S. Mills,

Steam Balanced Valve.

No. 48,969. Patented July 25, 1865.

Fig. 1.

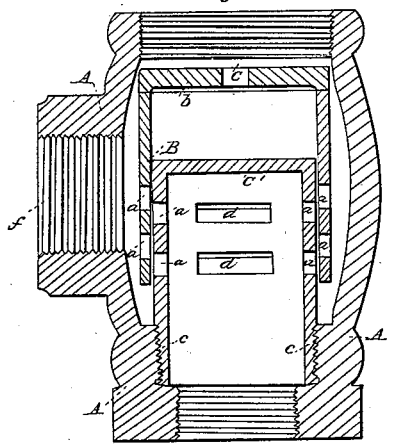


Fig. 2.

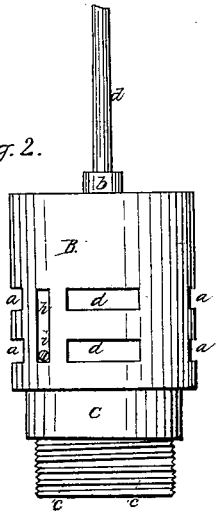
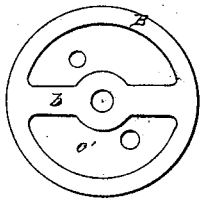


Fig. 3.



Witnesses.
J. A. Heald
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UNITED STATES PATENT OFFICE.

SAMUEL MILLS, OF JERSEY CITY, NEW JERSEY.

IMPROVEMENT IN GOVERNOR-VALVES FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. **48,969**, dated July 25, 1865.

To all whom it may concern:

Be it known that I, SAMUEL MILLS, of Jersey City, in the town of Bergen, county of Hudson, in the State of New Jersey, have invented certain new and useful Improvements in Governor-Valves (called "Mills' Equipoise Governor Valve or Regulator") for Steam-Engines; and the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents a section through the steam-chamber and the cylindrical sliding balanced valve. Fig. 2 shows the exterior portion of the valve without the steam-chamber or the casing to inclose it. Fig. 3 shows the top-end view of the cylindrical slide or cut-off for steam-regulator to steam-engines.

The object of my invention is to supply steam-engines with a governor-valve that is equipoised, whose action is sensitive, and also will close and shut off the steam when the governor fails to regulate the speed of the engine.

My invention consists in sliding one tube over another, in the manner of telescope slide, with lateral openings through the tubes to match on all sides, so that the pressure of steam in the chamber will be equal on all sides of the valve, and the range of motion given to the sliding tube being sufficient to entirely shut off the steam from the steam-chest both at its extreme upward and downward movement.

To enable others skilled in the art to make and use my invention, I will describe it more fully, referring to the drawings and to the letters marked thereon.

The steam-chamber A A, in which my improved governor-valve is fitted to operate, is made round and bilging sufficiently to leave space for the steam to surround the telescopic or sliding tubes B and C, which form the steam cut-off or governor valve to regulate the speed of the engine, the tube C being made in the form of an inverted cup, the top end, C′, being closed, the lower end being open, with a screw-thread, *c c*, to fit into the chamber A A, so that it stands firm centrally in the chamber A, the outer surface of the tube or cup C being turned off true and perfect, so that the tube B will fit closely over and slide on it. On the four sides of the tube B and the cup C are made two or more long openings, *a a a a a a*, which correspond with each other, so that a free passage for the steam to be let into the steam-chest on all sides of the tubes is effected when the sliding tube B is midway between the two extremes of its motion, the distance being controlled by the slot *h* and the stop-pin *i*. When the sliding tube or valve B falls down to its lowest point in the chamber the steam is entirely cut off from the chest, so that should the belt break or run off the pulley that drives the ball-governor the balls fall and shut off the steam and stop the engine, instead of allowing it to run on at an increased speed without anything to check its motion till the engineer can shut off at the throttle.

The governor is so arranged that when the steam is let in to start the engine the regulator-valve is full open, and as the motion increases the balls throw out by centrifugal force and raise the slide-valve B, when it closes all of the apertures *a a a a a a* equally on all sides and only admits steam sufficient to get to a certain speed, whether much or little power is required to drive the machinery attached. The slide B having to move so little to effect its purpose, it is very sensitive and answers almost instantly to any irregularity in the power required when the machinery is being thrown on and off.

Across the top of the slide B is a central bar, *b*, to which is attached the vertical rod *d*, which connects with the ball-governor, that being supported in a frame above the chamber, and is secured to it by screwing it into the socket *e* or large opening in the top of the chamber B.

The induction steam-pipe is connected at the side socket, *f*, in the valve-chamber A.

It will readily be seen that no arrangement can possibly be made which is more simple in its construction or cheap and efficient in its operation for the purpose of regulating the speed of a steam-engine, the steam in the chamber surrounding the sliding tube-valve, so that the pressure is perfectly equal on all of its surface, and consequently there is no perceptible friction, the slide working as easily under the highest pressure of steam as when there is none in

the chamber; and another advantage is that the governor mechanism may be made very small comparatively, and yet control perfectly the speed of a large engine. As the motion required to work the valve is so little, it is very sensitive and is felt instantly; also, the steam is shut off when the balls of the governor fall to their lowest point and stop the works.

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

The cylindrical valve-tube B, sliding over the cup C, they both having a series of openings through on all of the sides, so as to form an equilibrium governor-valve for steam-engines, as herein described.

In testimony whereof I hereunto subscribe my name.

SAMUEL MILLS.

Witnesses:
GEO. OLMSTEAD,
JOSEPH CHAMPION.