

April 15, 1924.

N. CHERNIAK

LIFE SAVING DEVICE

Filed Sept. 10, 1923

1,490,157

2 Sheets-Sheet 1

FIG. 1.

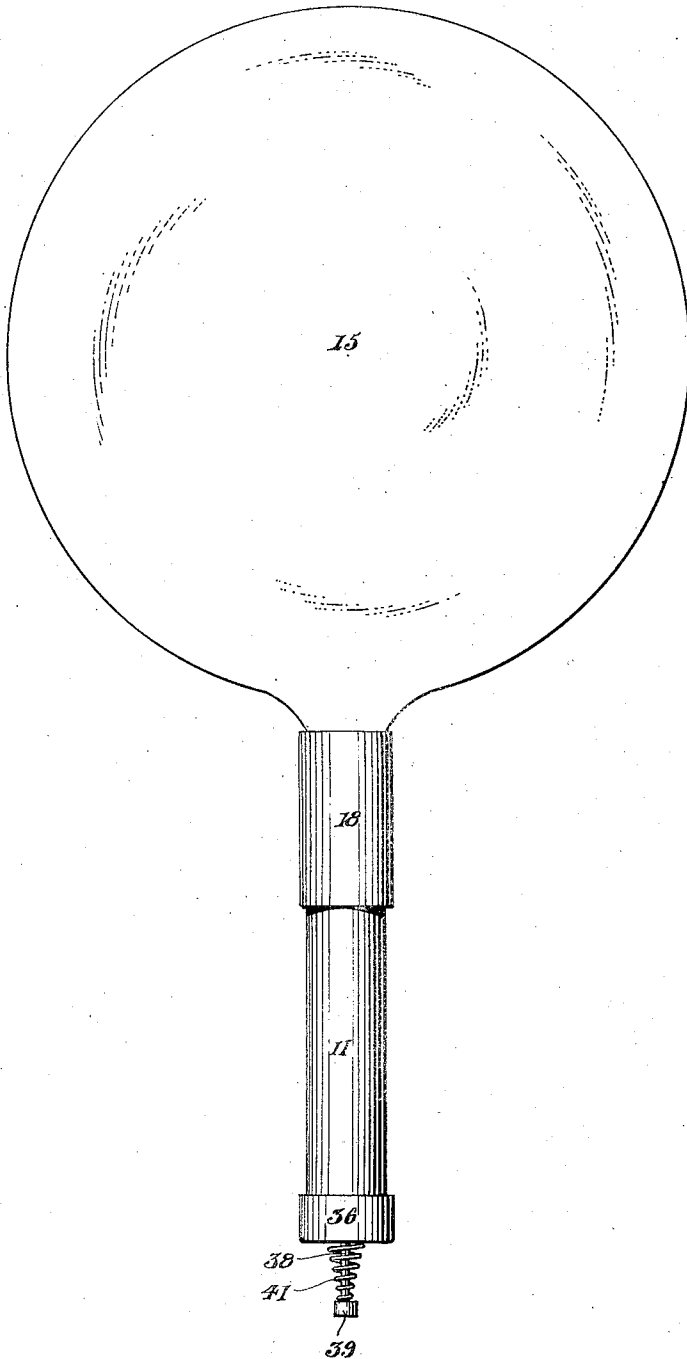


FIG. 4.

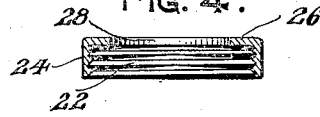


FIG. 5.



FIG. 6.

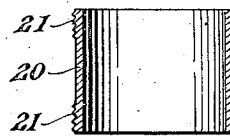


FIG. 7.

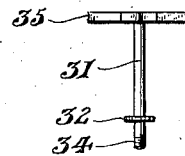


FIG. 8.



FIG. 9.

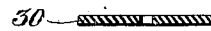
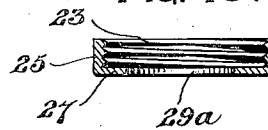


FIG. 10.



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April 15, 1924.

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2 Sheets-Sheet 2

FIG. 2.

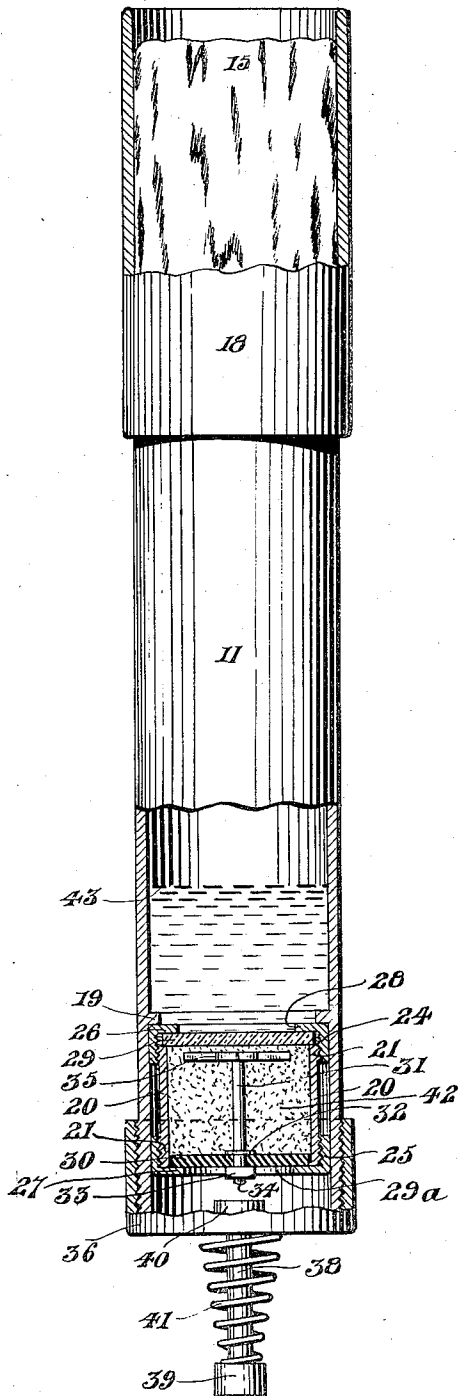
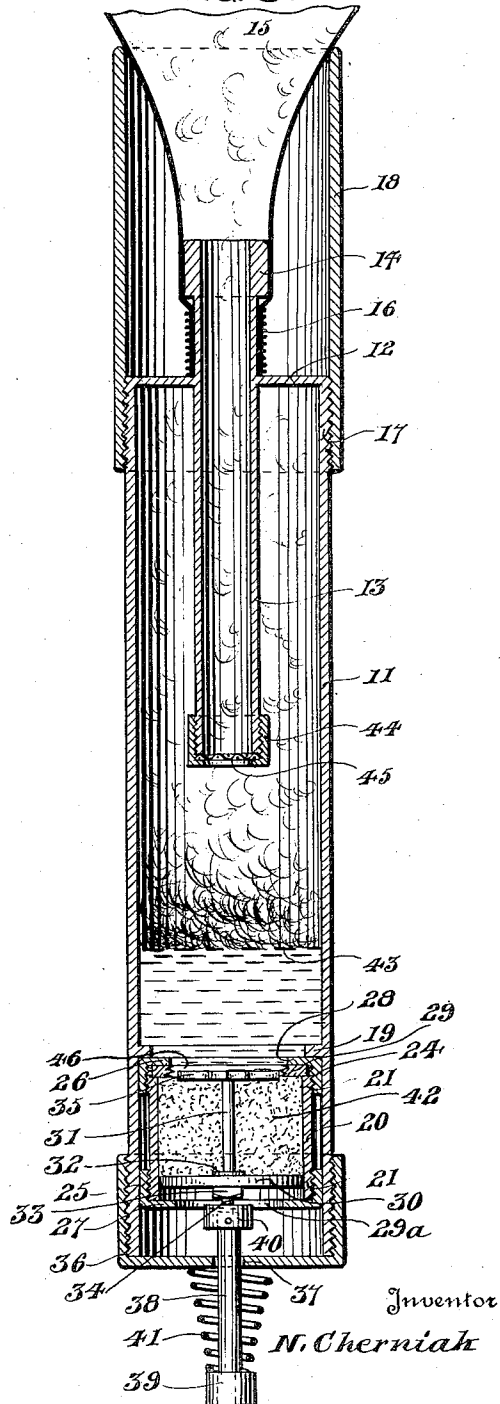


FIG. 3.



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UNITED STATES PATENT OFFICE.

NICHOLAS CHERNIAK, OF BETHLEHEM, PENNSYLVANIA.

LIFE-SAVING DEVICE.

Application filed September 10, 1923. Serial No. 661,899.

To all whom it may concern:

Be it known that I, NICHOLAS CHERNIAK, a citizen of Ukraine, residing at Bethlehem, in the county of Northampton and State of Pennsylvania, have invented certain new and useful Improvements in Life-Saving Devices, of which the following is a specification.

This invention relates to life saving devices and its main object is the provision of a device of a compact and portable nature.

Another important object of the invention is the provision of a normally collapsed inflatable bag in combination with a gas generating apparatus for the purpose of inflating said bag in case of an imminent necessity for sustaining a person upon the surface of water.

A still further object of the invention is the provision of a device containing separate compartments for various chemical agents associated with mechanical means to bring said chemical agents together and to cause a chemical action for the purpose of generating gas.

With the above general objects in view and others that will appear as the nature of the invention is better understood, the same consists in the novel construction, combination and arrangement of parts herein-after more fully described, illustrated in the accompanying drawings and pointed out in the appended claims.

In the drawings forming a part of this application, and in which like designating characters refer to corresponding parts throughout the several views,

Figure 1 is a side elevational view of the device in its operative position, showing the inflated bag and the cylindrical portion or hand grip of the device associated with said bag;

Figure 2 is a side elevational view, partly in section, illustrating the device in its in-operative condition;

Figure 3 is a longitudinal sectional view of the device showing the device in its operative position during the state of gas generation;

Figure 4 is a side sectional view of the upper cover holding in position a fragile disc upon a casing which provides a housing within the device for receiving one series of chemical agents;

Figure 5 is a side elevational view of a fragile disc upon said casing;

Figure 6 is a side sectional view of the cylindrical wall of said casing;

Figure 7 is a side elevational view of a plunger rod with a plunger head and a washer;

Figure 8 is a top plan view of the plunger head;

Figure 9 is a side sectional view of a flexible disc within said casing providing a lower closure for said casing; and

Figure 10 is a side sectional view of the lower cover for said casing providing a means for holding said flexible disc in position within said casing.

Coming now to a more detail description of the invention, the same embodies a main cylindrical receptacle 11 in a form of a tube, which at its upper end is provided with a closure 12 integrally formed therewith. A tube 13 passes through said closure 12 and is integrally formed therewith. At its upper end the tube 13 carries an annular shoulder 14 that prevents the mouth of the bag 15 from slipping from said tube. The mouth of the bag 15 is placed over said shoulder and is firmly held upon said tube as at 16 by any suitable means such as wrapping coil strands as illustrated in the drawings.

The cylindrical receptacle 11 at its upper end is provided with external screw threads 17 for the purpose of receiving the tube 18 that is open at its upper end and provides a housing for the bag 15 when in a collapsed condition. The tube 11 is provided with an internal annular shoulder 19 adjacent its lower end that is formed integrally therewith. The purpose of said shoulder 19 is to prevent any longitudinal shifting of the inner cylindrical casing which will be presently described.

The above mentioned inner cylindrical casing embodies a cylindrical wall 20, shown in detail in Fig. 6, provided at opposite ends with spaced sets of external threads 21 permitting the reception of the upper cover 22 and lower cover 23 shown in Figs. 4 and 10 which fit over said cylindrical wall 20 at its upper and lower ends, respectively. Both of said covers are of identical construction and embody side walls 24 and 25, and annular flanges 26 and 27, respectively, the covers having apertures 28 and 29, respectively. A disc 29 made of any fragile material such as glass or the like is positioned over the upper opening of the cy-

lindrical wall 20 and held firmly thereover by the annular flange 26 of the upper cover 22.

A disc or washer 30 made of rubber or any other flexible material is in frictional contact with the inside surface of said cylindrical wall 20 and normally rests at the lower portion thereof as clearly shown in Fig. 2.

A plunger rod 31 shown in detail in Fig. 7 is carried by the center of said disc 30 and passes therethrough. A small washer 32 is carried by and is integrally formed with said rod 31 for the purpose of preventing the disc 30 from moving upon said rod. In further anchoring said disc upon said rod a nut 33 is provided to engage rod 31 at its threaded end 34. The upper end of rod 31 is provided with a star-shaped plunger head 35. The inner cylindrical casing as above described is adapted to be received within the tube 11 and frictionally held therein, and any upward movement of said casing is limited by the shoulder 19.

The lower end of the tube 11 is externally threaded to receive thereon a cup-shaped member 36 as clearly shown in Figs. 2 and 3. Said cup-shaped member in its bottom wall is provided with a central aperture 37 to receive a plunger rod 38 provided with a head 39 at its lower end and with a hammer 40 at its upper end. A coil spring 41 surrounds the plunger rod 38 and is positioned between the bottom wall of the cup-shaped member 36 and the head 39. The coil spring 41 normally holds the hammer 40 on the plunger rod in a retracted position in respect to the lower end 34 of the plunger rod 31, as illustrated in Fig. 2.

It is understood that bag 15 may be made of any suitable material, such as rubber covered with canvas or the like, and which is waterproof and at the same time impervious to gas such as hydrogen.

To prepare the device for a ready operation a predetermined quantity of potassium and sodium is placed in the cylindrical casing 20 and then the casing is filled with kerosene as at 42 to prevent said two metals from coming in contact with atmosphere and preserve their chemical properties. It is observed that the casing constructed in accordance with the hereinbefore made description will substantially provide a hermetic seal, preventing the kerosene escaping therefrom or any extraneous agents to enter said casing and in any manner affect the quality of the potassium and sodium therein.

The tube 11 is partly filled with water as at 43 which constitutes another chemical agent necessary in causing a chemical action hereinafter described. It is observed that the quantity of water should be predetermined as necessary for the completion of valence in the chemical action which is about to be described. It is further noted

that the inlet tube 13 should extend sufficiently far within the tube 11 so as to prevent the entrance of water from tube 11 to the tube 13. From the construction shown in Fig. 3, it will be apparent that the device is capable of being carried in any position, and if there is only a necessary amount of water in the tube 11, taking of course into consideration the quantity of chemical agents in the casing 20 as well as the size of bag 15 and the length of tube 13, then the device may safely be handled in any position without fear that the water may pass into tube 13 and from there to bag 15. As a further guard to prevent any splashing of water reaching the tube 13, a collar 44 with a sieve or mesh 45 are provided at the inlet end of the tube 13. The mesh 45 will also guard against any impurities as a result of chemical action passing to said tube 13 and from there to the bag 15.

Referring more in detail to the mode of operating of the device, in case of an emergency on a ship or the like, a person provided with one of the devices herein described, will impart a comparatively forceful blow to the head 39, which will cause the hammer 40 to strike the plunger rod 31 which in turn with its plunger head 35 will come in rapid contact with the fragile disc 25 and as a result thereof said disc will be crushed and a communicating entrance between tube 11 and casing 20 will be created as at 46 on Fig. 3. The water will come in contact with potassium and sodium and a chemical action between water and the two metals will take place as is obvious. As a result of said chemical action hydrogen gas will be generated which will escape through tube 13 and will automatically fill the bag 15, the bag being inflated and moved outwardly of the tube section 18, to assume the positions shown in Figs. 1 and 3.

I do not wish to limit myself to the chemical agents above specified as obviously any other substances may be used, such for instance as carbide and water, or any others capable of answering the purpose for generating gas suitable for the inflation of the bag.

It is observed that the impact of the hammer 40 at the end 34 of rod 31, as illustrated in Fig. 3, will cause the disc 30 to slide in an upward direction and to prevent any compression of the contents in the casing 20 or to retard the action of plunger member 35, the disc 30 is made of a flexible material allowing the expansion of the contents in the casing 20 during the action herein described and illustrated in Figs. 2 and 3.

To make tube 11 and casing 20 immune from the chemical action during operation of the device I make them of aluminum which metal is more inert and will be unaffected by said chemical action. Of course,

any other suitable material may be used depending upon the nature of the chemical agents employed and the nature of the consequent chemical action. If preferable, tube 11 and casing 20 may be coated with glass or rubber or the like, in which case tube 11 and casing 20 may be made of any metal.

As is obvious from Fig. 1, the inflated bag 15 during the operation of the device will provide a float capable of sustaining one or more persons upon the surface of water, and tube 11 will provide a handle capable of being grasped at by person in the water. Other details may be added to the tube 11, such as wire or strand cord handles to provide a means for sustaining several persons upon the water.

While there is described herein a preferred embodiment of the present invention, it is nevertheless to be understood that minor changes may be made therein without departing from the spirit and scope of the invention as claimed.

What is claimed as new is:—

1. In a device of the class described, a gas generating apparatus, an inflatable bag associated therewith, and a tube detachably positioned by one of its ends upon said gas generating apparatus and providing a housing for said bag during the inoperative condition thereof, the other end of the tube being open permitting a ready emergence of the bag during the process of inflation.

2. In a device of the class described, a main receptacle, a casing positioned therewithin, a bag associated with said main receptacle, a tube positioned upon said main receptacle providing a housing for said bag during the inoperative position thereof, said receptacle and casing each housing a series of chemical agents, and mechanical means associated with said receptacle and casing for bringing said chemical agents together for the purpose of generating gas to inflate said bag.

3. In a device of the class described, a main receptacle, a casing therewithin, a tube extending inwardly and outwardly of said main receptacle, an inflatable bag positioned upon the outward end of said tube, a tube upon said main receptacle providing a housing for the bag during its inoperative position, said receptacle and casing each housing a series of chemical agents, and mechanical means associated with said receptacle and casing for bringing said chemical agents together for the purpose of generating gas to inflate said bag.

4. In a device of the class described, a main receptacle, a casing therewithin, an inflatable bag associated with said main receptacle, said receptacle and casing each housing a series of chemical agents, mechanical means associated with said receptacle and casing for bringing said chemical agents

together for the purpose of generating gas to inflate said bag, and an annular shoulder within said main receptacle preventing upward movement of said casing during the operation of said mechanical means.

5. In a device of the class described; a main receptacle; a casing therewithin; an inflatable bag associated with said main receptacle; said casing including a fragile disc providing an upper closure therefor, and a flexible disc providing a lower closure therefor; said receptacle and casing each housing a series of chemical agents; and mechanical means for bringing said chemical agents together for the purpose of generating gas for inflating said bag; said mechanical means including a plunger rod anchored in said flexible disc, and a plunger rod associated with said main receptacle, said last named plunger rod being under tension and normally away from said first named plunger rod.

6. In a device of the class described, a main receptacle, a casing therewithin, an inflatable bag associated with said main receptacle, said receptacle and casing each housing a series of chemical agents, said casing including a fragile closure, and mechanical means associated with said receptacle and casing for bringing said chemical agents together for the purpose to generate gas to inflate said bag, said means including a plunger rod associated with said casing and a plunger rod associated with said receptacle, said last named plunger rod being under tension and normally away from said first named plunger rod, said first named plunger rod being adapted to fracture said closure during the operation of said last named plunger rod.

7. In a device of the class described, a main receptacle, a casing therewithin, said receptacle and casing each housing a series of chemical agents, the chemical agent in the receptacle being of a liquid form, a bag associated with said receptacle, means to bring said chemical agents together to generate gas to inflate said bag, and a communicating passage between said receptacle and said bag capable of preventing the entrance of said liquid chemical agent from the receptacle to the bag and of allowing free passage of the generated gas from said receptacle to said bag.

8. In a device of the class described, a gas generating apparatus, an inflatable bag associated therewith, a series of chemical agents housed within said gas generating apparatus, one of said series of chemical agents being positioned within said generating apparatus adjacent to said bag and being of a liquid form, means to bring said chemical agents together to generate gas to inflate said bag, and communicating passage between said gas generating apparatus and

said bag, said communicating passage possessing means to prevent the entrance of the liquid chemical agent to said bag during the inoperative state of the device and to allow the free entrance of the generated gas to said bag upon operation of the device.

9. In a device of the class described, a main receptacle, a casing therewithin, an inflatable bag associated with said receptacle, said receptacle and casing each housing a series of chemical agents, a fragile closure upon one end of said casing preventing communication between said receptacle and casing during the inoperative state of the device, a flexible closure at the other end of the casing, a plunger rod anchored by one of its ends in said flexible closure and with the other end positioned adjacent said fragile closure, a cup-shaped member positioned upon said receptacle, and a tensioned plunger rod associated with said cup-shaped member, said first named plunger rod being adapted to be actuated by the action of the

last named plunger rod for breaking said fragile closure for the purpose of bringing said chemical agents together to generate gas to inflate said bag.

10. In a device of the class described, a gas generating apparatus, a series of chemical agents therewithin, mechanical means to bring said chemical agents together to generate gas, a tube extending inwardly and outwardly of said gas generating apparatus, one of said chemical agents being of liquid properties and being housed adjacent to said tube, and an inflatable bag upon the outward end of said tube, the tube affording a communicating passage between the receptacle and the bag during both inoperative and operative state of the device and being capable of preventing the liquid chemical agent to enter the bag and of allowing free entrance thereto of the generated gas.

In testimony whereof I affix my signature.

NICHOLAS CHERNIAK.