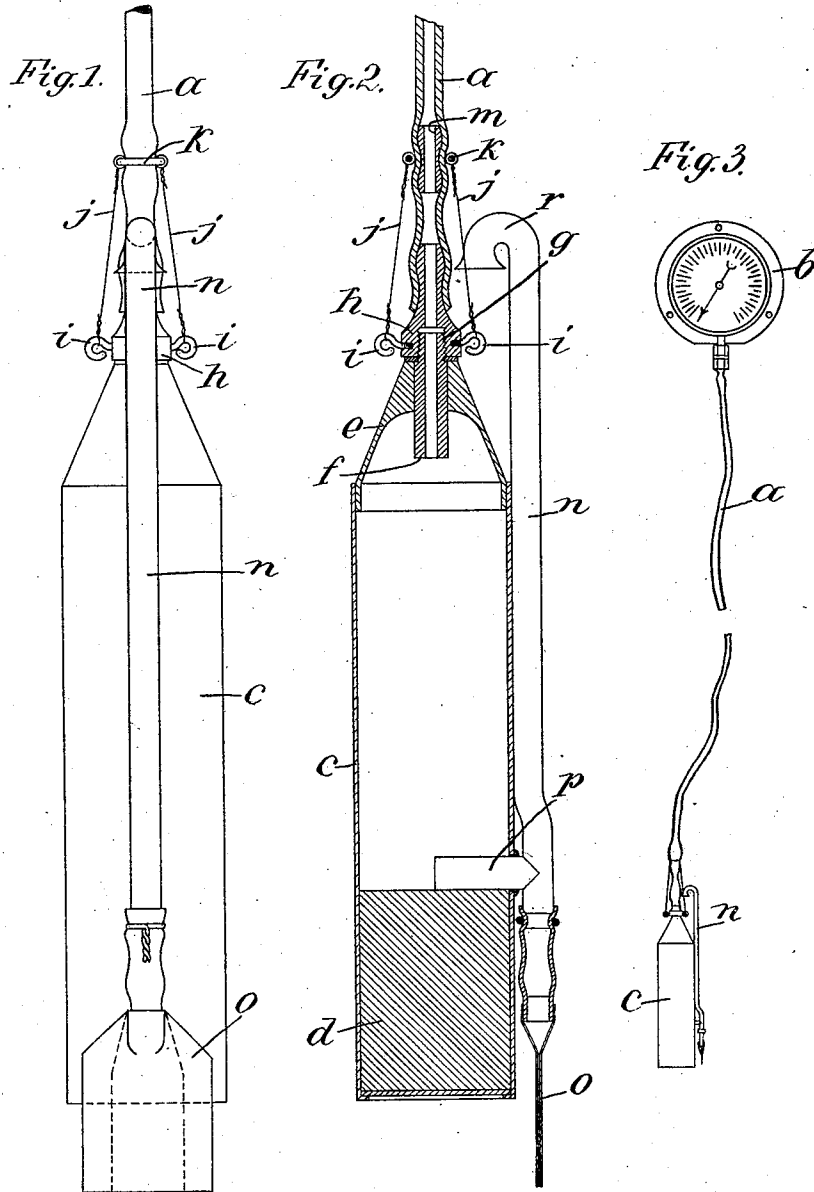


O. GUTT & F. H. C. HEYN.
SOUNDING TACKLE.
APPLICATION FILED AUG. 1, 1908.

938,143.

Patented Oct. 26, 1909.

2 SHEETS—SHEET 1.



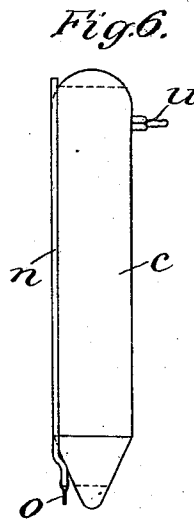
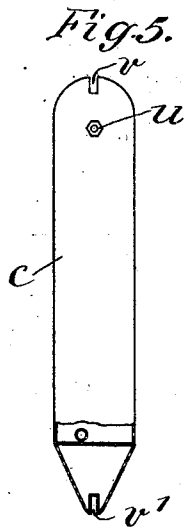
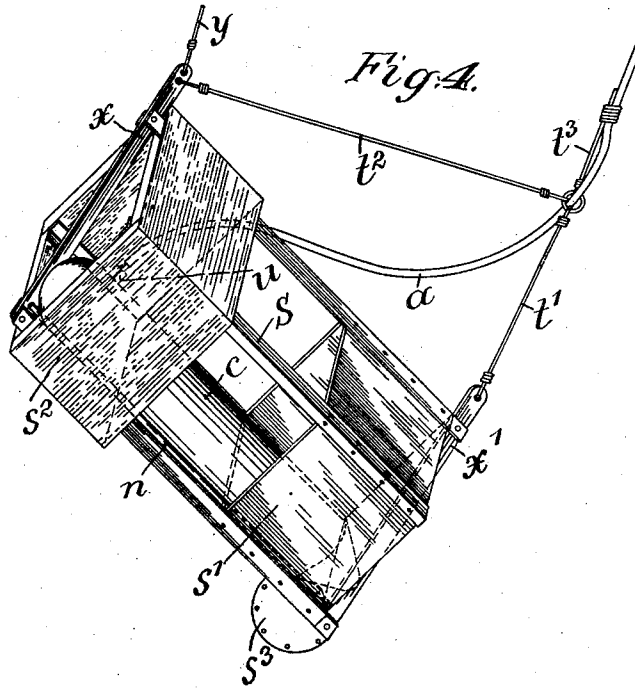
Witnesses:
P. F. Nagle.
H. G. Dietrich

By *Oscar Gutt.*
Friedrich Hermann Carl Heyn.
Niederheim & Fairbanks
Attorneys.

O. GUTT & F. H. C. HEYN.
SOUNDING TACKLE.
APPLICATION FILED AUG. 1, 1908.

938,143.

Patented Oct. 26, 1909.
2 SHEETS—SHEET 2.



Witnesses:
P. F. Nagle,
H. S. Dieterich

By

Inventors.
Oscar Gutt,
Friedrich Hermann Carl Heyn,
Wiedersheim & Fairbanks,
Attorneys.

UNITED STATES PATENT OFFICE.

OSCAR GUTT, OF GEESTEMÜNDE, AND FRIEDRICH HERMANN CARL HEYN, OF HAMBURG,
GERMANY.

SOUNDING-TACKLE.

938,143.

Specification of Letters Patent.

Patented Oct. 26, 1909.

Application filed August 1, 1908. Serial No. 446,389.

To all whom it may concern:

Be it known that we, OSCAR GUTT, officer of the Imperial German Navy, German subject, residing at No. 1 Am Markt, Geestemünde, Germany, and FRIEDRICH HERMANN CARL HEYN, gentleman, German subject, residing at No. 14 Averhoffstrasse, Hamburg, Germany, have invented new and useful Improvements in Sounding-Tackle, of which the following is a specification.

Our invention relates to a sounding apparatus, presenting a hose-pipe adapted to be let down into the water and whose non-submerged end is provided with a pressure-gage, in order that, by means of the air-pressure in the hose, depending upon the hydrostatic pressure prevailing, the depth of the water may be read off directly upon the gage.

The characteristic feature of the invention consists in the provision of a special water inlet tube for the air-reservoir, which is connected with the lower end of the hose. This tube is furnished at its bottom end in well-known manner with a lip-valve, which only opens outwardly when the pressure of the air confined in the air-reservoir and in the hose is greater than the water pressure. This valved water inlet tube thus prevents air from escaping from the air reservoir on the tackle being cast, so that there is always a guarantee for the accuracy of the measurement. The provision of the lip-valve also prevents the entrance of dirt into the air-reservoir. It further insures perfect emptying of the air-reservoir on each occasion of the apparatus being drawn up out of the water, as the water can flow out unobstructed through the lip-valve.

Our invention is illustrated in the accompanying drawing, which shows certain constructional forms by way of example.

Figure 1 is a side elevation of the air reservoir attached to the lower end of the hose. Fig. 2 is a vertical section thereof. Fig. 3 is a view of the entire sounding tackle, the central portion of the hose-pipe only being omitted. Fig. 4 is a perspective view showing the employment of the air reservoir in conjunction with a so-called water-kite. Fig. 5 is an elevation of the air reservoir shown in Fig. 4, and Fig. 6 is a like view, the reservoir having been turned through 90 degrees.

To the top end of the hose-pipe *a* there is

secured a pressure-gage *b*, and to the bottom end an air-reservoir *c*.

In the construction shown in Figs. 1-3, the air-reservoir consists of a preferably cylindrical casing *c*, whose bottom part is loaded, for instance by pouring in molten lead *d* or the like. The top of the casing, which may advantageously be conically tapered, accommodates a tube *f*, having a threaded end *g*, to which there is screwed the nipple *h* for connection of the hose-pipe *a*. Inside the latter is a short tubular stiffener *m*, to which the hose *a* is bound by a ring *k*. This latter is secured by means of wires *j* to eyes *i* screwed into the nipple *h*. In this manner the strain is taken off the end of the hose-pipe *a* and disconnection of the latter from the air-reservoir thus prevented. At the side of the air-reservoir *c* there is a tube *n*, the bottom end of which is furnished with a rubber lip-valve *o* which consists of two flat strips of rubber joined together at two edges and formed at the one end to a socket part which is adapted to fit on to the end of the tube *n*. This lip valve *o* will be closed so long as the external pressure is greater than the internal pressure but when the internal pressure exceeds the external pressure then the parts of the two strips of rubber which are not joined together will be forced apart and a passage will be formed therebetween. The tube *n* has a branch *p*, entering the interior of the air-reservoir *c*, and its top end *r* is flared and downwardly turned to facilitate entrance of water.

When the loaded vessel *c* is cast, the hydrostatic pressure of the water which enters the tube *n* (and which cannot escape owing to the lip-valve *o* being kept closed by the pressure of the water outside) causes compression of the air confined in the reservoir *c* and hose *a*. This pressure will naturally increase the deeper the air-reservoir is let down into the water. This air-pressure is transmitted to the pressure-gage *b*, which enables the air-pressure and thus the depth of the water to be read off directly. On drawing up the apparatus from the water, the lip-valve *o* will open, so that the volume of water which has entered the reservoir *c* flows out again. To enable complete emptying of the reservoir, the branch *p* of the tube *n* should be located immediately adjacent to the bottom of the vessel constituted by the weight *d*.

It is obvious that with the new tackle, unlike prior sounding apparatuses, dirt is absolutely prevented from getting access to the interior of the air reservoir, although absolute draining of the reservoir is insured on its withdrawal from the water, so that the apparatus is always ready for re-use.

Figs. 4-6 illustrate the employment of the new sounding-tackle in conjunction with a so-called "water-kite", whereby a very practical drag sounding apparatus is constituted. The water-kite *S* consists of a box-shaped body open at both ends and having lateral apertures. Its lower part *s'* is preferably constructed of iron and its upper part *s²* of wood. The part *s'* is loaded by weights *s³*. This composite body *S* is attached by ropes *t¹* *t²* to the drag-line *t³*, in such manner that the water-kite assumes the inclined position shown in Fig. 4, in which the current of water acts against the inner and outer body-walls presented to it. In this way the current of water always tends to force the kite down.

The air-reservoir *c* (Figs. 5 and 6), provided with the water inlet tube *n*, is secured to the water-kite in any suitable manner. The base-pipe *a* conducting to the pressure-gage (not shown in these figures) is attached to the air-reservoir by means of a screw-connection *u*. To enable better connection of the reservoir *c* to the water-kite *S*, the former is furnished at top and bottom with notches *v v¹*, in which there engage the upright diagonal bars *x x'* of the kite. *y* is the so-called auxiliary-line of the kite.

The manner of operation of this apparatus is the same as that of the tackle shown in Fig. 1-3. On the apparatus being cast, the water-current will drive it down, the depth depending upon the length of the drag-line *t³*. The pressure of the water entering the tube *n* causes compression of the air confined in the air-reservoir *c* and in the hose *a*. This pressure will naturally increase the deeper the air reservoir is let down into the water. This air-pressure is transmitted to the pressure-gage, so that the depth of the water can be read off directly. On drawing up the apparatus out of the water the lip-valve *o* will open, so that the volume of water which has entered the reservoir *c* flows out again.

Having thus described our invention, we declare that what we claim is:

1. A sounding tackle, comprising a flexi-

ble pipe, a pressure-gage attached to the top-end, and an air-reservoir attached to the bottom-end thereof, a tube secured to the reservoir and communicating therewith and having a water-inlet and water-exit, and a lip-valve made of two strips of rubber joined at two edges and to a socket part which controls said exit and opening only when the air-pressure in the reservoir overcomes the external water-pressure, substantially as described.

2. A sounding tackle, comprising a flexible pipe, a pressure-gage attached to the top-end thereof, and an air-reservoir communicating with the bottom-end thereof, and means holding it externally to the reservoir, a tube secured to the reservoir and communicating therewith, and having a water-inlet and a water-exit, and a lip-valve controlling said exit, substantially as described.

3. A sounding-tackle, comprising a flexible pipe, a pressure-gage attached to the top-end, and an air-reservoir attached to the bottom-end thereof, a tube secured to the reservoir and communicating therewith and having a flared downwardly bent top, water-inlet, end, and a lip-valve made of two strips of rubber joined at two edges and to a socket part controlling the bottom, water-exit end of the tube, substantially as described.

4. A sounding-tackle, comprising a flexible pipe, a pressure-gage attached to the top-end, and an air-reservoir attached to the bottom-end thereof, a tube secured to the reservoir and communicating therewith and having a water-inlet and water-exit, and a lip-valve made of two strips of rubber joined at two edges and to a socket part controlling said exit and opening only when the air-pressure in the reservoir overcomes the external water-pressure, and a water-kite carrying said apparatus and consisting of a box-shaped body open at both ends and having lateral apertures, and weighted below and means for attaching a drag-line to the body, substantially as described.

In witness whereof we have hereunto signed our names this 13th day of July 1908, in the presence of two subscribing witnesses.

OSCAR GUTT.

FRIEDRICH HERMANN CARL HEYN.

Witnesses:

ERNEST H. L. MUMMENHOFF,
PHILIPP BRUNNER.