

No. 677,600.

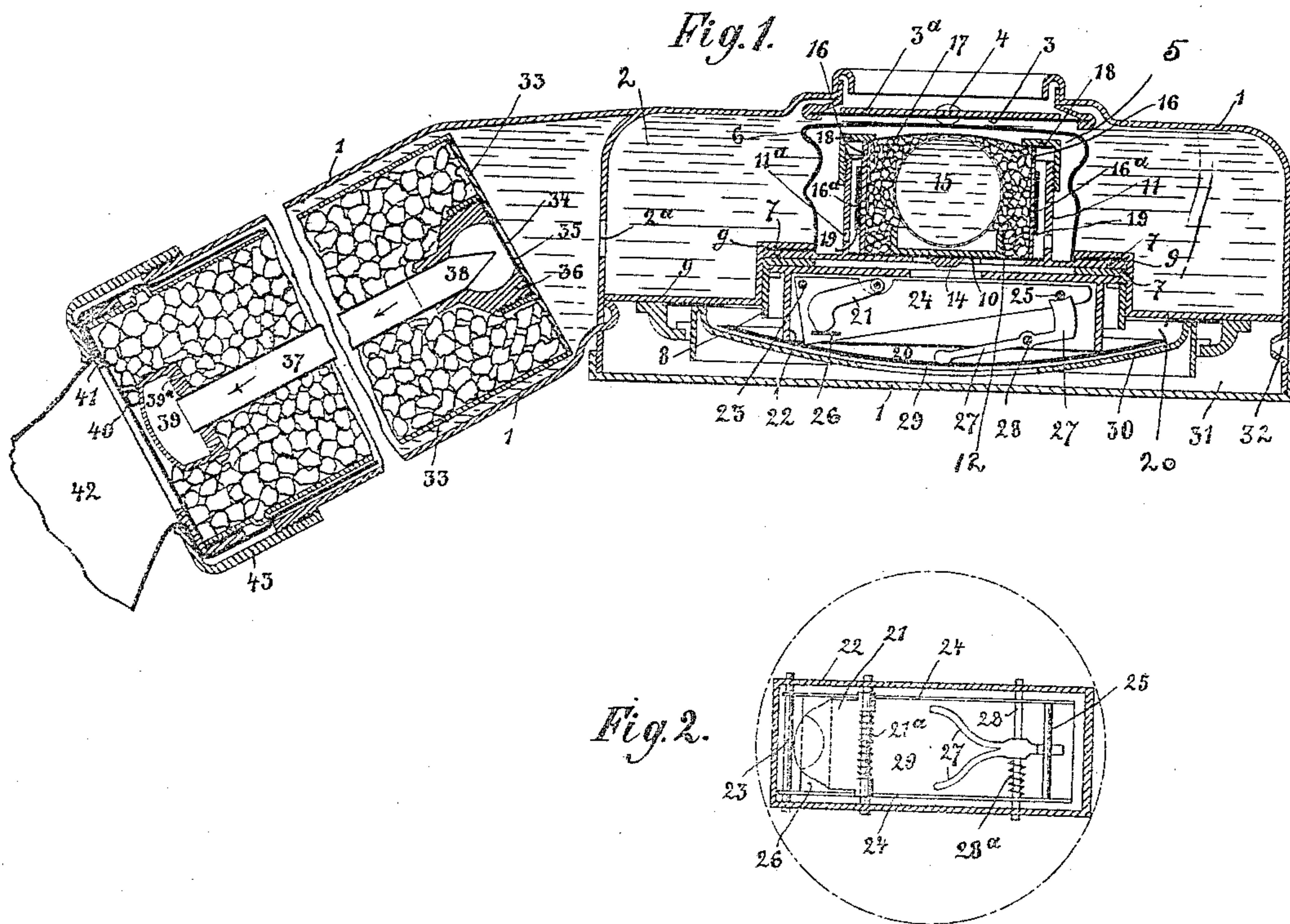
J. RUCK.

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ACETYLENE GENERATOR FOR LIFE SAVING APPARATUS.

(Application filed Mar. 23, 1901.)

(No Model.)



Witnesses:
James R. Mansfield.
Thos. E. Robertson

Inventor:
Johannes Ruck.
By Alexander F. Fowell.
attorneys.

UNITED STATES PATENT OFFICE.

JOHANNES RUCK, OF OLDENFELDE, NEAR ALT-RAHLSTEDT, GERMANY.

ACETYLENE-GENERATOR FOR LIFE-SAVING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 677,600, dated July 2, 1901.

Application filed March 23, 1901. Serial No. 52,838. (No model.)

To all whom it may concern:

Be it known that I, JOHANNES RUCK, a subject of the King of Prussia, German Emperor, residing at Oldenfelde, near Alt-Rahlstedt, Holstein, Prussia, Germany, have invented certain new and useful Improvements in Acetylene-Generators for Life-Saving Apparatus, of which the following is a specification.

My invention relates to an improved apparatus for saving life at sea; and it consists of an acetylene-generator combined with a tube or pipe of rubber or other suitable material, which is inflated by the gas generated when the apparatus is in use.

My invention is based substantially on the idea of starting the generation of the gas to fill the main tube of the apparatus by means of a preliminary development of acetylene gas, which forces water contained in a chamber in the apparatus to enter the main gas-generator. The preliminary development of gas expands an elastic bag or bladder, in this manner forcing water into the acetylene-generator. The preliminary generator is started by breaking a small glass bulb containing water, which on the bulb being broken comes into contact with calcium carbide or other suitable gas-developing substance. The breaking of the glass bulb can be effected either by hand or by a hammer device actuated by the pressure of water entering the apparatus on the latter being thrown or placed into the sea.

In the accompanying drawings, illustrating my invention, Figure 1 is a section through the gas-generators when not in use, and Fig. 2 is a plan of the hammer or bulb-breaking device.

The generators consist of the preliminary developing apparatus, the hammer or bulb-breaking device for starting the preliminary developing apparatus, a reservoir for the water to be used in the main generator, and the main generator itself, which is connected with the tube of rubber or other suitable material forming the buoyant part of the apparatus.

All the above-mentioned apparatus are contained in a casing 1, which is divided into several different compartments. The compartment 2, which is provided with an opening 2^a on the left side, is filled with water.

On the top this compartment is closed by an elastic diaphragm 3, on which is secured a metal plate 3^a, possessing a button or knob 4. The compartment 2, which may be called the "water-reservoir," is divided from the compartment 5, which contains the apparatus for the preliminary development of gas, by an expansible bag or bladder 5. The preliminary developing apparatus contained in this bag consists of a plate 7, which is pressed upon the wall 9 of the casing 1 by means of a screw-threaded sleeve 8, which also holds the bag 6, in this manner providing the necessary tightness. From the plate 7, which is provided with a hole 10 in the middle, rises a cylinder or ring 11, which has a number of holes 11^a in its wall. The plate 7 covers an elastic diaphragm 12, on the under surface of which is secured the percussion-surface or so-called "anvil" 14, and above plate 12 is a glass bulb 15. On the elastic diaphragm 12 also stands a ring or cylinder 16, covered by an elastic diaphragm 17, which is pressed upon the ring 16 by a screw-threaded sleeve 18. In this manner the elastic diaphragm 12 is also secured. The ring 16 is provided with a number of holes 16^a, covered by a rubber ring 19. Underneath this device is situated the compartment 20, which contains the bulb-breaking or hammer device. The hammer 21 of this device is carried on a spindle journaled in the side walls of the casing 22. The said walls also support the spindle 23, on which the frame 24 is supported. At the free end of the frame is supported a roller 25. The catch 26, against which the hammer 21 is pressed by the coiled spring 21^a on its supporting-spindle, is secured to the frame 24. In the drawings the frame 24 is shown supported in its uppermost position by the shorter arm of a lever 27, bearing against the roller 25. The other end of the lever 27 is pressed by a coil-spring 28^a on the spindle 28, carrying the lever 27, against an elastic diaphragm 29, connected, by means of a suitable sleeve, to the cover 30, forming the boundary of this compartment. In the middle of the cover 30 is provided an opening, as shown in the drawings. The compartment 31 is in communication with the exterior air through the openings or holes 32.

The left part of the casing 1 contains the

receptacle for the carbid of the main gas-generator. This generator consists of a cylindrical receptacle 33, which is provided on the side toward the water-reservoir 2 with a hole 34, covered by an elastic diaphragm 35. The elastic diaphragm is pressed against the wall of the receptacle 33 by means of the plug 36.

To the plug 36 is joined a tube 37, which carries a pointed blade 38 at the end near to the elastic diaphragm 35. The other end of the tube 37 is provided with a hollow headpiece 39, having a number of perforations or holes 39^a, by which the interior of the tube is connected with the receptacle containing the carbid. The receptacle 33 is closed at this lower end by an elastic diaphragm 40, secured to the receptacle by means of the annular cover 41. At this end the tube 42, forming the buoyant part of the apparatus, is also attached to the generators, which is done by drawing it over the receptacle 33, in which position it is held by means of a screw-threaded sleeve 43, screwed onto the casing 1.

The operation of the generators is as follows: Assuming that all parts are in the position shown in Fig. 1, as soon as the apparatus is thrown or placed into the sea the water will enter through the openings 32 into the compartment or chamber 31 and exercise a pressure on the elastic diaphragm 29. As a consequence the lever 27 will be moved contrary to the tension of the spring 28^a, so that the roller 25 will be released. The frame 24 can then turn on its supporting-spindle 23, which it will do in a downward direction, thus removing the catch 26 from beneath the hammer 21, which is at once turned on a spindle by the spring 21^a and strikes against the anvil 14, breaking the glass bulb 15. The water thus released from the bulb comes into contact with the carbid in the receptacle 16, so that gas is developed. The gas escapes through the holes 16^a in the sleeve 16 and expands the bag or bladder 6. Owing to the expansion of the bag 6 the water in the reservoir 2 is forced against the elastic diaphragm 35, which on coming into contact with the pointed blade 38 is perforated, so that the water can enter into the tube 37 and from thence through the headpiece 39 and openings 39^a into the carbid-receptacle 33. When a certain quantity of gas has been developed in this receptacle, the elastic diaphragm 40 will burst and the gas will enter into the tube or buoyant part 42 of the apparatus.

Instead of starting the preliminary gas-developing apparatus by the pressure of the water on the diaphragm 29 the bulb can be broken by hand on pressing the button 4, secured to the diaphragm 3. This diaphragm 3 also serves for equalizing the pressure of the water in the reservoir 2 when the apparatus is not in work, and in this manner to protect the membrane 35, which might, owing to change of temperature in the water, be

forced against the pointed blade 38 when it is not desired to start the apparatus. In order to prevent the gas preliminarily developed from being generated too quickly, it is advisable to surround the bulb with a netting of wire or the like.

The exact form and dimensions of the various parts can be varied according to desire without altering the essential subject-matter of my invention.

What I claim, and desire to secure by Letters Patent of the United States, is—

1. In a life-saving apparatus the combination of a main and an auxiliary gas-generating compartment, and means whereby the generation of gas in the auxiliary compartment causes the generation of gas in the main compartment, substantially as described.

2. The combination of the inflatable apparatus, a main gas-developing device connected therewith, and an auxiliary developing device, means for starting the auxiliary device into action, and means whereby the generation of gas in the auxiliary device starts the main developing device into action.

3. The combination of an inflatable member, a gas-generating compartment connected therewith, a secondary gas-generating compartment, means for admitting water to the secondary generator to generate gas therein, and means actuated by the expansion of gas in the secondary holder for forcing water into the main gas-generator.

4. The combination of a carbid-holder, a water-receptacle therein, a water-chamber surrounding said holder, a second carbid-holder, connected to the water-chamber, a partition between the second holder and water-chamber, and means for breaking the water-receptacle in the first generator, whereupon the expansion of gas generated therein eventually causes the rupture of said partition and forces water into the second holder, substantially as described.

5. In a life-saving apparatus an auxiliary acetylene-gas-developing device adapted to compress the water into the main carbid-receiver to develop the gas to fill the main buoyant part of the life-saving apparatus, substantially as described.

6. In a life-saving apparatus, the combination of an auxiliary acetylene-gas-developing device adapted to force the water into the main gas-generating apparatus, with the main gas-generating apparatus, substantially as described.

7. In a life-saving apparatus a chamber 2 containing water, a receptacle 33 containing carbid, and an auxiliary gas-generating device for forcing the water of said chamber into the receptacle 33, when the apparatus is to be used, substantially as described.

8. In a life-saving apparatus, an auxiliary acetylene-gas-developing device, comprising a bulb 15 containing water, means for breaking said bulb on the apparatus being thrown or placed into the water, a receptacle sur-

rounding the bulb 15 and containing carbid, a bag of elastic material adapted to expand on the water escaping from the broken bulb, coming into contact with the carbid and generating acetylene gas; a chamber 2 surrounding or inclosing the said bag and containing water, a receptacle 33 containing carbid, an elastic diaphragm 35 covering a hole in the end of said receptacle 33, a pointed blade adapted on the elastic diaphragm being pressed in by the pressure of the water to perforate said diaphragm 35 so as to admit the water to the carbid in the main gas-developing apparatus, substantially as described.

In a life-saving apparatus, an auxiliary acetylene-gas-developing device, comprising a bulb 15 containing water, means for breaking said bulb on the apparatus being thrown or placed into the water, said means comprising a hammer 21, pivoted below the bulb, a catch 26 supporting said hammer, a frame 24 supporting said catch 26, a roller 25 secured to said frame 24, a two-armed lever 27 adapted in its normal position by bearing against the roller 25 to keep the frame 24 in its raised position, so that the catch 26 remains in contact with the hammer 21, an elastic diaphragm 29 adapted on the apparatus being placed or thrown into water to raise the other end of the lever 27 and thus to release the catch 26 and enable the hammer to strike under the action of a spring against the bulb and break the same, substantially as described.

10. In a life-saving apparatus, an auxiliary acetylene-gas-developing device, comprising a bulb 15 containing water; a hammer 21 adapted on its being released from a catch 26 to break said bulb, a receptacle surrounding the bulb 15 and containing carbid, a bag of elastic material adapted to expand on the

water escaping from the broken bulb coming into contact with the carbid and generating acetylene gas, a chamber 2 inclosing the said bag and containing water; a receptacle 33 containing carbid and means for enabling the water in the receptacle 2 to pass into the receptacle 33 under the action of the gas in the preliminary acetylene-generating apparatus, substantially as described.

11. In a life-saving apparatus, an auxiliary acetylene-gas-developing device, comprising a bulb 15 containing water means for breaking said bulb on the apparatus being thrown or placed into the water, a bag of elastic material adapted to expand on the water escaping from the broken bulb coming into contact with the carbid and generating acetylene gas; a chamber 2 inclosing said bag and containing water, an elastic diaphragm in the wall of said chamber, a metal plate on said diaphragm, a knob 4 on said diaphragm, a receptacle 33 containing carbid and means for enabling the water in the receptacle 2 to pass into the receptacle 33 under the action of the gas in the preliminary acetylene-generating apparatus, substantially as described.

12. In a life-saving apparatus, a main gas-developing device comprising a receptacle 33 containing carbid, a membrane 35 covering a hole in the end of said receptacle, a pointed blade adapted on the membrane being pressed in to puncture said membrane, a tube 37 connected with the hole in the end of the receptacle 33, and a perforated headpiece at the end of said tube, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two witnesses.

JOHANNES RUCK.

Witnesses:

LEO FOLLES,

E. H. L. MUMMENHOFF.