

March 21, 1967

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3,310,024

SIGNAL BALLOON

Filed Oct. 23, 1965

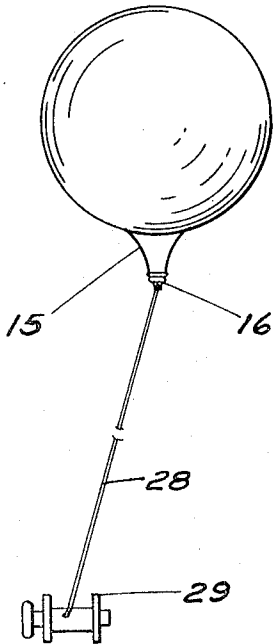


FIG. 1

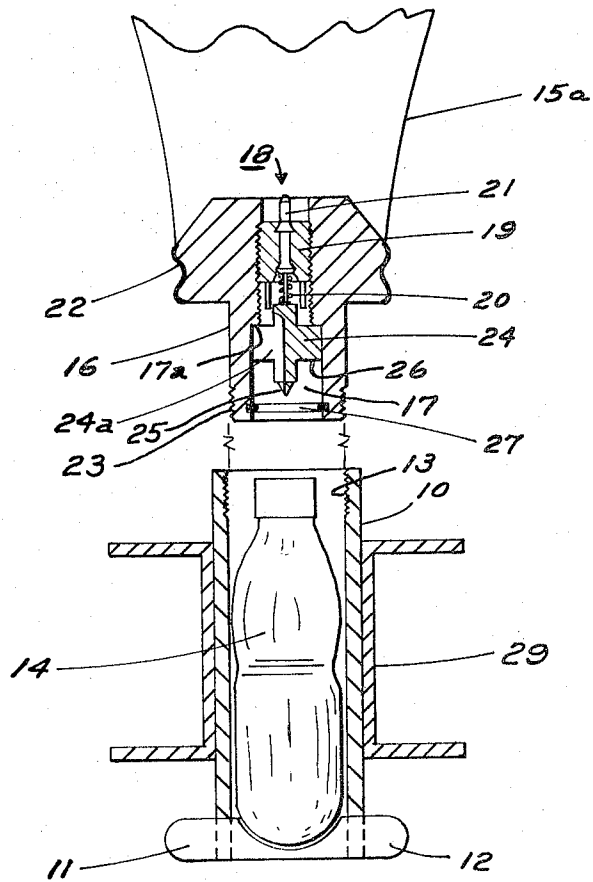


FIG. 2

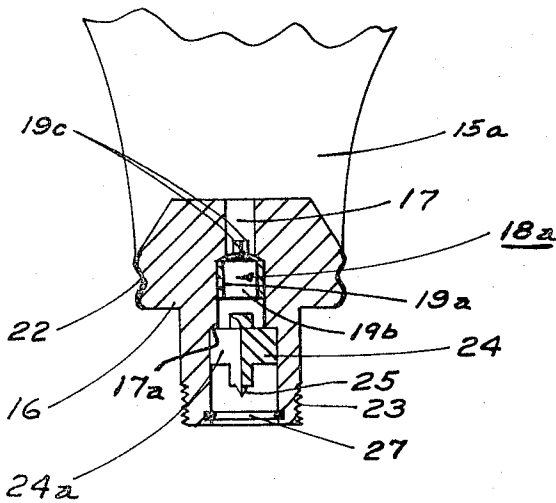


FIG. 3

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3,310,024  
**SIGNAL BALLOON**  
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Filed Oct. 23, 1965, Ser. No. 503,179  
2 Claims. (Cl. 116-124)

This invention relates to signal apparatus and, more particularly, to signal apparatus for individual use to indicate the location of a person in distress or to mark the position or location of an object.

In general, the invention contemplates the provision of an inflatable balloon, which may be brightly colored, coated with a reflective surface or with a fluorescent material so that it may be quickly and easily recognized, a compact cartridge containing a pressurized supply of a fluid that is lighter-than-air, such as helium, tethering means, and improved closure and filling means whereby the cartridge may readily be detachably connected to the balloon during inflation thereof with the lighter-than-air fluid which is automatically retained within the balloon when the cartridge is detached therefrom after inflation and prior to sending the balloon signal aloft.

An important object of the present invention is to provide an improved signal device that is economical to manufacture, is very light and compact, is very simple and easy to operate and yet is very effective in rescue or other operations to indicate the location of a person or an object.

Another object is to provide an improved signalling device for indicating the need for emergency aid and the location at which such aid is needed without requiring the exertion of undue physical energy or complicated manipulation by an injured user thereof.

These and other objects will become apparent from the following description taken in conjunction with the accompanying drawings, in which:

FIGURE 1 is an assembly view of a signal balloon device in accordance with the invention as it appears when inflated and ready for use;

FIGURE 2 is a cross-sectional view, partly broken away, illustrating the various elements of the invention; and,

FIGURE 3 is a cross-sectional view illustrating a modification of the embodiment shown in FIGURE 2.

In the drawings, the invention, as illustrated, includes a tubular housing 10 provided with depending portions 11, 12 at one end thereof and with a threaded portion 13 at the opposite end thereof. Slidably contained within housing 10 is a cartridge or bottle 14 which in turn contains a pressurized supply of a lighter-than-air fluid, such as helium, which serves to inflate a balloon 15 and thereby render it bouyant within the surrounding air of the atmosphere. Within neck portion 15a of the balloon there is provided a member 16 which serves the dual function of providing a portion of the means for inflating the balloon and also serves to retain the lighter-than-air fluid within the interior of the balloon after inflation thereof.

Within member 16 there is provided a longitudinally-extending passageway 17 extending throughout the extent of member 16. In order to inflate the balloon 15 and at the same time provide means for retaining therein the fluid with which it has been inflated, there is mounted within passageway 17 check valve means indicated generally at 18. Conveniently, check valve means 18 may be of the type or identical with the valve means commonly employed to retain air within automobile tires and, hence, will not be further described herein except to note that, as illustrated in FIGURE 2, it includes a body 19, a spring plunger 20, and a valve member 21 which

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is thus capable of limited movement in a direction coaxial with respect to passageway 17.

Alternatively, a different type of check valve means may be employed if desired. For example, an alternative check valve 18a is illustrated in FIGURE 3 and merely comprises a deformable body 19a of resilient material such as rubber, neoprene, or the like. Check valve 18a is mounted and retained within passageway 17. The body 19a has an opening 19b extending therethrough, one end of opening 19b normally being closed by a pair of abutting projections 19c which depend from body 19a and which are readily deformable to open opening 19b.

Closure member 16 is enlarged at one end thereof, said enlarged end being somewhat larger than the neck 15a of the balloon so that the walls of the neck 15a will tightly engage the enlarged end surfaces of member 16 when it is inserted therein. To insure tight engagement between said surface of member 16 and neck 15a, a clamping means 22 may be employed which means conveniently may comprise a heat shrinkable plastic ring shrunk into clamping engagement with the wall of neck 15a after member 16 has been inserted therein. The opposite end of member 16 is provided with threads 23 adapted to threadedly engage threads 13 of housing 10. When so engaged, a cartridge or bottle 14, contained within housing 10, is held in alignment with and in registry with passageway 17.

Within passageway 17 there is provided means for automatically releasing the pressured fluid contained within the cartridge or bottle 14 when it is connected with passageway 17 by housing 10. In accordance with the invention, such means includes a member 24 having axial extent and provided with a pointed end portion 25 for piercing cartridge or bottle 14. Member 24 also is provided with an enlarged portion 26 which is slidably received within passageway 17 and cooperates therewith to properly position and align end portion 25. Fluid communication is maintained in passageway 17 on both sides of member 24 by the provision of an opening therethrough which conveniently may be in the form of a slot 24a. Alignment is maintained by virtue of the sliding fit between enlarged portion 26 and passageway 17. Desired positioning of end portion 25 is achieved by the provision of a shoulder portion 17a in passageway 17 against which enlarged portion 26 abuts, thus positioning end portion 25 at a location where it first contacts and ultimately pierces cartridge or bottle 14 as the latter moves toward and into passageway 17 when threaded portions 13 and 23 are engaged and tightened. In order to avoid accidental loss of slidable member 24, retention means is provided which conveniently may be an O ring 27 disposed within passageway 17 adjacent threaded end portion 23. Thus, O ring 27 simultaneously and additionally provides a fluid seal between the neck of cartridge or bottle 14 and passageway 17.

In order to insure that the signal device of the present invention will serve to mark or indicate the location of an object or of a person, tethering means is provided including a tether cord or line 28 connected at one end thereof to closure member 16 and at the opposite end to a reel 29 carried by housing 10.

Operation of the device is extremely simple and requires a minimum amount of physical exertion to make it ready for use. Prior to use, the balloon portion of the device is, of course, deflated and the remaining portions are small and light in weight and the entire device is sufficiently compact that it can be easily carried in a pocket of an article of clothing. To render the device operable, housing 10 containing cartridge or bottle 14 is connected to balloon 15 and its closure member 16 by threadedly engaging and tightening threaded por-

tions 13 and 23, using housing 10 and its depending portions 11, 12 as a wrench. During such connection and tightening operation, cartridge or bottle 14 is pierced by end portion 25 thereby releasing the pressurized lighter-than-air fluid from bottle 14. If a check valve means 18a, as illustrated in FIGURE 3, is employed, the pressurized fluid deforms projections 19c thereof so that opening 19b then extends completely through valve means 18a with the result that the pressurized fluid flows through said opening and inflates the balloon 15. Housing 10 is then removed together with bottle 14 by unscrewing threaded portions 13 and 23. Balloon 15 then is allowed to rise to signal the location of an object or a person by allowing tether line 28 to unwind from reel 29.

If a check valve means 18, as illustrated in FIGURE 2, is employed, the position of member 24 is such, at the right hand limit of its movement, that the end portion thereof opposite pointed end portion 25 engages and moves valve member 21 to its open position thereby causing inflation of the balloon as a result of the flow of the then released pressurized lighter-than-air fluid from bottle 14 through passageway 17 and then open valve means 18. Irrespective of which type of check valve means is employed, after inflation of balloon 15 the check valve means closes to prevent escape of fluid from the balloon.

While particular embodiments of the invention have been illustrated and described, it will be obvious to those skilled in the art that various changes and modifications may be made without departing from the invention which is defined in the appended claims, and it is intended in such claims to cover all such changes and modifications that fall within the true spirit and scope of the invention.

What is claimed is:

1. In a signal device, an inflatable balloon having a neck portion, closure means mounted within said neck portion and having a passageway adapted to receive pressurized fluid and to admit said fluid into the interior of the balloon, valve means biased to closed position and disposed within said passageway, a member movably disposed within said passageway and engageable

with said valve means for opening the same in at least one position of said member, said member having a piercing portion for puncturing a pressurized fluid container, annular yieldable means carried by said closure means and at least partially projecting into said passageway for sealingly engaging the neck portion of said container and for retaining said movable member within said passageway, tether means connected to said closure means, inflation means including a container having a neck portion and having a pressurized lighter-than-air fluid therein, and

means including a housing member for readily detachably connecting said inflation means to said closure means and operable to move said container into puncturing relation with said piercing portion and with said neck portion extending into said passageway and sealingly engaged by said yieldable means and simultaneously causing said member to move to said one position, and

thereby automatically admitting pressurized fluid from said container when so connected to said closure means into the interior of the balloon and to prevent escape of fluid from the balloon when said container is detached.

2. A device in accordance with claim 1 wherein said tether means includes reel means mounted on said connecting means.

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