O. HEIKEL.

Magneto-Electric Machine.

No. 168,018. Patented Sept. 21, 1875.

Fig. 1.

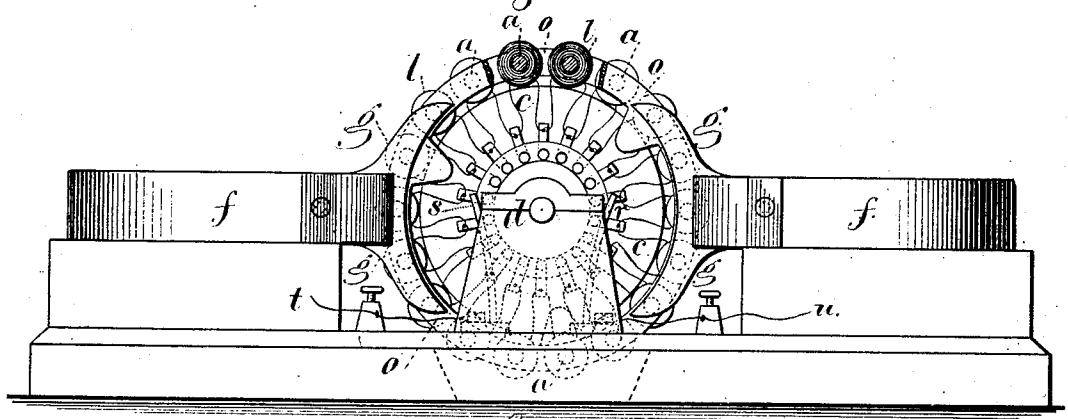


Fig. 2.

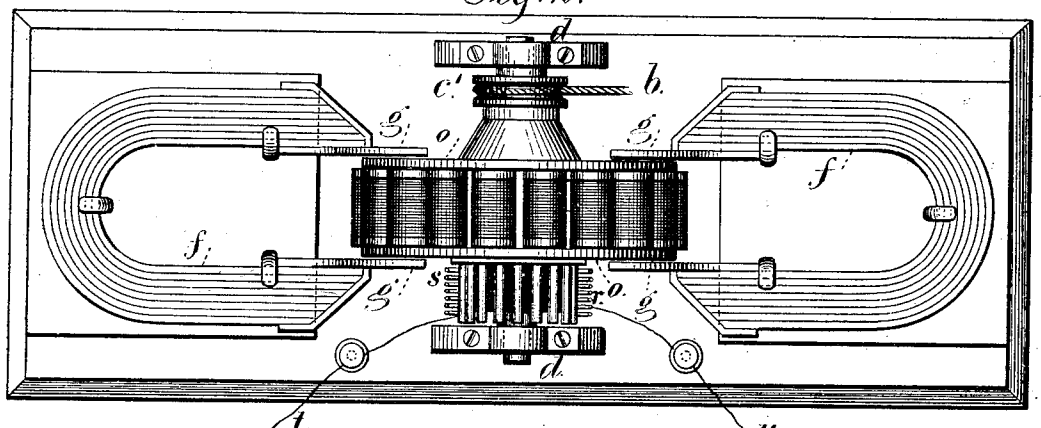


Fig. 3.

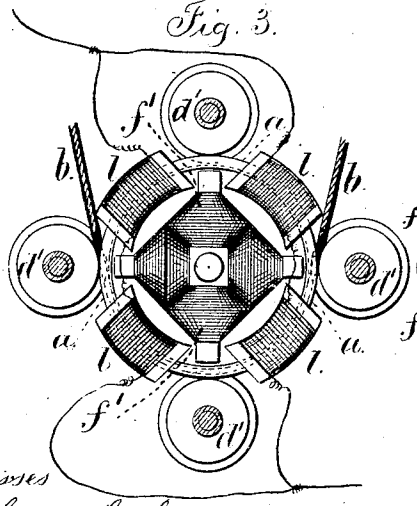


Fig. 4.

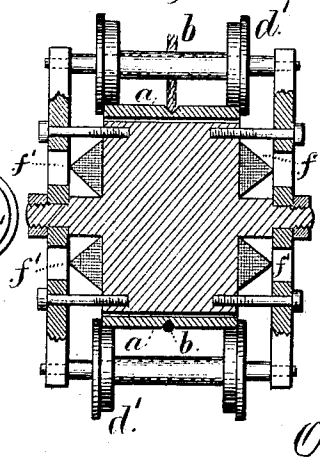
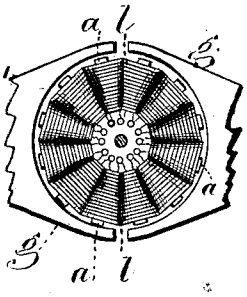


Fig. 5.



Witnesses
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UNITED STATES PATENT OFFICE.

OTTO HEIKEL, OF JERSEY CITY, NEW JERSEY.

IMPROVEMENT IN MAGNETO-ELECTRIC MACHINES.

Specification forming part of Letters Patent No. **168,018**, dated September 21, 1875; application filed June 5, 1875.

To all whom it may concern:

Be it known that I, OTTO HEIKEL, of Jersey City, in the county of Hudson and State of New Jersey, have invented an Improvement in Magneto-Electric Machines, of which the following is a specification:

This invention is for producing a secondary or induced current continuously by a revolving motion imparted to the cores, that are magnetized by the inductive effect of permanent or electro magnets near which such cores are revolved, and for dispensing with commutators and circuit-breakers, heretofore used.

The permanent magnets are so arranged, in respect to the revolving wheel and cores, that the cores become polarized, and in the revolution of the wheel there is a constant change in the polarity of the cores as they pass from one magnetic influence to the next; and the helices are so connected that the inductive currents are taken off continuously through circuit-wires that connect the helices, while such helices are positively charged and while they are negatively charged. Thereby a magneto-electric machine is produced that is adapted to use in telegraphy.

In the drawing, Figure 1 is an elevation, partially in section, of this magneto-electric machine. Fig. 2 is a plan of the same. Fig. 3 is an elevation, and Fig. 4 a section, of a modification of the said machine.

The soft-iron cores *a a* are revolved by power applied to the same by a belt, *b*, or otherwise. In Figs. 1 and 2 these soft-iron cores *a* are upon a hub, *c*, of wood or similar non-magnetic material, and the belt *b* is applied to the pulley *c'*, and the hub is upon a shaft in bearings *d*. In Figs. 3 and 4 the core *a* is supported by anti-friction bearing-wheels *d'*, and it is grooved or trough-shaped, so that the belt *b* can lie in the groove thereof and revolve such ring.

The magnets *f* are shown in Figs. 1 and 2 as permanent or horseshoe magnets, with pole-segments *g* contiguous to the cores *a a*. These magnets may, however, be electro-magnets, that are energized by a portion of the induced current passed through the helix, or by a battery, or otherwise.

In Fig. 3 I have shown an X-shaped electro-magnet, *f'*, with helices around the arms, wound in such a manner that two of the poles will be N. and the other two S.; and in Fig. 5 I have shown the segmental ends *g* of the magnets contiguous to the cores *a* of the radial helices that revolve between such segments.

It will now be apparent that the revolving cores *a* of the helices *l* will be polarized by induction from the adjacent stationary magnetic poles, and that when the cores are revolved there is a constant change in polarity taking place in the particles of iron composing such cores, and that this change takes place from N. to S. and S. to N., and in the curved lines of the magnetic influence. This magnetic influence is transferred into induced electricity by the series of helices surrounding such cores.

In Figs. 3 and 4 the wires from the helices will be grouped according to the direction in which the current will flow through the helices, and this magneto-electric machine produces a flow of electric current in one direction, and no commutator is employed.

I find it is advantageous to connect the cores *a a* by soft-iron rings *o o*, as in Figs. 1 and 2, and the wires of the helices are connected continuously throughout the whole circular range of induction-helices; and these wires are also connected with the circuit-pins, that are placed in the radial lines between the respective helices, and these circuit-pins move in contact with the circuit-springs *r* and *s* at opposite sides of the shaft, and these circuit-springs are stationary and connected with the wires *t u*, through which the induced current is passed.

It will be apparent that in this magneto-electric machine the current is caused to circulate continuously through the helices in a direction corresponding to the magnetic curves, and that the electrical current due to the magnetic force circulates toward and from the respective magnetic poles, and the circuit is not broken, but is complete and remains closed, and the electric current flows like that from a battery, and is capable of being opened or closed by a finger-key; hence it is adapted to telegraphic and other purposes.

The same effect will be produced if the helices are wound as sections around the ring *a*, and from this ring lateral cores project radi-

ally and pass contiguously to the stationary magnets, when the ring, helices, and cores are revolved.

I claim as my invention—

1. The magneto-electric machine, containing helices that are connected together and combined with the circuit-wires, cores, and stationary magnets, arranged substantially as set forth, to produce a continuous circulation of the electric current in one direction, as specified.

2. The revolving core *a*, contiguous to the stationary magnets, in combination with the helices, arranged in respect to the core, substantially as set forth, to induce a continuous current flowing through the helices, as set forth.

Signed by me this 1st day of June, 1875.

OTTO HEIKEL.

Witnesses:

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