

W. H. Howland.

Steam Engine Governor.

N^o 92,051.

Patented Jun. 29, 1869.

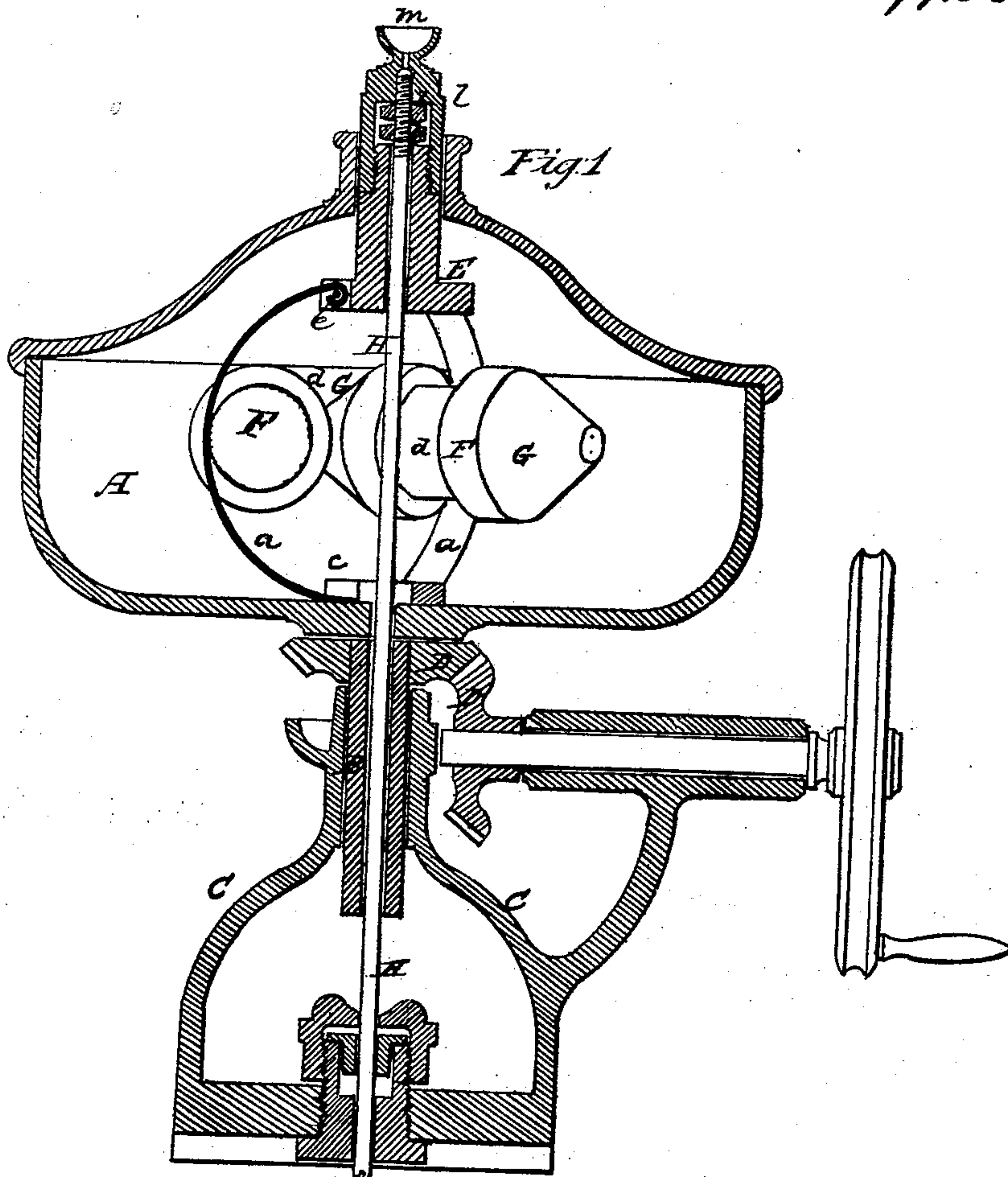


Fig. 1

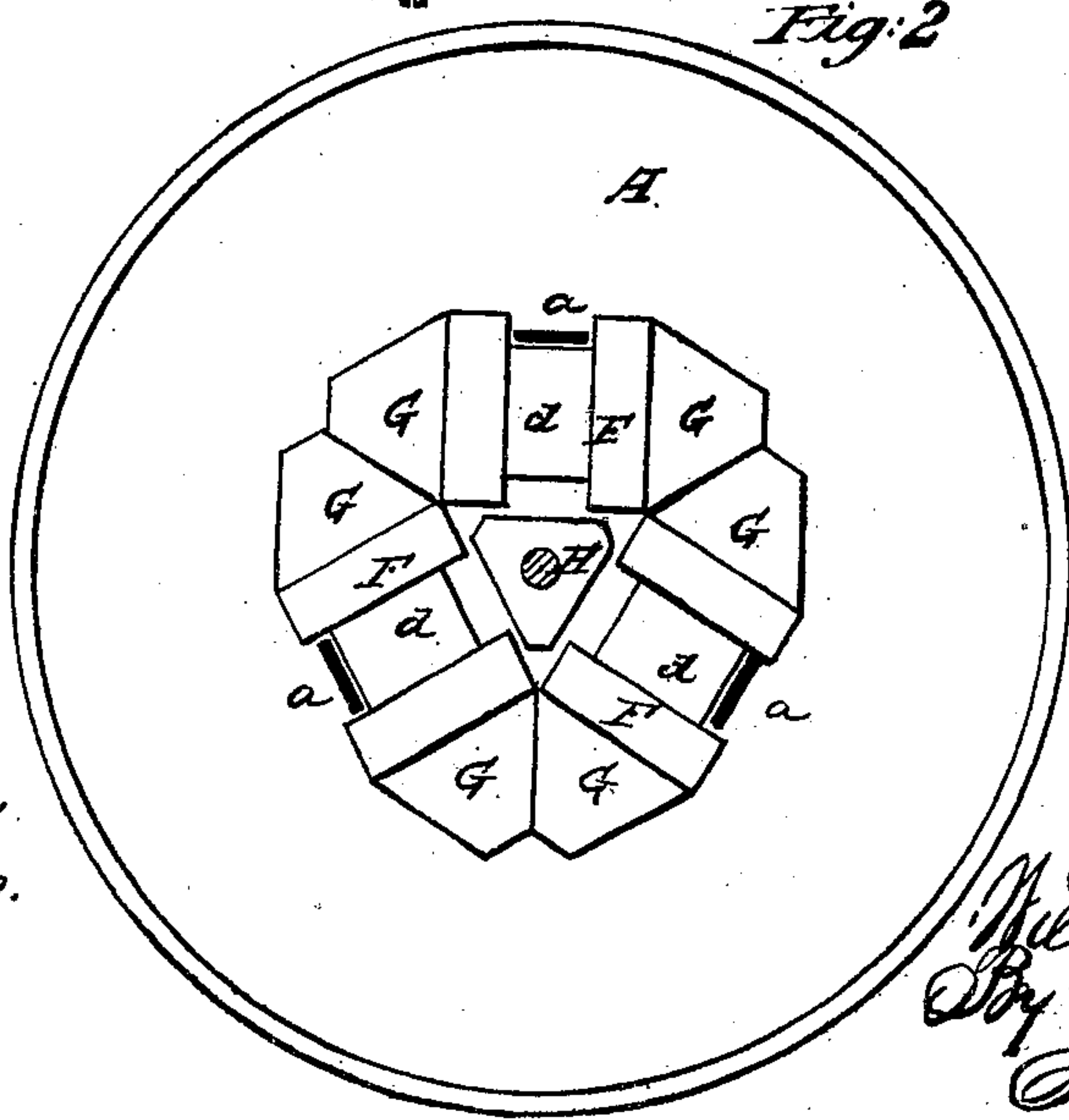


Fig. 2

*Witnesses:
Geo. H. Strong.
J. L. Bunn.*

*Inventor:
William H. Howland
By Dwyer & Co
His Attorneys*

United States Patent Office.

WILLIAM H. HOWLAND, OF SAN FRANCISCO, CALIFORNIA.

Letters Patent No. 92,051, dated June 29, 1869.

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, WILLIAM H. HOWLAND, of the city and county of San Francisco, State of California, have invented an Improved Governor; and I do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains, to make and use my said invention or improvements without further invention or experiment.

My invention relates to governors, or regulators, and more especially to that class of quick-running governors used for steam-engines, by which great delicacy is attained in regulating the amount of steam admitted to the cylinders; and

It consists of two or more light curved springs, which are pivoted at one end to a loosely-moving sleeve, or collar, by which the valve-stem is operated, and which are fastened at the other end to the spindle or disk, from which they receive their rotary motion.

The weights consist of short cylinders, with conical ends, placed within the springs, and having their cones formed at such an angle, that when in place they bear against and support each other.

The weights are unattached, and are kept in place by means of grooves turned at their middle, and in which the springs rest, so that as they are thrown out or drawn in by the varying speed, the weights change their positions, rising or falling slightly on the springs.

The whole of these parts are encased, and the upper part of the case serves to support the stem, so that the hollow spindle need not be continued to the top, as in other governors.

Referring to the accompanying drawings and letters of reference for a more complete explanation of my invention—

Figure 1 is a side sectional elevation.

Figure 2 is a plan, showing the position of the weights.

Similar letters of reference in each of the figures indicate like parts.

A is a containing-case, having a spindle, B, extending from the bottom down through the standard C, by which it is steadied and supported.

The bevel-gear wheels D give motion to the governor.

Within the case A, three light, curved steel springs, *a a a*, are fastened firmly to the bottom, at *c*, and at the top are pivoted to the sleeve, or collar E, so that as the springs are spread apart by centrifugal motion, and the collar is thus drawn down, the springs move

about the pins *e*, and relieve them of the strain which would in time break them if they were fastened rigidly.

Within the springs *a*, the weights F F F are placed loosely, being kept in place by a groove, *d*, which is turned near the centre of each weight, and in which the spring rests.

The ends G of these weights are made conical, and of such an angle, that when the three are in place, they bear against and support each other without any other fastening.

When the governor is not in motion, the weights settle down slightly into the curve of the springs, and when it is in motion they rise, so as to rest in the largest diameter, caused by the centrifugal motion, and always adjust themselves to any changes that may occur.

The valve-stem H passes through the spindle B, and also through the sleeve, or collar E, and is lengthened or shortened by means of the nuts *i i*.

A cap, I, is screwed on the top of the collar E, covering the stem H, and having an oil-cup, *m*, at the top, through which the stem can be kept lubricated.

The valve-stem does not turn, but is moved up or down by the rising and falling of the collar E.

The springs may be constructed very cheaply, and are easily replaced when necessary.

The case A protects the working-parts from dust and observation, and serves to support the upper part of the stem H and the collar E, so that the long hollow spindle is unnecessary, and finally, by its weight, steadies the motion of the governor, acting as a fly-wheel.

Having thus described my invention,

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

1. In combination with the springs *a*, the weights F, when constructed and arranged substantially as herein set forth.

2. In combination with the springs and weights above claimed, the case A, provided with the sliding collar E, containing the valve-stem H, substantially as described.

3. In combination with the collar E, the adjusting-nuts *i i*, cap I, and cup *m*, substantially as described.

In witness whereof, I have hereunto set my hand and seal.

WILLIAM H. HOWLAND. [L. s.]

Witnesses:

WILLIAM STANFORTH,
GEO. H. STRONG.