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MOTOR FOR SHIPS' LOGS

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By

ATTORNEYS
To all whom it may concern:

Be it known that I, Sidney M. Davison, of Annisquam, in the county of Essex and State of Massachusetts, a citizen of the United States, have invented a new and useful Improvement in Motors for Ships' Logs, of which the following is a specification.

My invention relates to that class of logs which are permanently mounted on board ship and by means of an indicator which may be located in the pilot-house or other convenient spot, show to the captain or pilot not only the speed of the vessel but also its travel.

In its preferred form, my invention is shown in the drawings, although the details of the apparatus there shown may be altered without departing from the essence of my invention.

Figure 1 is a vertical section showing the interior construction of an apparatus embodying my invention.

Fig. 2 is a vertical section taken on a plane at right angles to the plane of Fig. 1, the inlet and discharge pipes being continued to their extremities.

Figs. 3 and 4 illustrate in section the inlet and discharge pipes, these figures being taken at right angles to each other.

A is a casing which is mounted upon a pipe B and having a cover C attached thereto by bolts A. The pipe B connects a chamber D within the casing with the outer water through the orifice B, thus forming a discharge passage. D is the inlet pipe which is mounted upon a plug E having an opening D covered preferably with a grating F. This plug is held in place in the bottom of the pipe B by screws G. The upper end of the pipe D is narrowed as shown at H, so as to deliver water in a stream considerably narrower than the thickness of the wheel or rotor E and at the same time it is broadened in the opposite direction (see Fig. 1); the purpose of this nozzle being to deliver the water without waste to the periphery of the wheel E.

The periphery of this wheel E is grooved as shown in Fig. 1 at e, and is provided with buckets e, the purpose of the groove and the narrowing of the nozzle D being to apply to the water driven up through the pipe D to secure the full value of the force of the water driven up through the pipe D with as little waste as possible.

As shown in Fig. 1, where the nozzle D delivers a stream in the middle of the periphery of the wheel, it will be noted that there are two grooves f. The purpose of these grooves is to allow the water after it has acted upon a bucket e to discharge itself therefrom without interference with the incoming stream of water or the rotation of the wheel. As shown, there being two grooves in the periphery of the wheel, it is convenient to throw the stream in such a way that a portion of it will pass to each groove and be discharged; or, if the nozzle is placed on one side, a single groove may be used, the stream being preferably delivered at one of the outer edges of the groove.

The wheel E is preferably made of hard rubber or some light material so that it will operate with the least possible inertia. It is mounted on a hub F which is keyed to a shaft G to which it is attached by the nut H. The shaft G passes backward through a bearing I having suitable stuffing boxes J, K, and is connected to a worm K which meshes with the worm gear L. This worm gear L is on the end of a shaft M mounted in bearings in the casing C by which a counter of any desirable character may be operated.

The shaft E, has preferably loosely coupled therewith a shaft g, the coupling as shown comprising the slitting of the opposing ends of the shaft E and shaft g, and the winding of a spiral spring g′ around the ends of the shaft, the ends of the spring being attached to the shafts in the slots so that a certain amount of flexibility is allowed between the shafts. The shaft g is mounted in suitable ball bearings and provided with stuffing box, etc., as shown in Fig. 1 at G, and the shaft carries on its rear end a gear M. This gear may cooperate with a second gear (not shown) to operate a speed indicator of any desired character.

In order that the instrument when installed on board ship may be properly
calibrated according to the peculiarities of the ship itself, or the particular instrument, I have shown at I a throttle having a threaded end \( k \) which passes through a suitable neck \( k \) in the side of the casing and when once properly adjusted may be held in place by a screw \( k' \). It will be seen from Figs. 1 and 2 that this plug in cross section completely fills and closes so much of the intake as is desired; that is, its diameter is equal to the width of the portion of the nozzle into which it projects so that it will close tightly by lateral contact of nozzle, and as will be seen from Fig. 4, it may be screwed into or out of the nozzle as far as may be desired. This adjustment, however, is only to be used when the apparatus is first installed.

I have also shown at J an oil cup from which a wick \( j \) passes up through a suitable opening to lubricate the shaft \( E \). Other means of lubrication may be used as desired. The various gears and other moving parts should be lubricated in some suitable manner such as may occur to the user. The wheel or rotor \( E \) is so designed and is made of material such as to offer a minimum amount of resistance to its passage through the water. If thought best it may be weighted at the rim so that it will have a fly-wheel action.

As shown, the bearings are packed to prevent leakage from the casing.

In practice the log is so supported that the intake and discharge openings are about 15 inches below the vessel in which the log is mounted, the intake opening facing the bow and the discharge the stern thereof. A grating may be used if desired, as shown, to keep solid matter from the intake pipe.

What I claim as my invention is:

1. In a device of the kind described, a casing forming a chamber having an outlet, a rotor mounted to rotate in said chamber, and means comprising a pipe having an open intake at its lower end and a nozzle at its upper end located to deliver water from said pipe against the under side of the periphery of said rotor, said casing having an opening in its bottom through which said pipe passes into the chamber in said casing and the water from said chamber passes away.

2. In a device of the kind described, a casing containing a chamber having an outlet, a rotor mounted to rotate in said chamber, and means comprising a pipe having an intake at its lower end and a nozzle at its upper end located to deliver water from said pipe against the periphery of said rotor, said casing having an opening in its bottom through which said pipe passes into the chamber within said casing, and a discharge pipe closing said opening and surrounding said first-named pipe.

3. In a device of the kind described, a casing forming a chamber having an outlet, a rotor mounted on a horizontal shaft to rotate in said chamber, and means comprising a pipe having an open intake at its lower end and a nozzle at its upper end located to deliver water from said pipe against the under side of the periphery of said rotor whereby its movement through the water will cause water to rise therein and be forced from said nozzle.

4. In a device of the kind described, a casing forming a chamber having an outlet, a rotor having buckets mounted to rotate in said chamber, and means comprising a pipe having an open intake at its lower end and a nozzle at its upper end located to deliver water from said pipe against the under side of periphery of said rotor, the edge of said nozzle having an elongated discharge shaped to conform to the periphery of said rotor, and extended to deliver water to a plurality of buckets the width of said nozzle being narrower than the thickness of said rotor and also than the diameter of said pipe whereby the rapid movement of the device through the water will cause water to rise therein and be forced out from said pipe with a maximum of force depending upon the speed of said movement.

5. A device of the kind described comprising a casing forming a chamber, a rotor mounted to rotate in said chamber, a delivery pipe having a nozzle located to deliver water against the under side of said rotor and a drainage pipe surrounding said delivery pipe and connected at its upper end to said casing to drain the said chamber, its lower end being closed, said drainage pipe having openings in its opposite sides above its lower end one of said openings being connected to said delivery pipe whereby it may serve as an intake therefor and the other opening serving as an outlet for said drainage pipe whereby the contents of said chamber may be drained.

6. In a device of the kind described, a casing forming a chamber having an outlet, a rotor mounted to rotate in said chamber and means comprising a delivery pipe having a nozzle at its upper end located to deliver water against the periphery of said rotor, said outlet comprising a pipe connected to said chamber and having a plug located to close its extreme lower end, said outlet pipe having openings on opposite sides above its extreme lower end and said plug having a passage therethrough connecting one of said openings with said delivery pipe whereby water may be taken into said delivery pipe, said plug being shaped with relation to the interior wall of said outlet pipe to allow water draining from said casing to pass out through the
other opening in said drainage pipe whereby two separate channels will be maintained in said outlet pipe, one channel adapted to receive and deliver water to said nozzle and the other to drain said casing.

7. In a device of the kind described, a casing forming a chamber having an outlet, a rotor mounted to rotate in said chamber, and means comprising a pipe having an intake at its lower end and a nozzle at its upper end located to deliver water from said pipe against the under side of the periphery of said rotor, said nozzle being narrower than the diameter of said pipe and a throttle plug having a threaded extension of less diameter than said plug located in said nozzle, said plug and its extension being supported by the opposing walls thereof and also engaging the sides of said nozzle whereby the size of the stream delivered against the rotor may be adjusted.

8. In a log, a casing forming a chamber having an outlet in its lower portion, a rotor mounted in said chamber and having buckets about its periphery and means for rotating said rotor comprising a pipe closed at the bottom and having an opening in one side thereof near its lower end adapted to receive water, and a nozzle at its upper end narrower than the thickness of the rotor and located to deliver water against the under side of the periphery of said rotor, the periphery of the rotor being shaped whereby the water on striking it will fall off therefrom in a lateral direction without interfering with the incoming stream from the nozzle.

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