

Eco-Friendly Energy Generation through Speed Breaker

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Abstract— This paper introduces useful concept of the present day scenario, power is a major need for human life. There is a need to develop non- conventional sources for power generation due to the reason that our conventional sources of power are getting scarcer by the day. This paper emphasizes on the idea that the kinetic energy getting wasted while vehicles move can be utilized to generate power by using a special arrangement of Spring/Piston Assembly with Water Tank. This generated power can be used for general purpose applications like streetlights, traffic signals. In addition, we could also have solar panels, which would satisfy our power needs, when there is no vehicular movement.

Index Terms- Kinetic energy, Speed breaker, Electro-mechanical unit, Conventional Energy, Power generation, Energy conservation.

I. INTRODUCTION

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. Here in this paper we are looking forward to conserve the kinetic energy that gone wasted, while vehicles move. The number of vehicles passing over speed breaker on road is increasing day by day.

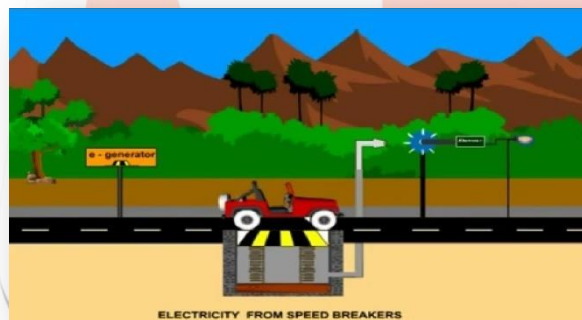


Fig 1

Beneath speed breaker, setting up an electro-mechanical unit known piston/water tank assembly could help us conserving this energy and use it for power generation. This generated power can be stored, by using different electrical devices. We can supply this energy to street lights, traffic lights, and nearby areas, and thus helps in country's economy.

This is a design of such a type that there will not be any problem to drive the vehicle over it. From cycle and motorcycle to L.C.V. or M.C.V. or all types of heavy vehicles can pass through this system.

II. PROPOSED DESIGN

The working of this speed breaker arrangement for producing electricity is very simple. There are a large number of automobiles running on the road. These automobiles go over a number of speed breakers present on the road.

The vehicle is having a variety of weight like trucks, buses, cars, and two wheelers therefore whenever they are passing over a speed breaker a lot of energy is wasted. So when the vehicle will come on the speed breaker because of its weight the top portion of the speed breaker moves down wards and the piston/spring arrangement is there is this is also moves downwards.

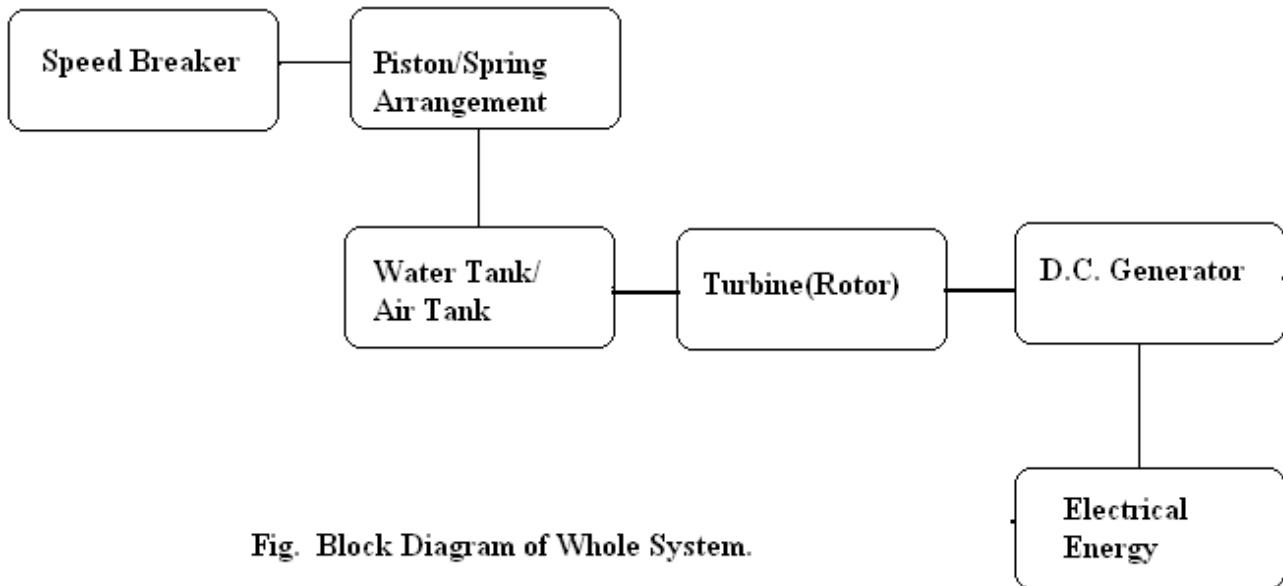


Fig. Block Diagram of Whole System.

Fig 2 Block Diagram of whole system

Due to this force is applied on the piston/spring mechanism in the water tank. And then water is coming outside of the tank. Now one valve & DP transmitter is there which measured the pressure & Valve is maintaining of flow of water. This water is passing on rotor blade which rotates & one chain belt is there so Generator is also rotates with rotor.

This generator generates electricity which can be used for lighting of the lamps on the road or it may be stored in the battery and can be converted in AC current using inverter and used for lighting of the lamps, signals sign boards on the road.

This principle can also be used in the steps of the staircase to produce electricity. In which whenever a person puts his foot on the step due to his weight the step gets displaced in the down ward direction and will rotate the rotor of the generator in same manner as in case of speed breaker arrangement.

III.FLOW CHART OF PROPOSED DESIGN

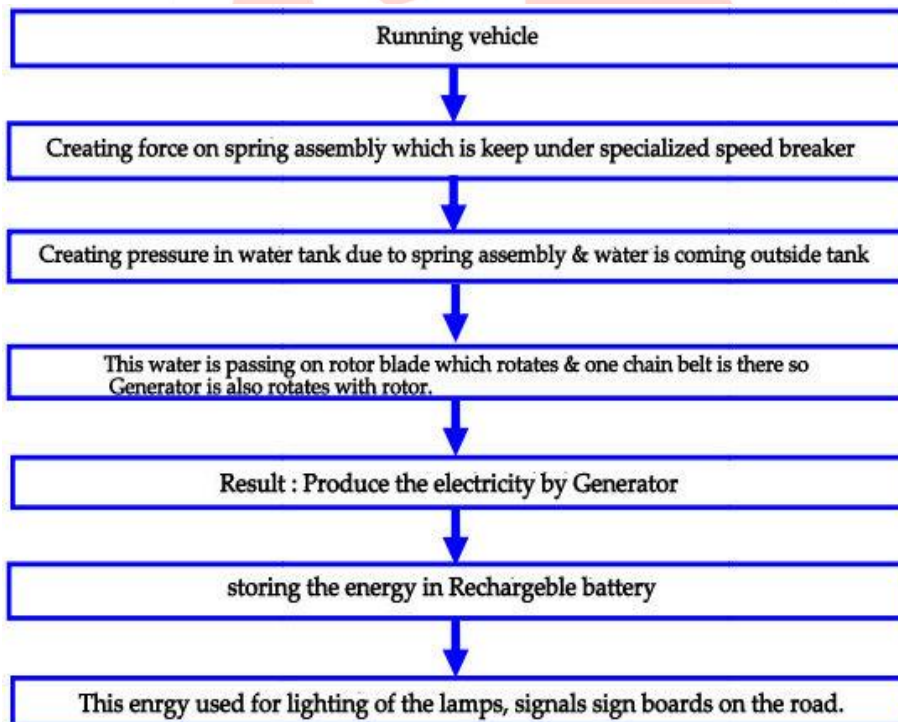


Fig 3 Flow chart of the whole system operation

IV.OBSERVATION

As far as the experiment concerns, we have two related observations with regard to the voltage generated to the variations in speed and load. The following were the two illustrations: a). Let us consider the load (heavier vehicle) is constant on the speed breaker. Now we have the voltage produced, to the variations in the speed of the vehicle. If the vehicle runs slowly then it certainly applies the pressure on the speed breaker for a long time so the voltage produced will be most in this case. While we keep on increasing the speed, the vehicle rushes over the speed breaker, the pressure keep on decreasing so as the voltage produced. The graph plotted between these two variables, is shown Fig.

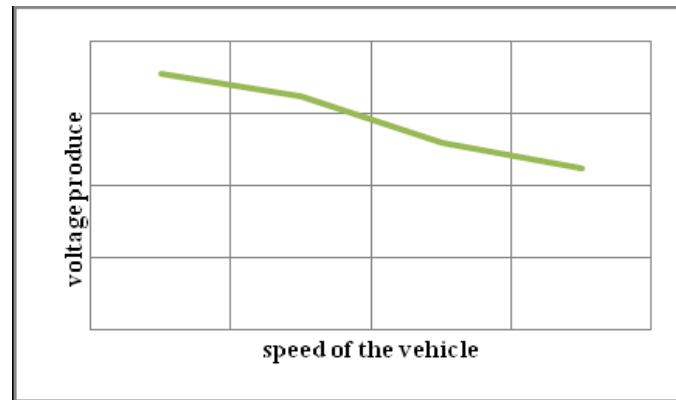


Fig 4 Voltage produced vs Speed of the vehicle

b). Let us consider the speed (usually low) of the vehicle is kept constant on the speed breaker. Now we have the voltage produced, to the variations in the load (vehicles) applied on the speed breakers. Assume, if the vehicle that runs over it has the least load capacity compared to others then it certainly applies a very less pressure that result in a least voltage produced.

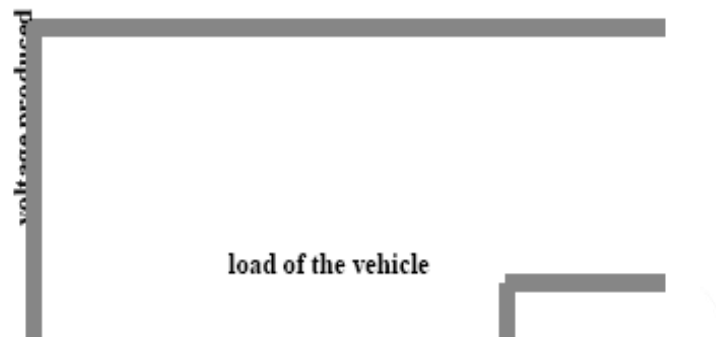


Fig 5 Voltage Produced VS Load of the Vehicle

V.ADVANTAGES

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

1. This technique can be used in all roadways Speed breaker.
2. This technique can be used in all highways.

This mechanism of generating of electricity can be placed on the actual speed breaker of the roads. The power is generated when the vehicles pass through it. Which in can be stored in the battery. This power can be used in many places after using the inverter, which enhances in the voltage from 12 volts to 230 volts. This power can be used in the following:

1. Street Lights.
2. Road Signals.
3. Sign boards on the roads.
4. Lighting of the bus stops.
5. Lighting of the check post on the highways etc.

VI.FUTURE SCOPE

1. The shortage of light can be reduced at some extant.
2. Wastage of energy of vehicles passing on roads can be minimized.
3. Such speed breakers can be designed for heavy vehicles, thus increasing input weight and ultimately increasing output of generator.
4. More suitable and compact mechanisms to enhance efficiency.
5. It may be used for light vehicle also.

VII.CONCLUSION

The utilization of energy is an indication of the growth of a nation. One might conclude that to be materially rich and prosperous, a human being needs to consume more and more energy. And this paper is best source of energy that we get in day to day life.

VIII.ACKNOWLEDGEMENT

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