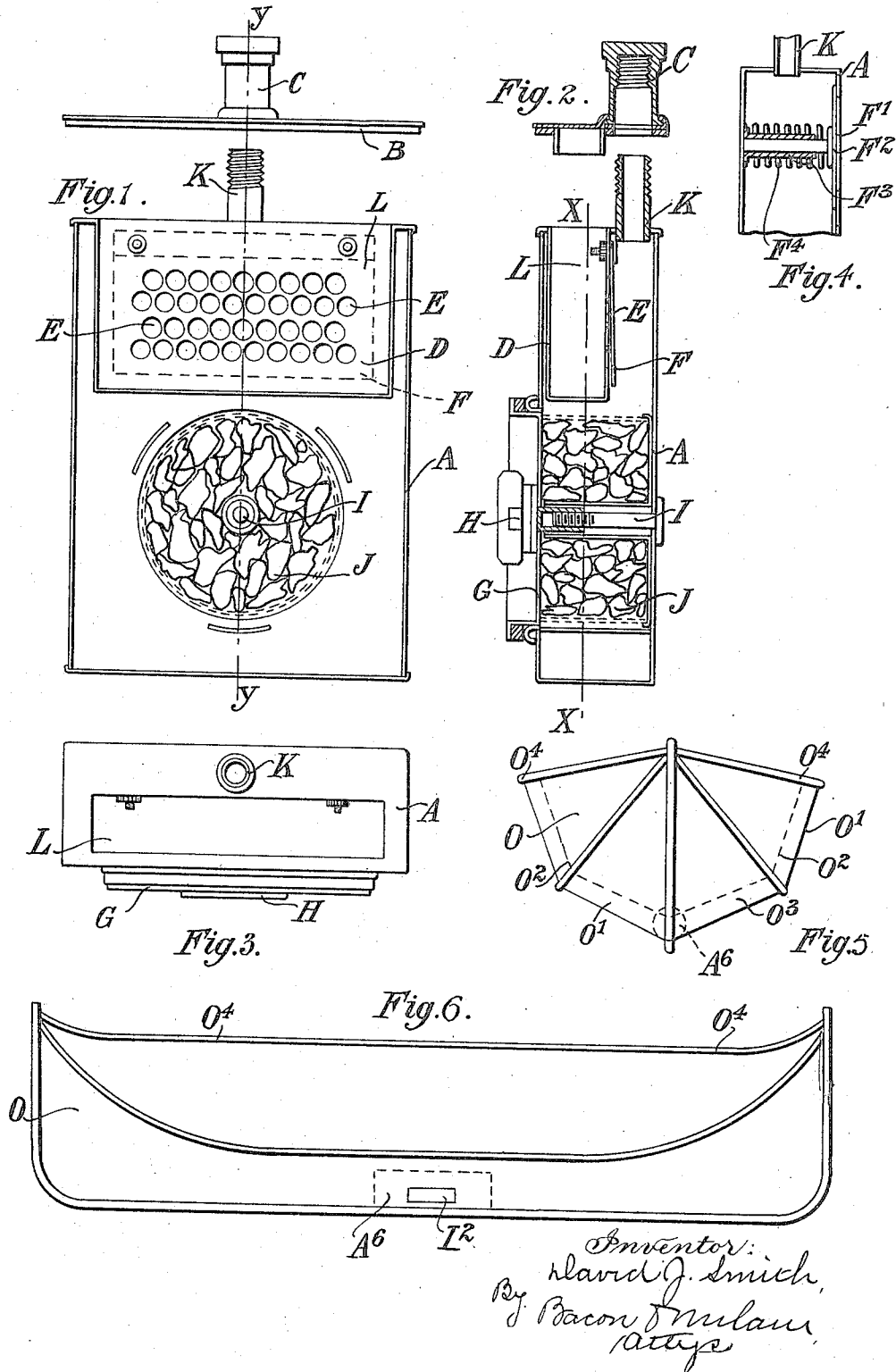


D. J. SMITH,
INFLATABLE MARINE LIFE SAVING APPLIANCE.
APPLICATION FILED JULY 26, 1915.

1,301,515.

Patented Apr. 22, 1919.



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UNITED STATES PATENT OFFICE.

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To all whom it may concern:

Be it known that I, DAVID JOSEPH SMITH, a subject of the King of Great Britain, and a resident of 40 Woodberry Grove, Finsbury Park, London, N., England, have invented new and useful Improvements in and Relating to Inflatable Marine Life-Saving Appliances, of which the following is the specification.

10 This invention relates to improvements in life-saving apparatus of the type in which acetylene gas supplied by a generator containing calcium carbide is employed after immersion in water, to distend or inflate a belt or waistcoat.

15 The objects of this invention are to provide an improved construction of automatic acetylene generator of this type, an improved arrangement of generator combined with an improved construction of belt or the like, and to provide improved appliances for life-saving purposes in which such a generator is suitably combined or embodied for distending or inflating same to render it or

20 them operative for life-saving purposes.

25 The quantity of calcium carbide is proportioned to the size or cubic contents of the bags or receptacles to which the generator is connected, so that enough gas or gases is or are provided to fill, but not to risk bursting them. Between the generator and the bags or receptacles a non-return or back pressure valve is fitted, to allow gas to flow into the bags or receptacles but not back into the

30 generator. A valve may also be fitted on the pipe or pipes connecting the generator with bags or receptacles by which the gas in the said bags or receptacles may be allowed to escape into the air whenever it is desired to

35 deflate and collapse the said receptacles. The said valve may be either operated by hand or by excess pressure of gas.

40 On the person wearing the apparatus such as the belt afterward described falling into water, the water flows into the generator through the valve or valves or openings provided, and is brought into contact with the gas producing material contained therein. Gas is immediately generated and as the

45 valves admitting water open inward only, the gas passes by means of the pipe or pipes to the bags or receptacles and inflates them. The generator may be attached to the bag or receptacle or one of them and form part of

50 the said bag or receptacle. The capacity of

these said bags or receptacles as in the belt afterward described is sufficient to prevent a person from sinking, even if the person is unconscious or fully clothed.

The generator is so constructed that the spent charge of gas producing material may be removed and a fresh charge inserted after use, or if at any time it is thought that the charge has deteriorated.

55 In the application to or combination of the apparatus with buoys which may be employed when inflated for signaling purposes, the generator may be attached either by flexible or rigid tubes to, or form part of a collapsible buoy, made from some impervious material or metal. The buoy may be fitted with collapsible signal masts provided with flags or other devices which could be raised or inflated by the pressure of gases from the generator when the buoy was inflated. Such a buoy would be of relatively large size when inflated and yet could be stored away in small compass when in its deflated state. It could be brought into action by throwing it into the water, or attaching it to the vessel carrying it, by a long rope or chain, so that on the vessel sinking, the buoy would inflate automatically and rise to the surface, indicating the position of the vessel under water.

60 In the employment of the apparatus with collapsible boats, the boats may be formed with a double skin of some impervious material; the space inclosed between the two skins is gastight. The generator is connected to this space or chamber in a suitable manner so that the gas produced from it could enter the space, and by inflating it, cause the boat to expand, assume its operative or distended shape, and render it unsinkable. The collapsible boats made in this manner would be thrown into the sea in a collapsed state, or left loose on the deck of a ship. In either case, as soon as the water entered the generator the boat would be inflated into its correct shape, and float.

65 Some portion of the gas may if desired be taken into a separate collapsible chamber or chambers, which when inflated, would insure the buoyancy of the boat should it fill during inflation or opening.

70 In the employment of the apparatus with rafts carried on ships and which normally occupy much space, the rafts could for the purposes of this invention be made collapsi-

ble, or formed of wood laths or planks either folded or rolled up in the manner of wooden roller blinds or shutters.

And in order that my invention may be completely understood and carried into practice reference should be made to the accompanying sheet of drawings, which illustrate its application to different purposes, the illustrations being diagrammatic. Figure 1 is a section on the line X X of Fig. 2, of one form of the generator.

Fig. 2 is a section of same on the line Y Y of Fig. 1.

Fig. 3 is a plan of same with the cover removed.

Fig. 4 shows an alternative form of valve to that shown in Fig. 2.

Figs. 5 and 6 show one mode of the application of the apparatus to a collapsible boat. Referring to Figs. 1, 2 and 3, the generator shown consists of a casing A having an airtight lid B which is held in place when the generator is not in use by the cap C. The interior of the generator has a compartment D projecting within the generator, said compartment being perforated with holes at E, the holes being closed normally by the valve F. The compartment D, being within the generator, the valve F is protected from external matter or dirt which might otherwise get between the valve and its seating when not in use. The lower part of the generator is closed by a gastight cover G, Fig. 2, held in place by the thumb nut H screwed on to the stud I secured in the back of the casing. Beneath the cover G is a removable perforated receptacle J adapted to hold carbid of calcium for the purpose of generating gas. Any material capable of generating gas in sufficient quantity may be employed. K is a pipe for the purpose of conveying the gas from the generator. L is an opening to admit water into the compartment D.

The receptacle J is filled with carbid of calcium or other gas generating material and inserted into the generator, and the cover G screwed down. When in use the cover B is removed and the outlet K connected to the inflatable belt by means of a length of flexible tube.

The described generator is capable of being fitted to any form of belt or the like, or waistcoat, or collar or like apparatus, with an inflatable chamber formed of airtight and watertight flexible material. The example of generator shown may be carried in the pocket and when the necessity arises, the cap B is removed by unscrewing the cap C from the thread on the tube K, and the flexible tube usually fitted to life saving belts or collars and the like, is connected thereto.

On being thrown into the water, the water passes into the compartment D through the

opening L, and then through the holes E in the said compartment past the valve F, and falls upon the calcium carbid or other suitable material contained in the receptacle J, thereby generating gas in the casing A of the generator. The pressure of the gas thus generated closes the valve F preventing further entrance of water into the generator or escape of gas, and passes from the outlet K to the belt, collar, boat or the like, and rapidly distends or inflates same.

Fig. 4 shows a modified form of the non-return valve shown in Fig. 2, which consists of a flat seating valve F¹ having a stem F² adapted to slidably fit a guide F³ secured in any suitable manner to the casing A. The valve F¹ is lightly pressed on to its seating by the action of the spring F⁴, said spring being of such load that it allows the valve to admit water to the generator when the latter is immersed, while keeping the generator normally airtight.

Referring to Figs. 5 and 6, the boat O is formed with two skins or sheets of flexible fabric O¹, O², forming a gastight space O³. The flexible fabric O² is attached to foldable longitudinal frame portions which may be pivotally connected at their ends so as to collapse when the boat is not in use and occupy very little space. The generator A⁵ is of the type before described having an opening L² for the admission of water to the non-return valve. The action is as follows:—

The boat is thrown into or reaches the water, and the water entering the generator by way of the inlet L², gas is generated and inflates the space O³ between the two skins O¹, O², Fig. 6. The boat can be provided if desired with a light cover at O⁴, Fig. 6, to prevent the water entering the boat while the boat is being inflated by the action of the gas, or to prevent the boat being distended by rain water.

The generator may also be attached to a collapsible boat not necessarily to open the boat automatically, but as a means of increasing the buoyancy of the boat.

What I do claim as my invention and desire to secure by Letters Patent is:—

1. The combination of a boat including rigid longitudinal frame members connected together to fold together laterally and to be spread apart in open boat forming position, a flexible gas receptacle connected with the laterally folding longitudinal frame members, and a gas generator associated with the gas receptacle adapted upon the entrance of water thereto to supply gas to the flexible receptacle, the flexible gas receptacle being adapted by its inflation to laterally spread apart the longitudinal frame members in open position.

2. The combination of a boat including rigid longitudinal frame members connected together to fold together laterally and to

be spread apart in open boat forming position, a flexible gas receptacle connected with the laterally folding longitudinal frame members, a gas generator associated with the
 5 gas receptacle adapted upon the entrance of water thereto to supply gas to the flexible receptacle, the flexible gas receptacle being adapted by its inflation to laterally spread apart the longitudinal frame members in
 10 open position, said flexible gas receptacle extending between the frame members and constituting the walls of the boat between the frame members.

3. The combination of a boat including
 15 rigid longitudinal frame members pivotally connected together to fold together laterally and to be spread apart in open boat forming position, a flexible gas receptacle connected with the laterally folding longitudinal
 20 frame members, a gas generator associated with the gas receptacle adapted upon the entrance of water thereto to supply gas to the flexible receptacle, the flexible gas receptacle being adapted by its inflation to laterally

spread apart the longitudinal frame mem- 25
 bers in open position, said flexible gas receptacle extending between the frame members and constituting the walls of the boat between the frame members.

4. The combination of a boat including 30
 rigid longitudinal frame members connected together to fold together laterally and to be spread apart in open boat forming position, a flexible gas receptacle connected with the
 35 laterally folding longitudinal frame member, and a gas generator associated with the gas receptacle adapted upon the entrance of water thereto to supply gas to the flexible receptacle, the flexible gas receptacle being
 40 adapted by its inflation to laterally spread apart the longitudinal frame members in open position, said generator being located substantially centrally of the sides of the boat.

DAVID JOSEPH SMITH.

Witnesses:

I. D. ROOTS,
 A. L. PARISH.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."