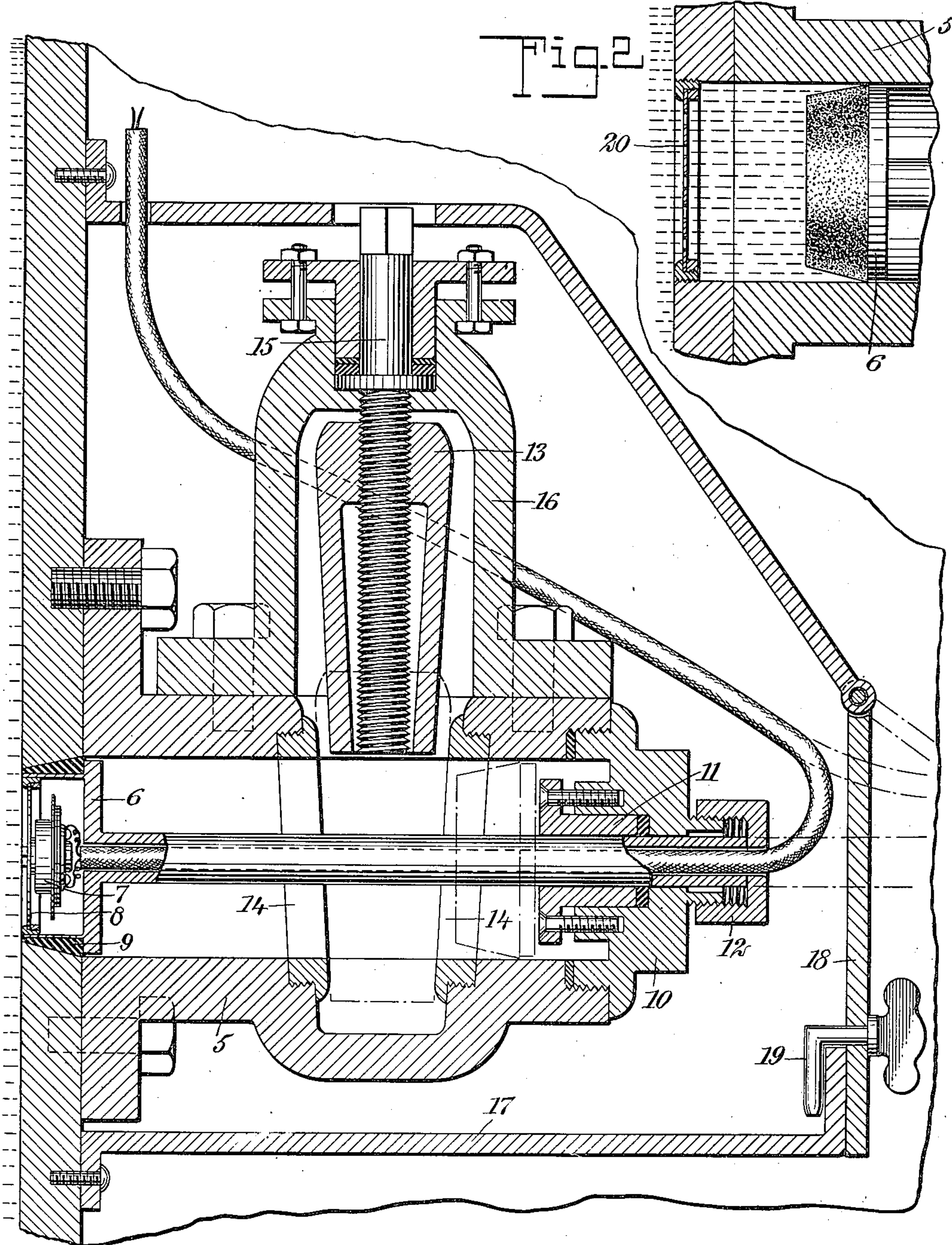


C. H. MUNDY.  
 APPARATUS FOR RECEIVING SUBMARINE SIGNALS.  
 APPLICATION FILED APR. 21, 1908.

908,877.

Patented Jan. 5, 1909.



WITNESSES  
*J. A. Brophy*  
*W. W. Holt*

Fig. 1

INVENTOR  
*Charles H. Mundy*  
 BY *Mumford & Co.*

ATTORNEYS



# UNITED STATES PATENT OFFICE.

CHARLES HOSKINS MUNDY, OF METUCHEN, NEW JERSEY, ASSIGNOR TO FLORA B. MUNDY, TRUSTEE, OF NEWTONVILLE, MASSACHUSETTS.

## APPARATUS FOR RECEIVING SUBMARINE SIGNALS.

No. 908,877.

Specification of Letters Patent.

Patented Jan. 5, 1909.

Application filed April 21, 1908. Serial No. 428,427.

*To all whom it may concern:*

Be it known that I, CHARLES H. MUNDY, a citizen of the United States, and a resident of Metuchen, in the county of Middlesex and State of New Jersey, have invented a new and Improved Apparatus for Receiving Submarine Signals, of which the following is a full, clear, and exact description.

This invention is an improvement in submarine signal receivers such as are placed on board ship for the interception of warning sounds. Such devices as now existing or heretofore suggested, may be divided into three different classes: first, apparatus to be lowered over the side of the ship into the water; second, apparatus fastened to the outside skin of the ship, but not accessible from within; and third, apparatus fastened to the inside skin of the ship and accessible from within. The first class yields the best results in so far as loudness and distinctness of sound is concerned, and the third class is in these respects the least efficient; yet the latter has been adopted in commercial use because of the difficulty of handling the first in stormy weather while the ship is in motion, as well as its liability to injury. The second class although presenting all of the advantages of the first, with the additional advantage that it is unaffected by stormy weather, is, however, objectionable for the reason that it is inaccessible for the purpose of making repairs, etc.

My invention belongs to a fourth class of this art, which possesses all the advantages enumerated of the first three classes and others, the same consisting of a sound transmitter exposed directly to the sea and accessible from within the ship, and is distinguished from other inventions of this class in that the transmitter proper may be removed and replaced while the ship is afloat without taking water within the ship.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in both views.

Figure 1 is a central vertical section through a submarine receiving apparatus applied to a ship and embodying my invention; and Fig. 2 is a fragmentary sectional view illustrating a slight modification.

In carrying out my invention I provide a chamber preferably a cylinder 5, which is bolted or otherwise secured to the inside of

the hull or skin of the ship, in register with an opening formed in the latter, which, as shown in Fig. 1, is of tapering form with the enlarged portion at the inside. This cylinder may be installed at any point on the hull below the water line, as, for example, in the cut-water on the bow of the vessel, in which position sounds ahead and from either side of the ship would be heard with equal clearness. Movable within the cylinder is a piston 6, the head of which is hollow and contains any of the usual or other form of transmitter 7, inclosed on the front by the diaphragm 8, which, by reason of the opening in the hull, is exposed directly to the sea.

The piston head is of a form to closely fit the opening in the hull, and when firmly pushed to its seat in that type of the invention shown in Fig. 1, will be substantially flush with the hull's outer surface. If the piston head be made of metal, such as brass, and the hull be of iron, it is desirable that a gasket of rubber or some equally efficient substance, 9, be placed about the piston in order to avoid electrolysis; said gasket also serving as a cushion between the receiver and the skin of the ship, so as to give close phonetic contact between them, and in any case there should be one or more grooves between the piston head and the skin of the ship, so as to permit free passage of water from the open sea into the chamber when the piston head or receiver is pressed firmly into position and flush with the outside skin of the ship.

The inner end of the cylinder is closed by a removable head 10 having a stuffing-box 11 through which the stem of the piston passes, forming therewith a water-tight joint around the head. On the outside of the head is threaded or otherwise adjustably attached, a thimble 12 which operates when screwed up to firmly force the piston head to its seat in the hull of the ship. The piston stem, it will be observed, is made hollow, and the thimble 12 is provided with a registering central opening through which pass electric conductors leading from the transmitter to the telephone receiver, which is ordinarily located in the pilot house. At an intermediate point of the cylinder, preferably near its center, a valve is provided, which I have shown in the form of an ordinary gate valve comprising the wedge-shaped valve-head 13, seating between two reversely inclined rings 14, detachably fitted at opposite sides of an



enlargement in the cylinder. The head 13 is operated by a screw 15, revolubly mounted in the top of a dome 16, which latter is secured to the cylinder over the opening therein through which the gate valve moves.

After the apparatus thus far described is installed in the ship, it is preferably inclosed in a casing 17, which, in the present form of the invention shown, is provided with a hinged door 18, at the front, adapted to be held in closed position by a thumb latch 19; the casing also having openings, respectively for the passage of the conductors and for the operation of the gate valve.

In some instances it may be found desirable to protect the transmitter from sea growth and other deranging influences from without, for which purpose I have shown in Fig. 2, a screen 20 arranged over the opening in the hull of the ship. In this particular form of the invention shown, the transmitter is not designed to be brought flush with the outer surface of the hull, as in the type of the invention illustrated in Fig. 1, but it may be placed in whatever position in the cylinder it may be found by actual test to be the most desirable. The cylinder may be considered as a resonating chamber, and the proper position of the transmitter therein will depend upon the pitch of the sound received from the bell signal.

The transmitter may be easily focused to meet the conditions of any pitch, by merely increasing or decreasing the distance between the transmitter diaphragm and the hull of the ship. When the screen is not used, it will be preferable to position the transmitter as illustrated in Fig. 1, as by setting it back within the cylinder, in the absence of the screen, a whistling sound is likely to result, or if projected ever so slightly beyond the outer surface of the hull, the clearness of the signal would be impaired by the flow of the water against the transmitter. When it is desired to clean the transmitter, the thimble 12 is removed after opening the door 18 and turning it back upon the inclined portion of the casing, in which position it will remain under the action of its own weight. The piston may then be retracted to the limit of its inward movement, as shown in dotted outline in Fig. 1, after which the gate valve is lowered, cutting off the rear of the cylinder from the open sea, when the cylinder head may be detached and the piston removed. If the opening in the hull of the ship has become in any wise fouled, the piston may be replaced by a dummy piston or plunger, and the latter used after the cylinder head is placed in position and the valve opened, to force out the collected growth. In this way the transmitter may be kept in perfect order, and the apparatus will in no wise be rendered less efficient after long usage, if it is given the proper attention.

The apparatus, it will be observed, is not only rendered more efficient by presenting the transmitter directly to the sea, but this efficiency is augmented when the piston is forced to its seat, by reason of the close phonetic contact with the skin of the ship, which acts as a sound collector; and, under the circumstances, the cylinder will have an inexhaustible supply of water, and as a consequence the apparatus will not be rendered less effective by a portion of the water being lost through leakage or evaporation, which on the other hand would render an apparatus for this purpose inclosed within a tank practically useless.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. The combination of a cylinder, a piston movable within the cylinder having a sound transmitter, and means intermediate the cylinder for cutting off communication between the opposite ends thereof.

2. The combination of a cylinder adapted to be secured within the hull of a ship in communication with the sea, a detachable head covering one end of the cylinder, and a piston having a stem slidable through said head and provided with a sound transmitter.

3. The combination of a cylinder having one end thereof open, a detachable head covering the opposite end of the cylinder, a piston movable in the cylinder, having a hollow head and provided with a hollow stem passing through said head, and a sound transmitter arranged within the hollow piston, having conductors passing therefrom through the hollow stem.

4. In combination with a ship having an opening in the hull thereof below the water line, a chamber secured within the ship in communication with said opening, and a piston movable in the chamber, adapted to seat in said opening and provided with a sound transmitter.

5. In combination with a ship having an opening in the hull thereof below the water line, a cylinder secured within the ship in communication with said opening, a head covering the inner end of the cylinder, a piston within the cylinder slidable through said head and provided with a sound transmitter, and means carried by the head of the cylinder for forcing the piston to said opening.

6. In combination with a ship having an opening in the hull thereof below the water line, a cylinder secured within the ship in communication with said opening, a sound transmitter within the cylinder movable to and from said opening, and means intermediate the cylinder for cutting off communication between its opposite ends.

7. The combination of a chamber, a sound transmitter within the chamber movable



longitudinally thereof, and means intermediate the length of the chamber for cutting off communication between its opposite ends.

5 8. The combination of a cylinder, a sound transmitter movable within the cylinder longitudinally thereof, and a gate valve movable transversely to the cylinder at an intermediate point thereof for cutting off  
10 the communication between the opposite ends of the cylinder.

9. The combination of a cylinder having a detachable head, a piston within the cylinder slidable in said head, a sound transmitter  
15 carried by the piston, and a valve for cutting off the communication between the opposite ends of the cylinder, with the piston between it and said head.

10. The combination of a cylinder having  
20 a detachable head, a piston within the cylinder slidable in said head, a sound transmitter carried by the piston, a casing inclosing the cylinder, and a gate valve also inclosed by the casing for cutting off the communi-  
25 cation between the opposite ends of the cylinder and operable from the outside of the casing.

11. The combination of a ship having an opening in the hull thereof below the water  
30 line, a cylinder secured within the hull over said opening, having a detachable head at its inner end, a piston within the cylinder slidable in said head, means for cutting off the communication between the opposite  
35 ends of the cylinder, a sound transmitter

carried by the piston, and a casing covering the cylinder having a door providing access to the cylinder head.

12. In combination with a ship, a sound transmitter movable in, removable from and  
40 exposable to the water through the walls of said ship, and means mounted adjacent said transmitter for preventing the inflow of water when said transmitter is removed while said ship is afloat.

13. A casing adapted to occupy a position  
45 below the surface of a body of water and have an inlet through which the water is adapted to pass, said casing being otherwise water-tight, and a sound transmitter within  
50 the casing, movable to and from said opening.

14. A casing having an inlet opening through which water is adapted to pass, said casing being otherwise water-tight, a  
55 sound transmitter within the casing, and a valve for cutting off the water in the casing between said opening and the transmitter.

15. In combination with a ship, a sound transmitter exposable to the water without  
60 the ship, and means preventing the inflow of water within the ship when said transmitter is removed.

In testimony whereof I have signed my name to this specification in the presence of  
65 two subscribing witnesses.

CHARLES HOSKINS MUNDY.

Witnesses:

ELBRIDGE F. HILLS,  
STACY R. HILLS.