

Swing Electricity Generation System

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Abstract - Energy need of today's modern world is growing day by days because of consumption of some or larger extent or amount of growing population. This project is about a swing, which is used by children for playing that produces electricity while being used. 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.

Keywords— Swing, Generator, Flywheel, Wheel, Bearings.

I. INTRODUCTION

Energy is the ability to do work. Energy need of today's modern world is growing day by day because of increase in population. This project is about a swing, which is used by children for playing that produces electricity in both side of swing. The electricity thus produced can be used for local use, free of cost and is ecologically friendlier. This way of generation of electricity if implemented at various parks, play houses, schools etc. can certainly help saving electricity.

This swing electricity project not only generates electricity but also can be a very useful tool to educate children to learn to conserve energy. This project utilizes energy that is given away while playing.

II. OBJECTIVE

The objective of the project is to convert obtained mechanical energy during the movement of seating of swing set into electrical energy along with no added effort and also storing the electricity thus generated into a battery, which can be utilized whenever needed.

III. METHODOLOGY

The main aim of this project is to utilize the mechanical energy generated during the swinging action of swing set and

convert it into electricity, and store the electricity thus generated into a battery. It works based on the principle that energy can neither be created nor destroyed but can be converted from one form to another.

IV WORKING PRINCIPLE

During the forward stroke & backward stroke of swing some torque is induced in shaft. The shaft is mounted between two bearings. At one end of the shaft a large sprocket is attached rigidly, this sprocket pivots over shaft axis when the shaft is displaced. The larger sprocket is attached to a smaller sprocket using chain. The smaller sprocket is mounted on a sprocket shaft, on one side of which a flywheel is attached and on another side a generator is mounted with help of screws.

When the seating of the swing set moves forward & backward some torque is induced in the shaft by the holding bars of swing set. This torque displaces the larger sprocket which is pivoted over axis of shaft causing the angular displacement. This angular movement is converted to rotational motion of smaller sprocket by chain attachment. The sprocket rotates the flywheel which runs the generator, thus producing the electricity. Flywheel is used to smoothen the flow of energy as the power is produced in alternate stroke. The electricity thus produced is stored in a battery by using electric circuits as shown in fig 1.

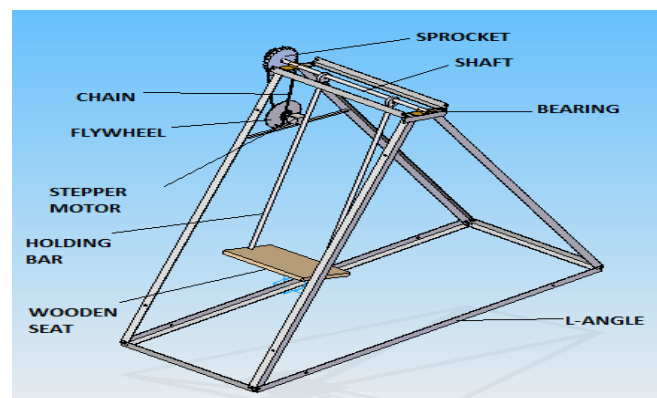


Fig1 – Working Mechanism

V. ADVANTAGES, LIMITATIONS & APPLICATIONS

Following are the Advantages, Limitations & Applications of developed model,

Advantages

- Pollution free electricity generation.
- This power can be stored in battery array so as to use it further.
- Can be installed at places such as schools, playgrounds where mass transit of children is sighted e.g. hotels, fairs etc.
- Easy installation and maintenance.
- Simple mechanism.

Limitations

- Require periodic checkups.
- Implementation cost is bit higher than overall average production cost.
- Power generation is not continuous.

Applications

The system can be employed in places such as,

- Schools
- Nurseries
- Parks
- Gardens
- Playgrounds

VI RESULTS AND DISCUSSION

Fig2 Shows and Table 1 shows the variation of output voltage with respect to angle of swing,

Table 1: O/P Volts and Range of swing angle (Degrees)

| Range of Swing Angle(Degree) | Output (Volts) |
|------------------------------|----------------|
| 20-30 | 2 |
| 40-60 | 3 |
| 60-90 | 5 |
| 90-120 | 6 |

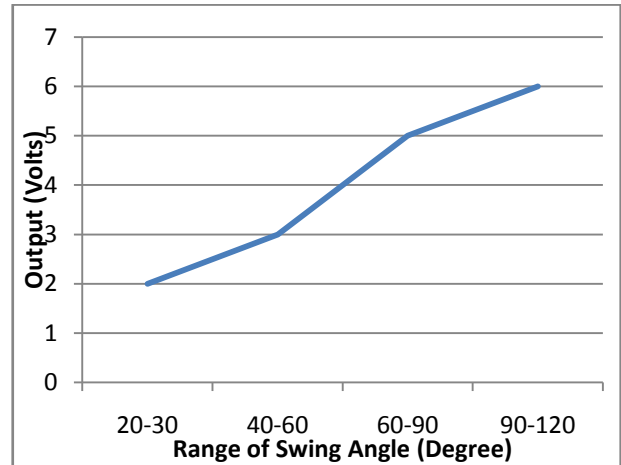
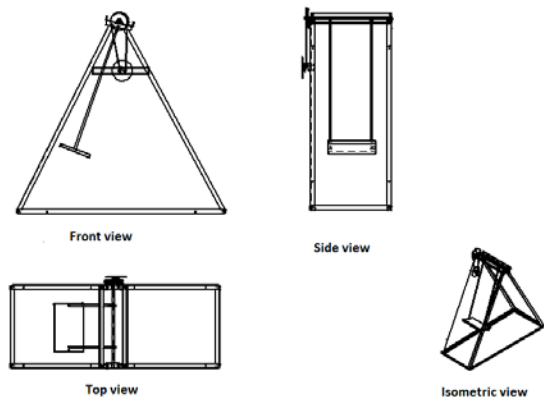


Figure 2: O/P Volts VS Range of swing angle (Degrees)

VII. DIFFERENT VIEWS OF OVERALL ASSEMBLY



VIII CONCLUSION

- The proposed system offers an innovative method to generate electricity from the mechanical energy produced during the swinging action of swing seat with no added effort to the person sitting on it, which would otherwise be wasted.
- The proposed system can be used to generate electricity effectively in a non-polluting manner at various places like schools, parks, playgrounds, garden, etc.
- It is an attractive technology for optimal use of available sources.

SCOPE FOR FUTURE WORK

- A different electric circuit may be introduced further to amplify the voltage.

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