Oct. 31, 1950 U. C. WALK 2,527,604

ACTUATING MECHANISM FOR INFLATING DEVICES

Filed Sept. 19, 1945

FIG. 1

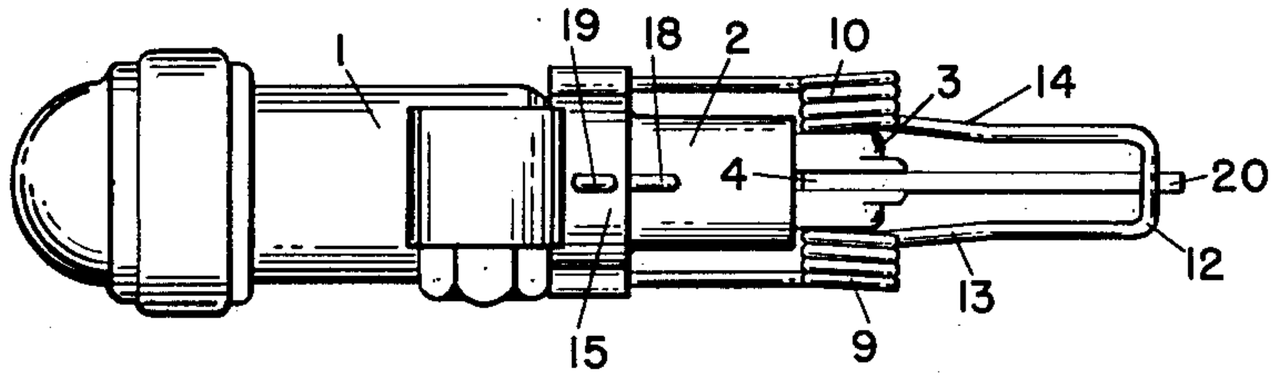


FIG. 2

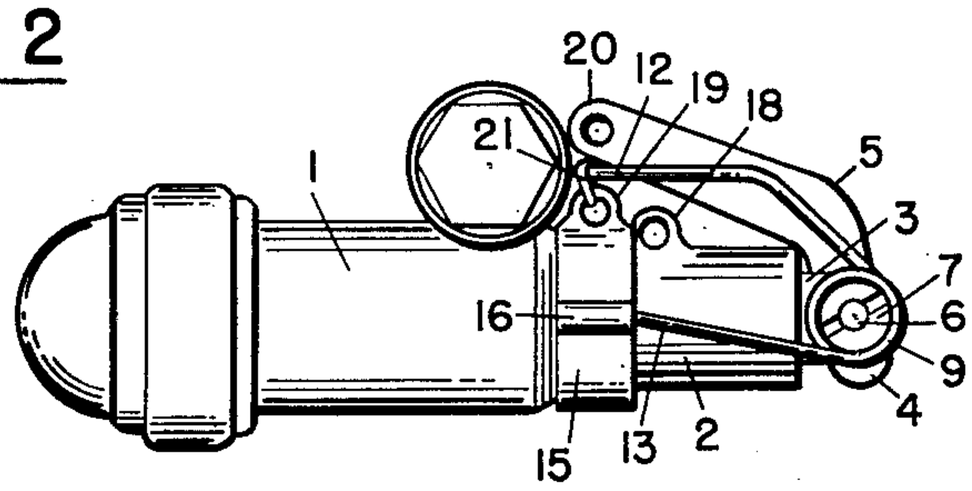


FIG. 3

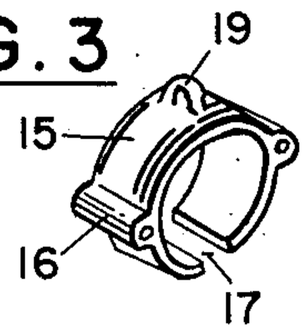
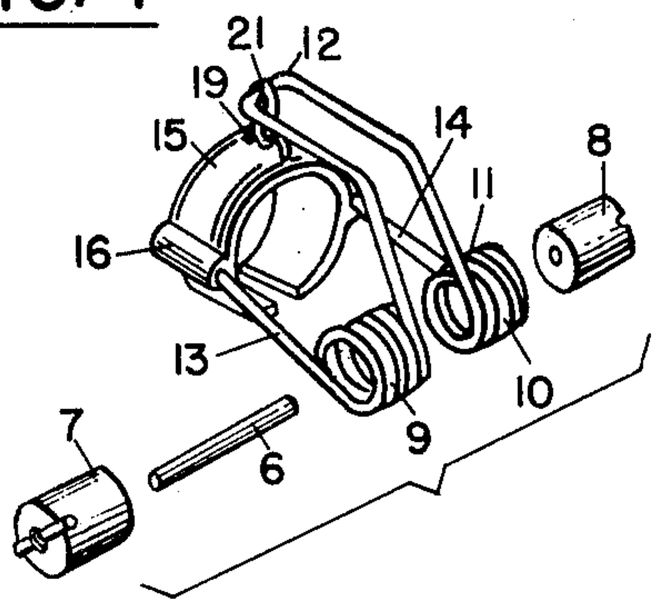


FIG. 4



INVENTOR

UDELL C. WALK

BY

Ralph L. Chappell

ATTORNEY

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ACTUATING MECHANISM FOR INFLATING DEVICES

Udell C. Walk, United States Navy, Carmel, Calif.

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7 Claims. (Cl. 222—5)

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This invention relates to life belt inflators and more particularly to actuating mechanisms therefor.

Heretofore, it has been the experience of personnel engaged in overwater operations to be rendered unconscious or otherwise incapacitated from a severe crash landing or in the case of military and naval personnel as the result of enemy action. This hazard is particularly present in amphibious military operations.

Present life belts require manual operation by the wearer and provide no means of inflating the same in the event the wearer is incapacitated.

Release mechanisms have been designed to operate in either fresh or salt water. However, at the present time, such mechanisms are usually affected in a relatively short time by humidity, fog and rain.

Objects of this invention are, therefore, to provide a life belt inflator that is not subject to premature inflation from humidity, fog and rain; to provide for attaching inflators embodying the present invention to existing life belts without requiring changes therein; to provide for making existing life belts fully automatic; to allow for manual operation of conventional actuating mechanisms in existing belt inflators; to provide improved elements and arrangements thereof in life belt inflators; and to provide an economical and efficient inflator of the character and for the purposes noted.

In accomplishing these and other objects of the invention I have provided improved details of structure, the preferred form of which is illustrated in the accompanying drawing, wherein:

Fig. 1 is a plan view of my improved inflator with its actuating spring in extended position.

Fig. 2 is a side elevational view of my improved inflator with the actuating spring wired down in the cocked position.

Fig. 3 is a detail perspective view illustrating the spring holding collar that serves as a cathode.

Fig. 4 is an exploded perspective view of the lever actuating mechanism of my improved life belt inflator.

Referring more in detail to the drawing:

1 designates a conventional type of life belt inflator that comprises a barrel adapted to contain gas under pressure for the purpose of inflating life belts. The barrel is provided with a reduced portion 2 at one end thereof that terminates in spaced bosses 3 between which one end 4 of a lever 5 is mounted. The end 4 of the lever is provided with a suitable puncturing device, not shown, for puncturing the reduced portion 2 of the barrel to allow escape of the gas contained in the barrel to inflate a life belt in customary fashion. The lever 5 is pivoted adjacent the end 4 to the bosses 3 by a pin 6, the pin 6 acting as an axle or shaft support for bushings 7 and 8.

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In the conventional operation of this device the wearer of a life belt provided with this inflator manually actuates the lever 5 to puncture the barrel allowing the gas in the barrel to escape into life belt chambers and thus inflate the belt. This type of inflator is quite commonly available and widely used particularly by the United States Navy. The details of its construction appear in United States Navy Bureau of Aeronautics specification 23 P 17 (Aer) and constitutes no part of my invention.

My invention comprises certain elements hereinafter described which may be added to the conventional inflator without the necessity of altering the construction of that inflator and without impairing the ability of the inflator to operate in its usual manner. My invention provides for an automatic means for actuating the inflator lever 5 as an alternative to the manual operation thereof. An essential element of my combination is a spring. The bushings 7 and 8 form bearing supports for coils 9 and 10 of this spring which is generally designated 11. The intermediate end of the spring is formed into a loop 12 and the outer extremities of the spring form supporting arms 13 and 14 for the spring.

In order to so arrange the spring that it may act on and actuate the lever 5, I provide a collar 15 that is sleeved on the reduced portion 2 of the inflator barrel and is provided with diametrically opposed bored bosses 16 to receive the ends of the arms 13 and 14 of the spring 11. The collar 15 is also provided with a slot 17 to allow it to be sleeved over the reduced portion 2 at the outer end thereof, the slot allowing passage of the sleeve past the wiring eyelet 18 on the inflator after which the sleeve may be rotated 180° to arrange a wiring eyelet 19 on the collar immediately below the apertured end 20 of the lever 5. In the conventional construction of the inflator, a frangible wire is passed through the eye in the end 20 of the lever 5 and the eyelet 18 to tie these two parts together sufficiently to prevent accidental actuation of the lever 5 which might be occasioned by the wearer of a life belt brushing against various objects. The wire is sufficiently weak, however, to be broken immediately upon manual operation of the lever 5 or upon automatic operation thereof by the spring 11.

21 designates a wire or the like that is engageable with the eyelet 19 on the collar 15 and the looped end 12 of the spring to hold the spring in depressed condition.

The collar 15 is preferably copper for the purpose of acting as a cathode and the link 21 is preferably magnesium wire to act as an anode. Thus, when the inflator is immersed in water, and especially salt water, a galvanic action occurs between these materials and effects deterioration of the magnesium anode line 21.

Operation

With a life belt inflator equipped with an actuating mechanism constructed as described, wearers of such life belts may fall or be thrown into the water and without any conscious effort on their part, galvanic action between the collar cathode and line anode sets up to disintegrate the wire anode and release it from the collar or spring. Release of the wire anode frees the spring 11 and the looped end 12 thereof pushes the end 20 of the lever 5 up and to the right, Fig. 2, to effect pivoting thereof and cause movement of the puncturing device on the end 4 on the lever into the barrel. The gas in the barrel is thus allowed to escape and inflate the life belt even though the person wearing the belt may have been rendered unconscious.

It is apparent that should it be desired to manually operate the lever, this may be done without interference by the spring actuating mechanism.

Although I have herein shown and described my invention in what I have conceived to be the most practical and preferred embodiment, it is recognized that departures may be made therefrom within the scope of my invention, which is not to be limited to the details disclosed herein, but is to be accorded the full scope of claims so as to embrace any and all equivalent mechanisms.

While I prefer to use pure magnesium wire as an anode, and pure copper as a cathode, other materials known to the art may be used or it may be desirable to stimulate or retard the galvanic action by adding a chemically treated coating to either or both electrodes.

It may be further desirable to independently attach the spring coil bushings so that dismounting the existing lever pin would not be necessary.

It may be further found that a suitable plastic or similar material or a suitable coated material exists or may be developed which could be used to normally depress the actuating spring and thus eliminate the necessity of galvanic action entirely.

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.

I claim:

1. In a device of the character described having a barrel containing a gas and a lever pivotally mounted on the barrel having a barrel puncturing element, the improvement which comprises means for actuating the lever to effect puncturing of the barrel including a spring mounted on the barrel at the pivot point of the lever and having one end arranged below the lever, a collar mounted on the barrel confining the other end of the spring, and means on the collar engageable with the first named end of the spring for restraining action thereof on the lever.

2. In a device of the character described having a barrel containing a gas and a lever pivotally mounted on the barrel having a barrel puncturing element, the improvement which comprises means for actuating the lever to effect puncturing of the barrel including a spring mounted on the barrel at the pivot point of the lever and having one end arranged below the lever, a collar mounted on the barrel and confining the other end of the spring, and means on the collar engageable with the first named end of the spring for restraining action thereof on the lever, at least one of said collar and spring restraining means being decomposable in water.

3. In a device of the character described having a barrel containing a gas and a lever pivotally mounted on the barrel having a barrel puncturing element, the improvement which comprises means for actuating the lever to effect puncturing of the barrel including a spring mounted on the barrel at the pivot point of the lever and having one end arranged below the lever, a collar mounted on the barrel and confining the other end of the spring, and means on the collar engageable with the first named end of the spring for restraining action thereof on the lever, said collar having the characteristics of a cathode and said spring restraining means having the characteristics of an anode to effect galvanic deterioration of the anode upon immersion in water.

4. In a device of the character described having a barrel containing a gas and a lever pivotally mounted on the barrel having a barrel puncturing element, the improvement which comprises means for actuating the lever to effect puncturing of the barrel including a spring mounted on the barrel at the pivot point of the lever having one end normally acting against the lever, a copper collar mounted on the barrel confining the other end of the spring, and a magnesium wire on the collar engaged with the first named end of the spring for restraining action of the spring.

5. In a device of the character described, a metallic collar adapted to be mounted on an inflator, means mounted on the collar adapted to be cocked relative to an inflator puncturing lever, and means metallically dissimilar to said collar for normally holding said cocking means in cocked condition, the composition of said collar and said holding means being such that said holding means will disintegrate relatively rapidly upon exposure of said device to sea water.

6. In a device of the character described, an attaching device, a cocking device, and means metallically dissimilar to at least one of the attaching and cocking devices for normally holding the cocking device in cocked condition, the composition of said holding means being such as to cause said holding means to disintegrate relatively rapidly upon exposure of said first mentioned device to sea water.

7. In a device of the character described, a copper collar adapted to be mounted on an inflator, means mounted on the collar adapted to be cocked relative to an inflator puncturing lever, and a magnesium wire in electrical conducting relation to said collar for normally holding said cocking means in cocked condition.

UDELL C. WALK.

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