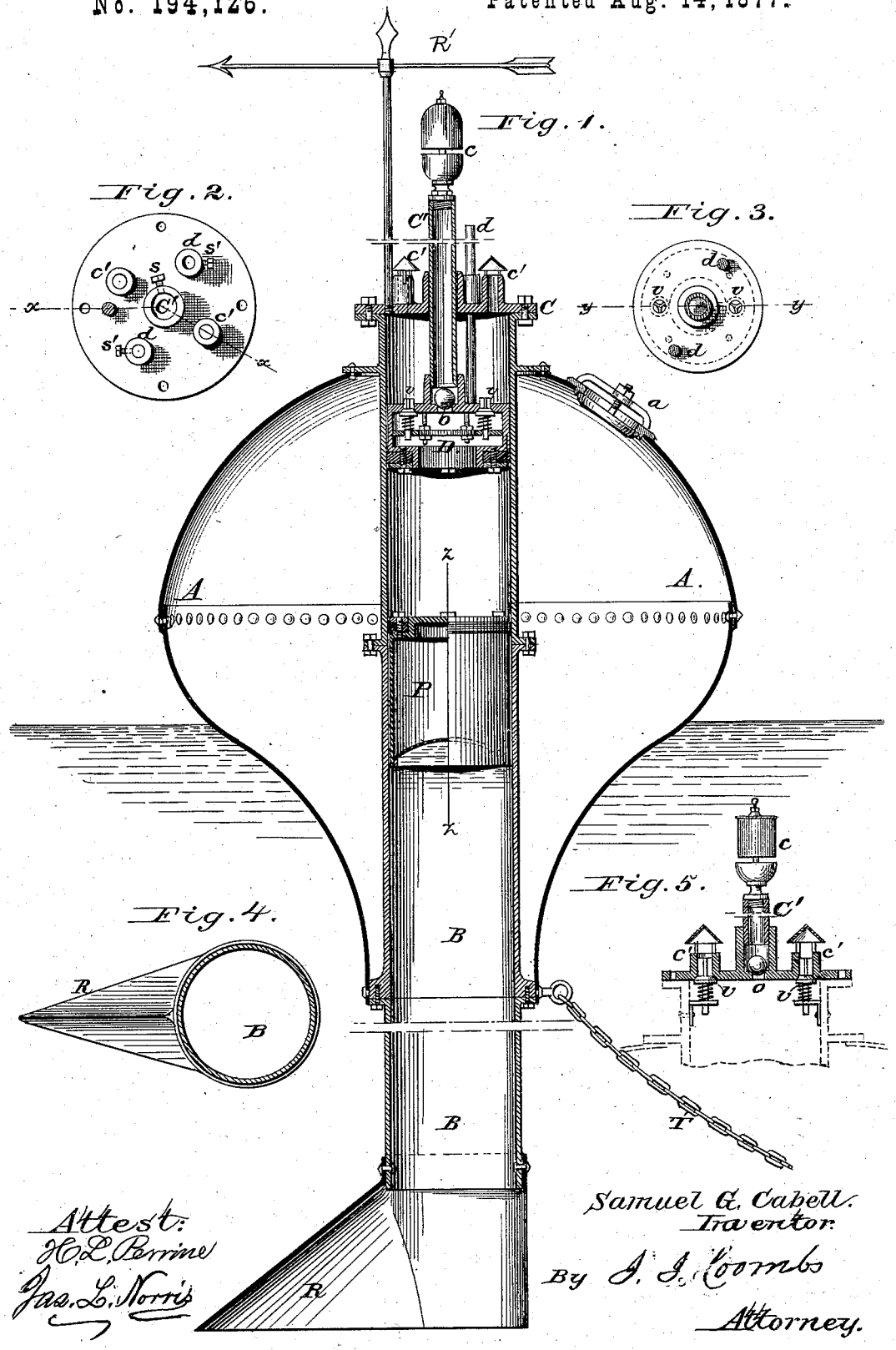
S. G. CABELL.

NAUTICAL ALARM-BUOYS.

No. 194,126. Patented Aug. 14, 1877.



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UNITED STATES PATENT OFFICE.

SAMUEL G. CABELL, OF WASHINGTON COUNTY, DISTRICT OF COLUMBIA.

IMPROVEMENT IN NAUTICAL ALARM-BUOYS.

Specification forming part of Letters Patent No. **194,126**, dated August 14, 1877; application filed July 26, 1877.

To all whom it may concern:

Be it known that I, SAMUEL G. CABELL, of the District of Columbia, Washington county, have invented certain new and useful Improvements in Nautical Alarm-Buoys, of which the following is a specification:

This invention is an improvement upon an alarm-buoy for which Letters Patent of the United States, No. 116,152, were granted to me June 2, 1871, as represented in Figure 5 of the drawings annexed to said Letters Patent.

As in the case of the buoy represented and described in my said former patent, this buoy is designed to be anchored in the water at any point where a signal-buoy is required, so that it will float, and will be caused to rise and fall by the waves, and when rising will draw in air by suction, and when falling the air will be expelled by the pressure of the water through a whistle or trumpet, making a loud noise.

In the accompanying drawings, Figure 1 represents a vertical section of the buoy on an angular line *x x*, as shown in Fig. 2. Fig. 2 is a plan view of the top plate or cap marked C in Fig. 1. Fig. 3 is a top view of an adjustable diaphragm marked D in Fig. 1. Fig. 4 is an end view of the lower end of the central pipe marked B in Fig. 1, and Fig. 5 is a vertical cross-section of the cap-plate marked C in Fig. 1.

A is the buoy proper, consisting of a hollow shell of sheet-copper or other suitable metal, and *a* is a man-hole therein. B is a pipe extending centrally down through the shell A, and may vary in length according to the depth of the water in which the buoy is used. C is a cap-plate covering the upper end of said pipe, having a central hole through which an air-pipe, C′, passes, having a whistle or trumpet, *c*, at its upper end. Said cap-plate has also two induction air-holes, *c′*, through it, or it may have but one. The lower end of said air-pipe C′ is attached to an adjustable diaphragm, (shown in vertical section in line *y y*, Fig. 3,) which is movable up and down in the pipe B, and may be fixed at any point therein by a set-screw, *s*, Fig. 2. At the lower end of said air-pipe C′ I have shown a ball-valve, *o*, which opens when the air-pressure is upward; but this I do not consider essential, as said pipe may be left open all the time. In said adjustable diaphragm there are two spring-valves, *v*, which open when the buoy rises, to admit air below the diaphragm, but close when the buoy sinks, compelling the air below it to pass out through the pipe C′ and the whistle or trumpet *c*. One valve, however, would answer the purpose. Two guide-rods, *d d*, attached to the movable diaphragm D, extend up through the cap-plate C, and may be fixed at any point by set-screws *s′ s′*, Fig. 2. The object of said adjustable diaphragm is to so limit the air-chamber between the surface of the water in the pipe B and the air-exit port to the whistle, that at each sinking of the buoy all or nearly all of the air in said chamber shall be expelled; and it is made adjustable, in order that it may be readily moved and fixed at any point in said pipe B that may be found most suitable to its operation. It will be seen, also, that by removing the cap C said diaphragm and all its attachments may be withdrawn entirely from the pipe B, for the purpose of repair. Said diaphragm is provided with a packing to render it air-tight.

Instead of said adjustable diaphragm, however, the same effect may be produced by fixing the air-pipe C′ permanently in the cap-plate C, and also locating the inlet air-valves *v v* in said cap-plate, as shown in Fig. 5, and employing a floating piston, P, of such weight that it will rise above the surface of the water, so as to limit the air-chamber between it and the cap-plate to any dimensions desired. Thus it will be seen that when the adjustable diaphragm is used the floating piston will be unnecessary, and when the floating piston is used the adjustable diaphragm will be unnecessary; but both may be used together by proper adjustment for that purpose. I construct said piston P of sheet-copper or other suitable metal, in the form of a cylindrical shell, closed air-tight at both ends, and having a packing around it to make it fit the pipe B water-tight, but yet allow it to slide freely therein. In the drawing it is shown in vertical section on one side of the line *z z*, and

in elevation on the other side of said line. I have shown the lower end made concave; but this is not essential.

R is a rudder or vane at the lower end of the pipe B, which will prevent the buoy from turning, except as the under-current changes its course. This is placed low down in the water, so that it shall not be affected by the wind, or by the surface-currents produced by the wind. R′ is an indicator, mounted on a staff fixed firmly to the cap-plate C, to show the direction in which the under-current is running. T is the anchor-chain.

Having thus fully described my invention, and explained its several modes of operation, what I claim as new, and desire to claim by Letters Patent, is—

1. In combination with the hollow shell A, central pipe B, and cap C, the adjustable diaphragm D, carrying the air-pipe C′ and whistle or trumpet *c*, constructed and arranged to operate substantially as described.

2. In combination with the hollow shell A, central pipe B, and cap C, containing inlet air-valves, and carrying a whistle or trumpet mounted on a permanently-fixed air-conducting pipe, as described, I claim the floating piston P, constructed and arranged to operate substantially as set forth.

3. In combination with the hollow shell A, central pipe B, and cap C, I claim both the adjustable diaphragm D and the floating piston P, arranged as shown in Fig. 1.

4. In combination with the hollow shell A and central pipe B, the rudder or vane R and indicator R′, substantially as and for the purpose described.

In testimony that I claim the foregoing I have hereunto set my hand in the presence of the subscribing witnesses.

S. G. CABELL.

Witnesses:

ALBERT H. NORRIS,

JAMES A. RUTHERFORD.

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