Magnetic Field

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ABSTRACT

In this research we can make electricity current and kinetic energy via magnetic fields which actually can be used in many places. Here three phenomena, which are caused and happened by magnetic fields are analyzed.

Key words *Magnetic fields, electricity, energy,*

1 Introduction

In magnet science, scientists achieved an extreme progress. We have many famous laws and famous scientists in this science, such as: Faraday's law, Lenz law, Joseph Henry (inductance), Hans Christian Oersted (magnetic fields).

There are motors which work via magnets and magnetic fields; but all of them use an external energy to meet the needs of themselves such as electricity or fossil fuels.

In mechanism that I've investigated and worked on, we can make electricity current and kinetic energy via magnetic fields. Actually, if we inspire and optimize this theory's consequences; we can use them in many places.

In this article, we analyze three phenomena as follows, which are caused and happened by magnetic fields:

a) to make electricity current by the means of magnetic field (Fig. 1)

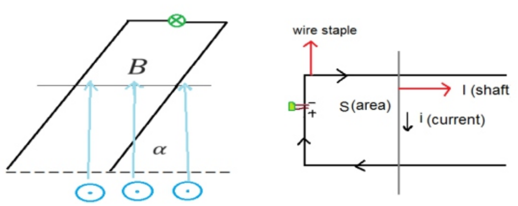


Fig.1: Current by magnetic field

b) making magnetic turbine by magnetic fields around the carrying current wire (Fig 2)

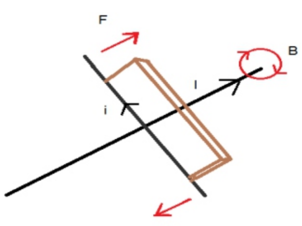


Fig.2: Magnetic turbine by magnetic field

c) magnetic engine: moving a round metal by magnet and heat (by magnifier) (Fig. 3)

Fig. 3: Magnetic engine

2 Experimental Setup

In a mechanism that I've investigated and worked on, we can make electricity current and kinetic energy via magnetic fields(Fig. 4). The main theories are explained to find the real and relevant parameters in our magnetic engine and also some equipment for our experimental setup such as:

- A conductive shaft (ferro alloy)
- Wire staple
- A diode
- Mag

Fig. 4: Experimental setup

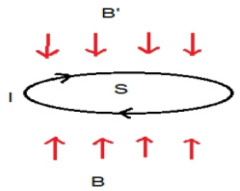
Magnetic flux $(\varphi = \vec{B} \cdot A)$: it is the number of magnetic field lines passing through a surface (Fig. 5).

For increasing the flux, we can increase the A (area).

B = constant

S = increasing area

B´ = magnetic field that is made by the induced current



$$\varphi = \vec{B} \cdot S$$

Fig. 5: Magnetic Flux

Faraday's law's details: if you want to make lots of EMF, then you have to find a way to change the flux near the conductor. Then more change the flux near the conductor, the more EMF you make (Eq. 1).

$$\varepsilon = \frac{d\varphi}{dt} \quad (1)$$

Lenz's law: As we know that the nature is against to the magnetic flux, by flux's changes, the induced EMF in the circle is opposite to the first EMF; because, the new magnetic field have to be made opposite to the first magnetic field (Eq. 2).

$$\varepsilon = -\frac{d\varphi}{dt} \quad (2)$$

In this process;

For making the drift velocity in wire, we use magnet to make magnetic field.

We imagine that the magnetic field which is made by the magnets, is constant. Because of the magnetic flux in the wire; it makes magnetic field to prevent the magnetic flux. By increasing the area (A), magnetic flux increases too; and more magnetic flux, more EMF. By shaft's falling down (because of the gravity); induced current will be made in the circle; this current causes the diode's lightness (Fig.6) (Eq. 3,4,5).

$$\varphi = BS\cos\theta,\ \cos\theta = 1,\ S = Lx \quad (3)$$

$$\varphi = BLx$$

$$\varepsilon = -\frac{d\varphi}{dt} \rightarrow \varepsilon = -BL\frac{dx}{dt} \rightarrow \varepsilon = -BLV \quad (4)$$

$$\varepsilon = IR \rightarrow I = \frac{BLV}{R} \quad (5)$$

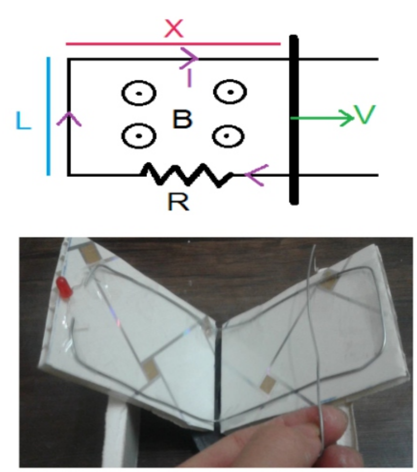


Fig. 6: Induced current

2-1 Magnetic Turbine

As shown in Figure (7), we have a main current inside wire $(I2 \ll I1)$ and a vane which is on the main wire (1) and it has another wire (2) just under itself related to the main wire.

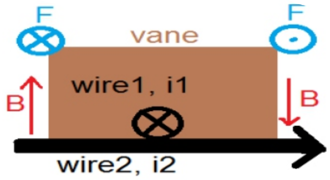


Fig. 7: Magnetic Field due to the current inside the wire

We know that electrical current which flows in wire makes magnetic field and according to the right-hand rule, we have two opposite forces which cause the vane's turning. According to the magnetic field we have some options to increase the force $(F = IL \times \vec{B})$: $B = \frac{\mu \cdot I}{2\pi r}$

- Increasing the (B) by increasing the (I),
- Increasing the length of the wire (L) and increasing the current (I)

2-2 Curie Point Engine

The dipoles are aligned by external magnetic field. We define magnetic materials as small rings that an electron (e) rotates around it by the speed of (v) and angular acceleration (Eqs. 6-9).

$$\mu = IA = \frac{ev}{2\pi r} \times \pi r^2 = \frac{rev}{2} \quad (6)$$

$$\tau = \vec{\mu} \times \vec{B} = \frac{rev}{2} \times \vec{B} = \frac{revB}{2} \quad (7)$$

$$\tau = I\alpha \rightarrow \tau = \frac{mR^2}{2}\alpha = \frac{revB}{2} \quad (8)$$

$$\alpha = \frac{revB}{mR^2} \quad \text{angular accerelation} \quad (9)$$

For different metals, we have specific temperature (curie point); in this temperature, ferromagnetic metals, lose their permanent magnetism and their atoms convert to magnetic polarization (Fig. 8).

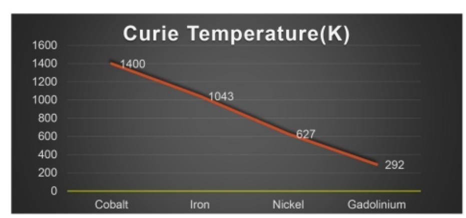


Fig. 8: Curie Temperature

When the temperature of a ferromagnetic material arrives to its curie point, they lose their magnetic basins and their dipoles will be free and unlimited and by getting the force which enters to them from the magnet, their magnetic polarizations will move and it causes the surface's moving (Fig. 9).

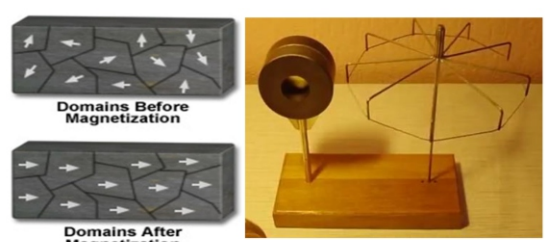


Fig. 9: Curie Point engine

3 Conclusion & Results

a)We can use this theory (Induced Current) to make electricity current.
By slopes we can save electricity such as the (U) which is used in amusement parks. People can play with them and at the same time the (U) makes electricity (Fig. 10).

Fig. 10: U makes electricity in amusement parks

b) In our cities, we have many cables and AC currents which can make magnetic turbines on them (Fig.11).

Fig. 11: AC Currents and magnetic turbines

C) We found out that in this phenomenon, we can rotate something by bringing the temperature to the curie point. We can use magnifier instead of heaters and we don't need to use gas and fuels for doing this, we just need solar energy. And also we can use its turning for making electricity the same as turbines. And also we can use rewind around them and by moving the surface and rewind in magnetic field, we can make current and electricity (Fig. 12).

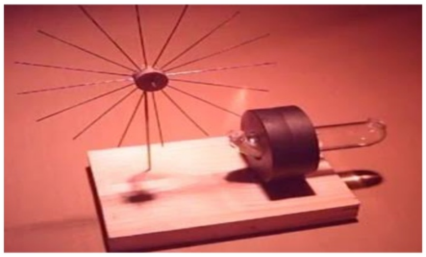


Fig. 12: rotating something by bringing the temperature to the curie point

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