(No Model.)

J. F. BROWN.

GgovernOR FOR STEAM ENGINES.

No. 265,569. Patented Oct. 10, 1882.

Fig. 1.

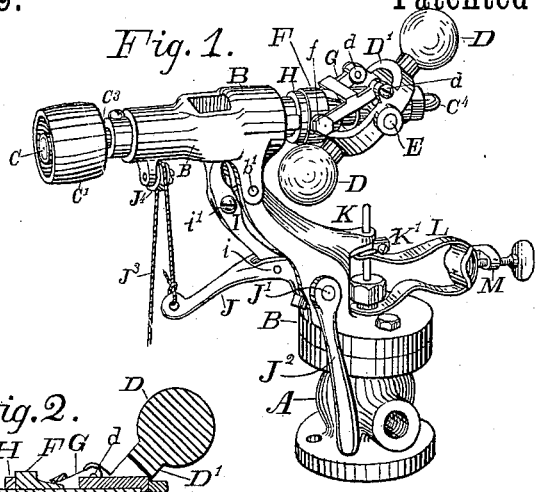


Fig. 3.

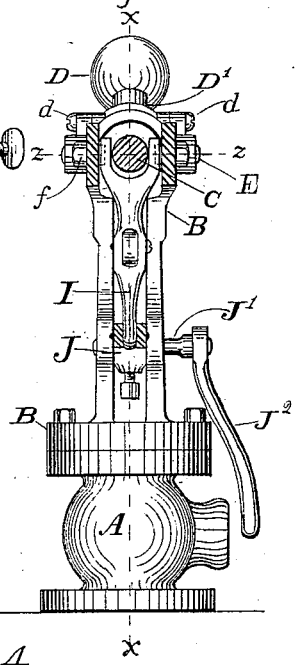


Fig. 2.

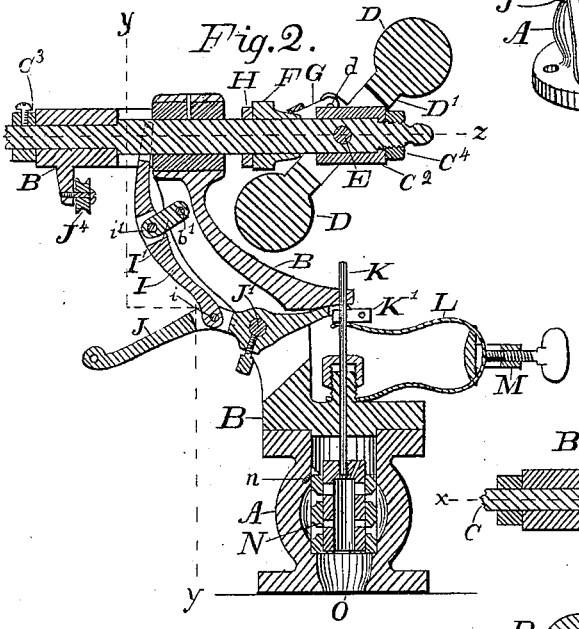


Fig. 4.

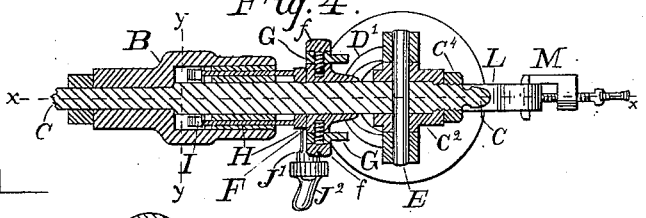


Fig. 5.

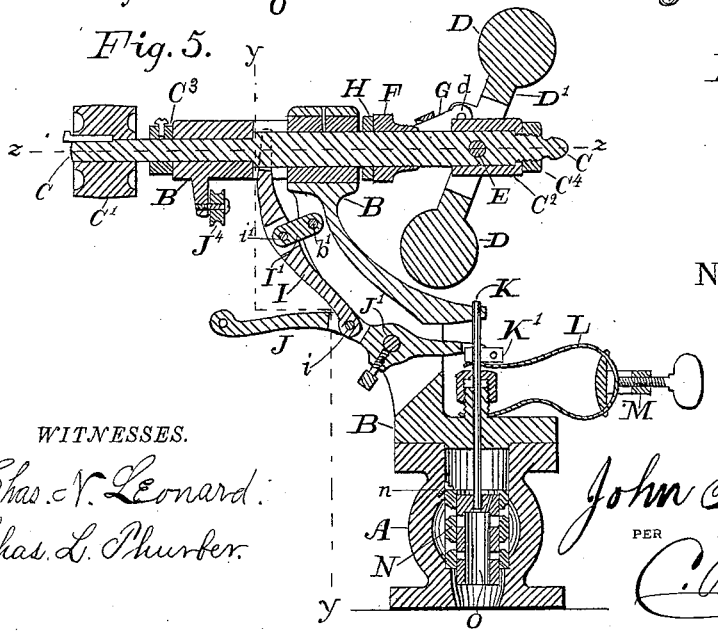
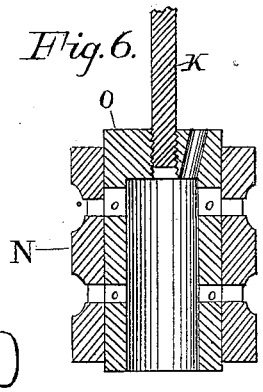


Fig. 6.



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GOVERNOR FOR STEAM-ENGINES.

SPECIFICATION forming part of Letters Patent No. 265,569, dated October 10, 1882.

Application filed January 31, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. BROWN, of the city of Indianapolis, county of Marion, and State of Indiana, have invented certain new and useful Improvements in Governors for Steam-Engines, of which the following is a specification.

The object of my said invention is to produce a cheap and simple governor for steam-engines; and it consists of certain details of construction and combinations of parts, as will hereinafter be more specifically set forth.

Referring to the accompanying drawings, which are made a part hereof, and on which similar letters of reference indicate similar parts, Figure 1 is a perspective view of a governor embodying my invention; Fig. 2, a longitudinal vertical section thereof on the dotted line *x x;* Fig. 3, a transverse vertical section, looking to the right from the dotted lines *y y;* Fig. 4, a horizontal section, looking downwardly from the dotted line *z z;* Fig. 5, a view similar to Fig. 2, but with the movable parts shown in the position they assume when fully operated; and Fig. 6, a detail sectional view on an enlarged scale of the valve and valve-seat when in the position commonly assumed in ordinary use.

In said drawings, the portions marked A B represent the two main castings of the governor, which constitute the shell and frame-work of the same; C, the governor-shaft; D, the governor-balls; D′, the arm on which they are mounted, which in my invention is cast in one piece with said balls; E, a pin running through the shaft C, which forms trunnions or pivots on which the governor-balls swing; F, a sliding collar on the shaft C, which also revolves therewith; G, a link or links connecting the same to the arm D′; H, a non-rotating slide which passes from said collar to the upper end of a lever which forms one of a system connecting with the governor-valve; I, said lever; J, the second lever of the system; K, the valve-stem; L, a spring which acts reversely to the force of the governor-balls; M, a clamp by which the tension of the spring is adjusted; N, the valve-seat, and O the valve.

The casting A is simply the ordinary shell to receive the governor-valve and the steam-pipe connections. The valve-seat N is fitted therein, and is held in place by a screw, *n*, and the valve O is contained in said seat, and is attached to the valve-stem K, which passes up through a stuffing-box in the cover of said casting A in the ordinary manner.

The casting B is secured to the casting A and forms a top therefor. It also extends out in the form of an arm and contains bearings for the shaft C and for the pivots of the levers I J, or their connections.

The shaft C rests in bearings in the casting B, and carries the governor-balls D, and the parts connected thereto and directly operated thereby, and also the pulley C′, by which the shaft is driven, the sleeve C^2, and the collar C^3, the latter of which, together with the shoulder on said shaft, secures said shaft against endwise movement.

The device D D D′ comprises what in this invention takes the place of the usual governor-balls, their arms, and immediate connections, and is mounted upon the trunnion-pin E, which passes through the central portion of said device, the shaft C, and the sleeve or casing C^2 thereon. This pin is securely held in place by the nut C^4, which presses the sleeve C^2 firmly against it.

The collar F is simply a collar which rotates with the shaft and with the governor-balls and their arm, but is free to move longitudinally when permitted or caused to do so by the action of said balls, to the arm of which this collar is connected by the link or links G, which latter are pivoted to said arm by the pivots *d*, and to said collar by the pivot *f*.

The slide H consists of a ring surrounding the shaft, and two arms secured to said ring and extending back through suitable openings in the casting forming the bearing to the shaft, or in its lining, to a point where they come in contact with the upper ends of the forks of the bifurcated lever I, and is thus the means of communicating the force of said balls to said lever, and through it and its connections to the stem of the governor-valve.

The lever I is connected to the casting B by the link I′, to which it is connected by the pivot *i′*, and which is connected to said casting by the pivot *b′*. Its upper end is bifur-

cated to pass up on each side of the shaft C, so that the slide H, through its two arms, shall be enabled to press evenly against it and force it back as the balls exert their power.

The lever J is pivoted to the casting B by the pivot-shaft J′, to the lever I by the pivot *i*, and its forward end rests upon the yoke K′ on the valve-stem. It connects said lever I and said valve-stem, and is the immediate means of operating said valve-stem and the valve attached thereto. Upon the shaft J′ is a hand-lever, J^2, by which the valve can be operated independently of the governor, and there may be attached to the rear end of the lever J a cord, J^3, (which should preferably run over a pulley, J^4, upon the casting B,) which may be made to serve a similar purpose. This latter may also be used to convert the valve into a "sawyer's valve," when desired, or, in other words, enable it to be operated from a distance—as, for instance, the station of the sawyer in a saw-mill.

The valve-stem K is not different in itself from ordinary valve-stems. It has a clamp or yoke, K′, secured thereto, upon which the lever J operates, whereby said valve-stem and the valve thereon are forced downwardly.

The spring L is preferably a flat spring, both ends of which have a hole therein, through which the valve-stem passes, one end of which rests upon the top of that portion of the casting B through which said stem passes and the other against the under side of the yoke K′. By this means the said valve-stem and the valve attached thereto are always held in their highest position, except when forced down by the power of the governor-balls or otherwise.

The clamp M is, as will be readily understood from the drawings, a device for regulating the tension of the spring. It consists of a brace-like portion which rests between the two leaves of the spring a bracket-like arm, and a thumb-screw, the latter of which, when screwed up, increases the tension of the spring.

The valve-seat N is a cylindrical valve-seat, and is firmly secured in the casting A by being fitted therein, and by the screw *n*, which rests in a notch in one corner of the valve-seat and enters the casting.

The valve O is also an ordinary cylindrical valve, and fits inside the valve-seat N. It is provided with ports *o*, which correspond with like ports through the valve-seat, except that they are so made (see Figs. 2, 5, and 6) that one will close somewhat before the other, thus providing for a more gradual shutting off of the steam. In the form shown it will be noticed that the bottoms of all the ports will be exactly level when they are entirely open, (see Fig. 6,) but that the top of the top port in the valve is considerably higher than the top of the corresponding port in the valve-seat, while the lower ports are both alike in this particular. When therefore the valve is moved down and closed by the force of the governor-balls the upper ports are left partly open after the lower ones are entirely closed. The valve is operated by the valve-stem K, which is in turn operated by the spring L in one direction and by the levers or action of the governor-balls in the other. The valve is preferably so constructed that when there is no force exerted to counteract that of the spring, said valve will be entirely closed, as shown in Fig. 2, thus making this a safety-governor, as, should the belt break and the governor be thus stopped, the spring would immediately close the valve, preventing all possibility of the engine "running away." In starting the engine, where this apparatus is employed, it is necessary to first open the valve, which may be done by means of the lever J^2 or cord J^3. When, however, the engine is fairly started, the governor will come into operation and properly regulate its said valve.

The operation of my said invention may be briefly recapitulated as follows: The engine being put in motion, as above explained, the rotation of the shaft C causes the governor-balls D to assume a position more or less nearly at right angles with said shaft, according to the velocity of the latter, and consequently to push against the collar F through the links G, and through the slide H, and levers I and J upon the valve-stem K, thus compressing the spring L and holding the valve in proper position. When the shaft attains too rapid a speed, the spring will be still further compressed, partly or wholly closing the valve until the speed is reduced. In this latter case it will be noticed that the ports of the valve are below those of the valve-seat, (see Fig. 5,) while when the governor is at rest they are above, as shown in Fig. 2. When in a normal position when in use the ports are about level, as shown in Fig. 6.

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a governor for steam-engines, of the single-piece governor-balls and bar running diagonally across the shaft and pivoted thereon, the said shaft, a system of links and levers, G H I J, whereby said bar is connected with the valve-stem, said valve-stem and a valve thereon, and a spring which operates reversely to the force of said balls, all substantially as set forth.

2. The combination, with the single-piece governor-balls and bar D D D′, of the sliding collar F on the same shaft as said bar, the link connecting said bar and said collar, and said collar, whereby said governor-balls are enabled to communicate their force to a system of levers, I J, and through them to the valve-stem, said valve-stem being situated directly beneath the governor-balls and bar, but at right angles with the axis thereof, substantially as described, and for the purposes specified.

3. The combination of the one-piece govern-

or-balls and bar, and the sliding collar operated thereby, of the slide H, the arms of which extend back through the bearing and come in contact with the upper end of a lever, said slide thus forming a portion of the means of communicating power from said governor-balls to the valve, all substantially as set forth.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 28th day of January, A. D. 1882.

JOHN F. BROWN. [L. S.]

In presence of—

C. BRADFORD,

CHAS. L. THURBER.