(No Model.) 2 Sheets—Sheet 1.

C. E. KIRTLAND.

SOUNDING APPARATUS.

No. 528,600. Patented Nov. 6, 1894.

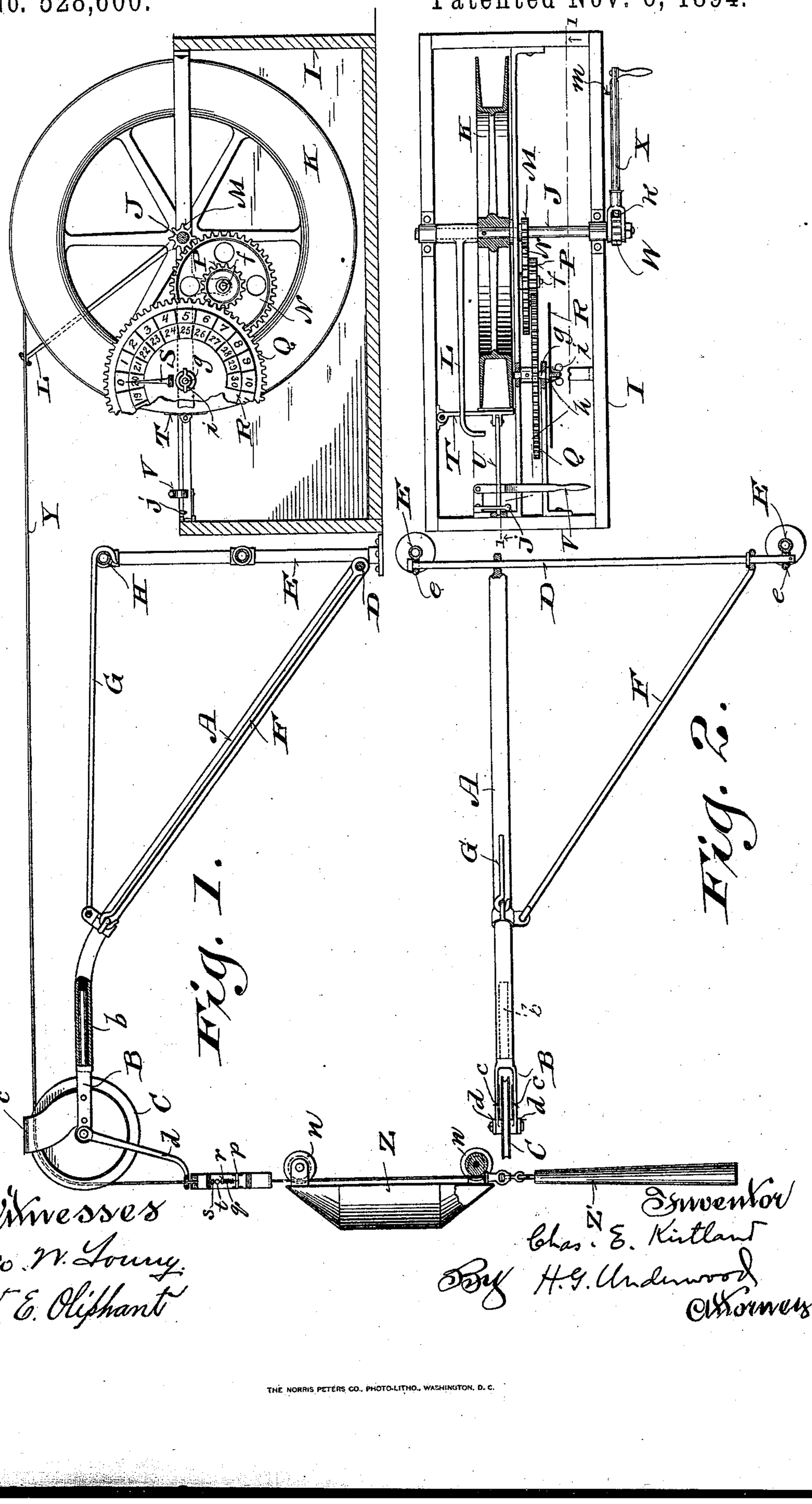

Fig. 1.

Fig. 2.

Witnesses
Geo. W. Young.
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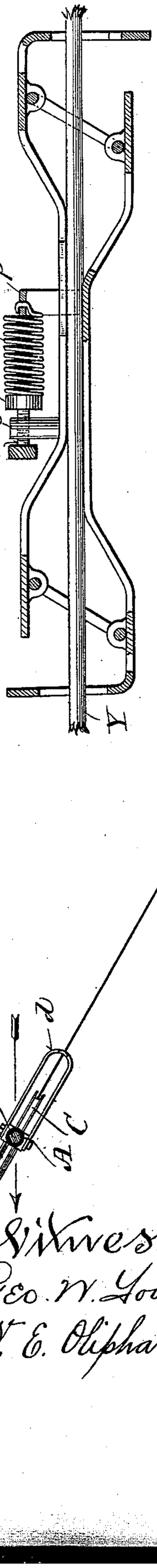

Fig. 4.

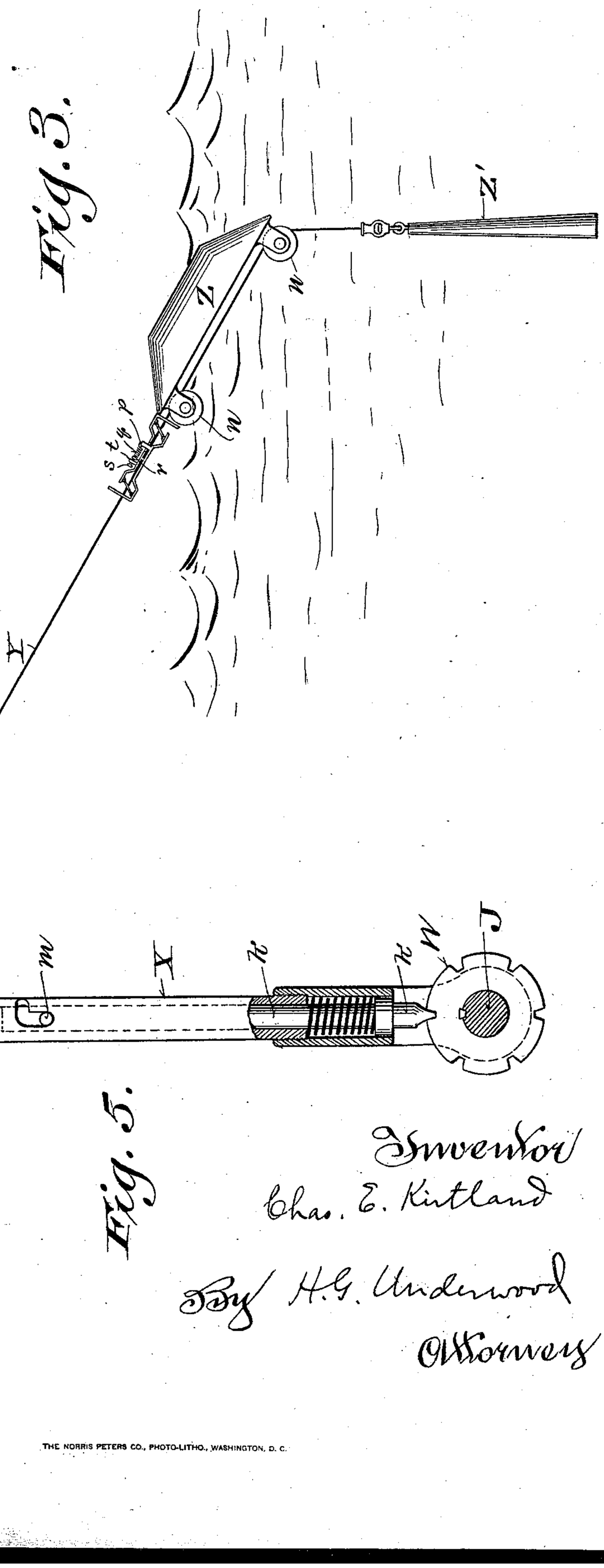

Fig. 3.

Fig. 5.

Witnesses
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UNITED STATES PATENT OFFICE.

CHARLES E. KIRTLAND, OF ST. FRANCIS, WISCONSIN.

SOUNDING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 528,600, dated November 6, 1894.

Application filed July 5, 1894. Serial No. 516,532. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. KIRTLAND, a citizen of the United States, and a resident of St. Francis, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Sounding Apparatus; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention has for its object to provide a simple, economical and efficient apparatus especially designed for obtaining accurate soundings from a fixed point on a marine vessel under way without requiring said vessel to slacken speed; and it consists in certain peculiarities of construction and combination of parts hereinafter specified with reference to the accompanying drawings and subsequently claimed.

In the drawings: Figure 1 represents an elevation of my apparatus partly in section on line 1—1 of the succeeding figure and positioned on a marine vessel ready for use, the view being from the bow of the vessel looking aft. Fig. 2 represents a plan view of the major portion of the apparatus partly in horizontal section. Fig. 3 is a view looking outward from the vessel and illustrating the position of a mark and float with relation to a lead when the latter is descending in the water. Fig. 4 represents a partly sectional detail view of a peculiar mark that constitutes part of my apparatus; and Fig. 5 is a partly sectional view illustrating a ratchet and crank that also constitute parts of said apparatus.

Referring by letter to the drawings A represents an angular arm having a horizontal outer end, this arm being preferably made from metal tubing, but in any event its outer end is hollow to thereby serve as a socket for the shank *b* of a head B in which a sheave C is mounted, this head being also provided with an upwardly extended line-guard *c* and a depending line guide *d*, as is clearly illustrated in Figs. 1 and 3. The inner end of the arm A is loose on a horizontal rod D, and in practice this rod is detachably secured in eyes *e* made fast to the deck of a marine vessel or standards E rising therefrom. A stay-rod F is employed to connect the arm A and deck-rod D, and another stay rod G is utilized to connect said arm and rail H of the vessel.

The arm and rods above specified constitute a frame that in practice extends outward from a side of a marine vessel, but when said frame is not required for use the rod-member G thereof is unhooked from the vessel rail and the arm A and rod F swung upward out of the way.

While I have described one form of a folding frame it is to be understood that the same may be considerably varied in the matter of structural detail without departure from my invention, inasmuch as said frame must always be adapted to the vessel on which my sounding apparatus is employed.

Arranged on the deck of the vessel is a casing I or other suitable support having bearings for a shaft J to which a drum K is made fast, and the inner end of a line-guide L is loose on the shaft adjacent to the drum. The shaft also carries a pinion M that meshes with a spur-wheel N arranged to turn on a conveniently located stud *f*, this gear-wheel being cast with or otherwise rigidly connected to another pinion P that meshes with a gear-wheel Q fast on a spindle *g* supported in suitable bearings, the spindle being provided with a collar *h* against which a dial R is held by means of a thumb-nut *i*, said dial being graduated in any suitable manner to indicate fathoms. The rotative speed of the dial is governed by the gearing above specified and a pointer S is arranged opposite the face of said dial.

A pivotal brake-shoe T opposes the periphery of the drum-flanges and a sliding bar U connected to the brake-shoe is controlled by a hand lever V, as best illustrated in Fig. 2. The brake shoe may be locked in working position by any suitable means, and as one way of automatically accomplishing this result I show a gravity latch *j* that engages a notch in the lever-controlled sliding bar.

A ratch W is fast on that end of the shaft J nearest the operator and loose on said shaft is a crank X provided with a spring-controlled plunger *k* that engages the ratchet when the drum is to be rotated. A lug *m* on the plunger *k* engages a bayonet-slot in the handle and by a proper adjustment of the lug in the slot said plunger may be held out

of engagement with the ratchet W to prevent rotation of the crank.

Wound on the drum K is a line Y of wire cable or other suitable material that is run through the guide L, over the sheave C and down through the guide *d* that depends from the sheave-head. The line is also run through a mark, hereinafter specifically set forth, and against sheaves *n* that are supported on a float Z, the outer end of said line being in swivel-connection with a sounding lead Z′ of ordinary construction.

The line-mark referred to in the foregoing is necessarily in the form of a clamp that will rise and fall with the line between the float and the line-guard that depends from the sheave-head B, but which will otherwise yield to said line when the latter is running in either direction.

As a matter of detail the mark herein shown comprises a pair of angular plates joined together by links, an inturned end of each plate being provided with an eye for the passage of the line, and the latter also runs through said links, as is clearly illustrated in Fig. 4.

One of the clamp-plates is provided with a yoke *p* and a spiral-spring *q* connected to the yoke is joined to a head *r* on a screw *s* that turns in a post *t* on the other plate. From the foregoing it will be seen that the contraction of the spring tends to bring the clamp-plates toward each other against the line because of the yield of the connecting links, and the tension of the spring is regulated by the adjustment of the screw.

The float is preferably an air-tight sheet-metal shell presenting a flat surface in opposition to the line, and this flat surface facing the water said float has a good hold thereon.

In practice no heed is given to the amount of line extending from the drum to the lead when the latter, float and mark are at their greatest elevation as shown in Fig. 1, the dial being set to have the graduations thereon start from naught at the indicating point. The line being let out the mark will stand against the upper end of the float and the latter will be over the lead, said line running free through said mark and on the sheaves attached to said float. As the line runs out the crank is unlatched from the ratchet on the drum-shaft in order not to endanger the operator, the latter regulating the rotative speed of the drum by means of the brake-mechanism above specified. To wind in the line, the crank is clutched with the drum-shaft and rotated. The slack of the line having been taken up further winding of said line will cause the mark in clutch therewith to rise from the float, and as soon as said mark comes up to the line-guide *d*, depending from the sheave-head B, the graduation on the dial opposite the pointer will determine the depth of the sounding. The sheave-head shank being loose in its support there is always sufficient pivotal play to permit of the line running free in either direction or in other words there is no liability of said line binding in said sheave-head.

From the foregoing it will be seen that the operator is only required to watch the rise of the mark as the line winds up, in order to determine the depth of sounding by reference to the graduated dial and by means of the latch the brake may be set against the drum to hold the latter against rotation while the sounding is being noted.

One of the especial advantages of my apparatus is the fact that accurate soundings may be obtained by others than those skilled in the art, as the entire operation is purely mechanical, while at the same time said operation is materially facilitated and rendered less difficult than by the means ordinarily employed, and it is not necessary to slacken speed of the vessel employing said apparatus. It is also to be noted that I employ a float in connection with the lead-line, and this float is of material advantage because as it remains on the surface of the water immediately over the lead when the latter is cast, I overcome the necessity for carrying said line forward on a moving vessel to make a cast as has heretofore been a necessary procedure.

While I have shown and described a float having a flat surface and provided with sheaves for the lead-line, I do not wish to be understood as confining myself to this construction nor to any means for ascertaining the amount of line below the float, as it is possible to arrive at this result in a variety of ways.

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

1. A sounding apparatus embodying a suitable support, a drum and means for rotating the same, a line trained from the drum over the support, a line-guard below said support, a lead attached to the outer end of the line, a float loose on said line above the lead, a mark arranged on the aforesaid line and capable of travel therewith intermediate of the float and guard but incapable of resisting run or draw of the line, and a registering mechanism in gear with the drum, substantially as set forth.

2. A sounding apparatus embodying a suitable support, a drum and means for rotating the same, a brake-mechanism for the drum, a line trained from the drum over the support, a line-guard below said support, a lead attached to the outer end of the line, a float loose on said line above the lead, a mark arranged on the aforesaid line and capable of travel therewith intermediate of the float and guard but incapable of resisting run or draw of the line, and a register mechanism in gear with the drum, substantially as set forth.

3. A sounding apparatus embodying a suitable support, a drum and means for rotating the same, a line trained from the drum over

the support, a line-guard below said support, a lead attached to the outer end of the line, a float loose on said line above the lead, a mark arranged on the aforesaid line and capable of travel therewith intermediate of the float and guard but incapable of resisting run or draw of the line, a spindle in gear-connection with the drum-shaft, a graduated dial rotarily adjustable on the spindle, suitable means for clamping the dial in adjusted position, and a pointer opposed to said dial, substantially as set forth.

4. A sounding apparatus embodying a folding frame attachable to a vessel, a sheave having its head provided with a shank loose in the outer portion of the frame, a drum and means for rotating the same, a line trained from the drum over the sheave, a line-guard extending from the sheave-head, a lead attached to the outer end of the line, a float loose on said line above the lead, a mark arranged on the aforesaid line and capable of travel therewith intermediate of the float and guard but incapable of resisting run or draw of the line, and a register mechanism in gear with the drum, substantially as set forth.

5. A sounding apparatus embodying a suitable support, a drum and means for rotating the same, a line trained from the drum over the support, a pivotal brake-shoe for said drum, a lever-controlled, sliding-bar connected to the brake-shoe and provided with a notch, a latch for engagement with the bar-notch, a line-guard below said support, a lead attached to the outer end of the line, a float loose on said line above the lead, a mark arranged on the aforesaid line and capable of travel therewith intermediate of the float and line-guard, but incapable of resisting run or draw of the line, and a registering mechanism in gear with the drum-shaft, substantially as set forth.

6. A sounding apparatus embodying a suitable support, a drum having its shaft provided with a ratchet, a crank loose on the shaft and provided with a clutch-plunger engageable with the ratchet at will, a lead-line trained from the drum over the support, a line-guard depending from the support, a float and slip-mark on the line intermediate of the lead and guard, and a registering mechanism in gear with the drum-shaft, substantially as set forth.

7. A sounding apparatus embodying a slip-mark comprising a pair of angular plates in link-connection and having inturned ends provided with eyes for passage of a lead-line, a yoke on one of the plates, a post on the other, and a spring-connection between the yoke and post, substantially as set forth.

8. A sounding apparatus embodying a slip-mark comprising a pair of angular plates in link-connection and having inturned ends provided with eyes for passage of a lead-line, a yoke on one of the plates, a post on the other and an adjustable spring-connection between the yoke and post, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

CHAS. E. KIRTLAND.

Witnesses:
N. E. OLIPHANT,
H. G. UNDERWOOD.