

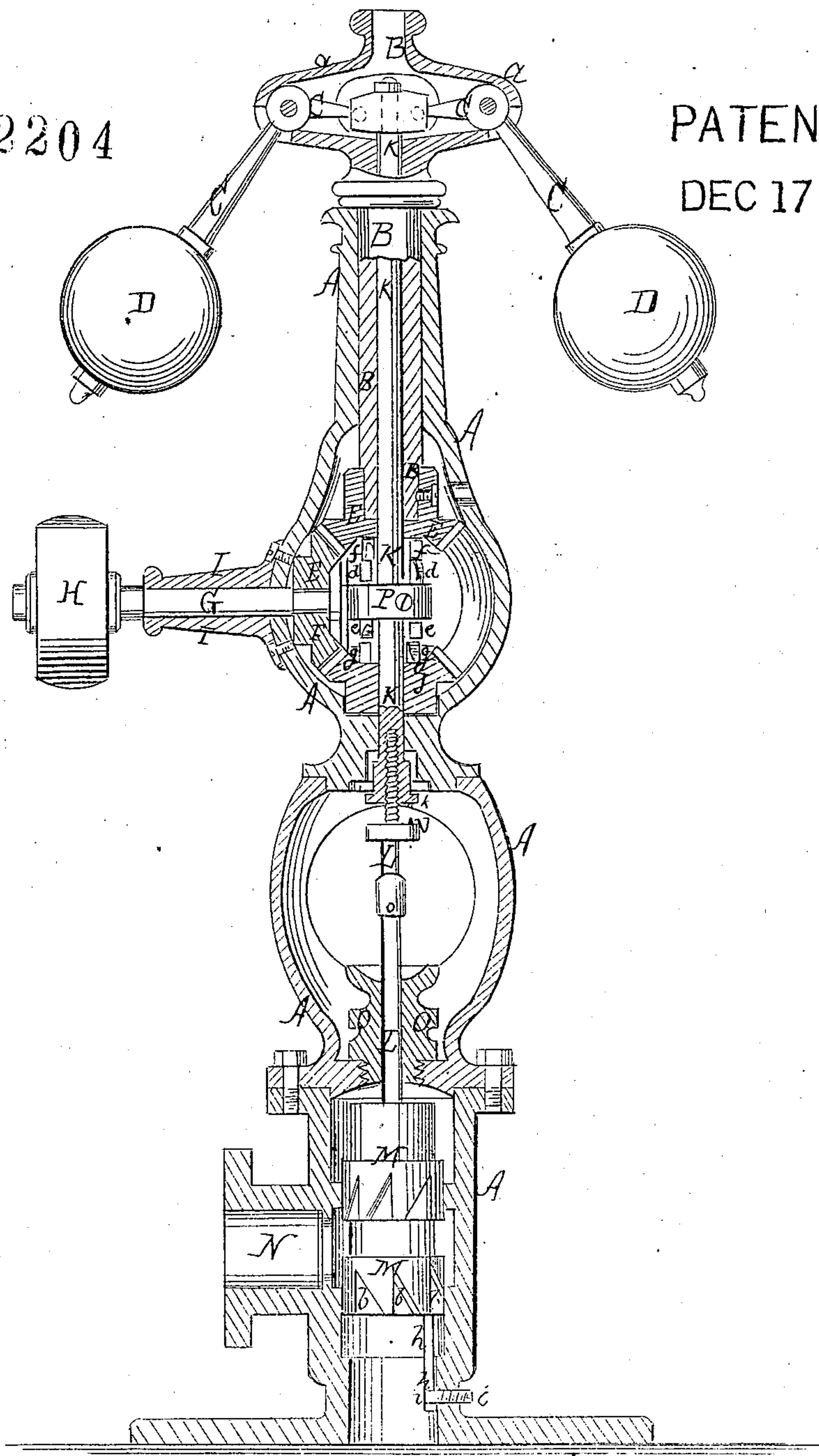
# Oliver A. Kelly Governor:

*Assigned to Lamb, Cook & Co.*

72204

PATENTED

DEC 17 1867



Witnesses.  
*Thos. Encke*  
*J. A. Service*

Inventor.  
*O. A. Kelly*  
*Per Munn & Co.*  
*Attorneys*



# United States Patent Office.

OLIVER A. KELLY, OF SLATERSVILLE, ASSIGNOR TO LAMB, COOK & CO., OF FORRESTVILLE, RHODE ISLAND.

*Letters Patent No. 72,204, dated December 17, 1867.*

## IMPROVEMENT IN STEAM-ENGINE GOVERNORS.

The Schedule referred to in these Letters Patent and making part of the same.

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, OLIVER A. KELLY, of Slatersville, in the county of Providence, and State of Rhode Island, have invented a new and improved Steam-Engine Governor; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

The drawing represents a sectional elevation of my improved governor.

Similar letters of reference indicate corresponding parts.

The object of this invention is to obviate the violent changes and consequent fluctuations in the quantity of steam admitted to the piston, and is especially designed for engines that are regulated by the main valves.

The invention consists in the arrangement, within the hollow spindle, of a sliding vertical rod, which is made of two pieces that are screwed together, the upper one being connected with the balls, while, from the lower one, the valve is suspended. The upper piece is provided with an adjustable sleeve, which has pins, by which it is or may be connected with bevel-gear wheels, arranged above and below, and revolving in opposite directions. When the requisite amount of steam is in the cylinder, so that the spindle revolves with the required velocity, the aforesaid sleeve will be suspended between the two gear-wheels, and will not at all come in contact with the same, so that the spindle will not be revolved. The valve will thereby be held suspended in the desired position, so as to admit the required amount of steam to the cylinder. As soon as the spindle revolves too quick, the rod will be lowered, so that the sleeve will come in contact with the lower gear-wheel; thereby the upper end of the rod is turned so as to be gradually unscrewed from the lower end, which only slides, not turns, and the valve is thus gradually lowered to diminish the quantity of steam allowed to the piston. When the required velocity is reached, the sleeve will again be out of gear, and the valve will be in its proper position. Should the spindle revolve too slow, the valve-rod will be raised, so as to be revolved by the upper gear-wheel, whereby the upper part is turned so as to draw the lower part up, thereby enlarging the passage for the steam until the required equilibrium is again reached. The sleeve being adjustable up and down on the valve-rod, it can be set so that the engine may revolve with any desired velocity. The governor will, after having been adjusted, not require any more attention from the engineer, and will prevent the fluctuations in the speed of the engine.

A represents the hollow shell or case which supports and holds all the other parts of the governor. B is the tubular spindle, carrying two arms *a* on top, in which the levers C of the balls D are pivoted. On the lower end of the spindle is a bevel-gear wheel, E, which meshes into the teeth of a similar wheel, F; the latter being mounted on a horizontal shaft, G, carrying the driving-pulley H, as shown. The shaft G has its bearings in a tube, I, projecting from the shell A, as is clearly shown in the drawing. J is another bevel-gear wheel arranged under the wheel E, so as also to mesh into the wheel F. Thus, as the driving-shaft G is turned, the wheels E and J will revolve in opposite directions, and with the former will the spindle B be rotated. K is a straight rod, which is fitted loosely through the tubular spindle B and through the wheels E and J, so as to allow the spindle and wheels to turn freely around it without turning itself. The lower end of the rod K is screwed to the upper end of another rod, L, which is arranged in the lower part of the shell, and which carries at its lower end the valve M, as is clearly shown in the drawing. This valve is provided with triangular recesses *b b*, through which the steam must enter the steam-pipe N on its passage to the same from the boiler. The more the valve is lowered, the smaller will be that portion of the recess which is open to the pipe N, and the smaller will consequently be the quantity of steam admitted to the engine. The more the valve is raised the larger will be the quantity of steam admitted, as is easily understood from the drawing. Although I prefer the use of this valve, it is evident that valves of different construction can be arranged in the governor with equal effect; and I do not herein claim the construction of the valve. The upper part of the rod K is connected with the ends of the levers C, as seen, so that the rod K L will be raised or lowered as the balls are more or less spread. O is a stuffing-box, arranged around the rod L, above the valve-chamber, to prevent the escape of steam. P is a sleeve, fitted around the rod K, between the gear-wheels E and J, and secured to the same by means of a set-screw, *c*. From the upper and under face of this sleeve project vertical pins *d* and *e* respectively. To the



under face of the wheel E are secured vertical pins, *f*, and to the upper surface of the wheel J similar pins, *g*, as is clearly shown in the drawing.

The operation will now be easily understood: The valve M has at its under side a projecting pin, *h*, which strikes against a horizontal pin, *i*, so that the valve and its stem L will be prevented from revolving, at least as long as the valve is not quite open or raised. The pins *d* and *e* on the sleeve P should be so short that the distance between their extreme ends is less than the distance between the extreme ends of the pins *f* and *g*. The sleeve P being set on the rod K in the desired position, so that the valve will be opened far enough to admit a certain desired quantity of steam, the spindle is revolved. The sleeve will then be just between the wheels E and J, so that its pins *d* and *e* move clear of the pins *f* and *g*, as in the drawing. But when the spindle turns too quick, so that the balls are spread further, the rod K will be a little lowered, so that the pins *e* come in contact with the pins *g* on the wheel J. Thereby the rod K will be turned, and will be unscrewed from the rod L; that is, the whole rod K L will be lengthened, so that the valve is lowered and the supply of steam gradually diminished. When the spindle revolves too slow, so that the balls come together, the rod K will be raised, so that the pins *d* on the sleeve P will be brought in contact with the pins *f* on the wheel E. Thereby the rod K will be turned so as to be screwed together with the rod L, or so that the whole rod K L will be shortened, whereby the valve is raised until the volume of steam admitted is sufficiently large. During all these motions the rod L is prevented from turning by means of the pins *h* and *i*. But when the valve is raised as high as possible, so that a full volume of steam is allowed, and so that the engine revolves with the least velocity, the pin *h* will not reach to the pin *i*, and a pin, *j*, on a shoulder formed near the upper end of the rod L, will engage with a pin, *k*, on the lower end of the rod K, whereby the rods K and L will be united so as to revolve together, thereby preventing the parts from becoming disordered. When the spindle begins to turn quicker again, the whole rod K L will be lowered by the spreading balls, and the pins *h* and *i* will be again brought in contact with each other, when one half turn of the rod K will be sufficient to release the pins *j* and *k* from each other.

I claim as new, and desire to secure by Letters Patent—

1. The valve M, constructed as described, with the triangular recesses *b b* and downward-projecting pin *h*, arranged in relation with the pin *i* and screw-valve rod L, as herein described for the purpose specified.
2. The arrangement of the valve M, pins *h i*, valve-rod L, sliding rod K, and pins *j k*, as herein described, for the purpose specified.

OLIVER A. KELLY.

Witnesses:

SAMUEL S. SCAMMELL,  
WM. H. SEAGROVE.