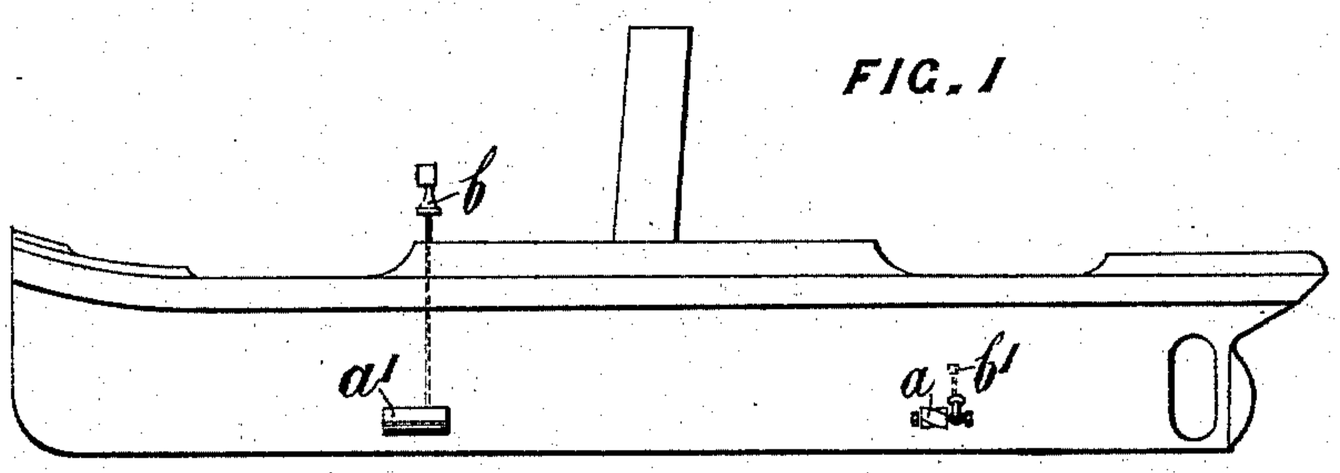
(No Model.) 2 Sheets—Sheet 1.

G. THOM.

SHIP'S LOG.

No. 527,464. Patented Oct. 16, 1894.

FIG. I



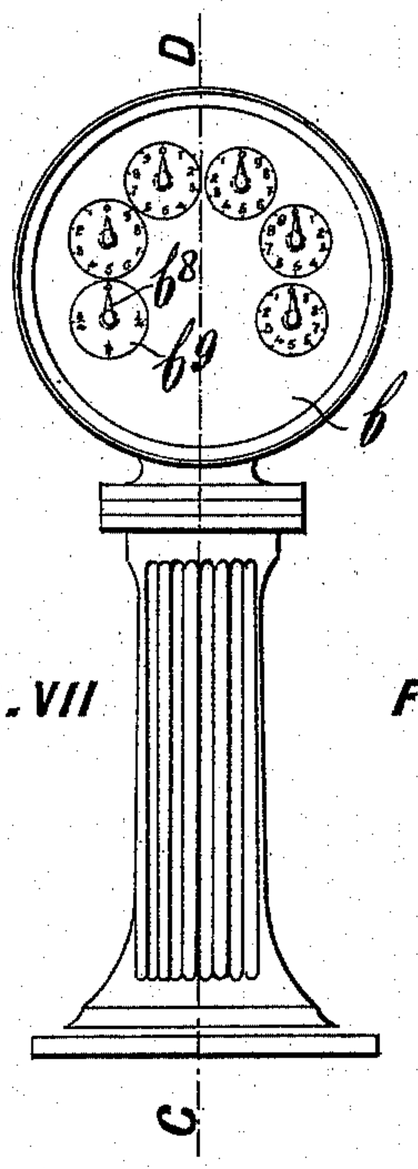


FIG. VII

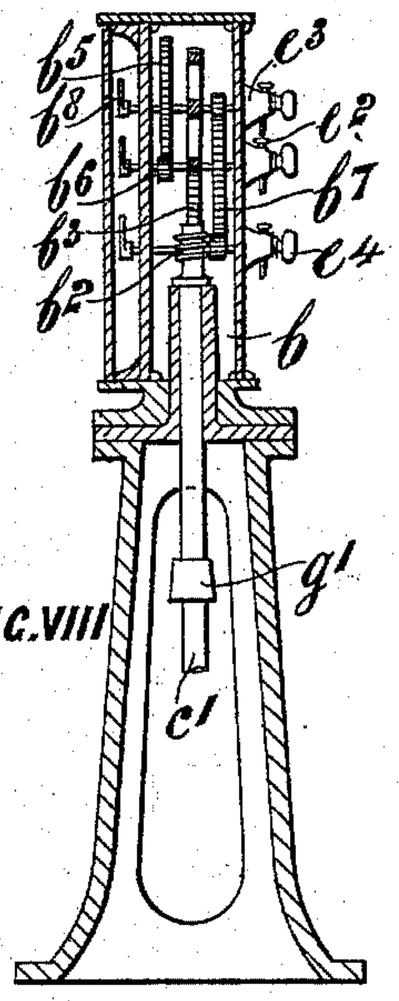


FIG. VIII

FIG. IX

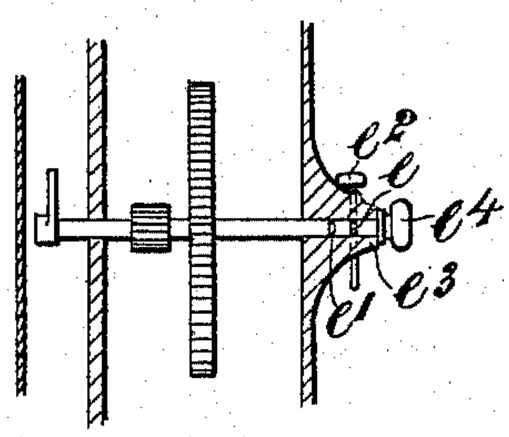


FIG. X

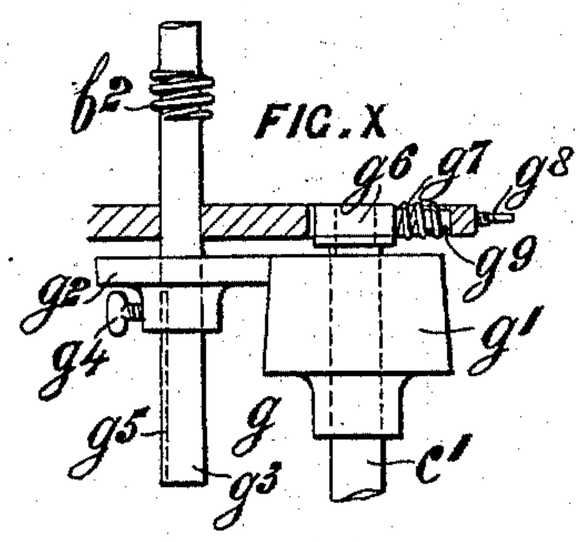


FIG. VI

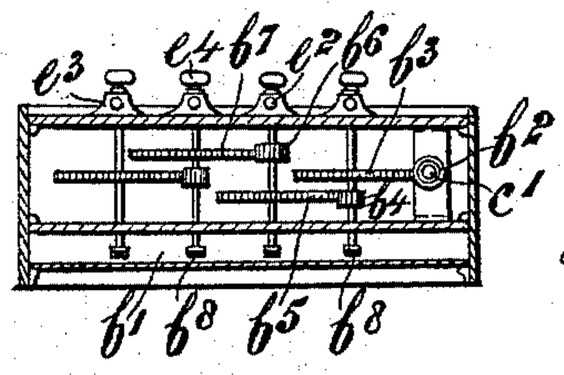
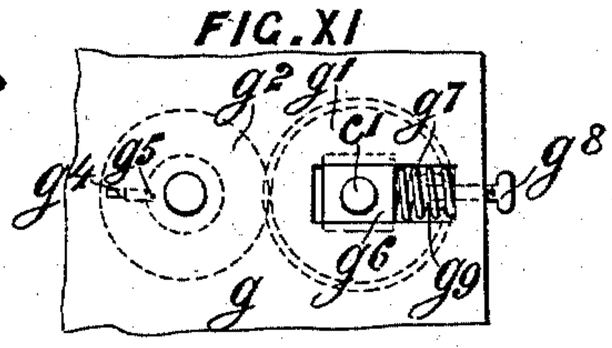


FIG. XI



WITNESSES

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(No Model.) 2 Sheets—Sheet 2.

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SHIP'S LOG.

No. 527,464. Patented Oct. 16, 1894.

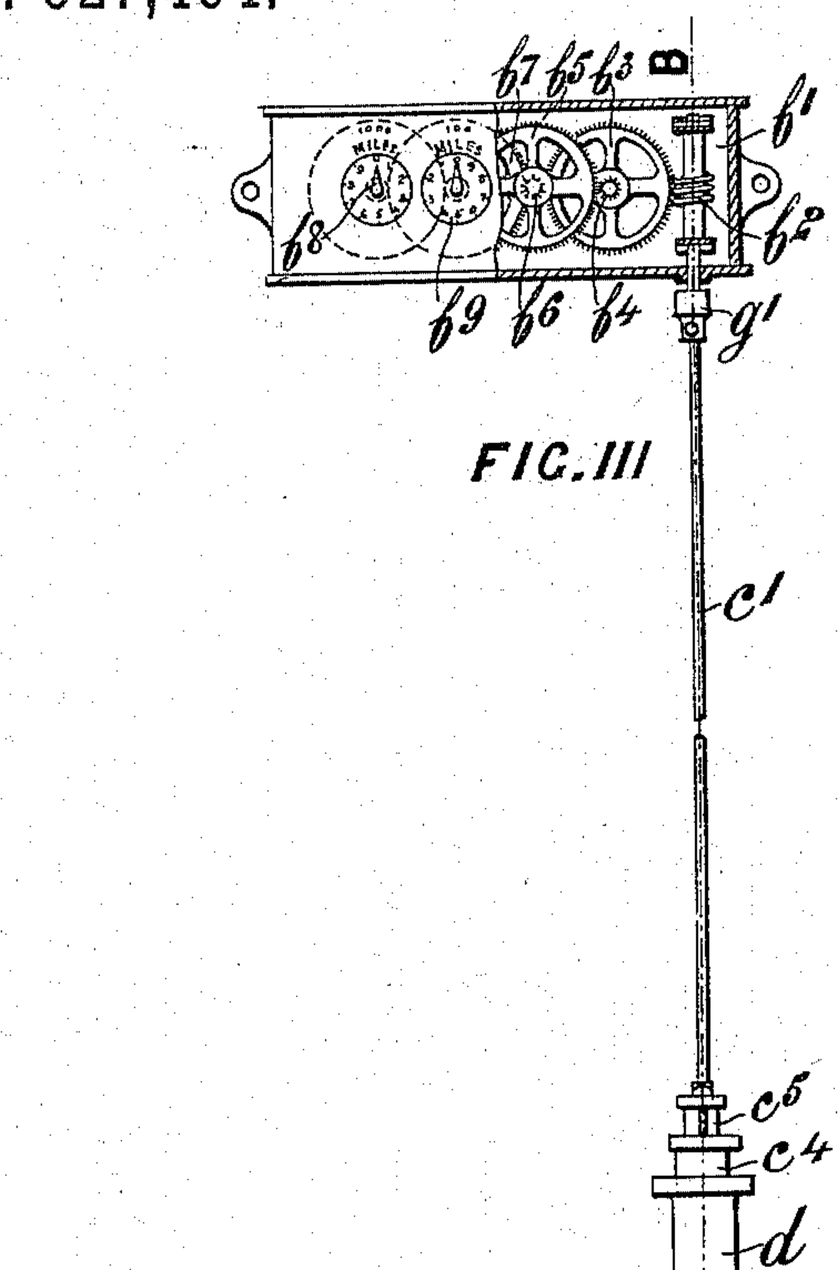

FIG. III

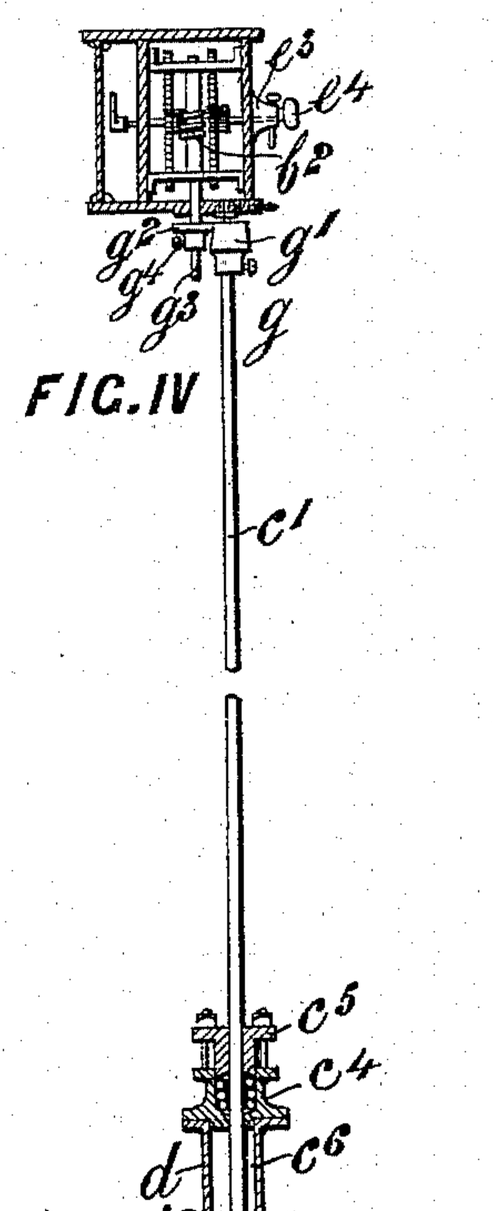

FIG. IV

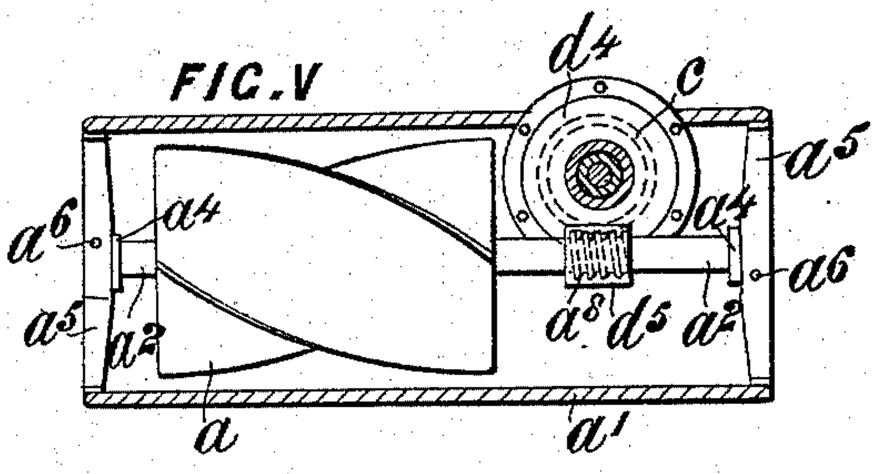

FIG. V

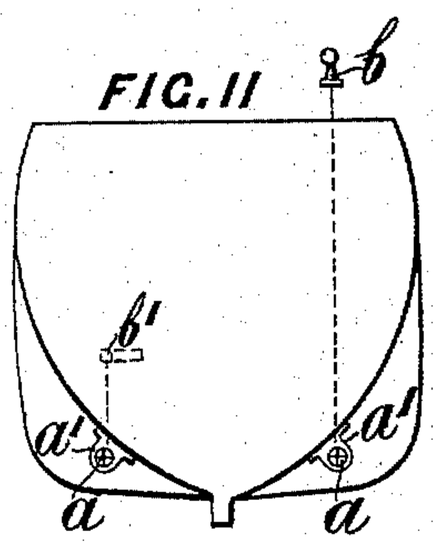

FIG. II

WITNESSES

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UNITED STATES PATENT OFFICE.

GEORGE THOM, OF DUNEDIN, NEW ZEALAND.

SHIP'S LOG.

SPECIFICATION forming part of Letters Patent No. 527,464, dated October 16, 1894.

Application filed March 22, 1894. Serial No. 504,713. (No model.)

To all whom it may concern:

Be it known that I, GEORGE THOM, a subject of the Queen of Great Britain, of McCrae Street, Mornington, Dunedin, in the Colony of New Zealand, have invented new and useful Improvements in Apparatus for Indicating the Distance Traveled by Steam and Sailing Ships, of which the following is a full, clear, and exact description.

My invention relates to apparatus attached to a vessel whose progress it is desired to indicate and has for its objects providing apparatus which shall overcome the difficulties at present experienced with the logs hitherto in use for this purpose.

With my invention indicators may be fixed on the bridge and under the eye of the officer stationed there, in the engine room in view of the engineer, or in other desired parts of a vessel.

It is well known that when a sailing or other vessel is going very slowly the logs in use hitherto will sink in the water and thus fail to give a record of the progress of the vessel. My apparatus is designed to overcome this objection and to indicate the distance traveled even when the ship is going at a very slow speed.

A further improvement is a tube and fittings which form a bearing for a shaft passing through the bottom of the ship and at the same time exclude the water and prevent the same gaining an entrance to the vessel.

I attain these objects of my invention by mechanism illustrated on the accompanying drawings, whereon similar letters refer to similar parts throughout the several views.

Figure I, is a side elevation of a steam ship with my apparatus attached. Fig. II, is a cross section of the same. Fig. III, is a vertical elevation of the apparatus and indicator for use in the engine room, part in section. Fig. IV, is a side elevation of the same, in section on line A, B. Fig. V, is a plan of the same, with the indicator removed. Fig. VI, is a plan of my arrangement of indicator to be used in the engine room, with top of casing removed. Fig. VII, is a front elevation of indicator for use on the bridge of ship. Fig. VIII, is a side view of the same, in section on line C, D. Fig. IX, is an enlarged view of a detail. Fig. X, is an enlarged view of a regulator. Fig. XI, is a plan of the same.

(a) in Figs. I and II represents the rotator and (a') the shield for protecting the same from the action of waves and of the water when the ship is rolling, and which may be placed on either side of the vessel and in the most convenient positions. By Fig. II it will be seen that they are so situated as to be well above the lower portion of the hull and thus would be clear of mud in shallow water.

(b and b') are respectively the indicators for the bridge and engine room.

In Figs. III, IV and V the rotator (a) is shown on a larger scale, secured to its shaft (a^2) by screws (a^3). The bearings (a^4), secured in the brackets (a^5), by the pins (a^6), receive this said shaft and take the thrust of the same upon the plates (a^7). Upon the shaft (a^2) is formed a worm (a^8) which, gearing with the worm wheel (c), transmits its motion to the shaft (c'). At its upper end this shaft (c') is connected by the regulator (g) to the small shaft (g^3) whereon is formed a worm (b^2) which gears with the first (b^8) of a train of wheels in the indicator (b').

The rotator (a) with its bearings (a^4), and brackets (a^5) are carried by the shield (a') which is fixed to the hull (k) of the vessel. The shaft (c') is supported upon the bearing (c^2) by its collar (c^3) Fig. IV.

(c^4) is a stuffing box and (c^5) a gland surrounding the shaft (c'). The space (c^6) is filled with oil to lubricate the bearing (c^2) and to exclude any water which might otherwise find its way between the bearing (c^2) and shaft (c') into the ship. The oil is prevented from escaping in an upward direction by the stuffing box (c^4) and being lighter than water does not escape downwardly. The tubes (d and d') are fixed to the hull (k) by the bolts (d^2) and hold the bearing (c^2) in position by the bolts (d^3).

(d^4) is a cover to shield the worm wheel (c) from the action of the water and the shield (d^5) performs a similar duty to the worm (a^8).

The rotator (a) is made of phosphor bronze by preference and with four blades, shaped as shown by curve (h) Fig. IV, to give a clear run for the water, and having a pitch of about two feet makes two thousand six hundred

and forty revolutions per mile, and the worm wheel (c) having thirty teeth makes the shaft (c') and worm (b^2) revolve eighty-eight times per mile. The wheel (b^3) has eighty-eight teeth and gearing with the worm (b^2) makes one revolution per mile. The pinion (b^4) on the same arbor as the wheel (b^3) has ten leaves which gear into the one hundred teeth on wheel (b^5). The pinion (b^6) has ten leaves gearing with the one hundred teeth on wheel (b^7) and so on throughout the remainder of the series. It will be obvious that the indicator will thus show single miles and multiples of ten of the same according to the number of wheels in the train. Each of the wheels is provided with a pointer (b^8) and dial (b^9) whereby the distance traveled may be read at a glance.

The rotator may be of such diameter and pitch as may be required to overcome the friction of the different parts and accurately drive the indicator (b'), and I find a pitch of about two feet as stated, and diameter of about ten inches suitable for most large vessels.

In Figs. VI and IX is shown a provision for throwing the indicator in and out of gear with the worm (b^2) and for setting the pointers (b^8). The arbors are grooved as shown at (e) in Fig. IX and the arbor of the first wheel (b^3) has a second groove (e'). The pins (e^2) pass through the bosses (e^3) and engage with these grooves (e) to prevent lateral movement of the said arbors. By withdrawing the pin (e^2) and pulling the knob (e^4) the pinion (b^4) may be disengaged from the wheel (b^5) and wheel (b^3) from worm (b^2) and by replacing the pin (e^2) to engage with the groove (e') no motion of the indicator will take place. In a similar manner the other wheels may be thrown out of gear to set the pointers. Immediately the vessel is under way the officer puts the indicator into gear and the apparatus begins to work.

(g) is the regulator by which the indicator may be adjusted to make allowance for slip of the rotator (a). (g') is a conical friction wheel made by preference of hardened steel to resist wear, and secured to the shaft (c'). The driven wheel (g^2) is made of similar metal and may be raised and lowered upon the shaft (g^3), and secured thereto by the thumb screw (g^4) and slot (g^5). The upper part of the shaft (c') is reduced in diameter and runs in the brass bearing (g^6) which fits in a slot provided for that purpose in the bottom of the case of the indicator (b'). Contact between the friction wheels (g' and g^2) is maintained by the helical spring (g^7) which bears against the brass bearing (g^6). The set screw (g^8) and washer (g^9) hold this spring (g^7) in position. Should the indicator not be working accurately the wheels (g' and g^2) may be separated by means of the spring (g^7) to throw them out of gear and the wheel (g^2) may then be raised or lowered as desired until the necessary speed is communicated to it by the varying diameter of the conical wheel (g').

Figs. VII and VIII show the form of indicator for the bridge; which is a modification of the one previously mentioned and does not require further description. Six dials and a train of six wheels are shown on this indicator giving a capacity for indicating up to one hundred thousand miles without resetting.

Where it is difficult to fix a straight shaft as (c') I use some kind of flexible shafting, or I may use light shafting and bevel gearing to connect the indicator and rotator. In this manner I am enabled to choose the most favorable position for the rotator and where there will be no fear of its being damaged.

I am aware that indicators and rotators have already been employed for indicating the speed of vessels and I do not claim these broadly, but

What I do claim as my invention, and wish to secure by Letters Patent, is—

1. In an apparatus such as set forth herein for indicating the distance traveled by steam and sailing vessels, the combination of the shaft (c') having collar (c^3), with bearing (c^2) stuffing box (c^4) and tubes (d and d') providing a space (c^6) for containing oil, substantially as and for the purposes described and illustrated.

2. In combination, with the rotator, the shaft c' extending therefrom, the indicator mechanism, the said shaft c' having a cone friction gear g' at its upper end which upper end is guided to move laterally in the indicator case, the shaft g^3 extending from the indicator mechanism parallel with the shaft c', the driving disk g^2 adjustable along the shaft and the means for holding the upper end of the shaft c' inwardly to press the friction wheel g' against the driving disk, substantially as described.

3. The combination, in an apparatus such as described herein for indicating the distance traveled by steam and sailing vessels, of a rotator (a) having worm (a^8), with worm wheel (c) shaft (c') bearing (c^2) stuffing box (c^4) tubes (d and d') space (c^6), regulator (g) and indicator (b'), substantially as and for the purposes set forth herein and illustrated.

GEORGE THOM.

Witnesses:
GEO. SMITH,
ERNEST SMITH BALDWIN.