



# ELECTRIC POWER GENERATION IN ROAD WAYS

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## Abstract

In this project, The electrical power is generated in non-conventional method by simply running train on the highway roads. Non-conventional energy system is very essential at this time to our nation. Non-conventional energy using locomotive path needs no fuel input power to generate the output of the electrical power. The main aim of the concept is to utilize the train crossing time on a highway roads. The power is produced by the highway roads power generation equipment. Here the vehicles tyre is rubbing the roller held on the axle with the gear set which rotates the generator to generate electricity during the roller rolling. The roller will be rolling for the entire length of the vehicles moving on it, and the energy generated will be stored in the battery and we use this energy for electric vehicles, and for also LEDs

**Keywords:-** Rack and pinion, Gear wheel and fly wheel, PMDC Generator, Return spring, Shaft.

## I.INTRODUCTION

Man has needed and used energy at an increasing rate for his sustenance and well-being ever since he came on the earth a few million years ago.

Primitive man required energy primarily in the form of food. He derived this by eating plants or animals, which he hunted. Subsequently he discovered fire and his energy needs increased as he started to make use of wood and other bio mass to supply the energy needs for cooking as well as for keeping himself warm.

With the passage of time, man started to cultivate land for agriculture. He added a new dimension to the use of energy by domesticating and training animals to work for him.

With further demand for energy, man began to use the wind for sailing ships and for driving windmills, and the force of falling water to turn water for sailing ships and for driving windmills, and the force of falling water to turn water wheels.

## II. LITERATURE REVIEW

Power Generation from highway roads is an important concern in today's life because it carries large number of vehicles moving over it. In this project an attempt is made to design a mechanism which able to carry load and generate power using Simple mechanical elements. This mechanism used hydraulic press and Chain drive mechanism to transmit power. The mechanism design in this project is Alternative way to store the energy which is generated using vehicle when passes over the roadway tracks with continuous power production process. This mechanism is has the advantages of less in cost to manufacture and maintenance free and requires less space to install it.

## III. DESIGN METHODOLOGY RACK AND

### PINION :-

A rack and pinion is a type of linear actuator that comprises a circular gear (the *pinion*) engaging a linear gear (the *rack*), which operate to translate rotational motion into linear motion. Driving the pinion into rotation causes the rack to be driven linearly. Driving the rack linearly will cause the pinion to be driven into a rotation. A rack and pinion drive can use both straight and helical gears. Though some suggest Helical gears are noted for "quieter" operation, there is no science to support this theory. Helical racks while being more affordable, have proven to increase side torque on the datums, increasing operating temperature leading to premature wear. Straight racks require a lower driving force and offer increased torque and speed per percentage of gear ratio which allows lower operating temperature and lessens viscal friction and energy use. The maximum force that can be transmitted in a rack and pinion mechanism is determined by the tooth pitch and the size of the pinion as well as the gear ratio.

For example, in a rack railway, the rotation of a pinion mounted on a locomotive or a railroad car engages a rack placed between the rails and helps to move the train up a steep gradient.

For every pair of conjugate involute profile, there is a basic rack. This basic rack is the profile of the conjugate gear of infinite pitch radius (i.e. a toothed straight edge).

A generating rack is a rack outline used to indicate tooth details and dimensions for the design of a generating tool, such as a hob or a gear shaper cutter. Fig 1:-



Fig.1:- Rack and pinion gear mechanism.

## Energy Conversion:-

Energy conversion, the transformation of energy from forms provided by nature to forms that can be used by humans.

Over the centuries a wide array of devices and systems has been developed for this purpose. Some of these energy converters are quite simple. The early windmills, for example, transformed the kinetic energy of wind into mechanical energy for pumping water and grinding grain. Other energy-conversion systems are decidedly more complex, particularly those that take raw energy from fossil fuels and nuclear fuels to generate electrical power. Systems of this kind require multiple steps or processes in which energy undergoes a whole series of transformations through various intermediate forms. Fig 2:-

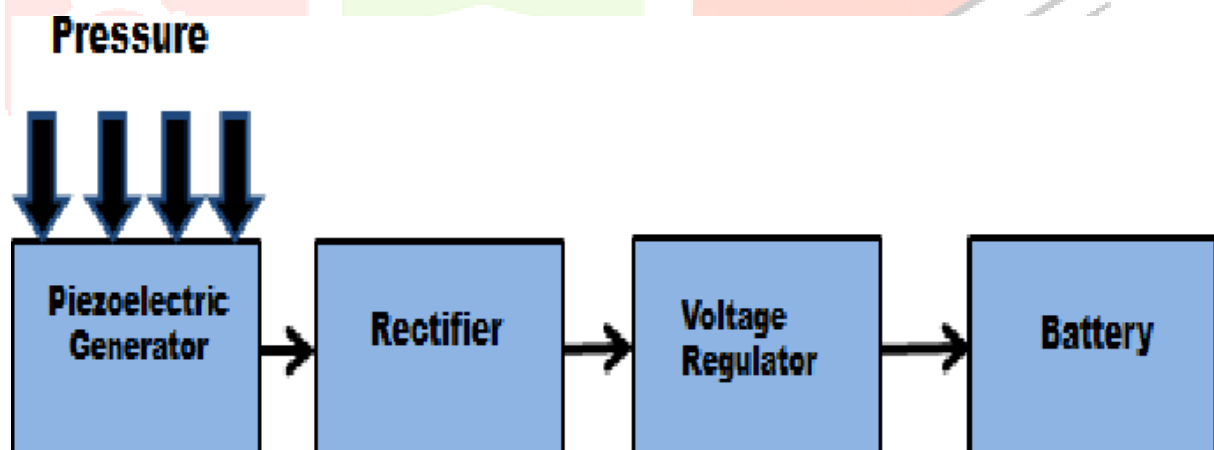


Fig 2:- Energy converting process

## IV. WORKING PRINCIPLE:-

This project is designed with electrical power generation for roadway tracks, return spring and rack & pinion, bearing, sprocket, gear wheel, battery, fly wheel, P.M.D.C generator; shaft the rack and pinion arrangement is the mechanical arrangement with wheels. This arrangement is placed in the roadway track. Whenever the vehicle is run over the track due to the heavy load the plate is pushed. This downward motion is converted to rotary motion through rack and pinion movement. The rotary motion is given to the flywheel. In this arrangement the dynamo is coupled with the fly wheels, so the dynamo is rotated and generates the electrical power. The generated voltage is the alternate voltage. The AC voltage given to rectifier circuit to convert into DC voltage. Then the rectified voltage is given to filter circuit to remove the ripple voltage. After the filtration the pure DC voltage is given to battery through the charging circuit. The stored DC voltage is used to different application. Through this way electric energy. is generated and compensated the electric demands. Fig 3 :-

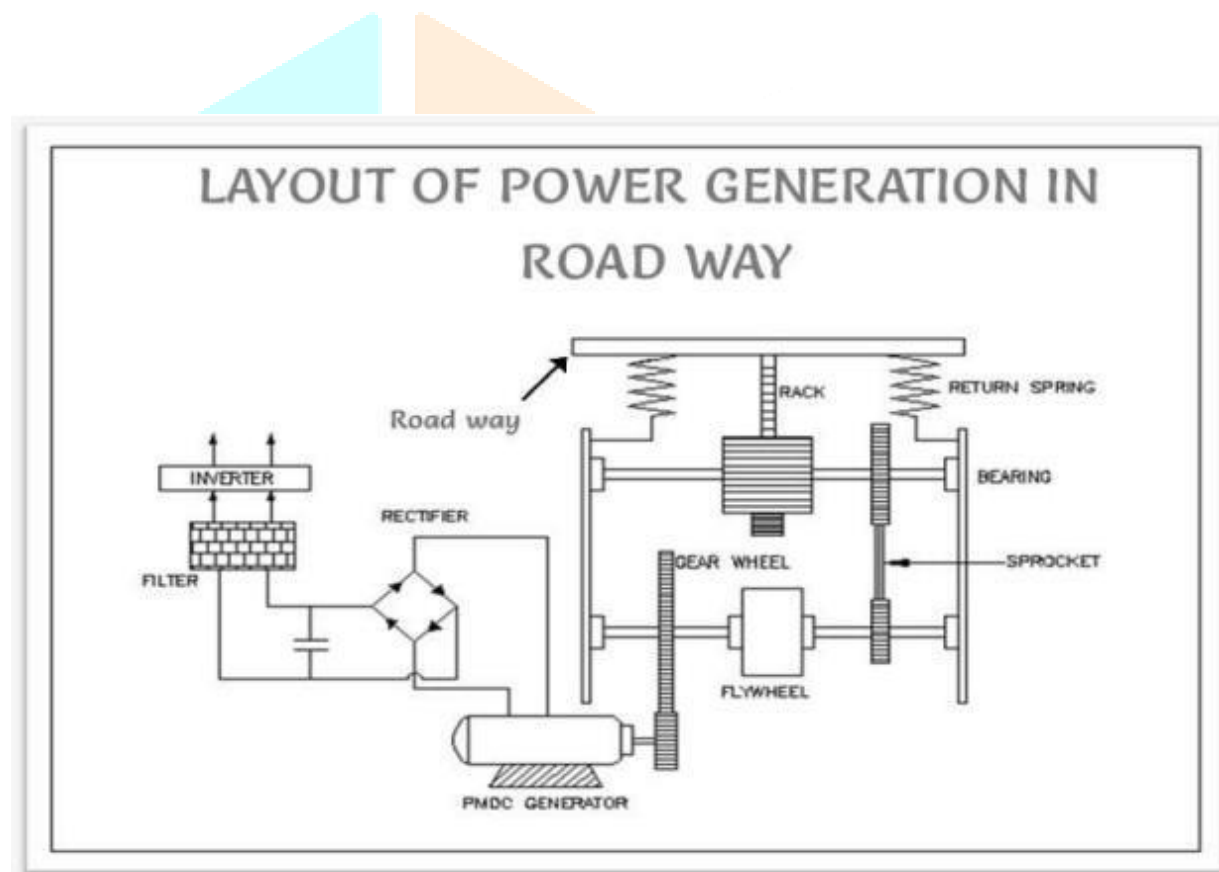


Fig 3:- Layout Of Power Generation In Roadways





Fig 4:- Real View

## V. CONCLUSIONS

“Electricity plays a very important role in our life”. Due to population explosion, the current power generation has become insufficient to fulfil our requirements. In this project we discover technology to generate electricity from speed breakers in which the system used is reliable and this technique will help conserve our natural resources. In coming days, this will prove a great boon to the world, since it will save a lot of electricity of power plants that gets wasted in illuminating the street lights. As the conventional sources are depleting very fast, it's high time to think of alternative resources. We got to save the power gained from the conventional sources for efficient use. So this idea not only provides alternative but also adds to the economy of the country.

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