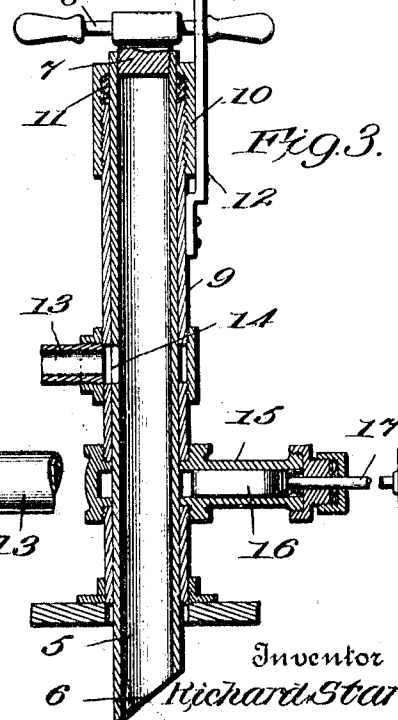
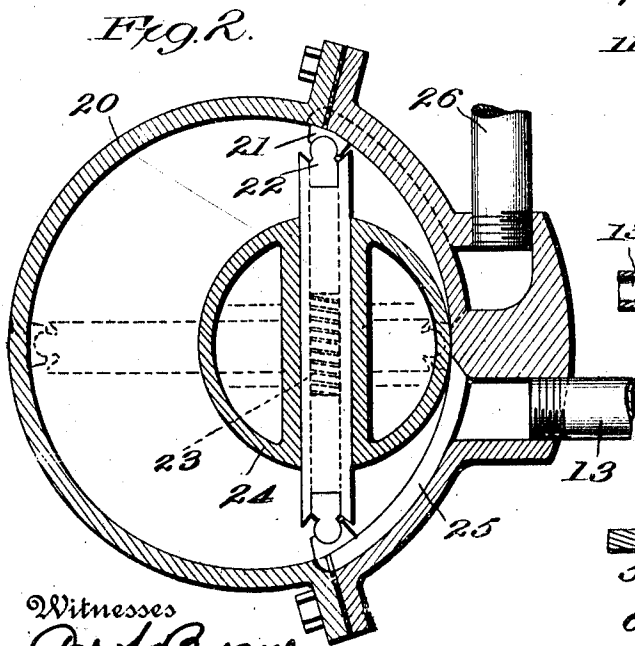
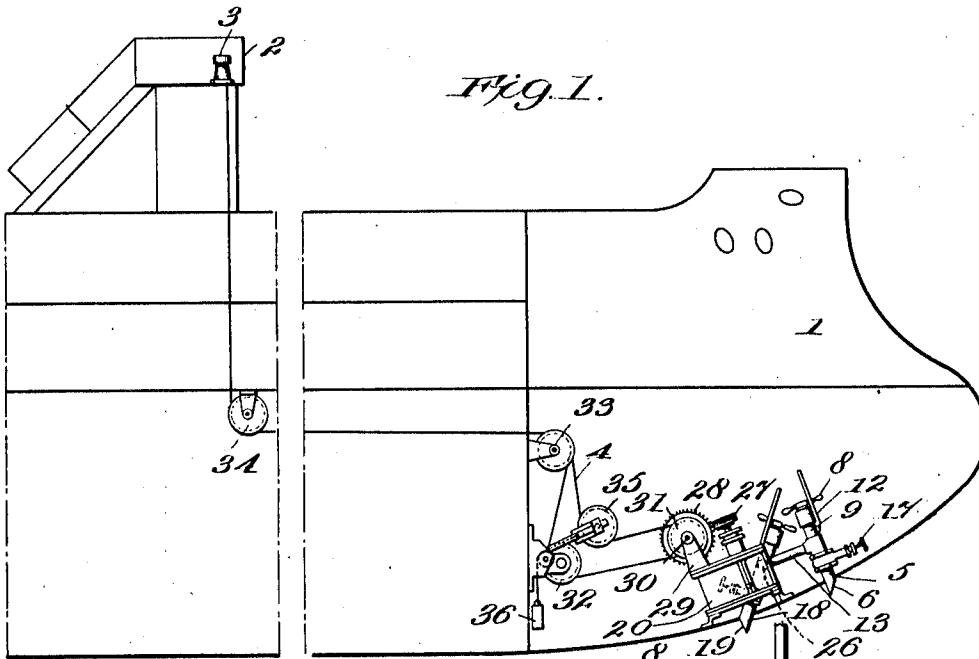


R. STAR.
 APPARATUS FOR INDICATING THE SPEED OF SHIPS.
 APPLICATION FILED APR. 15, 1910.

988,832.

Patented Apr. 4, 1911.



Witnesses
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UNITED STATES PATENT OFFICE.

RICHARD STAR, OF THE UNITED STATES NAVY.

APPARATUS FOR INDICATING THE SPEED OF SHIPS.

988,832.

Specification of Letters Patent.

Patented Apr. 4, 1911.

Application filed April 15, 1910. Serial No. 555,672.

To all whom it may concern.

Be it known that I, RICHARD STAR, a citizen of the United States, stationed on U. S. S. *Georgia*, have invented certain new and useful Improvements in Apparatus for Indicating the Speed of Ships; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in apparatus for indicating the speed of ships, being a specific improvement upon my prior Patent Number 955,008, dated April 12, 1910.

The object of the present invention is to improve upon the details of the invention shown in my former application, and especially the means for causing a vacuum in the outlet pipe communicating with the motor.

With this and other objects in view, my invention consists in the construction and combinations of parts as hereinafter described and claimed.

In the accompanying drawing—Figure 1 represents, in outline, part of a ship, my invention being applied thereto. Fig. 2 is a cross-section of the motor on an enlarged scale, and Fig. 3 is an enlarged cross-section of the inlet tube.

1 represents a portion of the hull of the ship, 2 the bridge thereof, and 3 the indicator mounted thereon, which may be of any suitable construction, this indicator being operated by means of a cord or wire 4, leading from the motor to the indicator. The cords, pulleys, and connections may all be cased in, if desired, but they are not so shown on the drawing.

5 represents the inlet tube, having its lower end beveled off as shown at 6, and preferably set at an angle to the bottom of the ship, as shown in Fig. 1. This inlet tube has its upper end closed by a plug 7, to which is connected a handle 8, and the tube is arranged to slide in a larger tube 9, whose lower end is fastened to the bottom of the ship. The top of the tube 9 is closed by a cap 10, having packing 11 therearound, and on said tube 9 is mounted a slotted guide 12, the slot in which limits the upward and downward motion of the tube 5. Connected to the tube 9 is a branch tube 13, which leads to the motor, and the tube 5 is provided with a slot 14, so that when the tube 5 is forced

downwardly with its lower end below the ship's bottom, there will be a free passage for the water entering the lower end of the tube 5 into the pipe 13. The tube 9 is also provided with an extension 15, in which is located a valve 16, operated by a handle 17, passing through a stuffing box. The purpose of this valve is to close the pipe 9 to prevent water from leaking into the ship when the pipe 5 is drawn up. 18 represents the outlet pipe, having its lower end beveled, as shown at 19. This pipe and its connected parts are substantially the same in construction as the pipe 5, except that the beveled end 19 is arranged pointing to the stern instead of to the bow, as shown in Fig. 1. The tube 19 is also inclined toward the stern, as shown. This arrangement of the inlet and outlet pipes is of considerable importance. The pipe 5 being inclined toward the bow, and also having its lower end beveled in the same direction, causes a strong current of water to flow into the pipe 5, and thence to the motor, while the outlet pipe 18 being inclined backwardly and having its rear end beveled in the same direction, tends strongly to create a vacuum in the motor as the ship moves forward. In fact, the effect upon the motor by reason of the partial vacuum is almost as great as the effect on said motor by the pressure of the water entering the pipe 5.

The pipe 13 delivers into a motor casing 20, the motor and casing being constructed substantially in accordance with the construction shown in my former application, Serial No. 496,022. The motor is composed of two pistons at right angles to each other, one being shown in full lines and the other in dotted lines in Fig. 2, and the casing is provided with a partition, separating it into two chambers, in one of which each of the pistons works. Each piston comprises a central portion sliding freely in a central slot in a revoluble cylinder 24. In slots in this main portion are two end pieces 22, each terminating in a pin, which bears against a centrally located spring 23, which tends to push the end pieces against the interior of the casing. The outer ends of the end pieces are rounded and over them are slipped the filling pieces 21, which move freely on the end pieces 22 and fit against the interior of the casing, the construction in both chambers being the same.

As the pistons in the motor casing re-

5 involve, they drive a shaft extending upwardly
 through the casing, on the top of which is
 mounted a worm 27, gearing with a worm
 wheel 28, mounted on a shaft 30, mounted
 10 in brackets 29 supported on the motor casing
 20. Of course, any other form of connect-
 ing gearing could be used. Mounted on the
 shaft 30 is a pulley 31, over which the cord
 or wire 4 passes. 32, 33, and 34 represent
 10 fixed guide pulleys for this cord or wire.

35 represents a movable tightener pulley,
 mounted in a movable yoke and adapted to
 regulate the tension of the cord 4 by means
 of a weight 36 in the usual manner.

15 I claim:—

1. The combination with a ship having
 an upwardly inclined bow, of an apparatus
 located in said bow for indicating the speed
 of the ship, including indicating means, a
 20 motor operating said indicating means,
 means for admitting water to said motor as
 the ship moves forwardly, including inlet
 and outlet pipes adapted to be pushed down
 through the bottom of the ship and connec-
 25 tions between said pipes and said motor,
 said inlet pipe having its receiving end beveled
 and said outlet pipe having its dis-

charge end beveled, substantially as described.

2. The combination of a ship having an
 upwardly inclined bow and means for indi-
 cating the speed of the ship including an
 indicator, a motor, connections between said
 motor and indicator, said motor being
 located in the bow of the ship, inlet and
 35 outlet pipes in proximity to said motor and
 adapted to be pushed outwardly and down-
 wardly through the bottom of the bow of
 the ship, casings in which said inlet and
 outlet pipes freely slide, means for limiting
 40 the movement of said pipes, valves to pre-
 vent the entrance of water into said ship
 when said pipes are drawn up within the
 ship, and connections between said pipes and
 said motor, said inlet pipe being provided
 45 with a beveled receiving end, and said out-
 let pipe being provided with a beveled dis-
 charge end, substantially as described.

In testimony whereof, I affix my signature,
 in presence of two witnesses.

RICHARD STAR.

Witnesses:

JOHN LUTHY,
 H. C. BURNHAM.