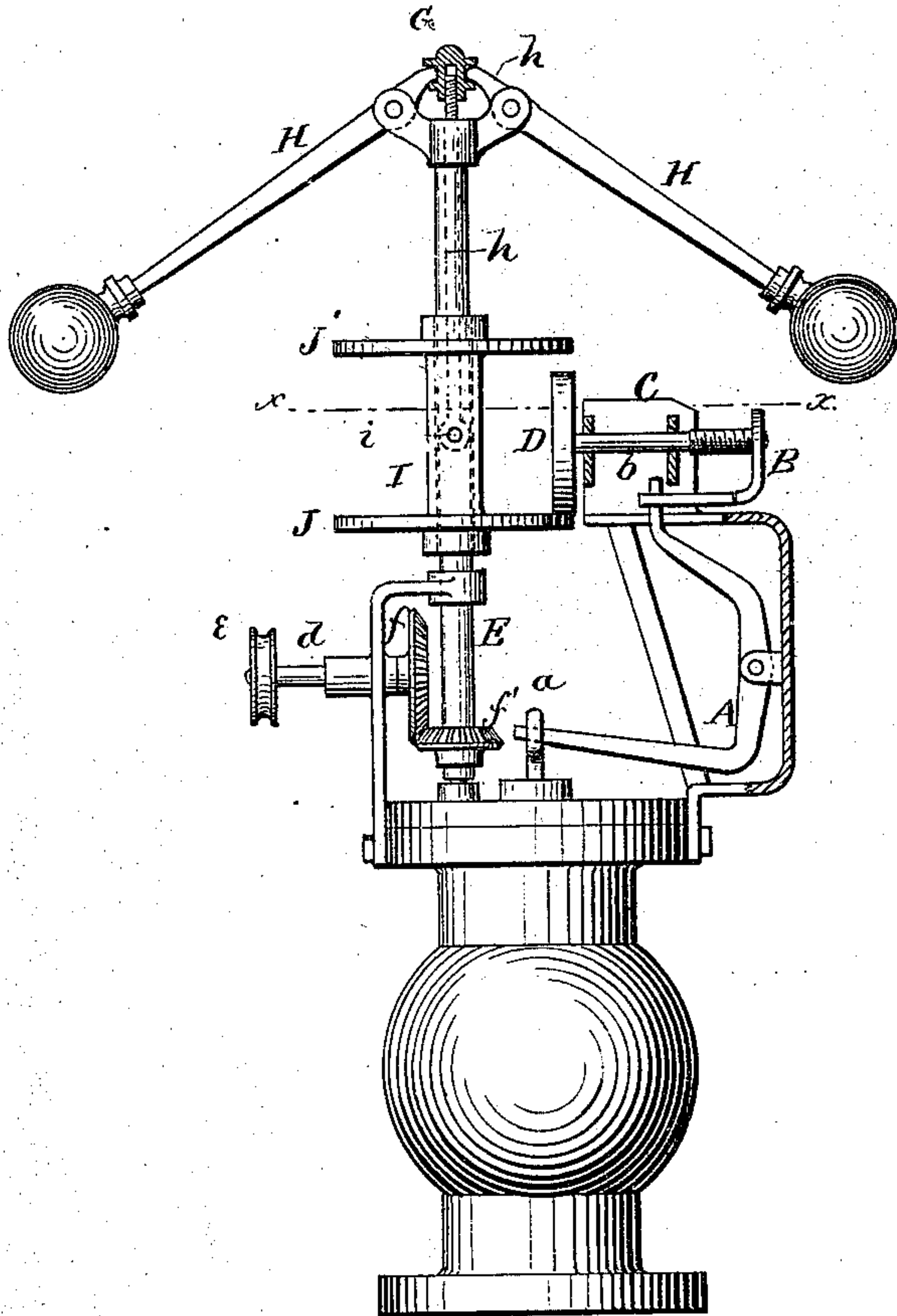


H. HOWE.  
GOVERNOR.

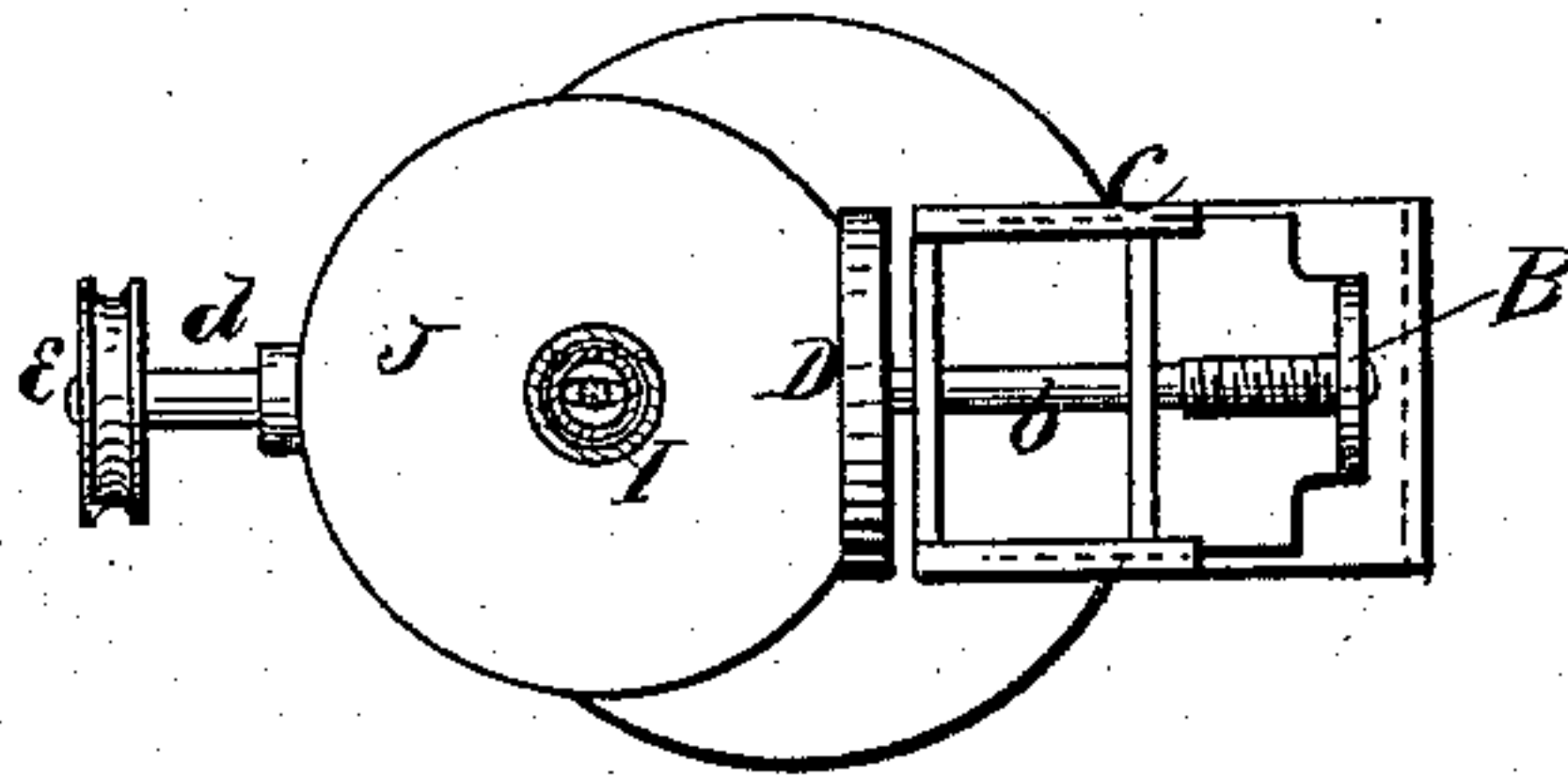
No. 176,957.

Patented May 2, 1876.

*Fig. 1.*



*Fig. 2.*



Witnesses:

C. L. Ewer,  
H. Neville Miller

Inventor's

Henry Howe,  
per Alexander Mason  
atys.

# UNITED STATES PATENT OFFICE.

HENRY HOWE, OF COUNCIL BLUFFS, IOWA.

## IMPROVEMENT IN GOVERNORS.

Specification forming part of Letters Patent No. **176,957**, dated May 2, 1876; application filed February 21, 1876.

*To all whom it may concern:*

Be it known that I, HENRY HOWE, of Council Bluffs, in the county of Pottawattamie, and in the State of Iowa, have invented certain new and useful Improvements in Governors; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

The nature of my invention consists in the construction and arrangement of a governor for steam-engines, water-power, &c., as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawing, in which—

Figure 1 is a side elevation of my governor. Fig. 2 is a horizontal section of the same through the line *x x*, Fig. 1.

*a* represents the stem or rod of the valve to be actuated by the governor, the upper end of which rod is hung on the lower end of a bent lever, A. This lever is pivoted, as shown, and its upper arm is placed in a slide, B, placed in a frame, C, and actuated by means of a screw-shaft, *b*, said shaft being placed in suitable bearings on the frame C, and provided on its inner end with a vertical friction-wheel, D. *d* is the shaft, with pulley *e*, through which motion is communicated to the governor, said shaft being, by miter or beveled gears *f f'*, connected with the upright shaft E of the governor.

The upper end of the shaft E is hollow, and has a rod, *h*, passing down into it. This rod has on its upper end a cap or knob, G, into holes in which the inner ends of the governor-arms H H are inserted, said governor-arms being pivoted to arms *k*, projecting from the upper end of the shaft E.

On the shaft E is placed a tube, I, with two horizontal disks, J J', and this tube is, by a pin, *i*, connected with the lower end of the rod *h*, said pin passing through a vertical slot in the shaft E. The position of the parts will be such that the disk J is below and the disk J' above the friction-wheel D.

When the governor revolves slowly the lower disk J is in contact with the disk D, rotating the screw-shaft *b*, so as to move the slide in the proper direction for opening the valve by means of the lever A. When the governor revolves faster, and the arms H rise, the tube I is thereby depressed, causing the disk J' to come in contact with the friction-wheel, and rotate the screw-shaft *b* in the opposite direction, and thereby closing the valve. As the speed then decreases, the movement is reversed again.

The head G will, in a working machine, be connected to the rod *h* by screw-threads, so that the tube, with its disks, may be raised and lowered at will, to increase or decrease the motion of the governor-arms, as the case may require.

By this governor a perfectly-regular motion is obtained under all circumstances. It will keep exactly the same motion of the engine, whether the steam is high or low, only so that there is steam enough to give it the desired speed with the valve wide open, or whether there is much load to pull, or none at all.

In a working machine the friction-wheel D will be so close to both the disks J J' that the least variation of speed will at once make the required change.

The frame C, in a full-sized working machine, will be in a slide, with a spiral spring on top, so that in case the governor-belt should break or run off the weight of the balls will force said frame upward, and thereby disconnect the slide from the crooked lever that works the valve-stem, so that the motion will be the same in such an event as if nothing had happened.

This governor, with a slight alteration, can be used as a governor for water-power as well as for steam.

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

1. The valve-stem *a*, sliding frame B, both connected by the bent lever A, the screw-shaft *b*, friction-wheel D, and disks J J', all substantially as and for the purposes herein set forth.

2. The combination of the rotating gov-



ernor-shaft E, with weighted arms H H, having their ends connected to the adjustable head G, rod *h*, and tube I, with disks J J', friction-wheel D, screw-shaft *b*, frame B, lever A, and valve-rod *a*, substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing I

have hereunto set my hand this 25th day of January, 1876.

HENRY HOWE.

Witnesses:

J. D. EDMUNDSON,

N. C. PERKINS.