

Power generation using Speed Breaker

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Abstract— The energy crisis is a serious impediment to supply of energy resources in an economy. The idea of power generation using speed breaker will serve the purpose of reducing energy crises by simple energy conversion mechanism. The kinetic energy of vehicle on a speed breaker which otherwise goes waste can be harnessed by converting it to electrical energy which can be effectively stored and used.

IndexTerms— Speed breaker, power generation, cycle rear wheel mechanism

I. INTRODUCTION

Electricity in India is a big problem which is faced by people, who reside in the country. The conventional energy resources are limited in quantity, and on the other hand create a lot of pollution in atmosphere. Our aim is to utilise the energy that is wasted on speed breakers by vehicles during traffic and harness it to generate power which can be stored and used to electrify the premises. Generating electricity by speed breakers is an innovative and useful concept. As on speed breakers tremendous amount of energy gets wasted by vehicles, to utilize this energy through speed breakers, a lot of models were introduced. In the making of our project we studied various models that have been implemented through various papers published and after realizing the shortcomings of each model, we have proposed a model which would be very efficient as compared to others.

II. PROPOSED DESIGN

We are going to mount a wheel mechanism below the speed breaker that is similar to the rear wheel of a bicycle. The vehicle load acted upon the speed breaker system is transmitted to the pedal of bicycle arrangement mounted under the speed breaker. The design below illustrates the bicycle mechanism on which the speed breaker will be mounted to produce the required AC voltage to light the bulbs. To allow the rear tire to be spun without moving, it must be suspended above the ground. The stand would be able to keep the bike's rear tire lifted off from the ground. However, the part of the design that would hold the wheel to continue spinning was a task. The part that holds the axle in the air is difficult to mount and we are using springs for suspension. This way, the wheel wouldn't have to be suspended off the ground. A speed breaker prototype is made on a wooden ramp on which vehicle passes. As vehicle passes over it, it starts moving. Further arrangement is provided using the rear wheel of a bicycle which is mounted in such a way that we get the rotation only in one direction which transfers the motion to a dynamo for the generation of electricity. The output that we get from dynamo is around 9-12V. The inverter is responsible for converting the power stored in the batteries into a form that can be used and It is also responsible for keeping the batteries fully charged at all times. It also converts the power stored in your batteries from "direct current" (DC) into "alternating current" (AC). Then Step Up transformer can be used to get 230V AC output which is given to load.

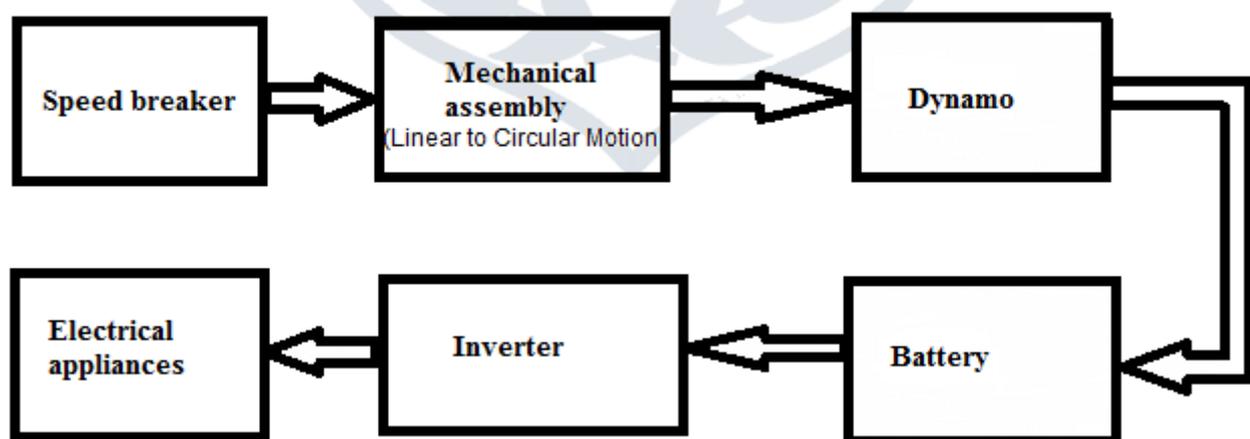


Figure 1: Block diagram of Project Design

III. Installation and utilization of the project

This arrangement shall be installed at the toll gate of highway or in parking plaza of various malls where the speed of vehicles is limited/slow, which is ideal to operate the arrangement in proper manner. Energy from the running vehicles on the road can thus be utilized for the purpose of energy transformation to generate electricity. The energy which is being lost without any utilization

can now be trapped. The generated electricity shall be useful to illuminate street lights in the vicinity of toll gate, to charge UPS Batteries at toll gate.

IV. ADVANTAGES

Such speed breakers can be easily mounted and can also be designed for heavy vehicles, thus increasing input torque and hence output of generator. These prototypes can be readily manufactured and put to use at all public toll-plazas to bring about an efficient system wherein the electricity generated can be used to lighten up the premises of the same place where it is generated thus making a self-sufficient model. These can be mainly used at toll booths, approaching traffic signals, parking plots of malls and complexes etc.

V. CONCLUSION

Energy conservation and reuse is important to sustain industrial growth and standard of living of a country. In order to promote sustainable development, it's important to reuse energy as it can significantly reduce the per capita consumption. Now as vehicle traffic is a major issue in most big cities, this can be used to our advantage by installing these speed breakers in heavy traffic roads and toll booths and we can generate electricity almost continuously by using the proposed mechanism with minimum effort and maintenance.

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