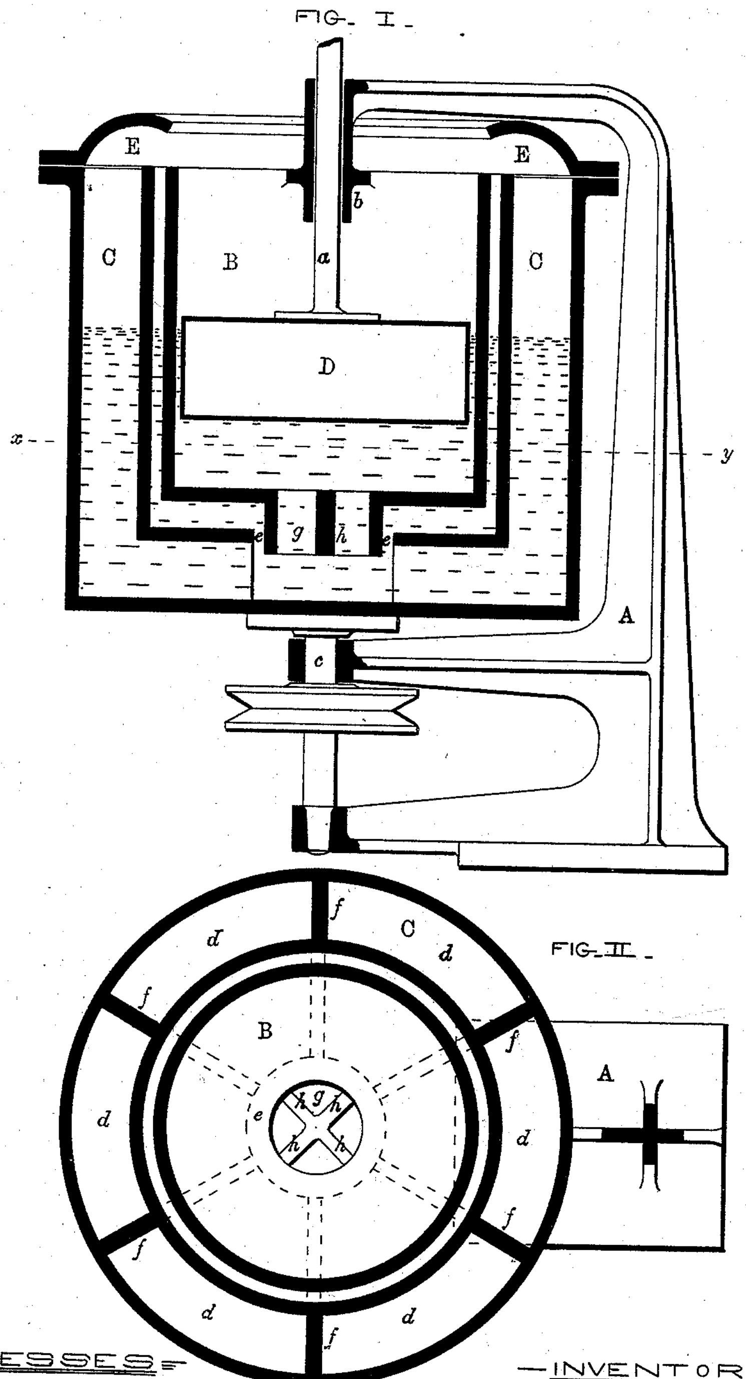
2 Sheets—Sheet 1.

R. HOOPER.

Governor for Engines.

No. 205,089. **Patented June 18. 1878.**



—WITNESSES—

J. Buckingham

Levi Bacon

—INVENTOR—

Robert Hooper,

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2 Sheets—Sheet 2.

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FIG. III.

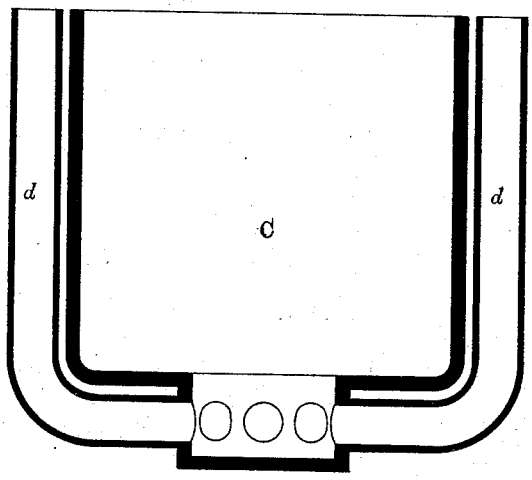
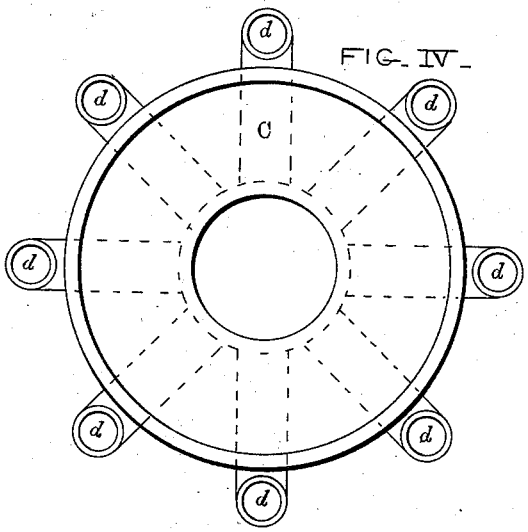


FIG. IV.



WITNESSES.

S. Buckingham
Levi Bacon

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UNITED STATES PATENT OFFICE.

ROBERT HOOPER, OF BALTIMORE, MARYLAND.

IMPROVEMENT IN GOVERNORS FOR ENGINES.

Specification forming part of Letters Patent No. **205,089**, dated June 18, 1878; application filed May 11, 1878.

To all whom it may concern:

Be it known that I, ROBERT HOOPER, of the city of Baltimore and State of Maryland, have invented certain Improvements in Engine-Governors, of which the following is a specification; and I do hereby declare that in the same is contained a full, clear, and exact description of my said invention, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

This invention relates to certain improvements in that class of engine-governors wherein the movement of the governing-valve is effected through the medium of a float supported by a body of water or other fluid, the height of which is varied as the speed of the engine to which the governor is applied is accelerated or reduced.

The said invention consists, first, in sustaining a float by means of two bodies of fluid, which, although in communication, are contained in separate vessels and acted upon differently in the operation of the governor. One of the fluid bodies is in direct contact with the float, and is not revoluble. The other is subjected to a rotary movement, which causes it to rise within the containing-vessel, and thereby effect depression of the stationary fluid body with which it is in communication.

The said invention consists, secondly, in means for preventing the rotary fluid body from communicating its motion to the stationary one, and in the novel construction of various parts of the device, as will hereinafter fully appear.

In the further description of my improved governor which follows, reference is made to the accompanying drawing, forming a part hereof, and in which—

Figure 1 is a partly sectional view of the governor. Fig. 2 is a transverse section of the invention on the dotted line *x y*. Figs. 3 and 4 are, respectively, a vertical section and a plan of certain parts of the governor slightly modified in construction.

Similar letters of reference indicate similar parts of the invention in all the views.

A is the stand or frame of the governor. B is the stationary fluid or float chamber, secured immovably to the frame A in such manner as to admit of the rotation of the revoluble chamber C, hereinafter described. D is a weighted float, constructed in any suitable manner, located within the chamber B, and provided with a stem, *a*, which passes loosely through a socket, *b*, formed in some stationary part of the governor. The stem *a* is connected, either directly or indirectly, with the governing-valve, which valve, as it forms no part of the present invention, is not shown or described herein. The revoluble fluid-chamber C, hereinbefore alluded to, is secured to a shaft, *c*, provided with a pulley which receives its movement from the engine to be controlled, and revolves exteriorly of the stationary chamber B. The chamber C is divided into independent sections *d*, which converge centrally of the lower part of the chamber and directly below an opening, *e*, in the inner casing of the same.

In the governor represented in Figs. 1 and 2 of the drawing, the sections are constructed by dividing the chamber C into a number of parts by means of ribs or partitions *f*, which extend from the opening *e* to the upper end of the chamber.

In Figs. 3 and 4 the same result is produced by placing around the inner casing of the chamber a series of pipes which radiate from a central well formed therein.

Referring to Figs. 1 and 2, the stationary chamber B is provided with a nozzle, *g*, divided vertically into sections by means of the strips *h*, which project through the opening *e*, the nozzle serving to bring the interiors of the two chambers into communication.

To adjust the governor, provided the stem and its attachments connecting the float to the governing-valve are of the proper length, and the governor is attached by means of a belt or by gearing to the engine, water or other fluid is poured into either of the chambers until the float is at such height as to give the desired opening to the governing-valve. Upon the engine being set in motion, centrifugal force causes the fluid in the revoluble chamber to rise, and the fluid in the stationary one to be proportionately depressed; consequently the float is lowered and the governing-valve partially closed. Upon the speed of the engine being reduced, the fluid in the chamber C falls and that in the one B rises, and the valve is opened through the medium of the float and its connections.

The object in dividing the nozzle *g* into com-

partments by means of the strips *h* is to prevent the gyratory motion of the fluid in the chamber C being communicated to that in the chamber B. I do not limit myself, however, to the employment of the strip *h*, as shown, as tubes or other devices may be used in lieu thereof, the strip being merely preferred.

To guard against ejectment of the fluid by a sudden or too rapid revolution of the governor, the outer chamber C is provided with a cap or annular flange, E, which serves to guide the fluid when thrown from the said chamber to the chamber B.

One special advantage of constructing and connecting the chambers B and C, as described and shown, is that there are no joints to pack and make tight, and no stuffing-boxes or other appliances that promote friction, to interfere with the free operation of the revoluble parts of the device.

Having thus described my invention, what I claim as new, and wish to secure by Letters Patent of the United States, is—

1. In a governor, the exterior revoluble fluid-chamber C and interior stationary fluid-chamber B, combined substantially as shown, and having suitable passages or ducts, whereby the interiors of the said chambers are in communication, substantially as specified, and for the purposes set forth.

2. In a governor, the revoluble chamber C, divided into sections, and having practically an open top, adapted in its revolution to conduct fluid from the center of the inner stationary chamber B, containing a float connected, directly or indirectly, with the governing-valve, substantially as herein set forth.

3. In a governor, the combination, with the revoluble chamber C, of the stationary fluid-chamber B, having the sectional nozzle *g*, adapted to pass below and through the inner casing of the said revoluble chamber, substantially as herein shown and described.

4. In a governor, the combination, with the stationary fluid-chamber B, of the revoluble fluid-chamber C, having the cap or annular flange E, adapted to deflect fluid ejected from the said revoluble chamber to the stationary one, substantially as herein specified.

In testimony whereof I have hereunto subscribed my name this 4th day of May, in the year of our Lord 1878.

ROBERT HOOPER.

Witnesses:

WM. T. HOWARD,

JNO. S. MADDOX.