Jan. 26, 1965 G. C. JOHNSON 3,167,050

EMERGENCY SIGNALING DEVICE

Filed May 3, 1963 2 Sheets-Sheet 1

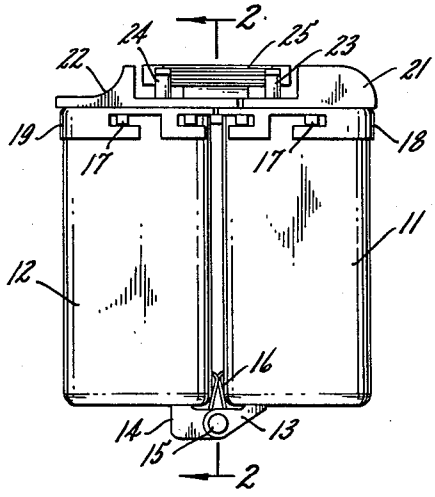


Fig. 1.

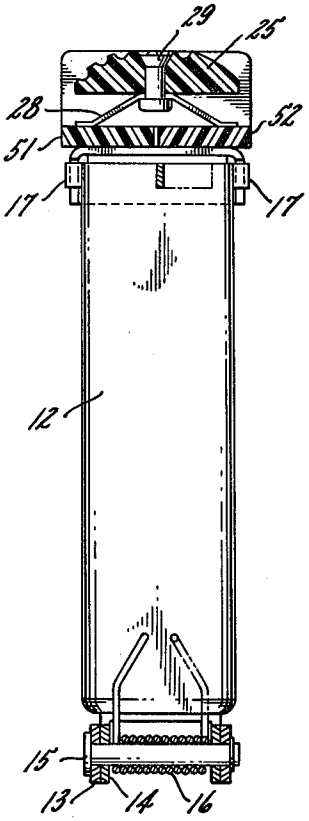


Fig. 2.

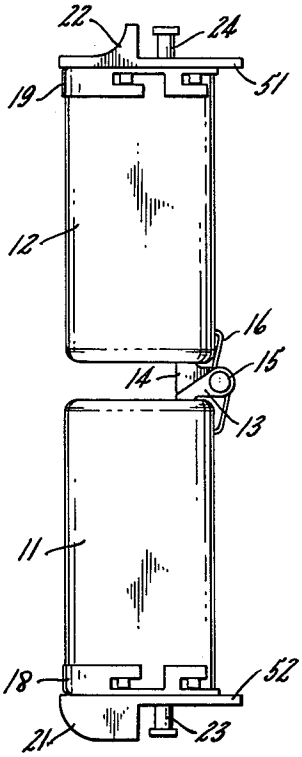


Fig. 5.

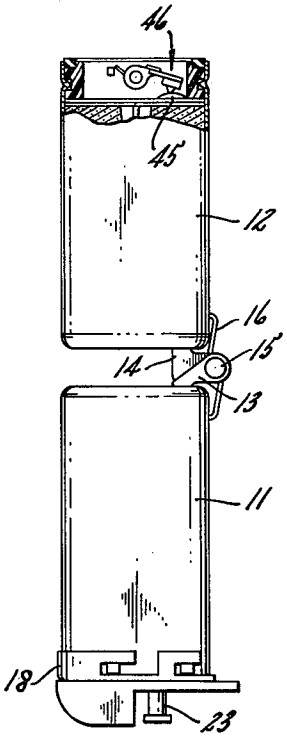


Fig. 6.

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EMERGENCY SIGNALING DEVICE

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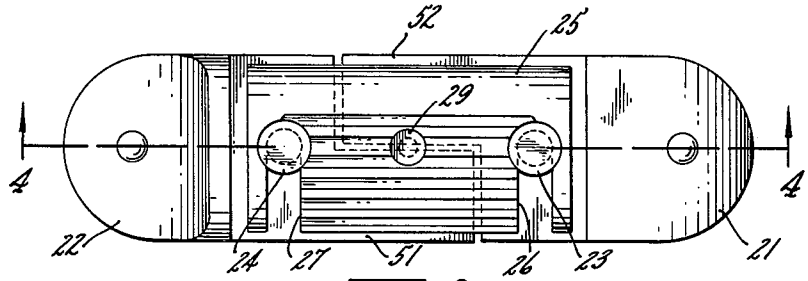


Fig. 3.

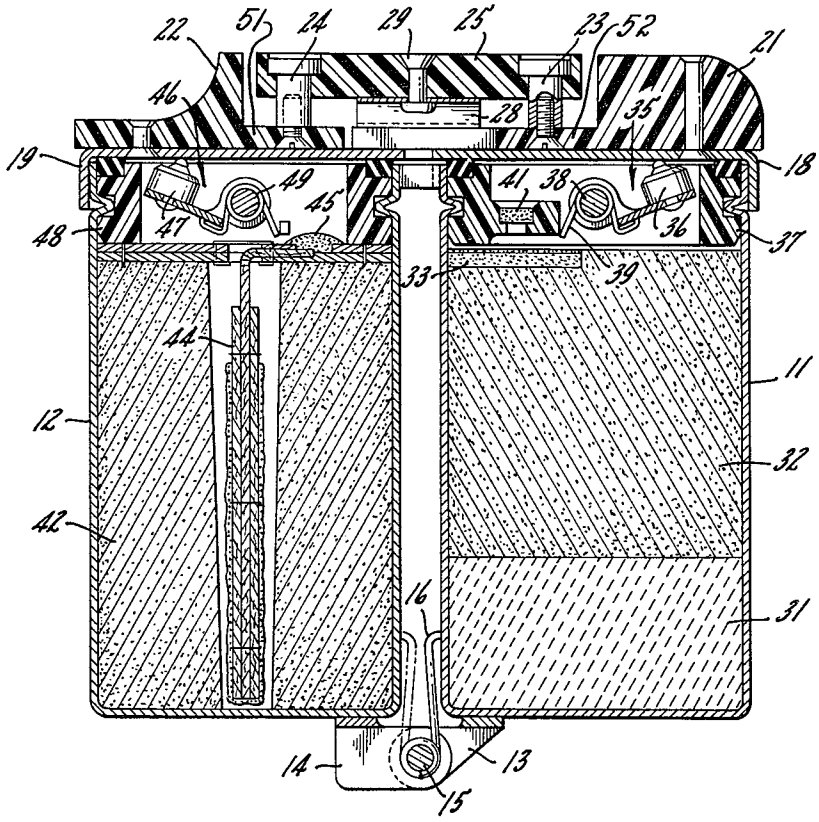


Fig. 4.

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3,167,050
EMERGENCY SIGNALING DEVICE

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3 Claims. (Cl. 116—124)
(Granted under Title 35, U.S. Code (1952), sec. 266)

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

The present invention relates to an emergency signaling device and more particularly to a smoke, signal, or illuminating flare for use by an aircraft pilot in a distress situation.

Emergency life rafts and many crewmen of aircraft are provided with signaling devices for use in emergency situations. A good emergency signal should be compact, be safe to handle and store, and also should be easily ignited as a person who has need for such a device may be injured or handicapped. In addition, it is desirable that the signal provide smoke for use in daylight and provide light for use at night.

Heretofore known signaling devices have had several inherent disadvantages. One main disadvantage is that the signals could not be easily operated, particularly by persons who may have sustained injuries in making emergency landings. Also the combination smoke and flare signals were not readily identified in darkness.

The present invention provides a small, compact, signaling device that can readily be activated by using only one hand. A pair of similar rectangular-shaped containers are pivotally connected together at one end with one container holding a smoke-producing composition and the other container holding a flare composition. A torsion spring is provided to maintain the containers in a side to side relationship. Each unit is initiated by a primer which is fired by a striker assembly similar to that used on a hand grenade. The striker assemblies are each maintained in a cocked position by a cover that is slidably attached to the container. The covers, which are of different configuration in order to identify the particular compositions, are held together by a release bottom that is spring-biased against a pair of locking pins.

When it is desired to ignite one of the compositions, the release button is first pushed downwardly and then outwardly to disengage the locking pins. The torsion spring will then cause a relative rotation of one hundred-eighty degrees so that the two units will then be in an end to end relationship. The unit to be activated is then identified by the configuration of the cover, and the cover is then removed by pushing the cover sideways, relative to the container. As the cover becomes disengaged, the striker assembly is actuated to ignite a primer which, in turn, ignites the signal producing composition. A short delay of the fuze permits the operator to re-position his hand to the unit that is not being actuated and this unit serves as a handle. The pyrotechnic compositions are designed to burn from 15 to 60 seconds.

It is therefore a general object of the present invention to provide an improved signaling device that can be used either during the day or night.

Another object of the present invention is to provide a combination signaling device that consists of a smoke unit and a flare unit.

Still another object of the present invention is to provide a signaling device that can be operated by using only one hand.

A further object of the present invention is to provide a combination signaling device having a smoke unit and a flare unit with one of said units serving as a handle while the other unit is burning.

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 drawings wherein:

FIGURE 1 is a front view of a signaling device showing a smoke container and a flare container in a locked side to side position;

FIGURE 2 is an enlarged sectional view taken on line 2—2 of FIGURE 1;

FIGURE 3 is an enlarged top view of the signaling device shown in FIGURE 1 of the drawings;

FIGURE 4 is a sectional view taken on line 4—4 of FIGURE 3;

FIGURE 5 is a front view of a signaling device showing a smoke container and a flare container in an end to end position; and

FIGURE 6 is a view similar to FIGURE 5 of the drawing only showing the smoke cover removed and the cover partially broken away to show parts in section.

Referring now to the drawings, and particularly to FIGURES 1–4, there is shown a first container **11** having a flare composition therein and a second container **12** having a smoke composition therein. Containers **11** and **12** are hinged together by means of tabs **13** and **14** and pin **15**. Spring **16** is supported around pin **15** and tends to bias containers **11** and **12** in an end to end position, as shown in FIGURES 5 and 6 of the drawings. Containers **11** and **12** are each provided with a pair of lugs **17** on each side, and covers **18** and **19** are slidably engaged with the respective lugs on containers **11** and **12**.

Cover **18** has a plate **52** attached thereto which has a rounded end configuration **21**, that might also be painted, to indicate that it closes a container having a flare composition, and cover **19** has a plate **51** attached thereto which has a sloping portion **22** to indicate that it closes a container having a smoke composition. Cover **18** is provided with a locking pin **23** that has an enlarged diameter portion and cover **19** has a similar locking pin **24** that also has an enlarged diameter portion. A release button **25** is provided with a pair of slots **26** and **27**, as best shown in FIGURE 3 of the drawings, and the ends of these slots are provided with a counterbore that will accommodate the enlarged diameter portions of the locking pins **23** and **24**. A spring **28** is attached, as by rivet **29**, to the underside of release button **25** to bias release button **25** against the enlarged diameter portions of locking pins **23** and **24**.

Container **11** contains a lower layer of fire clay **31** and an upper layer of flare mixture **32**. A starter pellet **33** is provided at the upper surface of flare mixture **32**. The flare mixture **32** may, for example, be comprised of the following formulation:

	Parts by weight
Magnesium (granulation 16)	6
Strontium nitrate	60
Potassium perchlorate	10
Polyvinyl chloride	15
"Gilsonite" (asphalt) a product of Ziegler Chemical & Mining Corp., Great Neck, New York	10
Linseed oil	3

The strontium nitrate is mixed with the potassium perchlorate and the polyvinyl chloride, and this mixture is blended through a thirty mesh screen three times. The Gilsonite is then added, and the mixture is again blended through a thirty mesh screen three times. Next the linseen oil and magnesium are blended together through a

thirty mesh screen and then the two blends are added together and blended through a thirty mesh screen four times. The resulting flare mixture is then compressed into container **11**.

The starter pellet, by way of example, might be comprised of the following formulation:

	Parts by weight
Lead peroxide	6
Cupric oxide	6
Silicon	8

The ingredients are mixed together and then blended four times through a thirty mesh screen. The mixture is then mixed with a suitable binder solution and then compacted into a pellet weighing about 5 grams.

A striker assembly **35** is positioned in container **11** above the flare mixture **32**. A striker **36** is rotatably supported in housing **37** by means of shaft **38**, and a spring **39**, which is supported around shaft **38**, provides a bias action to striker **36**. A primer **41** is mounted in housing **37** so that it is in position to be struck by striker **36**. Striker **36** is maintained in a cocked position by cover **18** which prevents striker **36** from rotating.

Container **12** contains a smoke mixture **42** which, by way of example, might be comprised of the following formulation:

	Parts by weight
Dye, Oil Scarlet 60	10
Dye, golden yellow	3.0
Potassium chlorate	4.4
Sugar	3.2
"Sil-O-Cel" (Thermal Insulation), a produce of Johns-Manville, New York, New York	0.8
Graphite	0.2
Paraffin oil (white, light, domestic)	1.0

Each ingredient is first screened through a sixty mesh screen and then the oil scarlet dye, golden yellow dye, sugar, Sil-O-Cel insulating powder, and graphite are blended three times through a thirty mesh screen. The potassium chlorate is then added and the mixture is again blended three times through a thirty mesh screen. The paraffin oil is next thoroughly blended by hand with the mixture, and the mixture is again blended three times through a thirty mesh screen.

Smoke mixture **42** is compacted in container **12**, and a hollow center is provided to accommodate a firecracker fuse **44** which has one end attached to a primer **45**. A striker assembly **46**, which is similar to striker assembly **35**, is positioned in container **12** above the smoke mixture **42**. Striker **47**, which is rotatably supported to housing **48** by shaft **49**, is maintained in a cocked position by cover **19**.

In operation, assuming that the smoke composition **42** is to be ignited, the operator first depresses release button **25** so that the enlarged diameter portions of locking pins **23** and **24** clear the top of release button **25**. Release button **25** can then be moved sideways with pins **23** and **24** passing through slots **26** and **27**, respectively. When release button **25** completely clears pins **23** and **24**, spring **16** causes containers **11** and **12** to be relatively rotated to an end to end position, as shown in FIGURE 5 of the drawings. The sloping portion **22** on cover **19** identifies the unit containing the smoke composition **42**, and cover **19** is then slidably moved by pushing on either pin **24** or plate **51**. When cover **19** has cleared the lugs **17**, the spring force of striker assembly **46** will cause cover **19** to flip off of container **12** and striker **47** will then rotate and strike primer **45**, which will in turn ignite the fire cracker fuze **44**. There will be a few seconds delay before smoke composition **42** will be ignited, and during this delay period the operator can be sliding his hand down to container **11**, which will serve as a holder while smoke composition **42** is burning.

Flare composition **32** can be ignited in a similar manner. After release button **25** has been removed and containers **11** and **12** have rotated to an end to end position, cover **18** can be slidably removed thus allowing striker **36** to be actuated and strike primer **41**. Primer **41** will ignite starter pellet **33** which, in turn, will ignite flare mixture **32**.

It can thus be seen that the present invention provides a complete smoke producing unit for daytime signaling and a complete light producing unit for night use. The two units are arranged in a side-to-side position for stowage and for carriage by an operator, and can be ignited by a relatively small force by an injured operator acting under adverse conditions.

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.

What is claimed is:

1. An emergency signaling device comprising,
   - a first container having an open end and containing a smoke composition,
   - a second container having an open end and containing a flare composition, said first and second containers being pivotally connected together at the ends opposite said open ends,
   - a striker assembly mounted in each said container adjacent said open end,
   - first and second primers positioned one each near the open ends of said first and second containers, respectively, said first primer being adaptable to be ignited upon actuation of said striker assembly in said first container thereby igniting said smoke composition and said second primer being adaptable to be ignited upon actuation of said striker assembly in said second container thereby igniting said flare composition,
   - first and second covers slidably attached to said first and second containers, respectively, said covers closing said open end and retaining said striker assemblies in cocked position,
   - first and second locking pins attached, respectively, to said first and second covers,
   - a release button engageable with said first and second locking pins for locking said covers together, and spring means for biasing said first and second containers in an end-to-end relationship.

2. An emergency signaling device as set forth in claim 1 wherein each said locking pin is provided with an enlarged diameter portion and said release button is spring-biased against said enlarged diameter portions.

3. An emergency signaling device as set forth in claim 1 wherein said first cover is provided with a sloping portion to physically distinguish said first cover from said cover.

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