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Maggneto Electricity Generator

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Abstract - *Until now the electricity generation is very costly and energy wasting procedure. So an alternative to the existing method is magneto electricity generator. This generator utilizes the basic principles of electricity to generate the power. It does not require a fuel for its operation so even if certain losses takes place it is not taken into account. By using this assembly, the problems related to generation like huge cost, pollution, losses, less efficiency can be minimized to a high extent. This paper gives a detailed information about how to construct and operate this kind of generator.*

Key Words: Generators, Electromagnetic Attraction, Electromagnetic repulsion, Windings, EMF.

1.INTRODUCTION

Generally, the growth of any country is decided by its combustion of energy and fuels. The day by day depleting fuels is very major problem in front of every country. In fact, all the world facing the same problems because as the amount of fuel is reducing its price is increasing considerably, tremendous amount of fuel is consumed by the electrical generating stations and remaining is used by transportation system, industries, and household utilizations.

The generation procedure mainly consists of conversions for e.g. thermal power plant. In thermal power plant we use coal as a fuel and then following stages are performed.

i) Conversion of chemical energy of coal into heat inside the combustion chamber.

ii) Conversion of heat into steam and its kinetic energy inside furnace.

iii) Conversion of kinetic energy of steam into mechanical energy using steam turbine.

iv) Conversion of mechanical energy into electrical energy using generator.

At every stage large amount of energy gets wasted as the efficiency of each conversion stage is not 100%. This causes the overall efficiency of the plant to be decrease hence, the efficiency of thermal power plant is 35% to 40% only which shows that large amount of expenditure on conversion.

Also this method leads to thermal losses and emission of greenhouse gasses which will pollute the environment. The problem with the renewable sources is their availability and environment dependency which causes the energy generation at very less amount their initial cost is very high for example Solar array.

2. COMPONENTS OF FREE ELECTRICITY GENERATOR:

As shown in fig. both the cores having coils on their periphery are connected to the base having some distance in between them. in this distance the bar having rotating assembly on its top is mounted at equal distance from each core. The permanent magnets are attached to the assembly and they are free to rotate over the cores.

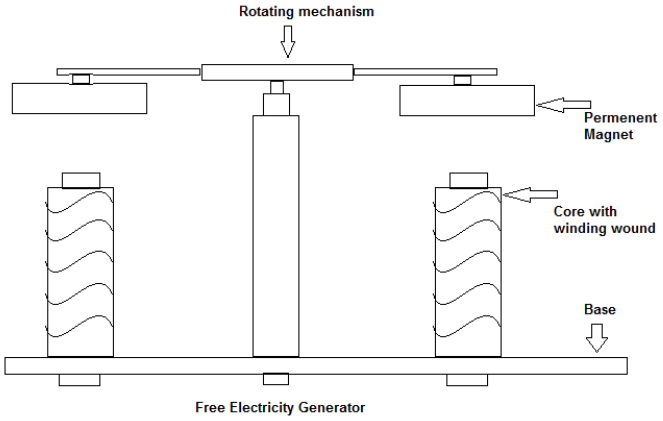


Fig. Constructional diagram of Free Electricity Generator

2.1 Cores

The core is made up of hollow iron formers. The diameter of core is selected according to the flux density of permanent magnets used. The length also depends upon on the number of turn to be wound and height of rotating assembly and clearance needed for proper operations. Highly magnetic, low reluctance and high permeability material like soft iron, silicon steel etc. is used. Both the cores are constructed in same way and for same number of turns. The cores also provided with paper insulation on them. Also the cores are provided with base fittings for robust installation on the base because the cores are supported at one end only and due to electro-mechanical stresses it will tend to attract or repel hence for strong adhesion nut bolt arrangement is provided.

2.2 Windings

The windings are generally made up of copper for high conductivity. Copper conductor with some insulation on its periphery is used. The diameter of winding conductor is very small in the range of micro-meter and mili-meter because the use of permanent magnets the flux density is very weak hence to induce enough amount of voltage the winding with smaller diameter is selected.

2.3 Permanent Magnets

The size is selected according to the output required and the size of winding and core. Circular shaped magnets are preferred because when they approach to core the flux density is increasing in nature, when they are exactly above the core the density is maximum and when the starts leaving the core the flux density is of reducing in nature. As soon as flux density of permanent magnet appears to reducing coils magnetism repulse them causing the desired operation.

2.4 Rotating Assembly

Frictional and windage losses depends upon the smoothens of mechanical components where mechanical power transmission take place. Hence due attention is must be given to rotating assembly. Generally, to reduce friction greasing and oiling is done. For heavy duty sleeve bearings are used and for small levels ball bearings are used. For coupling of magnets very accuracy of the Nano-metre is used and it also provided with the strong support at its bottom, it has to balance all the mechanical forces exerted by rotating assembly.

2.5 Base Frame

Any strong weld able material with insulation over it is used. It must be capable of bearing the static and dynamic weight of assembly. Static weight is the weight of assembly at steady state condition and dynamic weight is the total weight of assembly under operating conditions. Base is also provided with some wiring facilities and for mounting PCB's etc. nut bolt arrangement is done with very accurate measurement to provide proper robust construction.

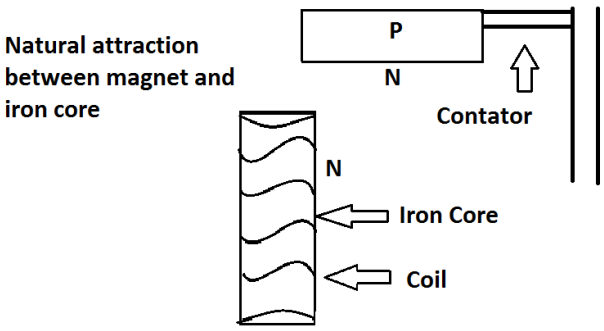
2.6 GENERATOR

An ac generator produces alternating power. A DC generator produces direct power. Both of these generators produce electrical power, based on same fundamental principle of Faraday's law of electromagnetic induction. Generator is selected according to the power output required and the tore driven capacity of rotating assembly. DC generators are preferred over ac because of less torque availability.

3. METHODOLOGY

3.1 Attraction

The natural property of magnet is to attract the magnetic particles in the magnetic flux line produce by it. It gives the area in which the influence of magnetic force can be realize. The amount of magnetic lines per unit area around the magnet is the measure of flux density. The magnet attracts the metallic material proportional to the magnetic dipoles present in the material. Also it depends on the movement of dipoles in the material.



The same property is use in above setup the core is made up of magnetic material and it contains large number of magnetic dipoles even in the absence of magnetic field. On the application of magnetic field this magnetic dipole gets aligned according to the pole facing. On increase in this magnetic field they tend to attract towards the magnet also the dipoles in the magnet gets attracted towards the magnetic material hence, resulting in the attraction between both the magnet and magnetic material and reduction in distance between them. This reduction takes place until the magnetic material comes exact over the magnetic core. Suddenly the peak magnetism is obtained at that point. Before this point magnetism is zero and rapidly increasing towards its peak and again starts reducing towards the zero. This whole process is analogues to the positive half cycle of the alternating wave.

3.2 Electromagnetic Repulsion

When the coil wounded on the core former then it can be act as the electromagnet if current is allowed to flow through it. If permanent magnet is allowed to pass over such arrangement, then it cuts the flux produce by the permanent magnet and according to law of electromagnetic induction the emf get induces in the coil. This emf is directly proportional to the speed of rotation, flux density and the angle between flux axis and conductor axis. And is given by,

$e = b*l*v*\sin\theta$

where, e = induced emf

b = flux density

v = velocity of magnet

ɵ = angle between flux and conductor axis

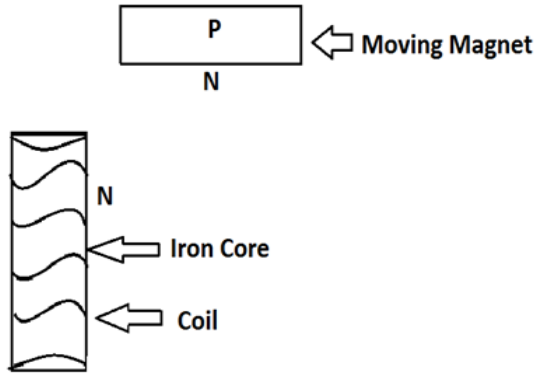


Fig. Electromagnetic Repulsion

Due to this emf current flows through the conductor placed on the core which is proportional to induced emf and inversely proportional to the impedance of coil. According to the law of magnetism the core suddenly acts as the magnet. As this happens due to virtue of the electric flow in it called as the electromagnetism. The polarity of magnet can be decided by the direction of flow of electric current through it. Also it can be simply found by the Lenze's law of electromagnetism. It states that the "induced ems always opposes the basic cause of its production". Accordingly, the magnets get repelled by the core because the facing poles of magnet and core are same. This causes the repulsion of permanent magnet by electromagnet every time.

4. WORKING

When the initial jerk is given to the rotating assembly it starts rotating and when magnet comes near the core it is attracted towards it because of natural magnetism as explained earlier. Due to this attraction magnet comes over the core, along with the magnet the steady state magnetic field also moves with the magnet. This movement causes the magnetic flux to be cut by the conductor placed on the core. According to Fradays law of electromagnetic induction emf induces in the coil, this emf causes the flow of the current through the coil. As a solenoid the magnetic material surrounded by the core starts acting as an electromagnet and its poles are also stable and depends on the magnetic field. But the top pole is same as the bottom pole of the magnet, which causes the magnet to repel by the electromagnet.

This repulsion causes the magnet to go away from the top realm of the electromagnet. At this time the magnet has two option of displacement, first is to go backwards or in the same direction from it is coming towards the core and second one is to rotate in the same direction. But to go backward it will have to oppose the inertia and to rotate in same direction it only has to assist the inertia and continue rotating without any stoppage. This whole process of attraction, cutting of fluxes, induction of emf, circulation of current and electromagnetic repulsion is very instantaneous and it happens every time when magnet comes go near the core. This whole process causes the continuous rotation of the rotating assembly.

This continuous rotation does not require any further energy to hold it rotating this process is cumulative and works like a chain reaction and exists continuously. This continuous rotation can be used to rotate any small size generator to get the electricity freely, without consuming any costly fuel. The generator is only to be coupled on same shaft on which the horizontal shaft which holds magnet in air is connected. Simple chain type coupling can be used to utilize this rotation. Or we can fix a turbines of aerodynamic shape to act it as the continuous rotating fan which can be used in the cooling systems.

5. APPLICATION

i) This small generator can be used to produce the DC supply up to 110v.
ii) Also it can be used to produce 110v low frequency AC supply.
iii) Can be used as a permanent rotating fan.
iv) Without any generator it can produce 6v DC supply if output is extracted from coil.
v) In remote areas where transmission is quite difficult it can be use as main plant for generation
vi) It is very much suitable as a base plant because of its constant speed and torque.

6. ADVANTAGES

i) Construction is simple and small.
ii) It does not require any input energy.
iii) Output torque and speed is constant.
iv) Reliability is very high.
v) Most suitable for synchronous generator.
vi) Very high scope of modification according to need.
vii) Torque can be increased by adding more number of magnets and more number of core calculating the required axis.
viii) Supply is continuous and continuity cannot be affected by any atmospheric reasons.
ix) Shortage of electricity can be minimizing totally.
x) Its initial cost is less and running cost is negligible.
xi) It does not pollute atmosphere.
xii) Can be used for household as well as other purposes.

7. DISADVANTAGES

i) Generated electricity is very small.
ii) Torque produce by rotating mechanism cannot be increased.
iii) Speed of rotation remains constant.
iv) Hence frequency of supply also remains low.
v) It requires initial jerk.

CONCLUSION

i) Electric energy can be generated freely without any combustion of fuels and using basic laws of magnet and electromagnetism.
ii) It will meet the day by day increasing demand of power all over the globe.

FUTURE SCOPE

i) It holds great potential to advance the power generation system as it can replace all the non-conventional power plants.
ii) Remote areas where electricity cannot be transported, this generator will make dramatic change.
iii) Scarcity of electricity and load sharing problems will be reduced totally throughout the word.

iv) By introducing more number of poles and rotating magnets the torque can be increased considerably to drive large generators.
v) This will lead to bulk amount of generation.

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