

Analysis and Design of Power Generation Through Speed Breaker

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Abstract:- The approach uses a renewable energy source, which is necessary for the nation's growth since energy needs must rise. He adds that energy is the closest and most significant thing. Our requirement for energy rises in tandem with the population growth rate. We must triple or quadruple energy production if we are to raise the level of living. This initiative offers a sustainable and low-pollution method of producing power. In remote areas where energy is not going through adequately, this project is deployed. Transmission lines become expensive to use to get power in remote areas. The article describes how we turn unused energy into electricity, which is then used in many technology in the future.

Keywords:- Breaker, Roller Mechanism , Electricity Generation , Motor.

I. INTRODUCTION

Although a roller is meant to stop a moving vehicle, we're using it for another purpose in this project. The roller mechanism of this device takes the role of the conventional speed breaker. The rotating speed breaker idea is just one tiny step toward lowering the use of traditional energy sources. Here, we utilize a roller that is shaft-mounted and coupled to the gears via a bearing. The shaft attached to the roller serves as a balancing device, and the bearing increases speed. There are two gears in operation. Two gears are attached to the generator shaft: one tiny gear and one larger gear. The rotation of the speed breaker through the gear produces electricity. The apparatus employed:

- Roller
- Shaft
- Spur Gears
- Bearing
- Generator



Fig 1 First Parts

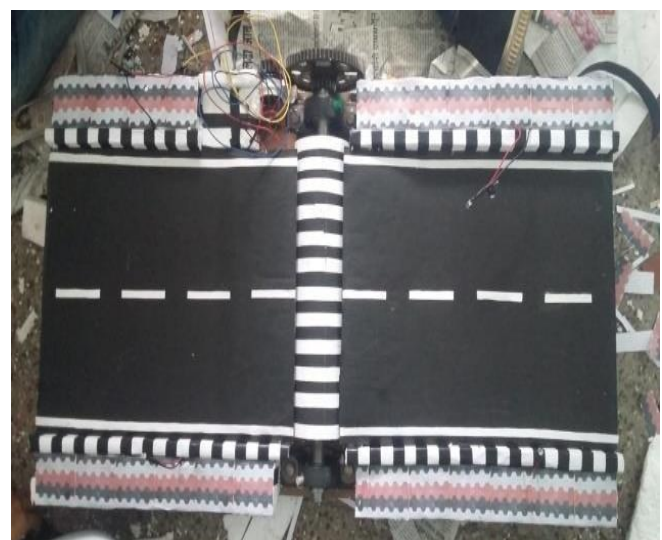


Fig 2 Final Design

➤ *Advantages*

- This equipment generates power at a cheap cost and helps preserve conventional electricity sources.
- The electricity produced by this kind of equipment is totally devoid of other factors during the whole year.
- Its installation location makes maintenance simple. It produces no pollution because no fuel is utilized. The traffic is unaffected in any way.
- No labor is needed because the device generates electricity on its own.
- It is an unconventional energy source.

➤ *Disadvantages*

- Choosing the right kind of generator is tough.
- The speed breaker doesn't get maintained at all.
- Rusting of equipment during the rainy season is an issue.
- The amount of traffic determines how quickly power is produced. Thus, we are unable to guarantee fixed electricity generation.
- Different weight rollers should be utilized for different types of vehicles.

➤ *Applications*

- This project is beneficial in distant, steep areas where light is not accessible.
- This method generates electricity that is utilized for signals, street lightning, and checkpost lightning.
- This method of producing power is realistically suitable in areas with heavy traffic.

II. LITERATURE REVIEW

➤ *Shakun Srivastava, Ankitasthana [1]*

Nowadays, power is the biggest issue facing people worldwide, including those in India. Electricity is a fundamental energy type that is abundant in nature and one of the energy sources that we utilize the most. A lot of villages and cities were constructed next to water falls that powered water wheels. A few years ago, the first electricity was produced, and now, albeit on a far greater scale, we are still producing electricity based on the same fundamental ideas. In this study, a chain drive mechanism is used to generate power. The more vehicles that pass, the more power we can produce.

➤ *Aniket Mishra, Pratik Kale, Atul Kamble [2]*

For their survival, every human being in the cosmos needs electricity. Everything that occurs in our surroundings is a form of energy. Daily population growth results in a decrease in the availability of traditional energy sources. A significant quantity of energy is produced when a car crosses a speed breaker. The speed breaker is used as a power producing machine to capture and create power from the produced energy. The mechanical energy of the shaft can be converted into the movement energy of moving vehicles by use of a rack and pinion system.

➤ *K.Ravivarma, B.Divya, C. P. Prajith, A. Sivamurugan, K. Vengatesan.[3]*

There is an energy crisis as a result of energy usage, thus it is necessary to establish strategies for optimal use that will both alleviate the crisis and protect the environment. Our focus is shifting more and more in the direction of conventional energy sources, which are crucial and emit less pollution. Since more and more cars are crossing over speed bumpers on roadways every day, we are addressing a new technique in this study to produce electricity from them. The speed breaker's kinetic energy is transformed into power via this mechanism.

➤ *Alok Kumar Singh, Deepak Singh, Madhawenda Kumar, Vijay Pandit, Prof. Surendra Agrawal [4]*

This study investigates the idea of producing energy from a revolving speed breaker using a prototype model. Every object possesses energy, but it's crucial to employ that energy in the right places. Thus, while bearing that in mind, we will make use of the energy released from the car to generate power. Any voltage that is generated is put to diverse uses. By adding an inverter circuit and large capacity battery, the power rating is raised. The rate of cars rises daily along with the road network, which will support our approach.

➤ *N. N. Ghuge, Arati Sathe, Varsha Patil, Anagha Warankar [5]*

People are dissatisfied with the state of power at the moment. The one and only form of energy that exists, powers nature, and is of utmost importance is electricity. Electricity is one of our secondary energy sources. We utilized rooms and kerosene lamps to generate power a few years ago. In comparison to the United States, India uses more electricity. However, some settlements are so remote that power is not available. Thus, this is the approach that will solve the issue. The idea of using a revolving speed breaker to generate power is creative and practical.

➤ *Priyanshi Vishnoi, Pradip Agrawal [6]*

People are not happy with how power is now being exercised. Electricity is the one and only energy that exists, drives nature, and is absolutely necessary. One of our backup energy sources is electricity. A few years ago, we generated power using kerosene lights in rooms. India is a country that utilizes more power than the US. Some communities, meanwhile, are so far away that electricity is unavailable. This strategy will therefore address the problem. It's a clever and useful concept to use a rotating speed breaker to create electricity.

➤ *G. Ramakrishna Prabu, G. Ethiraj [7]*

The shortage of oil and other resources has coincided with a decline in the cost of electricity. The energy produced by the speed breaker is harnessed. The mechanical energy of the shaft can be converted from the kinetic energy of moving vehicles by use of a rack and pinion system. The country will thrive when there is a steady supply of electricity and no periodic power loss. The only way it will happen is via creative thinking like this.

➤ *Anyaeq bunam [8]*

One of the most important types of energy is electricity, which is the most common energy source in the natural world. Many cities and villages experience power outages. The main energy sources that produce electricity are coal, natural gas, oil, and nuclear power. Using Faraday's dynamo generator, electricity generation was first established in the 1800s. Conventional energy sources are currently the main sources of energy and will become less so in the future as they are not renewable and damage the climate. This innovative and extremely practical idea of producing power using speed breakers is brilliant. This essay uses a speed breaker to demonstrate many techniques for producing renewable energy.

➤ *Miss. Shraddha Deshpande, Miss. Bhagyashri Kulkarni, Prof. Aashish Joshi [9]*

To produce power, a different mechanism replaces the conventional speed breaker. The rack and pinion system operates when the cars pass over the speed breakers, producing power as a result. With the increasing number of cars on the road, this method of generating electricity is very economical. This device may be installed at parking lot entrances, close to traffic signals, or anywhere else there is a lot of foot traffic. For the purpose of generating energy, A device that transmits motion to a DC motor/generator is provided by a rack and pinion and spring assembly mechanism. This method provides a useful way to capture the kinetic energy of moving automobiles on roads and highways in order to generate electricity.

III. EQUIPMENT REQUIRED

➤ *Gears*

This is a tool that transmits power positively and has a set velocity ratio. For correcting certain linear misalignment, it is recommended. It should have a high capacity for stress absorption and wear and tear.

➤ *Bearing*

- This apparatus is utilized for accelerating motion. The device uses a shaft to produce rolling motion.
- They efficiently transmit motion and minimize friction.

➤ *Motor*

With this tool, mechanical energy is converted to electrical energy. Through the application of "Faraday's principle of magnetic induction," the generator uses magnetic fields and rotating wire coils to convert mechanical rotation into a pulsing direct electric current.

➤ *Roller (Speed Breaker)*

It is the substance that makes up the speed breaker. The car will rotate and generate energy when its tires collide with or pass over the roller. MS is the material utilized as a roller in the speed breaker.

➤ *Shaft*

It is the substance that rotates the roller and connects it to this shaft (speed breaker). Steel bar or MS bar is used to make this material. The shaft attached to this roller rotates as well as the vehicle's wheel strikes the speed breaker.

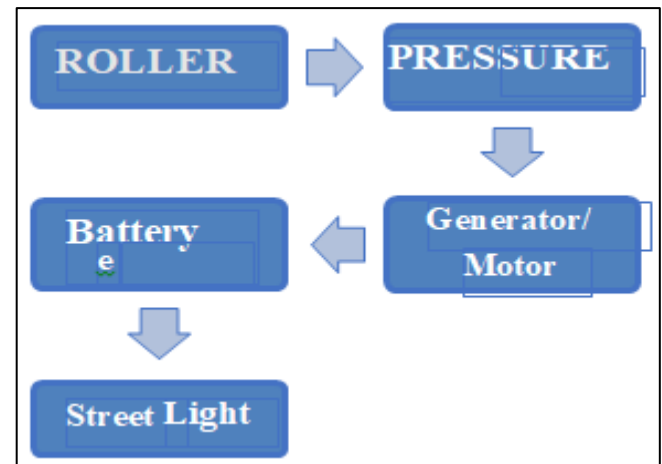


Fig 3 Block Diagram

IV. CONCLUSION

In order to enhance our daily quality of life, we need power. The principal sources of energy used to produce this electricity—coal, gas, etc.—will be diminished as the population grows. Thus, this initiative aids in solving the issue. This project is an example of modern technology that uses speed breakers to create power. This initiative offers the nation's economy in addition to alternatives.

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