

**GENERATION OF ELECTRICITY THROUGH SPEED BREAKERS: AN
INNOVATIVE METHOD TO PRODUCE THE ELECTRICITY
AND LIGHTING THE STREET**

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In this paper electricity in the form of energy is generated through speed breaker by power generators. We generate the electricity, as a secondary energy source from the conversion of other sources of energy, like coal, natural gas, oil, nuclear power and other natural sources, (primary sources) through speed breaker power generators. The conventional sources are in limited quantity, and on the other hand create a lot of pollution in atmosphere; a new technique of power generation is introduced here.

In this paper author describes generating electricity by speed breakers is an innovative and useful concept. As on speed breakers tremendous amount of energy get wasted by vehicles. We can utilize this energy through speed breakers. After producing electrical energy, we have to store during day and will be used during the night. This project and the idea can be applied on heavy traffic roads on a metro city like Mumbai, Delhi, Calcutta, Ahmadabad, and Chennai.

Keywords: power; speed breaker; roller

1. INTRODUCTION

Global requirement of energy increases day by day but primary energy sources are in limited quantity and it is not sufficient to fulfill the total demand of energy. So we have to produce the secondary energy sources in economical range. In this modern era man is totally dependent on electronics nowadays. Consumption of electricity in India is growing day by day and there are very less resources to meet the demands of the people because consumption is very much greater than the supply.

India's current installed capacity from all sources for power production (end of 2010) is 1, 70,229 MW. Power generation capacity is mainly based on thermal and hydraulic about 11% from renewable energy. In 2010, peak power shortage was 12 % . Electricity demand is expected to rise by 7.4%.

Producing electricity from a speed breaker is a new concept that is undergoing research. The number of vehicles on road is increasing rapidly and if we convert some of the kinetic energy of these vehicle into the rotational motion of roller then we can produce considerable amount of electricity, this is the main concept. In this project, a roller which is main component for produces electricity and this energy 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.

2. REASON FOR SELECTING THE PROJECT

In the present day scenario power has become the major need for human life. Energy is an important input in all the sectors of any countries economy. The day-to-day increasing population and decreasing conventional sources for power generation, provides a need to think on non-conventional energy resources. The utilization of energy is an indication of the growth of a nation. For example, the per capita energy consumption in USA is 9000 KWh (Kilo Watt hour) per year, whereas the consumption in India is 1200 KWh (Kilo Watt hour). One might conclude that to be materially rich and prosperous, a human being needs to consume more and more energy. We can supply this energy to street lights, traffic lights, and nearby areas, and thus helps in country's economy.

3. REQUIREMENT OF SPEED BREAKER

We have much need of speed breaker because of the question arises why only the speed breaker is used and not the rough road or plane road where the kinetic energy of the vehicle is more then what is getting on the speed breaker for answer to this question.

Let look on one example: A car or any heavy vehicle is coming with a speed of 120 mph at speed breaker on the road and passing over this roller which is fitted at the level of the road then this roller is gaining the speed nearly somewhere 100 mph (due to losses). So now suppose a cycle is coming with a speed of 30 mph and is going to pass this roller (which is moving at a speed of 100 mph) due to this difference in the speed there will be a collision that is the main reason for using this concept on the speed breaker.

4. WORKING PRINCIPLE

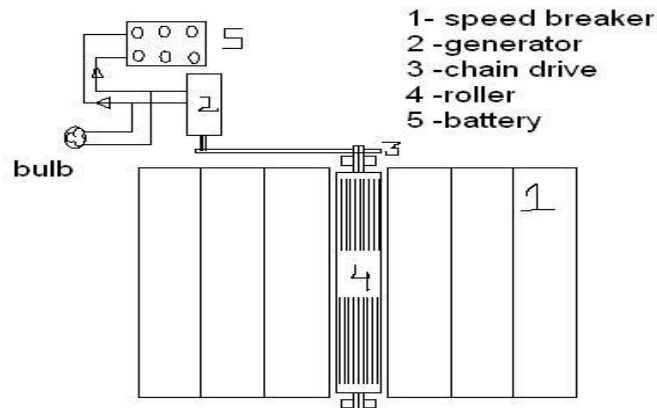


FIGURE 1. TOP VIEW OF PROJECT

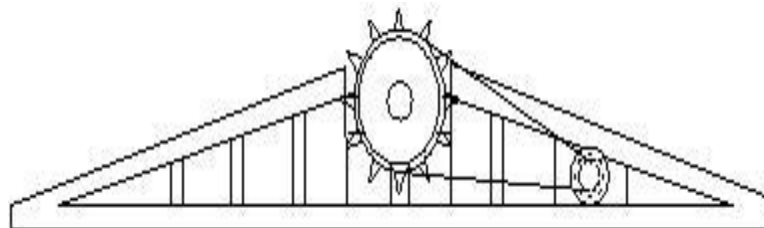


FIGURE 2. SIDE VIEW OF THE PROJECT

The principle of the electric power generation using speed breaker mechanism is very simple. In this setup mechanical energy is converted into electrical energy using a D.C. generator.

A roller is fitted in between a speed breaker and some kind of a grip is provided on the speed bumper so that when a vehicle passes over speed breaker it rotates the roller. As the vehicle moves over the roller, the gear arrangement attached to the roller comes into motion. The rotation of larger gear attached to the roller causes the smaller gear to rotate by the help of chain drive. One rotation of the larger gear is equal to five rotations of the smaller gear. The smaller gear of the gear arrangement is attached to the dynamo. The dynamo is used to convert the rotational energy into electrical energy. After then this energy is stored to battery and use as required in street at night.

The function of each component as follow:

4.1. SPEED BREAKER

Speed breakers are used to slow down the speed of vehicle by offering a resistance on wheels. It is in strips in two to five numbers lying parallel to each other on the road. There are we can use directly roller instead of speed breaker in this project.

4.2. D.C. GENERATOR

The dynamo uses rotating coils of wire and magnetic fields to convert mechanical rotation into a pulsing direct electric current through Faraday's law. A dynamo machine consists of a stationary structure, called the stator, which provides a constant magnetic field, and a set of rotating winding called the armature which turns within that field.

4.3. ROLLER

A roller is main component of this project because of use of roller; we rotate the gear which is used to rotate the shaft of D.C. generator by the help of chain drive. In this project roller mechanism is more important because there is we use roller instead of speed breaker to produce electricity.

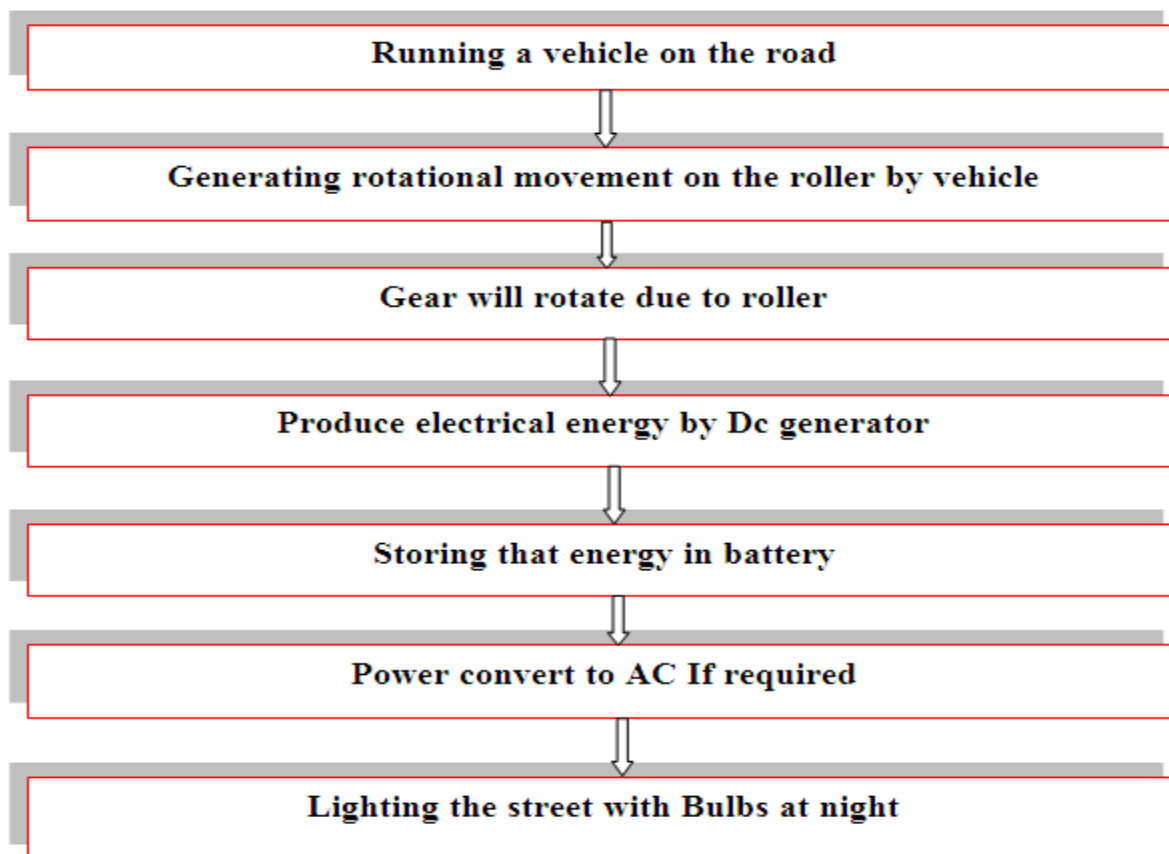
4.4. CHAIN DRIVE MECHANISM

Chain drive is a way of transmitting mechanical power from one place to another. It is often used to convey power to the wheels of a vehicle, particularly bicycles and motorcycles. It is also used in a wide variety of machines besides vehicles. Here we can also use chain drive to rotate shaft in dynamo because of gear will rotate through roller mechanism.

4.5. BATTERY

It is used for the storage of electrical energy generated by the dynamo. And use that energy as required at specified place.

6. FLOW DIAGRAM



7. FUTURE ENHANCEMENT

There are certain enhancements which may lead to the efficiency of the project & will also help in improving rate of electricity generation. Following are some enhancements:

Increasing the number of rollers, we can generate more electricity.

Using sprocket arrangement will produce high degree of power.

If the same arrangement is used on the next side of the roller then with the help of this setup more electricity can be generated.

8. ADVANTAGES & LIMITATION

Advantages: No consumption of any fossil fuel which is nonrenewable source of energy, low Budget electricity production, less floor area, no obstruction to traffic and Suitable at parking of multiplexes, malls, toll booths, signals, etc.

Limitations: Maintenance will be very difficult and might cause collision sometimes.

9. CONCLUSION

We conclude that our project is used for the utilization of energy in greater extent. It will specially be good for the developing countries which are suffering with energy-crisis. In the coming days, as demand of electricity is increasing every moment, since it will save a lot of electricity of power plants which are wasted in illuminating the street light. 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. For countries like India where rural development is still not at its pace, this idea is of utmost worth. It can be used for power supply into the remote areas, lighting the street lamps. It can be well employed on highways and the energy thus stored can be utilized in several ways.

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