No. 753,948. PATENTED MAR. 8, 1904.

E. E. WIGZELL.

INSTRUMENT FOR TAKING SOUNDINGS.

APPLICATION FILED MAY 26, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

FIG. 1.

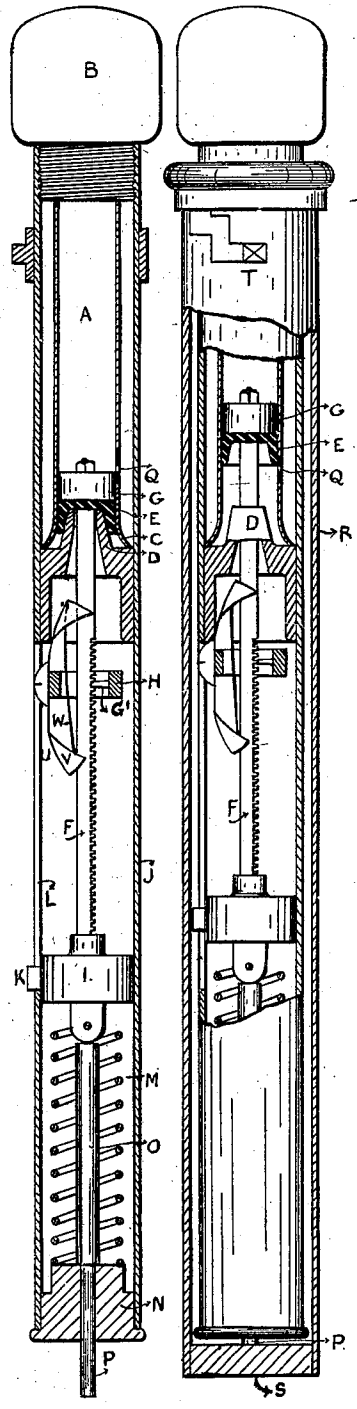
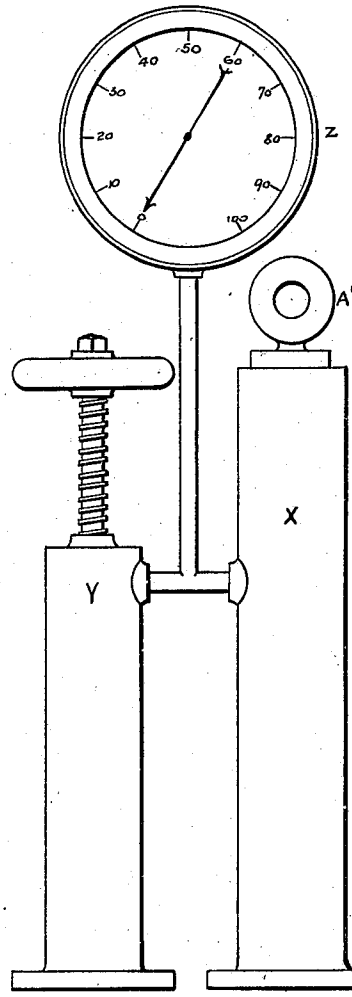


Fig. 2.

FIG 3.



Inventor:

E. E. Wigzell

Witnesses:

D. L. B. Palmer

Charlotte Fender

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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INSTRUMENT FOR TAKING SOUNDINGS.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig 4

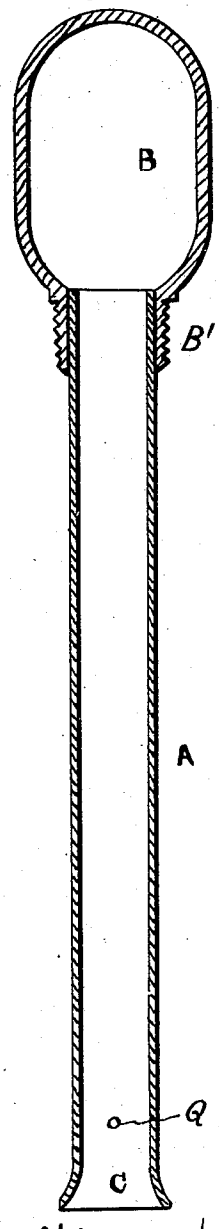


Fig. 5.

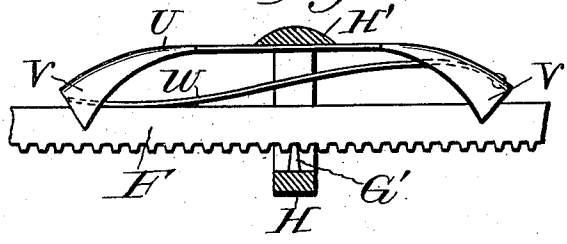
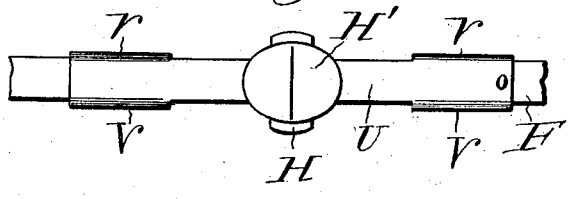


Fig. 6.



Witnesses:

E. L. Dunn,

E. Thos. Loftus

Inventor.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 753,948. Patented March 8, 1904.

UNITED STATES PATENT OFFICE.

EUSTACE E. WIGZELL, OF LONDON, ENGLAND.

INSTRUMENT FOR TAKING SOUNDINGS.

SPECIFICATION forming part of Letters Patent No. 753,948, dated March 8, 1904.

Application filed May 26, 1902. Serial No. 109,044. (No model.)

To all whom it may concern:

Be it known that I, EUSTACE ERNEST WIGZELL, a subject of the King of Great Britain and Ireland, and a resident of London, England, have invented a new and useful Improvement in Instruments for Taking Soundings, of which the following is a specification.

The present improvement consists in an improved cylindrical sounding instrument that is automatic in action; also, in certain novel combinations of parts therein, whereby I am enabled to quickly get rid of any water of condensation in the top of the instrument after each cast, to keep the customary cup-leather in effective shape and condition, to adjust the instrument for operation by the act of inclosing it within a protecting casing, and to provide the same with a self-adjusting marker of novel construction.

Two sheets of drawings accompany this specification as part thereof.

Figure 1 represents a longitudinal section of the improved instrument without its casing. Fig. 2 represents a side view, partly in section, of the instrument provided with its casing. Fig. 3 is an elevation of hydraulic apparatus for testing and marking off the sounding instrument. Fig. 4 represents a longitudinal section through the cylinder-tube and air-ball on a larger scale. Fig. 5 is a fragmentary detail view, showing the marker partly in section; and Fig. 6 is a plan view projected from Fig. 5.

Like letters of reference indicate like parts in all the figures.

The improved instrument comprises a cylinder-tube A, soldered fast at its upper end within the neck B′ of an air-ball B and having its lower end C bell-mouthed. Within this end C a cone-shaped mold D projects upward, leaving sufficient space between the mold D and the bell-mouthed end C to admit the cup-leather E, which in its retracted position is held in contact with said mold, as in Fig. 1. A rack-bar F is attached to said cup-leather E and to a piston G above it and in operation carries the marker H, as hereinafter more particularly described. At its lower end the rack-bar F is attached to a guide-piston I, which slides in the cylindrical main tube J of the instrument and has a lug K thereon to work in a longitudinal slot L at the front of said main tube. The upper end of the main tube J is tightly screwed to the neck B′, Fig. 4, of the air-ball B, and the piece which carries the mold D is fast within said main tube at a point intermediate between its ends. A spiral spring M, of German silver, is attached at its upper end to said guide-piston I and at its lower end to the bottom plug N of said main tube J, and within said spring a loose rod O, having a reduced lower end P, is supported by a bore in said bottom plug, fitted to said reduced end, and by the contact of the top of the plug with the shoulder of the rod when the instrument is without its casing, as in Fig. 1. In this condition of the instrument, Fig. 1, a hole Q in the cylinder-tube A communicates with the air-chamber within said tube A and the air-ball B and permits any water of condensation to freely escape therefrom, while the cup-leather E confined between the mold D and the bell-mouthed end C of said tube keeps the leather in effective shape. An outer casing R, Fig. 2, is constructed with a bottom S fast therein to contact with said lower end P of the loose rod D and is secured in place by a bayonet-joint fastening T. In the act of applying said casing R and fastening it in place said rod O is moved lengthwise against the bottom of said guide-piston I or a projection on the latter, as in Fig. 2, and said piston I and therewith the rack-bar F, piston G, and cup-leather E are preliminarily shifted, as in this figure, to close the water-escape hole Q and prepare the instrument for operation. Previous to so inclosing the instrument in its casing the marker H is adjusted on the rack-bar F to its zero position, which is at the top of said slot L in the main tube J. The body of this marker H is ring-shaped, with an index-button H′, Figs. 5 and 6, at its front, the hair-line of which is alined successively with the customary graduations at one or both sides of the slot L. Behind the rack-bar F and parallel with the teeth of the rack the marker H carries a knife-shaped internal projection G′ to interlock with the rack-teeth. At the front

of the rack-bar and immediately behind the index-button H′ the marker H is provided with a mainspring U, held in place within the marker in any approved way—as, for example, by means of solder—projecting above and below the index-button along the front of the rack-bar and constructed with V-shaped projections V, turned back at the sides of the rack-bar to keep the marker from turning. An under spring W, attached to one end of said mainspring U, extends lengthwise of the rack-bar between its front and said mainspring and tends to keep said knife-shaped projection G′ in mesh with the rack-teeth. When the index-button H′ is pressed on the marker, springs U and W are compressed, said knife-shaped projection G′ is cleared from the rack, and the marker may be slipped back to zero. It is thus adjusted preliminary to each cast, and in this position the contact of the mainspring U with the interior of the hollow support of the mold B, as in Fig. 2, keeps the marker disconnected to a sufficient extent for the rack-bar F to move therethrough under the pressure of the water. In the reverse movement of the rack-bar, under the impulse of the compressed air within the cylinder-tube A and air-ball B and of the spiral spring M, the marker H attaches itself to the rack-bar and moves therewith and in the position where it come to rest it indicates the depth reached by the sounding instrument.

The graduations on the main tube J along the slot L to read in connection with the marker H are determined in the following manner: A test-tube X, Fig. 3, filled with water, is connected with a hydraulic pump Y and with a test-gage Z, marked off in fathoms. The instrument, as in Fig. 2, is placed inside said test-tube X and its top A′ is screwed on water-tight. The water is then forced in by the hydraulic pump Y to the pressure corresponding with a given depth, as indicated by the test-gage Z. The pressure is then reduced to zero, the top A′ of the test-tube is removed, the sounding instrument is taken out, its casing R is removed, and the depth is marked on the main tube J opposite where the marker H is found. This operation is repeated until the instrument is graduated from naught to one hundred fathoms.

In using the improved instrument for sounding purposes a strap is secured around the outer casing R, one end having a sinker attached thereto of sufficient weight to carry the instrument to the bottom of the water to be sounded. The other end of the strap is attached to a wire connected to a winch fixed at the stern of the ship. There is a fair-lead over the stern, and the instrument is passed over this fair-lead with the sinker and allowed to run out smartly, faster than the vessel is going. When the sounder reaches the bottom, the line slackens and the brake is applied to the winch, which is also provided with crank-handles for heaving in. When the instrument is brought up to the top deck, it is taken out of the outer casing R and the depth read off opposite the marker H, the spring M having restored the rack-bar F, piston G, and slide I to their positions of rest represented in Fig. 1 and therewith moved the marker a distance downward corresponding with the displacement of the piston G and the parts movable upward therewith by the water-pressure due to maximum submergence. For another cast the marker H is pressed in to disengage its projection G′ from the teeth of the rack-bar F, and the marker is pushed back to zero at the top of the slot L in the main tube J. The outer casing R is then replaced. These operations are repeated in taking a series of soundings of any desired number.

Having thus described said improvement, I claim as my invention and desire to patent under this specification—

1. A sounding instrument having, in combination, a cylinder-tube, a piston and cup-leather movable in said tube by water-pressure, a mold at one end of said tube, and a spring and connections whereby said piston is retracted and said cup-leather is normally held in contact with said mold.

2. A sounding instrument having, in combination, a cylinder-tube provided in its side with a water-escape hole, a piston movable in said tube by water-pressure, and a spring and connections whereby said piston is retracted and said water-escape hole is opened after each sounding cast.

3. A sounding instrument having, in combination, a cylinder-tube provided in its side with a water-escape hole, a piston movable in said tube by water-pressure, a spring and connections whereby said piston is retracted and said water-escape hole is opened after each sounding cast, a loose endwise-movable rod, and an outer casing having a bottom which moves said rod and therewith said piston to close said hole when said outer casing is applied.

4. A sounding instrument having, in combination, a cylinder-tube, a piston movable in said tube by water-pressure, means for retracting the same after each sounding cast, a rack-bar movable with said piston, and a ring-shaped marker, embracing said rack-bar, having a knife-shaped projection by which it is interlocked with the teeth of the rack-bar when the latter is retracted, an index-button at the front of the marker, an attachment thereto projecting above and below the index-button along the front of the rack-bar and constructed with backwardly-turned projections at the sides of the rack-bar to keep the marker from turning, and an under spring by which said projection is adapted to be disengaged from said teeth and the marker is adapted to be reset to zero by hand.

5. A sounding instrument having a ring-

shaped marker provided with an index-button at front and an internal projection at its back and with main and under springs at its front, such mainspring projecting above and below the index-button of the marker and the under spring attached to one end of said mainspring, in combination with a longitudinally-movable rack-bar having teeth at back to interlock with said projection and a front face against which said springs press, substantially as hereinbefore specified.

In witness whereof I have hereunto set my hand, in the presence of two witnesses, this 14th day of May, 1902.

E. E. WIGZELL.

Witnesses:
E. F. B. PALMER,
CHAS. JOHN FIELDER.