

May 28, 1940.

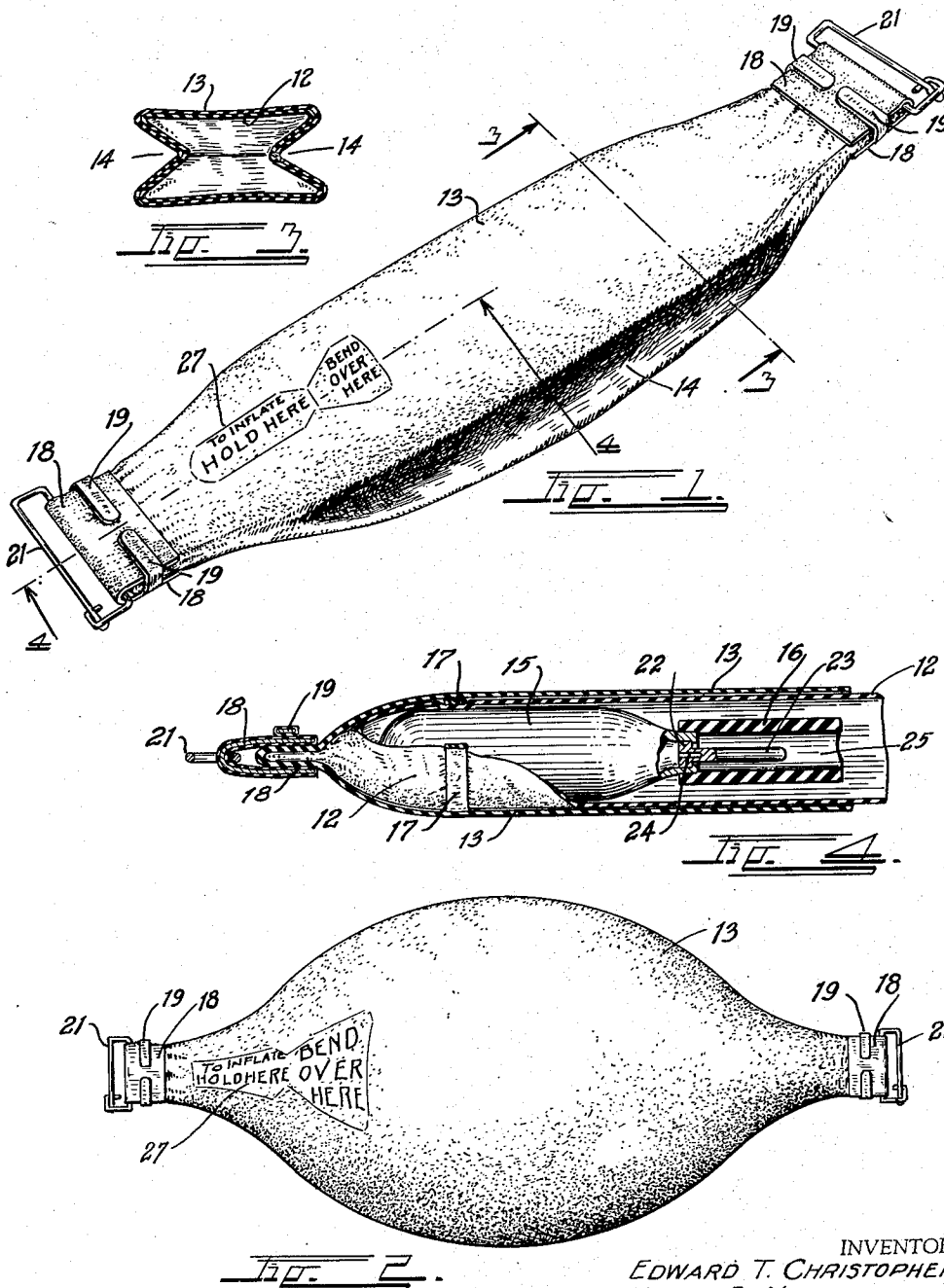
E. T. CHRISTOPHER ET AL

2,202,415

SELF-INFLATING LIFE PRESERVER

Filed April 19, 1938

2 Sheets-Sheet 1



INVENTORS
EDWARD T. CHRISTOPHER.
HUGH E. MURRAY.
BY *R. H. M. M. M.* ATTORNEY.

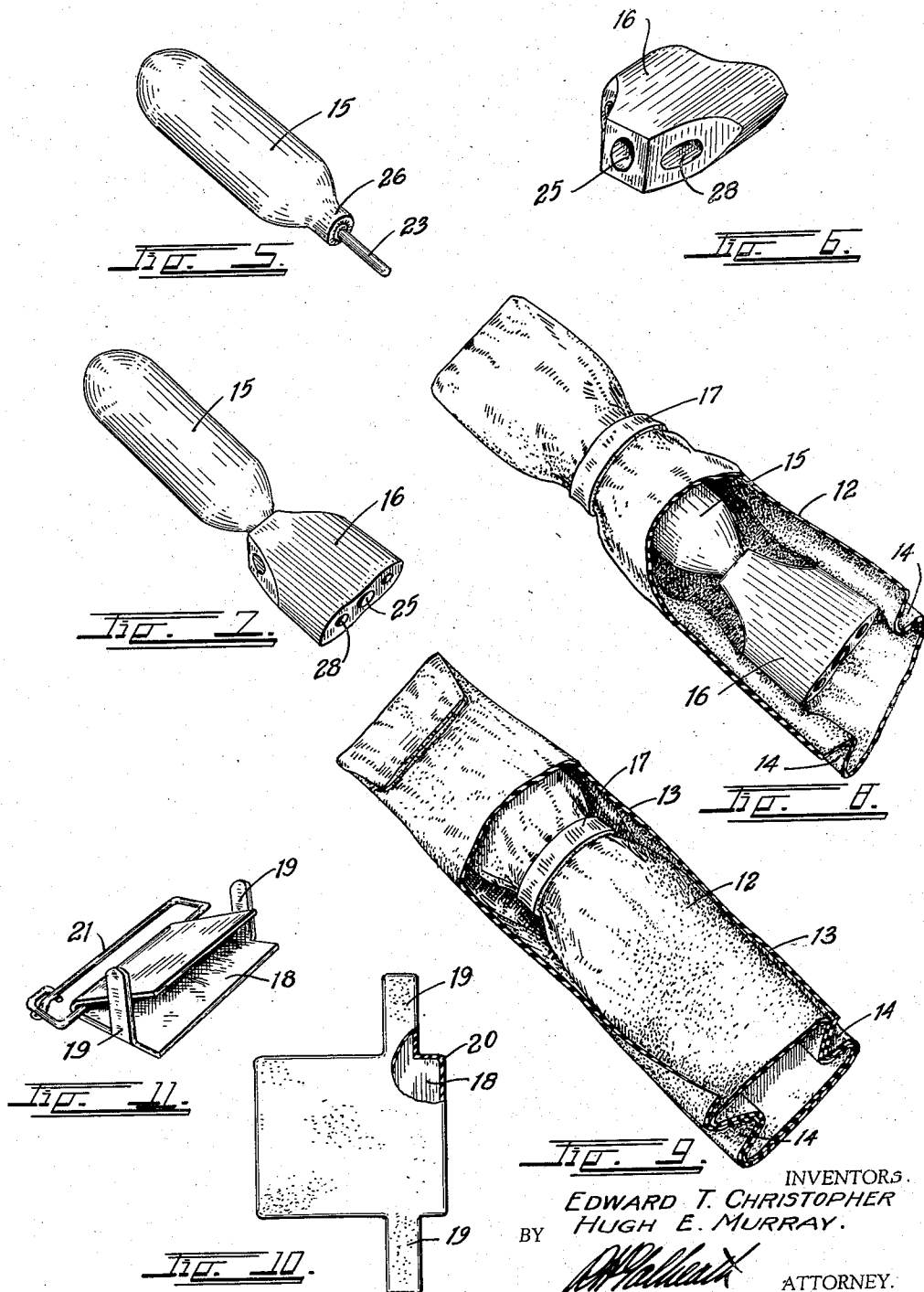
May 28, 1940.

E. T. CHRISTOPHER ET AL
SELF-INFLATING LIFE PRESERVER

2,202,415

Filed April 19, 1938

2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE

2,202,415

SELF-INFLATING LIFE PRESERVER

Edward T. Christopher and Hugh E. Murray,
Denver, Colo.

Application April 19, 1938, Serial No. 202,843

5 Claims. (Cl. 9-19)

This invention relates to a self-inflating life preserver and is more particularly designed as an improvement over the device shown in applicant's copending application, Serial No. 85,247 which has matured into Patent No. 2,118,165 dated May 24, 1938.

The principal object of the invention is to provide a neat, compact and highly efficient device which can be attached to the garments of a person and which can be quickly and easily actuated to instantly inflate itself to bring the person to the surface and support him thereon.

Other objects of the invention are: to construct a device of this character in which the mode of operation will be clearly indicated to the user so that the preserver can be operated by anyone in an emergency without previous instructions; to provide a double expanding bag or tube so that the weak points of one tube will be protected by the other; to provide means for preventing the breakable tip of the pressure bottle, or the expanding gas therefrom, from damaging the expandable tube; to provide means for securely and permanently attaching both tubes to a garment attachment device; and to permanently and securely locate a compressed gas bottle and its protecting member at a fixed location within the tube; and to so construct the preserver that it will have maximum strength and maximum expansive qualities with a minimum of size when deflated.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention reference is had to the accompanying drawings which form a part hereof. Like numerals refer to like parts in all views of the drawings and throughout the description.

In the drawings:

Fig. 1 is a perspective view of the improved self-inflating life preserver in the deflated condition.

Fig. 2 is a similar view illustrating the preserver, on a somewhat smaller scale, in the inflated condition.

Fig. 3 is a detail cross section taken on the line 3-3, Fig. 1.

Fig. 4 is a detail longitudinal section through one extremity of the preserver taken on the line 4-4, Fig. 1.

Fig. 5 illustrates the type of metallic pressure bottle employed in the device.

Fig. 6 illustrates the tip protector for the bottle.

Fig. 7 illustrates the assembled tip protector and bottle.

Fig. 8 illustrates the tip protector and bottle in position in the inner tube.

Fig. 9 is a similar view illustrating the inner tube in position within the outer tube.

Fig. 10 illustrates the end clamping member in the open position.

Fig. 11 illustrates the assembly of the end clamping member and attachment clip.

The improved self-inflating life preserver employs an inner tube 12 positioned within an outer tube 13. The two tubes are exactly similar in contour, in fact, in manufacture, the outer tube is formed over the inner tube with a separating layer of soapstone, talc or similar material to prevent adhesion of the two tubes. Both tubes are formed with accordion-like, inwardly-extending pleats 14 in their opposite sides throughout the length of the mid portion thereof. These pleats allow the tubes to be drawn or folded flat when in place on the user and yet allow a wide expansion thereof when inflated.

When manufactured one extremity of each tube will be closed as shown in Fig. 8. The other extremity will be open for the insertion of a metallic pressure bottle 15 and its tip protector 16. The pressure bottle 15 is passed to the closed extremity of the inner tube and is clamped in place therein by means of a tight fitting rubber band 17 which clamps the inner tube snugly about the bottle 15.

The open extremities of the tubes are then folded over and cemented to close the tubes. The closed extremities of both tubes are then passed into a metallic end clamping member 18, shown in detail in Figs. 10 and 11. This clamping member is bent over the extremities of both tubes and is tightly pressed together over the extremities after the latter have been coated with a layer of water proof cement. One flap of the clamping members 18 is formed with locking tongues 19 which are folded over and forced down upon the other flap as shown, in Fig. 1, to firmly lock the member in the folded position.

It is preferred to have the clamping members rubber plated to prevent corrosion and to allow them to be permanently cemented in place. This rubber plating is indicated at 20 in Fig. 10. Each clamping member hingedly carries a wire attachment clip 21 of any suitable design by means of which the entire preserver may be clamped to the belt or other garment of the user.

This method of construction permanently closes both tubes and permanently attaches the extremities of both tubes to the attachment clips so that should either tube become broken, the other tube will be in position to support the user.

It is impossible to form a rubber article with absolute uniform walls so that it will expand uniformly at all points. A weak place in the wall allows the entire expansion to take place at that point. By employing two tubes, however, it is very unlikely that the weak places in both tubes will occur at the same points so that each tube acts to reinforce the other and cause a uniform expansion.

The pressure bottle 15 is preferably of the type employed in siphon bottles for supplying carbon dioxide gas provided with a narrow neck portion 26. The bottle is packed with the gas in solid form and is closed by means of a metallic disc 22, over which the extremity of the bottle 15 is rolled to form a permanent pressure proof seal.

A relatively long slender tip 23 projects from the disc 22. This tip contains a gas escape passage 24 which extends therein to a point just beyond the disc 22. The remainder of the tip is solid material. This construction forms a weak point in the tip where it emerges from the bottle so that when an attempt is made to bend the tip in any direction, it will break at this point and at no other. The tip is formed of easily breakable material, such as pot metal, pewter, or similar frangible material.

The protector 16 is formed of relatively stiff rubber or similar flexible material and has a central passage 25 of a size to fit snugly over the narrow neck 26 of the bottle 15. In assembling, the protector is cemented to this narrow neck 26 to form the assembly of Fig. 7. The tip protector 16 is widened to present a wide, flat appearance which will not interfere with the flat folding of the collapsed article and yet will present a wide surface for finger contact.

A picture outline 27 is printed upon the outer tube immediately over the position of the bottle 15 and its protector 16 so as to inform the user of the exact position of these elements within the tubes. The pictured representation of the bottle contains the wording, "To inflate hold here," and the picture representation of the tip member 16 contains the wording, "Bend over here." This informs the user without additional instructions exactly how to operate the preserver. If these instructions are followed, the bending of the protector breaks the tip 23 from the bottle and allows the now liquefied gas therein to immediately expand to the gaseous state thereby inflating the tubes to the condition of Fig. 2.

The rapid expansion of the gas upon leaving the bottle lowers the temperature thereof to a point well below zero C. If this gas were allowed to immediately contact the tubes, it would freeze the rubber therein to prevent expansion at that point, thus causing a clean cut hole and rendering the preserver useless. This is prevented, however, by the tip protector 16 which is formed of heavy solid rubber and absorbs the first cold expansion of the gas to prevent it from immediately striking the tubes. The tube protector 16 is lightened in weight by additional openings or passage ways 28.

It is desired to call attention to the fact that the pleating of the middle portion of the tubes relieves the end portions thereof from damaging

strains when expanded and causes a localized expansion which gives the user more freedom of movement with the preserver inflated or deflated.

The use of a double bag allows both bags to be of thinner material thus allowing greater expansion and more flexibility without danger of bursting.

While a specific form of the improvement has been described and illustrated herein, it is desired to be understood that the same may be varied, within the scope of the appended claims, without departing from the spirit of the invention.

Having thus described the invention, what is claimed and desired secured by Letters Patent is:

1. A self-inflating life preserver comprising: an inner expansible tube; an outer expansible tube, both tubes having the same contour with one fitting snugly within the other; an attachment clip at each extremity of both tubes; means for securing the extremities of both tubes to said attachment clips; a compressed gas container within the inner tube; means operable from the exterior for releasing the gas therefrom; and a tight fitting rubber band clamping said inner tube about said gas container to firmly hold the latter in a fixed position therein.

2. A self-inflating life preserver comprising: an elongated expansible tube; a compressed gas bottle within said tube; means for locking said bottle in a fixed position within said tube; a narrow neck portion on said bottle; a frangible tip projecting from said neck portion which when broken will release the gas from said bottle; an elastic tip projecting member fitted over and secured to said neck portion about said tip; an outer elastic, impervious, expansible tube snugly enclosing said first tube, the extremities of said two tubes being permanently secured to each other; attachment members secured to said secured together extremities, said tubes having longitudinally-extending, accordion-like pleats in their sides; and means on the outer tube for designating the position and location of the pressure container in the inner tube.

3. In a self-inflating life preserver of the expansible type, means for attaching said preserver to a user comprising: a folded metallic member the flaps of which are pressed against opposite sides of the extremities of said preserver; a rubber plating on said folded member; an attachment clip hingedly mounted in said folded member; and projecting ears on one flap of said member folded about and over the other flap.

4. A self-inflating life preserver comprising: an inner elongated expansible rubber envelope; a compressed gas bottle sealed within said inner envelope at one extremity thereof; gas releasing means on said bottle; a rubber band about said inner envelope clamping said bottle in fixed position therein; an outer expansible rubber envelope completely sealed about said inner envelope both of said envelopes having longitudinally-extending, accordion-like pleats in their sides; means for attaching the extremities of the inner envelope to the extremities of the outer envelope to prevent relative shifting; visible means on the outer envelope for indicating the position of the bottle and the gas releasing means within the inner envelope; and means for pinning said life preserver to the clothing of a user thereof.

5. A self-inflating life preserver comprising: an inner elongated expansible rubber envelope; a compressed gas bottle in said envelope; a tight-fitting rubber band for locking said bottle in said

envelope adjacent its one extremity; a narrow neck portion on said bottle; a frangible tip projecting from said neck portion; a relatively flat stiff-rubber tip projecting member fitted over and secured to said neck portion about said tip; an outer expansible rubber envelope completely sealed about said inner envelope; both of said envelopes having accordion-like pleats in their sides; means for preventing adhesion between

said envelopes; means for securing the extremities of said inner envelope to extremities of said outer envelope; means for preventing the gas from freezing the rubber upon release of said gas; and means for attaching said preserver to the clothing of a user.

EDWARD T. CHRISTOPHER.
HUGH E. MURRAY.