

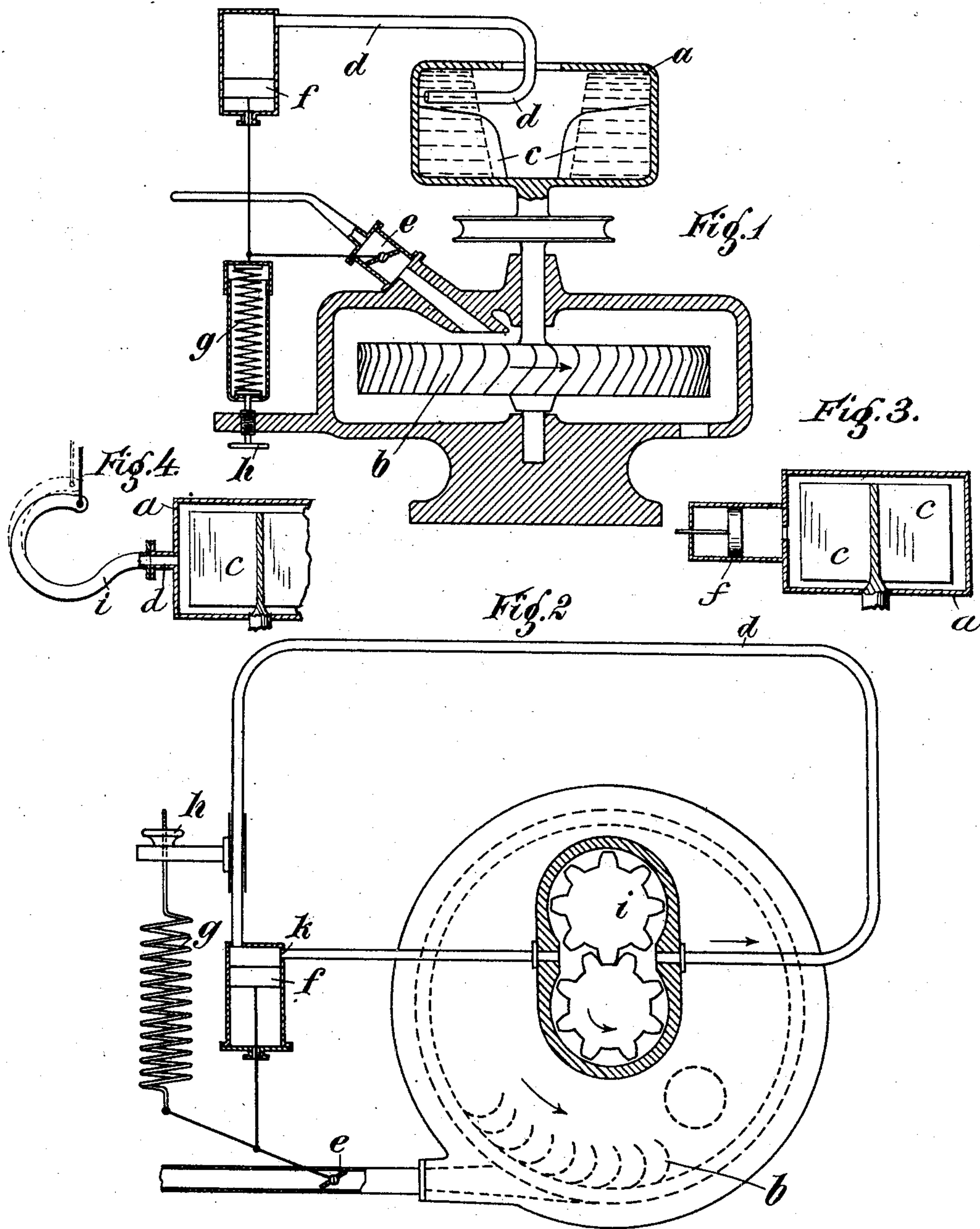
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F. REICHENBACH.
REGULATING DEVICE FOR MOTORS OR ENGINES.

APPLICATION FILED SEPT. 23, 1903.

NO MODEL.



Witnesses:

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UNITED STATES PATENT OFFICE.

FRITZ REICHENBACH, OF CHARLOTTENBURG, GERMANY.

REGULATING DEVICE FOR MOTORS OR ENGINES.

SPECIFICATION forming part of Letters Patent No. 771,497, dated October 4, 1904.

Application filed September 23, 1903. Serial No. 174,315. (No model.)

To all whom it may concern:

Be it known that I, FRITZ REICHENBACH, civil engineer, a subject of the King of Prussia, German Emperor, residing at No. 14 Bismarckstrasse, Charlottenburg, in the Kingdom of Prussia, German Empire, have invented a new and Improved Regulating Device for Motors or Engines, of which the following is a specification.

10 This invention relates to a regulating device for motors and engines of all kinds in which the movement of a governor is transmitted to the regulating parts of the power-motor by means of a liquid.

15 The governor to be used with this device is preferably constituted by a pump of some suitable kind which produces directly the pressure of the transmitting fluid.

20 The new regulating device is completely free from friction and can be easily applied even when the motor is very compact and where there are several regulating parts and in cases where arrangement of rods would offer certain difficulties.

25 In order to make my invention more clear, I refer to the accompanying drawings, in which similar letters denote similar parts throughout the several views, and in which—

30 Figure 1 is a vertical section through a regulating device constructed according to my invention. Fig. 2 is a side view of another form of construction also based on the principle embodied in my invention, and Figs. 3 and 4 illustrate further modifications.

35 Referring to Fig. 1, the governor *a* is for the sake of simplicity arranged directly on the vertical spindle of a steam-turbine *b*, which in this case represents the power-motor to be controlled. The governor consists of a vessel
40 *a*, containing water, oil, mercury, or the like, said liquid being forced against the walls of the vessel by centrifugal force. In order to insure the liquid properly participating in the rotation, the vessel *a* can be provided with
45 ribs or baffles *c*. The liquid is transmitted through a fixed pipe *d* in the construction described to a cylinder with a piston *f*, connected with the device for regulating the admission of steam—say a throttle-valve *e* in the
50 steam-pipe. Water or oil passing into the

cylinder is automatically replaced in the governor. When the speed of the turbine increases, the centrifugal force of the liquid increases as well, and consequently its pressure increases also, and liquid is forced through
55 the pipe into the cylinder and drives the piston *f* outward, the piston-rod thereupon closing the throttle-valve and compressing a spring *g*, which is used to return the piston to its original position. When it is desired to alter the
60 speed at which the governor acts, the tension of the spring *g* can be altered as desired, preferably by means of a hand-wheel *h*. The fluid-transmission pipe *d* is preferably bent in the direction of rotation of the vessel *a*, as
65 well as slightly inward. The fluid-containing vessel *a* could also be fixed so that only the blades *c* (which in that case would have to be secured to the spindle of the turbine) would
70 cause the rotation of the liquid. The cylinder in which the piston *f* moves could be secured to the vessel *a* direct either in radial or in tangential direction, as indicated in Fig. 3. The cylinder and piston *f* could also be re-
75 placed by a pressure-gage tube, the alteration of the shape of which by the pressure of the contained liquid would operate the regulating parts, as indicated in Fig. 4.

In a modified construction illustrated in Fig. 2 in plan a Roots pump *i* or the like is used
80 as the governor. For the return of the liquid into the pump there is provided a small opening *k* in the return or discharge pipe. When the motor or the pump increases in speed, more liquid escapes through this small opening *k*,
85 which escape is only possible when the pressure of the liquid increases. The pressure is transmitted to the regulating piston or cylinder device and causes the engine to go slower. By increasing or reducing the pressure of the
90 counteracting spring *g*, which in this case may be a tension-spring, the pressure of the liquid, and therefore the number of revolutions of the turbine, can be regulated and altered.

Having now described my invention, what I
95 desire to secure by a patent of the United States is—

1. In a regulating device for motors and engines, the combination with a rotary part or
100 parts driven by the motor or engine, a fluid

subjected to pressure and caused to move in cycle by virtue of the rotation of said part or parts, and means for causing said fluid under pressure to change the quantity of the driving medium passing to and into the motor or engine.

2. In a regulating device for motors and engines, the combination with a rotary part or parts driven by the motor or engine, a liquid subjected to pressure and caused to move in cycle by virtue of the rotation of said part or parts, means for changing the quantity of the driving medium passing to and into the motor or engine, and means for causing said liquid under pressure to operate said first-mentioned means.

3. In a regulating device for motors and engines, the combination with a rotary part or parts driven by the motor or engine, a liquid subjected to pressure by virtue of the rotation of said part or parts, means for changing the quantity of the driving medium passing to and into the motor or engine, and means for causing said liquid under pressure first to operate said first-mentioned means and then to return to the said rotary part or parts.

4. In a regulating device for motors and engines, the combination with a rotary part or parts driven by the motor or engine, a liquid subjected to pressure and caused to move in cycle by virtue of the rotation of said part or parts, means for changing the quantity of the driving medium passing to and into the motor or engine, means for causing said liquid under pressure to operate said first-mentioned means, and a pipe for leading the liquid under pressure to the means mentioned in the second place.

5. In a regulating device for motors and engines, the combination with a rotary part or parts driven by the motor or engine, a liquid subjected to pressure by virtue of the rotation of said part or parts, a pipe adapted to receive said liquid under pressure, a cylinder connected with said pipe, a return-pipe from cylinder to the rotary part, a piston in said cylinder, means for changing the quantity of the driving medium passing to and into the motor or engine, and means for causing said piston to operate said first-mentioned means.

6. In a regulating device for motors and en-

gines, the combination with a rotary part or parts driven by the motor or engine, a liquid subjected to pressure by virtue of the rotation of said part or parts, a pipe adapted to receive said liquid under pressure, a cylinder connected with said pipe, a return-pipe from the cylinder to the rotary part, a constriction in the return-pipe, a piston in said cylinder, means for changing the quantity of the driving medium passing to and into the motor or engine, means for causing said piston to operate said first-mentioned means and a spring adapted to move said piston opposite to the direction of the liquid under pressure.

7. In a regulating device for motors and engines, the combination with a rotary part or parts driven by the motor or engine, a liquid subjected to pressure by virtue of the rotation of said part or parts, a pipe adapted to receive said liquid under pressure, a cylinder connected with said pipe, a piston in said cylinder, another pipe adapted to conduct the liquid under pressure back to said rotary part or parts, a constriction in the second pipe at the outlet from the cylinder, means for changing the quantity of the driving medium passing to and into the motor or engine, and means for causing said piston to operate said first-mentioned means.

8. In a regulating device for motors and engines, the combination with a vessel containing a liquid, a pipe adapted to receive said liquid, a rotary pump for causing the motor or engine to drive the said liquid into said pipe, a cylinder connected with said pipe, a piston in said cylinder, a return-pipe from the pressure side of the piston to the pump, a constriction in return-pipe at the outlet from the cylinder, a valve adapted to change the quantity of the driving medium passing to and into the motor or engine, a connection between said valve and the piston-rod, and a spring adapted to move the valve and the piston back into their former positions.

In witness whereof I have hereunto set my hand in presence of two witnesses.

FRITZ REICHENBACH.

Witnesses:

WOLDEMAR HAUPT,
HENRY HASPER.