(No Model.)

2 Sheets—Sheet 1.

E. C. BATES.

WHISTLE FOR BUOYS.

No. 585,882. Patented July 6, 1897.

Fig. 1.

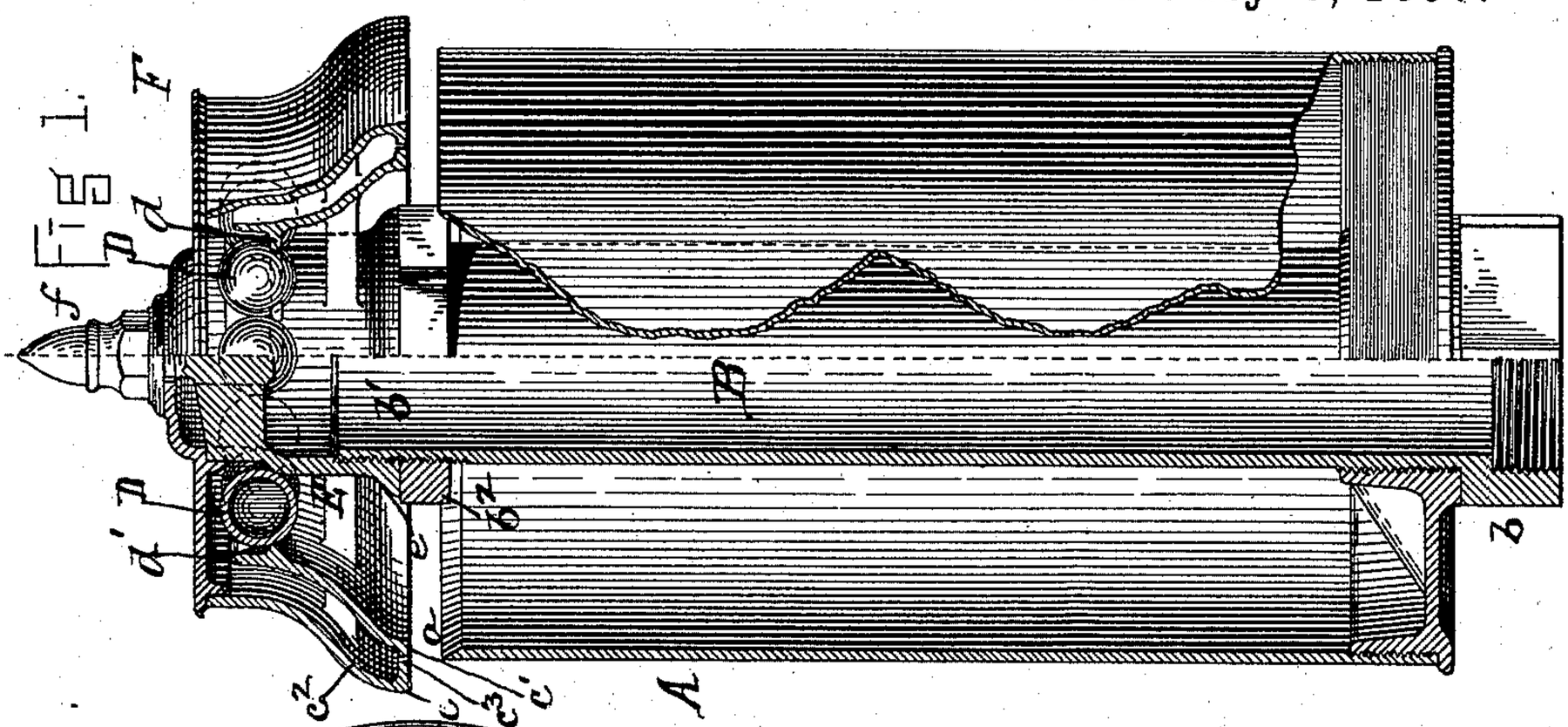


Fig. 2.

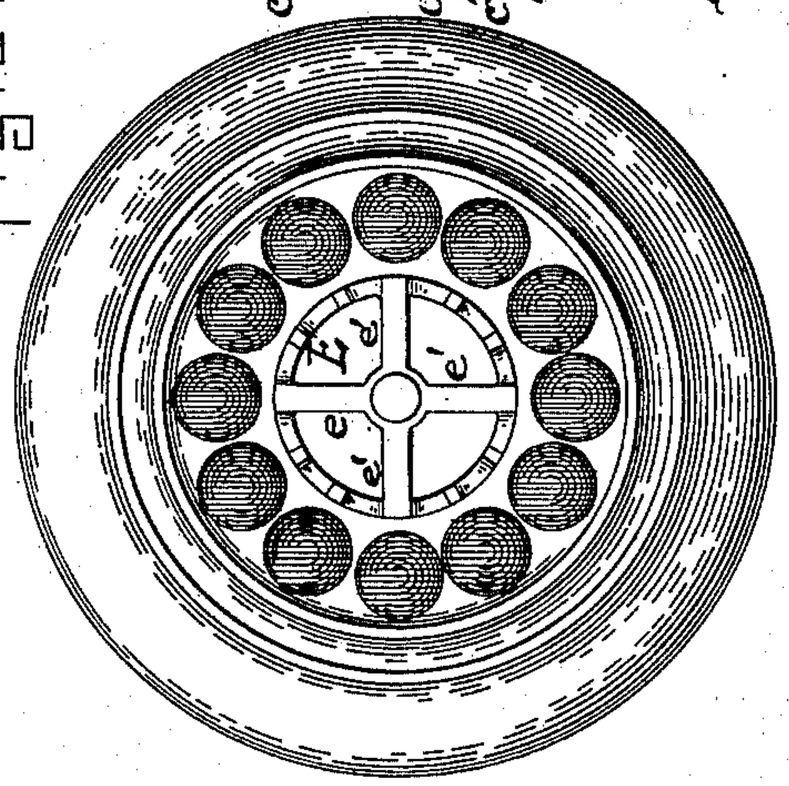


Fig. 4.

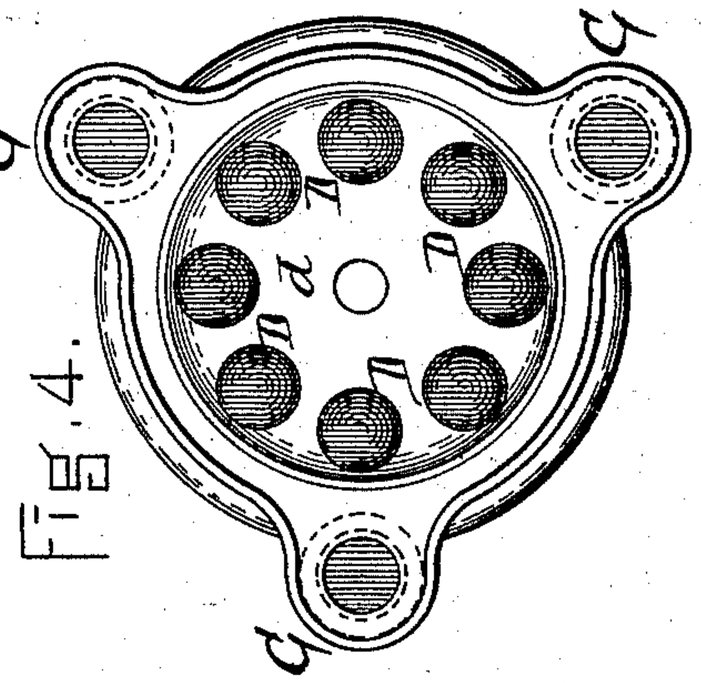
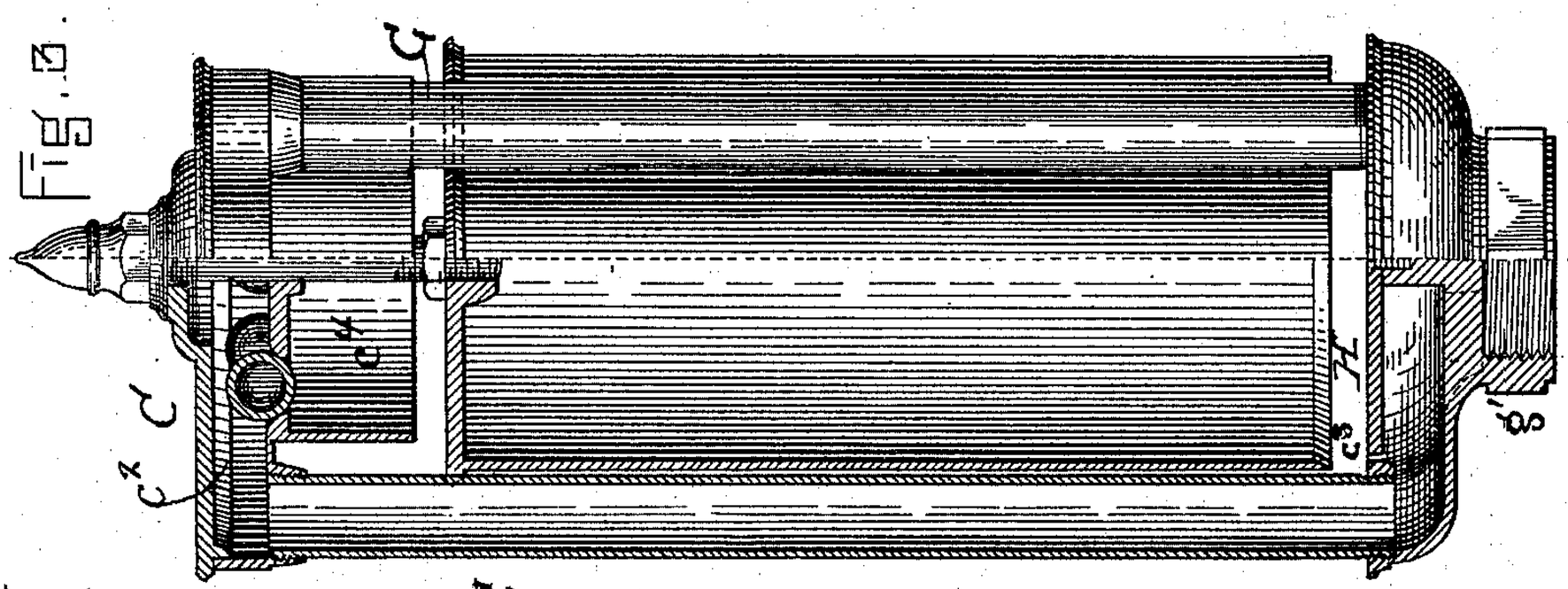


Fig. 3.



WITNESSES.

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C. F. Tadelly

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(No Model.)

2 Sheets—Sheet 2.

E. C. BATES.

WHISTLE FOR BUOYS.

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Fig. 5.

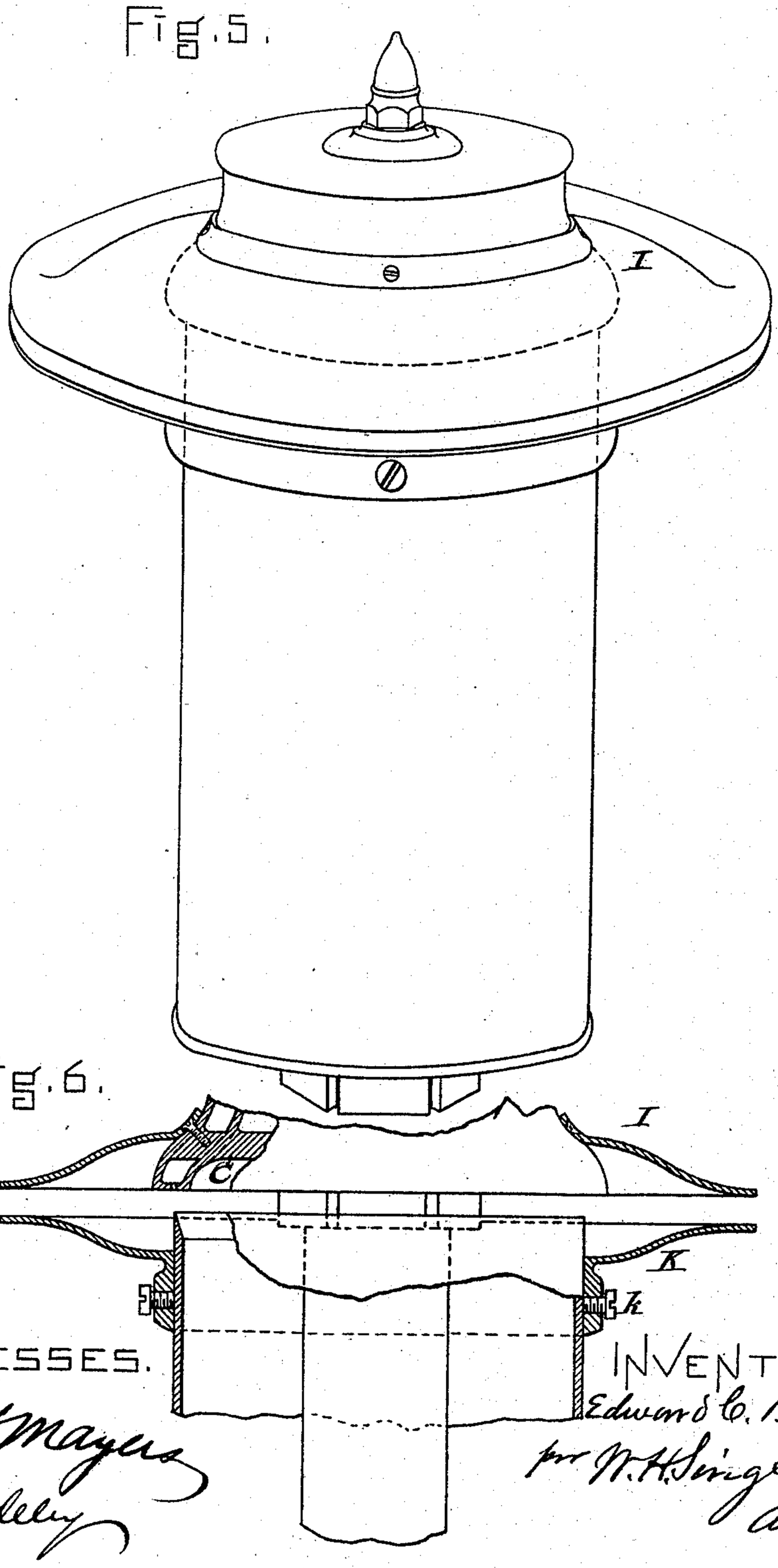

Fig. 6.

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UNITED STATES PATENT OFFICE.

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WHISTLE FOR BUOYS.

SPECIFICATION forming part of Letters Patent No. 585,882, dated July 6, 1897.

Application filed May 12, 1896. Serial No. 591,227. (No model.)

To all whom it may concern:

Be it known that I, EDWARD CARRINGTON BATES, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Whistles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an improvement in whistling-buoys. These whistling-buoys are so constructed that the whistle is sounded by the air which is received into them upon the rise of the buoy on the wave, thence forced outward through the whistle, causing it to sound upon the fall of the buoy as it descends into the trough of the sea, thus alternately taking in air as it rises and exhaling it as it falls.

In the annexed drawings, Figure 1 represents the whistle, which is here inverted, having upon its open end the cup with its ball-valves, as may be seen in section. Fig. 2 is a sectional view showing the ball-valves of Fig. 1. Fig. 3 is another form of whistle and valve. Here the whistle is shown as nominally used with the open mouth downward, having the ball-valve on top, communicating with the ordinary cup of the whistle through the three pipes shown. Fig. 4 represents a sectional view through the valve surmounting the whistle, Fig. 3, showing the balls in their place and the three pipes mentioned. Fig. 5 is a perspective view in outline of the whistle with two deflectors or sounding-plates attached to the same. Fig. 6 shows in section that portion of Fig. 5 where the plates are attached to the whistle and its cup.

In the drawings, the letter A indicates the ordinary whistle-bell, passing centrally through which is the air-tube B, having projections below the threaded end b for connection with the buoy. This tube B extends above the bell A, as at b', and fastened to the top of the tube B is the circular cup C. The cup C is positioned upon the tube B by the check-nut b^2. This cup C has the exterior and interior walls c c', with the chamber c^2, between them. Where the walls come together there is a slit c^3, communicating with the chamber c^2, such slit being just above the chamfered edge a of the bell A. Near the top of the wall c' there is on the inside a diaphragm d, having a number of perforations d', in which are seated, on top of the diaphragm, balls D. A hollow central boss E projects upwardly and downwardly from the diaphragm, and its lower end e is secured to the upper end of the tube B. At the top of the boss E bars e' cross each other, and from the center e^2 rises a projection e^3. A cover F fits upon the cup C, resting on the upper end of the central boss E, and is held in place by a nut f, which fits upon the projection e^3.

When attached to a buoy and the latter rises upon the wave, the water within the pipe or internal chamber of the buoy recedes and the space of the retreating water is replaced with air, which finds its way upward through the cup into the chamber c^2, connected to the upper part of the large pipe B, thence flows downward through the pipe B into the buoy, filling all the space made by the descending water. Upon the descent of the buoy upon the retreating wave the water rushing into the buoy or its depending pipe compresses the air therein and forces it upward through the pipe B into the chamber c^2, thence downward through the narrow slit or opening c^3, and there sounds the whistle in the usual way. The balls are at the same time forced firmly to their seats, so that no air escapes outward through them. This alternate action goes on so long as there is any agitation of the buoy by the movement of the water.

Fig. 3 is another form of whistle, as above stated. In this case the whistle is screwed to the pipe of the buoy at its inlet g'. The cup C is connected to the cup H, and thus to the internal chamber of the buoy, by the three pipes G G G. The sounding of this whistle is as follows: When the buoy to which the whistle is attached rises, upon the receding of the water therein, the air passes upward through the circular opening c^4, thence through the ball-valves D into the chamber formed above them, c^2, thence downward through the three pipes G G G into the cup

H below the open mouth of the whistle, thence downward into the chamber of the buoy to replace the water which has thus receded. Upon the buoy descending, as before described, on the retreating wave the inrushing water compresses the air and forces it outward through the circular slit c^3 in the whistle-cup H, and thus sounds the whistle, the cups being firmly held to their seats meantime.

Figs. 5 and 6 disclose deflecting or sounding plates which surround the whistle, as shown in Fig. 1. The upper circular plate I is made fast or adjustable to the cup C. The lower deflecting or sounding plate K is adjustable upon the whistle-bell A, and may be adjusted upward and downward, as desired, by sliding the same upon the bell, having in the hub of the deflector set-screws *k* for fastening it firmly when located at the desirable position. The object of these plates is to disseminate or diffuse the sound laterally along the surface of the water rather than to permit it to rise upward and diffuse itself in all directions, as would be the case if they were not present.

Whistling-buoys to-day are in use, but they are largely of this fashion: They consist of mounting upon a buoy an ordinary whistle, which receives its air through an independent pipe and a ball or other kind of check valve communicating directly to the air-chamber of the buoy. These buoys have been in extensive use, but have not given very much satisfaction to the Government or public on account of the inability by their construction to give forth sufficient sound due to the short supply of air. Experimenting was done for several weeks on this subject and it was found that the older type, which has been in general use, was very inefficient, due to having the whistle and the ball-valve separate and independent of each other without a proper regard for the relative opening to the same. In the present device the whistle and valve are so designed that there are a large number of sensitive valves intended to be of sufficient area of opening as to provide all the air necessary to permit the water to quickly retreat in its rise upon the wave. Moreover, it will be observed that one of the peculiarities of the whistle is that it is inverted, and thus is raised higher from the water than when it is located in the ordinary way, allowing a greater diffusion of sound and preventing an accumulation of ice when used in northern waters. This is the first instance known of the manufacture of whistles having such combination as described.

Having described my invention, what I claim is—

1. The combination of the whistle-bell having an edge; a receptacle having a chamber and a slit into such chamber, the slit being opposite the edge of the whistle-bell; a valve in such receptacle opening to the outer air; and an air-tube communicating with the interior of the buoy and the receptacle, as set forth.

2. The combination of the bell, A; the air-tube, B; the cup, C, having the chamber, c^2, the slit, c^3, adjacent to the edge, *a*, of the bell, A, the diaphragm, *d*, having the perforations, *d'*; and the balls, D, as set forth.

3. The combination of a whistle with two deflecting-plates placed opposite each other and having a passage between them, as set forth.

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

EDWARD CARRINGTON BATES.

Witnesses:
JOSHUA H. MILLETT,
ARTHUR L. BOWKER.