INCLINE GENERATING ELECTRICITY

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ABSTRACT

In this paper, Basically dealing with the generation of electricity it is an electronics project using mechanical arrangements. This mechanical arrangement uses a gear drive and a chain & sprocket arrangement. In this arrangement the kinetic energy is converted into rotational energy and finally rotational energy to electrical energy. The various arrangements that could be used are spring arrangement or reciprocating bump & roller arrangement. Here we would be discussing about the roller mechanism.

Keywords— *dc: direct current, ac: alternating current, generation, alternator and roller.*

I INTRODUCTION

Over millions of people in India have no access to electricity. Of those who do, almost all find electricity supply intermittent and unreliable. Lack of clean and reliable energy sources such as electricity is, in part, causing about 800 million people in India to continue using traditional biomass energy sources as fuel wood, agricultural waste and livestock dung – for cooking and other domestic needs. Traditional fuel combustion is the primary source of indoor air pollution in India, causes between 300,000 to 400,000 deaths per year and other chronic health issues.

Compared to the average emissions from coal-fired, oil-fired and natural gas-fired thermal power plants in European Union (EU-27) countries, India's thermal power plants emit 50 to 120 percent more Carbon dioxide per kWh produced.

The biggest lag in India , in sector of electricity was seen on July 2012. The July 2012 India blackout was the largest power outage in history, occurring as two separate events on 30 and 31 July 2012. The outage affected over 620 million people, about 9% of the world population, or half of India's population, spread across 22 states in Northern, Eastern, and Northeast India. An estimated 32 giga watts of generating capacity was taken offline in the outage. An article in The Wall Street Journal stated that of the affected population, 320 million initially had power, while the rest of the affected population lacked direct access.

The roller is directly connected to the mechanical arrangements which consist of Rack & Pinion & of Chain & sprocket arrangements. This arrangement is connected to a shaft that is connected to a rotor of the alternator. The rotor contains a magnet that, when turned, produces a rotating magnetic field. The rotor is surrounded by stationary casing called the stator, which contains the wound copper coils or windings. When the moving magnetic field passes by these windings, electricity is produced in them. By controlling the speed at which **the**

rotor is turned, a steady flow of electricity is produced in the windings. These windings are connected to the electricity network via transmission lines**.**

II EXPERIMENTAL SETUP

An iron roller is fixed on a wooden ramp on which vehicle passes. As vehicle passes over it, it starts moving. A linkage is provided which transfer the motion to a DC alternator for electricity generation.Fig.1

Fig.1 Experimental Setup

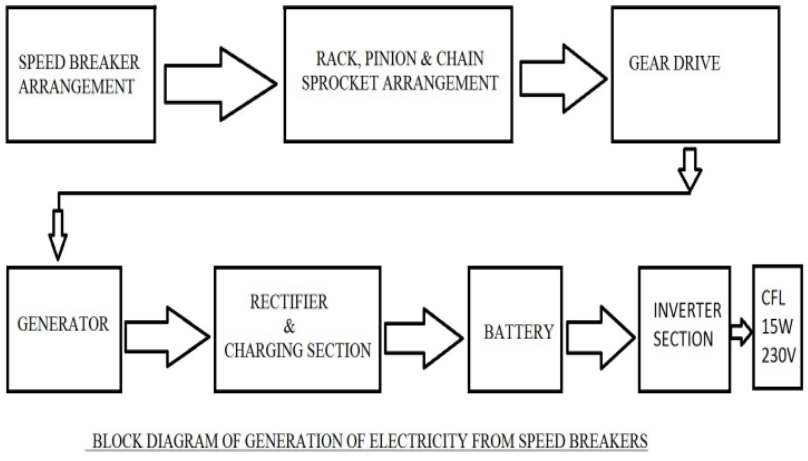

Fig.2 Block Diagram

III-EQUIPMENT USED

3.1 Rack And Pinion Gears

The rack and pinion is used to convert between rotary and linear motion. The rack is the flat, toothed part, the pinion is the gear. Rack and pinion can convert from rotary to linear of from linear to rotary.

Here we are using rack & pinion that are toothed gears, where rotary motion is converted to rotary motion with a speed gain..

3.2 Chain & sprocket arrangements

Using a gear of 24 teeth (a pair) is connected with the chain. this arrangement is used to increases number of revolutions per minutes is chain & sprocket fittings.

3.3 Bridge-wave Rectifier

A bridge-wave rectifier utilizes 4 diodes (1N4007) shown in Fig.2.It is employed in this project to enhance the efficiency of the system. It is preferred over centre-tapped rectifier because:

1. It is less costly than centre-tapped rectifier.
2. The peak inverse voltage of bridge-wave is half that of centre-tapped rectifiers.

The bridge wave rectifier prohibits the back flow of power to the alternator from the battery section.

3.4 Alternator

An alternator is an electromechanical device that converts mechanical energy to electrical energy in the form of alternating current. A dynamo without commutate is known as alternator. Basically, any AC electrical generator can be called an alternate or. Alternators use a rotating magnetic field with a stationary armature as shown in Fig.4

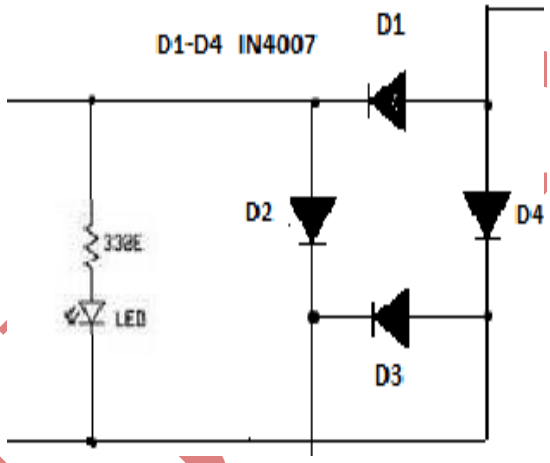

Fig.3 Bridge wave rectifier

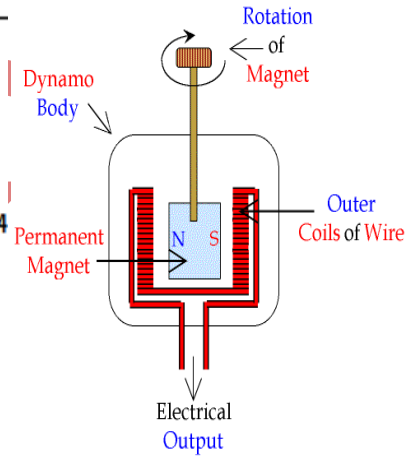

Fig.4Alternator (Dynamo)

3.5 LED

Light emitting diode is basically a P-N junction semiconductor diode which emits visible light. A normal LED emits at 2.5V and consumes mA of current. The LEDs are flat tiny P-N junction enclosed in a semi-spherical dome made up of coloured epoxy resin. The dome of a LED acts as a lens and diffuser of light.

3.6 Jack

A jack is a connector that connects to 2 voltages at different time.The jack used in the project works at 2 different voltages of 6V & 12V depending upon the battery ratings.

3.7 Storage Section

Here for the storage of power we are using a dry battery of 12V, weighing about 2.7 Kg.

3.8 Inverter

The inverter section is using 2 p-n-p transistors that along with a capacitor makes a colpitts oscillator which is used to convert DC to AC. In this section we also use another capacitor which absors excessive charge and prevents damage in output section.

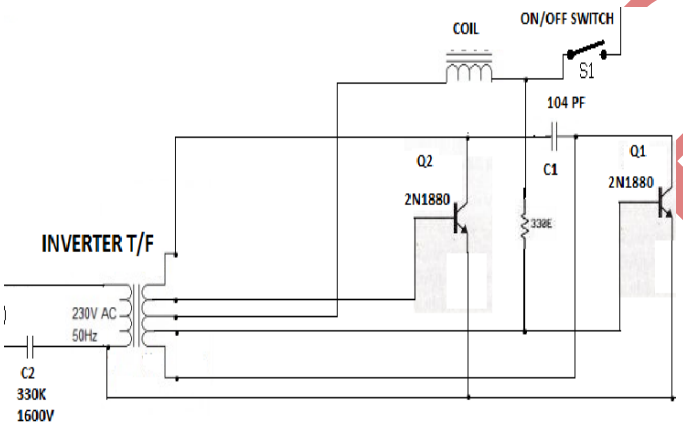

Fig .5 Inverter Circuit

In the end of inverter section we're using a Step up transformer that steps up 12V to 220V.

3.9 Output Section

In output section we are using a CFL(compact fluorescent lamp).We are getting a maximum output of 15W but we are using CFL of 5W.

Table 1: Specifications of Wooden Ramp

Sr. No.	Parts	Dimensions(mm)
1	Wooden Board	480*250
2	Platform	245*120

Table 2: Specifications of Metal Roller

S. No.	Parts	Dimensions(mm)
1	Outside diameter of roller	140
2	Inside diameter of roller	130
3	Length of roller	305
4	Diameter of shaft	30

IV CONCLUSION

In the coming days, as demand of electricity is increasing every moment, this kind of methods will be dominant, since it will save a lot of electricity. Any country can only develop when it uses power supply frequently and not by getting breakdown in middle course of time. Now times comes when these types of

innovative ideas should be brought into practice. At least, by this idea we should start to think something about to save electricity.

This project has some advantages which are:-

- The project is economical and easy to install.
- This project is non polluting.
- Maintenance cost is low.
- Once installed will last for many of years.
- Can save a huge amount of electricity.

V FUTURE ASPECTS

The project could be improved in many a ways by using following key points:

- Using more rollers at a bump so as to increase the electricity generated.
- Using replication of arrangement just opposite side of the roller so that out of single roller two CFLs could be glowed.
- Using helio watcher arrangement along with this arrangement will increase its efficiency.

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REFERENCES

[1]. S. A. Jalihal, K. Ravinder, T.S. Reddy, "*Traffic characteristics of India*", proceedings of the Eastern Asia Society for Transportation Studies, Vol. 5, and pp.1009 - 1024, 2005.

[2]. S. K. Singh, "Review of Urban Transportation in India," *Journal of Public Transportation",* Vol. 8, No. 1, 79-97, 2005.

[3]. H. P. Bloch, A Practical Guide to Compressor Technology, Second Edition, John Wiley and Sons, 2006, pp 1-120.

[4]. H. P. Bloch, Compressor and Modern Process Application, John Wiley and Sons, 2006, pp 3-21.