

J. ECKHOFF.
Bilge-Water Gage.

No. 219,702.

Patented Sept. 16, 1879.

FIG. 1

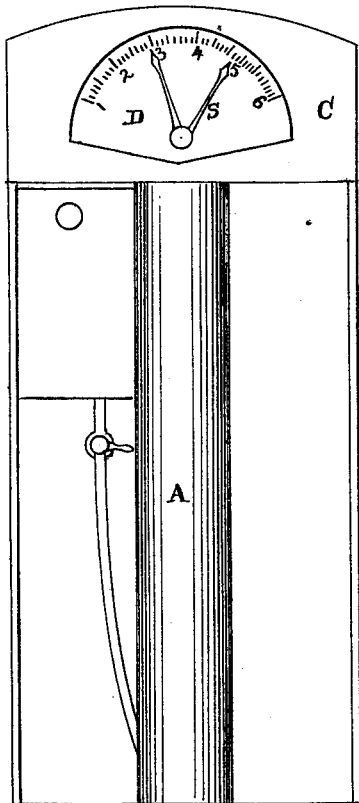


FIG. 2.

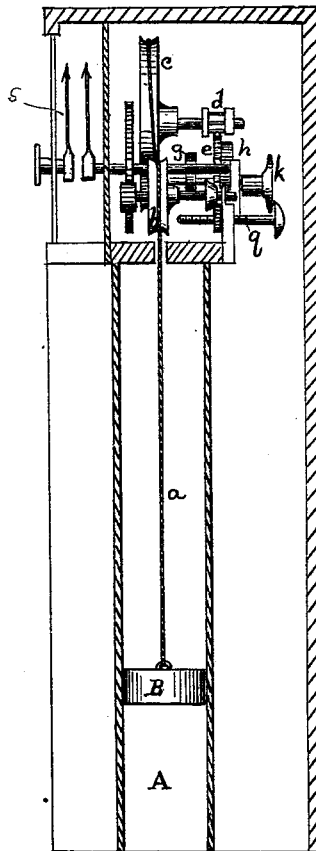
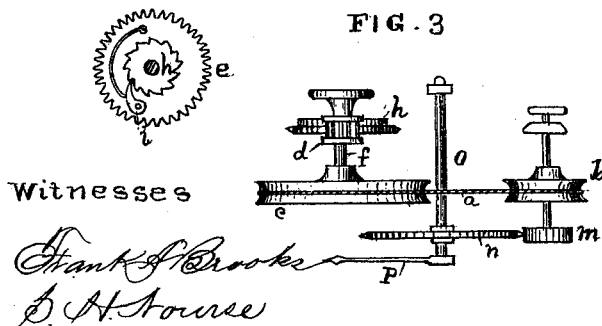


FIG. 3



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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN BILGE-WATER GAGES.

Specification forming part of Letters Patent No. **219,702**, dated September 16, 1879; application filed May 22, 1879.

To all whom it may concern:

Be it known that I, JACOB ECKHOFF, of Oakland, county of Alameda and State of California, have invented an Improved Water-Gage for Vessels; and I hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings.

My invention relates to an improved water-gage for vessels, as it consists in placing a float-valve inside a tube or pipe connecting with the lowest part of the hold, said float being so connected by gearing and spring mechanism with adjusting mechanism for regulating the tension of the float-cord as to actuate a pointer or an indicator-card on deck, and to indicate in feet and inches on said card the amount of water in the vessel at any time. A check-pointer is also connected with the card, so that it may be set, and the difference in the water-level between any one time and another be ascertained, so as to ascertain any increase or diminution of leakage exactly in inches.

Figure 1 is a front view of my device. Fig. 2 is a vertical section. Fig. 3 is a top view of the mechanism.

Let A represent the pipe or tube reaching from the deck down into the hold of the vessel, inside of which is placed the float B. At any suitable place on the deck of the vessel, so as to be in view, is placed the box C, in which is the gearing connected with the float, and on one side of which is the dial-card D, as shown.

A cord, *a*, is attached to the float, which passes over a pulley, *b*, and is secured on a reel, *c*. On the shaft on which this reel *c* is mounted is a pinion, *d*, engaging with a gear, *e*, on a spindle, *f*. On this spindle *f* is a coiled spring, *g*, and on the other side of the gear on the spindle is the ratchet-wheel *h*, engaging with the spring-pawl *i* on the gear *e*. A milled head, *k*, is formed on the head of the spindle, by which the tension of the spring may be increased (more or less) by turning the spring and allowing the pawl to catch in a new tooth on the ratchet.

On the same shaft as the pulley *b* is a pin-

ion, *m*, which engages with the gear *n* to rotate the shaft *o*, on which is the index-finger *p*, which indicates the feet and inches on the card.

As the water rises in the tube or pipe the float is lifted, and as its weight is partially relieved from the cord the spring *g* revolves the spindle and reel *c*, winding up the cord, and thus turning the pulley *b* and actuating the pinion and spur to move the finger over the face of the card in proportion to the lift of the float. As the water recedes and the float lowers, it unwinds the cord from the pulley *c*, and winds up the spring again. The weight has specific gravity enough at all times to overcome the resistance of the spring as it lowers in the tube, and as the water lifts the float part of its weight is relieved from the cord, so that the spring will wind up the cord on the reel. The screw-rod *q* is intended to keep the pulley *b* over in its proper position, so that the pinion will mesh with the gear to move the hands.

It will be obvious that the box with the gearing and indicating-card may be placed in the cabin of the vessel or elsewhere, and need not necessarily be immediately over the pipe or tube carrying the float, since the cord may be led from the float in the pipe to the gearing over suitable pulleys or in supplemental tubes. A pointer, *s*, is fixed on the glass of the dial, similar to that on an aneroid barometer, and by setting it and then noting the difference between its indicating-mark and that of the pointer connected with the gearing the relative increase or decrease in leakage of the vessel between specified times may be ascertained.

In this way a very convenient means of measuring the water in a ship's hold is obtained. Ordinarily it is necessary to sound the well by means of a string and rod or weight; but this is a very unsatisfactory method and takes some time. With the indicator-card always in view, the state of the water in the vessel is always known, and any increase shown.

A bell may be connected with the pointer or gearing, so that when over a certain amount of water is in the vessel it will sound the alarm and call the attention of the proper person to the fact.

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

The float B, moving in the tube A, and having the cord *a*, passing over the pulley *b*, which actuates the indicating-pointer, in combination with the reel *c*, with its pinion *d*, gear *n*, and spring *g*, said spring being provided with the adjusting mechanism, consisting of the spindle *f*, with its milled head *k*, the ratchet *h*,

and spring-pawl *i*, whereby the tension of the float-cord is regulated, substantially as and for the purpose herein described.

In witness whereof I have hereunto set my hand.

JACOB ECKHOFF.

Witnesses:

CHAS. G. YALE,
FRANK A. BROOKS.