(No Model.)

W. G. HANNAH.

MARINE ENGINE GOVERNOR.

No. 589,172. Patented Aug. 31, 1897.

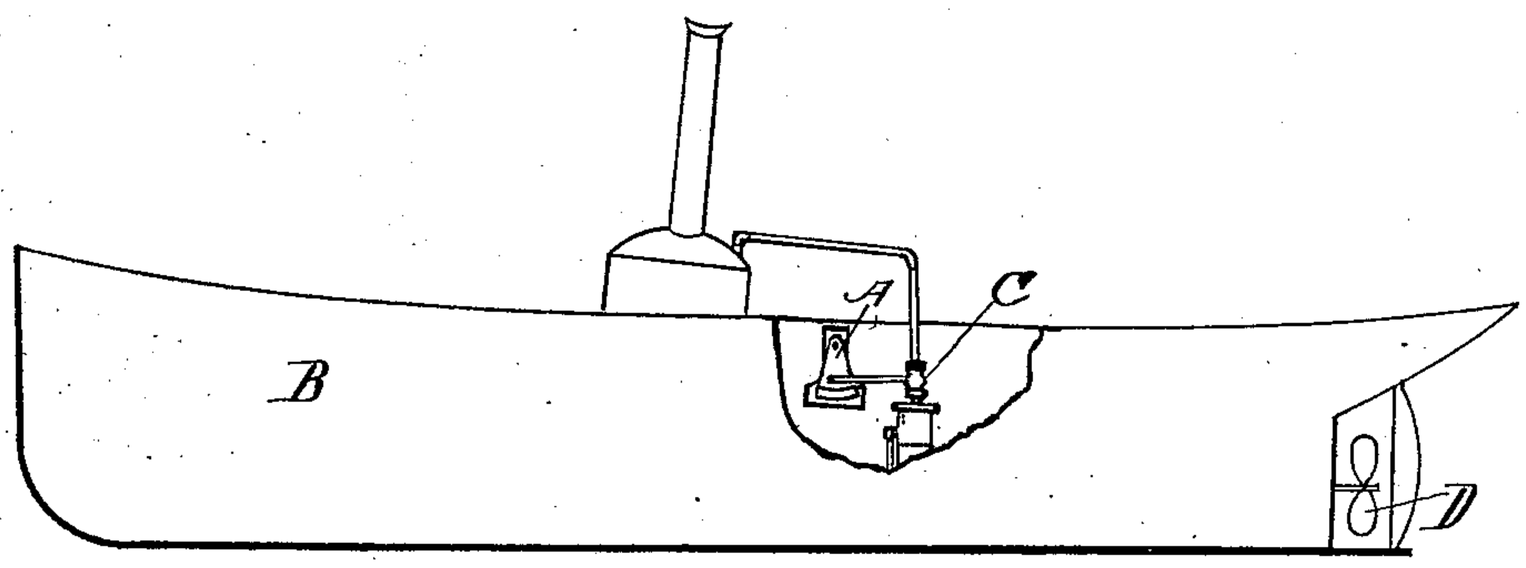

Fig. 1.

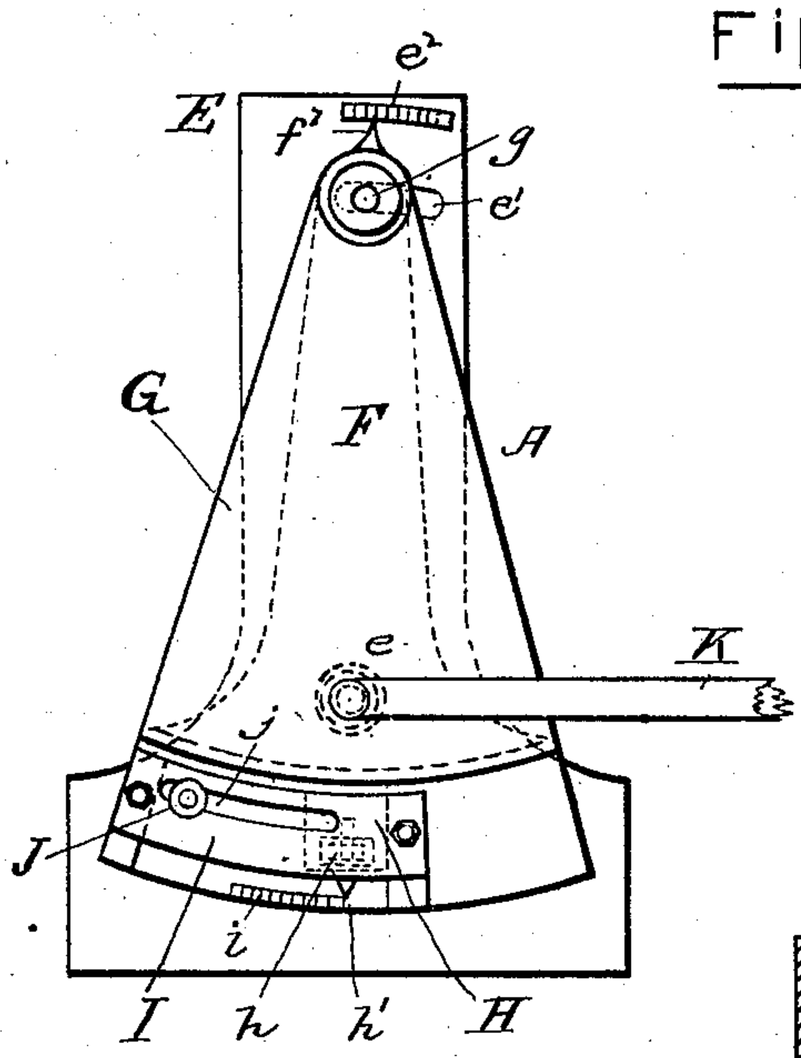

Fig. 2.

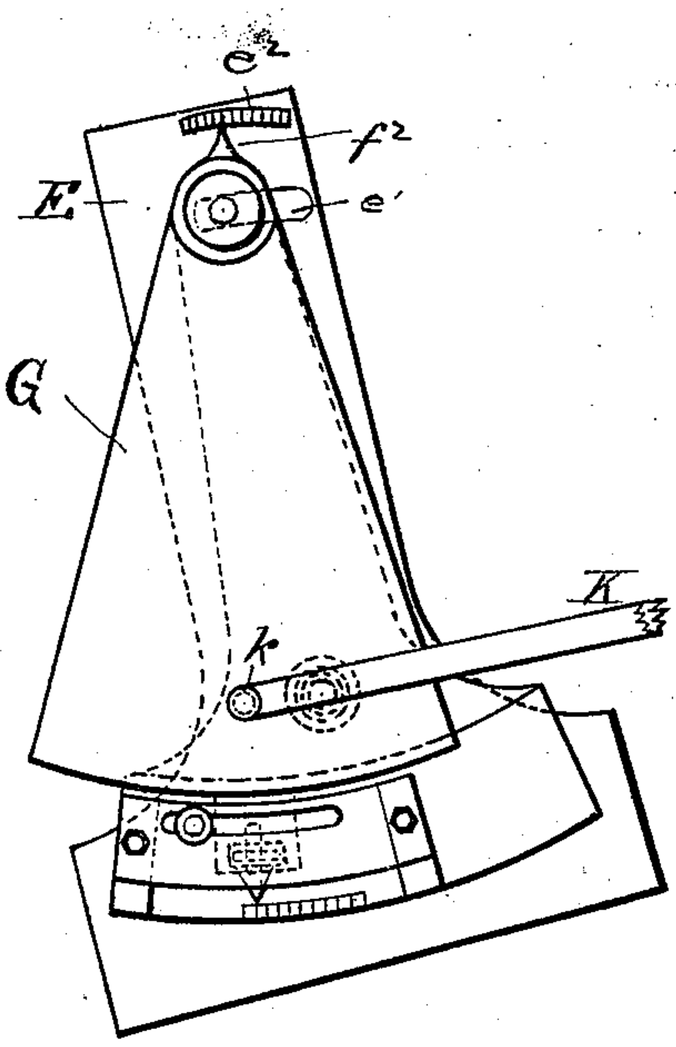

Fig. 3.

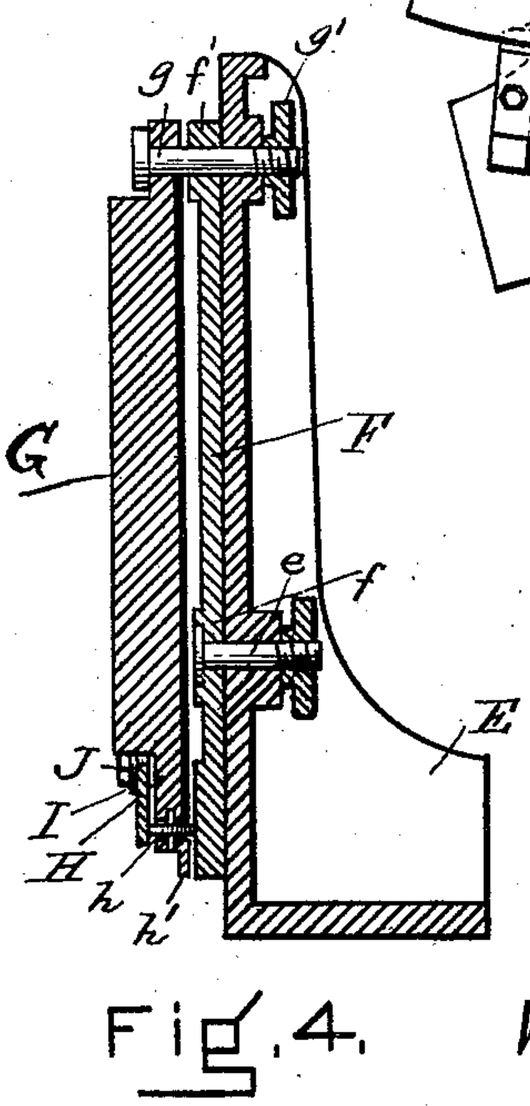

Fig. 4.

WITNESSES

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Atty

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MARINE-ENGINE GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 589,172, dated August 31, 1897.

Application filed August 20, 1896. Serial No. 603,314. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM G. HANNAH, a citizen of the United States, residing at Taunton, in the county of Bristol and Commonwealth of Massachusetts, have invented a new and useful Improvement in Marine-Engine Governors, of which the following is a full specification, reference being had to the accompanying drawings, wherein like letters represent like parts.

My invention relates to marine governors for controlling the supply of steam to the engine when a vessel is at sea in order to prevent the "racing" of the propeller when it is partly or wholly out of water on account of the pitching of the vessel; and it consists of a pendulum swinging fore and aft and suitably connected with the throttle-valve, so that as the vessel pitches and the stern rises the pendulum will swing forward and cut off the steam at a suitable point, as is hereinafter set forth.

In the drawings, Figure 1 is an elevation of a steam vessel having a part of the side B broken away to show the general arrangement of the governor A, throttle-valve C, and propeller D. Fig. 2 is an elevation of my governor as it stands when the vessel is on an even keel. Fig. 3 is an elevation of the same as it swings forward when the stern is raised. Fig. 4 is a vertical section through same.

My governor A is constructed as follows:

E is a standard which is rigidly secured to the vessel convenient to the throttle-valve and perpendicular to the water-line.

F is a T-shaped bracket swiveled to the frame E at the point *f* by the stud *e*. From the upper end *f'* of the bracket F is swung the pendulum G by means of the stud *g*, which passes through the pendulum G, bracket F, and circular slot *e'* in the frame E. Thus it will be seen that the bracket F may be swung on the pivot *e*, and the pivot for the pendulum G may consequently be swung backward for purposes hereinafter described. A bolt *g'* on the back of the frame E is used to clamp the stud *g* in the slot *e'*, and so hold the bracket F in any desired position.

My pendulum G, I preferably make in the form of a sector, having at its lower side a radial tongue H, which swings between the bracket F and a bracket I, bolted to said bracket F. The tongue H is provided with a roller *h*, designed to bear upon one or the other of the confining-brackets F or I, so that the pendulum may swing forward easily even if the vessel is rolling from side to side. The tongue A is provided with a finger *h'*, which travels over a scale *i* on the bracket F, showing the number of degrees through which the pendulum has swung, or the scale may be graduated so that the finger *h'* will indicate the amount of throttling of the steam at any position.

It is not desired that the pendulum swing backward when the stern settles, and the tongue H is arranged to strike against the fixed end of the bracket when in its normal condition with the throttle-valve open. The forward swing of the pendulum is regulated by the nut J in the bracket I, which may be adjusted in any desired position in the slot *j*. The rod K, pivoted at *k* to the pendulum, is connected with and actuates the throttle-valve, of which any suitable form of balanced valve may be used.

From the length of water-line, draft, and diameter of propeller can be figured trigonometrically the angles through which the pendulum must swing from the time the top of the propeller leaves the water until it is entirely uncovered, and knowing the angular motion required to open and close the throttle and the length of its lever the length of the pendulum between the point of support *g* to the point of attachment *k* of the connecting-rod may be figured.

It is obvious that the pendulum should not begin to swing forward and throttle the steam until the propeller begins to leave the water, and, as is usually the case, when the top of the propeller is some distance below the surface when the vessel is on an even keel it follows that the vessel should be allowed to swing through a considerable angle before the pendulum starts to swing forward. I accomplish this by swinging the point of pivot *g* of the pendulum backward from the perpendicular through the required angle, which can be computed trigonometrically, and this is

done by swinging the bracket F on the pivot e, the upper stud g traveling in and being clamped at the proper joint in the slot e'.

As the vessel is loaded and the draft increased the propeller will sink deeper below the surface, and consequently the bracket F must be swung backward more. A finger f^2 on the top of the bracket F points to a dial e^2, fixed to the standard E, and shows the angle through which the frame F has been swung. The scale e^2 may be graduated in terms of the draft of the vessel, and thus before starting on a voyage the engineer has simply to observe the draft of his vessel and set his governor so that the finger f^2 points at the proper draft, as indicated on the scale e^2. He will then know that the governor will begin to cut off at the proper time—*i. e.*, when the propeller reaches the surface of the water.

I claim—

1. A marine governor consisting of a throttle-operating pendulum provided with an adjustable pivot, substantially as described.

2. A marine governor consisting of a throttle-operating forwardly-swinging pendulum G, provided with a backwardly-adjustable pivoted supporting-bracket F, and a fixed supporting-frame E, substantially as described.

3. In a marine governor, a throttle-operating pendulum G, and connecting-rod K, in combination with a supporting-bracket F, having the pivots g and e, and the fixed supporting-frame E having the slot e', substantially as described.

4. In a marine governor, a throttle-operating, adjustably-pivoted pendulum having the tongue H, finger h' and roller h in combination with the bracket I, having the slot j and adjustable stop J, and with the supporting-bracket F, having the dial i, substantially as described.

5. In a marine governor, a throttle-operating pendulum and a swinging supporting-bracket F, having a finger f^2 in combination with a frameE, having a dial e^2, substantially as described.

In witness whereof I have hereunto set my hand.

WILLIAM G. HANNAH.

Witnesses:
WM. B. H. DOWSE,
GEO. A. HOLMES.