Oct. 31, 1950 U. C. WALK 2,527,605

ACTUATING MECHANISM FOR INFLATING DEVICES

Filed Nov. 14, 1945

FIG 1

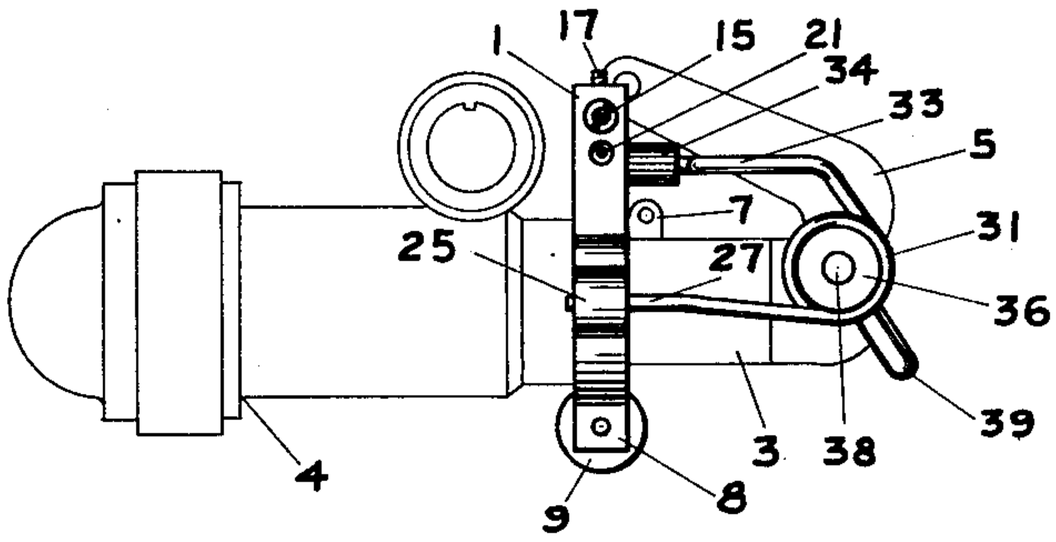


FIG 2

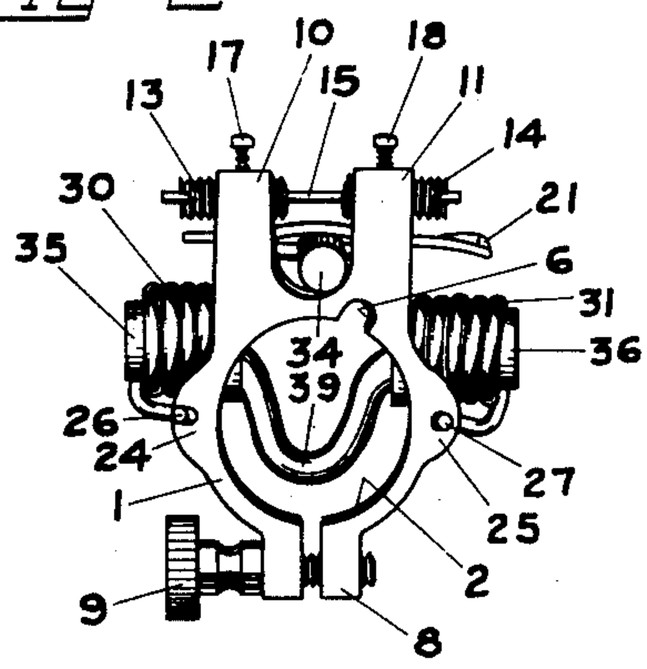


FIG 3

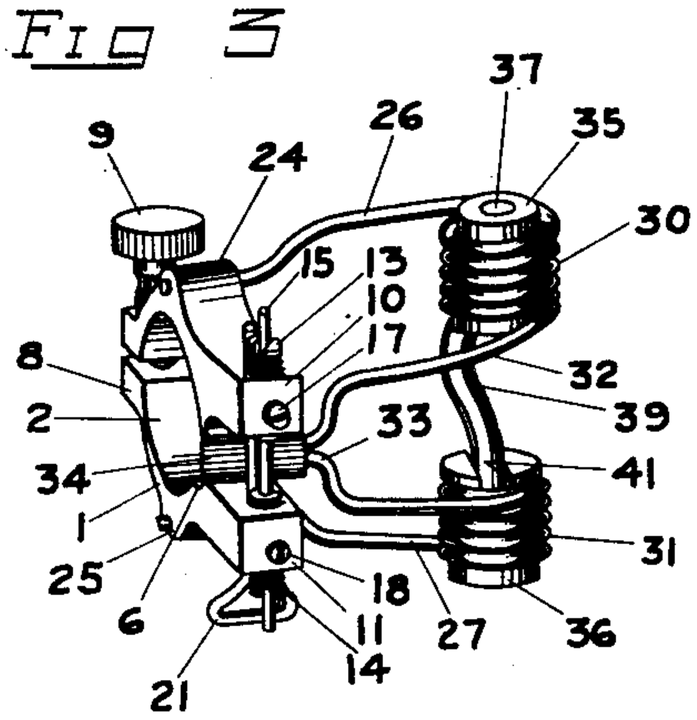
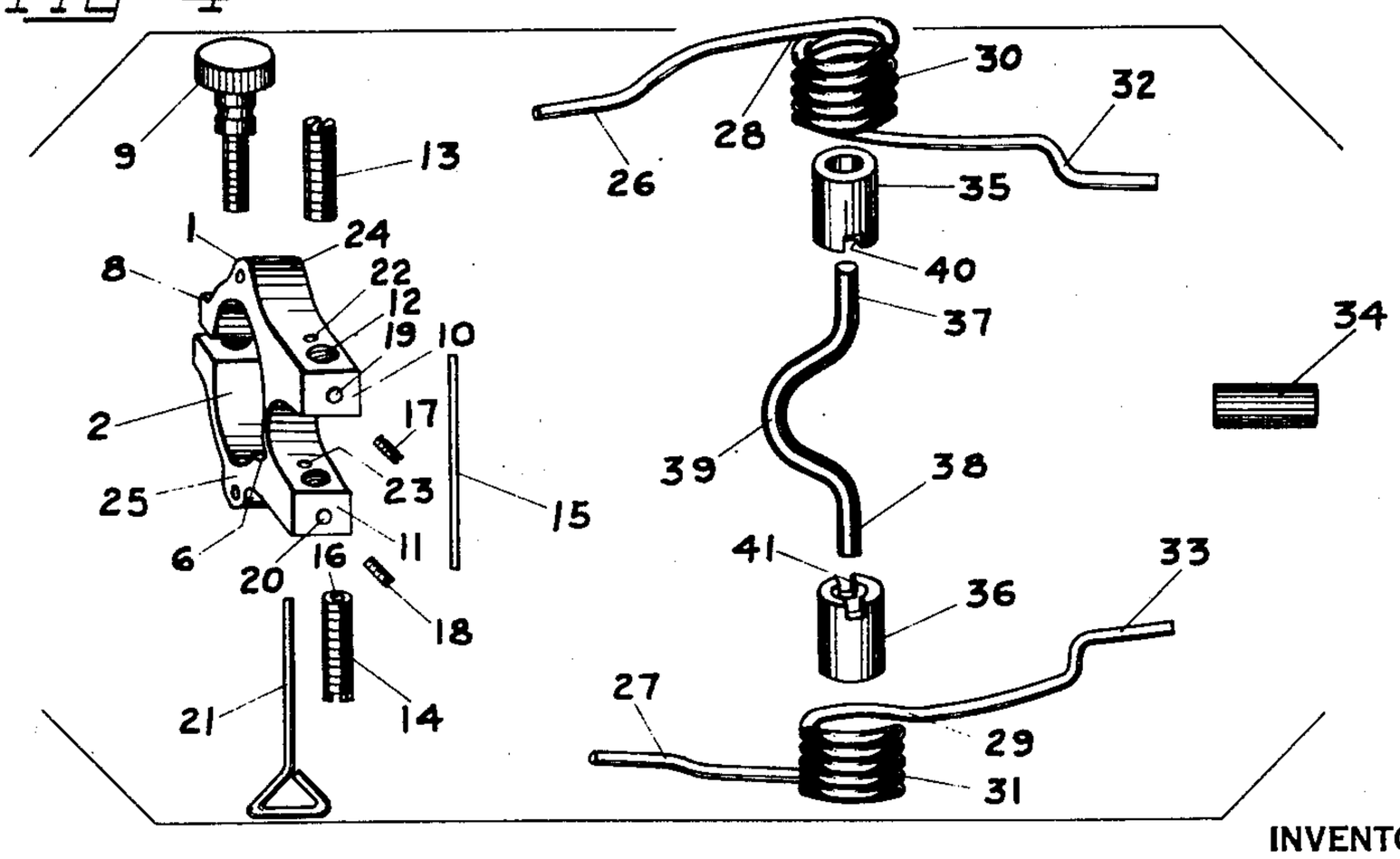


FIG 4



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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3 Claims. (Cl. 222—5)

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This invention relates to an actuating mechanism for inflating devices and more particularly to such a mechanism for life belt and like inflators.

Life preservers, such as belts, vests and similar devices of inflatable type, that are now available require a manual operation for inflation. No arrangement has heretofore been provided, to my knowledge, for automatically inflating life preservers in emergency situations in which the wearer has been incapacitated.

For example, 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.

Release mechanisms for life preserver inflators have been designed to operate in either fresh or salt water. At the present time, however, 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 preserver inflator actuating mechanism that is not subject to premature operation from humidity, fog and rain; to provide for attaching devices embodying the present invention to existing life belts and preservers without requiring changes therein; to provide for making existing life preservers fully automatic; to provide for varying the time of actuation of such mechanisms; to allow for manual operation of conventional actuating mechanisms in existing inflators; to provide improved elements and arrangements thereof in life belt inflators; and to provide for carrying out the foregoing objects in a facile, economical and efficient manner.

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

Fig. 1 is a side elevational view showing my improved inflator attachment mounted on a conventional life preserver inflator.

Fig. 2 is an end elevational view of my improved attachment per se.

Fig. 3 is an elevational view of my improved attachment at right angles to the showing thereof in Fig. 2.

Fig. 4 is a detail perspective view of the several elements of my improved attachment in disassembled relation.

Referring more in detail to the drawing:

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1, Fig. 4, designates a collar of copper or other electrolytically reactive metal, the collar having a central aperture 2 adapting the same to be mounted on a staging 3, Fig. 1, of an inflator 4. A lever arm 5 is pivotally mounted on the inflator and is provided with a pin (not shown) to puncture a carbon-dioxide or like gas containing cartridge, in the inflator chamber as and when the lever is pivoted outwardly and to the right, Fig. 1. The central aperture 2 of the collar is provided with an off-set slot 6 for adapting the collar to pass a safety wire eyelet 7 on the inflator staging.

One portion of the collar is provided with separable adjusting wings 8 that project laterally from the collar and are provided with transversely arranged aligned threaded apertures for receiving an adjusting screw 9. It is apparent that the adjusting screw may be loosened to mount the collar on the inflator staging and subsequently tightened to clamp the same thereto.

Another portion of the collar is preferably provided with laterally projecting spaced bosses 10 and 11, the ends of which are preferably provided with transversely aligned threaded apertures 12 to receive adjustable bridge supporting adjusting screws 13 and 14.

A bridge 15 consisting of a metal dissimilar to the collar 1 and preferably formed of magnesium wire extends through longitudinal bores 16 in the screws 13 and 14 to bridge the space between the bosses 10 and 11.

17 and 18 designate set screws engageable in threaded apertures 19 and 20 in the outer ends of the bridge bosses to fix the screws, and consequently the bridge, in adjusted position relative to the collar 1.

If desired a safety lock pin 21 may be arranged between the bosses 10 and 11 by passing the same through transversely aligned apertures 22 and 23 in the bosses that are arranged between the bridge and the collar proper.

The collar is also provided with apertured, preferably diametrically apposed lugs 24 and 25 on its periphery, the apertures of which are adapted to seat the ends of arms 26 and 27 of springs 28 and 29. The springs are each preferably coiled as at 30 and 31 intermediately of their ends. The ends of the springs opposite the arms 26 and 27 terminate in arms 32 and 33 that are opposed to the arms 26 and 27. 34 designates a tubular cap that receives and connects together the arms 32 and 33 of the springs.

The coils 30 and 31 of the springs are so turned as to adapt them to receive bushings 35 and 36 provided with internal passages that form bear-

ing seats for the trunnions forming ends **37** and **38** of a yoke **39**, the curved intermediate portion of which adapts the attachment for mounting on the inflator without disassembling the same. The inner ends of the bushings are provided with transverse ways **40** and **41** to seat portions of the yoke, Fig. 3, and deter unintended turning of the yoke in the bushings.

Assembly and operation

The assembly and operation of an inflator attachment constructed as described is as follows:

The trunnions **37** and **38** are inserted in the central openings of the bushings **35** and **36** which latter are inserted in the coils **30** and **31** respectively of the springs **28** and **29**. The cap **34** is then arranged over the ends of the arms **32** and **33** to hold them together. The ends of the arms **26** and **27** are then mounted in the apertures of the collarg lugs **24** and **25**, after which the cap **34** is manipulated to fold the arms **32** and **33** against tension of the spring coils into the collar recess between the bosses **10** and **11**. The safety key or lock pin **21** is then inserted in the apertures **22** and **23** to hold the spring in its thus cocked condition.

The bridge adjusting screws **13** and **14** are then mounted in the threaded apertures provided therefor in the collar bosses **10** and **11** and the bridge **15** is inserted through the bridge screw bores **16** to bridge the collar bosses. The adjusting screws **13** and **14** may be adjusted laterally to vary the length of the magnesium wire bridge and thus adjust it as to strength and rigidity to counteract the strength of the spring for predetermined periods of time when the attachment is subjected to sea water. When the bridge has been so adjusted, the set screws **17** and **18** may be turned down to hold the adjusting screws **13** and **14** in desired position.

The attachment as a unit, as shown in Figs. 2 and 3 is then mounted on the staging **3** of an inflator **4**, by pivoting the lever **5** to the right (before the inflator shell has been provided with a gas cartridge) and sleeving the collar over the lever **5** and staging **3**. The offset slot **6** passes the wiring eyelet **7** on the inflator and the collar is then rotated to align the cap **34** within the collar boss recess. The clamping screw **9** is then turned down to hold the collar and attachment in set on the inflator. The lever is then pivoted back to the left, Fig. 1, over the bridge **15** and is then in cocked condition.

Due to the shape of the yoke **39** that interconnects the bushings and spring coil assembly, the attachment may be mounted on existing inflators of the type shown in Fig. 1 around the end of the lever **5** without the necessity of disassembling the attachment.

Assuming the attachment to be assembled on an inflator in the manner described and the inflator to be applied to a life preserver the wearer of such a preserver is protected if thrown into the sea even though he may be incapacitated by shock, injury or the like in the following manner:

The safety key **21** having been removed when the life preserver is put on, and the copper collar and magnesium wire bridge being of dissimilar elements, exposure thereof to sea water sets up a galvanic action that causes relatively rapid corrosion of the magnesium wire depending upon its rigidity and strength as determined by the bridge adjusting screws **13** and **14**. Upon deterioration of the magnesium wire bridge, its ability to withstand the pressure of the cocking spring is reduced and the spring automatically fractures the wire. The stored spring tension forces the arms **32** and **33** upwardly and outwardly relative to Fig. 1 against the lever **5** of the inflator **4**. The lever of the inflator is provided with a puncturing device for a gas cartridge in the inflator chamber that allows escape of carbon dioxide or like gases to effect inflation of a life preserver to which it is attached.

It is thus apparent that without any conscious effort on the part of the wearer, automatic inflation of a life preserver occurs when the attachment so described is subjected to sea water.

While I have shown but one embodiment of my invention, it is apparent that the device is susceptible to modification without departing from the spirit of the invention. For example in some instances, it may be desirable to omit the bridge adjusting screws and design the bridge to react with the collar to fracture at predetermined set time periods after exposure to sea water. I do not wish, therefore, to be limited by the disclosures set forth, but only by the scope of the appended claims.

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, a copper or other suitable metallic collar having a central aperture to mount the same on a life preserver inflator staging, the collar having a slot to pass an inflator wiring eyelet on said staging, separably adjustable clamping wings on the collar, means for adjusting said clamping wings, spaced bosses on said collar, a magnesium wire bridge between said bosses, means for adjusting the bridge to vary the space between said bosses, and the strength of the bridge, means for fixing said adjusting means in position, a safety key removably mounted between said bridge and collar, opposed apertured lugs on said collar, springs having arms mounted in the apertures of said lugs, said springs being coiled intermediately of their ends and having arms extending oppositely to said first named arms, means inter-connecting said last named arms engageable between said collar bosses and within the collar and bridge, bushings mounted in the coils of said springs having transverse slots and a yoke having trunnion ends mounted in said bushings and the slots thereof to prevent unintended turning of the yoke and having a curved intermediate portion to fit around a lever on the inflator whereby the device may be mounted on an inflator without disassembling the same.

2. In a device of the character described, a metallic collar having a central aperture to mount the same on a life preserver inflator staging, separably adjustable clamping wings on the collar, means for adjusting said clamping wings, spaced bosses on said collar, a bridge between said bosses of a metal dissimilar to said collar, opposed apertured lugs on said collar, springs having arms mounted in the apertures of said lugs, said springs being coiled intermediately of their ends and having arms extending oppositely to said first named arms, means inter-connecting said last named arms engageable between said collar bosses and between the collar and bridge, bushings mounted in the coils of said springs, and a yoke having ends mounted in said coil bushings to interconnect the spring assembly.

3. In a device of the character described, a metallic collar, spaced bosses on said collar, a variable bridge between said bosses of a metal dissimilar to said collar, and springs having arms mounted in said collar, said springs having interconnected arms extending oppositely to said first named arms engageable between the collar and bridge.

UDELL C. WALK.

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