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Electricity Generation Using Speed Breakers

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ABSTRACT

This research paper is about how to utilize the energy which is wasted when the vehicles passes over the speed breakers. We can produce electricity when vehicles passes over speed breakers by using this model.

The kinetic energy of moving vehicles can be converted into mechanical energy of the shaft through rack and pinion mechanism. Then, this mechanical energy will be converted to electrical energy using generator which will be saved with the use of battery.

The energy we save during the day time can be used in the night for lighting the street lights. This method is an effective way to produce electricity. The number of vehicles are increasing day by day passing over the speed breaker so we can use this speed breakers efficiently to produce energywith affordable cost. It can be effectively placed near traffic lights, at the entrance of parking lots and any other place where the traffic density is high. Rollers are fixed on a wooden ramp on which vehicle passes. As vehicle passes over it, it starts moving. A chain drive mechanism is provided which transfer the motion to a DC motor for electricity generation.

Keywords: production of electrical energy , speedbreaker, sprockets,

I. INRODUCTION

In the present scenario power becomes the major need for human life. The availability and its per capita day consumptions are regarded as the index of national standard of living in the present day civilization. Energy is an important input in all the sectors of any countries economy. Energy crisis is due to two reasons, firstly the population of the world and secondly of living standard of human beings has improved.

The availability of regular conventional fossil fuels will be the main sources for power generation, but there is fear that they will get exhausted eventually by the few decades. Therefore, we have to investigate some approximate, alternative, new sources for power generation, which is not depleted by the very few years.Increasing demand of energy adds to the need of identifying non-conventional resources of energy. In this paper, we will discuss about power generation from speed breaker and the possible mechanism required for it.The number of vehicles are increasing day by day so we can use kinetic energy of vehicle to produce Electrical energy which can be used for the various purpose. We can tap this energy to produce power by making speed breaker as a power producing unit.

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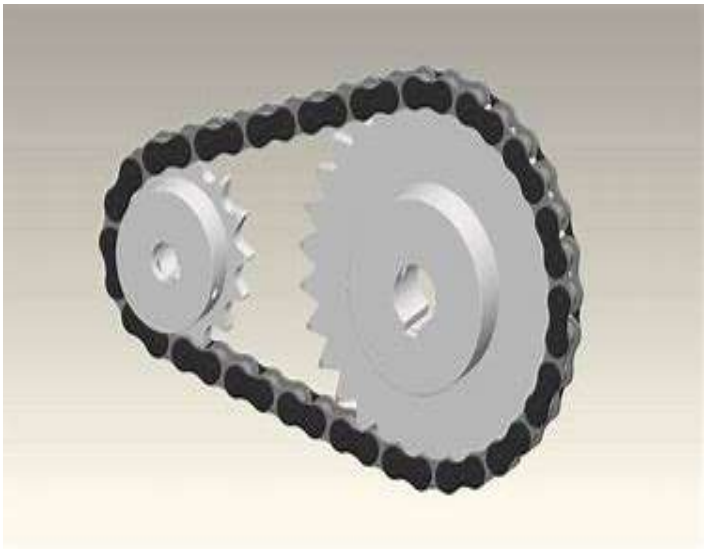

II. WORKING

This project explains the mechanism of electricity from speed breakers. The vehicle load acted upon the speed breaker and is transmitted to rack and pinion arrangements. Then, reciprocating motion of the speed-breaker is converted into rotational motion using the rack and pinion arrangement where the axis of the pinion is coupled with the sprocket arrangement.

The sprocket arrangement is made of two sprockets. One of the sprocket is larger in dimension than the other sprocket. Both the sprockets are connected with chain which transmits the power from the larger sprocket to the smaller sprocket. As the power is transmitted from the larger sprocket to the smaller sprocket, the speed that is available at the larger sprocket is relatively multiplied at the rotation of the smaller sprocket. The axis of the smaller sprocket is coupled to gear arrangement. Here we can change gear dimension. The gear wheel with the larger diameter is coupled to the axis of the smaller sprocket. Hence, the speed that has been increased at the smaller sprocket wheel is passed on to this gear wheel of larger diameter. The smaller gear is coupled to the larger gear has more intensity though the speed due to rotation motion achieved at the larger sprocket wheel is less, as the power is transmitted to gear, the final speed achieved is high. This speed is sufficient to rotate the rotor of a generator and is fed into the rotation of generator. The rotor which rotate within a static magnetic stator cuts the magnetic flux surrounding it , thus producing the electric motive force (emf). This generated emf is then send to an inverter, where the generated emf is regulated. 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 providing power to street lights.

2.1 Different Mechanisms

i.Spring Coil mechanism: Spring coil mechanism is used to store energy and subsequently release it, to absorb shock or to maintain a force between surfaces which are in contact.

ii.Rack-pinion mechanism: This mechanism is used to convert rotational energy to the linear energy.

iii.Crank-shaft mechanism : It is used to convert circular energy to the reciprocating energy or vice versa. (Reciprocating energy is produced due to the up and down or back and forth linear motion.

iv.Roller Mechanism: It converts rotational energy to linear Kinetic energy and vice versa.

2.2 Materials Used

- Rack - Mild steel
- Pinion - Mild steel
- Sprocket Wheels - Mild steel
- Chain - Mild steel
- Spur gears - Cast Iron
- Spring - Mild steel
- Shaft - Mild steel
- Speed beaker - Mild steel

2.3 Specification

- Generator – 12v DC generator
- Battery – Lead acid battery
- Inverter – 250 watt AC inverter

III. CONCLUSION

- It can be implemented at metropolitan cities
- So that more electric power is produce
- Arrangement of whole setup is easier
- The stored electricity could satisfy the daily requirement of electric power.
- It can be used to conserve natural resources.

IV. ACKNOWLEDGEMENTS

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The reference for preparing this project was taken from the book name,

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