

J. D. Lynde's
improvement in
Steam Governors.
 117903

PATENTED AUG 8 1871

Fig 1

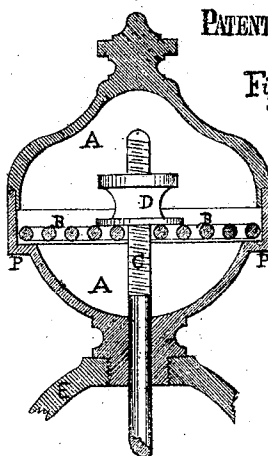
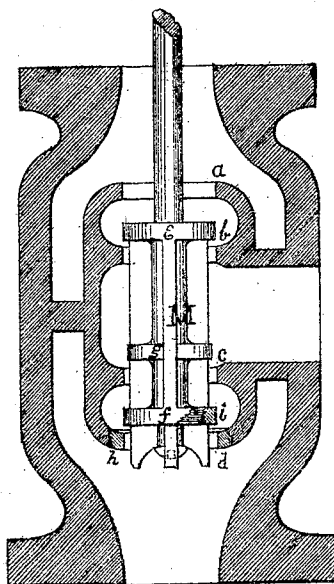


Fig 2



Witnesses:

John H. Sebold
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Inventor,

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UNITED STATES PATENT OFFICE.

JOHN D. LYNDE, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN GOVERNORS FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. 117,903, dated August 8, 1871.

To all whom it may concern:

Be it known that I, JOHN D. LYNDE, of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Governors for Regulating the Speed of Steam-Engines; and I do hereby declare that the following is a full and exact description of the construction and operation of the same, reference being had to the annexed drawing forming part thereof.

This invention is an improvement on my governor patented February 21, 1871; and its object is to equalize the steam pressure on the valves or disks as the steam passes through the openings up and down, passing the valves and their seats in its transit to the steam-cylinder of the engine, irrespective of the capacity of the engine or quantity of steam required to pass the governor-valve and the seats in a given time. Also, to provide a governor-valve so constructed with reference to each disk and with the seats or diaphragms as that, when acting in combination, it shall be entirely balanced under all pressures, passing unlimited quantity of steam and in any sized governor, thereby to cause the governor of the largest engine to act as sensitively as in the smallest, and regulate the motion of each with nearest accuracy, irrespective of increase or diminution of resistance, or increase and diminution of steam pressure between the minimum and maximum limits. It further consists in providing a regulating-spring attached to the valve-stem, and of such a construction and arrangement as will be most efficient, of the least cost, and occupy the least important room; and it also consists in providing suitable metal and mechanism for preventing the wear or cutting of the seats of the valve-chamber and valve or disks by reason of the passage of steam and water of condensed steam through and around them.

In the drawing, Figure 1 is a vertical section of the spring and its case. Fig. 2 is a vertical section of the bulb of the governor, inclosing the valve-case and valves.

It is found in practice that the volute form of spring is better than the spiral when properly adapted as a regulator, for the reason that it admits of a much greater range of motion before becoming stiffer, and without altering the set or elasticity.

In Fig. 1, A represents the spring-case with its ledge P for the support of the volute spring B;

C, the valve-rod; D, the regulating-nut; and E, a portion of the head of the governor.

To increase the speed of the engine, screw the regulating nut D down, and to diminish the speed screw the nut up.

Governors built after my patent above referred to have proven to be less efficient and do not regulate large engines with that accuracy it is found they regulate engines of less power, and this is due to the fact that, with the large governor, the volume of steam, when passing down by the seat C into the chamber surrounding disk *f*, acts on said disk when the valve in the steam-chest of the steam-cylinder is being opened, giving it an improper downward motion and immediate rise as the steam is cut off. To obviate the down-and-up motion above referred to I place between the disks *e* and *f* a smaller balance-disk, *g*, shown in Fig. 2, so that it will be just above seat *e*, and allow but a little more steam to pass down into the chamber around disk *f* than that required to pass through the opening under disk *f* to properly move the piston in the steam-cylinder, and thus is prevented the extra rush or pressure of steam above alluded to, while the lifting force of the steam under the disk *g* secures the required balance and an exact uniform motion of the engine. The valve-chamber is the same as that in my patent above referred to, and as in that the disks *e* and *f* are nearest *b* and *d*, regulating the amount of steam passing by *e* and *f* according to the demands of the engine to do its work.

A serious difficulty has been experienced in all governors for steam-engines of the valve-chambers and disks cutting or wearing away by the current of steam and water commingled. Especially has this been the case with the lower disk and seat, and in engines doing but little work, or when the water, owing to a faulty construction of the boiler, works over into the cylinder, or the water is impure. This cutting or wearing is of serious importance. To obviate this difficulty I bush the seats, as shown at *h*, Fig. 2, with a thin ring of composition, made of tin and copper, as hard as it can be worked, and the disks *e* and *f* are surrounded with a ring of the same metal. This construction prevents the cutting away before alluded to, and the difficulty incident to valves heretofore made entirely of brass, by reason of unequal expansion. With my improved construction, the composition ring

being slight, the expansion is but little more than it would be if the disks were all cast-iron, and that little proves of no disadvantage. The guides under the lowest disk are made in a separate piece, and held in place, after the disk is finished, with a screw.

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

1. The balance-disk *g*, in combination with the regulating-disks *e* and *f*, constructed and arranged substantially as herein set forth.

2. The arrangement of the valve *M* with the seats *a b c d*, constructed and operating substantially as herein set forth.

3. The volute spring *B*, in combination with the valve-rod *C*, when constructed and arranged substantially as herein set forth.

JOHN D. LYNDE.

Witnesses:

A. K. THOMPSON,

H. WILSON SHEIBLEY.