W. E. CLARKE.

DEEP SEA SOUNDER.

APPLICATION FILED JUNE 3, 1920.

1,421,672.

Patented July 4, 1922.

Fig. 1.

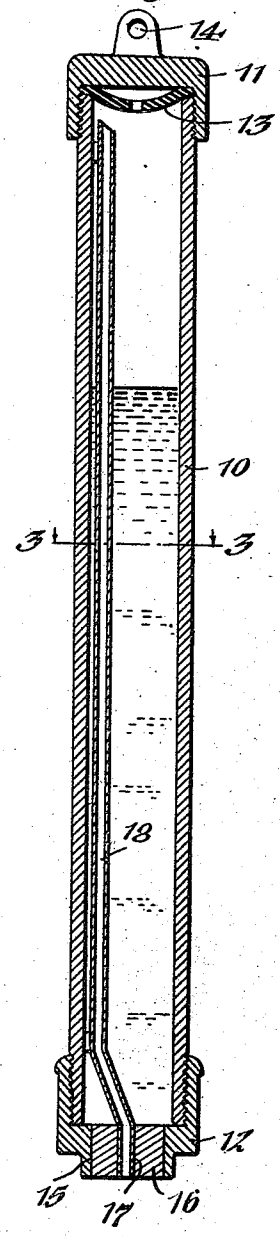


Fig. 2.

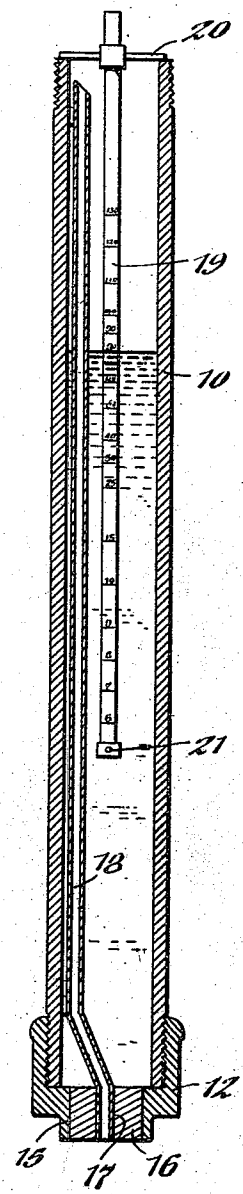


Fig. 3.

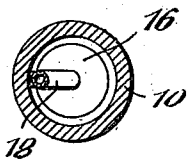
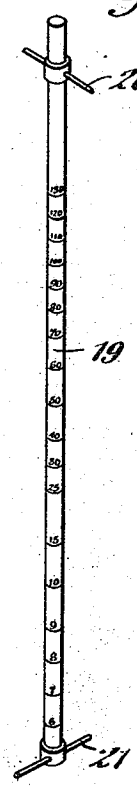


Fig. 4



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UNITED STATES PATENT OFFICE.

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DEEP-SEA SOUNDER.

1,421,672. Specification of Letters Patent. Patented July 4, 1922.

Application filed June 3, 1920. Serial No. 386,171.

To all whom it may concern:

Be it known that I, WILLIAM E. CLARKE, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Deep-Sea Sounders, of which the following is a specification.

This invention relates to the measuring devices used for deep sea sounding.

Its object is the production of a strong, simple and reliable sounder of this character which is free from valves or similar parts liable to get out of order or permit leakage, and which employs no glass tubes or other parts liable to be broken.

In the accompanying drawings:

Figure 1 is a longitudinal section of the sounder assuming the same to have been lowered into the sea and raised preparatory to removing its top-cap and inserting the scale to read the depth of the water. Figure 2 is a similar section with the top-cap removed and the scale inserted. Figure 3 is a horizontal section on line 3—3, Fig. 1. Figure 4 is a perspective view of the scale.

Similar characters of reference indicate corresponding parts throughout the several views.

The device comprises a tube or shell 10 of strong, irrefrangible material, as brass. This tube is closed at its ends by caps 11 and 12, the lower one 12 being preferably permanently screwed to the tube and sweated thereon to form a water-tight joint, while the upper cap 11 is removably screwed to the tube and provided with a gasket 13 of rubber or other suitable material which is clamped between the upper end of the tube and the head of said cap to form a water and air-tight joint at that point. This top cap carries an eye 14 for attaching a lanyard by which the sounder is lowered and raised.

The lower cap 12 may be solid, but it is preferably formed with a comparatively large central opening 15 in which a metallic plug or disk 16 is tightly and permanently secured. This plug contains a central opening 17 in which is tightly fastened the lower end of an open-ended water-inlet tube 18 extending upwardly into the main tube 10 nearly to its top. This tube is constructed of brass or other unbreakable material. A short distance above the lower cap 12 this inner tube is preferably bent toward the wall of the main tube and then extended upwardly along the same, being soldered or otherwise fastened thereto. By this construction, the upper part of the main tube is left unobstructed in its central portion to receive a removable scale or scale bar 19 for measuring the depth of the water in the tube after making a sounding, as hereinafter more fully explained. As shown, this scale bears fathom-graduations which increase from the lower toward the upper end of the scale. A suitable stop or gage-point is provided either on the scale-bar or in the interior of the main tube. The preferred device consists of a cross bar or pin 20 applied to the upper part of the scale and adapted to rest upon the upper end of the main tube after removing the top cap 11. At or near its lower end, the scale bar is preferably provided with suitable means for centering it in the main tube, so as to prevent its touching the wet walls thereof and becoming streaked with water. When this occurs, the streak or drop of water on the scale is liable to be mistaken for a graduation, especially in poor light. This centering device preferably consists of a cross pin 21 secured to the lower end of the scale-bar, and of the proper length to easily enter the main tube and yet hold the bar out of contact with its walls.

In the use of the sounder, the top cap 11 is tightly screwed upon the main tube and the device is lowered into the sea. As the sounder descends, the water enters the small-inner tube 18 and overflows the same into the chamber of the main tube, compressing the air therein in proportion to the depth-pressure of the water. Upon raising the sounder to the surface, the air expands and is partly discharged owing to the reduction of pressure in the main tube, while the water-level in the tube remains undisturbed. The top cap is next removed, and the scale lowered into said tube until its cross pin 20 strikes the upper edge thereof. Upon withdrawing the scale, the graduation at the division-line between the dry and wet portions of the scale indicate the depth of the water.

After reading the scale, the water is poured out of the sounder and its top cap is replaced, when the device is ready for the next sounding.

As the device is valveless and contains no loose or removable parts, except the detachable top-cap 11, no leakage of air or water

can take place, thus insuring absolutely accurate and reliable soundings. Being free from glass tubes or other frangible parts, the sounder is not liable to breakage by striking the side of the vessel or other objects in lowering and withdrawing it.

None of the parts of the device are subject to wear, excepting the gasket or packing 13 which can be readily renewed when necessary.

Being composed of but few parts, the sounder can be manufactured at correspondingly small cost.

I claim as my invention:

A valveless deep sea sounder, comprising a main tube irrefrangible throughout its length and on all sides and having a bottom cap provided with a central opening, a valveless open-ended water inlet tube having its lower end fitted in said opening, said inlet tube being irrefrangible and the portion thereof above said cap being bent toward the wall of said main tube and extended upwardly along the same nearly to its top whereby the central portion of the main tube is left unobstructed to receive a scale-bar, and a removable cap applied to the upper end of said main tube.

WILLIAM E. CLARKE.