

E. M. CLOUGH.
Throttle Valve.

No. 237,250.

Patented Feb. 1, 1881.

Fig. 1.

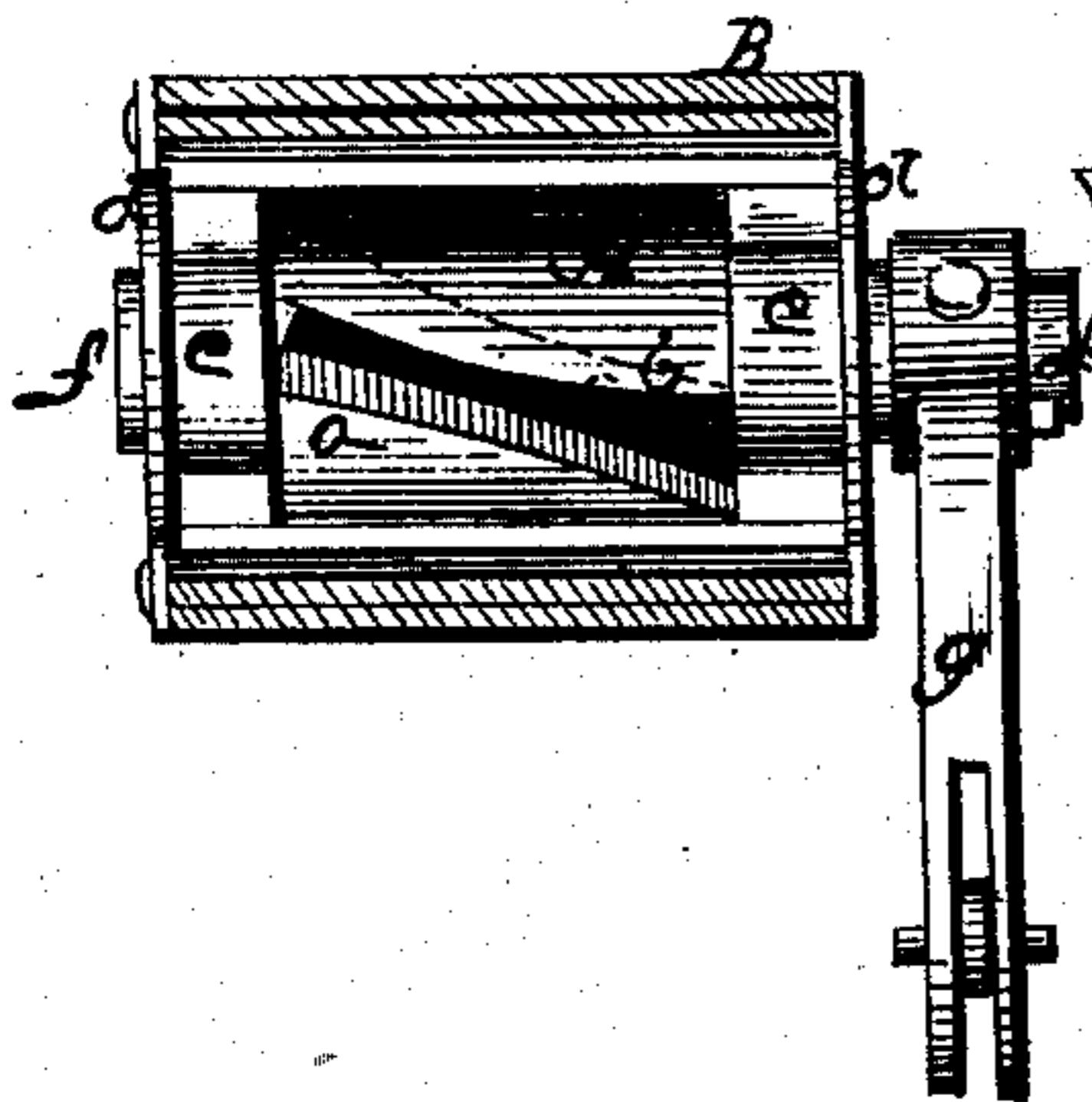


Fig. 2.

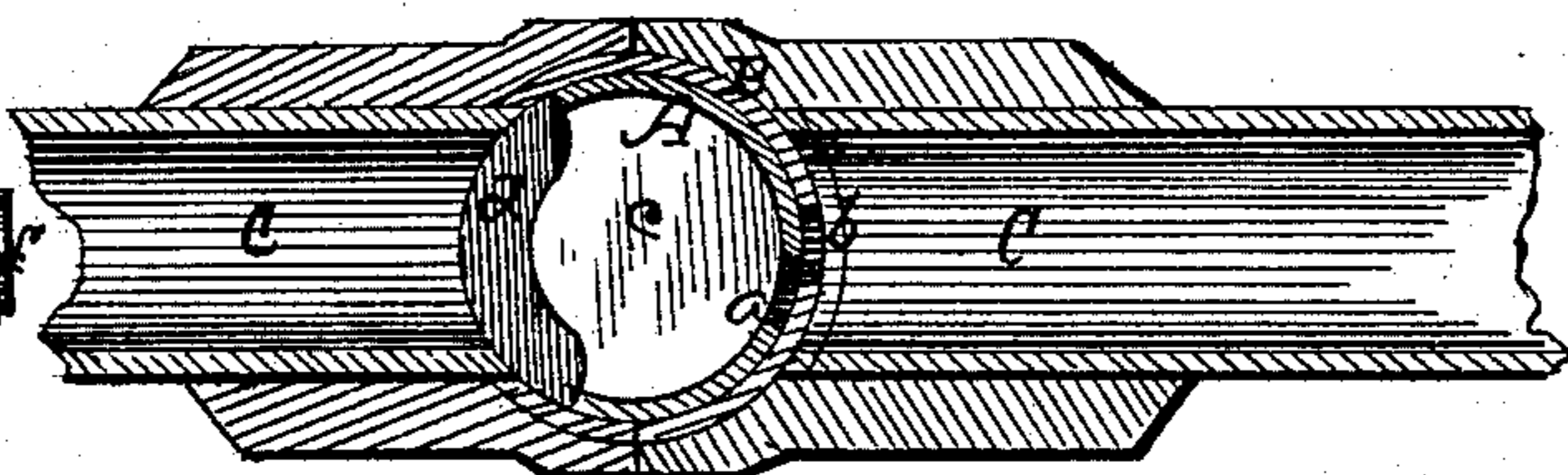


Fig. 5.

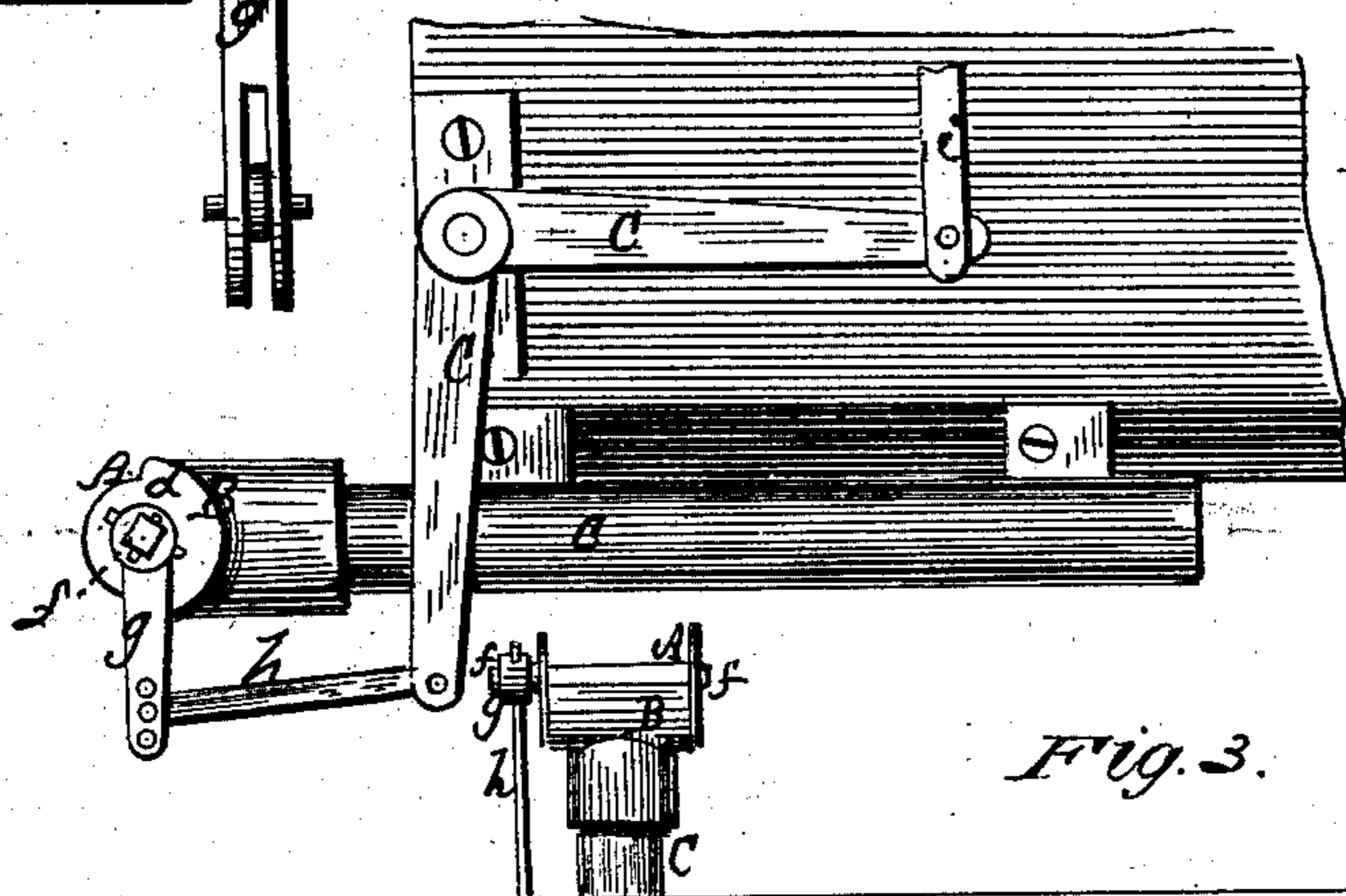


Fig. 3.

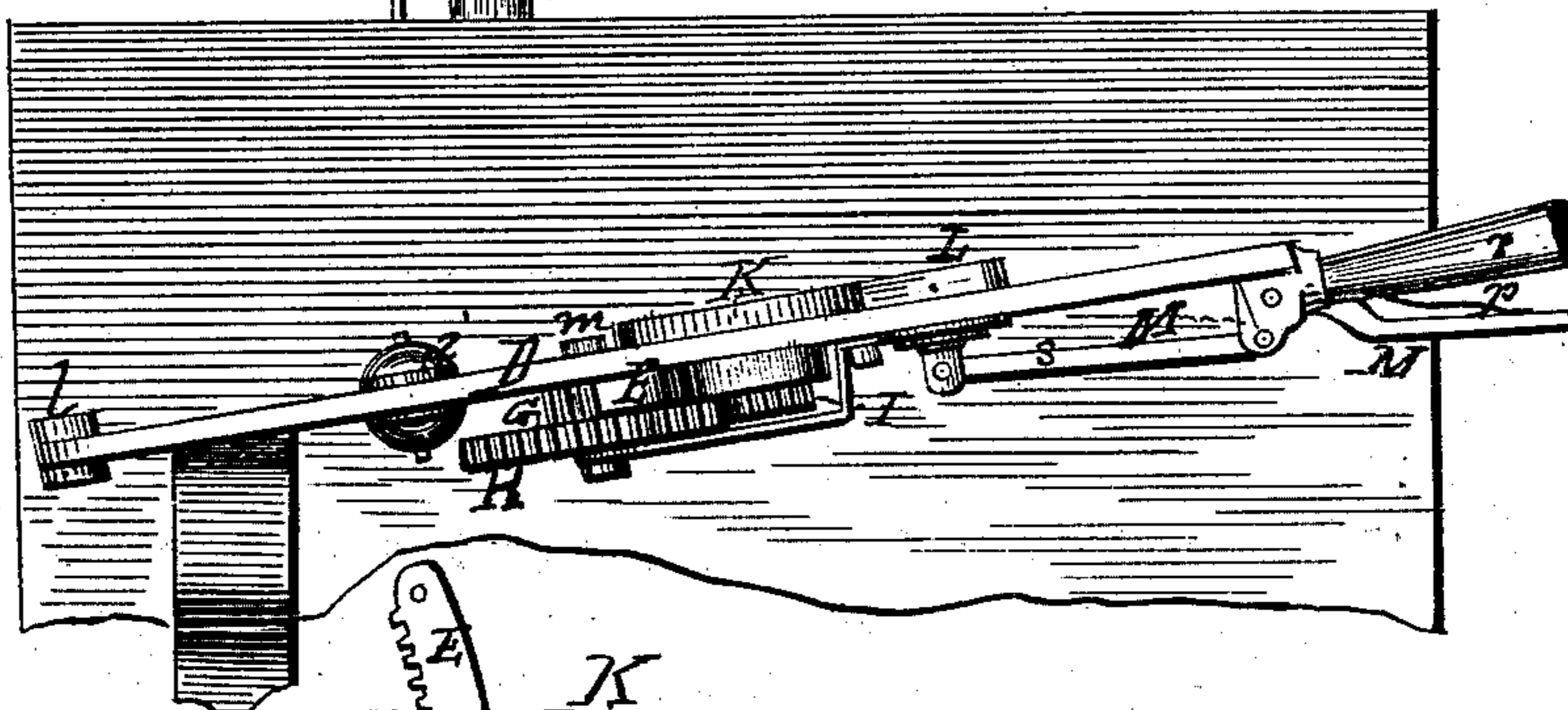
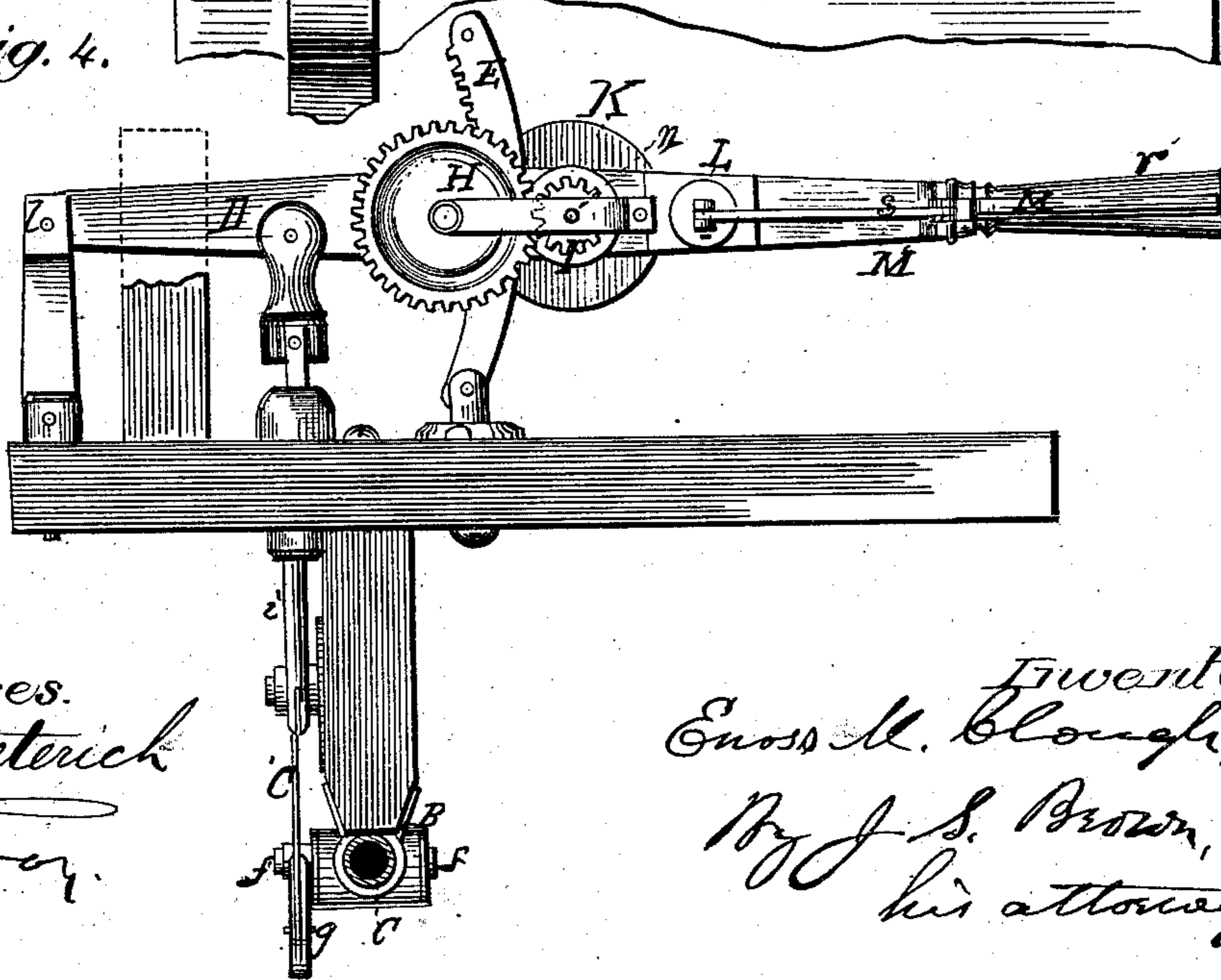


Fig. 4.



Witnesses.
Fred. G. Dietrich
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Inventor,
E. M. Clough,
By J. S. Brown,
his attorney.

UNITED STATES PATENT OFFICE.

ENOSS M. CLOUGH, OF MEREDITH, NEW HAMPSHIRE.

THROTTLE-VALVE.

SPECIFICATION forming part of Letters Patent No. 237,250, dated February 1, 1881.

Application filed October 18, 1879.

To all whom it may concern:

Be it known that I, ENOSS M. CLOUGH, of Meredith, in the county of Belknap and State of New Hampshire, have invented an Improved Throttle-Valve and device for regulating the same; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings making part of this specification—

Figure 1 being a section of the throttle-valve box in a line across the steam-pipe, showing a side view of the valve itself; Fig. 2, a section of the same in line with the steam-pipe; Fig. 3, a side view of the improved device for operating and regulating the valve; Fig. 4, a view of the same at right angles to the view in Fig. 3; Fig. 5, a view showing the means of connecting the valve with the operating and controlling device.

Like letters designate corresponding parts in all of the figures.

The throttle-valve is constructed with a partial (half, more or less,) hollow cylinder or tube, A, fitting and turning or vibrating in an entire inclosing or surrounding cylinder, B, the latter cylinder being connected transversely, by preference with and uniting two parts of the steam-pipe C, and the two cylinders having valve-apertures *a b*, respectively, in their peripheries, and arranged to coincide when the inner cylinder is turned to open the valve communication, but each opening to be closed by the other cylinder when the inner cylinder is moved to close the valve communication. The aperture *a* in the interior moving cylinder is wider at one end than at the other, while the other aperture, *b*, is of uniform width, or vice versa, so that on turning the inner cylinder the opening of the valve-aperture commences at one end and gradually extends to the other end, whereby the steam is let on and cut off gradually. The inner valve-cylinder has close ends or heads *c c* fitting closely the ends or heads *d d* of the inclosing outer cylinder, and trunnions or journals *f f* project from the heads *c c*, to turn in holes or bearings in the heads *d d*. One of these trunnions is provided with a projecting arm or crank-lever, *g*, outside, by which the movement is communicated to the valve. As represented in the drawings,

this arm is connected with a crank-lever, C, by a connecting-rod, *h*, pivoted to one end of the said lever, while the other end thereof is pivoted to a rod, *i*, extending to and connected with the hand-lever D, for actuating and regulating the throttle-valve.

My improved device for regulating the valve is as follows: A curved rack, E, is mounted on a fixed support in a position near one side of the hand-lever D, and is formed and arranged concentric with the pivot *l* of the said lever. A pinion, G, is mounted on a pivot, *m*, projecting from the lever so as to gear into the said rack in whatever position the hand-lever may be, and of course to turn, as it travels over the rack, when the lever is moved. Formed or connected with this pinion is a cog-wheel, H, and consequently turning therewith. This cog-wheel gears into another cog-wheel or pinion, I, of smaller diameter (as many times as desired) on a shaft, *n*, which is also mounted and turns in a bearing of the hand-lever; and on this same shaft is secured a friction disk or cylinder, K, against which bears a friction rubber or brake, L, that slides on the lever to and from the disk, being pressed to the said disk by a spring, *p*, arranged in any convenient manner, but as represented in connection with a small lever, M, at the side of the handle *r* of the hand-lever, the short arm of this small lever being connected with a projection of the slide rubber or brake L by a connecting-rod, *s*. The arrangement of this side lever is such that the engineer, while holding the handle of the hand-lever, can, by simply pressing the said side lever toward the handle, release the friction-brake from contact with the disk K, and thereby allow the wheels and pinion to turn freely, and consequently the hand-lever and valve to freely move; but the moment that the side lever is set free its spring forces the brake up to the friction-disk K, and immediately stops the movement of the hand-lever, and holds the valve immovably in the position to which it is at the moment brought. The relative sizes of the cog-wheels H and I are such as to give the friction-disk K any speed required, so that a very slight pressure of the friction-brake on the disk will securely hold the hand-lever and valve in any position, and at the same time

the brake is withdrawn by a slight effort of the engineer.

Any degree of speeding up the motion of the friction-disk by any number and size of gear-wheels may be employed; but the construction shown is ordinarily sufficient for the purpose.

The rack E may be pivoted to its support to give freedom of movement to the pinion G. It is then held by suitable guides, as shown, or otherwise.

A friction-brake for retaining the valve-lever in position has before been employed, the brake-rubber acting on a disk caused to revolve by a pinion thereon acting on an angularly stationary rack; but such a device not only requires a strong pressure of the brake, making it hard to relieve, but the brake is apt to slip at any time and not hold the valve securely. Besides, no very accurate adjustment of the valve can be made thereby, which requires a movement of the lever very nice and careful to adjust the valve; but my speeding

mechanism renders the movement of the friction-disk rapid with a slow movement of the lever, and a very slight pressure of the brake-rubber holds the lever securely and immovably in place. Again, the great motion of the friction-disk being readily apparent to the eye enables the engineer to make a very nice adjustment of the valve with great facility.

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

In combination with the stationary rack E, valve-operating lever D, friction-disk K, and rubber brake L, the multiplying-gear H I, for communicating increased speed from the rack-pinion G to the friction-disk, substantially as and for the purpose herein specified.

The foregoing specification signed by me this 15th day of September, 1879.

ENOSS M. CLOUGH.

Witnesses:

SAMUEL C. CLARK,
THOMAS HAM.