E. C. WOOD.

MICROPHONE MOUNTING.

APPLICATION FILED APR. 25, 1918.

1,419,596. Patented June 13, 1922.

Fig. 2.

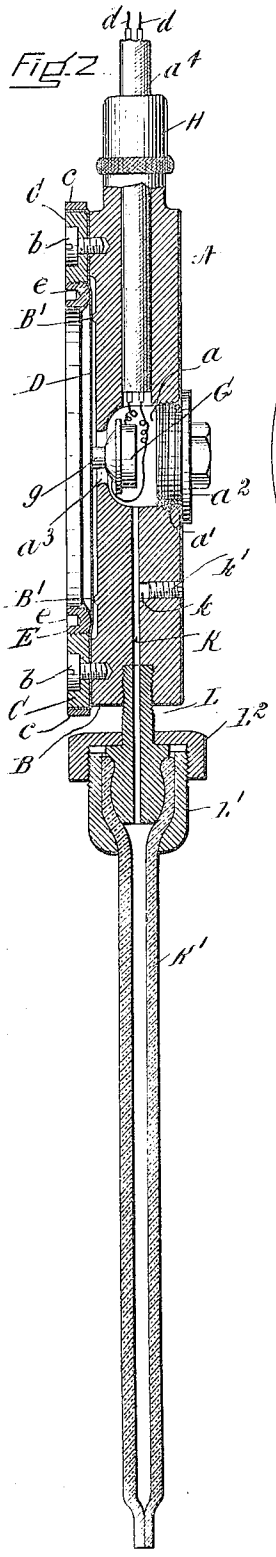


Fig. 1.

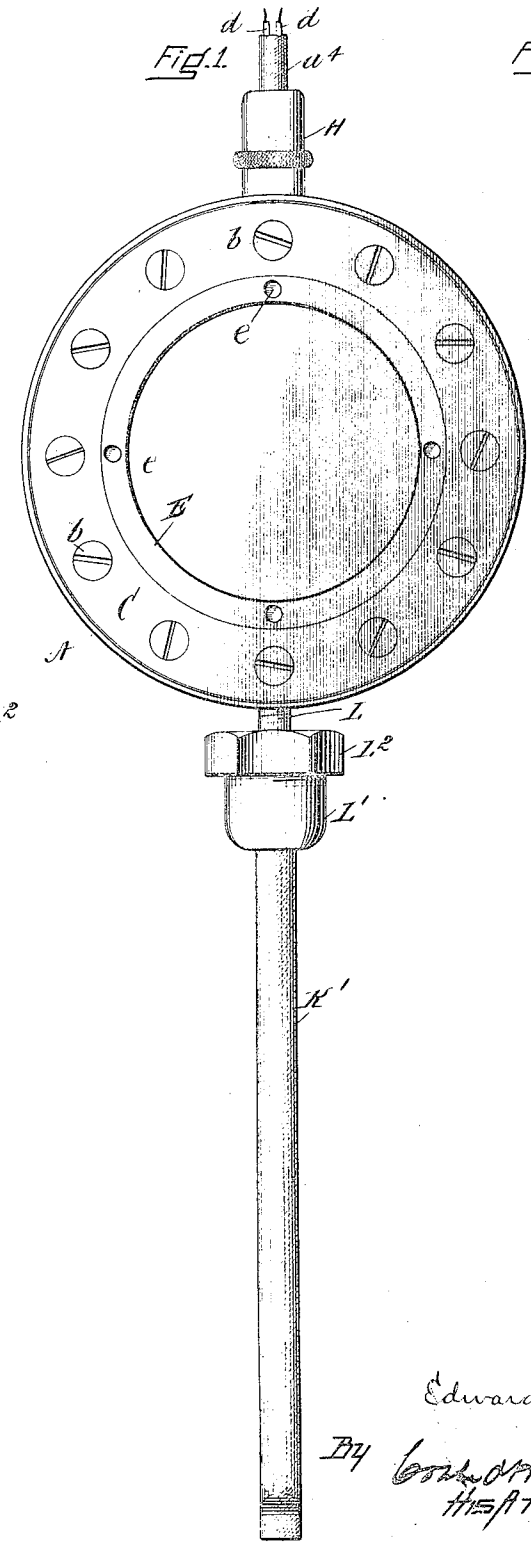
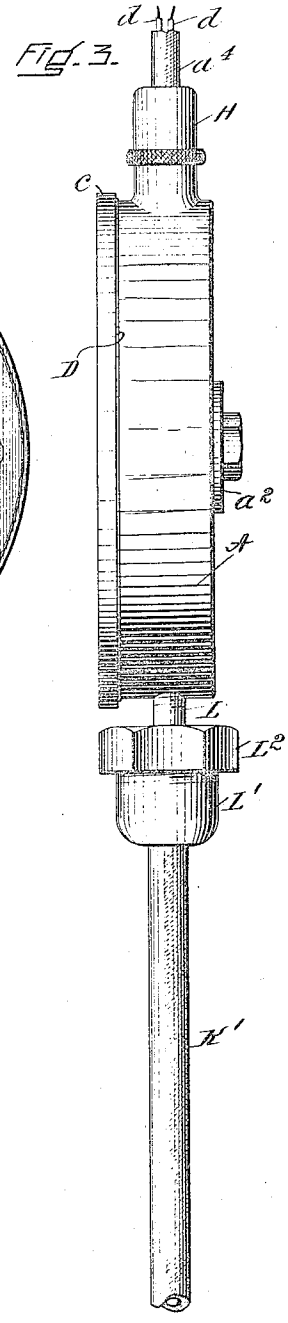


Fig. 3.



INVENTOR=

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HIS ATTORNEYS=

UNITED STATES PATENT OFFICE.

EDWARD C. WOOD, OF SOMERVILLE, MASSACHUSETTS, ASSIGNOR TO SUBMARINE SIGNAL COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MAINE.

MICROPHONE MOUNTING.

1,419,596. Specification of Letters Patent. Patented June 13, 1922.

Application filed April 25, 1918. Serial No. 230,799.

To all whom it may concern:

Be it known that I, EDWARD C. WOOD, of Somerville, in the county of Middlesex and State of Massachusetts, a citizen of the United States, have invented a new and useful Improvement in Microphone Mountings, of which the following is a specification.

My invention relates especially to the mounting of a microphone upon a tuned diaphragm such that external pressure will not change the pitch of the diaphragm. My invention is more particularly adapted for cases in which it is necessary or desirable to hang the microphone overboard from a vessel or pier.

A microphone when used as a submarine receiver is usually mounted on a metallic diaphragm which preferably is tuned to receive vibrations of a given pitch, more or less to the exclusion of other sounds. When mounted in a casing of such a character as not to interfere with its reception of sound waves from the surrounding water, upon submerging this diaphragm it is submitted to a pressure due to its depth of submersion, which interferes more or less with the pitch to which it is tuned. The purpose of my invention is to provide means such that the diaphragm will maintain its normal pitch however deep it may be submerged, the pressure on both sides of the diaphragm being automatically equalized, so that the device as a whole may be self-equalizing.

My invention will be understood by reference to the drawings in which it is shown in its preferred form.

Figure 1 is a front elevation,

Fig. 2 is a vertical section, and

Fig. 3 is a side elevation of a device in which my invention is embodied.

A is a circular casing having a chamber a at its centre and an opening a^1 opposite said chamber closed by a screw plug a^2. Opposite the opening a^1 is a second opening a^3. The front face of the casing has two circular projections thereon, one forming a rim B to which is attached by screws b a diaphragm-holding ring C, the other B^1 being a bridge over which the diaphragm D is stretched. The diaphragm D is provided with openings near its edge for the screws b and its outer edge is preferably turned outwardly and is clamped against the periphery of the ring C by a hoop c which may be soldered or driven into place to prevent the diaphragm from yielding under the strain set up by the ring E.

The diaphragm D is tuned by means of the ring E which screws into the ring C. The ring E is provided with spanner holes e to screw it into place.

It will be noted that the tuning ring E is larger in diameter than the bridge B^1 and smaller in diameter than the holding ring C so that by screwing it against the diaphragm it will strain the diaphragm over the bridge B^1 and thus make it responsive to any desired pitch. These parts all form a watertight chamber to one side of the casing, which otherwise would be open.

Upon the diaphragm D is mounted the microphone G by means of a stem g in the usual way, the microphone being in the chamber a and its stem g passing outwardly through the opening a^3. A neck H at the top edge of the casing has a stuffing box of ordinary construction (not shown) through which pass out the microphone leads d, d, which pass from the casing and preferably through a rubber tube a^4 located therein to centre and protect them.

From the chamber a projects downward a passage K having a test opening k closed by a plug k^1. This passage K is connected with a collapsible member K^1 by a watertight coupling which as shown comprises a short metallic pipe L threaded to screw into the casing A and enlarged at its outer end and properly shaped to have drawn over it the open end of the collapsible member K^1. The coupling proper comprises a clamping sleeve L^1 and nut L^2.

As shown the collapsible member K^1 comprises a rubber tube the lower end of which is sealed to make it both watertight and airtight, and all the joints of the device are made watertight and airtight so that the device is practically sealed, and under these circumstances of course the collapsing in any way of the collapsible member K^1 will result in the compression of the air contents of the device.

In practice, when this device is hung overboard in the water the collapsible member K^1 will be collapsed by water pressure, but the pressure on the collapsible member K^1 will compress the air inside the device and, being the same as the pressure on the diaphragm D, the two will equalize each other if the parts are properly proportioned so

that the device may be considered self-equalizing in every respect, the pressure on the two sides of the diaphragm being at all times equal. Thus the pitch of the diaphragm will in no wise be changed, nor will it lose its effectiveness because of any unequal pressure upon its two sides.

I do not mean to limit myself to the precise form of my invention shown as other forms thereof will occur to those skilled in the art. The collapsible member shown may be differently shaped and constructed and instead of air other gas may be used if desired. Moreover, as a pressure neutralizer my method is equally effective whether used with a tuned or untuned diaphragm.

What I claim as my invention is:—

1. A microphone instrument, for submarine use, comprising body casing parts within which is a chamber, a circular bridge on one of said body parts, a diaphragm so mounted as to form one side of said chamber and render the same water-tight, a microphone mounted at one side of said diaphragm in said chamber, a hollow collapsible member serving as an air container and the chamber of which member communicates with the said water-tight chamber, a ring secured to a body part of the device and by which ring said diaphragm is tightly clamped to a body part to make a water-tight joint, and an adjustable tuning ring bearing against said diaphragm inside of said first-named ring and outside of said circular bridge.

2. A microphone instrument, for submarine use, comprising body casing parts within which is a chamber, one of said body parts having a circular projection affording a bridge over which said diaphragm is stretched, a diaphragm so mounted as to form one side of said chamber and render the same water-tight, a microphone mounted at one side of said diaphragm in said chamber, a hollow collapsible member serving as an air container and the chamber of which communicates with the said water-tight chamber, a ring secured to a body part of the device and by which ring said diaphragm is tightly clamped to a body part to make a water-tight joint, an adjustable tuning ring bearing against said diaphragm inside of said first-named ring between said circular bridge and the clamped edge of said diaphragm, and leads or conductors extending from said microphone to the outside of said casing parts through a water-tight passage.

EDWARD C. WOOD.