

MARINE ENGINE-GOVERNOR.

Patented April 25, 1876.

Inventors,
James Sangster
W^m. S. Growen.

UNITED STATES PATENT OFFICE.

JAMES SANGSTER AND WILLIAM S. GROSVENOR, OF BUFFALO, N. Y.

IMPROVEMENT IN MARINE-ENGINE GOVERNORS.

Specification forming part of Letters Patent No. **176,485**, dated April 25, 1876; application filed January 24, 1876.

To all whom it may concern:

Be it known that we, JAMES SANGSTER and WILLIAM S. GROSVENOR, both of the city of Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Marine-Engine Governors, which improvements are fully set forth in the following specification, reference being had to the accompanying drawings.

Our invention relates to that class of marine governors in which the device for operating the valve is controlled by the motion of the vessel; and it consists, first, of a valve-stem of a steam-supply valve or other valve, provided with an oscillating arm or plate, receiving its movements by means of a float, or its equivalent, in combination with an arm having a reciprocating movement from a connection with the engine, and provided with two toes, either of which catches the oscillating plate on the valve-stem, and opens or closes the valve, according to the position of the float, the combination being such that a movement of the valve is effected at or near the time the crank or other connection with the engine is passing the center, and the reciprocating arm is in the slowest part of its movement, thereby avoiding a too sudden starting of the valve, and, consequently, the danger of breaking the machinery; second, our invention further consists in the combination of a float with a tube arranged within the vessel, and having an outlet through the side or bottom of the same; third, the float, connected by intermediate mechanism to the valve-gear, being so secured that it may be vertically adjusted, according as the vessel is lightly or heavily loaded, to perform its functions with uniformity under these varying conditions.

In said drawings, Figure 1 is a side elevation of our invention; Fig. 2, an enlarged view of the reciprocating arm, vibrating arm, and a portion of the valve-stem; and Fig. 3 represents a side elevation, showing how a continuously-revolving wheel may be made to effect the same purpose.

A, Fig. 1, represents the tube arranged within the vessel, and having an outlet, C, through the side or bottom, the dotted lines B showing the arrangement of the float within the tube. It is made hollow of sheet metal,

and is fastened to a vertical rod, *b*, which is made adjustable vertically by means of the sleeve *b*¹ and set-screw *d*. *b*² represents an arm projecting from *b*¹, one end of which passes through an opening in plate *e*, or a yoke, to limit its motion up or down. *e'* is a rod, one end of which is jointed to *b*², and the other to the oscillating arm *D*¹. At some convenient point on said rod is placed a spring, as shown, arranged so as to work both ways in the direction of its length, so as to act either when compressed or extended. *g* is the valve-stem, for operating the valve in the steam-chest F on cylinder G, or its equivalent. *D* represents the reciprocating arm, provided with the toes or projections N O. It swings on a joint, *D*², and is reciprocated by means of the connecting-rod *d*², and a crank or its equivalent, E.

The oscillating arm *D*¹ may be connected with and will operate any other kind of a valve for controlling the admission of steam or air to an engine or any part thereof.

The operation of this invention is as follows: When the float is raised or lifted by the partial immersion of the vessel, *D*¹ is moved into the position shown in Fig. 1, when the toe N on arm *D*, as it vibrates, catches it and moves the valve in the direction of the arrow, the spring on *e'* allowing it to yield until the arm *D* has moved to the end of its stroke, or very nearly so, so that it can slip past the toe, if the float should move it before that time.

It will be readily seen that a reverse movement of the float or oscillating arm *D*¹ will cause the valve to be moved in a reverse direction, all the parts acting in a similar manner, but reversed.

In Fig. 3 a similar result is produced by a rotating wheel. A movement of the float or rod *e'* downward causes one of the moving teeth *j* to engage with *j*¹ and move the valve in one direction, while a movement of the same upward causes an engagement of *j*² *j*, and consequently a reverse movement of the valve.

If required, an engine may be operated from a distance, or from any part of the boat, so as to be reversed or stopped, or made to go slower or faster, by means of connecting-wires leading to *e'* or *D*¹, to be operated like ordinary

bell-wires; or, by combining with the main engine a separate or auxiliary engine on a small scale, for reciprocating the arm D, the main engine may be started as well as stopped from any desired part of the vessel. In reversing, a connection should be made with the link, and the eccentric or crank E should be arranged with reference to the position of the crank on the main engine, so as to time the action of D in such a manner as to avoid the danger of catching on the center.

We claim as our invention—

1. The combination, substantially as specified, of the float, the oscillating arm connected with the stem of the steam-supply valve and with the float, and the mechanism driven by the engine for operating on said arm.

2. A valve-rod provided with an oscillating arm, D¹, in combination with connection c' and movable arm D, which has projections or

toes N O, and is driven from the engine, as and for the purpose specified.

3. In a marine governor controlling the steam-supply valve by means of a float, the combination, substantially as specified, of said float B, rod b, sleeve b¹, and set-screw d, rendering said float vertically adjustable to adapt it for uniform action, whether the vessel be lightly or heavily loaded.

4. The combination of the movable or reciprocating arm D, oscillating arm or plate D¹, rod c', provided with a spring, as described, and a float, substantially as and for the purpose specified.

JAMES SANGSTER.

WM. S. GROSVENOR.

Witnesses:

AMOS W. SANGSTER,

HUGH SANGSTER.