July 10, 1962 D. O. DAVIS ETAL 3,042,946

PERSONAL INFLATABLE LIFE PRESERVER

Filed July 14, 1960

FIG.1

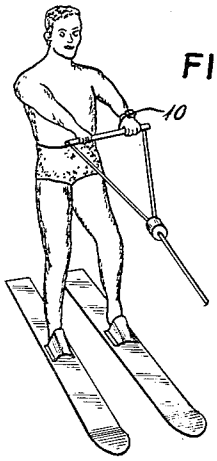
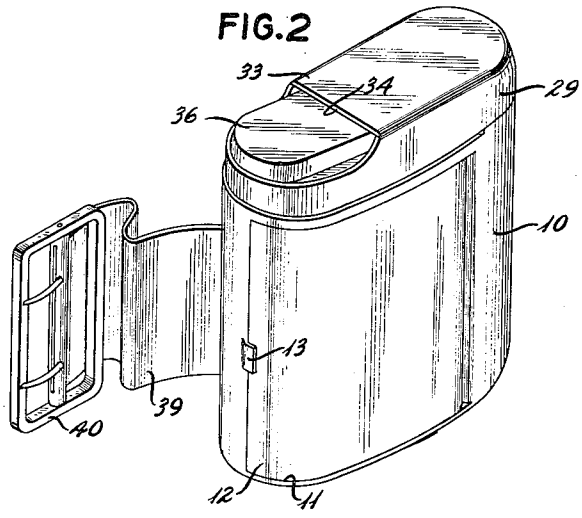


FIG.2



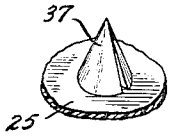


FIG.8

FIG.3

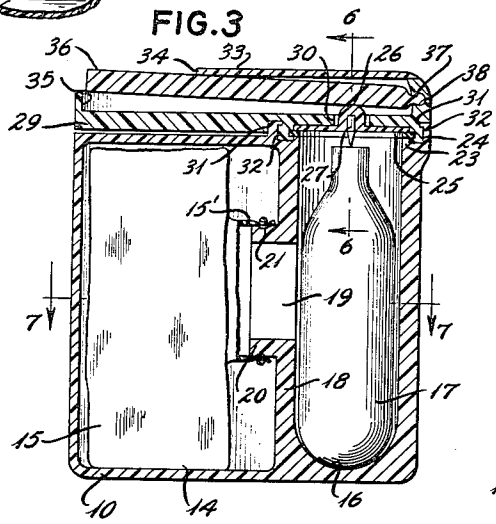


FIG.6

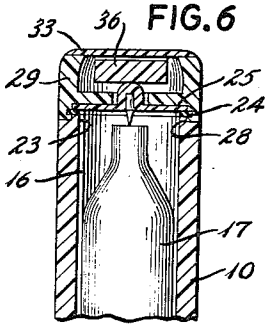
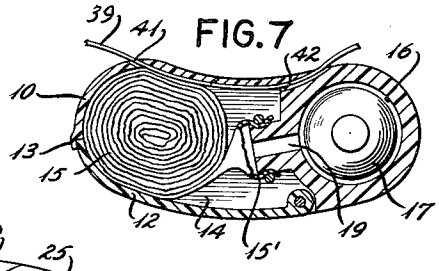


FIG.7



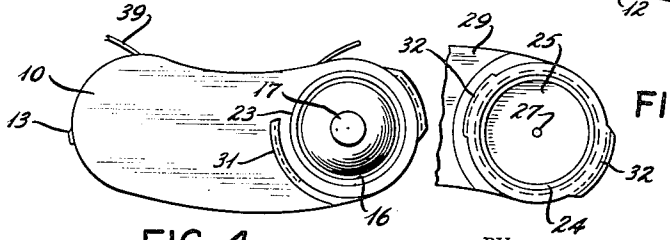


FIG.4

FIG.5

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3,042,946

Patented July 10, 1962

3,042,946

PERSONAL INFLATABLE LIFE PRESERVER

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Filed July 14, 1960, Ser. No. 42,948
4 Claims. (Cl. 9—316)

This invention relates to devices of relatively low specific gravity, regardless of whether they are hollow or solid, and buoyant in water rendering them suitable for use in keeping afloat by persons who cannot swim or who are distrustful of their ability to remain afloat for any sustained period and consequently desire assistance.

The invention relates particularly to inflatable devices which can be used for the guarding or preserving of life by contributing to the buoyancy of an individual and which devices can be maintained in collapsed compact condition but can be readily inflated to provide the necessary buoyancy and to preserve life.

Life preservers of many kinds have been produced some of which have been mounted in fixed locations readily available for those desiring to use them while others have been constructed for attachment to the person or to be worn and others have been inflatable by means of a gas cartridge. Prior devices have been unreliable and impractical and could not be readily relied upon by persons bathing, hunting, water skiing, or engaged in other activities in or near the water and during which it is desirable that the arms and other portions of the body be free.

One of the difficulties in using a container which could be inflated by a gas cartridge was the inability completely to seal the holder for the cartridge and the fact that the firing pin would plug the opening which it pierced in the cartridge and interfere with the passage of gas from the cartridge into the inflatable container. Another difficulty was that in certain prior devices the release and expansion of the inflating medium such as carbon dioxide gas produced a pronounced chilling or refrigerating effect which interfered with the satisfactory operation and use of the device.

It is an object of the invention to overcome the difficulties enumerated and to provide a relatively fool-proof life preserver of few parts capable of ready attachment to the human body, such attachment including a holder both for an inflatable container or casing and a cartridge for supplying the necessary gas for inflation of the casing or container and in which the cartridge is located in a completely sealed chamber with the only outlet leading to the casing or container and with means by which the cartridge can be pierced to release the compressed gas to allow it to escape into the casing or container and inflate the latter but with the piercing member of a physical construction that it cannot plug the opening pierced by it.

Another object of the invention is to provide a relatively simple, inexpensive and compact life preserver having a two-compartment housing in one compartment of which the expansive container is retained in compact condition and in the other the gas cartridge is held with the chamber for the container provided with openings for the reception of a retaining strap through which openings any accumulation of water, sand, or other substance may be discharged from the casing.

Other objects and advantages of the invention will be apparent from the following description taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is a perspective illustrating one application of the invention;

FIG. 2, an enlarged perspective of the invention;

FIG. 3, a vertical section;

FIG. 4, an end view with the cap and operating mechanism removed;

FIG. 5, a bottom plan view of the cap and operating member;

FIG. 6, a vertical section on the line 6—6 of FIG. 3;

FIG. 7, a horizontal section on the line 7—7 of FIG. 3; and

FIG. 8, a perspective of the piercing point or firing pin.

Briefly stated, the life preserver of the present invention comprises a relatively small housing curved to conform to and adapted to be worn upon a portion of the body such as the wrist. The housing is provided with a compartment for an inflatable container in folded condition and a compartment for a gas cartridge with a partition wall separating the compartments and with a passage in such partition wall between the compartments and an oval shaped tubular portion in the container compartment about which the mouth of an inflatable container is adapted to be clamped. The housing is provided with slots from the exterior into the container compartment and through which slots a retaining strap extends, the slots and straps differing in size sufficient to permit the discharge of water, sand, or the like from such container compartment. The compartment for the gas cartridge is rounded at one end to provide a seat for the cartridge and has an opening at its opposite end in which is received a diaphragm or closure member of flexible plastic or the like and in the center of which is carried a piercing point adapted to be forced into the end of the cartridge when the closure is sufficiently flexed so that no leakage is possible other than around the sealed edge of the diaphragm, the latter being held in place by an end member or cap and a bayonet joint between the same and the housing, such end member or cap having an opening centrally over the cartridge chamber in which a projection or enlargement of the diaphragm is received and against which projection is engaged a lever fulcrumed in the end member, the latter being hollow and having a recess for one end of the lever and a remotely spaced opening to afford access to the lever for forcing the piercing point into engagement with the cartridge, a coil spring normally maintaining such diaphragm and cartridge in spaced relation.

With continued reference to the drawing, a housing **10** is provided having an opening **11** and a closure **12** adapted to be maintained in closed position by means of a retaining latch **13**. The housing has a chamber **14** for an inflatable container **15** adapted to be retained therein in collapsed or folded condition. Also the housing has a chamber **16** for a compressed gas cartridge **17**, the chambers **14** and **16** being separated by means of a partition **18** having an opening **19** therebetween with a tubular extension **20** within the chamber for the container and a groove **21** about such tubular extension in which groove is adapted to be received the mouth **15'** of the casing **15** and to be held about such tubular extension **20** by means of an elastic band **22**.

The chamber **16** is open at one end of the housing and has an upstanding annular collar **23** against which a sealing gasket **24** and a diaphragm closure **25** is pressed, such diaphragm closure **25** having a central boss or enlargement **26** in which is carried a piercing point or firing pin **27** located in proximity to the cartridge **17**. The firing pin may be bifurcated or split as shown in FIG. 8 to prevent its interfering with the discharge of gas. The diaphragm closure **25** is received within a recess **28** in a cap or end member **29** and such cap is provided with an opening **30** in which is received a holding boss **26** molded about the firing pin **27**. The cap or end member **29** is fastened to the housing by a bayonet slot connection which includes spaced segmental overlying flange portions **31** on the housing and complementary overlying ledges **32**

on the member 29 so that by mere pressing the cap or end member 29 axially of the opening 16 in which the cartridge is located and rotation of the member 29 the parts can be fastened together with the only chance of leakage from the compartment 16 being around the gasket 24 or through the opening 19 into the container 15. The cap or end member 29 is relatively hollow having an outer wall 33 with an opening 34 and with a recess 35.

Within the cap or end member 29 is mounted an operating lever 36 having a reduced tip 37 which can be snapped into a receiving recess 38 in the body of the plastic or other material, to provide a fulcrum for the lever and with the underside of the lever bearing against the boss 26 to cause the piercing point to penetrate the cartridge and release the contents thereof so that such contents can flow through the opening 19 and inflate the container or casing 15 simultaneously expelling the same from the housing.

The housing may be fastened to the person in any desired manner one advantageous way being to the wrist by means of a strap 39 and a buckle 40, the housing having openings 41 and 42 (FIG. 7) for the accommodation of said strap and of a size to provide a differential sufficient to permit discharge of water, sand or the like from within the chamber 14 of said housing.

It will be obvious to one skilled in the art that various changes may be made in the invention without departing from the spirit and scope thereof and therefore the invention is not limited by that which is illustrated in the drawings and described in the specification, but only as indicated in the accompanying claims.

What is claimed is:

1. A personal inflatable life preserver comprising a housing having wall structure defining a chamber with an open end and a discharge opening in spaced relation to said open end, an imperforate diaphragm having an enlargement on one side closing said open end, a firing pin mounted in said diaphragm and projecting therefrom only into said chamber, sealing means between said diaphragm and said housing, said chamber receiving a compressed gas cartridge having one end constructed to be pierced, an inflatable container attached to said wall structure about said discharge opening in a manner to have closed communication with said chamber, and means for producing relative movement between said cartridge and said firing pin for causing the piercing of the cartridge to release the contents thereof, said wall structure being impervious to the compressed gas released from said cartridge.

2. The structure of claim 1 in which said diaphragm comprises a relatively flat wall portion disposed substantially at right angles to the axis of said pin.

3. The structure of claim 1 in which the means for producing relative movement comprises a handle operable against the enlarged portion of said diaphragm.

4. A personal inflatable life preserver comprising a housing having wall structure defining a chamber for an inflatable container and a chamber for a compressed gas cartridge, having one end constructed to be pierced, said cartridge chamber having an opening providing communication with said container chamber and an opening for receiving the cartridge, an imperforate diaphragm closing said cartridge receiving opening, a firing pin mounted in said diaphragm and projecting therefrom only into said chamber, sealing means between said diaphragm and said housing, an inflatable container attached to said wall structure about said communication opening, and means for producing relative movement between the cartridge and said firing pin for causing the piercing of the cartridge to release the contents thereof.

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