

L. F. Fuller.

Steam-Engine Governor.

N^o 76071.

Patented Mar. 31, 1868.

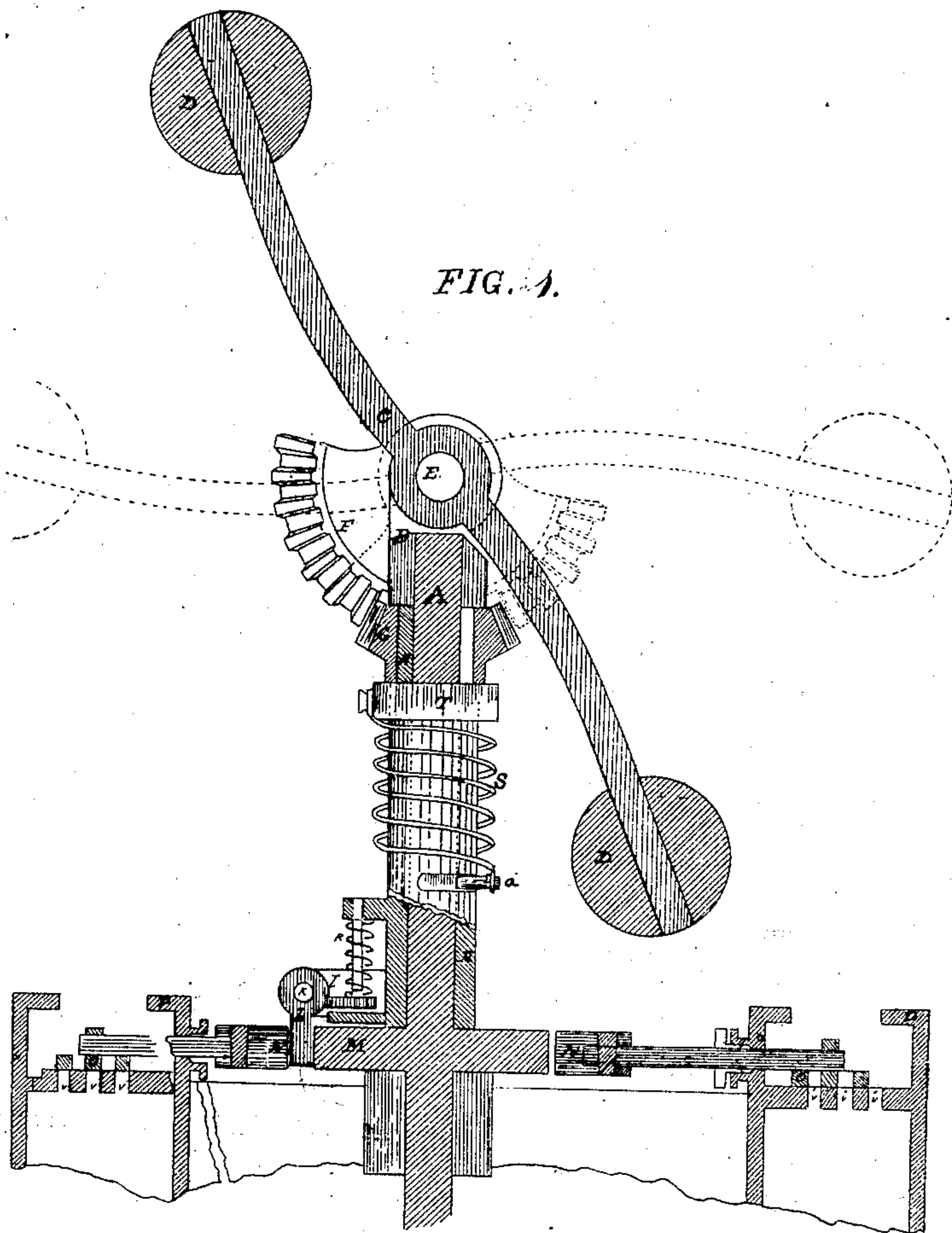


FIG. 1.

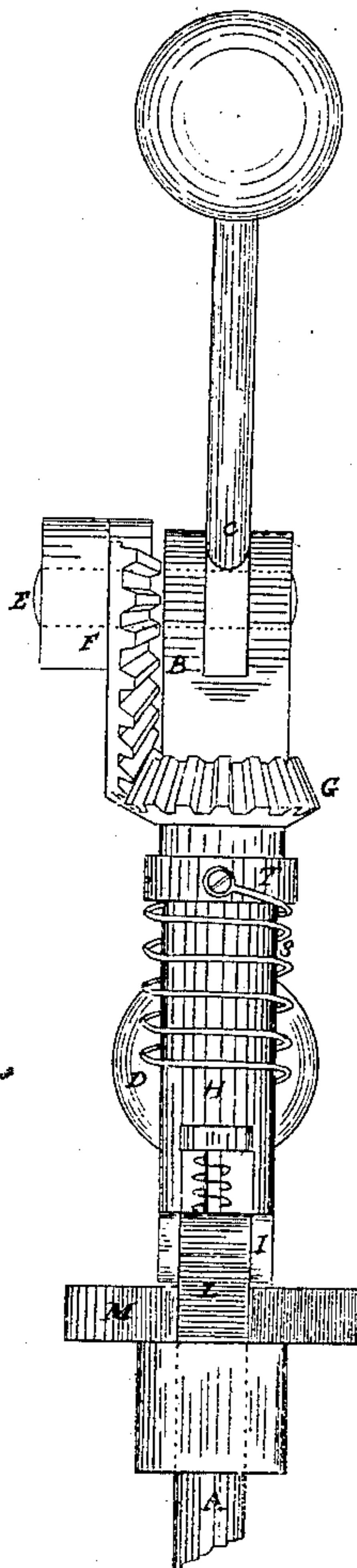


FIG. 2.

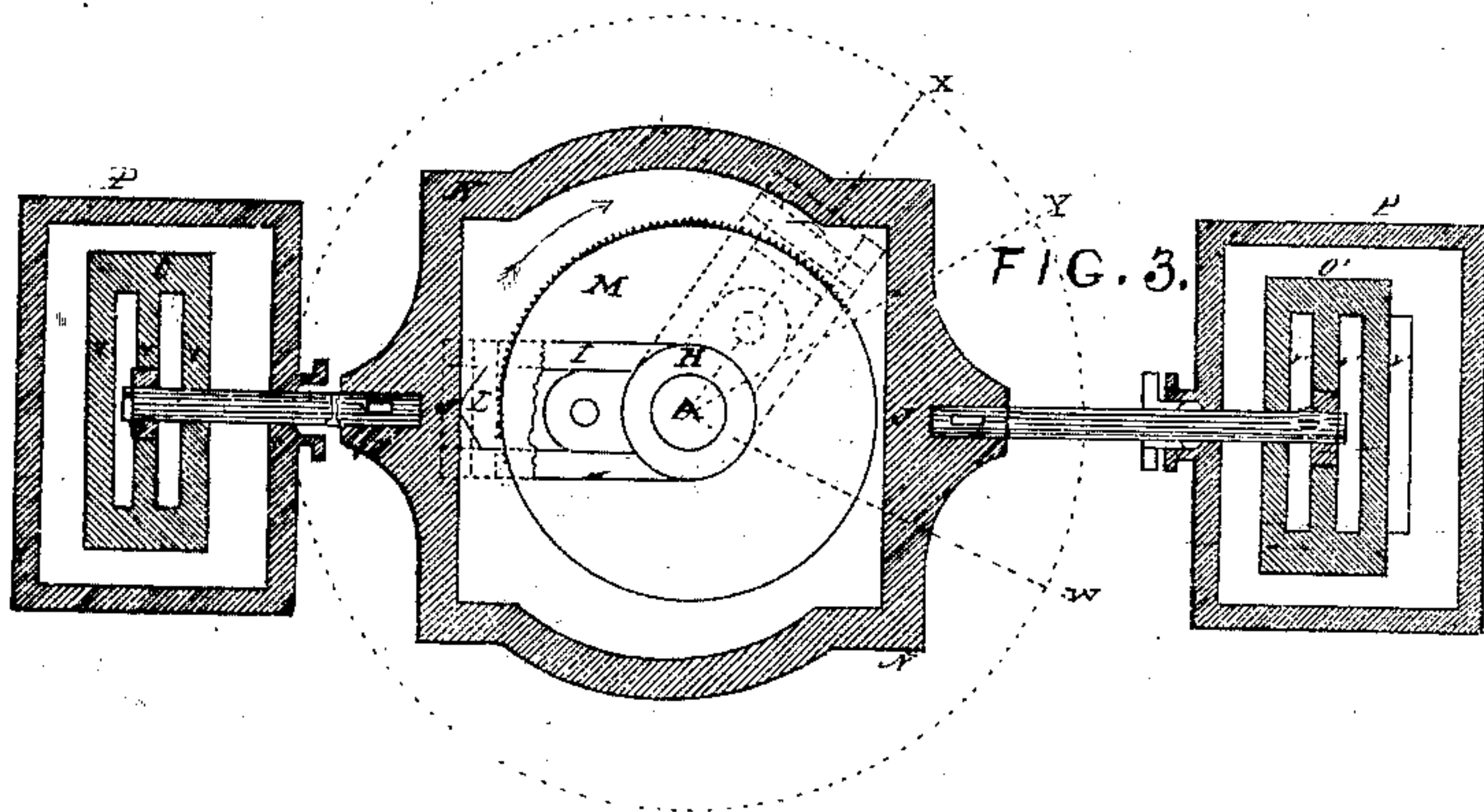


FIG. 3.

Witnessed
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LEONARD F. FULLER, OF PROVIDENCE, RHODE ISLAND.

Letters Patent No. 76,071, dated March 31, 1868.

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, LEONARD F. FULLER, of Providence, in the county of Providence, in the State of Rhode Island, have invented an Improved Variable Cut-Off Governor for Steam and other Engines; and I do hereby declare the following to be a full and correct description thereof, reference being had to the accompanying drawings, forming part of this specification, and to the letters of reference marked thereon.

The same letters refer to like parts in all the figures.

Figure 1 is a vertical longitudinal section of the regulator and valves.

Figure 2 is a side elevation.

Figure 3 is a horizontal section taken through just above the valves.

The construction is as follows:—C is the regulator-arm, having a ball on each end, D D, and vibrating at its centre on the stud or pivot E, between the jaws of the spindle A. The pivot E is fastened to the arm C, so as to turn with it, and has secured to one end the segment of a bevel-gear, F, which meshes into the bevel-gear G, secured on the barrel H, which is loose on the spindle A. The disk M is also fast to the spindle A, which is connected with the crank-shaft of the engine, so as to make an equal number of revolutions in a given time with that shaft; and as it revolves it carries with it the regulator-arm, segment-gear F, and, by means of the gear G, the barrel H. There are two projections, I, at the end of this barrel, near the disk M, between which the tongue L is hung, so as to move easily on the pivot K. The tongue L extends over the outside of the disk, or between it and the frame N which surrounds it. The edge of the disk M has a portion of its circumference fluted or grooved like a fine gear-wheel, and the inner face of the tongue L is fluted in a corresponding manner, so that the projections on one will lock into the grooves in the other when they are pressed together. A spring, R, is put on the inner end of the tongue L, if the weight of it, or the centrifugal force, is not sufficient to keep it clear of the disk when not moving the valves.

In the steam-boxes P P are the cut-off valves O O', which are connected to the frame N by rods passing through stuffing-boxes in the sides of the steam-boxes, in the usual way. The frame N is moved by the tongue L coming in contact with it at the points J J, for at whatever part of the disk the tongue may be when it comes in contact with the frame N, it will be pressed against the disk, and the projections and grooves interlocking, as before stated, the tongue will be held firm to the disk, so as to move the frame and close the valve at that end; but the instant the tongue has left the point of contact, it will be thrown clear of the disk by the spring, so as to be free to obey the regulator.

The position of the tongue L, with regard to the disk M, is determined by the balls D D, for if they fly out because of an increase of speed, they move the segment-wheel F, which turns the barrel H by the gear G, and advance the tongue L around the face of the disk, so that it arrives at the point of contact, J, sooner, and closes the cut-off valve at an earlier period of the stroke of the piston; that is, supposing the balls of the regulator to be in the position shown in fig. 1, then the several parts will be as shown at fig. 3, with the crank at Y, near the end of the stroke when the tongue L reaches J and closes the valve, but if, after the tongue passes J, there is a sudden increase of speed, and the balls take the position shown by the dotted lines, fig. 1, the tongue L will be carried to X, fig. 3, and will close the other valve by the time the crank has reached W on the return-stroke, which is at about one-eighth stroke.

A spring, S, is coiled around the barrel H, one end of which is fastened to the collar T, which is attached to the barrel, and the other end is secured to the stud *a* in the spindle A, which projects through an opening in the barrel. This spring is for the purpose of bringing the balls back when thrown out by an increase of speed, and operates by turning the barrel, and on the balls through the gear-wheel and segment before mentioned. By loosening the set-screw in the collar T, the collar may be turned on the barrel, and more or less tension put upon the spring, as required.

In this governor the shock of closing the valve is not thrown upon the arm and balls, nor are they influenced by it, but it is thrown upon the disk, which is driven by the main shaft with a positive motion. This prevents the vibration of the balls, often observed in some regulators, caused by lack of positive motion to move the valves, and depending, instead, more or less upon the inertia of the balls to operate the valves.

This feature (of positive motion) also adapts this regulator especially to engines running at high speed, as the cut-offs are operated with a correctness as to time of stroke not attainable when the valves are closed by springs or weights.

Having thus described my improved governor, what I claim as my invention, and desire to secure by Letters Patent, is—

1. I claim the disk M and tongue L, in combination with the frame N, substantially as herein described and for the purpose set forth.

2. I claim the combination of the segment-gear wheel F, gear-wheel G, and barrel H, arranged substantially as specified, and for the purpose set forth.

3. I claim the spring S, collar T, and barrel H, arranged substantially as described, and for the purpose set forth.

4. I claim the spring R, with tongue L, substantially as described, and for the purpose set forth.

LEONARD F. FULLER.

Witnesses:

J. LEON WADSWORTH,
FREDERIC FULLER.