No. 647,610. Patented Apr. 17, 1900.

W. H. ROSE & G. R. HOLMES.

MARINE TORCH.

(Application filed Aug. 2, 1899.)

(No Model.)

Fig. 1.

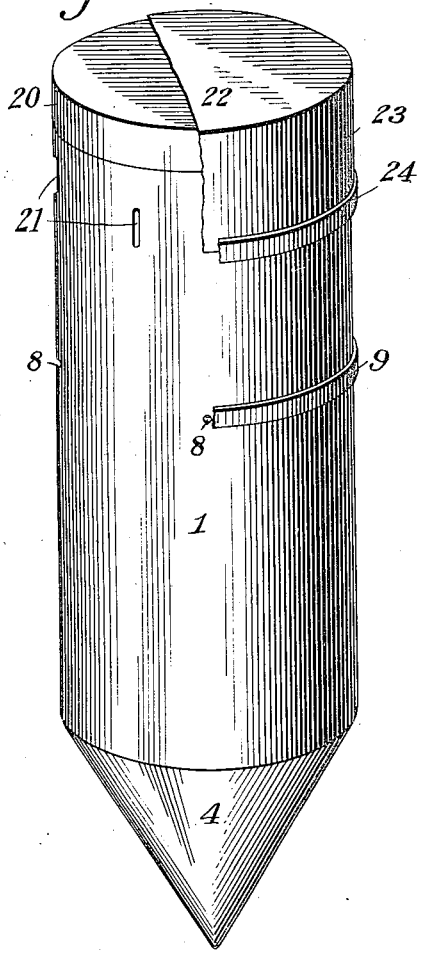


Fig. 3.

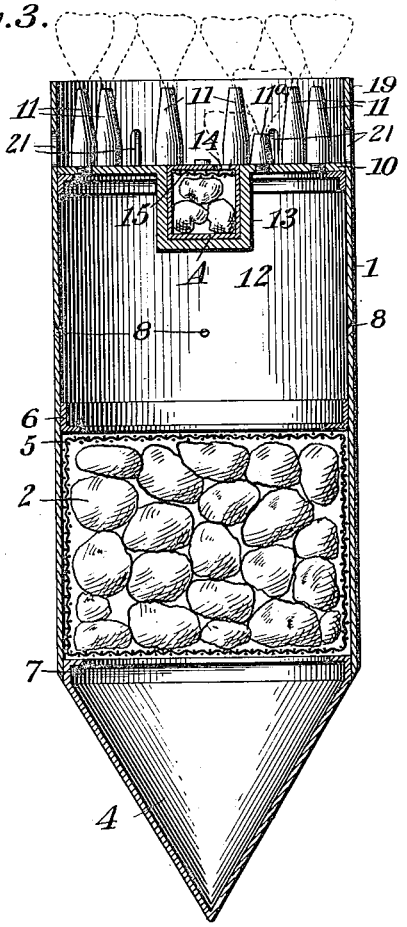
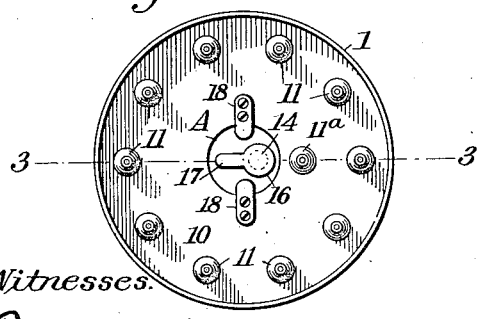


Fig. 2.

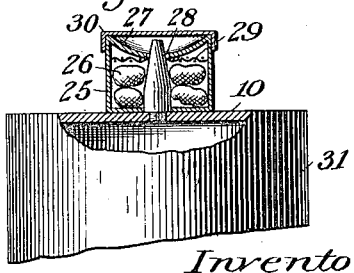


Witnesses.

Benjamin Odell.

H. M. Young.

Fig. 4.



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UNITED STATES PATENT OFFICE.

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MARINE TORCH.

SPECIFICATION forming part of Letters Patent No. 647,610, dated April 17, 1900.

Application filed August 2, 1899. Serial No. 725,906. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM H. ROSE and GWYLLYM R. HOLMES, citizens of the United States, residing at the city of Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Marine Torches, of which the following is a specification.

This invention consists in a marine torch adapted to ignite spontaneously and to produce a brilliant light when thrown into the water and to reignite quickly and repeatedly should it become temporarily submerged or extinguished by any other cause.

The invention comprises a floatable shell having a compartment for carbid of calcium or other gas-producing substance or illuminating-gas, a suitable burner or burners, and a pilot-light or igniting device consisting of a holder or compartment charged with phosphid of calcium.

The invention will be described in detail in connection with the accompanying drawings, in which—

Figure 1 is a perspective view of a shell in its completed condition, hermetically sealed and adapted to be stored for an indefinite period, parts of the closures being broken away. Fig. 2 is a plan view of the shell with the end diaphragm or cover removed to expose the burners. Fig. 3 is a central sectional view taken on the line 3 3 of Fig. 2, and Fig. 4 is a view of a modified form.

Referring to the drawings, 1 indicates a shell of suitable size and shape for the purpose for which the torch is intended. Shells which are intended to be fired from a gun in naval warfare or in connection with life-saving operations are preferably cylindrical, such as that illustrated. Shells for other purposes, which are to be thrown into the water by hand, may be of other forms, such as rectangular or spherical, if desired. The shell is preferably constructed with a carbid-compartment 2, an air-compartment 3 of sufficient size to give ample buoyancy to the shell, and a drainage-compartment below the carbid-compartment and adapted to receive the spent carbid. The carbid is to be confined in its compartment in some suitable manner which will permit water to enter and refuse to be discharged. As shown, it is contained in a basket 5, of wire-netting, which is retained in place by flanges 6 and 7.

Several small inlets 8 are provided in the wall of the air-chamber 4 to permit water to enter upon the carbid when the shell is thrown into a body of water. To prevent the carbid from deteriorating, when stored, by exposure to the atmosphere, the openings 8 are temporarily sealed by a suitable closure, which can be quickly removed when it is desired to use the shell. As shown in Fig. 1, the openings are sealed by a band 9, which can be stripped off quickly. Instead of the band separate pieces might be soldered or otherwise fastened over the holes.

At the upper end of the air-chamber 3 is a diaphragm or top plate 10, in which are a series of burners 11, suitable for burning acetylene or other gas. These burners may be of any suitable form and in any desired number and arrangement. Adjacent to one of the burners is a pilot-light A, which consists of a receptacle 12, containing a substance which will readily ignite in the presence of water. The substance which we prefer to use and which accomplishes the purpose perfectly is phosphid of calcium in the form of lumps. We have found that this substance, while not suitable in itself to produce a light which is valuable for illuminating purposes, is admirably adapted to ignite illuminating-gas and that it will reignite the gas many times and for a suitable period of time, as is required when a shell is repeatedly submerged at sea in rough weather. As shown in Figs. 2 and 3, the phosphid of calcium is contained in a vessel or compartment 12, which is fastened in a recess or depression 13 in the top 10 of the shell, the top of the vessel 12 being about on a level with said diaphragm 10.

The vessel 12 when in use is provided with an opening 14, through which water can enter and gas escape. To prevent the escape of the lumps of phosphid, a suitable network or grating 13 is placed across the opening 14. To prevent the phosphid from deteriorating prior to the use of the shell, the

opening 14 is hermetically sealed in such manner that it can be quickly opened. As shown, it is sealed by a metal disk 16, securely soldered to the top of the vessel 12 and provided with a strap or handle 17, by means of which it can be torn off. The vessel 12 is securely held in the recess 13 by clamps 18 or other suitable means.

The opening 14, as shown in Figs. 2 and 3, is at one side of the phosphid vessel and close to a burner 11^a, which is preferably somewhat lower than the burners 11. The relative arrangement of the phosphid vessel to the burners may be varied considerably, the only essential feature being that the opening through which the gas issues from the phosphid vessel must be adjacent to the burners and near enough to ignite the gas issuing therefrom.

We preferably arrange a flange 19 about the burners, which flange may be an extension of the shell 1. This flange serves to preserve the burners when the shell is fired from a gun, the usual method of firing being to place a firing-block 20 against the flange. The strain of firing is thus transmitted to the sides of the shell. Openings 21 are provided at the base of the flange, so that water may drain out. Another office of the flange is to hold some water temporarily as the shell rises after being submerged to insure sufficient water getting into the phosphid vessel.

The entire shell should be hermetically sealed until it is to be used to prevent deterioration of the carbid and phosphid by absorption of moisture from the atmosphere. The water-openings 8 may be sealed, as above described, and the openings 21 and the top of the shell may be sealed by a suitable cover 22, the flange 23 of which may be rendered air-tight by a band 24, soldered to the shell and adapted to be torn off when the shell is to be used.

In Fig. 4 we have shown a phosphid vessel 25, surrounding and attached to a burner 26, which is screwed into the top 10 of the shell 1. The phosphid vessel in this case has an inner cover 27, having an opening 28, surrounding the burner. The inner cover is preferably dished to direct a sufficient amount of water into the vessel. The phosphid is prevented from falling out by suitable network 29. The phosphid vessel is also provided with a temporary outer cover 30, which is air-tight and which can be removed when the shell is to be used. In Fig. 4 we have shown a small shell 31, which can be thrown into the water by hand. This shell may be provided with additional burners, if desired.

While we have described a shell having a chamber 3 for air or gas to render the same buoyant, it will be evident that the shell may be floated by other means, such as a surrounding belt of cork or other light material. It will also be evident that in some cases the shell may be charged with compressed or liquefied gas instead of carbid of calcium and an arrangement made for opening or puncturing the gas-chamber to permit the gas to pass to the burners just before launching the shell in the water.

In the foregoing specification we have described the best embodiment of our invention at present known to us. We do not, however, limit ourselves to the details of construction and arrangement illustrated and described, as such details are of minor importance. The essential feature of the invention is an apparatus adapted to float in water, comprising a compartment charged with carbid of calcium or other illuminating material, one or more burners for the illuminant, and a pilot-light consisting of a second and relatively-small compartment charged with phosphid of calcium and so constructed and arranged that it will be charged with water when submerged and will discharge its self-igniting gas sufficiently close to the burner or burners to ignite the illuminant.

Having described our invention, what we claim, and desire to secure by Letters Patent, is—

1. A marine torch comprising a floatable shell having a compartment charged with illuminating material, a burner communicating with said compartment, and a pilot-light for the burner consisting of a second compartment charged with phosphid of calcium, the said phosphid-compartment having an opening adjacent to the burner and being adapted to receive a charge of water, for the purpose set forth.

2. A marine torch comprising a floatable shell having a compartment charged with carbid of calcium, a gas-burner in communication with said compartment, and a pilot-light for said burner comprising a relatively-small compartment charged with phosphid of calcium, said phosphid-compartment having an opening adjacent to the burner, and means for admitting water to the carbid-compartment and the pilot-light when the shell is submerged, for the purpose set forth.

3. A marine torch comprising a floatable shell having a compartment charged with carbid of calcium and having openings to admit water to the said carbid-compartment when the shell is partially submerged, a gas-burner communicating with the carbid-compartment, and a pilot-light for said burner comprising a compartment charged with phosphid of calcium, said phosphid-compartment having an opening adjacent to the burner, and means for temporarily sealing the carbid and phosphid compartments from communication with the atmosphere, for the purpose set forth.

4. A marine torch comprising a shell having a compartment charged with carbid of calcium, a second compartment for air or gas to render the shell buoyant, a burner communi-

cating with said carbid-chamber, and a pilot-light adjacent to the burner comprising a compartment charged with phosphid of calcium, for the purpose set forth.

5. A marine torch comprising a floatable shell having a compartment charged with carbid of calcium, a gas-burner in communication with said compartment, and a second compartment or chamber charged with phosphid of calcium, said carbid and phosphid compartments having openings through which water may enter when the shell is submerged, for the purpose set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

WILLIAM H. ROSE.
GWYLLYM R. HOLMES.

Witnesses:
EDWARD B. AMBLER,
MILES W. ROSS.