C. CARPENTER, Jr.

MAGNETO ELECTRIC MACHINE.

No. 14,598. Patented Apr. 8, 1856.

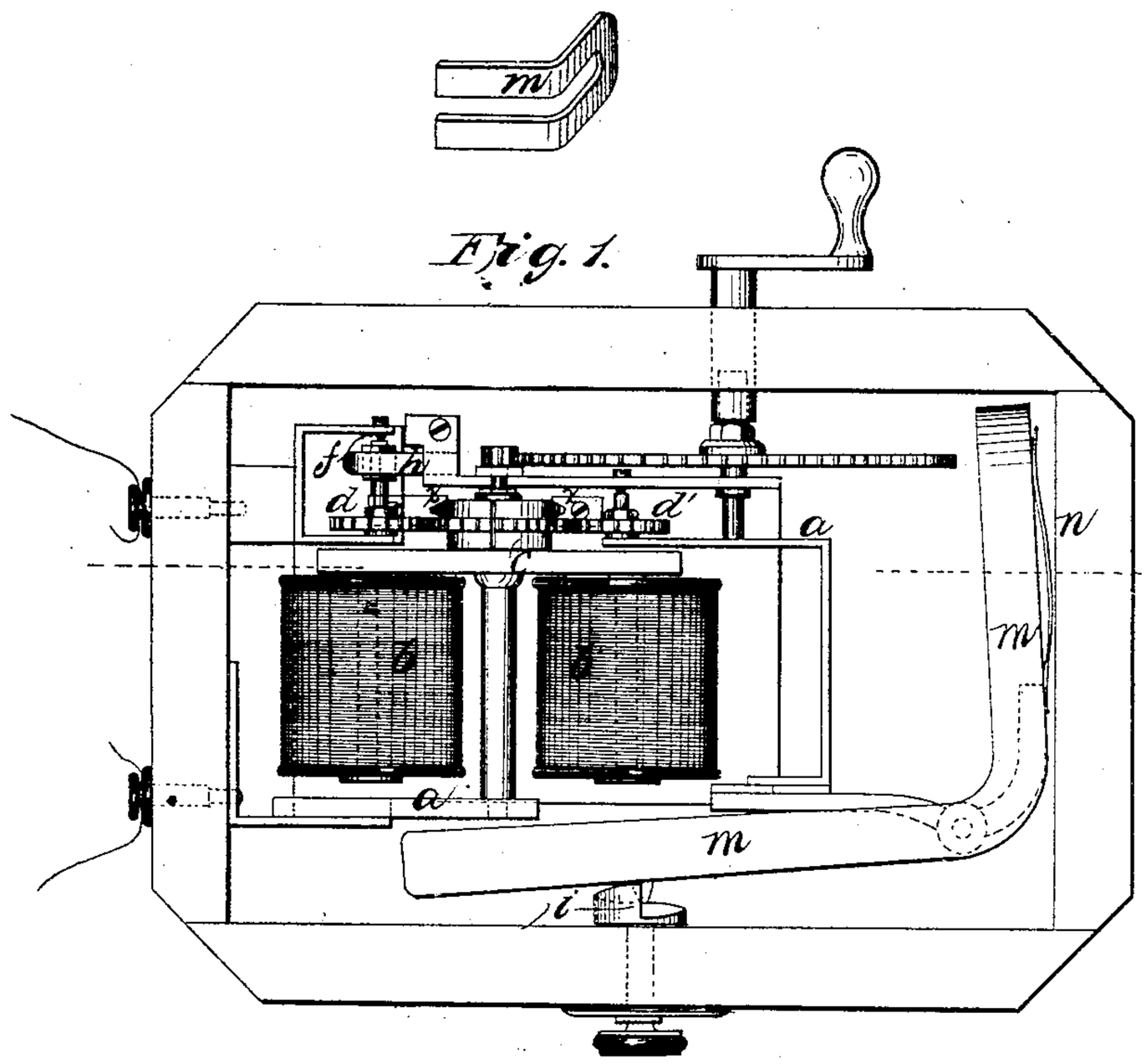

Fig. 1.

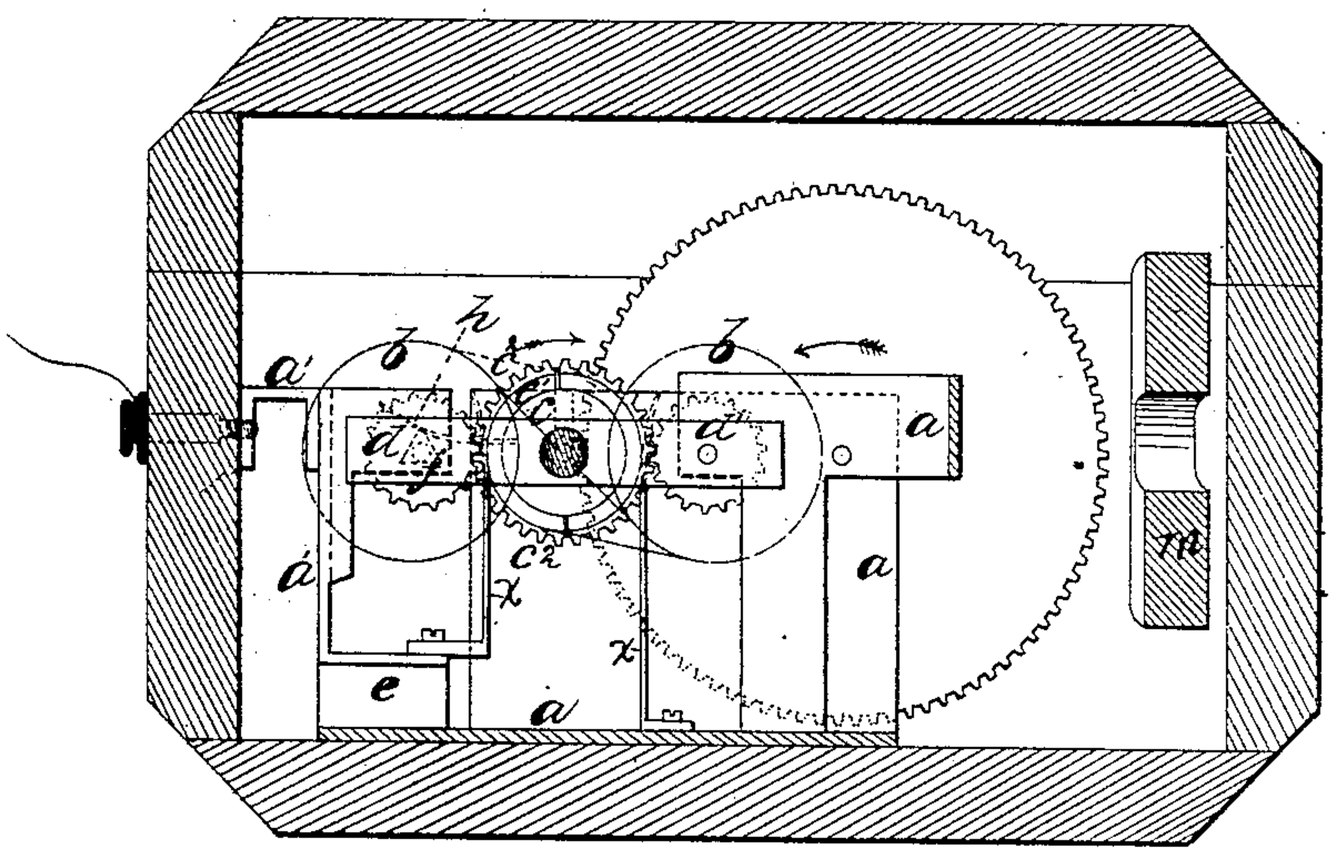

Fig. 2.

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UNITED STATES PATENT OFFICE.

CALVIN CARPENTER, JR., OF PROVIDENCE, RHODE ISLAND.

IMPROVEMENT IN MAGNETO-ELECTRIC MACHINES.

Specification forming part of Letters Patent No. **14,598**, dated April 8, 1856.

To all whom it may concern:

Be it known that I, CALVIN CARPENTER, Jr., of the city and county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Medical Magneto-Electric Batteries; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a plan, Fig. 2 an elevation, of the movement.

The object of my invention is to produce electric shocks from the combination of the magnet and helices in rapid succession for medical purposes, the current from which shall flow in one direction, or in such manner as to keep one of the poles of the battery permanently positive and the other permanently negative, which is not the case with ordinary magneto-electric medical batteries now in use. This is a very important element in the instrument for medical purposes, without which the operator cannot control the direction of the impelling forces of the shocks in their application to the human body, and the proper and desired effect for which the instrument is used cannot be produced for the cure of disease.

Another requisite to be attained by this machine is the regulation of the strength of the shocks sufficiently to equal, at least in this particular, the acid medical battery, while it is superior in every other particular.

The construction of the machinery is as follows:

a represents the frame of brass or other suitable metal.

b are the helices formed in the usual way, the two cores of soft iron being surrounded by coils of insulated copper wire of such size and proportion as is required for the strength of current that may be desired, care being taken that it is sufficiently strong for all medical purposes. I have found the following to answer, the cores of soft iron being half an inch diameter, and of sufficient length to wind a coil of insulated wire thereon of two inches in length and one and one-half inch in diameter of No. 30 copper wire, which are affixed in the usual way on an axis running in proper bearings in the frame. This axis has the pole-changer *c* (similar in principle to the ordinary pole-changer) affixed to it; but the construction of this pole-changer *c* is such as to give a direct current in one direction, instead of the alternating currents of the common battery.

It will be seen in the detail drawings, Fig. 2, that the ivory ferrule *c'* has two semicircular metal segments affixed thereto, on which are cogs projecting outward and forming a spur-wheel, c^2, the two halves of which are perfectly insulated from each other by the non-conducting ferrule of ivory or other proper material, by which means the gear becomes a pole-changer. Two other cog-wheels, *d d'*, gear into c^2, one on each side. These wheels take the place of the ordinary springs, which in this machine are represented at *x x* by blue lines, but I omit them in constructing my machines. (They are merely inserted for reference.) These wheels receive the current and transmit it in the same manner as the springs from the helices, but without wearing the surface of the pole-changers to the extent to which springs do, thus making it more durable and less liable to become filled up in the breaks with small particles of metal worn off by the friction, which often closes the circuit and stops the action of the apparatus until removed. The gearing thus arranged, the wheels *d d'* can be made smaller than the pole-changer or not, at pleasure, and the number of breaks can be indefinitely increased and repeated far beyond the speed at which it would be proper to revolve the coils, by which means more decided medical results can be obtained without giving the patient the pain produced by other batteries. This is effected by placing a prism, *f*, upon the axis of the cog-wheel *d*, (which is supported on a frame, *a'*, entirely insulated from the other parts of the machine by a non-conductor between them at *e*,) and a light spring, *h*, lying horizontally or otherwise over the prism *f*, is struck by its angles as it revolves, thus making a great number of rapid breaks, making the shocks finer and more agreeable.

The frame *a'* connects with one of the handles or poles, and the main frame *a* with the other, so that when the break-spring *h*, above-named, is not in contact with the prism the current passes through the patient, and when it is in contact with the angles of said prism the current through the poles or handles is

broken, it being understood that the spring represents one pole and the prism the other of the short current, which, when closed, cuts off the long circuit through the patient.

As the current in this machine is in one direction it can be applied to electrotyping or depositing metals by removing the break-spring out of contact with the prism.

The magnet is the common U-magnet, but in order to get a large-sized one into small compass I bend the two legs at right-angles, as clearly shown in the plan, *m* being the magnet. At or near this angle I hinge the magnet so that its poles can be made to approach or recede from the helices in the plane of revolution of their poles, by which means I can determine with the greatest exactness the strength of the shocks within the compass of the machine. To bear this magnet off from the coils I place a flat spring, *n*, against the bend, which causes it to recede when left at liberty to do so. This action is counteracted and regulated by a set-screw or cam, *i*, that moves it up toward the helices. This screw should be coarse-threaded, so that one turn will complete the range of movement. An index can then be attached to the screw with a scale permanently fixed so that it will mark the degree of strength of the shock to which the machine is set.

I am aware that machines have been made in which the magnet was made to slide to and from the coils, and I do not intend to claim or cover that broad ground; but in this case the ends of the magnet were made to approach the coils, while in mine the side is brought up, giving the advantage of surface, and a more convenient and perfect mode of adjustment.

Having thus fully described the construction of my new magneto-electric machine, what I claim therein as new, and for which I desire Letters Patent, is—

The cut-off consisting of the geared segments and gear wheels or wheel, and thus serving the purpose of springs, and driving a revolving prism, or its equivalent, for rapidly breaking the current, substantially in the manner and for the purposes set forth.

CALVIN CARPENTER, JR.

Witnesses:
SAML. COLMAN,
G. G. WALKER.