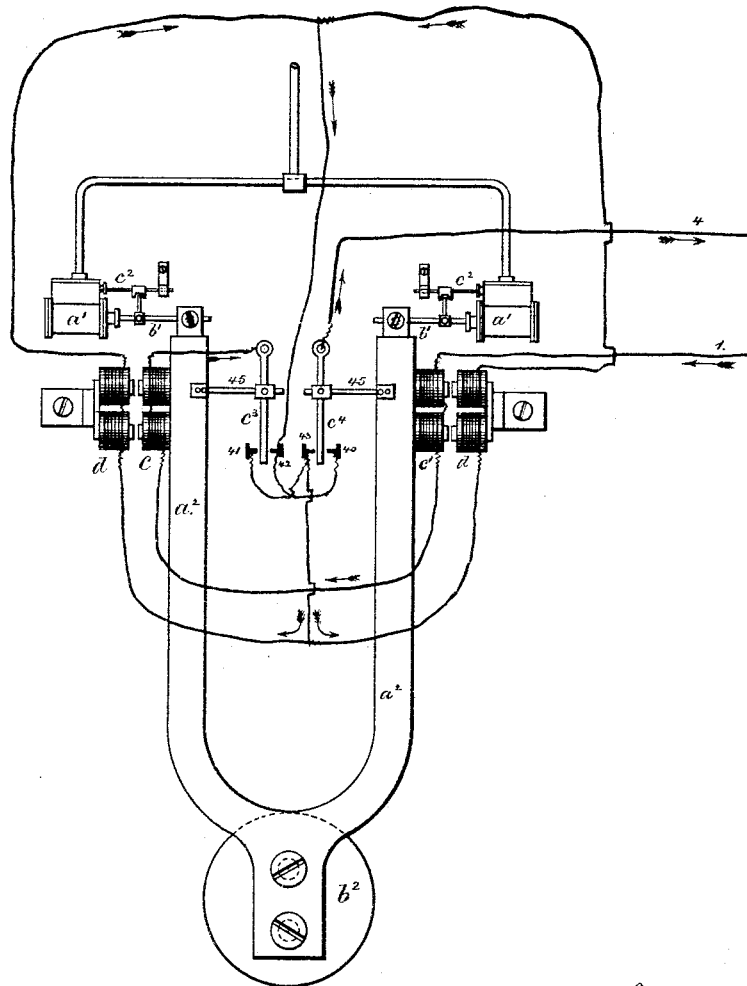


T. A. EDISON.  
 Magneto Electric Machine.

No. 218,166.

Patented Aug. 5, 1879.



Witnesses

Chas. H. Smith  
 Geo. T. Pinckney

Inventor

Thomas Alva Edison.

per Lemuel W. Serrell

att'y.

# UNITED STATES PATENT OFFICE

THOMAS A. EDISON, OF MENLO PARK, NEW JERSEY.

## IMPROVEMENT IN MAGNETO-ELECTRIC MACHINES.

Specification forming part of Letters Patent No. **218,166**, dated August 5, 1879; application filed December 9, 1878.

*To all whom it may concern:*

Be it known that I, THOMAS ALVA EDISON, of Menlo Park, in the State of New Jersey, have invented an Improvement in the Method of and Means for Developing Electric Currents, of which the following is a specification.

It has long been known that if two electro-magnets, or an electro-magnet and a permanent magnet, be drawn apart or caused to pass by each other, electric currents will be set up in the helix of the electro-magnet. It has also been known that vibrating bodies—such as a tuning-fork or a reed—can be kept in vibration by the exercise of but little power.

I avail of these two known forces, and combine them in such a manner as to obtain a powerful electric current by the expenditure of a small mechanical force.

In the drawing, a tuning-fork,  $a^2$ , is represented as firmly attached to a stand,  $b^2$ . This fork is preferably of two prongs; but only one might be employed, upon the principle of a musical reed. This vibrating bar or fork may be two meters long (more or less) and heavy in proportion. It has its regular rate of vibration, like a tuning-fork, and the mechanism that keeps it in vibration is to move in harmony. A crank and revolving shaft or other suitable mechanism may be employed; but I prefer a small air, gas, or water engine, applied to each end of the fork.

The cylinder  $a^1$  contains a piston and a rod,  $b^1$ , that is connected to the end of the bar, and steam, gas, water, or other fluid under pressure acts within the cylinder, being admitted first to one side of the piston and then the other by a suitable valve. The valve and direct-acting rod  $c^2$  are shown for this purpose.

The bar or fork  $a^2$  may be a permanent magnet or an electro-magnet, or else it is provided with permanent or electro-magnets.

I have shown electro-magnet  $c^1$  upon the prong of the fork. There may be two or more on each, and opposed to these are the cores of the electro-magnets  $d$ ; hence, as the fork is vibrated, a current is set up in the helix of each

electro-magnet  $d$  in one direction as the cores approach each other, and in the other direction as they recede.

This alternate current is available for electric lights; but if it is desired to convert the current into one of continuity in the same direction a commutator is employed, operated by the vibrations of the fork to change the circuit-connections each vibration, and thereby make the pulsations continuous on the line of one polarity.

A portion of the current thus generated may pass through the helices of the electro-magnets  $c^1$ , to intensify the same to the maximum power, and the remainder of the current is employed for any desired electrical operations wherever available. I, however, use the same, especially with my electric lights.

I have represented commutator springs or levers  $c^3$   $c^4$ , operated by rods 45, that slide through the levers  $c^3$   $c^4$ , and by friction move them. When the prongs  $a^2$   $a^2$  are moving from each other the contact of levers  $c^3$   $c^4$  will be with the screws 40 41, and the current will be from line 1 through  $c^1$  to  $c$ ; thence to  $c^3$ , to 41 43, and to circuit of electro-magnets  $d$   $d$ , and from  $d$   $d$ , by 42, to 40  $c^4$  and line 4, as indicated by the arrows. When the prongs  $a^2$   $a^2$  are vibrating toward each other, the circuit will be through  $c^1$   $c$   $c^3$  42, in the reverse direction through the circuit and magnets  $d$   $d$ , back to 43, and by  $c^4$  to line 4.

I claim as my invention—

The combination, with a vibrating body similar to a tuning-fork, of mechanism for maintaining the vibration, and magnets, cores, and helices, whereby a secondary current is set up, so as to convert mechanical motion into electric force, or the reverse, substantially as set forth.

Signed by me this 3d day of December, A. D. 1878.

THOMAS A. EDISON.

Witnesses:

STOCKTON L. GRIFFIN,  
GEO. E. CARMAN.