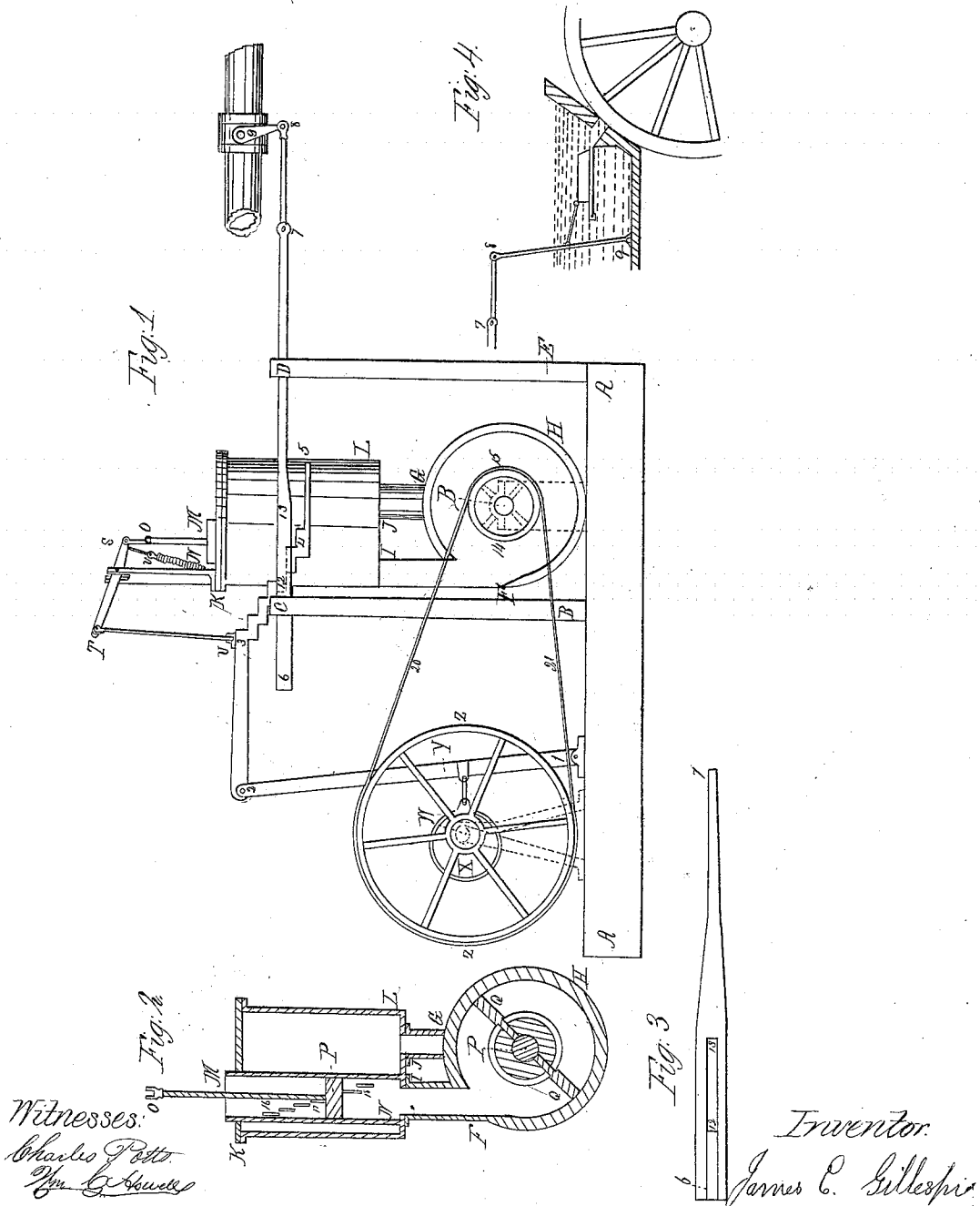


J. E. Gillespie,
Governor.

No 34,055.

Patented Jan. 7, 1862.



Witnesses:
Charles Potts
John G. Hume

Inventor:
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UNITED STATES PATENT OFFICE.

JAMES E. GILLESPIE, OF TRENTON, NEW JERSEY.

IMPROVED HYDRAULIC GOVERNOR.

Specification forming part of Letters Patent No. 34,055, dated January 7, 1862.

To all whom it may concern:

Be it known that I, JAMES E. GILLESPIE, of the city of Trenton, in the county of Mercer and State of New Jersey, have invented a new and Improved Hydraulic Governor for Regulating the Speed of Steam and other 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 part of this specification, in which—

Figure 1 represents an elevation or side view of the machine or governor; Fig. 2, a vertical section taken through the middle of the pump, cylinder, and jacket; and Figs. 3 and 4, representations of some of the details and modifications thereof.

The same letters and figures of reference are applied to similar parts of the machine in the respective figures of the drawings.

In Fig. 1, A A represent the foundation, floor, or bed-plate on which the machine is erected; B C and D E, two posts or standards; F G H, a rotatory or centrifugal pump, and R the axis or shaft on which the pistons Q Q in Fig. 2 of the rotatory or the wings of the centrifugal pump are attached; K L, a cistern or tank, and M N, Fig. 2, a cylinder placed inside of said tank. This cylinder is connected at the lower end with the pump by the tube or pipe F I, through which the water from the pump is forced and driven upward into said cylinder.

G J represent another pipe or tube extending from the bottom of the tank K L to the center opening of the pump, and by which the pump is to be supplied with water from said tank; O P, the piston-rod, and P the piston fitted to work freely in the chamber of the cylinder.

16 17 18 represent a series of openings or perforations made through the side of the cylinder.

Z Z represent the driving wheel, drum, or pulley, from which the belt 20 21 passes thence over the small drum or pulley 14 15, fastened onto the shaft or axle R of the pump F G H; X, an eccentric fitted on the shaft or axle W of the driving-pulley and turning around with it; 1 2, a bar or lever having its fulcrum at 1 and connected with the eccentric at Y by means of a connecting link or rod.

2 3 4 5 represent a bar or rod attached to the upper end of the lever 1 2 by a loose bolt. The end 3 4 5 of this bar is formed into a series of steps, and for the sake of easy description I shall call this the "zigzag bar;" 6 7, another bar or rod made to slide freely on the standards B C and D E. This bar has a long slit or slot formed in it, as shown at 12 13 in Fig. 3, through and in which the zigzag bar passes, and is intended to move back and forth; S T, a lever supported by a standard over the tank and connected at one end by the link S O with the piston-rod and at the other end by the rod T U with the zigzag bar 2 3 4 5.

S V represent a spiral spring connected with the end S of the lever S T; 7 8, a link or rod connecting the slotted bar 6 7 with the lever 8 9 of a throttle-valve of a steam-engine, as in Fig. 1, or the gate of a water-wheel, as in Fig. 4.

The operation of my improved hydraulic governor is as follows: Some water being poured into the tank K L will descend thence through the tube J G into the chamber of the pump. Hence motion being communicated to the driving-pulley Z Z by means of any of the usual modes of connecting the revolving parts of a steam-engine (or water-wheel) with the shaft W the pump will thus be set to work, and thereby cause the water to flow up the tube F I into the cylinder. The action of the eccentric at the same time will cause the lever 1 2 to vibrate back and forth, and along with it the zigzag bar 3 4 5, giving it a reciprocating motion in and along the slot 12 13 of the bar 6 7, and the extent to which this latter bar will thus be thrown out or drawn in will depend on the elevation of the zigzag in said slot. When the several parts, therefore, of the machine have been adjusted to the required speed of the engine, it is plain that should the velocity become increased the pump would raise a greater column of water into the cylinder, and thus by raising the piston cause the zigzag to descend more into the slot, and thereby draw back the bar 6 7 and along with it the lever of the throttle-valve, cutting off partially the supply of steam, and thus reducing the velocity down to the required speed. Again, on the other hand, should the velocity of the engine decrease below the required standard, the piston in the

cylinder would descend and raise the zigzag, so as to push the slotted bar farther out, and thus open the throttle-valve, thereby causing the speed to increase until it has attained the required velocity. When a rotatory or any other kind of forcing-pump is used to raise the water into the cylinder M N, the said column of water therein will continue to rise and elevate the piston until the flow of water through the perforations 16 17 18 is equivalent to the action of the pump. The water which passes through the perforations flows into the tank or jacket K L, and thence back to the pump. When a centrifugal pump is applied to raise the water, inasmuch as the height of the column raised would be in proportion to the centrifugal force exerted, it is obvious that the perforations in the cylinder in this case may be dispensed with. To aid the piston to descend freely into the chamber of the cylinder, I propose on land or stationary engines to suspend a weight and on marine engines to attach a spring, as S V, to the end S of the lever S T. This weight may be suspended on said lever S T somewhat like the weight on the common steelyard, so as to be shifted from one point to another when required, and the spring when used should have a link thereon, as 10, having a set-screw therein, so as to lengthen or shorten the connections thereof. With this weight or spring attached, as above mentioned, when the governor has

been adjusted to any particular speed it becomes easy to change the same from time to time as may be required simply by changing the position of said weight on the lever or changing the intensity of the spring.

I do not wish to limit myself in the use of my improved governor to using water only as the medium of transmitting the action of the pump to the piston in the cylinder. There are other liquids—oil, for instance—which would answer equally well.

I would also here remark that I prefer either the rotatory or centrifugal pump in combination with my improvement; but it is obvious that any of the ordinary force or plunge pumps can be readily applied so as to produce similar results.

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

1. The use of a rotatory pump F G H, in combination with a perforated cylinder M N and piston P, for the purpose of regulating the speed of engines, substantially as above described, and for the purposes set forth.

2. The use of the reciprocating zigzag bar 2 3 4 5, in combination with the eccentric X and the piston P, substantially as above described, and for the purposes herein set forth.

JAMES E. GILLESPIE.

Witnesses:

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