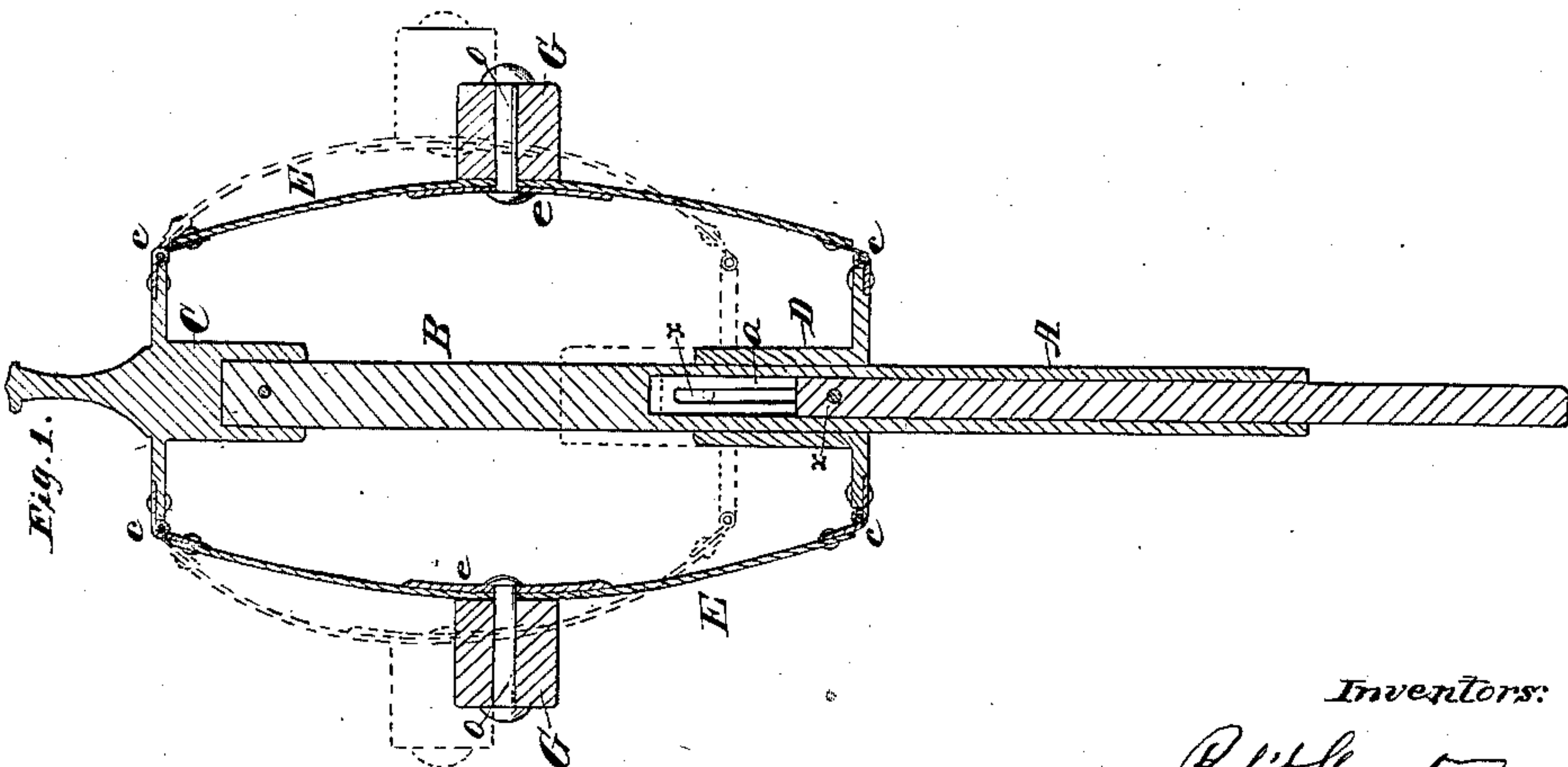
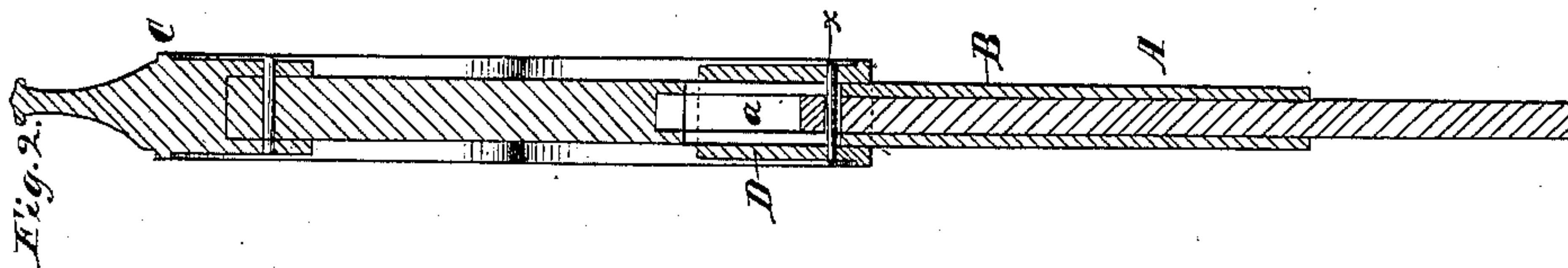


R. Stewart,

Governor.

N^o 65,444.

Patented June 4, 1867.



Witnesses:

*J. J. Stewart
J. G. Clayton*

Inventors:

*Robt Stewart
by
J. G. Clayton*

United States Patent Office.

ROBERT STEWART, OF ELMIRA, NEW YORK.

Letters Patent No. 65,444, dated June 4, 1867.

IMPROVEMENT IN 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, ROBERT STEWART, of Elmira, in the county of Chemung, and in the State of New York have invented certain new and useful Improvements in Governors for Steam Engines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, and to the letters of reference thereon marked.

Figure 1 is a vertical section, the operation being indicated by red lines.

Figure 2 is a section at right angles to the section shown by fig. 1.

My invention consists in a new mode of connecting the weight-balls of "governors" by means of elliptic springs and cross-heads to the rod which operates the valve to be governed.

In the drawings, A represents the valve-rod, which, by its rise and fall, opens and closes the valve. B is a hollow shaft, enclosing the upper part of the valve-rod A, and is vertically stationary, but horizontally revolves by power from the engine. C is a stationary cross-head, having two short arms, and is fixed to the top of the shaft B by means of a bolt. D is a similar cross-head, having arms of equal length of those of cross-head C. A pin, *x*, passes through this cross-head, and through slot *a* in the hollow shaft, and through the valve-rod A. E E are two flat elliptic springs, about three times the length of the cross-heads, to the opposite ends of which the ends of these springs are attached by hinges *c*. These springs are stiffened at their centres by means of an additional leaf, *e*. These springs are so arranged that the power of said springs is always active, being elliptical in shape, and hinged at each end to the cross-heads; they are very sensitive to action, even when the engine is at rest, so that when the engine comes to its proper motion the springs act readily, and lose no time in doing the work required of the governor. The centrifugal force by the weight of the balls comes directly into play, and the ease with which the springs move causes the work required to be done at once. These springs never lose their elasticity and force. G G are the weight-balls, of cylindrical form, and turning on axes *o* riveted to the centre of the springs E.

The operation of my improved governor is obvious, and is fully shown by red lines in the drawing. As the governor is revolved, centrifugal force separates the balls and opens the two springs in proportion to the velocity of the revolution, and raises the valve-rod, which is connected to the lower ends of the springs by the cross-head, thus opening and closing the valve in proportion to the velocity of the revolution. The combined result of the two hinged springs opposite each other, with the weight-balls turning on axes affixed to the springs, is to produce a more sensitive and quickly-operating action for a governor than I have heretofore known. The power is applied to the valve-rod with so much less loss than in other governors that I am enabled to make my machines very small and light.

Having thus fully described my invention, I do not claim broadly the use of springs in governors, but what I claim as new, and desire to secure by Letters Patent, is—

1. The elliptical springs E E, and hinges *c c*, when attached to cross-heads C D, constructed and operating as described, and for the purposes set forth.

2. The weight-balls G, operating in combination with the axes *o* and hinged-springs E, substantially as and for the purposes described.

3. The combination and arrangement of the hinged springs E E, and cross-heads C D, hollow shaft B, and valve-rod A, constructed and operating as described, and for the purposes set forth.

In testimony that I claim the above-described invention, I have hereunto signed my name this 18th day of December, 1866.

ROBERT STEWART.

Witnesses:

T. G. CLAYTON,

V. C. CLAYTON.