

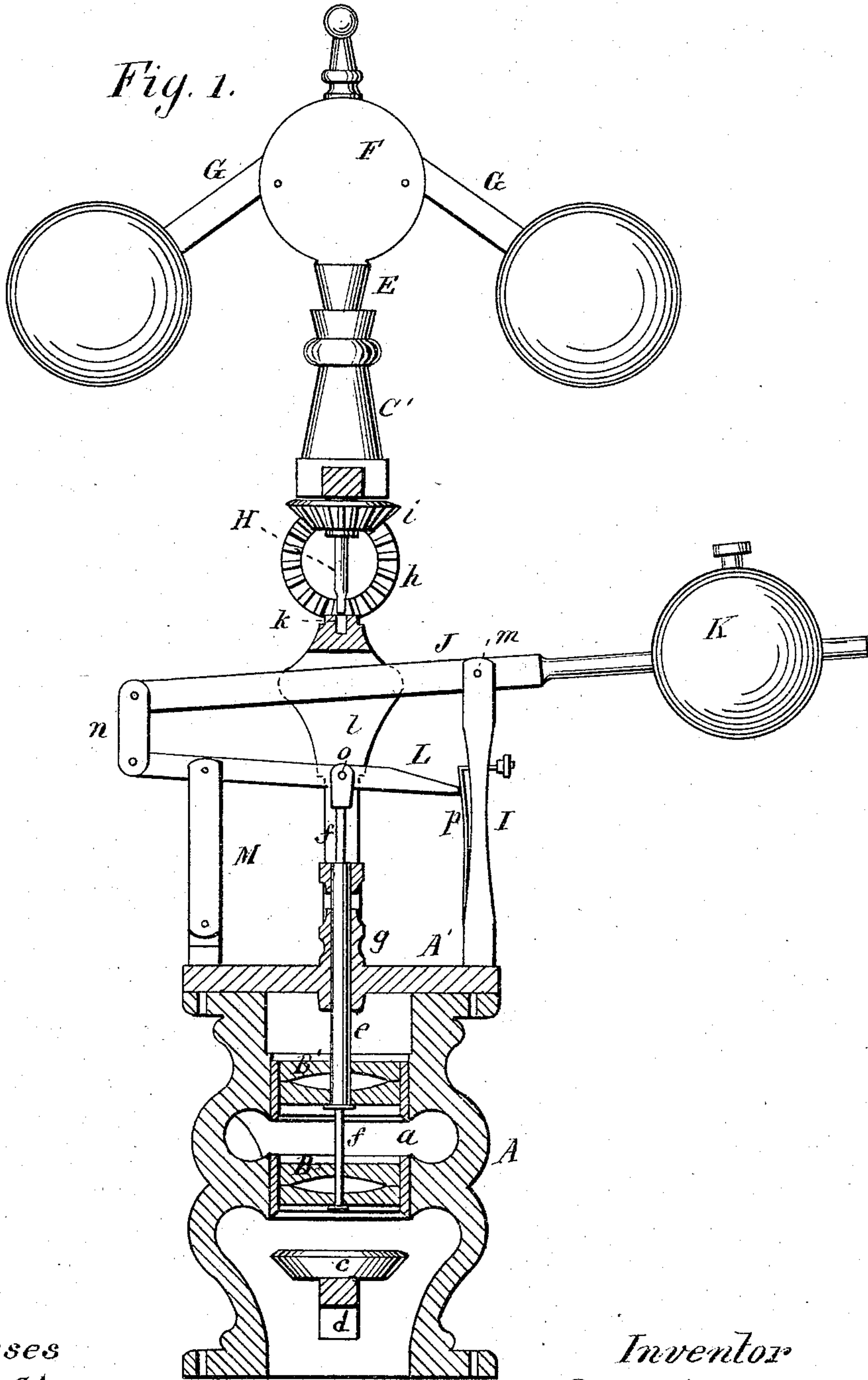
P. N. STOVER.

Governors for Steam-Engines.

No. 153,860.

Patented Aug. 4, 1874.

Fig. 1.



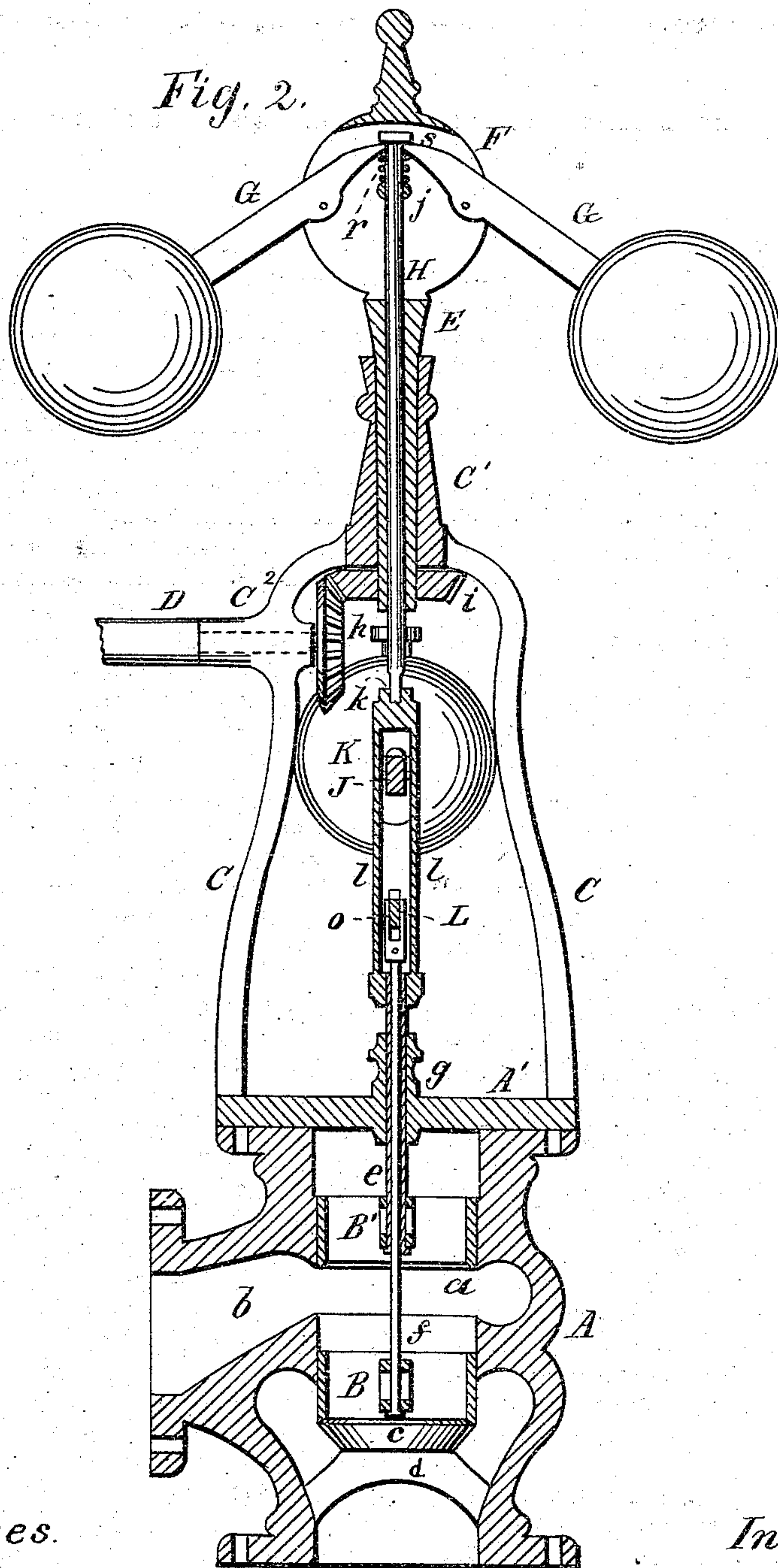
Witnesses
R. H. Syer.
C. Thurman.

Inventor
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UNITED STATES PATENT OFFICE.

PETER N. STOVER, OF WHITE ROCK, MICHIGAN, ASSIGNOR TO HIMSELF
AND JOHN L. MATHESON, OF SAME PLACE.

IMPROVEMENT IN GOVERNORS FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. **153,860**, dated August 4, 1874; application filed
January 19, 1874.

To all whom it may concern:

Be it known that I, PETER N. STOVER, of White Rock, in the county of Huron and State of Michigan, have invented an Improvement in Governors for Steam-Engines, of which the following is a specification:

The nature of this invention relates to an improvement in steam-engine governors, having for its object to make them quicker and more sensitive by reducing the travel of the spindle to one-fourth the distance heretofore required of it to travel in opening or closing the steam-port; also, to provide a "stop-motion" which will shut off steam from the engine in case of accident. The invention consists in a pair of cup-valves attached to separate spindles sleeved one upon the other, and actuated by the swinging arms through a series of levers, and, in connection therewith, a stop-motion arranged to operate as more fully hereinafter set forth.

Figure 1 is a vertical section of my governor and its valve-case. Fig. 2 is a vertical section of the valve-case, taken at a right angle from the section shown in Fig. 1.

In the drawing, A represents the valve-case of my governor, closed at the top by a cap, A', the upper part of the interior being cylindrically bored, to receive the cups or cylindrical shells, which are used as valves. Around this cylindrical bore a steam belt or passage, a, is cored in casting the casing, with a flanged opening, b, to which the steam-pipe is bolted. Below the bore the shell is cored out to form a chamber, in which is a circular stationary seat, c, held in position by cast arched ribs d, springing from the lower part of the casing, which is open at the bottom and flanged, so that it may be bolted to the steam-chest. B is a cup-valve, fitted to the lower section of the bore; and B' is a similar valve, fitted to said bore above the passage a, the former when dropped down to the seat c effectually closing the passage of steam to the steam-chest. When the valves are in the positions shown in Fig. 1 the port a is fully uncovered, and there is a free passage for the steam through the valve B to the steam-chest. If the valves be brought nearer together, the port may be partially or wholly closed to the admission of steam to the

interior of said valve B and the steam-chest. The valve B' is secured to the lower end of a tubular stem, e, which plays through a stuffing-box, g, in the cap. The valve B is pendant from a stem, f, which plays through the tubular stem e. C is an arched frame, rising from the casing, which frame terminates at the top in a hollow standard, C¹. There is also a projecting horizontal sleeve, C², near the top of said frame, which forms a bearing for the driving-shaft D journaled therein, at the inner end of which is a miter-gear, h, which meshes with and gives motion to a pinion, i, at the lower end of a tubular shaft, E, extending up through the hollow standard C¹, carrying at its top the plates F F, in which are pivoted the weighted arms G G, whose position varies with the velocity with which they revolve. The inner ends of said arms engage with a spool, j, at the top of a spindle, H, passing down through to the tubular shaft E, its lower end resting in a step-bearing, k, at the top of a pair of plates, l, to whose lower end is secured the upper end of the tubular valve-stem e. I is a post rising from one side of the cap A', to which post is pivoted a lever, J, provided with a sliding or adjustable weight, K. The short arm of said lever passes through the plates l, and is pivoted thereto at m. To the extremity of its short arm is pivoted a pair of links, n, pivoted to the extremity of a second lever, L, which is pivoted between the tops of a pair of swinging struts, M, whose lower ends are pivoted to a lug on the other side of the cap A'. This lever also plays between the plates l, and has pivoted to it, at o, the top of the valve-stem f. The free end of the lever L may be held up by a spring-latch, p, in the post I whenever the said latch is pushed in, the valves being in such case in position to fully uncover the port and allow steam a free passage to the steam-chest. r is a spiral spring sleeved on the spindle H between the spool j and a check-nut, s, on said spindle.

By the arrangement of the levers J and L in the manner described a downward movement of the spindle H for a given distance will move the valve B' the same distance down, and the valve B three times that distance up to close wholly or partially the port a; or, in

other words, a given movement of the governor-spindle compels a movement of the two valves, if considered as one, equivalent to four times the movement that it would impart to a valve-stem connected directly thereto, making this governor more sensitive to variations of speed in the engine in the same proportion.

When the engineer shuts off steam from the engine he pushes in the latch *p* to arrest the end of the lever *L* and support the valve *B* above the seat *c* in the position shown, so that when the throttle is again opened the steam can flow freely through said valve to the steam-chest. The engine being up to a certain motion, it withdraws the latch *p*, so if any part of the machinery breaks, or the governor-belt breaks or runs off the pulley, the valve *B* will drop down onto the seat *c* and cut off the supply of steam to the engine.

The spring *r* is employed to relieve the valves and connections from sudden jars, to which they might be subjected in case the engine was laboring hard and the main connections or belts give way, thereby causing a quick expansion of the governor-valves; but in no other case will said spring act, as it is so compressed, by the jam-nuts *s*, against the spool that the latter will not move in the ordinary work, but the spool being slotted where the pin which

secures it to the spindle passes through, a sufficient play of the spool may be had under such circumstances upon the spindle to accomplish the purpose.

By shifting the weight *K* on the lever *J* the speed of the governor-arms may be varied, and, through it, the speed of the engine.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In combination with a steam-engine governor, the valves *B B'*, weighted arms *G G*, spindle *H*, levers *J L*, plates *l*, and stems *e f*, the several parts being constructed and arranged substantially as described and shown.

2. The stationary seat *c* in the lower part of the case *A*, in combination with the valve *B*, as and for the purpose set forth.

3. The combination, with a steam-engine governor, of the spring-latch *p*, post *I*, lever *L*, spindle *f*, valve *B*, and stationary seat *c*, the several parts being constructed and arranged substantially as described and shown, for the purposes set forth.

Witnessed this 17th day of November, 1873.

PETER N. STOVER.

Witnesses:

Dr. A. M. JOHNSON,
THOS. THOMSON.