T. J. Loregrore,

Gorernor.

No. 48,344. Patented June 20, 1865.

Fig. 2

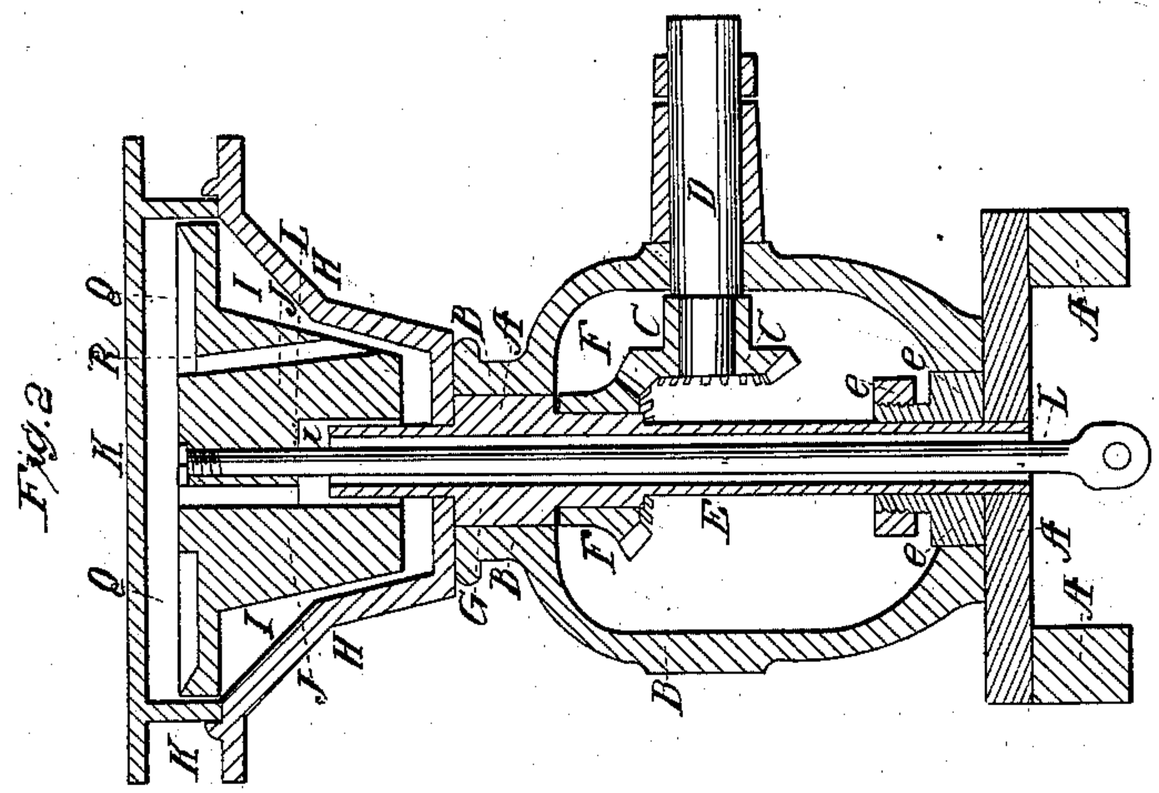
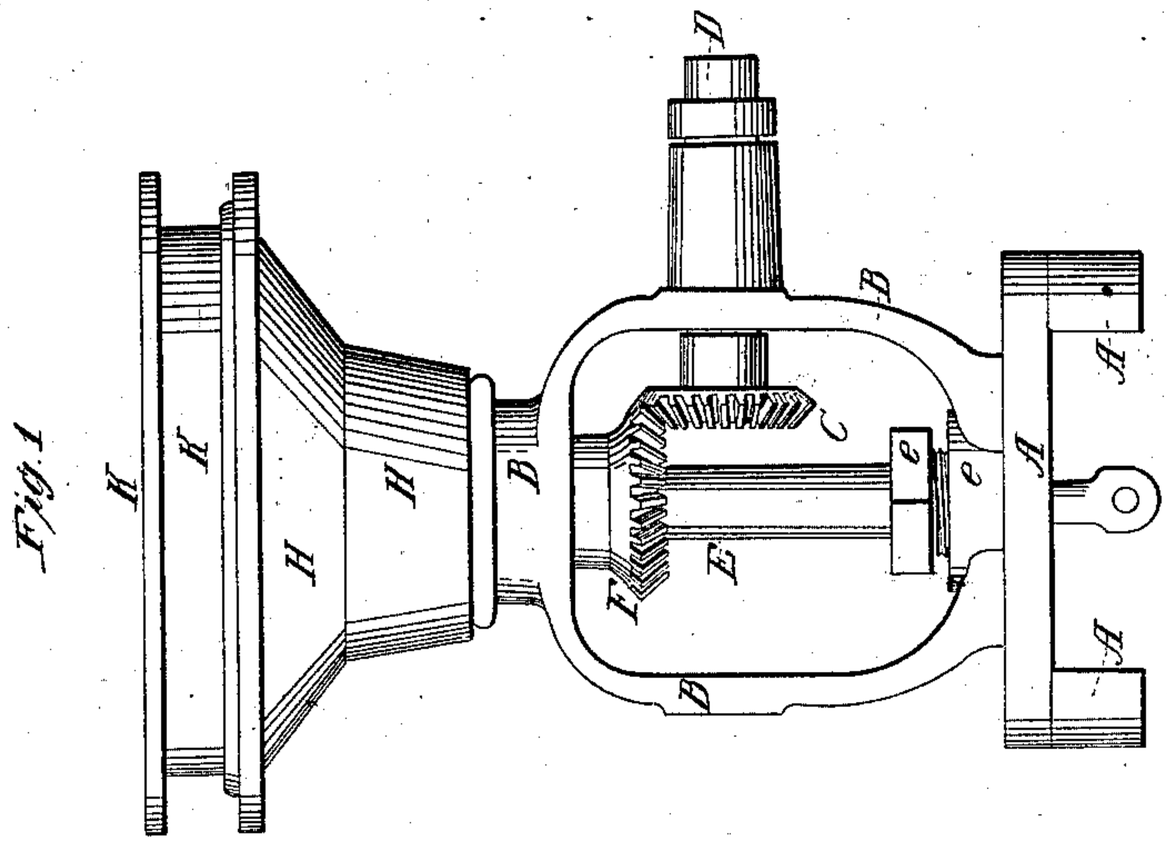


Fig. 1



Witnesses:

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by his Attys

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UNITED STATES PATENT OFFICE.

THOMAS J. LOVEGROVE, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO HIMSELF AND HENRY BALDWIN, JR., OF SAME PLACE.

IMPROVEMENT IN STEAM-ENGINE GOVERNORS.

Specification forming part of Letters Patent No. **48,344**, dated June 20, 1865.

To all whom it may concern:

Be it known that I, THOMAS J. LOVEGROVE, of the city and county of Philadelphia, in the State of Pennsylvania, have invented a new and useful Improvement in Governors for Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and in which—

Figure 1 is a view, in elevation, of my improved governor; and Fig. 2, a vertical central section through the same.

As usually constructed the governors of steam-engines are arranged to regulate the engine by opening the throttle-valve when the engine moves too slowly, or contracting it when the engine moves too fast. These modes are liable to two grave objections: first, in closing the throttle-valve there is a diminution of the volume of steam and of its pressure, and, of course, this involves a waste of power, for the steam, though raised to a high pressure, will, at times, not be used at its maximum of expansion; and, second, when the governor is stopped suddenly from any cause—as, for example, the breaking of its driving-belt—the throttle-valve is thrown wide open and the engine driven by a full head of steam, under which it is liable to breakage, or even endangers the bursting of the fly-wheel.

Now, it is the object of my invention to regulate or control the working of a steam-engine by means of a governor so constructed as to act simply by closing or opening the governor-valve or the engine-valve independently of the throttle-valve, which shall remain open all the time to work the steam at its maximum pressure; and to this end my invention consists, first, in opening and closing the governor-valve by the employment of crude mercury in the governor; second, in imparting a reciprocating motion to the stem of a governor-valve by a float and crude mercury, the mercury being diffused from under the float by centrifugal force when the governor is in motion, and concentrated beneath the float by its own gravity when the governor is at rest; third, in employing a chamber capable of revolving around a float to contain the mercury; fourth, in inclosing the valve stem or rod in a steam-chamber to diminish friction.

Upon a proper base or governor-seat, A, I construct a suitable frame, B, to receive and support the gear C on the inner end of the shaft D, which receives motion from the engine in any suitable manner. Within the frame B the sleeve E is revolved by the miter-gear F, secured upon it, and receiving motion from the gear C on the driving-wheel D. The sleeve E revolves in a packing-box, *e*, near its lower end, and carries a collar, G, that rotates in a suitable bearing in the top of the frame B.

Resting on and secured to the collar G a cup or circular basin, H, is placed with a tight joint around the sleeve to rotate with it. The cup H may be of any proper shape to contain the float J and hold the mercury required. In the drawings, the cup is shown as covered with a flat top, K, which may be of any form or material desired for ornamentation. The float J has a recess, *i*, that passes over the top of the sleeve E and fits it neatly, but so as to permit the sleeve a free rotation without touching the collar. Within the sleeve a valve-stem, L, is placed, which is made fast to the float at top in any suitable manner, and at the bottom is to be connected to the lever that moves the governor-valve, the length of the sleeve being fixed in such relation to the float as to allow it to move up or down within the sleeve E to the distance required for controlling the position of the governor-valve, as desired, to leave it open when the governor is moving properly, and to close it when the governor is at rest or moving too fast. Within the cup H a quantity of mercury is placed, sufficient to raise the float, so as to close the governor-valve when the governor is at rest, and when the governor is moving at a proper velocity this mercury will be so diffused around the interior of the cup and under the float by the centrifugal motion imparted to it by the rotation of the cup as to permit the float to fall and hold the governor-valve open a proper distance to insure the

speed desired. The float may be depressed in its top Q, and have one or more perforations, R, to permit the mercury to return through them in case it should be thrown over and on top of the float by the centrifugal force. The cup is surrounded by a space or chamber, I, over the walls of which the mercury may be diffused when the governor is being driven at a proper rate of speed.

The operation of the governor is obvious. When the sleeve and cup are put in motion the mercury within the latter will be rapidly dispersed in a thin sheet or minute globules around the inner surface of the cup and up the sides of the chamber I, which will permit the float to descend far enough to open the governor-valve to an extent sufficient to equalize the motion of the engine; but if the belt should be broken or the motion of the governor stopped from any other cause, the mercury will return down the sides of the cup, pass beneath the float, and raise the stem until the governor-valve shall be entirely closed, and thus arrest the motion of the engine.

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

1. The employment of the single closed chamber in a governor to contain crude mercury to control the engine, substantially as described.

2. Supporting a valve-stem in a single closed chamber upon crude mercury so that the valve shall close when the mercury is at rest in the chamber and open when the mercury is diffused by centrifugal motion over the chamber and float, substantially in the manner described.

3. The revolving closed chamber to contain mercury, combined with a float to be operated by the mercury, substantially in the manner and for the purpose set forth.

4. The combination of the sleeve E, the revolving chamber H, the float J, and the valve-stem L, substantially in the manner and for the purposes set forth.

In testimony whereof I have hereunto subscribed my name.

T. J. LOVEGROVE.

Witnesses:
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