

Generation of Electricity with the Use of Speed Breakers

Sagar Tayade¹, Shubham Pawar², Saurabh Deshmukh³, Uday Bhosale⁴, Swapna Manurkar⁵

^{1,2,3,4}Student, Department of Electrical Engineering, Vishwaniketan's iMEET, Khalapur, India

⁵Assistant Professor, Department of Electrical Engineering, Vishwaniketan's iMEET, Khalapur, India

Abstract: In the present scenario power becomes major need for human life. Due to day-to-day increase in population and lessen of the conventional sources, it becomes necessary that we must depend on non-conventional sources for power generation. While moving, the vehicles possess some kinetic energy and it is being wasted. This kinetic energy can be utilized to produce power by using a special arrangement called "POWER HUMP". The Kinetic energy of moving vehicles can be converted into mechanical energy of the shaft through rack and Roller mechanism. This shaft is connected to the electric dynamo and it produces electrical energy proportional to traffic density. This generated power can be regulated by using Zener diode for continuous supply. All this mechanism can be housed under the dome like speed breaker. This method provides an efficient way to generate electricity from the kinetic energy of moving vehicles in roads, highways, parking lots etc.

Keywords: Non - Conventional energy source, roller mechanism, speed breaker power, chain sprocket, generator.

1. Introduction

In this Mechanism, a roller is fitted in between a speed breaker and some kind of a grip is provided on the speed breaker so that when a vehicle passes over speed breaker it rotates the roller as the shaft of D.C. generator rotates, it produces electricity. This electricity is stored in a battery.

2. Working principle

In this Mechanism, a roller is fitted in between a speed breaker and some kind of a grip is provided on the speed breaker so that when a vehicle passes over speed breaker it rotates the roller. This movement of roller is used to rotate the shaft of D.C. generator by the help of chain drive which is there to provide different speed ratios. As the shaft of D.C. generator rotates, it produces electricity. This electricity is stored in a battery. Then the output of the battery is used to lighten the street lamps on the road. Now during daytime, we don't need electricity for lightening the street lamps so we are using a control switch which is manually operated. The control switch is connected by wire to the output of the battery. The control switch has ON/OFF mechanism which allows the current to flow when needed. This regulated emf is now sent to the storage battery where it is stored during the day time and can be used in night time for providing power to street lights.

3. Main components used

A. Rollers

The Material which is used is hardened EN8 Properties of EN8: EN8 is an unalloyed medium carbon steel with good tensile strength. It is normally supplied in cold drawn or as rolled. Tensile properties can vary but are usually between 500-800 N/mm². EN8 is available from stock in bar and can be cut to your requirements.

B. Bearing

A bearing is a device to allow constrained relative motion between two or more parts, typically rotation or linear movement. Bearings may be classified broadly according to the motions they allow and according to their principle of operation as well as by the directions of applied loads they can handle. The type of bearing used here is rolling element type bearing which is widely used, relatively high friction, suffers from station in some applications. Depending upon the application, lifetime can be higher or lower than rolling element bearings.

C. DC motor as a generator

An electrical generator is a device that converts mechanical energy to electrical energy, generally using electromagnetic induction. The source of mechanical energy may be a reciprocating or turbine steam engine, water falling through a turbine or waterwheel, an internal combustion engine, a wind turbine, a hand crank, or any other source of mechanical energy

4. Block diagram

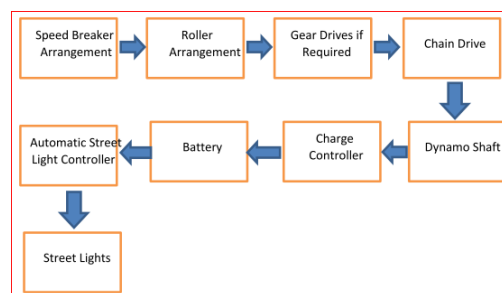


Fig. 1. Block Diagram of the Setup

In this project the ramps have been replaced with the specially designed rollers which directly absorbs the kinetic

energy of the moving vehicles and converts them to rotational energy and thereby rotating the generator, to produce the electrical power.

5. Conclusion

No one is happy with present situation of electricity in India. We need electricity for every small thing. More suitable and compact mechanisms to enhance efficiency. So, this is a small step to try to improve this situation by this project and contribute something for the society. Although less electrical output is being generated. The idea of generating electricity from kinetic energy of the moving vehicles has successfully implemented. If this concept is further developed and is produced in high potential.

6. Future scope

- In the current model, the rollers are covered with plain rubber to increase the friction between the rollers. It can be replaced with another material with a coarse texture to provide better grip between the tires and the rollers.
- The chain drive can be replaced with a V-belt drive. This would reduce the shocks and vibration caused

when under heavy load. Also Belt drives do not require lubrication which would decrease maintenance costs.

- The bearings can be replaced with more durable plumber bearings reducing the chance of failure.
- The material of the rollers can be made lighter so as to increase the efficiency. The mild steel used in this model can be replaced by aluminum alloy 6063 or 6061.

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