H. M. PAINE.

Electro Magnetic Engine.

No. 103,228. Patented May. 17, 1870.

Fig. 2.

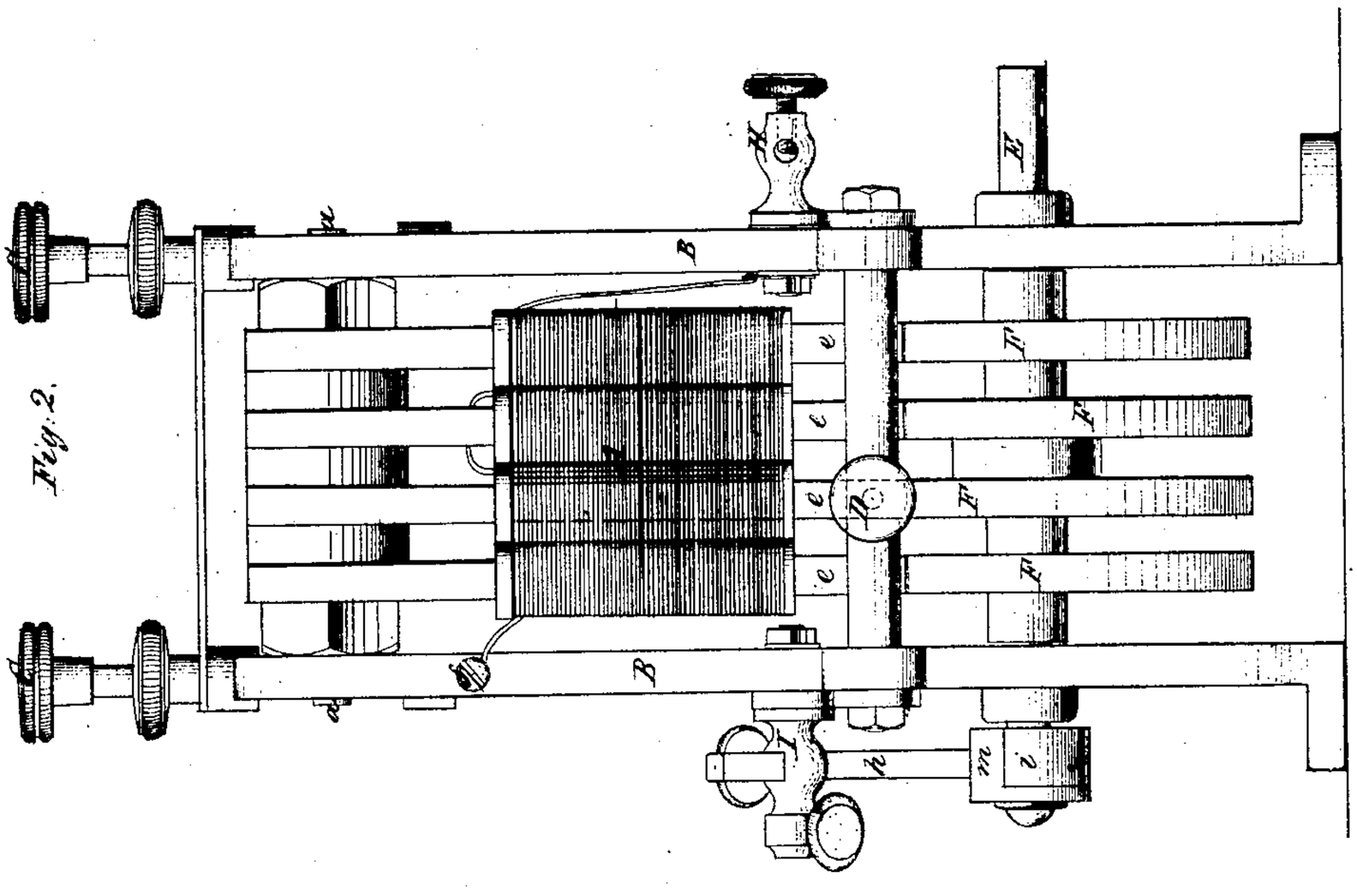
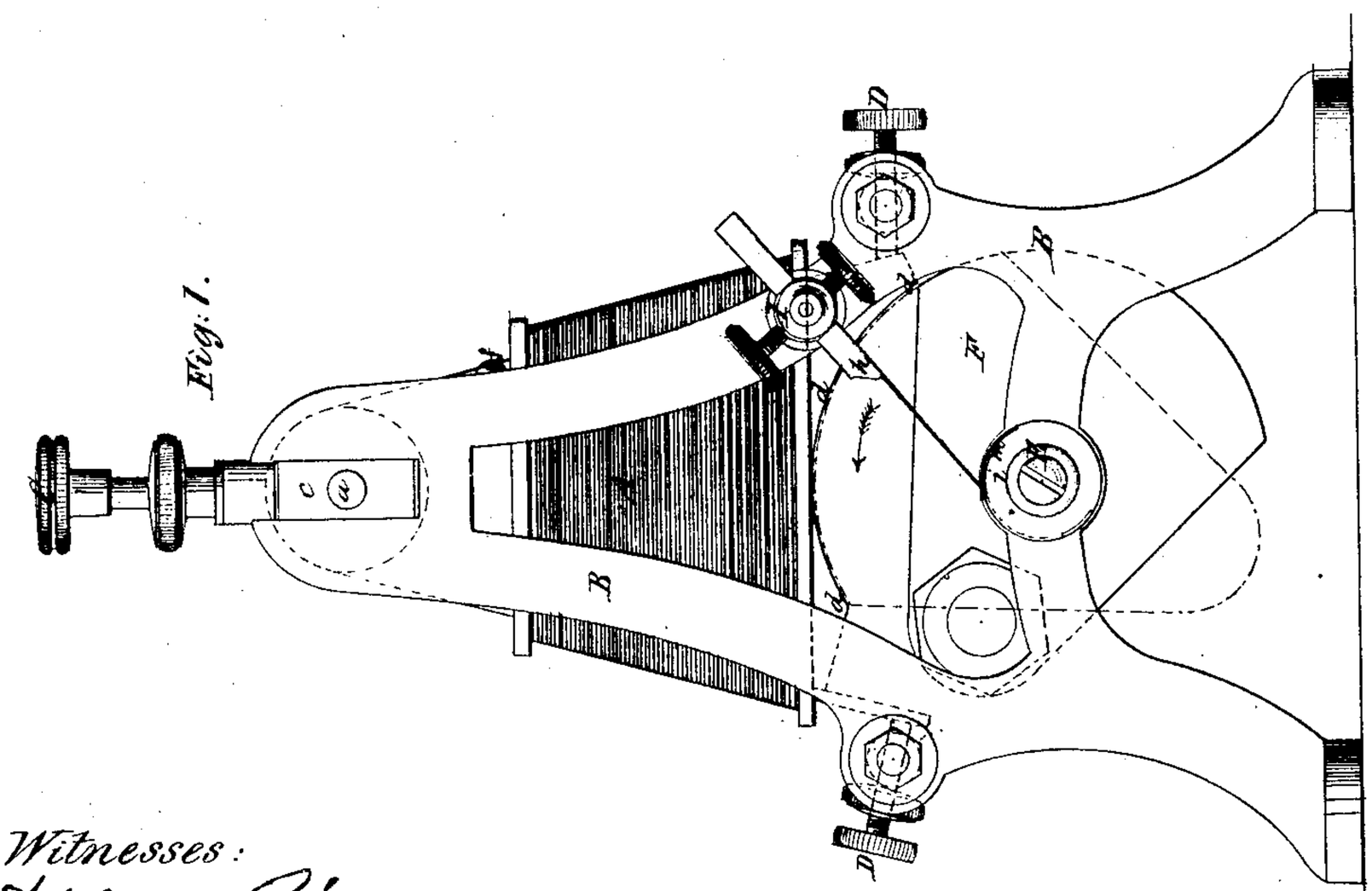


Fig. 1.



Witnesses:

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HENRY M. PAINE, OF NEWARK, NEW JERSEY, ASSIGNOR TO HIMSELF AND M. S. FROST, OF NEW YORK CITY.

Letters Patent No. 103,228, *dated May* 17, 1870.

IMPROVEMENT IN ELECTRO-MAGNETIC ENGINES.

The Schedule referred to in these Letters Patent and making part of the same

I, HENRY M. PAINE, of the city of Newark, and State of New Jersey, have invented certain Improvements in Electro-Magnetic Engines, of which the following is a specification.

My invention relates-

First, to the use of my sector electro-magnet, for which a patent was allowed November 2, 1869, in the construction of a rotary electro-magnetic engine; and,

Second, to the utilizing of the reflex currents.

I suspend a sector magnet, A, Figure 1, in a frame, B, the tie-bolt *a* being seated in an adjustable box, *c*, which is operated by the milled head-screw C.

D D are adjusting-screws, which operate as lateral adjustments of the magnet A.

On the driving-shaft E, Figures 1 and 2, a sector armature, F, whose links correspond in number and position with the links of the magnet A, is keyed.

The radius of this armature is described from the center of the shaft E, and the curve *d d d*, fig. 1, described in the poles *e e e e*, figs. 1 and 2, of the magnet A, must coincide with the radius of the armature, the vertical and lateral adjusting-screws C and D determining the proper distance between the poles of magnet and armature, which, to secure the best results, should be only sufficient to avoid the friction of actual contact.

One end of the wire around the magnet A is secured to the frame at *f*, figs. 1 and 2, and the other end to a pole-binder, H, fig. 2, which is electrically insulated from the frame.

Another pole-binder, I, figs. 1 and 2, also electrically insulated from the frame, holds a spring arm, *h*, fig. 1, which rests on a circuit-breaker, *i*.

The operation of this arrangement is such that, when the arm *h* rests on the non-conducting portion of the circuit-breaker, no current can traverse the links of the magnet, but, when the conducting part *m* comes in contact with the arm *h*, a circuit is made, and the armature made to rotate during the contact.

Having thus described the mechanical details of the application of the sector magnet to the production of rotary motion, I will proceed to describe my mode of utilizing the reflex currents.

Referring to fig. 1, and considering the armature to be revolving in direction of the arrow, and supposing that the circuit-breaker is so adjusted, with reference to the arm *h*, as to continue the action of the current till the axis of the magnet and armature are coincident, and then break, we would find that the reflex action of the current would resist any attempt of the armature to continue its onward motion, and this resistance is equivalent to seventy-five per cent. of the battery current.

But, if the adjustment of the circuit-breaker be such that the current is broken previous to the coincidence of axis of the magnet and armature, then the reflex current, instead of retarding the motion of the armature, will expend itself in assisting its motion; therefore, in order to convert this reactionary property of the currents into a valuable element of force, I adjust the circuit-breaker under such conditions as will insure a break previous to the coincidence of the axis of the magnet and armature, as shown in fig. 1, the dotted lines showing the position that the armature obtains through the action of the reflex currents, the break having been made when the armature was in the position shown by the full lines.

I claim as my invention—

1. The combination of the sector magnet A and sector-limbed armature F, with their adjustments or without.

2. The breaking of the circuit previous to the coincidence of the axis of magnet and armature, substantially in the manner and for the purpose specified.

HENRY M. PAINE.

Witnesses:
H. M. PIERSON,
J. STANBROUGH.