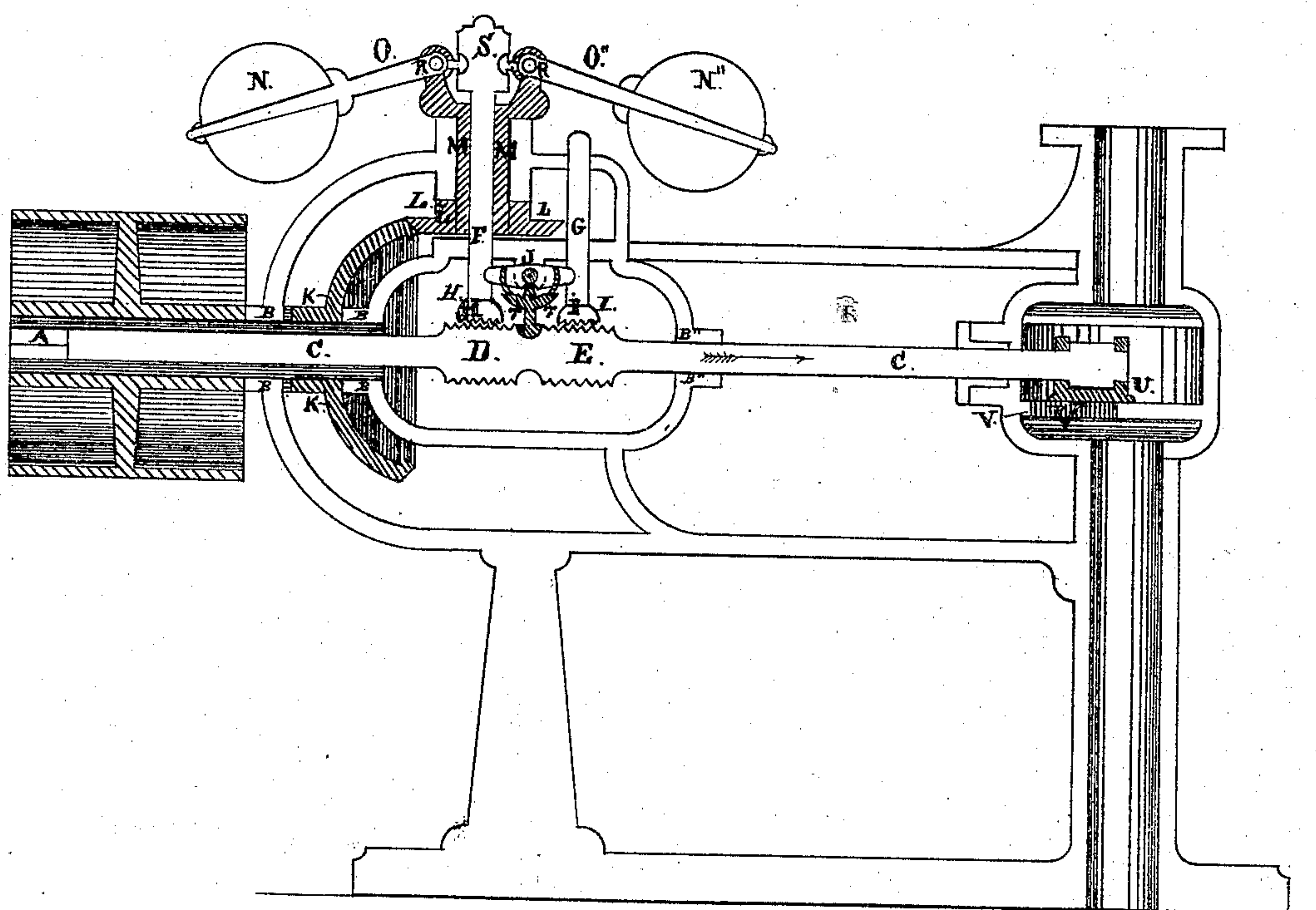


B. B. SMITH.
Governors for Steam-Engines.

No. 137,573.

Patented April 8, 1873.



WITNESSES

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BENNET B. SMITH, OF NASHVILLE, TENNESSEE, ASSIGNOR OF ONE-HALF HIS RIGHT TO WILLIAM H. McDONALD, OF GREEN HILL, ALABAMA.

IMPROVEMENT IN GOVERNORS FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. **137,573**, dated April 8, 1873; application filed January 29, 1872.

To all whom it may concern:

Be it known that I, BENNET B. SMITH, of Nashville, in the county of Davidson and State of Tennessee, have invented certain new and useful Improvements in Engine-Governors, of which the following is a specification:

Nature and Object.

The object of my invention is to produce a governor capable of wielding more power for working the throttle-valve than that derived from the governor-balls when thrown out or raised by centrifugal force by the rapid rotation of the same, or fall by their own specific gravity when the velocity of said rotation is diminished; and also to move said throttle-valve a great distance with a slight variation in the position of said balls. My invention consists of a shaft provided with a right and left hand screw, revolved by a hollow driving-shaft, into which it enters and reciprocates. To said driving-shaft is connected (by bevel-wheels) the shaft, which is connected with the governor-balls. The first-mentioned shaft, which is in constant rotation, is caused to reciprocate by two threaded plates alternately thrown in contact with either of the screws upon said shaft by the action of the governor-balls, as hereafter described; and to said reciprocating shaft the throttle-valve or other cut-off contrivances are attached by suitable connections.

General Description

with reference to the accompanying drawing, which is a vertical section of the entire apparatus.

A is the driving-shaft. B is the bearing for the same. C is a shaft composed of two screws at or near the center of the two outer portions, one of said outer portions being round, and revolves in bearing B, and the other square entering the hollow center of shaft A, which is also square to correspond with that of said shaft, and permits the same to reciprocate therein. The screws upon said shaft C are indicated by the letters D and E, the former being a right and the latter a left hand screw. K is a bevel-gear wheel attached to shaft A. L is a bevel-gear wheel attached to shaft M.

K and L work in connection, the latter being driven by the former, which produces rotary motion of the shaft M, to which the governor-balls N N are attached by means of arms O O and pins R R. Said shaft M has a hollow center, through which rod F passes and freely reciprocates, said reciprocation being caused by the vibration of the arms O O, the short or opposite ends of which are in connection with S, the top of F, as shown in the accompanying drawing. J is a beam oscillating upon a fixed center and connects F with G, (another reciprocating rod,) and compels them to move in opposite directions. Rigidly attached to the bottom of F is a plate, H, having grooves at the bottom to correspond with the threads of screw D. I is a plate similarly attached to rod G, having grooves at the bottom to correspond with the threads of screw E. T is a rod situated between the screws D and E, rounded at the bottom to correspond with a groove in shaft C; at the tops T is connected with (and oscillates upon) the center-pin of J. Said rod T is provided with two toes, one of which is brought in contact with either side of beam J. This is for the purpose of lifting either of plates D and E out of gear with its respective screw, when shaft C travels further than to perform its required duty.

Operation.

Considering the above-described apparatus to be in connection with an engine, the steam-supply of which is regulated by the valve U in connection with rod C, and the driving-shaft A properly connected with the engine-shaft to revolve in proportion to the same, to support the balls N N by centrifugal force in their position shown in the drawing when the engine is running at the desired speed, if the speed slackens the balls fall and the rod F rises, which compels the rod G to fall, bringing the plate I in contact with screw E, by means of which the shaft C is moved with great force in the direction of the arrow, which opens or partially opens the passage V by moving the valve U, increasing the flow of steam to the engine, the speed of which will increase, and the said balls N N

will lift the plate I from E, preventing further action of C in the direction mentioned; and should the speed of the engine still increase, the action of the balls will throw plate H in contact with screw D, and the shaft C will be moved in the opposite direction to the arrow, causing the valve U to close the passage V accordingly. When for any reason the steam-supply is shut off from the valve U, it of course immediately opens wide, but its travel is here stopped by the action of rod T with one of the toes in connection therewith, in the manner set forth in the general description.

Claim.

I claim—

The combination of the hollow shaft A and shaft C with the right and left hand screws D and E, plates H and I, rods F and G, beam J, and rod T, the bevel-gear wheels K and L, shaft M, arms O O, balls N N, and valve U, all constructed and arranged as and for the purpose set forth.

BENNET B. SMITH.

Witnesses:

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