

A. B. WOOD.
Oscillating Engine.

No. 230,515.

Patented July 27, 1880.

Fig. 1.

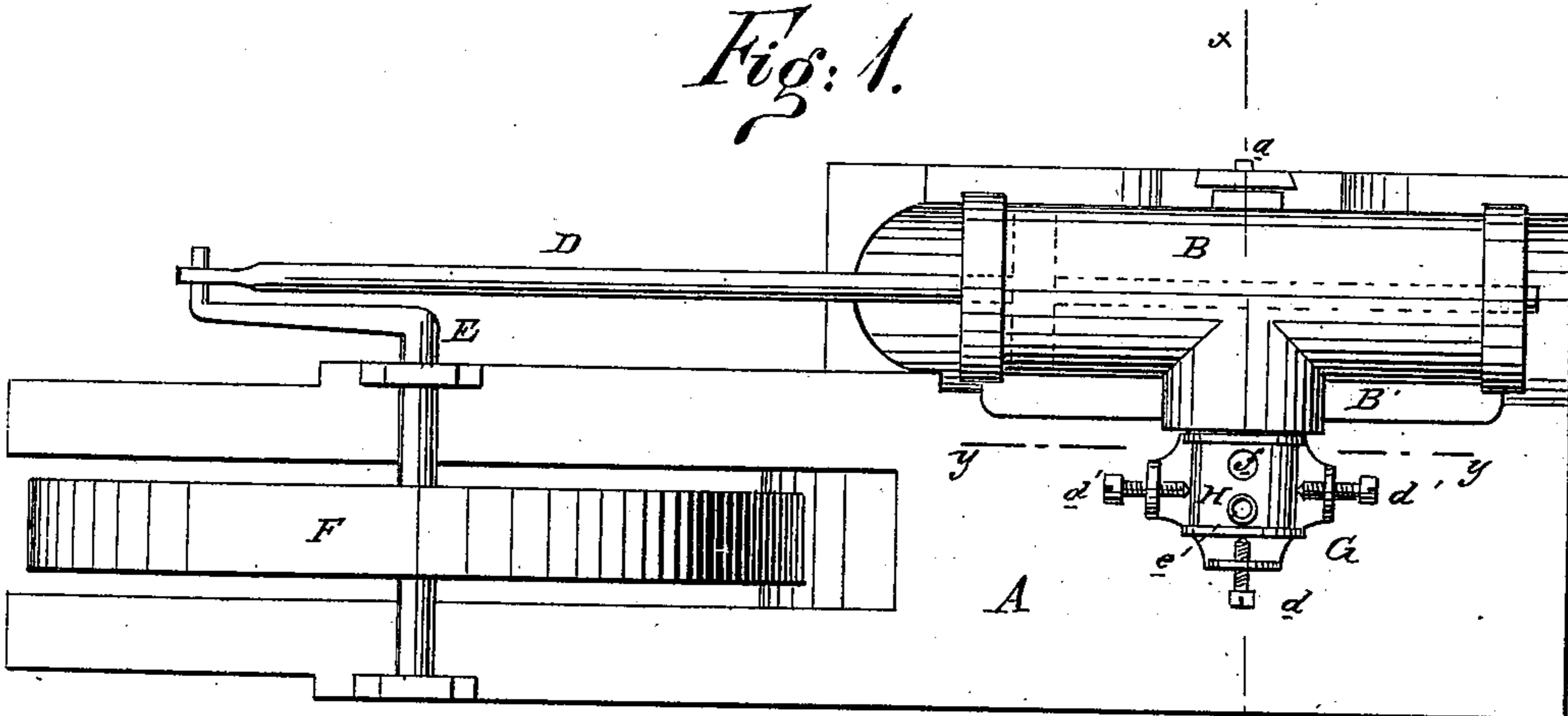


Fig. 2.

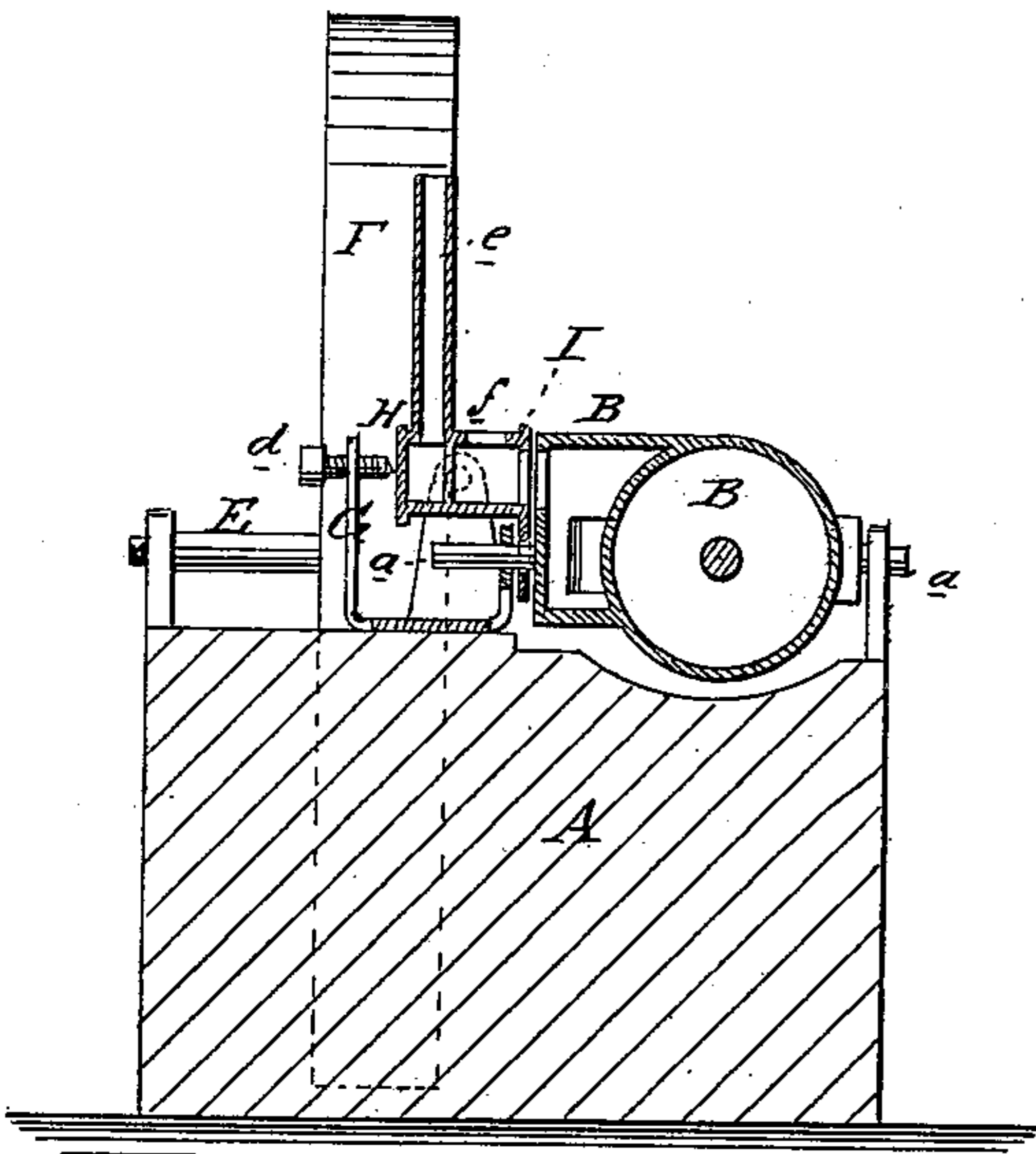


Fig. 3.

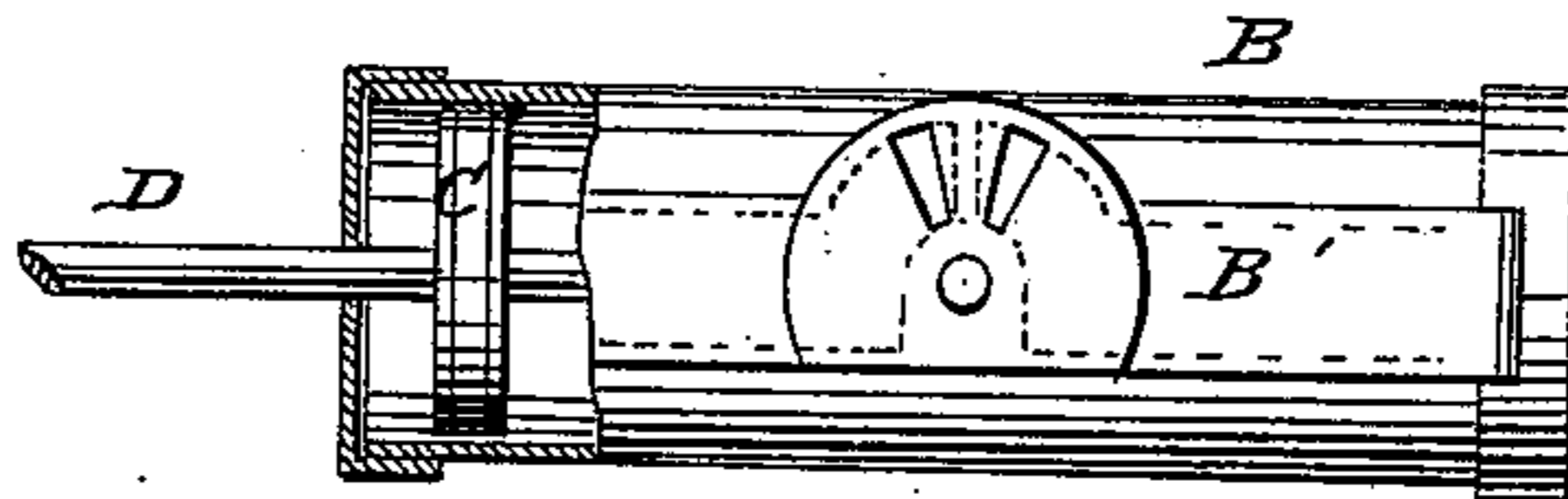


Fig. 4.

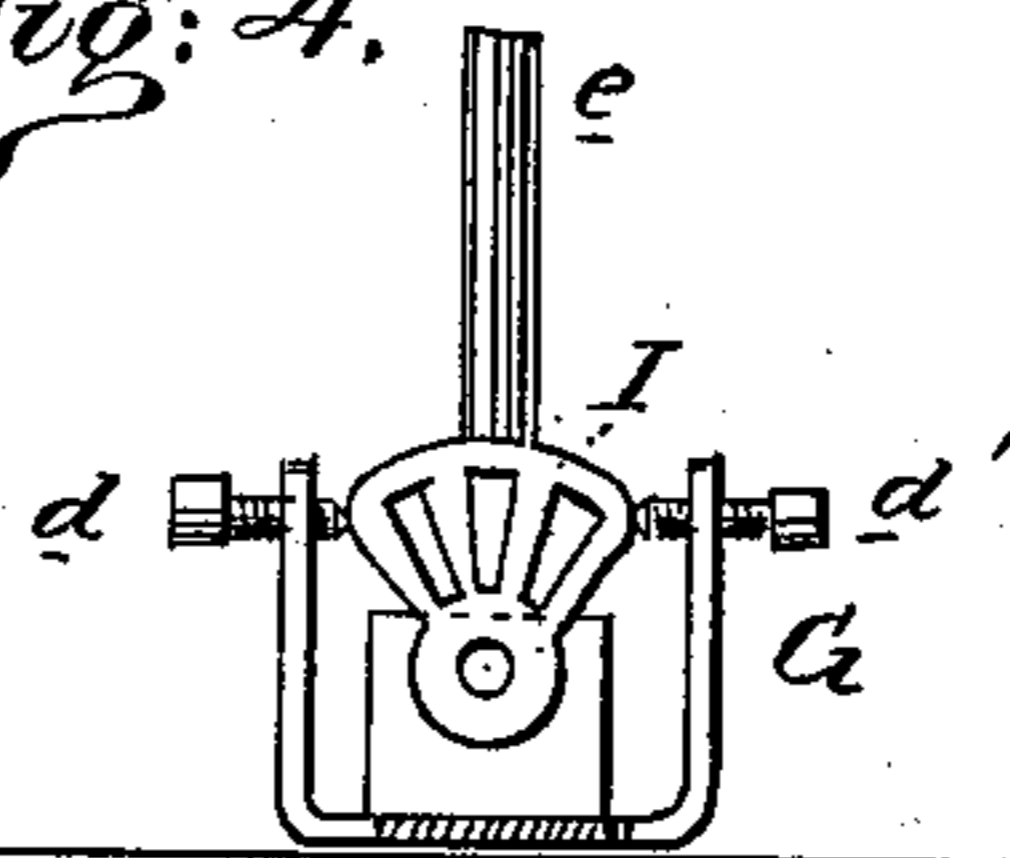
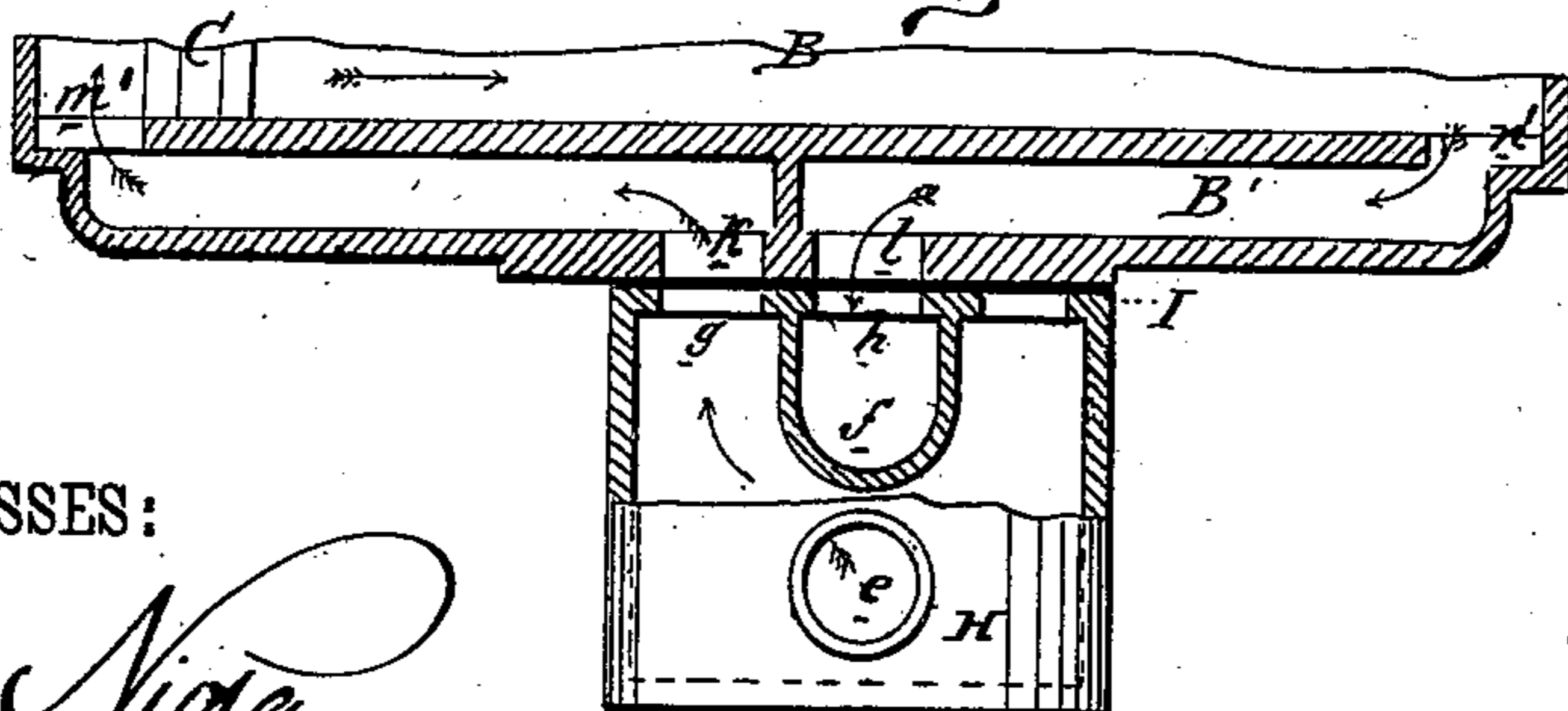


Fig. 5.



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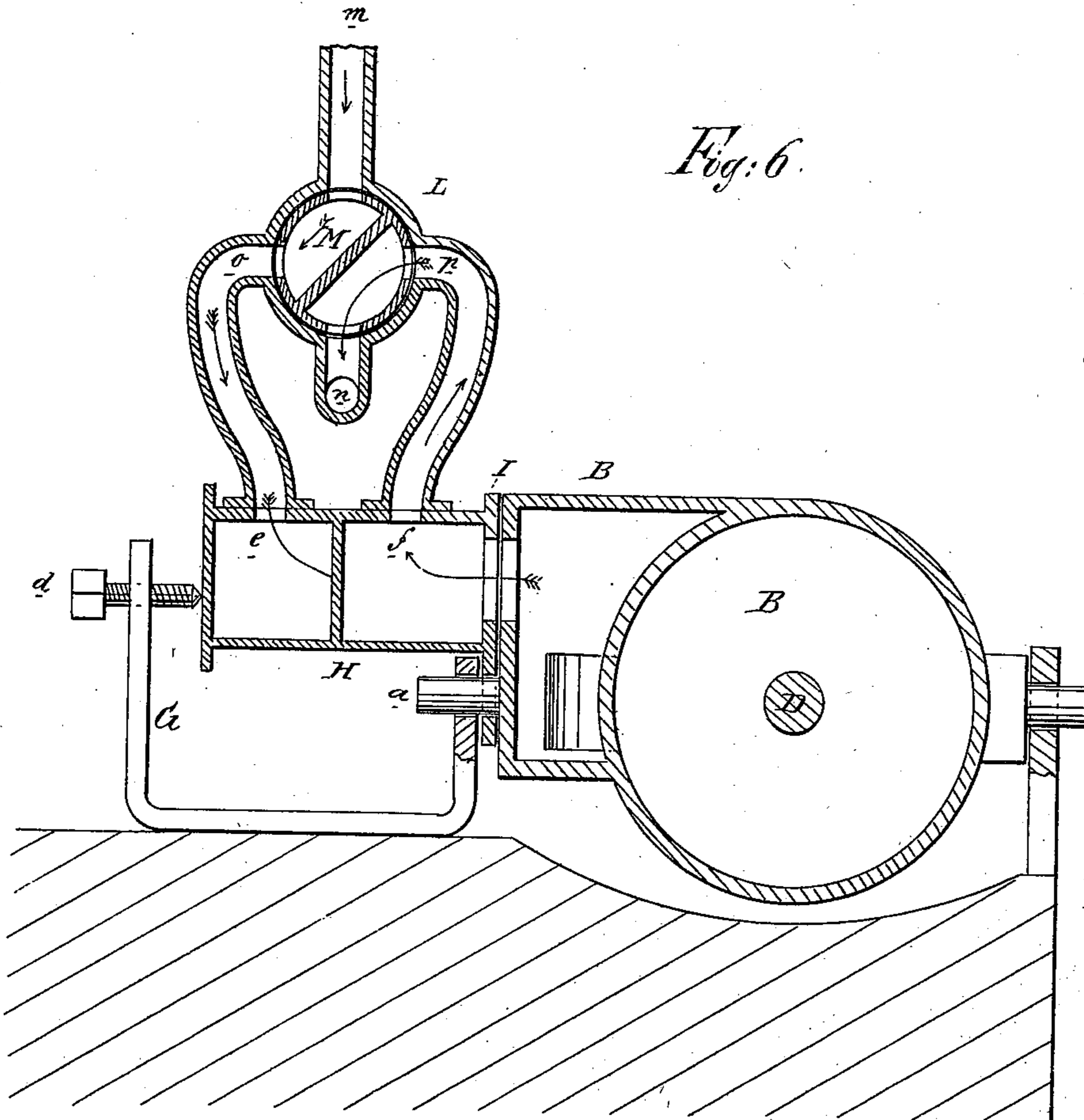


Fig. 6.

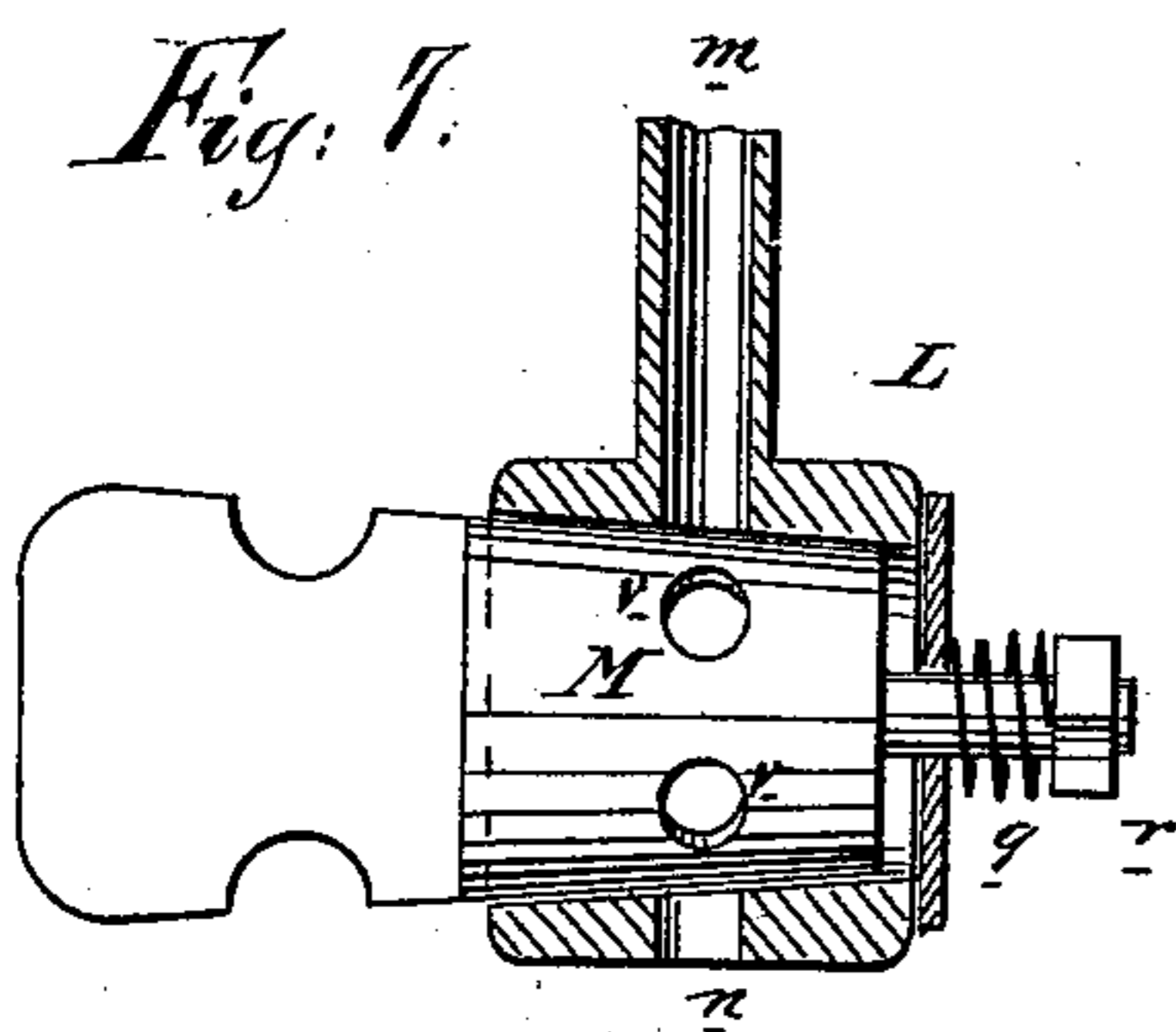


Fig. 7.

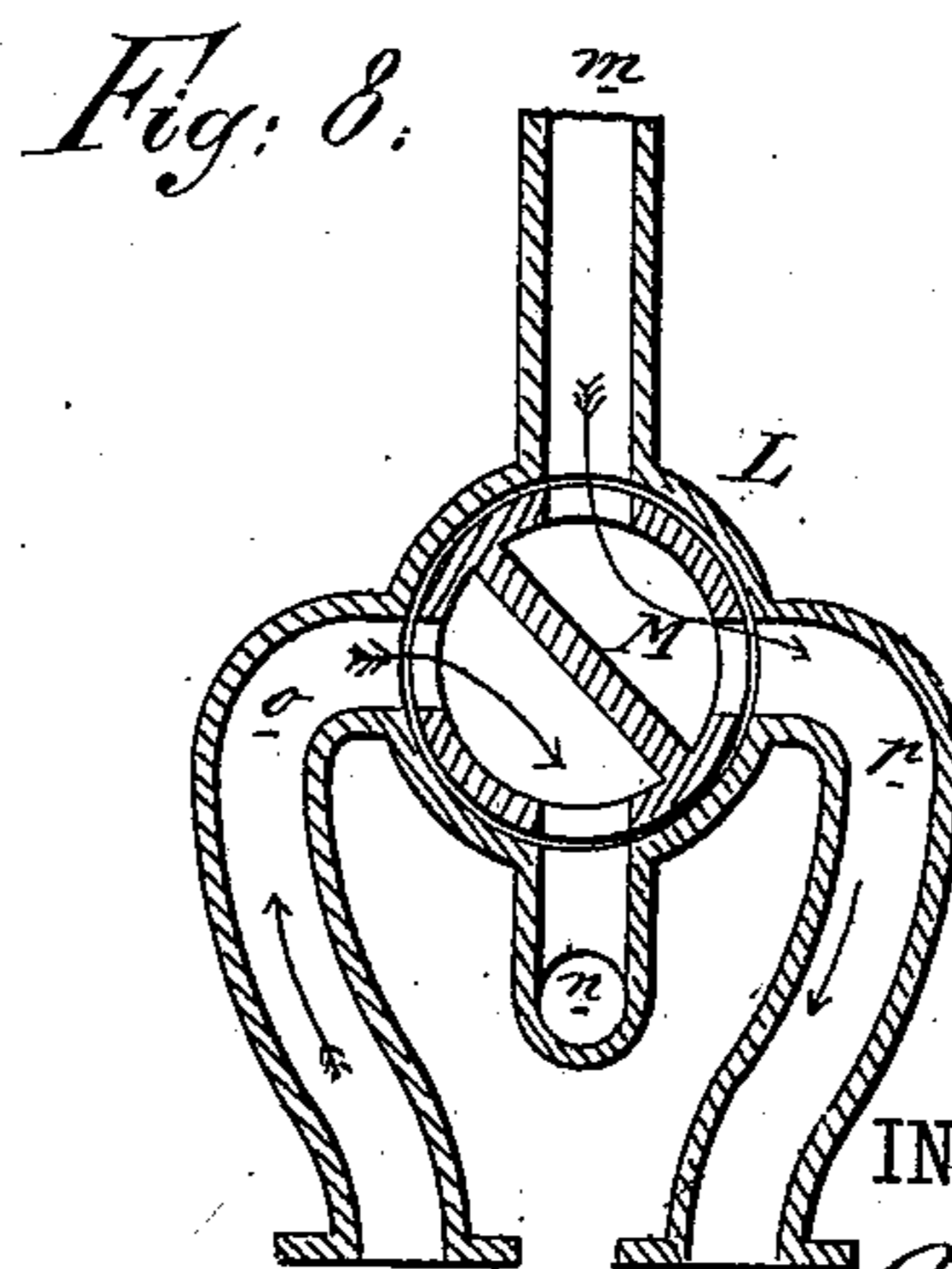


Fig. 8.

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UNITED STATES PATENT OFFICE.

AUGUSTUS B. WOOD, OF FOUNTAIN HILL, ARKANSAS.

OSCILLATING ENGINE.

SPECIFICATION forming part of Letters Patent No. 230,515, dated July 27, 1880.

Application filed December 1, 1879.

To all whom it may concern:

Be it known that I, AUGUSTUS B. WOOD, of Fountain Hill, in the county of Ashley and State of Arkansas, have invented a new and Improved Oscillating Engine, of which the following is a specification.

Figure 1 is a plan of the engine. Fig. 2 is a transverse vertical section on line *x x*, Fig. 1. Fig. 3 is a longitudinal elevation, partly in section, of the valve side of the cylinder. Fig. 4 is an end elevation of the valve-chest on line *y y*, Fig. 1. Fig. 5 is an enlarged horizontal plan, partly in section, of the valve-chest, steam-chest, and a portion of the cylinder. Fig. 6 represents a sectional end elevation of a reversing throttle-valve connected with the valve-chest of the engine and set for the reverse motion of the engine. Fig. 7 is a side elevation of the throttle-valve in position. Fig. 8 represents a sectional end elevation of the reversing throttle-valve set for the forward motion of the engine.

Similar letters of reference indicate corresponding parts.

The object of this invention is to provide a cheap and economical oscillating engine that is furnished with a valve so arranged and controlled that its friction and pressure upon the valve-seat are reduced simply to that which is necessary for preserving a steam-tight joint between the two.

The invention consists of a valve-chest having rigidly fixed in its face a quadrant-shaped valve, said valve-chest being supported by a trunnion of the engine in such a manner as to be capable of being pressed by set-screws and springs against the valve-seat on the engine-cylinder, so that the pressure of the valve upon the valve-seat may be adjusted at will independently of the steam-pressure.

In the drawings, A represents the bed-plate of the engine; B, the cylinder, moving on trunnions *a*, and having a steam-chest, B', attached to it. C is the piston; D, the piston-rod; E, the crank-shaft; F, the driving-wheel; G, the pillow-block which supports one of the trunnions *a*, and through which are passed the adjusting set-screws *d d'*, whose points bear against the valve-chest H and serve to adjust it in relation to the steam-chest B'.

e is the steam-supply, and *f* the exhaust-port, and I is the valve fixed in the face of the valve-chest H.

The direction of the steam entering and exhausting from the engine is not unlike that taken in other oscillating engines, as shown by the arrows in Fig. 5. In a half-stroke of the engine the steam, entering at the pipe *e*, passes through the port *g* of the valve I, thence through the port *k* of the steam-chest B', and thence into the cylinder B by the port *m*, the exhaust at the same time escaping through port *n* and ports *l h f* in succession, the port *h* of the valve I being always an exhaust-port, and the ports *J i* always supply-ports, while the ports *m'* and *n'* of the steam-chest B' are alternately supply and exhaust ports. The tendency of the entering steam is to force the valve-chest H apart from the steam-chest B', and hence in similar engines the valve is ordinarily set against the valve-seat on the steam-chest with sufficient constant pressure to always assure a steam-tight joint; consequently in such cases a valve whose frictional pressure absorbs but a low percentage of the power under a high pressure of steam consumes a very large percentage of the power when the steam-pressure is low. In this improvement, however, the valve-chest H, and with it the valve I, may be pressed against the valve-seat of the engine with a pressure made to correspond with the pressure of the steam; and it is found that a pressure excited by the set-screw *d* of two pounds or thereabout in excess of the pressure of the steam in the cylinder B is sufficient to keep the joint between the valve I and the steam-chest B' sufficiently steam-tight.

The pillow-block G may offer elastic or spring supports to the set-screw *d*, or a spring may be inserted between the end of the set-screw *d* and the valve-chest H, to serve the purpose of permitting an elastic rather than a rigid adjustment of the valve I. The set-screws *d'* serve for lateral adjustment of the said valve I, to make it cut off steam on each center. Against the opposite trunnion *a* from the valve-chest H a set-screw and spring may also be fixed, to counteract the pressure of the set-screw on the opposite side.

It is found in practice that with this adjustable valve properly arranged, as herein set forth, with set-screws and springs, a gain of nearly twenty-five per cent. in power is made over an engine with ordinary valve-construction, when running with high steam-pressure; and this form of valve-construction is found to be much cheaper than the ordinary one.

A reversing device for the engine is shown in Figs. 6, 7, and 8, and is connected by suitable pipes to the valve-chest H, in the manner indicated in Fig. 6, wherein L represents the throttle-valve shell and M the throttle-valve, provided with ports *v*, to correspond with the ports of the valve-shell.

The pipe *m* is always the steam-supply pipe, and the opening *n* always the exhaust, while the pipes *o p* may be either supply or exhaust. The throttle-valve M is made slightly tapering, and has a spiral spring, *q*, held on its stem by a nut, *r*, to keep it steam-tight in the valve-seat.

In Fig. 6 it will be seen by the direction of the arrows that the valve is set so that a forward motion is given to the engine, while in Fig. 8 the throttle-valve M is shown turned back to give the engine a reverse motion, as indicated by the arrows. If the said throttle M be turned so that the partition *s* is set in a vertical or horizontal position, all the supply and exhaust ports are thereby closed and the engine will stop.

To run the engine with a forward movement

the throttle M may be turned to the left an eighth part of a circle and then the ports of the throttle and the valve-shell all connect, and the steam has free movement through the ports, as desired.

In order to reverse the motion of the engine the throttle M may be turned back to its primary position, when the steam will be all cut off; then turn the throttle an eighth part of a circle farther to the right and a reverse motion to the engine will be given; or the throttle M may be turned continuously to the right or the left, and the same effects will be produced, turning it an eighth of a circle at a time, one-eighth to cut off and one-eighth to put the engine in motion.

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

1. The steam-chest of an oscillating engine supported by a trunnion and an adjusting-screw at right angles to the axis of the cylinder, and in line with the axis by additional set-screws, as shown, and for the purpose specified.

2. The adjustable valve-chest H of an oscillating engine, divided into two compartments, each connected by a pipe and ports with the valve M, for reversing the engine, as specified.

AUGUSTUS B. WOOD.

Witnesses:

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