No. 650,288. Patented May 22, 1900.

W. J. WILSON.

MARINE TORCH.

(Application filed July 8, 1898.)

(No Model.)

Fig. 1.

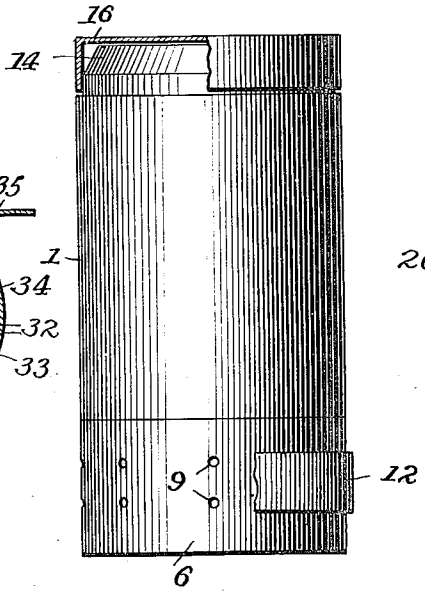


Fig. 4.

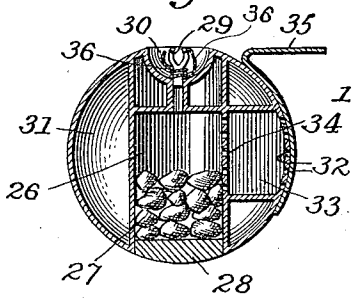


Fig. 5.

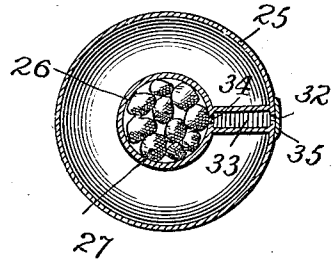


Fig. 2.

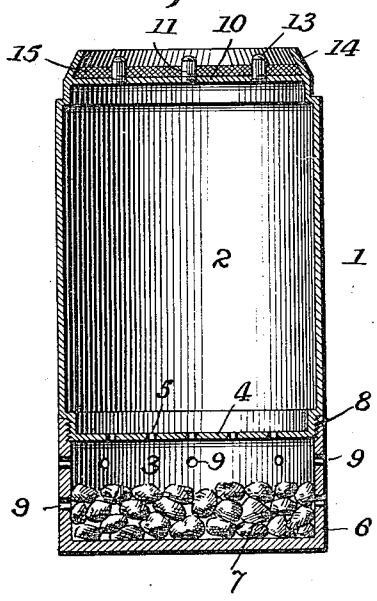
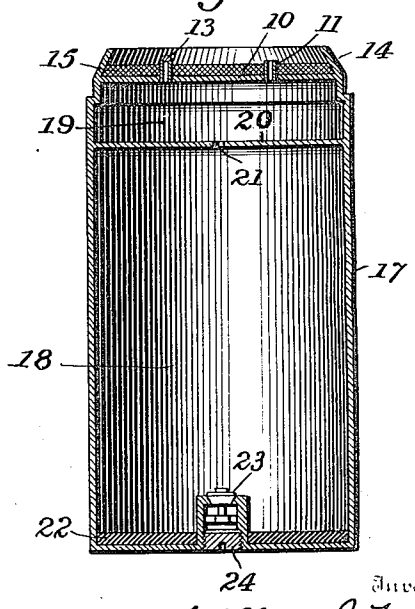


Fig. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM J. WILSON, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE AMERICAN ILLUMINATING SHELL COMPANY OF BALTIMORE CITY, OF MARYLAND.

MARINE TORCH.

SPECIFICATION forming part of Letters Patent No. 650,288, dated May 22, 1900.

Application filed July 8, 1898. Serial No. 685,433. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. WILSON, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Illuminating-Projectiles, of which the following is a specification.

This invention consists in a marine torch comprising a suitable casing or shell charged with illuminating material and provided with one or more burners and an igniting device to ignite the illuminant issuing from the burners when the shell is thrown into water. This shell is adapted to be thrown from a gun in naval operations to illuminate an enemy's vessel, fort, or harbor or to protect a vessel using the same from torpedo-boat attacks by illuminating the sea at a distance in every direction. The shell is also designed to be used for life-saving purposes in case of wrecks at night. It may be thrown from the shore by a suitable gun or thrown overboard from the vessel in distress to illuminate the vessel, indicate its whereabouts, and facilitate the launching of boats and their rescuing operations.

The invention will be described in detail, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of a shell embodying my invention, a part of the removable cap being broken away. Fig. 2 is a vertical central section illustrating one embodiment of the invention. Fig. 3 is a similar view illustrating another embodiment thereof. Fig. 4 is a similar view illustrating a different form of shell, and Fig. 5 is a central horizontal section of the shell shown in Fig. 4.

Referring to Figs. 1 and 2, 1 indicates a shell or casing having a gas-chamber 2 in its upper part and a carbid-chamber 3 in its lower part, the two being separated by a partition 4, provided with perforations 5 therein. As shown, the lower part 6 of the shell, containing the carbid of calcium 7, is attached to the upper part by means of a screw-joint 8 and the perforated bottom 4 is formed integral with the upper portion of the shell. The lower part of the shell is preferably made heavier than the upper part, and this extra weight, together with the weight of the carbid, causes the shell to float in a vertical position in water. The side wall of the carbid-chamber is provided with perforations 9 for the purpose of admitting water thereto when the chamber is partially submerged.

In the top plate 10 of the shell are perforations in which are secured burners 11 suitable for burning the acetylene gas produced by the carbid. As the moisture in the air would cause the gas to deteriorate, the shell is preferably sealed air-tight until it is to be used. The openings 9 may be closed by a sealing-strip 12, of paper, cloth, or metal, which is removably secured to the exterior of the shell over the small holes or inlets 9. The openings in the burners are preferably closed by means of a drop of readily-fusible solder 13, which will melt at a moderate degree of heat.

Surrounding the burners is a flange 14, one object of which is to protect the burners from the direct action of wind and water. Another object of the flange 14 is to form a vessel surrounding the burners to contain material which will ignite in the presence of water. For this purpose metallic potassium 15 is used.

The operation of the form of the invention illustrated in Figs. 1 and 2 is as follows: When the shell is thrown into water, either by hand or from a suitable gun, it will first be submerged and then immediately come to the surface and float upright with the burners uppermost. Water will immediately flow through the perforations 9 into the carbid-chamber, and acetylene gas will be generated. Simultaneously the potassium in the vessel surrounding the burners will ignite, first melting the solder from the burners and then igniting the gas issuing therefrom. The gas will continue to be generated until the carbid is exhausted, and the shell will float and produce a brilliant light as long as the gas-supply lasts. The pressure of gas within the shell is self-regulating. As soon as the pressure of gas exceeds the pressure of water in the openings 9 said gas-pressure will prevent

more water from entering until such time as the pressure of water on the outside predominates over the gas-pressure. For the protection of the burners the shell is preferably provided with a cover 16.

In Fig. 3 is shown a form of the invention in which compressed gas is used instead of a gas-producing substance. In this figure, 17 indicates a shell having a large compartment 18 for the storage of gas under pressure and a smaller compartment 19, communicating with burners 11. Between the compartments a diaphragm or partition 20, in which there is a small perforation 21, permitting the gas to pass from the compartment 18 to the compartment 19. The bottom of the shell is made heavy or provided with a weight 22, sufficient to cause the shell to float upright. In the bottom is also a valve 23 and a screw-plug 24. The plug may be removed for the purpose of pumping gas into the shell. The valve 23 prevents the gas from escaping, and the plug 24 when reinserted prevents the escape of gas should the valve leak. The upper end of the shell is closed by a top plate 10, and the burners 11 are arranged therein, the same as in Fig. 2. The shell is also provided with a flange 14, forming a vessel in which the ignited potassium 15 is used. The burners are sealed with solder 13, as heretofore described.

The operation of the shell shown in Fig. 3 is the same as that of the shell shown in Fig. 2, with the exception that the gas is already provided in the shell and does not require to be generated. A cap should be provided for temporarily excluding air from the potassium. When the shell is to be used, the cap is removed and the shell is thrown into the water. The potassium immediately ignites and first melts the solder 13 from the burners and afterward ignites the gas, which will issue from the burners as soon as the solder is removed. The gas in chamber 19 is at first under high pressure, which will prevent any solder from falling into the burners when it is melted. In a few moments the pressure in the chamber 19 is reduced, and thereafter the gas will burn at a lower pressure, the small perforation 21 acting as a reducing-valve between the chambers 18 and 19.

In Figs. 4 and 5 is shown a torch in the form of a spherical shell 25, adapted to be thrown from a gun or mortar. In the central portion of the shell is a vertical carbid-chamber 26, containing carbid of calcium 27. At the bottom of this chamber is a weight 28 to cause the shell to float with the burners 29 uppermost. The burners 29 are in communication with the carbid-chamber and located within a compartment 30 and wholly within the spherical outline of the shell. Surrounding the carbid-compartment is an annular air-tight compartment 31, which renders the shell buoyant. The shell is intended to float with a portion—say one-fourth—of its bulk above the surface of the water.

In the outer wall of the shell are a series of perforations 32, which permit water to enter a channel 33, and from said channel said water enters the carbid-chamber through perforations 34. The shell is preferably sealed until it is used to prevent the carbid from deteriorating by exposure to the atmosphere. This may be accomplished by pasting or otherwise attaching a strip 35 of suitable material to the shell, so as to cover the openings 32 and the burner-compartment 30. When the shell is to be used, the strip is torn off, so as to expose the burners and open the perforations 32. In Fig. 4 the strip is shown as partly torn off, uncovering the burner-compartment.

The burner-compartment may be provided with a potassium igniter, as illustrated in Figs. 5 and 6. In Fig. 4, however, is shown a time-fuse 36, which may be ignited just before firing the shell. The operation of the torch shown in Figs. 4 and 5 is exactly the same as the operation of the torch shown in Fig. 2, excepting when the former torch is provided with a time-fuse instead of a spontaneous igniter. Another point of difference is that the buoyancy of the shell shown in Fig. 4 is permanent, on account of the air-tight chamber 31, while the torch shown in Fig. 2 will eventually sink, no permanently-closed compartment being provided in it.

While it is preferred to use a large chamber filled with air or gas to float the shell, it will be evident that any other light substance, such as cork, might be used for this purpose. The shell will be termed a "floatable" shell, with the understanding that any shell constructed to float in water is included in this term. Although carbid of calcium in itself is not an illuminant, the words "illuminating material" will be used as a convenient term in the broader claims to include compressed gas, carbid of calcium, and other gas-producing materials.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A marine torch comprising, in combination, a floatable shell or casing charged with illuminating material, a burner for the illuminant, and means carried by the shell and independent of the illuminating material for igniting said illuminant.

2. A marine torch comprising, in combination, a floatable shell or casing having a compartment charged with carbid of calcium, means for admitting water to said compartment when the shell is afloat to produce acetylene gas, a burner for the gas, and means carried by the shell for igniting said gas at the burner.

3. A marine torch comprising, in combination, a floatable shell or casing charged with illuminating material, a burner for the illuminant, and an igniter independent of the illuminating material, said igniter consisting of a substance adapted to produce ignition in

the presence of water, whereby the illuminant is spontaneously ignited when the shell is thrown into water.

4. A marine torch comprising, in combination, a floatable shell or casing charged with carbid of calcium and having an opening to admit water thereto when the shell is afloat, a burner in communication with the carbid-chamber, and an igniter in communication with the burner, said igniter consisting of a substance adapted to produce ignition in the presence of water, whereby acetylene gas is generated and spontaneously ignited when the shell is thrown into water.

5. A marine torch comprising, in combination, a floatable shell or casing charged with carbid of calcium, said casing having a weight at one end, burners at the opposite end, and an opening to admit water to the carbid of calcium, and an igniter in communication with the burner, said igniter comprising a substance adapted to produce ignition in the presence of water, whereby the shell is adapted to float upright, and when thrown into water to generate and ignite illuminating-gas.

6. A marine torch comprising, in combination, a floatable shell or casing charged with illuminating material, a burner for the illuminant, an igniter in communication with the burner comprising a substance adapted to produce ignition in the presence of water, and means for temporarily sealing said illuminating material and igniting substance against contact with the atmosphere.

7. A marine torch comprising a floatable shell or casing having a compartment charged with illuminating material, a burner communicating with said compartment, and a second compartment, adjacent to the burner, charged with a substance adapted to produce ignition in the presence of water, whereby the illuminant is spontaneously ignited when the shell is thrown into water.

8. A marine torch comprising a floatable shell having a compartment charged with carbid of calcium, means for admitting water to said compartment when the shell is afloat, a gas-burner in communication with said compartment, and a second compartment, adjacent to the burner, charged with a substance adapted to produce ignition in the presence of water, whereby acetylene gas is generated and spontaneously ignited when the shell is thrown into water.

9. A marine torch comprising a floatable shell having a compartment charged with illuminating material, a burner in communication with said compartment, a second compartment which is empty and water-tight to provide buoyancy for the shell, and means carried by the shell for igniting the illuminant when the shell is afloat.

10. A marine torch comprising, in combination, a shell having a compartment charged with illuminating material, and a second compartment charged with a substance adapted to produce ignition in the presence of water, and detachable covering devices arranged to temporarily protect the contents of the compartments from the action of the atmosphere.

11. A marine torch comprising, in combination, a floatable shell or casing charged with illuminating material, a burner for the illuminant, a fusible seal for the burner, and an igniter arranged in proximity to the burner and adapted to fuse the seal and ignite the gas liberated from the burner.

12. A marine torch comprising, in combination, a floatable shell or casing charged with illuminating material, a burner for the illuminant, a fusible seal applied to said burner, and a compartment adjacent to the burner charged with a substance adapted to produce ignition in the presence of water, whereby the seal is fused and the liberated gas ignited at the burner when the shell is thrown into water.

In testimony whereof I affix my signature in the presence of two witnesses.

WILLIAM J. WILSON.

Witnesses:
CHARLES B. MANN, Jr.,
CHAPIN A. FERGUSEN.