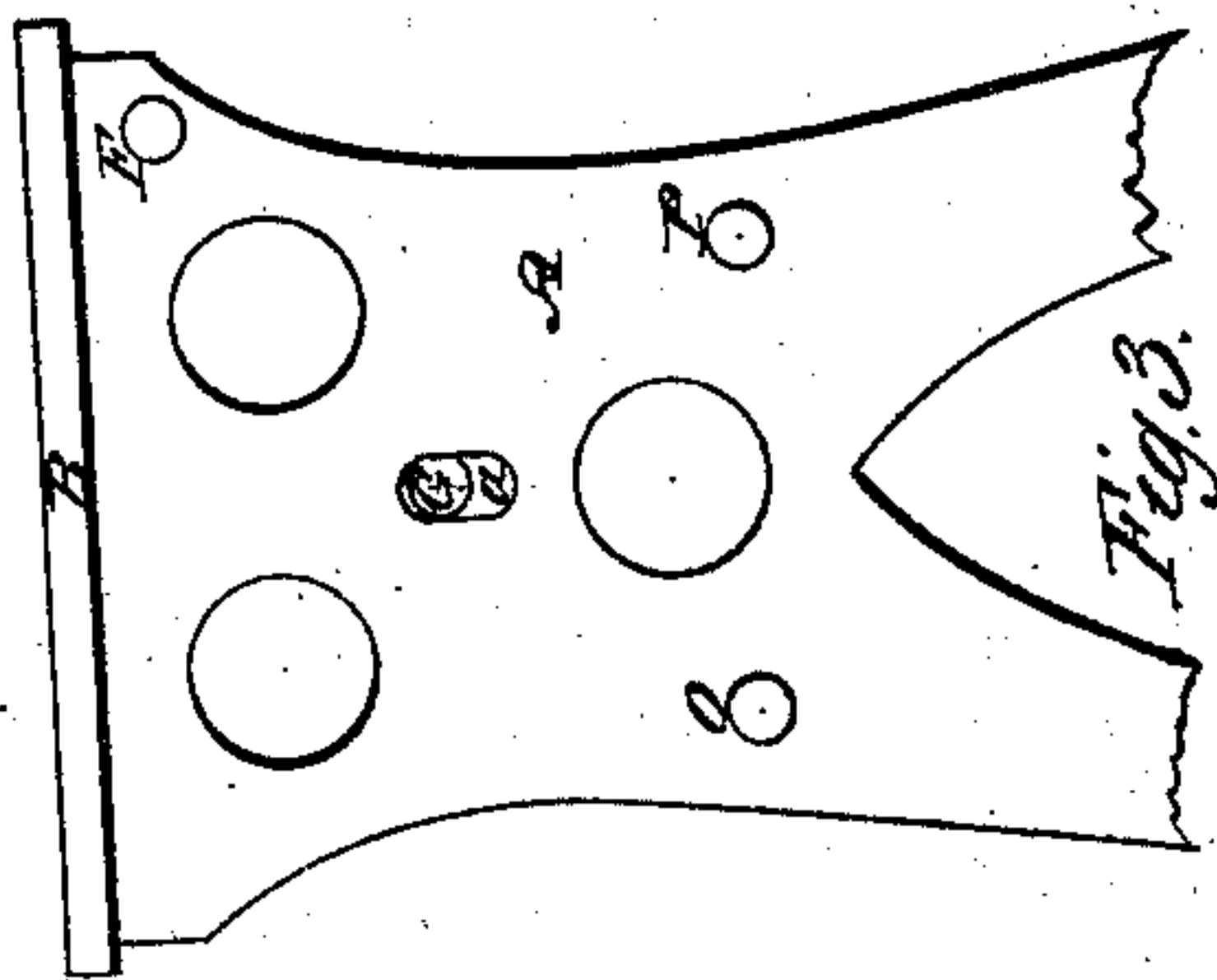
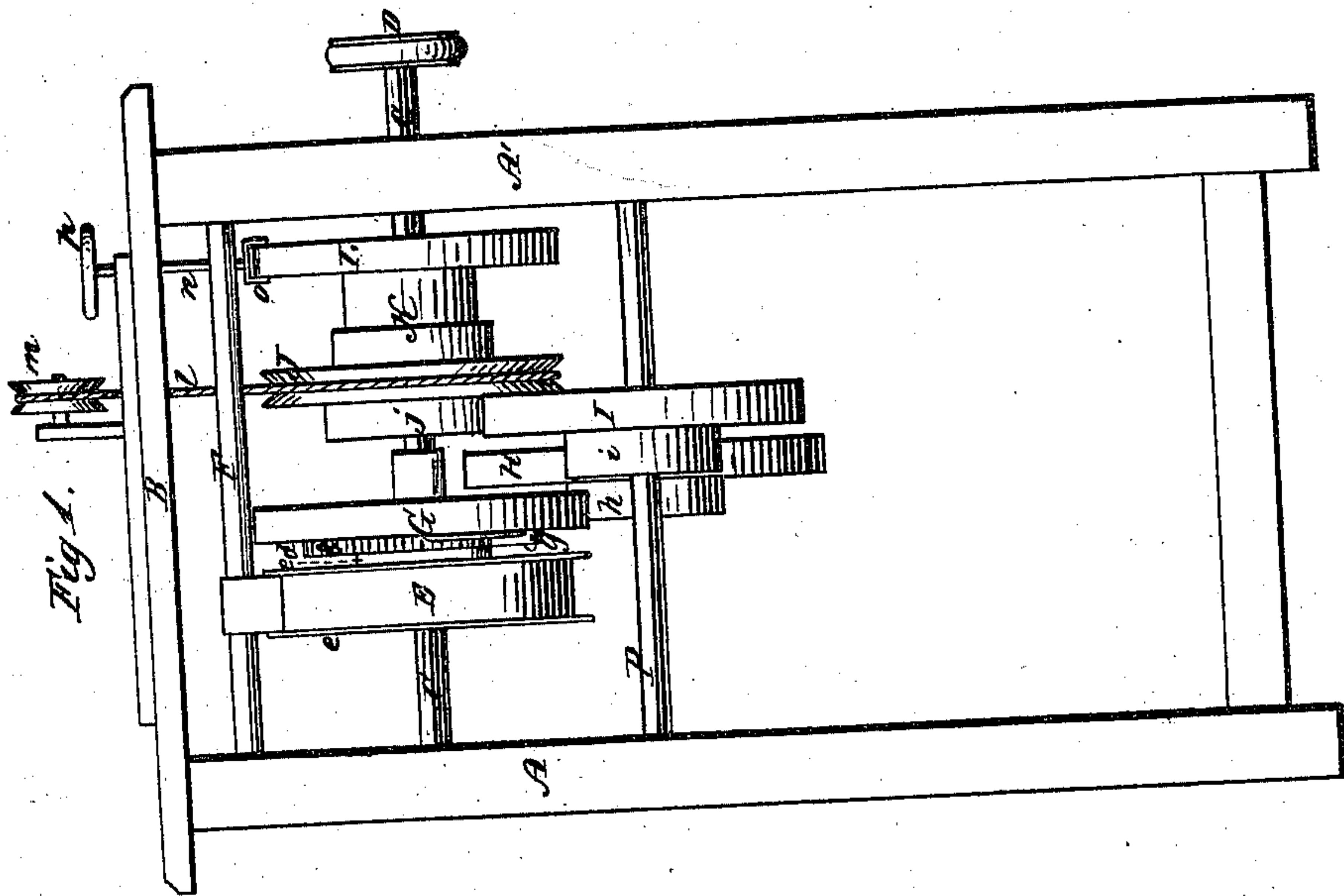
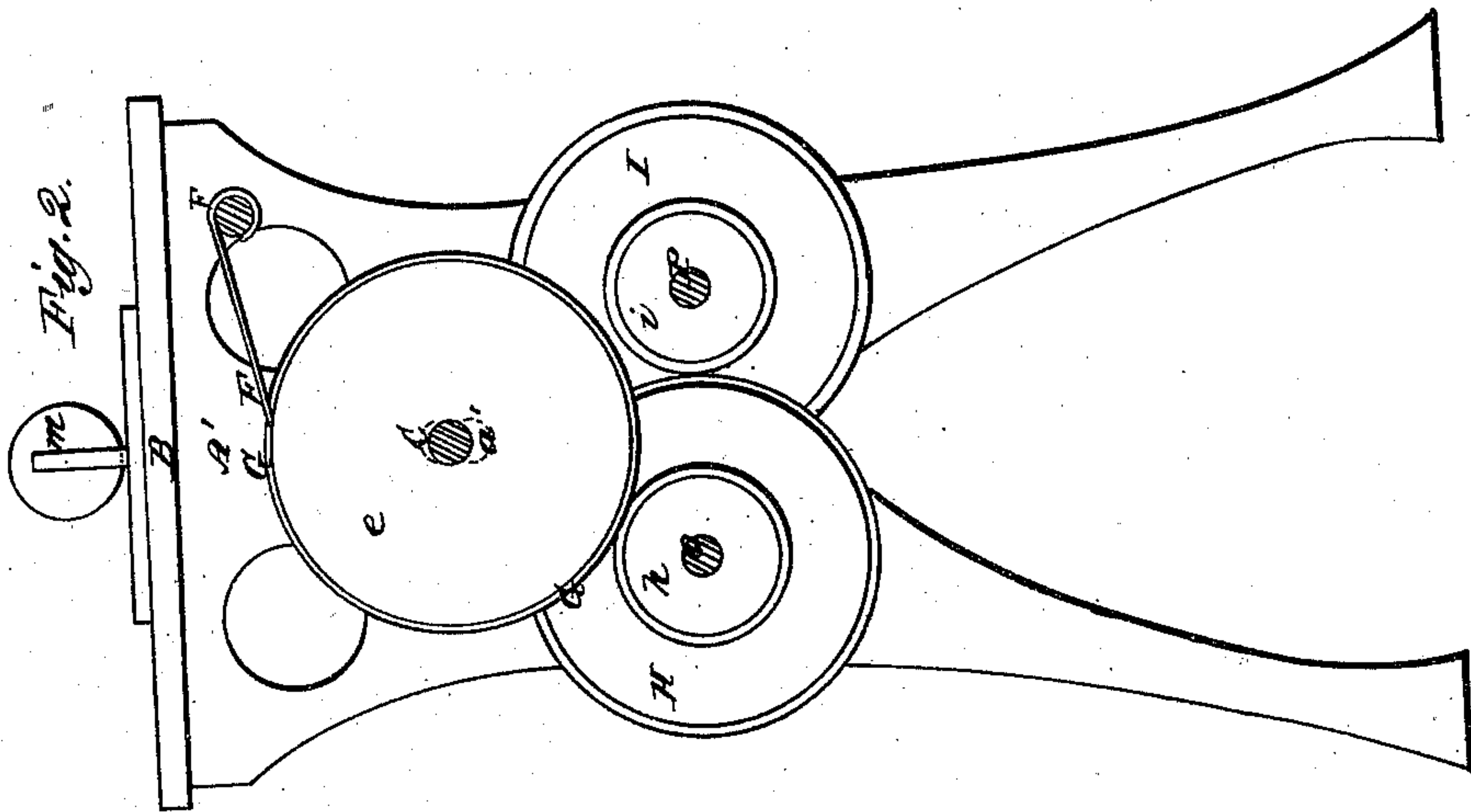


J. B. Ayer
Motive Power

N^o 95,069.

Patented Sept. 21, 1869.



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Letters Patent No. 95,069, dated September 21, 1869; antedated September 10, 1869.

IMPROVEMENT IN MOTIVE-POWER FOR SEWING AND OTHER MACHINES.

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, JAMES B. AYER, of the town of Elizabeth, in the county of Union, and State of New Jersey, have invented a new and improved Noiseless Driving-Power for Sewing-Machines; and I do hereby declare the following to be a full and correct description of the same, sufficient to enable others skilled in the art to which my invention appertains, to fully understand and construct the same, reference being had to the accompanying drawings, which make a part of this specification, and in which—

Figure 1 is a front elevation of a sewing-machine frame with my improvement attached.

Figure 2 is an end view of the same, one end piece of the frame being removed.

Figure 3 is a sectional detached view of part of the same, to show a part of my invention, hereinafter more fully described.

Like letters of reference indicate like parts in the several figures.

The nature of my invention consists in applying to sewing-machines a noiseless driving-power, derived from a coiled spring enclosed in a case or chamber, which, when wound up, by its reaction will impart motion to the shaft, on which one end is secured, which motion is, by means of a ratchet and pawl, also imparted to a wheel playing loosely on the same shaft, and from it transmitted by friction through a series of smaller and larger wheels, to the wheel immediately connecting with the machinery holding and working the needle and thread, in such a manner that the speed of revolution of this last wheel shall be very much greater than that of the first-mentioned wheel, the rim or face of each wheel bearing upon or pressing against another wheel to be covered with India rubber, or such other substance as may be preferable, to produce the required friction, and to render the motion as noiseless as possible.

A A', in the drawings, represent the end pieces, and B, the top of the frame of a sewing-machine.

In proper bearings, *a a'*, in the end pieces A A', and at a suitable distance from the top plate B, plays loosely a shaft, C, one end of which is provided, outside of piece A', with small hand-wheel D.

To this shaft C is attached one end of a coiled spring, E, the other end of which is secured to a shaft or rod, F, rigidly secured in the pieces A A'.

The spring E is situated in a chamber formed by two circular plates, *e*, attached to the shaft C, and provided with a very narrow sleeve, *d*, carrying a ratchet-wheel, *f*.

This ratchet-wheel *f* gears with a pawl, *g*, on a wheel, G, playing loosely on shaft C, in such a manner, that when the shaft C is turned by means of hand-wheel D, so as to wind up spring E, the pawl *g*

will slip over the ratchet *f*, not engaging with its teeth, but when the spring, in its reaction, turns shaft C, and with it the ratchet *f*, the pawl *g* will engage with the teeth of the ratchet, and thus the wheel G will be forced to move with the ratchet *f*.

The wheel G, by friction, transmits its motion to a smaller wheel, *h*, attached to or formed on a larger wheel, H, playing loosely on shaft O. The speed of wheel H of course becomes greater than that of wheel G, by reason of the intermittent smaller wheel *h*.

Wheel H transmits its motion to a similar set of wheels, *i* I, playing loosely on shaft P, and wheel I again its motion to a set of wheels, *j* J, playing loosely on shaft O, the wheel J immediately connecting with the machinery holding and working the needle and thread, by means of a belt, *l*, and small belt-wheel, *m*, above the table or top B, or any other suitable means.

The shafts O and P are rigidly secured in pieces A A', at suitable distance from shaft C.

On the side of wheel J is formed a sleeve, K, which carries a wheel, L.

Directly over this wheel L, a rod, *n*, passes through the top B, provided, at its lower end, with a bent piece, *o*, which fits exactly over, and when rod *n* is pressed or screwed down, seizes on wheel L, and by friction stops its motion.

The rod *n*, at its upper end, may be provided with a suitable head, *p*, and may be provided with a screw-thread, so as to screw up or down, or with a spring, holding it away from wheel L.

Neither of the devices, however, is essential, as the brake *n* will operate with or without either.

The wheels G, *h*, H, *i*, I, and *j*, have their rims covered with India rubber, or any other suitable material which will produce sufficient friction to keep the wheels in proper motion, and at the same time make the motion entirely noiseless, or as nearly so as is possible and practical.

When the spring is nearly run down, which will soon be observed by the retarding of the speed, it can be wound up by means of the hand-wheel D, the brake *n* being at the same time applied to wheel L, which stops, by means of the friction, all the wheels loose on their shafts, and consequently also wheel G, while the shaft C is turning round in winding up spring E. When the latter is wound up, the brake is released, and the motion is transmitted as before.

Should the operator at any time desire to stop the motion for a short time, this will be accomplished by putting down the brake *n* over on to the wheel L, which, by friction, will stop all the wheels, and, through pawl *g* and ratchet-wheel *f*, also the plates *e* and shaft C. On releasing the brake the power of the spring is again exerted, and the motion continued.

The bearings *a a'*, in which the shaft C plays, are

of a vertically-oblong form, as shown in figs. 2 and 3. By means of this form of bearings the friction of the wheels is regulated, for were the bearings of just sufficient size to allow the shaft C to pass through, and round, the friction of the different wheels might be too great to be overcome by the power of the spring; but the oblong bearings allow the shaft C to give just sufficiently in a vertical line to allow the friction to adjust itself in regard or relation to the power of the spring, thus preventing any undue friction to overcome the power of the spring, while the latter will not be able to sufficiently overcome the friction to disturb the smooth and even running of the friction-wheels.

Having thus described my invention,

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

1. The noiseless power for driving sewing-machines, consisting of the combination, with the spring E, of a

series of large and small friction-wheels with straight peripheries, arranged above and below each other on shafts C O P, to operate substantially as and for the purpose set forth.

2. In a sewing-machine, for the purpose of transmitting and accelerating motion, one or more series of large and small friction-wheels *h H i I*, with straight peripheries, which are covered with India rubber, or its equivalent, and arranged to operate substantially as herein described.

3. The vertically-oblong bearings *a a'* of the shaft C, in the pieces A A', substantially as and for the purposes set forth.

JAMES B. AYER.

Witnesses:

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