(No Model.)

A. H. WALKER.

SEA OILING ROCKET.

No. 411,479. Patented Sept. 24, 1889.

Fig. 1

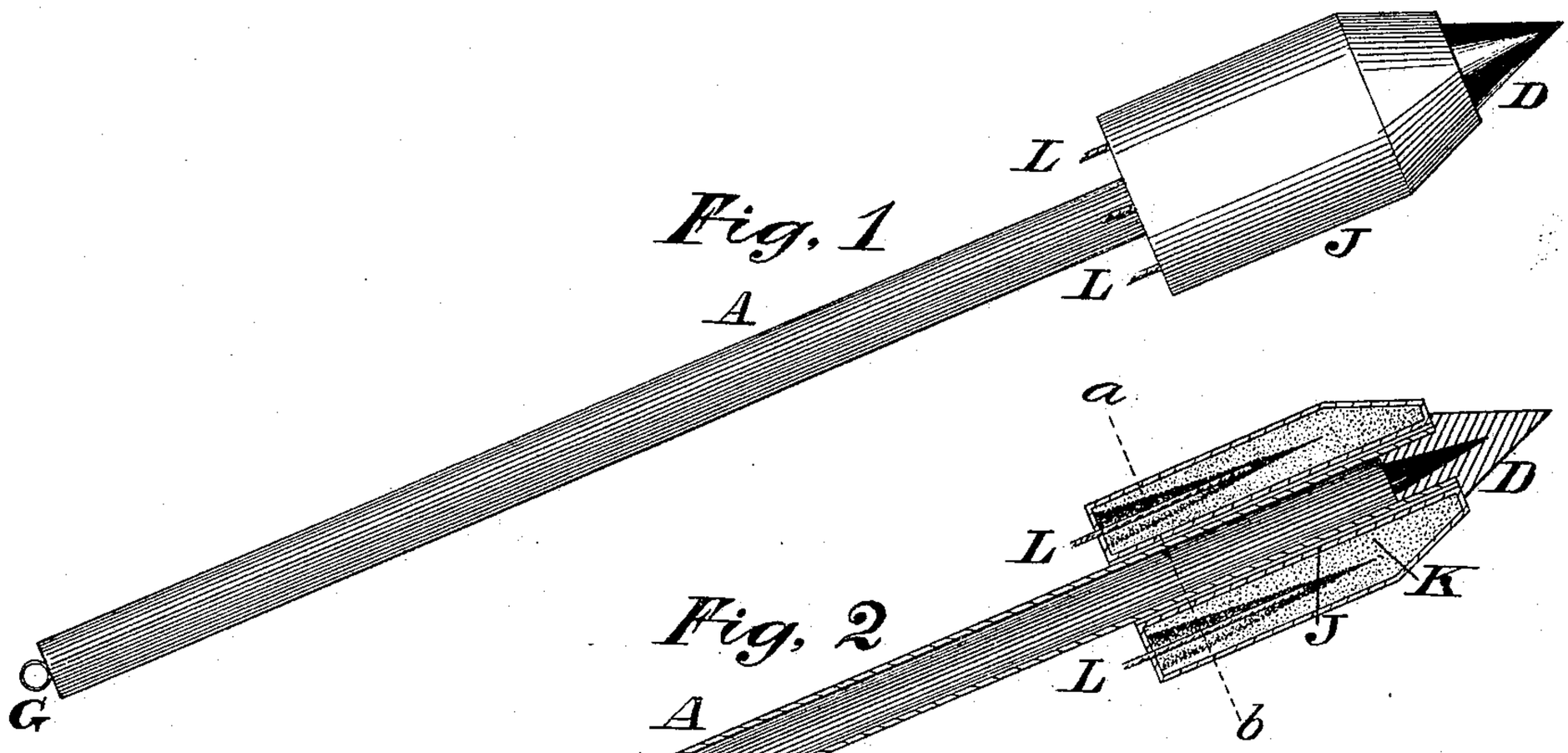

Fig. 2

Fig. 3

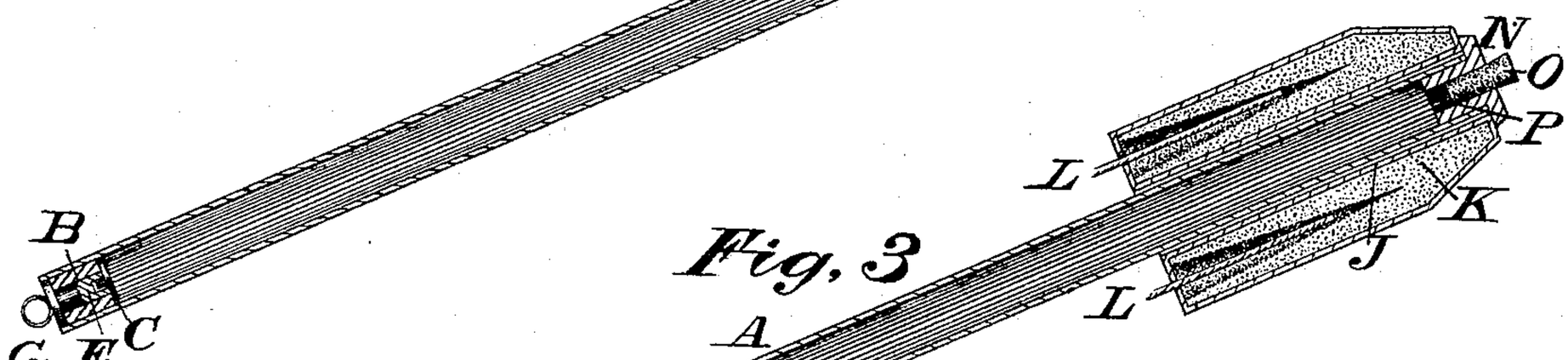

Fig. 4

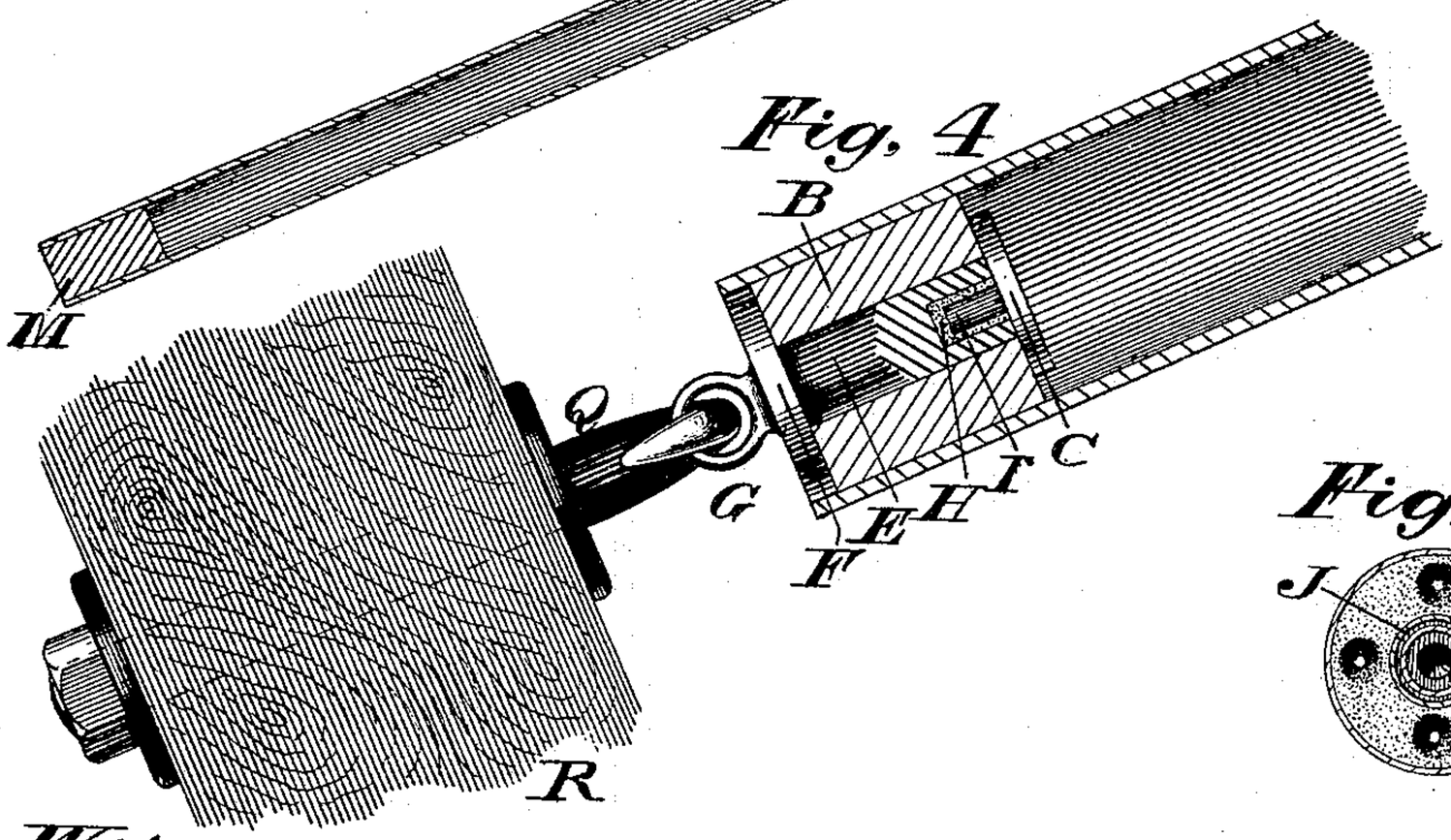

Fig. 5

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SEA-OILING ROCKET.

SPECIFICATION forming part of Letters Patent No. 411,479, dated September 24, 1889.

Application filed March 13, 1889. Serial No. 303,166. (No model.)

To all whom it may concern:

Be it known that I, ALBERT H. WALKER, of Hartford, Connecticut, have invented a new and useful Sea-Oiling Rocket, of which the following description and claims constitute the specification, and which is illustrated by the accompanying sheet of drawings.

This rocket consists of a powder-chamber at its head, and of a long and slender oil-chamber extending rearward from that powder-chamber and constituting the rocket-stick, and so constructed and equipped as to carry its oil from a shore or a ship into the sea and to discharge that oil upward through the water to the surface of the waves, and thus to allay the combers which would otherwise form upon their crests.

Figure 1 of the drawings is an exterior view of this rocket, and Fig. 2 is a central longitudinal section thereof. Fig. 3 is a central longitudinal section of a modified form of the rocket of Figs. 1 and 2. Fig. 4 is an enlarged view of the rear end of the rocket of Figs. 1 and 2, showing the detailed construction of that end, and showing, also, its engagement with a hook attached to a fixed rail on a rocket-stand. Fig. 5 is a cross-section on the line *a b* of Fig. 2.

The letter A indicates the shell of the oil-chamber; and the letter B indicates the base of the oil-chamber of Fig. 2, which base is preferably a cylindrical block of hemlock or spruce or other wood or substance of similar specific gravity.

The letter C indicates a valve, preferably made of iron and occupying a seat on the center of the inner end of the base-block B.

The letter D indicates a weight, preferably made of cast-iron, and firmly fixed in the forward end of the shell A, and provided with a flange extending outward from the forward end of that shell.

The letter E indicates a cast-iron plug, which is provided with the integral disk F and with the rearward integral ring G, and with the forward axial recess H for the reception of the stud I, which projects rearward from the center of the valve C and is integral therewith, and is held in its position in the recess H by any suitable cement occupying the space in that recess around that stud.

The letter J indicates the rocket-head, which contains the powder-chamber K, and which is annular in cross-section and is nearly filled with rocket-powder and is supplied with the fuses L.

The modified rocket of Fig. 3 differs from that of Figs. 1 and 2 in having the solid cast-iron plug M firmly and permanently fixed in the rearward end of the shell A, and in having the light annular and flanged cast-iron shell N firmly and permanently fixed in the forward end of the shell A, and in having the stopper O, closing the axial opening P in that shell. The hook Q is firmly and permanently fixed to the rail R, and that rail is a part of the rocket-stand from which the rocket is fired and which may be of any suitable construction.

The oil-chamber of the rocket of Figs. 1 and 2 is constructed by making the shell A of paper lined with either of the substances or compositions of matter with which paper receptacles of oil have heretofore been lined, and by firmly and permanently fixing the weight D in the forward end of that shell, and by assembling the valve C and the plug E and the base-block B by forcing that plug into that base-block and putting a small quantity of any suitable cement into its recess H and pressing the stud I into that recess, so as to fix the valve C in the position shown in Fig. 4, and then by inserting the base-block thus furnished tightly into the rearward end of the shell A after filling that shell with oil nearly up to the line to be occupied by the forward side of the valve C.

The rocket-head J is constructed of metal or paper or other suitable substance, and is nearly filled with rocket-powder, and is provided with rocket-fuses, as indicated in the drawings. The rocket-head is not structurally united to the shell A; but it is made and kept entirely separate therefrom and is not assembled therewith until the time the rocket is to be fired.

The shell A of the oil-chamber of the rocket of Fig. 3 is identical with the shell A of the oil-chamber of Figs. 1 and 2, and the oil-chamber of the rocket of Fig. 3 is completed by forcing the permanent iron plug M into the rearward end thereof, and by firmly fastening the light shell N into the forward end thereof, and by filling the chamber thus con-

structed with oil, and by closing that chamber with the stopper O.

The mode of operation of the rocket of Figs. 1 and 2 is as follows: The oil-chamber and the powder-chamber are assembled by passing the powder-chamber over the rearward end of the oil-chamber and thence upward along that chamber until the forward end of the powder-chamber is stopped by the flange of the weight D. The assembled rocket is then placed upon the rocket-stand, with its ring G in engagement with the hook Q. The fuses are then lighted, and when the rocket-head shoots forward it pulls the oil-chamber along with it, because the flange of the weight D extends outward from the shell A and upon the forward end of the rocket-head J. The hook Q prevents the plug E from participating in this forward motion and pulls that plug out from the base-block B against the slight resistance of the friction between the outside of the plug and the inside of the base-block and of the cement between the inside of the plug and the outside of the stud I. During the flight of the rocket through the air the valve C is caused to retain its place on its seat on the forward side of the base-block B by the outward suction through the opening in the base-block, which is caused by the rapid passage of the rocket through the atmosphere. When the rocket-powder is burned out, the resistance of the air to the forward motion of the empty shell J is greater in proportion to the momentum of that shell than is the resistance of the air to the forward motion of the oil-chamber, and therefore the oil-chamber flies forward out from the interior of the shell J and into the sea, as if it had been originally projected from a gun. When the oil-chamber reaches the water, its momentum carries it point downward, somewhat below the surface, although its aggregate specific gravity is less than that of water. As soon as its downward motion is arrested by the water, the valve C falls from its seat through the oil to the forward end of the oil-chamber, and thus uncovers the forward end of the opening through the base-block B. Thereupon the oil rises through this opening and out of the oil-chamber, while a corresponding quantity of water enters the oil-chamber to take its place, because its specific gravity is greater than that of oil. This operation continues until the oil in the oil-chamber is discharged from the upward end thereof, whence it rises to the surface of the sea, where it spreads as a film upon the waves.

The specific gravity of the valve C must be greater than that of oil and not great enough to prematurely dislocate it from its seat or to neutralize the buoyancy of the rearward end of the oil-chamber, which is caused by the small specific gravity of the base-block B and by the fact that the specific gravity of the shell A and the oil therein is less than that of water.

The specific gravity of the weight D must be great enough to cause the forward end of the oil-chamber to point downward in the sea, but not great enough to cause the aggregate specific gravity of the oil-chamber to exceed that of sea-water.

The mode of operation of the modified rocket of Fig. 3 differs somewhat from that of the rocket of Figs. 1 and 2, because the rearward end of the oil-chamber is permanently closed by the cast-iron plug M, which serves also as a weight, instead of being provided with the base-block B, the valve C, and the plug E, and because its forward end is permanently provided with the light shell N and temporarily closed by the stopper O, instead of being permanently closed by the weight D, and that difference consists in withdrawing the stopper O from the shell N just before the rocket is fired, and in retaining the oil in the oil-chamber during its flight through the air by means of the pressure of the air on the forward end of the column of oil, which is exerted through the opening in the shell N, and in employing the forward end of the oil-chamber as its upper and open end after the oil-chamber has come to rest in the sea.

The gravity of the shell N must not be great enough to neutralize the buoyancy of the forward end of the oil-chamber of the modified rocket of Fig. 3, which is caused by the fact that the shell of the oil-chamber and the oil therein is of less specific gravity than water, and the specific gravity of the weight M must be great enough to cause the rearward end of that oil-chamber to point downward in the sea, and not great enough to cause the aggregate specific gravity of the oil-chamber to exceed that of sea-water.

The oil in the oil-chamber may be fish-oil, linseed-oil, olive-oil, crude petroleum, or lubricating mineral oil, and still other oils will produce beneficial results, though fish-oil is probably best. When the rockets are to be used in cold weather, any thick and heavy oil therein requires to be mixed with lubricating mineral oil to give it sufficient fluidity.

Published data relevant to extemporaneous experiments which have been made with oil upon broken water, indicate a high degree of efficacy in the scientific use of small quantities thereof; but these rockets may be made of any desired size, with oil-chambers of any desired capacity, and may be used in many situations where a projectile shot from a gun would not be available on account of the recoil which is incident to a gun and is not incident to a rocket, or on account of the greater cost and weight of a gun as compared with a rocket-stand.

The principle of this rocket consists in a powder-chamber, and an oil-chamber carried thereby, and so constructed as to carry its oil into the sea and not to discharge any oil during its flight through the air. The foregoing description sets forth the best mode of applying that principle; but it may also be applied where the annular powder-chamber is struct-

urally or otherwise permanently fixed to the oil-chamber, and also where the powder-chamber is cylindrical in cross-section and is permanently or is separably fixed to one side of the oil-chamber instead of surrounding the same.

I claim as my invention—

1. A sea-oiling rocket consisting of a powder-chamber at its head, and of a filled oil-chamber extending rearward from that powder-chamber and constituting the rocket-stick, and having specific gravity less than that of water, while one of its ends has specific gravity greater than that of water, and the other end is provided with a passage for the upward egress of the oil when the oil-chamber is immersed in the sea, all substantially as described.

2. A sea-oiling rocket consisting of an annular powder-chamber at its head, and of a filled oil-chamber placed axially therein and extending rearward therefrom and constituting the rocket-stick, and having specific gravity less than that of water, while one of its ends has specific gravity greater than that of water, and the other end is provided with a passage for the upward egress of the oil when the oil-chamber is immersed in the sea, all substantially as described.

3. A sea-oiling rocket consisting of an annular powder-chamber at its head, and of a filled oil-chamber separable therefrom and loosely placed axially therein and extending rearward therefrom and constituting the rocket-stick, and having specific gravity less than that of water, while one of its ends has specific gravity greater than that of water, and the other end is provided with a passage for the upward egress of the oil when the oil-chamber is immersed in the sea, all substantially as described.

4. A sea-oiling projectile consisting of the combination of the shell A, the base-block B, provided with an opening therethrough, the valve C, closing that opening, the weight D, adapted to keep that opening upward in the water, and the plug E, holding the valve C on its seat in the base-block B and adapted to release that hold by being pulled out from the base-block, all substantially as described.

Hartford, Connecticut, March 12, 1889.

ALBERT H. WALKER.

Witnesses:
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JOHN H. WHITE.