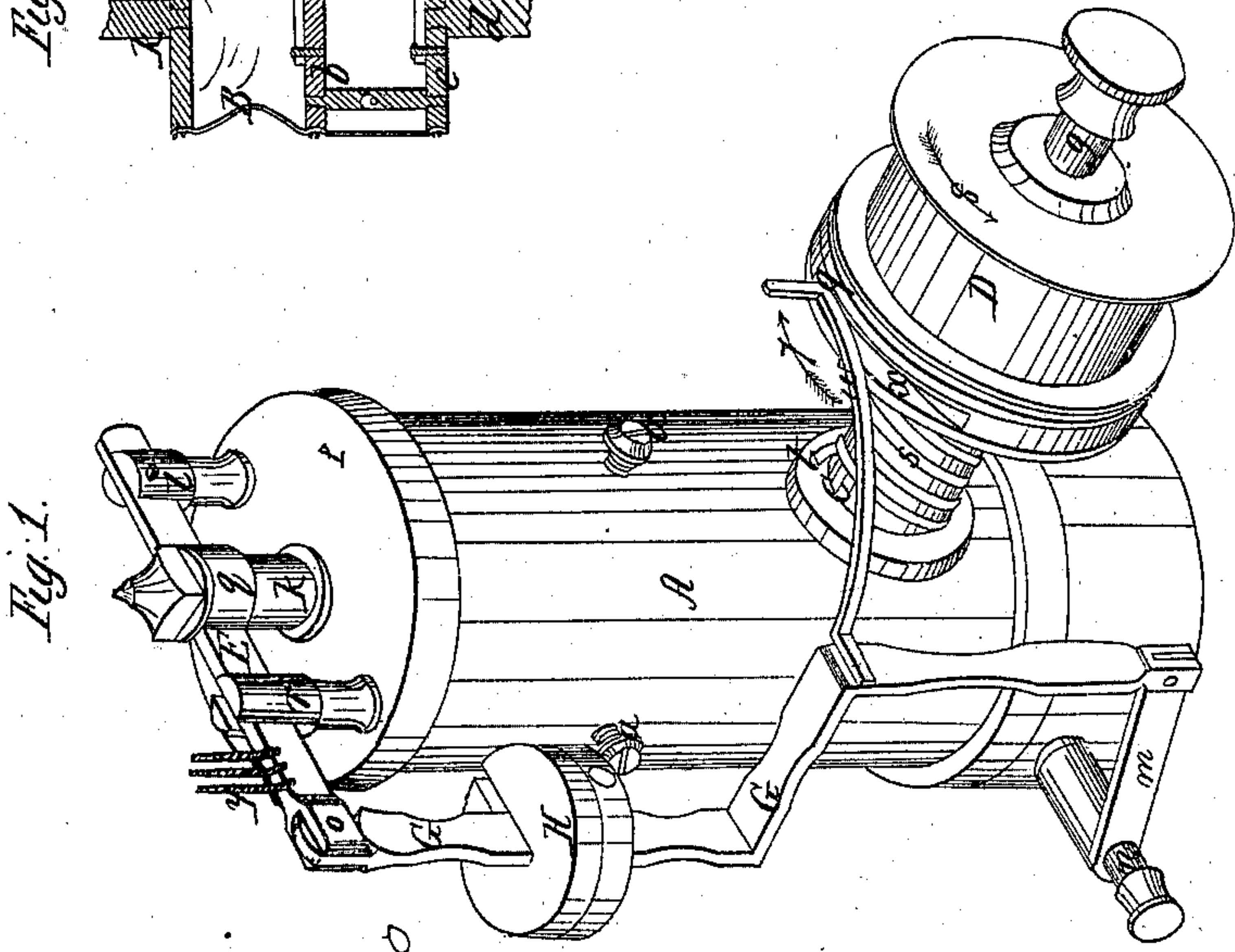
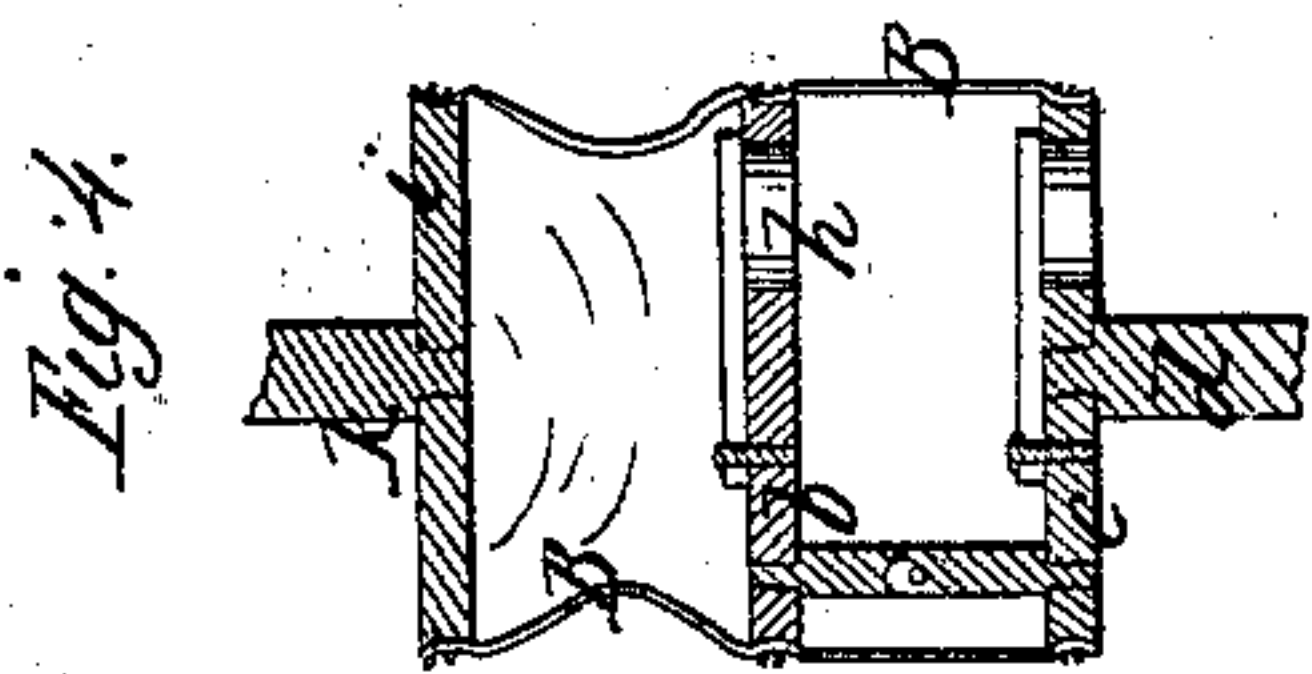
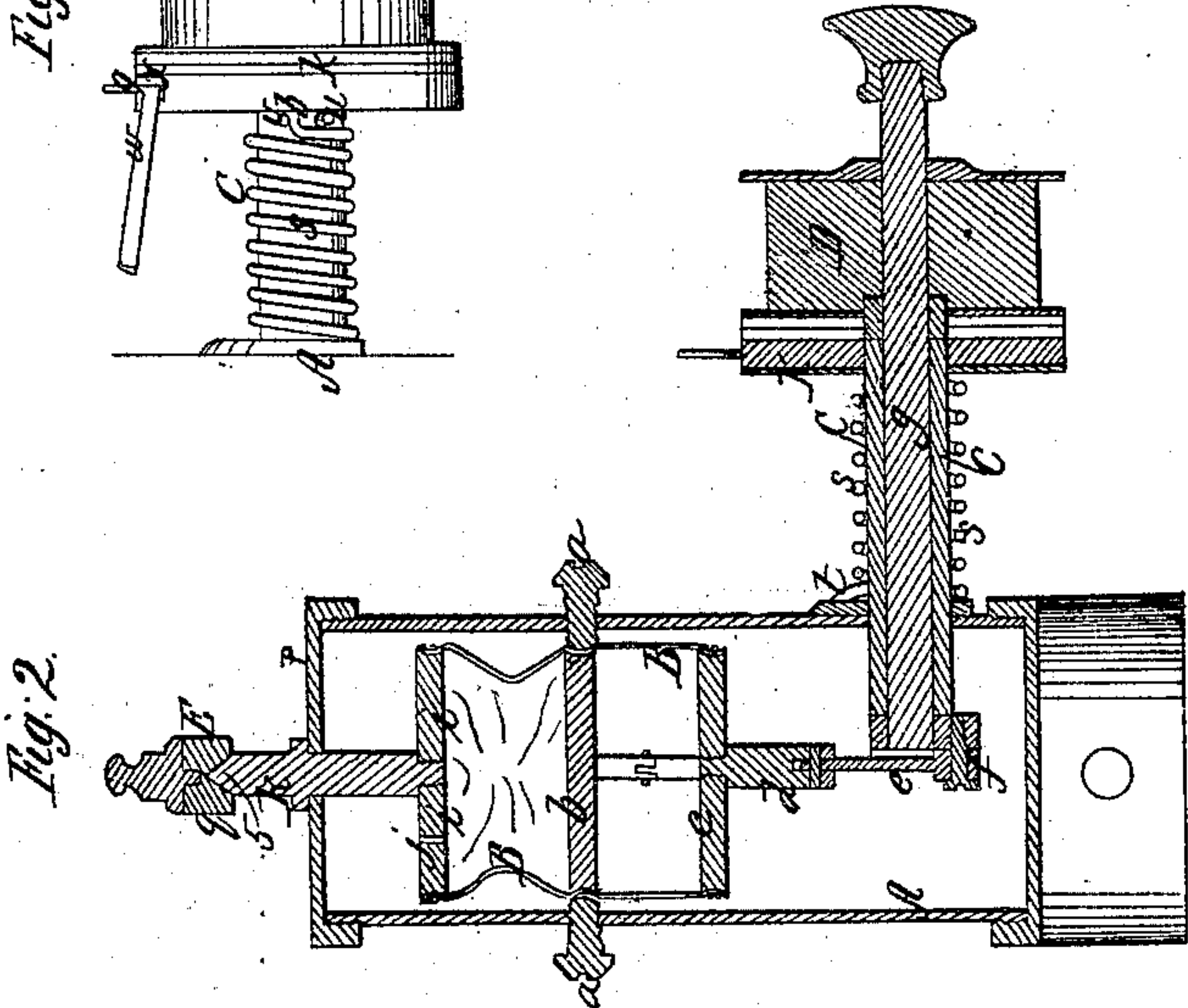
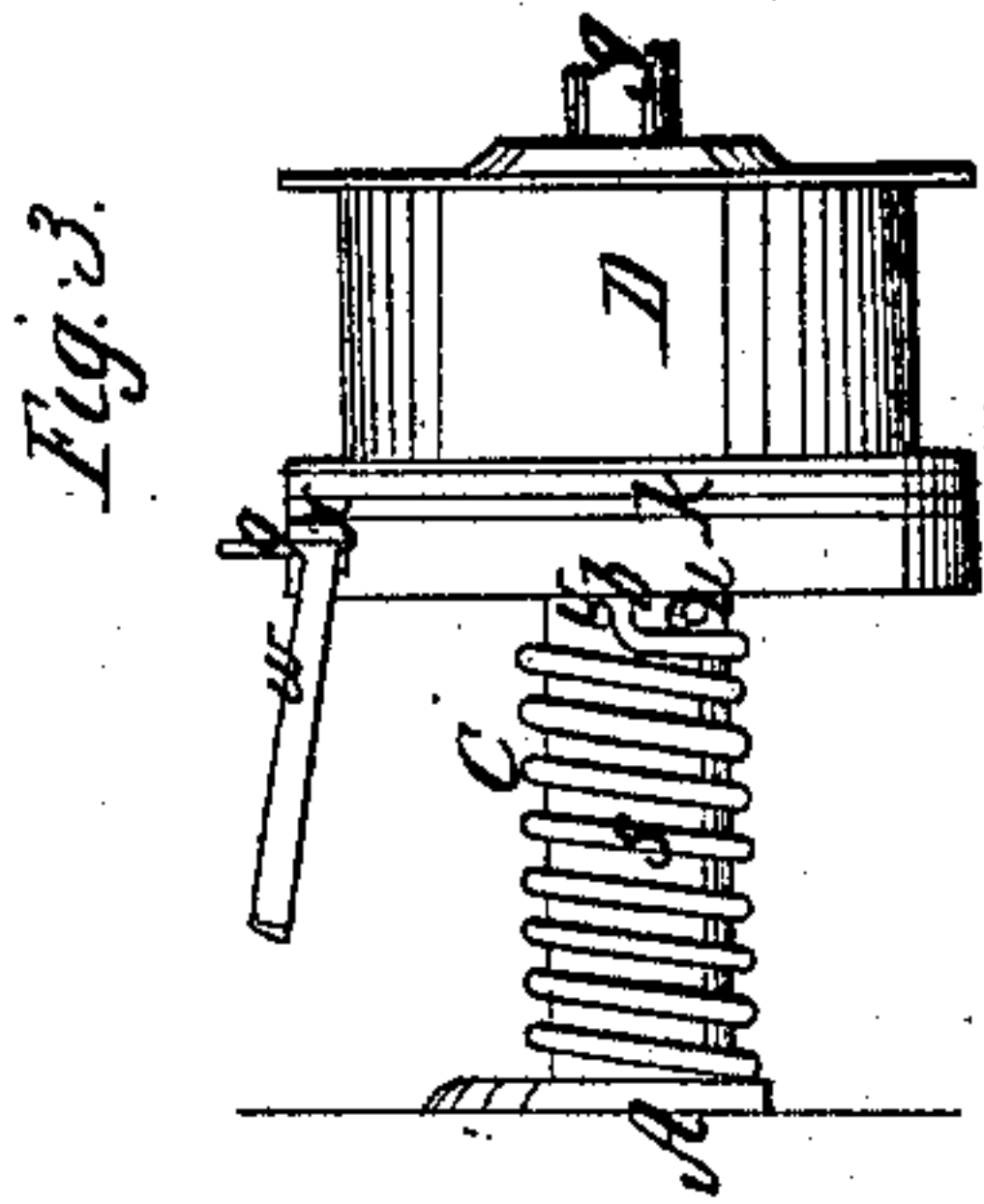


J. A. Marden.

Steam Engine Governor.

N^o 88,495.

Patented Mar 30, 1869.



Witnesses;
H. C. Cambridge
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United States Patent Office.

JEREMIAH A. MARDEN, OF BOSTON, MASSACHUSETTS, ASSIGNOR
TO JOHN H. AND CHARLES E. ABBOTT, OF SAME PLACE.

Letters Patent No. 88,495, dated March 30, 1869.

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, JEREMIAH A. MARDEN, of Boston, in the county of Suffolk, and State of Massachusetts, have invented an Improved Governor and Stop-Motion for Steam-Engines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a perspective view of my improved governor for steam-engines.

Figure 2 is a vertical section through the centre of the same.

Figures 3 and 4, details, to be referred to.

This invention relates to certain improvements in governors for steam-engines; and consists in operating the steam-valve by the pressure of air, acting on suitable mechanism connected with the valve, the pressure being produced by a bellows, fan, air-pump, or other suitable device, operated by the engine, so that the rate of speed of the latter will regulate the pressure of the air, and thus cause the valve to be opened or closed more or less as required; and

My invention also consists in a stop-motion, so arranged, that in the event of the breakage of the belt or other connection between the engine and the governor, the valve will be instantly closed; a means being also provided for closing the valve from parts of the building located at a distance from the engine-room, for the purpose of avoiding the delay of communicating with the engineer, in case of accident.

To enable others skilled in the art to understand and use my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawings—

A represents a cylinder, placed immediately over the steam-valve.

Within this cylinder is a bellows, B, which is secured in place by means of screws, *a*, passing through from the exterior of the cylinder, and bearing against the central disk, or plate *b* of the bellows.

To the lower plate *c* of the bellows is secured a post, *d*, which is connected, by a rod, *e*, with a crank, *f*, on the end of a horizontal shaft, *g*, which revolves within a hollow bearing, C, projecting from the side of the cylinder A, and carries, at its outer end, a pulley, D, which is driven by a belt (not shown) from the engine, so that, as the speed of the latter increases, the bellows will be operated more rapidly, and a proportionately larger quantity of air will be forced through the valve *h*, fig. 4, in the central disk *b*, thus increasing the pressure of the air between it and the upper disk *i*, which is consequently raised, carrying with it the vertical post *k*, attached thereto, and lifting a lever, E, one end of which is pivoted to a vertical post, *l*, the other end being secured to a bent connecting-rod, G, which is pivoted at its lower end to an arm, *m*, on the end of

the stem *n* of the steam-valve, which is thus closed in proportion as the lever E is raised.

On the other hand, as the speed of the engine decreases, the pressure of the air within the bellows will be diminished, causing the lever E to fall, and, through the connections explained, open the valve, and admit more steam, as required, the air between the disks *i* and *b* being allowed to escape through a small aperture, *j*.

The post *k*, attached to the upper disk *i* of the bellows, passes through the cap, *p*, of the cylinder A, and terminates at its upper end in a point, 5, upon which rests an enlargement, *q*, of the lever E, this lever being guided, as it rises and falls, by a forked post, or guide, *r*, rising from the cap, *p*.

When it is desired to run the engine at an increased rate of speed, one or more weights, H, are attached to the rod G, thus necessitating an increased pressure of air within the bellows, to raise the lever E, and close the valve.

It is evident, that instead of a bellows, an air-pump, fan, or other suitable device, operated by the engine, may be employed to compress air, without departing from the spirit of my invention, the pressure thus produced being employed to operate suitable mechanism connected with the valve.

I will now describe the stop-motion, or device, by means of which the valve is entirely closed, in the event of the breakage of the belt or other connection between the governor and the engine.

K is a disk, which fits loosely over the end of the hollow bearing C, and has secured to it, at 6, one end of a spiral spring, *s*, which is coiled around the bearing, the opposite end of the spring being attached to the cylinder A at *t*.

The amount of rotation of the disk K, is determined by two stop-pins, *u* *v*, against which the bent portion 6 of the spring strikes, the tendency of the spring being to rotate the disk in the direction of the arrow 7, fig. 1, while the longitudinal outward pressure of the spring serves to force the outer face of the disk, which is covered with leather, against the inner face of the pulley D, (also covered with leather,) producing such an amount of friction that the pulley D, as it revolves in the direction of the arrow 8, will rotate the disk against the resistance of the spring *s*, until the portion 6 strikes against the stop-pin *u*, in which position the disk will be held by the friction between its face and that of the pulley, as the latter continues to revolve.

When the disk is in this position, the end, 9, of a curved arm, *w*, rests on its periphery, the opposite end of the arm being secured to the bent rod G, which, when the parts are in the position seen in fig. 1, is supported at such a height as to hold the steam-valve wide open, the further raising of the arm G, by the

pressure of air within the bellows B, as before stated, serving to close the valve, and diminish the supply of steam.

In the event, however, of the breakage of the belt which drives the pulley D, the disk K, and, with it, the pulley, will be carried back by the spring *s*, until the portion 6 strikes against the pin *v*, as seen in fig. 3, this partial rotation of the disk in the direction of the arrow 7, causing the end 9 of the arm *w* to fall into a recess, *x*, allowing the rod G to drop, and entirely close the valve, thus stopping the engine, and preventing any liability of its "running away."

By means of the construction herein described, I have provided a stop-motion, which is incapable of being disarranged by the cutting off of the steam at the close of the work, an occurrence incident to all other stop-motions now used; that is to say, all other stop-motions require to be periodically adjusted, in order that they may perform their intended functions, and if, through neglect, this is omitted, the stop-motion is inoperative, while my improved stop-motion requires only to be adjusted once in place, where it permanently remains without liability of derangement.

In order to provide a means for closing the valve and stopping the engine from any portion of the building, situated at a distance from the engine-room, one or more wires or cords, *y*, are attached to the lever E, and led to different portions of the building, so that, in the event of the occurrence of an accident, the lever may be raised, and the valve instantly closed by drawing up one of the wires, thus avoiding the delay which would be occasioned by communicating with the engineer.

Claim.

What I claim as my invention, and desire to secure by Letters Patent, as an improvement in Governors for Steam Engines, is—

The within-described stop-motion, consisting of the friction-disk K, with its recess *x*, the pulley D, and the spring *s*, in combination with the arm *w*, connected with the valve, all operating substantially as set forth.

JEREMIAH A. MARDEN.

Witnesses:

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