America as represented by the Secretary of the Navy,** Washington, D.C.

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[52] **U.S. Cl.** **102/37.4;** 102/37.8

[51] **Int. Cl.**[2] **F42B 4/20**

[58] **Field of Search** 102/37.4, 31, 37.6, 37.8, 102/90; 116/DIG. 40

[56] **References Cited**

UNITED STATES PATENTS

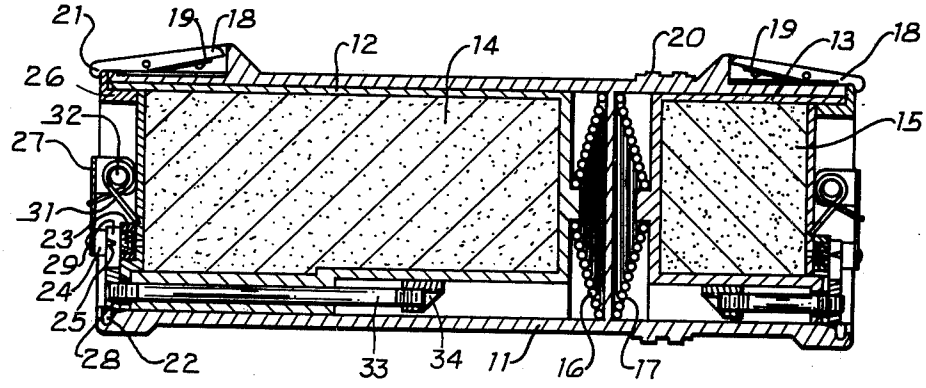
2,595,939	5/1952	Griffith	102/37.4
3,167,050	1/1965	Johnson	102/90
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Primary Examiner—Harvey E. Behrend
Assistant Examiner—C. T. Jordan
Attorney, Agent, or Firm—R. S. Sciascia; Paul S. Collignon

[57] **ABSTRACT**

A hand-held pyrotechnic device having a housing containing a quantity of pyrotechnic material, a primer for igniting the pyrotechnic material, a pivotally mounted firing pin for detonating the primer, a spring for actuating the firing pin and a manually actuated push-rod for pivoting the firing pin and increasing spring pressure and then releasing the firing pin after a predetermined amount of pivoting of the firing pin.

4 Claims, 4 Drawing Figures



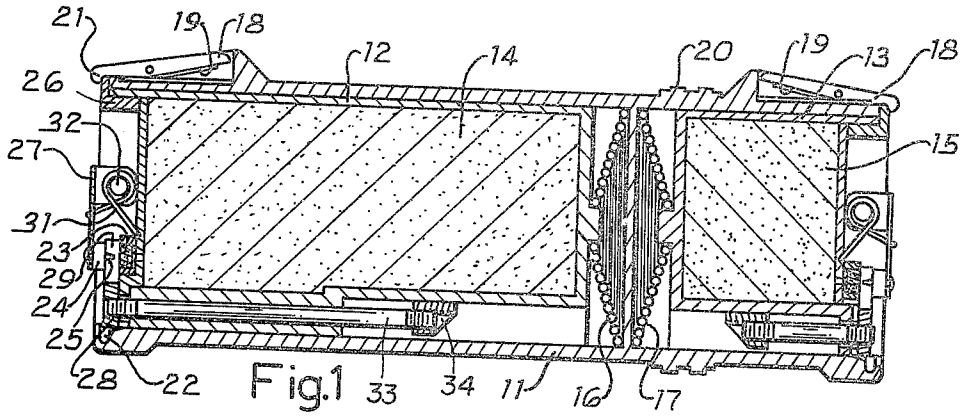


Fig.1

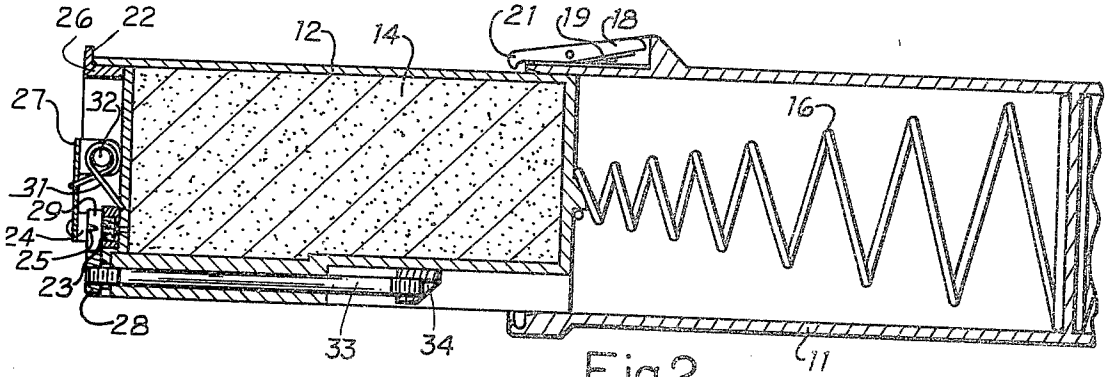


Fig.2

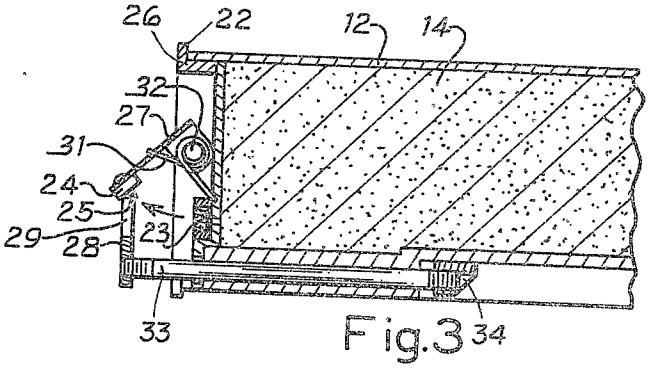


Fig.3

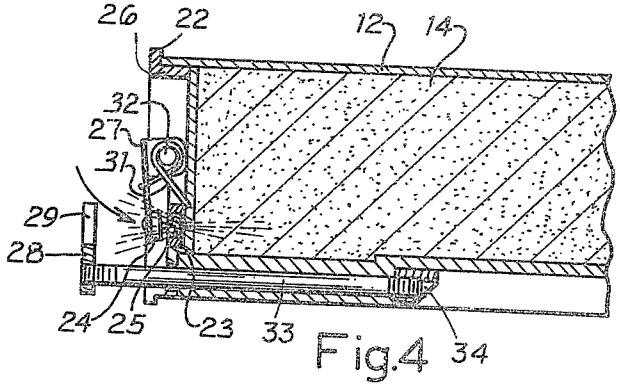


Fig.4

ONE HAND OPERABLE DISTRESS SIGNAL

BACKGROUND OF THE INVENTION

The present invention relates to a hand-held signaling device and more particularly to a device for producing either smoke or light and which can be readily actuated by using only one hand.

Various types of hand-held pyrotechnic devices are used by the military departments primarily for signaling purposes. In one type of Navy flare, which is sometimes referred to as a Railroad Warning flare, ignition is made by a friction igniter. One end of the flare is closed by a cover which has an exterior coating of the same abrasive material found on the side of a safety-match box. Beneath the cover is a small cotton wad that protects the friction igniter which is impregnated in a cloth substance covering the pyrotechnic composition. This friction igniter is the same material as is used in the head of a safety match. The signal is ignited by scraping the inverted cover across the friction igniter.

In another type of friction ignition device, a pull wire is provided to ignite a primer. A sharp, quick pull on a ring moves a friction wire through igniter material and causes ignition thereof, and this igniter material, in turn, ignites either a smoke mixture, for day use, or a pyrotechnic candle, for night use.

While the above-described hand-held ignition devices are still being used by the military departments, reliability is not as good as desired and also ignition of these devices normally require the use of both hands. Accordingly, in the event a person might be in the water and holding onto a raft, or in the event a person might be injured, ignition devices which require the use of both hands are undesirable.

A third, and more sophisticated triggering device, utilizes a spring actuated striker assembly. One such device is shown in U.S. Pat. No. 3,167,050, which issued Jan. 26, 1965, to Glenn C. Johnson. In this patented device, a striker assembly is maintained in a cocked position by a cover that is slidably attached to the container. The cover can be removed by pushing sideways, and as the cover becomes disengaged, the striker assembly is actuated to ignite a primer which, in turn, ignites the signal producing composition. This device is constructed so that it can be operated by using only one hand.

SUMMARY OF THE INVENTION

The present invention provides a container having a smoke-producing composition in one end and a flare composition in the other end. Each pyrotechnic composition is contained in a separate inner container which in turn are housed in a telescoping fashion in each end of an outer container. A spring is provided for extending each inner container and a locking lever is provided for retaining the inner container inside the outer container. Once the inner container is extended, a manual firing lever is accessible for actuating a firing pin which detonates a primer and, in turn, ignites a pyrotechnic material.

It is therefore a general obejct of the present invention to provide an improved firing device for a hand-held pyrotechnic signal.

Other objects and advantages of the present invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a longitudinal sectional view of a preferred embodiment of the invention;

FIG. 2 is a longitudinal sectional view of a preferred embodiment showing a smoke container in an extended position;

FIG. 3 is a partial sectional view showing a firing pin being actuated; and

FIG. 4 is a partial sectional view showing a firing pin detonating a primer.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawing, there is shown a cylindrical housing **11** that has slidably mounted therein containers **12** and **13.** A smoke mixture **14** is provided in container **12** and a flare composition **15** is provided in container **13.** By way of example, smoke mixture **14** and flare composition **15** might be formulated as described in U.S. Pat. No. 3,167,050, which issued Jan. 26, 1965, to G. C. Johnson. A pair of springs **16** and **17** are provided for extending containers **12** and **13,** respectively, and arming levers **18,** which are pivotally connected to housing **11,** are provided for retaining the containers within housing **11.** Springs **19** are provided for keeping levers **18** in a latched position, with hook **21** on lever **18** being engaged with a forward lip **22** on the covers **26** of the containers. A boss **20** is provided around container **11** at the flare end in order to orient the housing in darkness.

As the firing mechanism is the same for both the smoke composition and the flare composition, only the mechanism for firing the smoke composition will be discussed. A primer **23** is provided for igniting smoke composition **14,** and a firing pin **24,** having a tang **25** thereon, is rotatably attached to cover **26** which closes container **12** by means of arm **27.** A barrier **28,** having a slot **29** therein, is positioned between firing pin **24** and primer **23,** with tang **25** being positioned in slot **29.** A spring **31** is positioned around shaft **32** about which arm **27** is rotatable, and spring **31** biases firing pin **24** against barrier **28.** Barrier **28** is threadedly attached to shaft **33** which is slidably mounted in container **12,** and a firing button **34** is attached to one end of shaft **33** to facilitate actuation of shaft **33.**

OPERATION

In operation, an operator, such as a downed pilot, first determines which pyrotechnic composition is to be ignited. During daylight hours, smoke composition **14** would normally be ignited and, during darkness, the flare composition would be ignited. In darkness, boss **20** helps identify the end of container **11** housing the flare composition.

Assuming it is desired to ignite smoke composition **14,** lever **18** is pivotally actuated so that hook **21** disengages lip **22** on the covers **26** of container **12** and spring **16** extends container **12,** as shown in FIG. **2** of the drawing. With container **12** being extended, firing button **34** is now accessible. When ignition of smoke composition **14** is desired, firing button **34** is pushed outwardly and shaft **33** is slidably moved in container **12.** Barrier **28,** which is threadedly attached to the end of shaft **33,** moves outwardly and causes arm **27** holding

firing pin **24** to pivot about shaft **32**. Slot **29** in barrier **28** prevents tang **25** on firing pin **24** from binding the barrier **28**, as barrier **28** moves linearly and firing pin **24** moves in an arcuate path. As arm **27** rotates, spring **31** becomes tightened and, upon disengagement of barrier **28** with firing pin **24**, firing pin **24** is driven by spring **31** in a reverse direction to detonate primer **23** which, in turn, ignites smoke composition **14**.

It can thus be seen that the present invention provides a signaling device which can readily be actuated by using one hand. Obviously many modifications and variations of the present invention are possible in the light of the above teachings. It is therefore to be understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described.

We claim:

1. A hand-held signaling device comprising,

an outer container opened at both ends,

first and second inner containers within said outer container, said first container having a smoke composition therein and being extendable through one end of said outer container, and said second container having a flare composition therein and being extendable through the other end of said outer container,

first and second springs for extending portions of said first and second inner containers, respectively, outwardly from said outer container,

latching means pivotally attached to said outer container for releasably retaining said inner containers within said outer container,

first and second primers for igniting each said composition,

first and second firing pins pivotally connected to said first and second inner containers, respectively, for detonating said primers, and

first and second manually-actuated means for triggering said first and second firing pins, respectively.

2. A hand-held signaling device as set forth in claim **1** wherein said first and second manually-actuated means are attached to said first and second inner containers and surrounded by said outer container when said inner containers are retained in said outer container thereby preventing actuation of said firing pins.

3. A hand-held signaling device as set forth in claim **1** wherein each said manually-actuated means includes a shaft slidably mounted to an inner container and having a barrier attached to one end of said shaft, said barrier being positioned between a firing pin and a primer when said inner container is positioned within said outer container and said barrier being adaptable for rotating said firing pin.

4. A hand-held signaling device as set forth in claim **3** wherein each said firing pin is biased by a spring wherein after a predetermined amount of rotation of a firing pin in one direction by linear movement of said barrier, said firing pin is disengaged from said barrier and rotated by said spring in an opposite direction to detonate a primer.

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