J. T. Rich,

Governor.

No. 45,522. Patented Dec. 20, 1864.

Fig. 1.

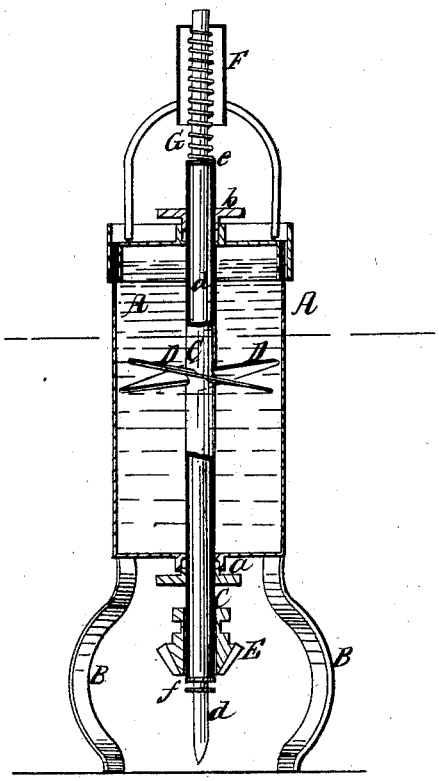
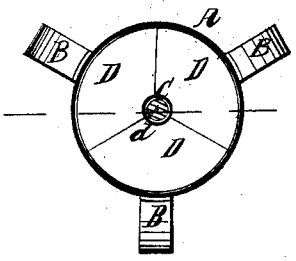


Fig. 2.



Witnesses:
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UNITED STATES PATENT OFFICE.

J. T. RICH, OF RAHWAY, NEW JERSEY.

IMPROVEMENT IN GOVERNORS.

Specification forming part of Letters Patent No. **45,522**, dated December 20, 1864; antedated December 14, 1864.

To all whom it may concern:

Be it known that I, J. T. RICH, of Rahway, in the county of Union and State of New Jersey, have invented a new and Improved Governor for Steam-Engines and other Motors; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a central vertical section of the governor. Fig. 2 is a horizontal section of the same.

Similar letters of reference indicate corresponding parts in both figures.

This invention consists in a spindle furnished with spiral blades or wings rotating in a cylinder containing oil or other liquid, and a spring applied to the said spindle to press it longitudinally in one direction. The pressure of the faces of the blades against the liquid, produced by their revolution, tends to produce a longitudinal movement of the spindle in the opposite direction to the pressure of the spring, such tendency being greater or less, according to the velocity of revolution, and the spindle being connected with the regulator of the engine or motor, its longitudinal movement is made the means of operating upon the regulator to govern the movement of the engine or motor.

To enable others skilled in the art to make and apply my invention, I will proceed to describe its construction and operation.

A is the cylinder containing the oil or other liquid, represented as being supported in an upright position by suitable standards, B, B. C is the rotating spindle passing longitudinally and centrally through the cylinder A. In the bottom of the cylinder, there is a stuffing-box, *a*, to prevent leakage of the oil or other liquid around the spindle, and on the top thereof is a guide, *b*, to keep the spindle upright. The said spindle is free to move longitudinally, as well as rotate. D D are the spiral wings or blades firmly secured to the spindle C. These wings or blades resemble those of a screw-propeller. On the lower part of the said spindle there is a bevel-gear, E, or pulley, to which to apply power from the engine or motor to produce its rotary motion. This bevel-gear or pulley should be fitted to the spindle with a spline and groove which will permit the longitudinal movement of the spindle, while such movement of the gear or pulley is prevented by suitable means, but will compel the spindle to rotate with the gear or pulley. The spindle is made hollow for the reception of a loosely-fitted rod, *d*, which is fitted or furnished with collars *e f*, above and below the spindle, to compel it to move longitudinally with the spindle, but the said rod is not intended to rotate with the spindle. The lower end of the said rod is to be connected with the throttle-valve or regulator in such manner that the upward movement of the spindle and rod will tend to reduce the speed of the engine or motor and the downward movement will produce an opposite effect. Above the center of the cylinder A there is placed the stationary spring-box F, containing the spiral spring G, which surrounds the upper part of the rod *d*, and which presses upon the upper collar, *e*, of the said rod and so tends to depress the said rod and the spindle C. The rotary motion given to the spindle C is in such direction that the pressure of the faces of the wings or blades D upon the oil or other liquid in the cylinder tends to make the said blades rise and carry the spindle upward in opposition to the downward pressure of the spring G, which is of such strength that the upward and downward pressures upon the spindle balance each other when the regulator is in position to give the proper speed to the engine or motor with an average pressure of the steam or other motive agent, and an average load on the engine or motor.

When the speed of the motor begins to increase, the increase of velocity of the rotary motion of the spindle and its blades causes the blades and spindle to rise and so operate on the regulator as to reduce the supply of the motive agent in such degree as to restore the proper speed of the motor, and when the speed of the motor begins to decrease an opposite effect is produced on the blades and spindle, and consequently upon the regulator, and the proper speed of the motor is restored.

The governor, constructed as represented in the drawings, with a spring, G, may be arranged in a horizontal or inclined position, instead of in the vertical position represented,

I am aware that a governor operating on the same general principle as mine, but with a weight instead of a spring, is described in a patent granted to Henry Burt on the 31st of August, 1844.

The advantages I claim over Burt's governor are, first, a compensating-spring to resist the pressure of the screw, which admits the operation of the governor at any speed, from the pivot-start until it has obtained its maximum number of revolutions, and prevents too sudden change of speed from injurious effects upon the engine; second, by the construction of my governor I am enabled to operate it in any position, which is a great advantage, especially for marine engines; third, in the transmission of motion from the screw-spindle to the throttle-valve the power is augmented, instead of reduced, as is the case with most governors. In my governor I have a lift of from ten pounds, twelve inches, which is double the throw required for any throttle-valve, so that I can double, instead of reducing, power by means of levers, and so reduce friction and wear, besides absorbing only one-half the power for driving. I also can use my governor as a speed-indicator by attaching a pointer to the vertical stem, which passes through the spindle, and placing a table opposite with figures corresponding to the number of revolutions necessary to raise the spindle a given height. In fine, my governor is easily adjusted, substantial, runs light, and requires little power for driving purposes, and readily controls the throttle-valve, one of ordinary size having actual power of five hundred pounds lift at the throttle.

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

The combination of the screw D, spindle C, and spring G, all arranged and operating as and for the purposes specified.

JOHN T. RICH.

Witnesses:

JAMES P. HALL,

M. M. LIVINGSTON.