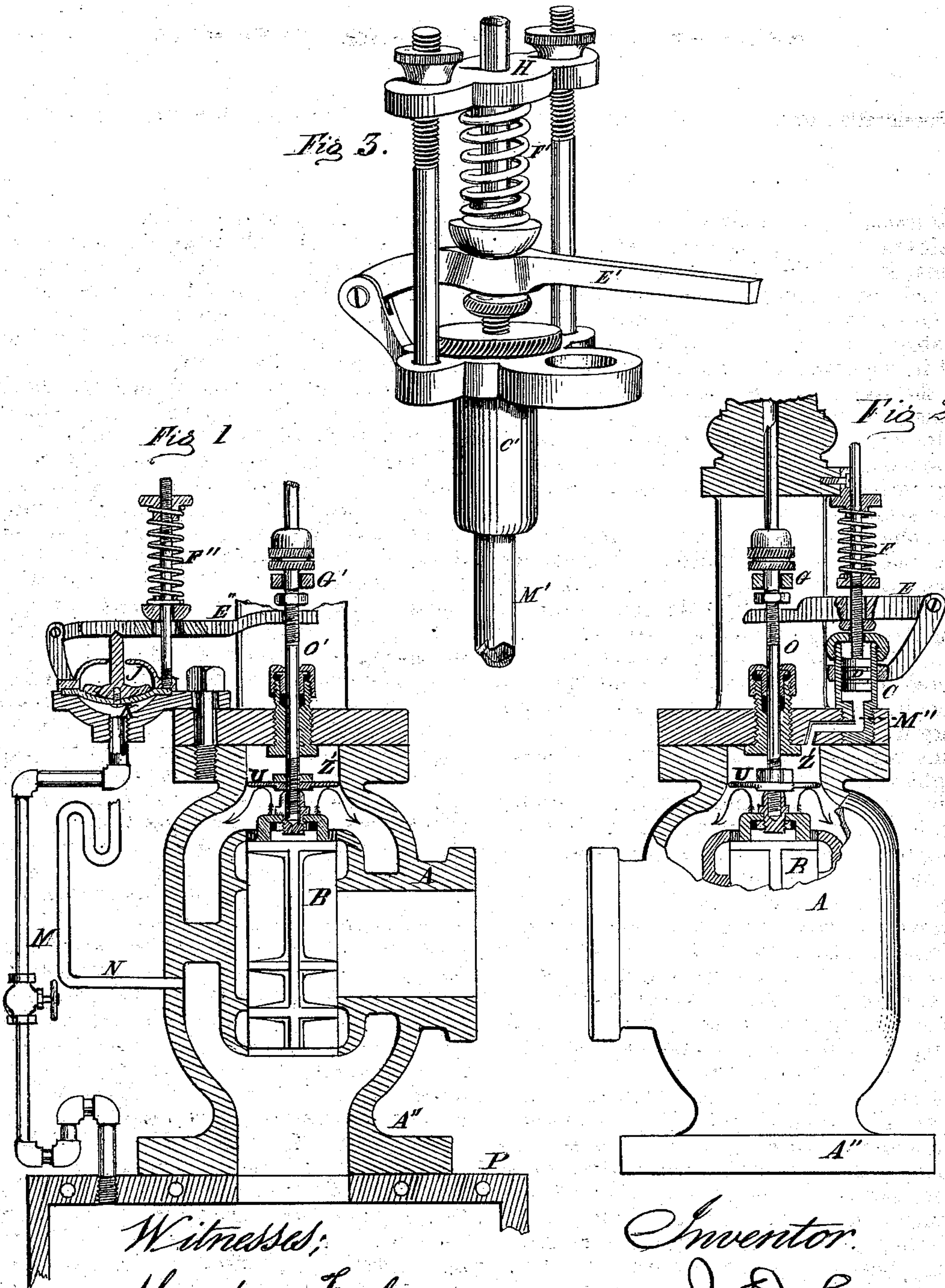


J. D. LYNDE.
Steam-Engine Governors.

No. 154,405.

Patented Aug. 25, 1874.



Witnesses:
Alexander Fogel
John H. Sebold

Inventor.
J. D. Lynde

UNITED STATES PATENT OFFICE.

JOHN D. LYNDE, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN STEAM-ENGINE GOVERNORS.

Specification forming part of Letters Patent No. 154,405, dated August 25, 1874; application filed April 30, 1874.

To all whom it may concern:

Be it known that I, JOHN D. LYNDE, of Philadelphia, State of Pennsylvania, have invented new and useful Improvements in Steam-Engine Governors, whereby to render available the steam in the steam-cylinder or steam-chest in regulating the speed of the engine, so that the speed is kept more uniform during the changes of load on the engine than by regulating in the manner heretofore, relying on the motion of the engine alone to actuate the governor. The following is a specification of my said invention.

The object of this invention is, first, to construct and make such additions to governor-valves and steam passages or ports that the valve will be more fully balanced on certain engines requiring suddenly a large amount of steam. Heretofore, governors have been constructed to operate according to the speed of the engine, so that, in cases where the load is very irregular and the work being done requiring regular speed, the difference of speed in light and heavy work has been too great, causing trouble, loss, and damage. Another difficulty has been experienced in some kinds of engines, especially such as are constructed with puppet-valves, taking the steam so suddenly (as the valves are jerked open with cams) the governor-valve receives a sudden impetus from the steam, as, with great velocity, it rushes into the cylinder, causing a jerk on the rods and works of the governor, causing unwonted detriment and wear; also, the steam driving by and above and around the valve, in many cases unbalancing it.

Referring to the drawings, Figures 1 and 2 are partial sectional views of this invention.

It is found that, in many manufactories where various kinds of work are being done by one engine, and where the load on the engine is extremely unequal, it has been quite an impossibility to keep a regular speed at all times. Usually, the amount of steam permitted to go to the cylinder has been governed by the speed of the engine itself, so that when large changes of load occur too much change of speed is necessary before the steam will be added or retarded, as required. To meet this most serious difficulty another power has

been brought to bear to assist the governor. The actual load of the engine is used to assist in supplying steam so as to keep up its regular speed. Figs. 1 and 2 show two forms of apparatus for the purpose, as applied to a governor; Fig 3, another form, which is similarly applied as that in Fig. 1.

A is the body or valve-chamber of the governor; B, the valve. C and C' are cylinders, in which is fitted the grooved piston D. E, E', and E'' are levers which, when forced upward, assist the governor in lifting the steam-valve in chamber A; F, F', and F'', springs to regulate the pressure exerted by the lever. G and G' show a section of the fork of lever of governor by which the valve is lifted, and under which lever lever E acts, lifting upward transversely. In each of the three ways the spring is compressed differently—in Fig. 1, by screwing down the nut at top; in Fig. 2, by screwing up the nut on which it rests at bottom; in Fig. 3, by screwing down the nuts on cross-head H. The power used to operate the described levers E, E', and E'' is the pressure of steam in the steam-chest and cylinder, which varies with the changes of load. When the construction used is like exhibits Figs. 2 and 3, the pressure is admitted under the piston D in Fig. 2. It is taken from the top of the outer chamber of the governor, (in which the pressure is the same as in the steam-chest,) through passage M''. In Fig. 3 the pressure is taken from the steam-chest or from governor-chamber, as in Fig. 1. In Fig. 1, instead of a cylinder, a construction is used similar to a steam damper-regulator, in which the piston J stands on a disk of rubber, K, under which the pressure is admitted from steam-chest by pipe M, or from side of chamber A, by a similar pipe as M. The governor is set so that when the engine is light it will run the proper speed. The spring F'' being tightened down so as to just prevent the lever E'' from having any effect on the lever G', as soon as load is put on the engine the pressure in the cylinder will be increased, which will be instantly felt under the piston J, and, pressing up lever E'', will proportionately assist the revolving weights of the governor to depress and raise the valve to supply the

necessary increase of steam without perceptible change of speed of engine. The three plans of using the said power are shown, Fig. 2 being built with the governor, while Figs. 1 and 3 may be attached to a governor already in operation. The steam which passes upward, through or by the valve B, must be turned downward, and, rushing into the chamber Z', the force of the velocity is added to the pressure, which causes a momentary slightly increased pressure in the chamber Z', and, reacting on the valve, causes the jerk downward described. To obviate the said jerk, the adjustable disk U is provided, Fig. 1, which is set so as to receive on its under side enough of the force

from said velocity to balance the reaction, and the valve remains practically balanced.

Having thus described the nature and object of my said invention, what I claim therein as new, and desire to secure by Letters Patent, is—

The combination of the pipe M, disk K, piston J, lever E'', adjustable spring F'', valve-rod O', disk U, valve B, and chamber A, substantially as and for the purpose herein set forth.

JOHN D. LYNDE.

Witnesses:

ALEXANDER FOGEL,
JOHN H. SEBOLD.