

# ENERGY GENERATION USING FLYWHEEL AND MAGNETS

*Project Reference No.: 45S\_BE\_3700*

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## **Keywords:**

Flywheel, Generator, Magnet, Pedal

## **Introduction:**

Electricity is one of the most significant gifts that science has bestowed upon humanity. It has also become an integral part of modern life such that it is difficult to imagine a world without it. Electricity has numerous applications in our daily lives. To enable an object to consume the power which is required for its function, electrical energy must be produced. There are different ways in which electricity can be produced, which includes burning of coal, petrol and diesel, or producing electricity from steam etc.

These above mentioned methods are inconvenient in many ways. Burning of non renewable sources are hazardous to environment as it produces harmful gases. The batteries which are used to produce electricity is also manufactured using harmful substances. Using high pressure steam and batteries are expensive and hard to maintain.

## **Objectives:**

- To arrange magnets in such a way it produces mechanical force.
- To design the Flywheel.
- To design the generator .
- To produce electrical energy for maximum extent of time using flywheel and magnets.
- To generate electricity using applied mechanical force.
- To use flywheel as an alternative for battery.
- To produce electricity using minimum resources.
- To generate electrical energy without producing hazardous pollutants.
- To create a convenient method of energy generation which is easy to maintain.
- To produce electricity in a way which is environment friendly.

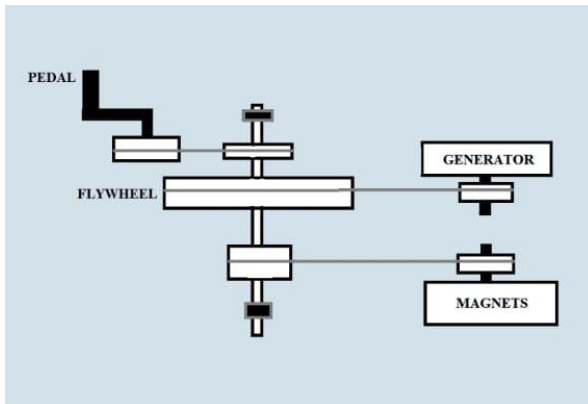
## **METHODOLOGY**

### **Materials Required:**

1. Flywheel - A bicycle wheel is used as a flywheel along with a heavy weight which increases its potential to store energy
2. Generator - A ceiling fan is modified as a generator by arranging magnets over its stator.

3. Pedal - Bicycle pedal is used as a pedal which is required to apply mechanical force.
4. Neodymium magnets - Strong neodymium magnets are placed in two lanes in a V shape.

**Block Diagram:**



**Working:**

- Initially the mechanical force is applied externally by rotating the pedal by human force.
- The mechanical force powered by pedal rotates the flywheel, V gate magnetic machine and generator.
- This mechanical energy is stored in the form of kinetic energy in the flywheel.
- When the external mechanical force is stopped the energy stored in the flywheel is utilised which keeps it rotating for some time.
- The flywheel is connected to V type magnetic machine.
- This magnetic arrangement picks up the momentum after some rotation which in turn provides rotational force to the flywheel.
- The generator which is also connected to flywheel rotates along with the flywheel.
- The generator converts mechanical energy into electrical energy.

**V TYPE MAGNETIC MACHINE:**

V type magnetic machine consists of two lanes of magnets arranged in a V shape. One lane has the magnets which has North pole upside and another lane has the magnets which has South pole upside. When a bar magnet is placed with opposite poles on the joint side of gate it starts moving towards the opening. But when it reaches the opening it stops. So on reaching the opening the bar magnet is lifted, to make next rotation.



**Results and conclusions:**

In this project, the electrical energy is generated by generator which mechanically powered by external mechanical force applied by human which gets stored in flywheel and also by V type magnetic machine. When the external source of mechanical force is removed, the flywheel continues to rotate for some time. Therefore, the model works as a battery.

Due to friction, there is loss of mechanical energy stored in the flywheel. This can be reduced by using magnetic levitation technique where more stronger magnets need to be used. Also if the strength of magnets used in the V-type magnetic machine increased, more rotational force will be provided to the flywheel by V-type magnetic machine.

### **Scope For Future Work:**

The demand of electricity is increasing day by day in recent time. Today, it is impossible to imagine a life without electricity. From basic necessity of using lights and fans to using electric vehicles, our lives have become so much dependent on electricity. In this scenario, generation and storage of more and more electricity is very much necessary. But, the sources to generate electricity are limited. The non renewable sources are extinguishing and these method of producing electricity are hazardous to environment. The renewable sources like hydro and wind requires high installation cost, large area, etc. In this situation, producing electricity using flywheel can be an excellent source with minimum resources and easy maintenance. This method of generating electricity can be improved by using different methods and techniques where the production time of electricity can be increased. By this method it is also possible to store energy which can be an alternative to battery. In present situation the battery which are used are manufactured using costly, non renewable and harmful sources. Therefore this technique serves the purpose along with being environment friendly.