

(No Model.)

J. M. BATCHELDER.

SUBMARINE SIGNAL.

No. 368,272.

Patented Aug. 16, 1887.

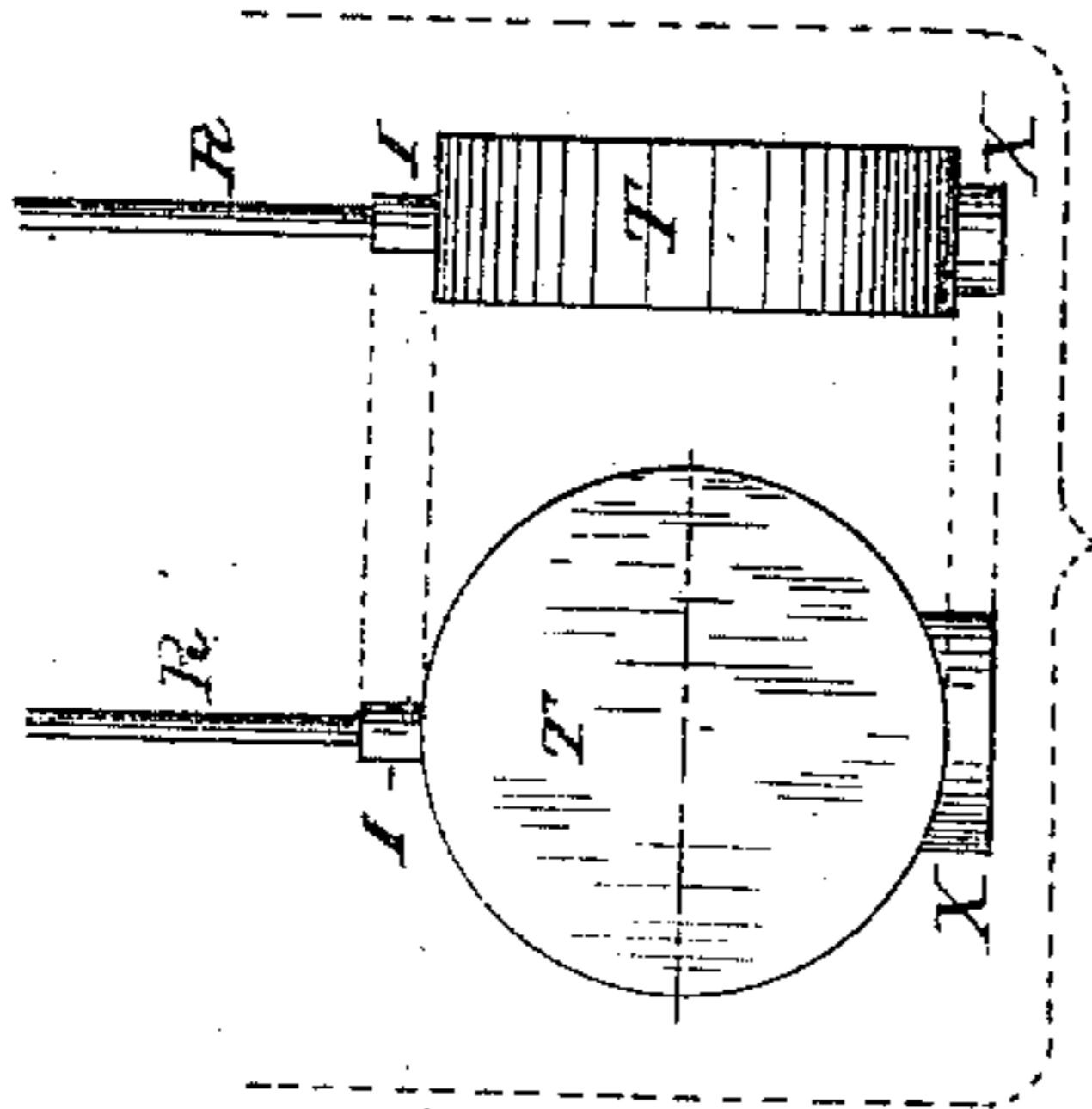


Fig. III.

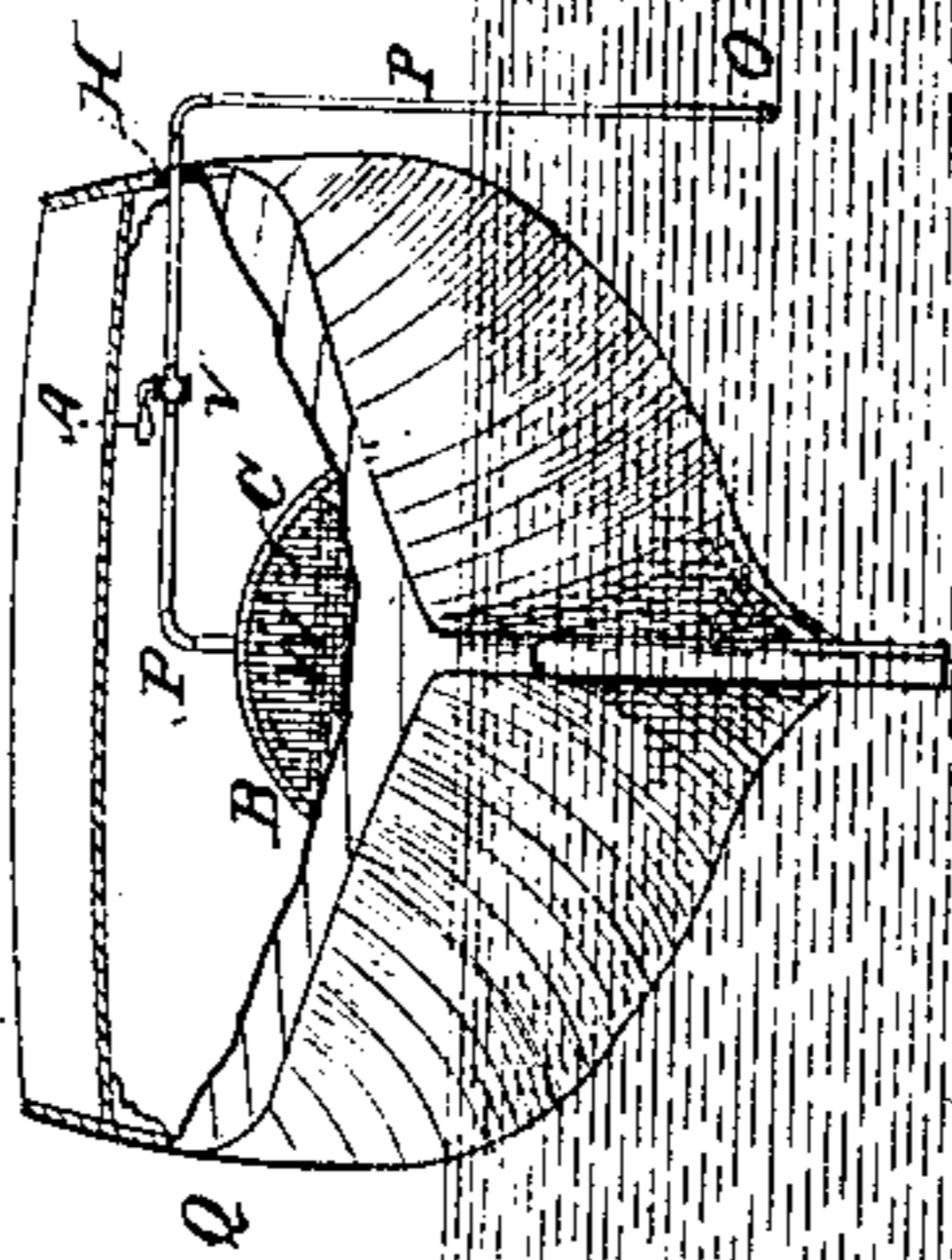


Fig. I.

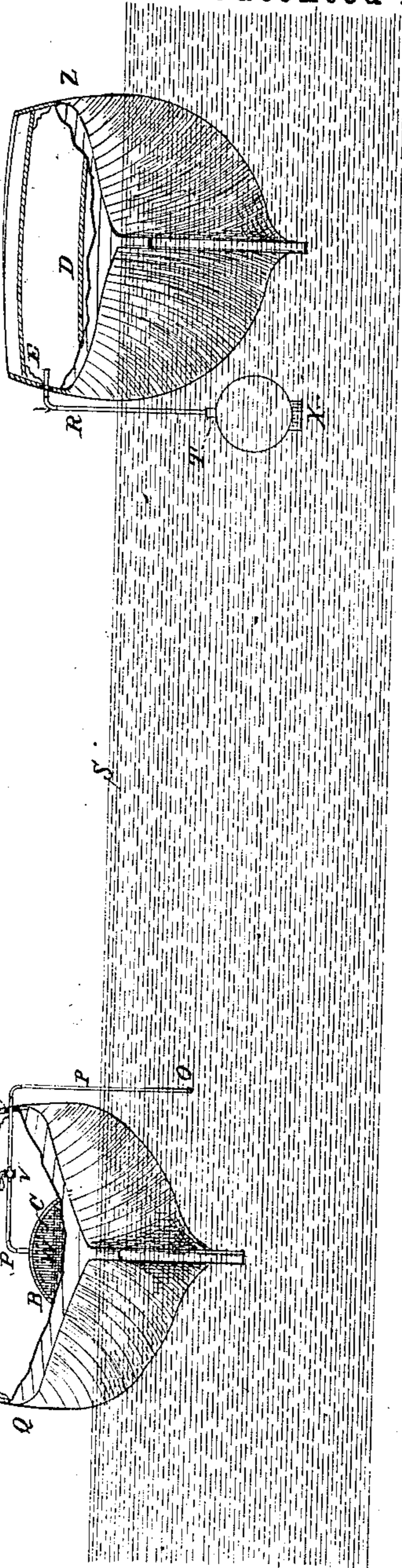


Fig. II.

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UNITED STATES PATENT OFFICE.

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SUBMARINE SIGNAL.

SPECIFICATION forming part of Letters Patent No. 368,272, dated August 16, 1887.

Application filed January 11, 1886. Serial No. 188,273. (No model.)

To all whom it may concern:

Be it known that I, JOHN MONTGOMERY BATCHELDER, a citizen of the United States, residing at Cambridge, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Submarine Signals, of which the following is a specification.

The herein-described apparatus is intended for giving signals or for affording communication between steamboats, steamships, or other vessels during a fog or by night. The system is entirely acoustic and has no relation to visual or to electric signals.

In the drawings, making a part of this specification, Figure I represents the sending apparatus in position for use. Fig. II is a view of the tympanum and its attached rod or tube constituting the receiving-instrument. Fig. III is a front and a side view of the tympanum.

Upon the steamer or vessel Q, Fig. I, a pipe, P, is connected with the steam-boiler B, its upper orifice being within the steam space or chamber C above the water W, and its lower end, O, immersed in the open water S alongside of the vessel Q, which is supposed in this case to be the sender of the signal or message. The steam-pipe P passes through a scupper or port-hole, H, and has at any suitable point in its length a common stop-cock or valve, V, provided with a handle or lever, A, that can be turned to open or close the cock and admit to or exclude from the open water a jet of

steam at any required intervals of time. As the jet of steam enters the cold water, S, that occupies the space between the two points of observation, it is condensed, a vacuum is formed, and a loud cracking or snapping sound is produced.

The description thus far relates to the sending apparatus. The receiving part consists of a drum or tympanum, T, Figs. II and III, provided with a socket, I, in which a wooden rod, R, or a metal tube, a wire, or other good conductor of sound is inserted. This rod or tube R leads from the tympanum T to the ear of an observer at E on the vessel or steamer Z, that is to receive the signal or message from the steamer Q. The drum is made of sheet metal—that is, sonorous—and may be about one foot in diameter and an inch in thickness. (Shown in the front and side views, Fig. III.) Air is inclosed in the drum T, which is submerged by the attached weight X to the depth of a few feet below the surface of the water S. It is not necessary that the drum should be on the same level as the lower end of the steam-pipe P, as the sound and vibration proceeds from the point O in all directions.

In the case of two steamboats nearing each other in a fog—both being provided with the apparatus for sending and receiving signals—the sounds may be often repeated to call attention. If the course of a distant boat is wanted, a message may be sent thus by the use of the telegraphic alphabet:

How do you head?

E. N. E.

The velocity of sound in water is about four thousand seven hundred and eight feet per second, equal to about nine-tenths of a mile. Therefore for all practical purposes in its use for signals its transmission for several miles may be considered as instantaneous. When vessels are near each other, the loud cracking sound of the steam as it escapes in the water may be heard by using a small tube of metal open at both ends, or a wooden rod as receivers of sound. In this case the tube or rod

should enter the water about two fathoms, in order to present sufficient surface to the action of the sound-waves, the other end of the tube or rod being held to the ear of the observer at E, Fig. II.

This system of signals is suitable for giving to passing vessels notice of the proximity of dangerous capes, headlands, or shores, special provision being made at these points for generating steam to be applied as herein stated. It can also be used between terminal stations

or positions that are not in the line of direct vision.

The stop-cock V in the pipe P may be placed near the steam-generator and a rubber hose
5 used for the conveyance of steam to the open water. When used in this manner, the outer end of the hose should have a metallic nozzle two or three feet in length to increase the resonance.

10 I claim—

The combination of a transmitter consisting of a steam-generator, a valved pipe extend-

ing from the same beneath the surface of the water, and a receiver having a tympanum adapted for immersion in the water to receive
15 the sounds caused by the escape and condensation of steam as it enters the water from the transmitter, and a pipe, tube, or equivalent device for conveying such sound to the ear of the observer from such tympanum.

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Witnesses:

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