

ROAD POWER GENERATION BY FRICTION

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ABSTRACT

Road Power Generation (RGP) is one of the recent power generation concepts to be used now a days. It is one of the alternative and most recent concept used. Once fully installed, engineers say that devices may be used to replace conventional electrical supplies for powering roadway signs, street and building lights, storage systems for back-up and emergency power, and other electronics appliances, and even devices used in homes and businesses. This device converts the kinetic energy of the vehicles into electric energy. It is done by moving plate installed on the road, this plate take the stroke motion of the vehicles and convert it to the rotary motion by crank mechanism and it generates the electricity.

Keywords: Flywheel, Flip plate, Lead Acid Battery, D.C. Generator, Permanent magnet, Flywheel

I. INTRODUCTION

Due to the advent and development in the field of renewable energy source, the dependence on fossil fuels and conventional energy sources has decreased drastically and led to development of new sources of energy. As we know the fact that the number of vehicles are increasing rapidly day by day. Each and every time a vehicle passes over Speed Breaker, a very huge amount of energy is wasted as friction. There is great possibility that we can generate power by tapping this energy. By just placing a unit like the "Power Generation Unit from Speed Breakers" or "Road Power Generator", a significant amount of energy can be produced. This generated electricity can be used for different purpose such as battery charging, lightning of street and signal lights of road etc. The propose of designing is that it offers pollution free power generation, that would cause no obstruction in traffic system, and thus low budget is required for producing electricity. It thus occupies less floor area and its maintenance is easy. The power generated using this technique can be used in road signal, street lights, lighting for the bus stops, lightening of check post on highways etc.

II. OBJECTIVE

- The AIM of "road power generation" is provide production of electricity by the method of road power generation and providing the electrical energy maximum reducing the cost off investment and also reduce the noise of power generation.
- The purpose of this project is the conversion of kinetic energy of vibrating road into electrical energy.
- We used a permanent magnet D.C. generator which generated 12Volt D.C. This D.C. voltage is stored on a lead 12-volt battery. Electricity stored in battery is used to activate the light, fan etc. rating capacity is increased by using higher capacity battery.

III. NOVELTY

We have reduced its size and cost. We will make this road power generation use by speed breaker so that it can be used easily anywhere.

(Like-generate the electricity and use any where).

IV. DESIGN WORK

4.1 Chassis size: -The chassis of the vehicle is made iron rectangular section of 24*54 inches dimension.



Fig. 1: Chassis

4.2 Rack and pinion: - 1 to 2 inch



Fig. 2: Rack

4.3 speed breaker size :-



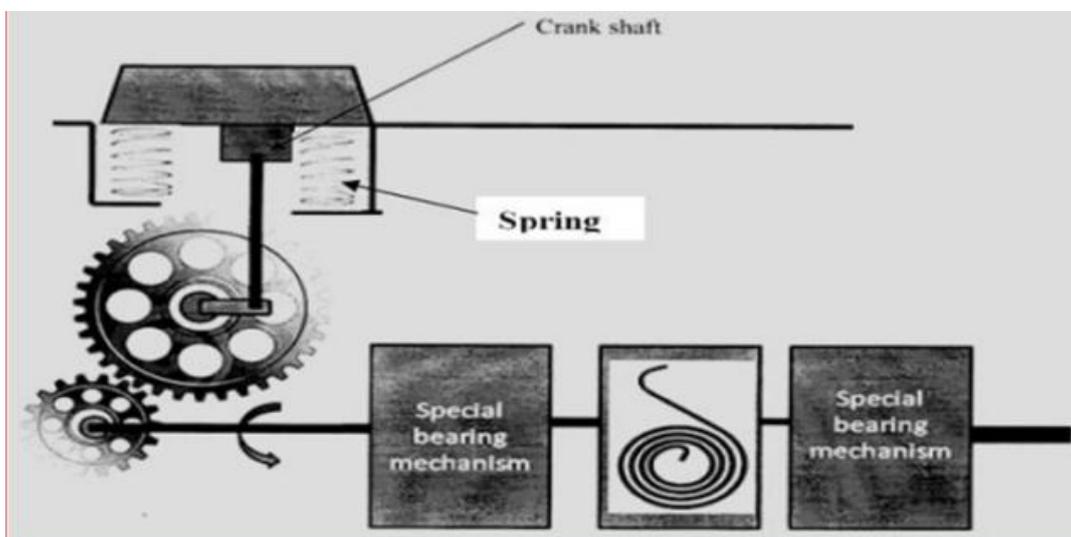
Fig. 3: Bumper

4.4 Speed Breaker Testing



Fig. 4: Speed Breaker Testing

4.5 Tools: - There are following tool sused in proposed system design: -



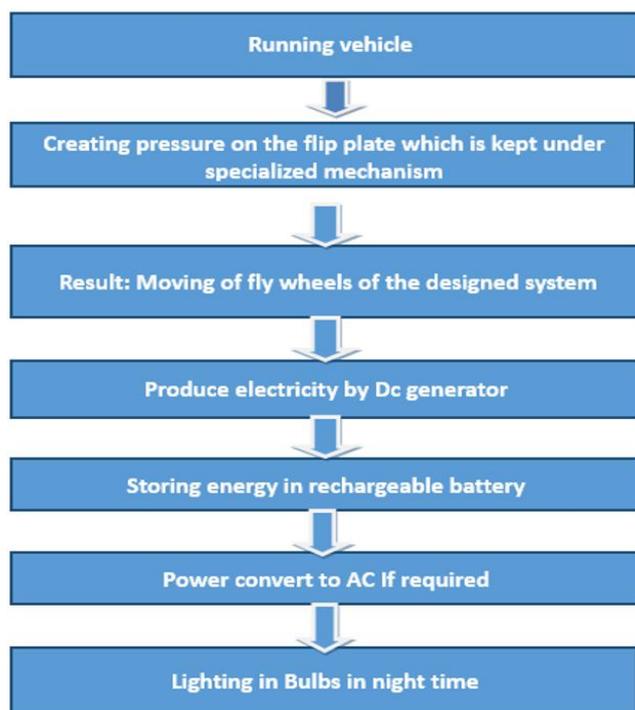


Fig. 5: Showing Algo Oof RIP

V. CALCULATION

Entrance and Exit of School

The mass of vehicle running over the flip plate = 280 Kg.

Height of the plate from surface = 10 cm.

Work done = Force applied x Distance moved But,

Force = mass x acceleration due to gravity = $280 \times 10 = 2800\text{N}$.

Therefore, work done / sec by flip plate = $(2800 \times 0.10/60) = 4.666$ watt (pushing force)

Therefore, power developed by moving one vehicle passing over the flip plate for one minute = 4.66 watt

Power developed for 60 min (1 hr) = 280 watt/hr Power developed for 24 hrs = 6052KW/day

VI. APPLICATIONS

Power generation using speed breaker system can be used in most of the places such as:

1. This technique can be used at highways.
2. This technique can be used at roadways Speed barkers.
3. This mechanism can be placed on the actual speed breaker of the roads to obtain high electricity.
4. This power generation can be used to charge batteries placed at different nodal junctions .
5. This power generation can be used to charge inverter which can produce a voltage varying from 12 to 230 volt .
6. This power can also be used at following places:
 - a) Lightning of bus stops. b) Road Signals. c) Check posts on roads . d) Street lights. e) Sign boards on roads etc.

VII. CONCLUSION

Road Power Generation is one of the latest type of unconventional sources of energy. This is a type of harvesting of vibration energy. It uses the waste energy generated by the vehicles and converts kinetic energy into electric energy. RPG can also be used as battery charging station and recharge with green power and power coming from electric

vehicles earning wasted kinetic energy. The higher frequency of passing vehicles higher the capacity of electricity generated by this generation.

VIII. FUTURE SCOPE

This project is designed for road power generation and is specifically used on highways, , company and college, entrance and exit of schools and malls , petrol stations etc. It can also be installed at bus stands, tool booths , railways parking zones so electricity is generated by road power generation.

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