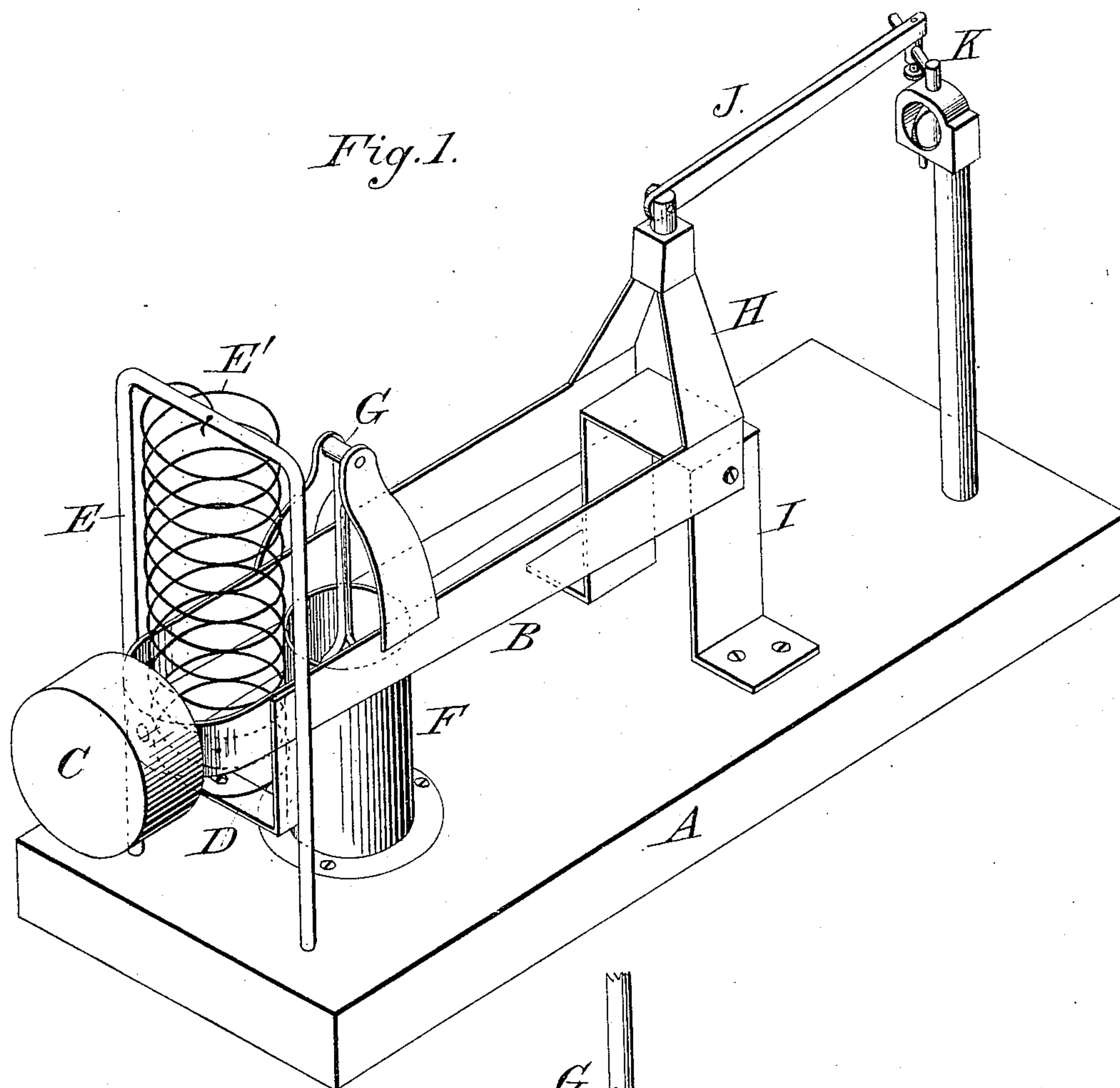


(Model.)

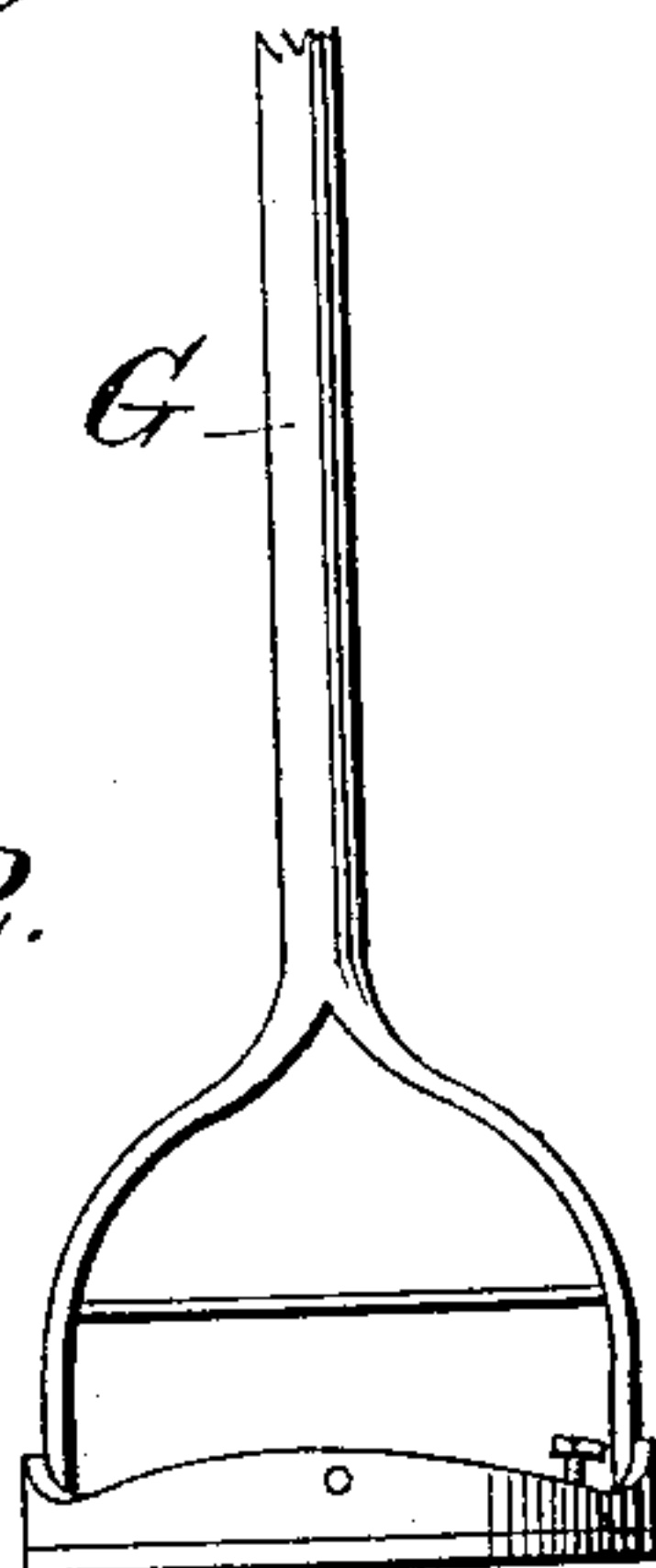
W. WÜRDEMANN.  
Governor for Marine Engines.

No. 238,473.

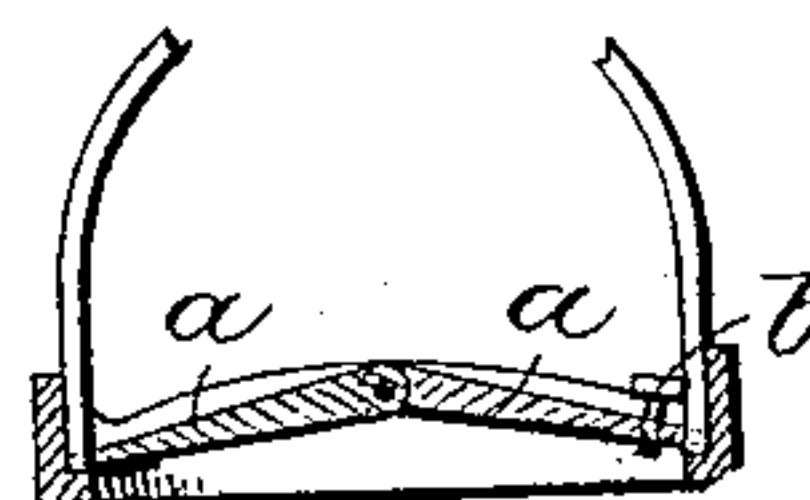
Patented March 1, 1881.



*Fig. 2.*

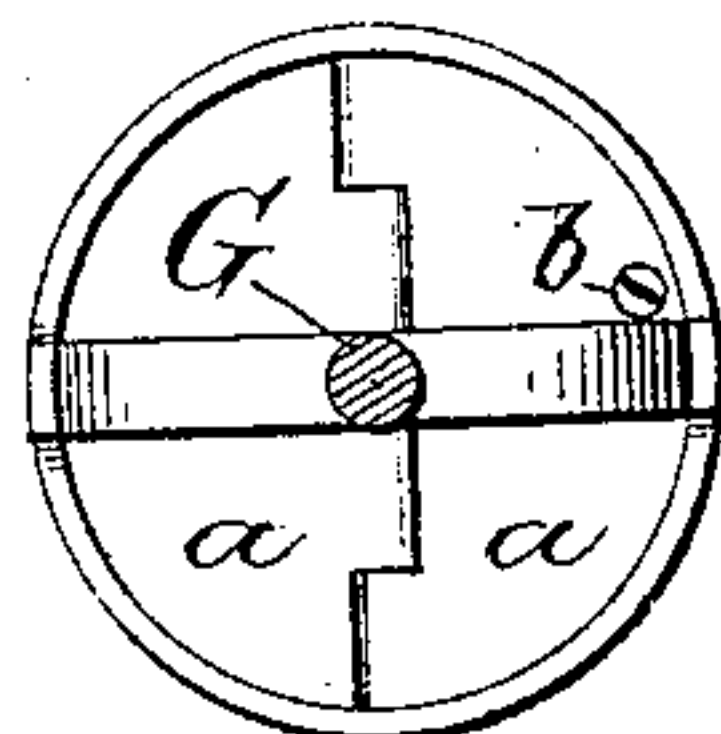


*Fig. 3.*



*Attest*

*J. H. Schott.*  
*James Maylor Jr.*



*Inventor:*

*Wm Würdemann*



# UNITED STATES PATENT OFFICE.

WILLIAM WÜRDEMANN, OF WASHINGTON, DISTRICT OF COLUMBIA.

## GOVERNOR FOR MARINE ENGINES.

SPECIFICATION forming part of Letters Patent No. 238,473, dated March 1, 1881.

Application filed September 16, 1880. (Model.)

*To all whom it may concern:*

Be it known that I, WILLIAM WÜRDEMANN, a citizen of the United States, and resident of Washington, District of Columbia, have invented a new and useful Improvement in Governors of Marine Engines, of which the following is a specification.

Sea-going vessels sailing a course transverse to the direction of the wind—that is, across the waves—are subjected to a pitching or oscillatory motion fore and aft, the stern being at one part of the oscillation deeply buried in the water and at the other part lifted nearly or quite out of the water. With screw-propellers this pitching motion causes a great inconvenience, owing to the fact that the screw, when deep in the water, offers a greater resistance, thereby retarding the motion of the engine, and again, when lifted nearly or quite out of the water, offering a less resistance, thereby accelerating the motion of the engine. In order to counteract this tendency to unequal motion, it is necessary for the engineer to move the throttle-valve constantly with every movement of the ship to regulate the supply of steam to the cylinder. This is especially necessary in heavy seas. To regulate this motion, usually the steam is entirely cut off for about two seconds of time, just at the moment the stern begins to lift. This labor is very exacting and tiresome to the engineer, and frequently, through fatigue and overwork, he is not able to exactly regulate the supply of steam and to close the valve at the proper moment.

The object of my invention is to construct an automatic machine to perform this important duty.

My invention consists in suspending a weight or mass upon a horizontal vibrating beam by means of a light spring, and connecting said beam with the throttle-valve in such manner that the relative movement of the beam will open and close the valve. The movement of the beam is also regulated, to some extent, by means of a drag piston or disk.

The principle of operation of the machine is, that the inertia of the weight or mass prevents it from immediately partaking of the movement of the stern of the vessel—that is to say, the weight remains stationary while the stern moves upward toward it relatively—that is,

the same as if the weight vibrated downward—which movement closes the valve, or partially closes it, as may be desired. This downward movement of the weight occurs just at the moment the stern begins to rise, and the weight is brought to its first position by the tension of the spring, the time of the movement being regulated by the drag piston and cylinder.

The construction and operation of the machine will be more fully explained by aid of the accompanying drawings, in which—

Figure 1 is a perspective view of the machine. Fig. 2 is an elevation and plan of the drag-piston or disk. Fig. 3 is a detail section of the drag-piston, showing two valves and a regulating-screw.

A represents the base or bed plate, upon which are secured the standard I, drag-cylinder F, and gallows-frame E.

B is a vibrating beam, which, in this instance, is made of two parallel bars for greater strength. The beam is pivoted at one end to the standard I, and carries at its other end the weight C. Near the weight upon the cross-bar D is secured one end of the spiral spring E', its other end being secured to the cross-tree of the gallows-frame E.

G is the stem of the drag-piston, which is journaled upon arms rising up from the beam B. The beam at its pivoted end has a projecting arm, H, to which is pivoted the link J, that is connected with and imparts movement to the valve K when the beam vibrates. The drag-piston has two upwardly-opening valves, *a a*, one or both of which may have a regulating screw, *b*. The drag-cylinder is filled with water or other liquid. The drag-piston offers little or no resistance to downward movement, as the valves open freely and allow it to pass through the water. The return movement is prevented by the closing of the valves. The valve or valves are kept partly open by the screw *b*, which allows the piston to return slowly, and the time of the movement can be regulated as desired by the screw.

For effectual use the apparatus is to be fixed within the vessel and properly connected with the throttle-valve of the engine. It must be placed in the stern of the vessel, so as to partake of the greatest amount of rise and fall of the same, which rise and fall will produce a movement in the weighted beam in an oppo-



site direction by the force of inertia. The movement of the bar upward is limited to the point where the valve is open, while in its downward movement the valve is closed and the steam shut off. The time the throttle-valve is to remain closed may be regulated by means of the regulating-screw of the drag-piston, which, as will readily be seen, determines the time allowed for the weighted beam to recover its normal position.

The main objection to all steam-governors for marine engines heretofore has been that they operate too late—that is, when the speed has already increased beyond the proper rate—leaving the cylinders of the engine full of steam at the time of shutting off, which, by expansion, will continue to work. Instead, therefore, of placing reliance upon such governors, it has been preferred to do the work by hand. The engineer must during rough weather remain with his hand on the lever of the throttle-valve, watching the motion of the engine, and when she slows, indicating a greater dip of the propeller-screw, he knows that a great rise is to follow, and, before this can take place, quickly shuts off the steam. The great dip mentioned will also bring down the weighted lever of the above-described governor, and it will remain down by its own inertia when the ship's stern rises again, keeping the steam-valve for a short time shut, (which time, on an average, need not exceed two seconds,) thus doing with much more certainty and precision the work that is subject to be done irregularly through fatigue or lack of attention by the human operator.

Having thus described my invention, what

I desire to claim and secure by Letters Patent is—

1. The combination, in a marine governor, of a pivoted and weighted beam, counterbalanced by a spring and regulated in its movement by a drag piston or disk in a cylinder, substantially as above described.

2. In a marine governor, a weighted, counterbalanced, and pivoted beam, in combination with a drag piston or disk and cylinder, said drag piston or disk being provided with a valve and regulating-screw, substantially as described.

3. In a marine governor, a counterbalanced, weighted, and pivoted L-shaped beam, in combination with the connecting-bar and steam-valve, substantially as described.

4. In a marine governor, a weighted beam supported by a spring and adapted to move in a vertical plane, combined with means for regulating its motion, and with the throttle-valve, whereby the same is controlled through the movement of the vessel.

5. A weighted beam counterbalanced by a spring and adapted to move in a vertical plane, and means to control the reaction of the spring to regulate the time required for the weighted beam to regain its normal position, in combination with the valve of a marine engine, all combined to operate as and for the purpose described.

In witness whereof I have hereunto set my hand this 14th day of September, 1880.

WM. WÜRDEMANN.

Witnesses:

F. H. SCHOTT,  
J. C. TASKER.