

# Design And Fabrication Of Power Generation In Children's Park Using Swing Power System Embedded With Creo Software.

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## Abstract

Renewable energy can be used to decrease global dependence on natural resources, and power can be the primary form of renewable power utilized. Two case studies, Annapolis Royal and La Rance, prove that swing power plants are capable of producing reliable and efficient power. Problems, such as initial cost and power transportation hinder future implementation of power plants. This project emphasizes the possibilities of utilizing the power by pollution free, Power generation. This project reciprocating motion converted into rotary motion using rack and pinion mechanisms. In our project, a new method is proposed for harnessing of human power based on children's play in playgrounds and public places, on devices such as the swing. When large numbers of children play in a playground, part of the power of their play can be usefully harnessed resulting in significant energy storage. This stored energy can then be converted to electricity for powering basic, low-power appliances such as lights, fans, communications equipment, and so on. The method provides a low-cost, low-resource means of generation of electricity, especially for use in developing countries. The paper discusses the basic theory behind the method. The parts of our project are designed and assembled using the Creo software and finally the fabrication part has been carried out.

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## I. Introduction

Energy need of today's modern world is growing day by day because of consumption of some or larger extent or amount of growing population. Due to lack of proper planning and delay in its implementation is leading to a factor called —load shedding. Many concepts are being carried out to generate electricity on local basis and utilize the same for said to locality. This project is about a swing, which is used by children for playing that produces electricity while being used. In its simple construction, the swinging action of swing makes the horizontal beam member turn through some angle continuously to and fro motion now this motion is transferred to link which transfers this angular motion into linear one as well as amplifies the same. This amplified motion is then transmitted to a free wheel that uses flexible links. The free wheel turns this linear reciprocating motion into circular one directional motion and transmits the same to flywheel. The flywheel is connected to a generator by specific transmission to increase the speed at generator end. The generator converts the mechanical energy into electrical and this electricity is produced. The swing generates electricity while being used only. The electricity thus produced can be used for local use. The electricity thus produced is free of cost and is ecologically friendlier. This way of generation of electricity if implemented at various parks, play houses, schools etc. can certainly lower down the load on main grid thus helping save electricity. This swing electricity generator not only generates electricity but also can be a very useful tool for educating children to learn to conserve energy. Along with this project uses that energy that is given a way in playing. Swing electricity generation system produces electricity and can be used for local purpose. This electricity thus produces free of cost and ecologically friendlier this way of generation electricity. If implemented at various parks, play houses, schools etc. can be certainly lower down the load on main grid thus helps in saving electricity. This system can be a very useful tool for educating children to learn to use a renewable source of energy along with this project uses that energy that is given a way in playing.

## II. Literature Survey

**Ayneendra B et al (2017), Fabrication of Swing Motion Power Generation, International Journal of Latest Engineering Research and Applications, Volume – 02, Issue – 05.**

Energy need of the world is growing day by day because of consumption of energy at a larger extent with the population growth. This paper is about generating power by using a swing in such a way that when it swings the mechanical energy is generated and it is converted into electrical energy by a commutator and is stored in a battery. The construction is such a way that, the swinging action makes the horizontal beam rotating through an angle. This shaft is connected to a sprocket to transfer the motion to the free wheel which rotates proportionally with respect to the angle of motion of the swing. The angular movement is converted into a complete rotation with the help of a chain drive connecting both sprocket and free wheel. The free wheel is connected to a shaft which in turn rotates the spur gear and dynamo arrangement to generate electricity.

**Mr. Jayawant Goykar et al (2017), Electrical Energy Generation by using Swing, International Journal for Scientific Research & Development, vol-5, issue-3.**

To convert oscillatory motion of swing in to rotary motion of bicycle wheel and dynamo is connected to bicycle wheel and dynamo convert the mechanical energy into electrical energy. This is very useful in the purpose of lightening of garden. Children can enjoy swing and can also useful in generation of electricity. It will reduce the energy consumption required to lightening the garden at the night. Paper contains design calculations, results for fabrication of swing. Project contains the use of sprocket, chain wheel, bicycle wheel, bearings, dynamo, rectifier, battery and LED bulb etc.

**Rameshwar Kadu et al (2017), Electricity generation and bottle crushing by using Swing, IJARIE, vol-3, issue-2.**

Swing is generally used by children for playing in parks & playgrounds that will produce electricity during its use. During swinging pendulum motion of shaft transfers its motion to flywheel. This rotary motion of flywheel is transferred to low RPM generator which generates electricity in small scale. On the other side of shaft crushing mechanism is connected, which can be used to crush plastic waste collected in the park or playground.

**Manjunatha C J et al (2015), Swing Electricity Generation System, International Journal Of Scientific Progress And Research, Volume-13, Number – 01.**

In the swinging action of swing makes the horizontal beam member turns through some angle continuous it's to and fro motion. Now this motion is transferred to link which transfers this angular motion of the beam to rotary motion of the flywheel, which is rigidly connected at the end. The flywheel is connected to a generator by specific transmission to increase the speed at generator end. The generator converts the mechanical energy into electrical and thus electricity is produced. The swing generates electricity while being used. Along with this project uses that energy that is given a way in playing

## III. Components

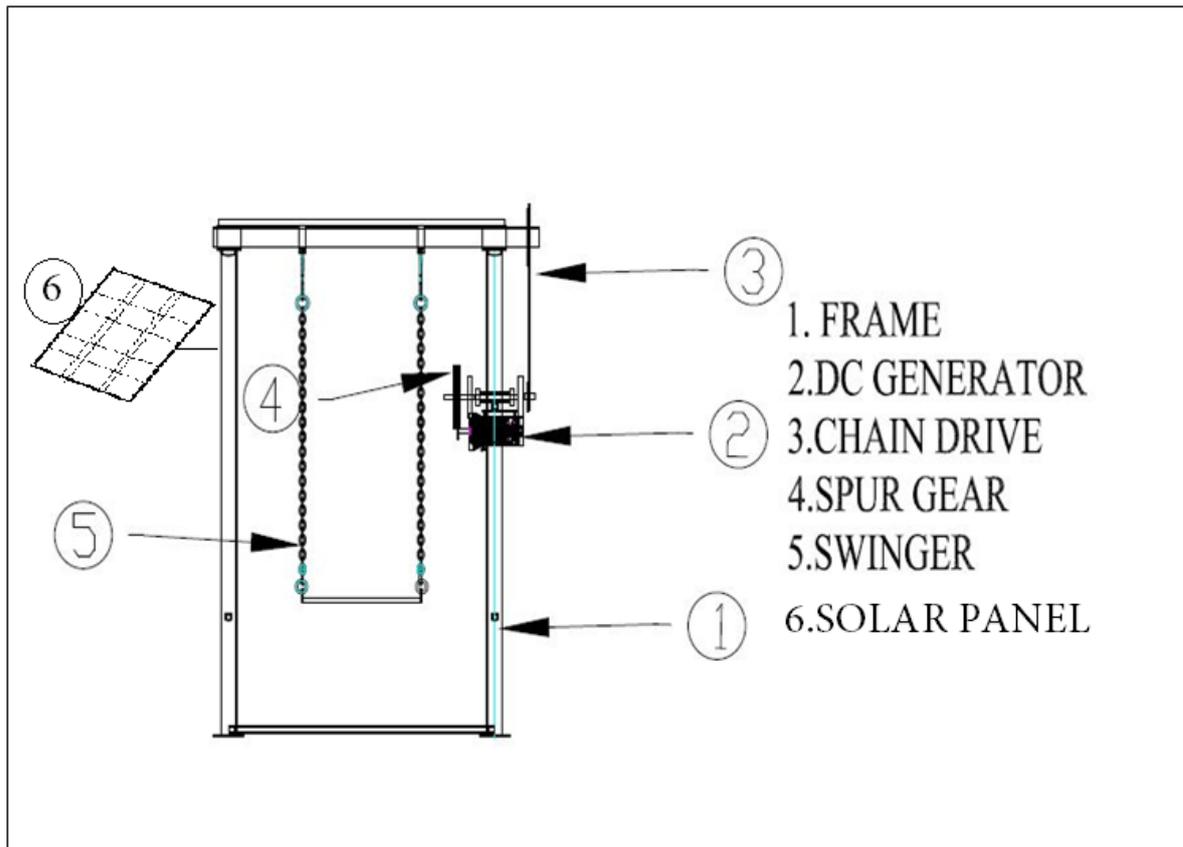
The major parts that are effectively employed in the design and the fabrication of the swing electricity generation system are described below:

- Battery,
- Bearing With Bearing Cap,
- Spur gear,
- Frame,
- Sprocket and chain drive,
- DC generator.
- Solar panel

DESIGN : CREO S/W

A traditional swing consists of main frame which is connected with a rotating shaft at both the ends by using ball bearings. Since its swing motion is in single direction, power generated is less. So, new model is designed to generate electrical power based on bi-directional swing motion with sprocket, spur gear arrangement and dynamo. One side of the main shaft as driver sprocket which is fixed and below it a driven sprocket (freewheel) is connected by chain and it is coupled with the spur gear arrangement which drives the dynamo.

The swing is designed using solid bars instead of chain in order to allow maximum torque to the bearings which will result in effective power generation.



*Fig 1.0 Design Framework on Swing*

#### **IV. Working Principle**

The experimental setup of our project consists of a swing frame in which the small modification is made such that the rod attached with the movable swing moves along with the swing when it is actuated when a child plays. The end of the rod is connected with the sprocket and the chain drive which transmits power. The other end of chain drive is connected with the help of the free wheel so that the rotation motion is achieved in only one direction and the free wheel helps to prevent the smaller sprocket to rotate in the opposite direction. The smaller sprocket is coupled with that of the spur gear and it turns to the generator. The spur gears are used to increase or decrease the speed rotational speed.

Hence when the swing is played by the child, the rod oscillates and the motion from the rod is transmitted to the smaller sprocket by means of chain drive and then to the spur gear. The spur gear enhances the rotational speed of the sprocket and delivers it to the generator thereby resulting in the suitable power generation. The generated power can be stored up in the batteries which can be used for the future purposes.

#### **V. Conclusion**

Thus the fabrication of “**SWING MOTION POWER GENERATION**” kit was fabricated and demonstrated. Now a days the alternate power generation is the most essential one. Due to the modern technological approach and industrial growth the electricity is the most important. Therefore, Alternate source of energy generation is very essential. In this regard, We designed and fabricated the working model of “**ELECTRICITY GENERATION FROM SWING**”. With using this setup, all the houses can and participate for the nation development and full fill the minimum amount of electricity demands. so, swing power electricity generation is considered as a promising alternate for exhausting energy sources.

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