(No Model.) 2 Sheets—Sheet 1.

E. E. HASKELL.

SHIP'S LOG.

No. 384,362. Patented June 12, 1888.

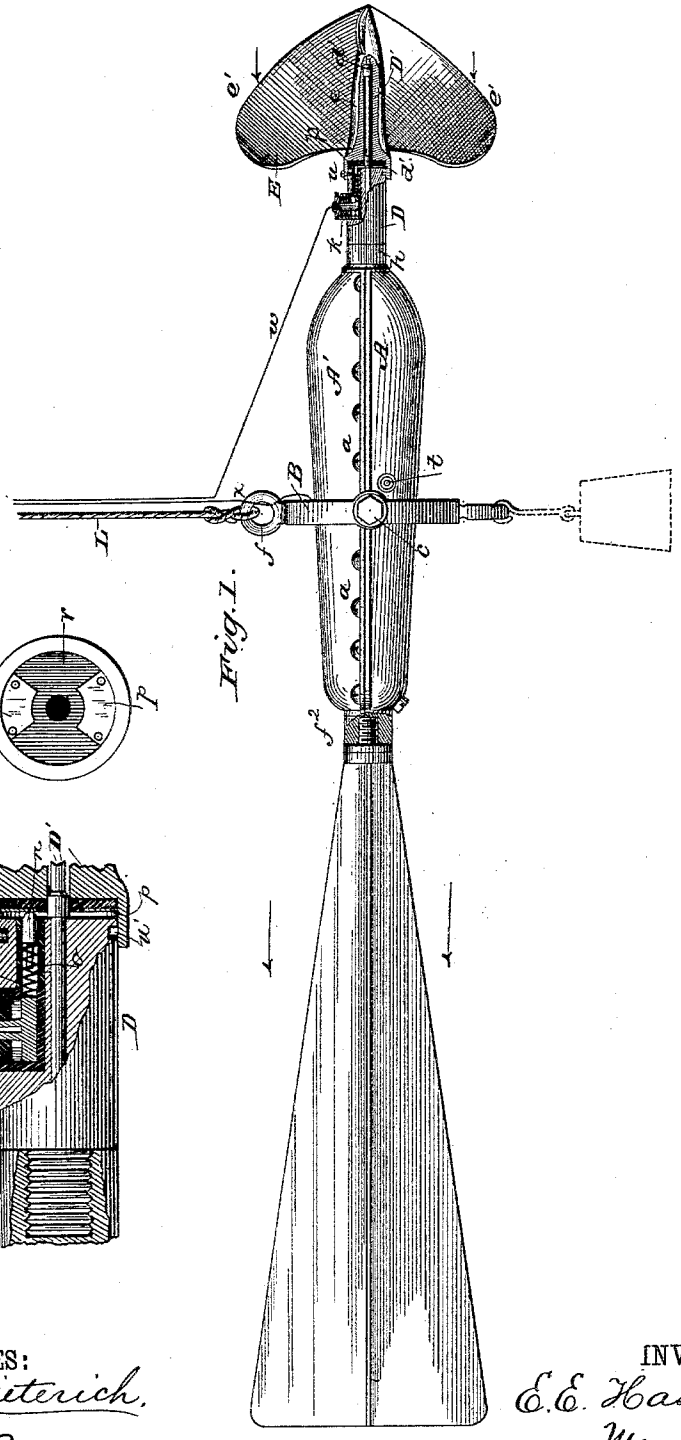


Fig. 1.

Fig. 5.

Fig. 4.

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Fig. 2.

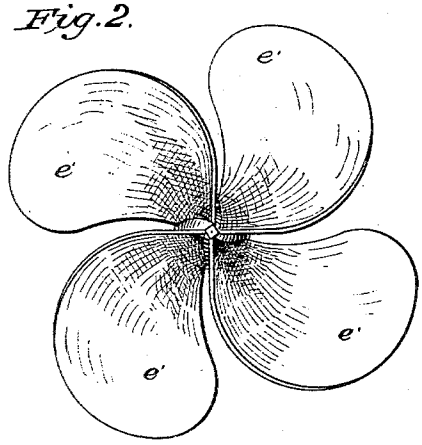
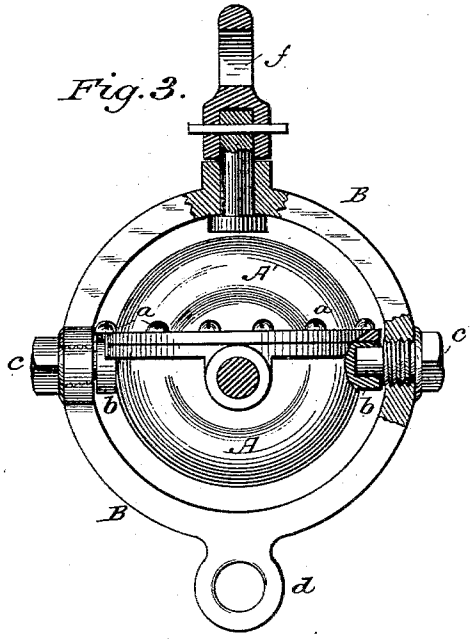


Fig. 3.



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UNITED STATES PATENT OFFICE.

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SHIP'S LOG.

SPECIFICATION forming part of Letters Patent No. 384,362, dated June 12, 1888.

Application filed January 17, 1888. Serial No. 261,073. (No model.)

To all whom it may concern:

Be it known that I, EUGENE E. HASKELL, of Forestville, in the county of Chautauqua and State of New York, have invented a new and useful Improvement in Instruments for Indicating the Velocity of Submarine Currents, of which the following is a specification.

My invention is in the nature of an instrument designed to be lowered by a cable beneath the surface of a running body of water for the purpose of ascertaining the velocity of the currents; and it consists in the peculiar construction and arrangement of its parts and their combination with electric contacts for determining the number of revolutions per minute of a propeller-wheel, and thus comparatively determining the velocity of the current, as hereinafter fully described.

Figure 1 is a side elevation, partly in section. Fig. 2 is a front end view of the propeller-shaped speed-wheel. Fig. 3 is a rear end view with the tail or guide vanes removed, and Figs. 4 and 5 are detail views.

In the drawings, A A′ represent the central body portion, which is made in the shape of an elongated or oblong chamber composed of upper section, A′, and lower section, A, whose edges are flanged and fastened together by screws *a*, with a gasket between the flanges to make a tight joint. On the opposite sides of the lower section, A, of the body are formed screw-sockets *b*, to receive headed screw-bolts *c*, which pass through eyes in a circular yoke or frame, B, and form trunnion-supports for the same. This circular yoke B surrounds the body of the instrument, and has at its lower side an eye or point of connection, *d*, for a suspended weight, and at its top a swiveling-eye, *f*, for connection with the cable by which the instrument is suspended and lowered into the water.

At the rear end of the body portion is formed a screw-socket, f^2, into which is screwed four right-angular blades, forming a guiding vane or tail C, and at the front end of the body portion is formed a screw-socket, *h*, into which is screwed a shaft-section, D, for the revolving propeller-shaped wheel E. This wheel is constructed in a peculiar way—*i. e.*, it comprises a central tubular hub, *e*, with radial spiral blades, *e′*, all of which taper to a common axial point in front, so that the outer lines of these blades constitute a conical-pointed prow. As the current strikes these blades, moving against them in the axial line, it causes a revolution of the blades, the rapidity of which is dependent upon the velocity of the current.

The pointed shape of the wheel serves a very important purpose, since in all bodies of water there is more or less drifting material—such as grass and sticks—which would, with the ordinary construction of propeller, soon find lodgment against it that would obstruct and finally stop its revolution, so that it would not serve at all as an indicator of the velocity of the current. With my construction of wheel the pointed prow formed by the blades effectually prevents the lodgment of grass and similar obstructions, and enables me to obtain a reliable basis of calculation.

Within the hub of the wheel there extends a steel spindle, D′, which is firmly fixed in the shaft-section D, and has at the inner and outer edges of the hub enlarged bearing-faces *d′ d′*, while the space between is filled with oil. This causes the wheel to run perfectly true and with the greatest freedom from friction and cramping strain. To prevent the speed-wheel from coming off its spindle D′, a flange of the hub overlaps the front end of the shaft-section, and carries a set screw, *u*, which extends into and swivels in a peripheral groove, *u′*, around the said shaft-section.

In the side of the shaft-section D is seated an insulating-bushing, *k*, of hard rubber, and in the same is seated a split binding-post, *l*. Parallel with the axis of the shaft-section B there is bored a hole that penetrates the bushing *k* and exposes the metal of the binding-post. In the hole is placed an insulating non-conducting tube, *m*, of hard rubber, and in the tube is placed a spring-seated bolt, *n*, having a shoulder that rests against its spring *o*, which latter bears against and is in electrical contact with the binding-post *l*. The outer end of the spring-seated bolt *n* protrudes beyond the shaft-section D and bears with a uniform friction against the face of the hub of the wheel E. In this face there are two metal plates, *p p*, which are in electrical connection with the body of the wheel, while between these plates and flush with them is a non-conducting surface, *r*, of hard rubber.

The binding-post *l* in the side of the shaft-

section D constitutes one point of connection for a circuit-wire, *w*, which is coated with an insulating material, and extends up within or beside the cable L, by which the instrument is suspended. The end of this insulated wire is clasped between the split sections of the binding-post *l*, whose outer surfaces are made conical. These split sections are clasped upon the wire by a perforated screw-nut, *s*, of hard rubber, which turns into the bushing and pinches the split sections together. The outer end of the binding-post, where it is exposed to the water, may be protected by a soft-rubber plate or cap on the wire, so that the electric current may not be diverted or short-circuited through the water. The conducting-wire which leads to the binding-post is therefore completely insulated and carries the current to the spring-seated bolt *n*. The other conducting-wire, *x*, may or may not be insulated and connects with the metal parts of the instrument, this wire only being used because it is a better conductor than the water.

In the operation of the instrument it is connected to a cable by its swiveling-eye, in which cable the insulated conducting-wire runs to the binding-post *l*, and another wire runs to the metal parts of the device. The instrument is now lowered from a boom or other support to a desired position beneath the surface of the water, and the guide-tail at once throws the wheel so as to face the current. At each revolution of the wheel electric contact will be made and broken between the spring-seated bolt and the metal and rubber plates in the hub of the wheel, and the electrical impulses will be gathered from the conducting-wires and recorded on a register above to indicate the number of revolutions per minute.

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

1. The combination, with the guiding-tail and the suspending device, of the shaft-section having a spindle, D′, and the conical spiral wheel E, arranged at the extreme front end of the device, so as to form a clearing-prow, and having a hollow hub fitting with a long bearing on the spindle and inclosing the end thereof, substantially as and for the purpose described.

2. The combination, with a suspending device and guiding-tail, of the shaft-section D, having insulated bushing *k* and binding-post *l*, the insulated spring-seated bolt *n*, in electrical connection with the said post, the speed-wheel E, with contact and insulating plates *p* and *r* in its hub opposite the spring-bolt, and the electric-current wires, substantially as and for the purpose described.

3. The combination of the speed-wheel E with hub *e*, and flange with set-screw *u*, the shaft-section D, having spindle D′, with bearings *d d′*, and groove *u′* for the set-screw.

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Witnesses:-
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