DESIGN OF SPEED BREAKER FOR GENERATION OF POWER BY FORCASTING NUMBER OF VEHICLE PER DAY AT COE KASHTI

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ABSTRACT

In the present situation, business increases daily due to adding number of vehicles every day. This business is problem as well as occasion in hide. In our diurnal requirements power becomes introductory need for mortal life. Energy is responsible for major developments of any country's frugality. Conventional energy sources induce utmost of the energy of moment's world. But the population is adding day by day and the conventional energy sources are dwindling. Also, these conventional energy sources are contaminating and responsible for global warming. So, nontraditional sources are demanded to be developed for power generation which are clean, terrain friendly and sustainable. In this exploration we propose a renewable non-conventional energy source grounded on speed swell medium. Our design is to enlighten the thoroughfares exercising business and the jerking pressure which is wasted during the vehicles passes over speed swell in roadside. We can tap the energy generated by moving vehicles and produce power by using the speed swell as power generating unit. The kinetic energy of the moving vehicles can be converted into mechanical energy through rack and pinion medium and this mechanical energy will be converted to electrical energy using creator which will be used for lighting the road lights. Thus, by using this medium we can save lot of energy which can fulfill our unborn demands.

Keyword: *quantum, Empire, automatic.*

1. INTRODUCTION:

Electricity is the most necessary form of the energy. We can not indeed imagine our life without electricity. Consumption of the electricity is increase day by day. Now a day's utmost of the electricity is generated by conventional reactionary energies, ultimately the conventional power sources will get depleted by the coming many decades. This design is about to use nontraditional energy source for power generation. Then we induce energy by

rack and pinion medium. All the setup is place under speed swell when vehicle passing from speed swell it generates electricity. Main benefit of this system is then we use wasted energy for power generation.

Electricity in India is a big problem which is faced by people, who live in the country. Electricity is the form of energy. It's a introductory part of nature and one of our most extensively used forms of energy. We get electricity, from the conversion of other sources of energy, like coal, natural gas, canvas, nuclear power and other natural sources, which are called primary sources. Electricity generation was first developed in the 1800's using Faraday's fireball creator. Nearly 200 times latterly we're still using the same introductory principles to induce electricity, but on a much larger scale. Above mentioned primary energy coffers are the conventional and are in limited volume, and on the other hand produce a lot of pollution in atmosphere, a new fashion of power generation is introduced then, i.e. through speed swell power creators. Generating electricity by speed combers is an innovative and useful conception.

On road vehicles waste a tremendous quantum of energy on speed combers, where there's a necessity to handed speed swell to control the speed of the vehicles. The periodic rate of growth of motor vehicle population in India has been nearly 20 percent during the last decade. There's tremendous vehicular growth in time by time. The adding business and number speed combers on roads motivate to manufacture an innovative device which can direct the energy of vehicles that's wasted on speed combers to some useful work.

Now a day's power has come the major need for mortal life. Energy is an important input in all the sectors of any countries frugality. The vacuity of regular conventional reactionary energies will be the main sources for power generation, but there's a fear that they will get exhausted ultimately by the coming many decades. Thus, we've to probe other types of renewable sources. The day-to- day adding population and dwindling conventional sources for power generation, provides a need to suppose onnon-conventional energy coffers. Another major problem, which is getting the exiting content for moment is the pollution. Power stations and motorcars are the major pollution producing places. Sonon-conventional power source is demanded to reduce this problem. We proposed a nontraditional power generating system grounded on speed swell medium which induce electricity without using any marketable reactionary energies, which isn't producing any contaminating products. In this design, our end is to conserve the kinetic energy which convert into electricity that gone wasted, while vehicles move.

These biases are most common in developing countries. Accordingly, speed- combers are regular in multitudinous developing countries, including India, Chile, Egyptian Empire, and Ghana. The weight of vehicles in term of implicit energy can be employed for electricity generation purposes. In this design we developed a system of generating electricity using speed swell on the roads. To gain maximum power, the inflow of moving vehicles is veritably important. In this medium, a rack and pinions are used. This medium converts the kinetic energy of moving vehicles into electric energy with the help of speed swell on the roads. This is generating numerous kilowatts of power by using over as well as the upward stir of rack. Downcast stir is caused by cargo and upward stir is due to restoring force exercising store power in springs.

2. LITERATURE REVIEW

1. AmolS. Fawade (2015), whenever the vehicle is allowed to pass over the pate shape speed swell it gets pressed own. As the springs are attached to the pate, they get compressed and the rack, which is attached to the bottom of the pate, moves down in repaying stir. The affair of creator is given to the LED bulb which shows generation of electricity by blinking.

2. Ankita & Meenu Bala (2013), when the vehicle moves over the speed swell it reduces its speed. As these combers have a little height it gains an increase in its implicit energy. A vehicle importing kg passes over the system it pushes the mute to a depth of 10 cm it can produce roughly0.98-kilowatt power (immaculately). So, from one similar speed swell on a busy trace, where about 100 vehicles pass every nanosecond, about one kilowatt of electricity can be produced energy single nanosecond. This paper needs a lot exploration work as it can be proved anon-conventional resource of energy.

3. AnyaegbunamF.N.C. (2015), the periodic rate of growth of motor vehicle population in India has been nearly 10 percent during the last decade. There's tremendous vehicular growth in India time by time. On the Roads these

vehicles waste tremendous quantum of energy due to speed combers, the adding business and number of speed combers on roads gave rise to the manufacturing of an innovative device which can conduct the energy being wasted by vehicles on speed combers to some useful work.

4. Krishna.D. Shelaret.al. (2017), the spiral contraction spring is used for Suspense Purpose. In the speed swell system, the speed swell is made up of mild sword strips. The pate is also made of mild sword wastes. The spring is connected to the rod of the double amusement cylinder. Depicts the complete process of operation of speed swell device for generation of compressed air. The device was installed in the road and vehicles were allowed to pass over the device. The weight of vehicles presses the pate of swell which compress the spring which is connected to rod repaying in cylinder and the air is generated and stored in the air tank.

5. LeenaH. Patilet.al (2018), a check was done by the Tamil Nadu electricity board. According to this check, the electricity consumed by a remote vill for 45 days is equal to the electricity consumed by all the road lights in one night in Chennai megacity. By this script, we can get an idea of the rate by which electricity is being consumed in India, also, this consumption rate is adding day by day. Electricity and power can be called as the backbone for development and modernization of the country and thus, the rapid-fire speed of development has led to a constant increase in the rate of electricity consumption. The numbers also show a rapid-fire increase in the electricity consumption in India from the time 2014 to 2017, the electricity consumption per capita of India in the time 2014 was805.60 kwh, whereas it was 1149kwh in the time 2017. Taking into consideration this situation, it's obligatory that either consumption of electricity must be reduced or the generation of electricity must be increased. The consumption of electricity can be reduced only to a certain limit, beyond this limit the development can be hampered. But, by conservation, the quantum of electricity conserved will be in veritably small quantum, hence, adding the generation of electricity is the right option. Now, this increase in generation of electricity would affect in further and further use of conventional coffers, which are also on drop, this creates a need to induce electricity without using conventional coffers or at least using conventional coffers in veritably small quantum.

6. Mitul Patel &Prof.P.J. Gundaliya (2017), the roads are designed for a certain design speed to meet the mobility demand. Still, at some of the locales control of speed may come necessary. For that purpose, business calming measures have been used. This paper describes the colorful business calming measures used to reduce accidents/ crashes or reduce the inflexibility of accidents. Speed combers are one of the extensively used business calming measures. Colorful types of speed combers should be bandied along with problems associated with them.

3. METHODOLOGY

3.1 Traffic volume study

Business volume is a measure to quantify the business inflow. Business volume or business inflow is expressed as the number of vehicles that pass across a given transverse line of the road during unit time. As the expressway range of the road may vary the business is generally expressed as number of vehicles per hour or per day, per business lane.

Different classes of vehicles make use of the same thruway particularly in developing countries like India, therefore business sluice correspond of mixed business inflow. The vehicles of the business sluice may be classified into different vehicle classes. They correspond of 1) Fast moving vehicles similar as (a) passenger buses, (b) motorcars, (c) exchanges or heavy marketable vehicles (HCV), (d) light marketable vehicles (LCV), (e) bus- cabs, (f) two-wheeler motorcars (motor cycles & scooters) and 2) decelerate moving vehicles similar as beast drawn vehicles like bullock wagons, cycles cabs, pedal cycles, etc. Determination of volume of each vehicle class independently and chancing the total volume is called‘classified business volume studies.

3.1.1. Methods of classified traffic volume studies

Traffic volume counts may be carried out either manually or by using mechanical or automatic counters.

a) Manual counts:

This method employs a field team of enumerators at predetermined locations of the selected roads and intersections. The enumerator's carryout classified count of the vehicles and record them on the prescribed record sheets/forms at desired time intervals. By this method, it is possible to obtain all details of the classified traffic data which can be collected by mechanical or other automatic counters. It is possible to obtain details such as: 1) classification of different types of vehicles and their counts at desired time intervals, 2) noting the direction wise movements including each vehicle class at intersections, 3) classified vehicle counts with number of occupants in each passenger vehicle, 4) number of commercial vehicles (HCV & LCV) with details of load and the type of commodity transported and 5) desired details of pedestrian volume counts.\

The main drawback of manual counting method is that it is not practicable to carry out manual count of different vehicle classes during all the 24 hours of the day and on all the days round the year. Hence it is necessary to adopt statistical sampling techniques and resort to 'short counts' in order to cut down the manual hours involved in taking complete counts.

b) Mechanical traffic counts:

This may be either fixed or permanent type or portable type of counters. The mechanical counter can automatically record the total number of vehicles crossing a section of the road in a desired period. One of the old methods of automatic counter is by effect of impulses on a pneumatic hose placed across the roadway, traffic count is recorded by electrically operated counters and recorders capable of recording the impulses; but the impulses caused by vehicles of light weight may not be enough in some cases to actuate this type of counter.

The main drawback of the automatic counter is that it is not possible to classify and record every vehicle type and get details of turning movements, vehicle occupancy, type of commodity transported by the commercial vehicle, etc. It is also not possible to record details of pedestrian flow. However, it is possible to classify and group the different types of vehicles based on axle spacing, axle loads, speed, height of vehicle, etc.

3.2 Analysis of traffic volume

Average daily traffic (ADT)

When the traffic volume counts are carried out for only a few days (such as for 3days to 7 days) the average daily traffic volume obtained is called 'average daily traffic' or ADT. Traffic census on non-urban roads is generally carried out twice in a year by taking direction-wise counts for 7-days period, once during the peak traffic season and once during the lean season.

$$ADT = \frac{\text{24x7 day traffic count}}{\text{7 days}}$$

3.3 COMPONENTS OF SYSTEM

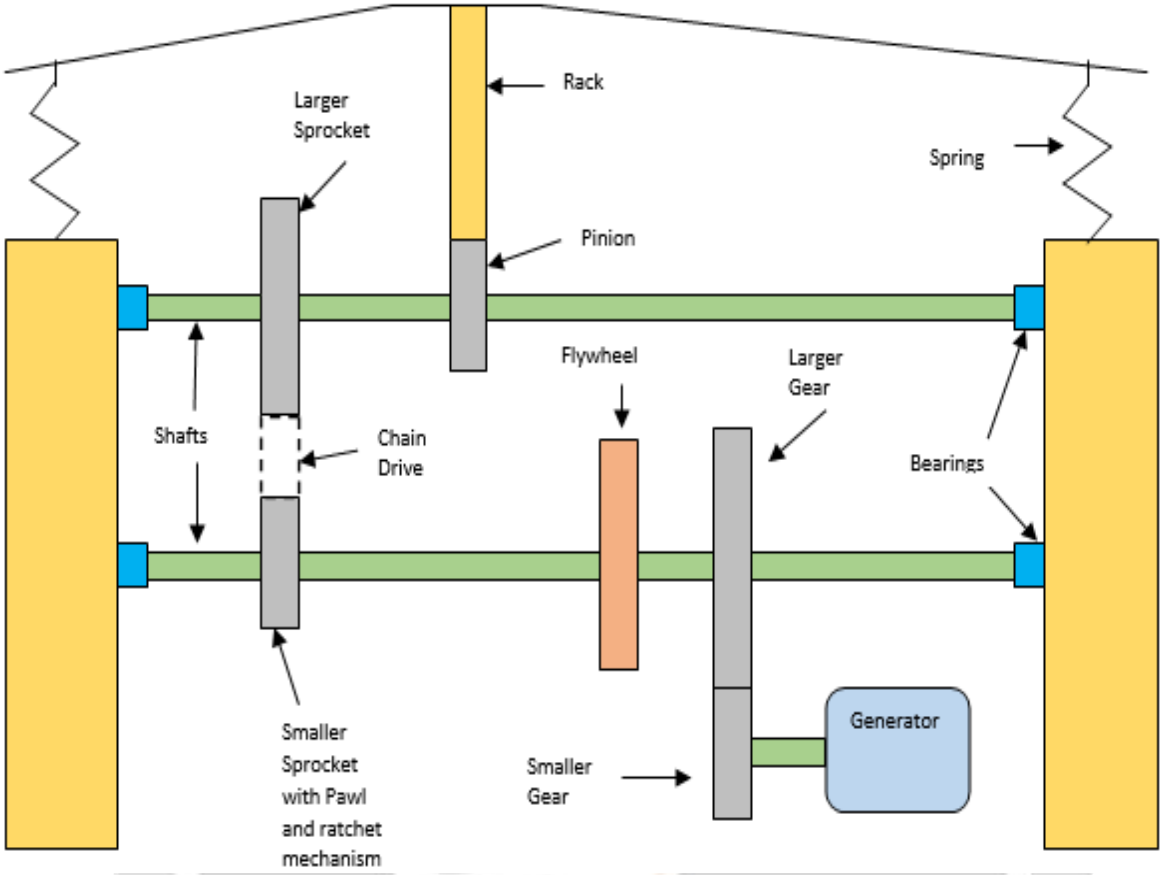

Fig: - components of rack and pinion.

a) SPEED BREAKER
b) RACK AND PINION
c) TENSION SPRING
d) PEDESTAL BEARING
e) FLYWHEEL
f) FREEWHEEL/SPROCKET MECHANISM
g) CHAIN DRIVE MECHANISM
h) Spur Gear
i) GENERATOR OR DYNAMO
j) BATTERY

4. CONCLUSION

The utilization of energy is an indication of the growth of a nation. This research introduces a generation system for harnessing energy from speed breaker while keeping the engineering environment in check. It produces electrical energy proportional to traffic density which shows more possibility of collecting large amount of energy in busy cities. This method is suitable to develop the country like Bangladesh by utilizing wasted energy of the vehicle in a more useful manner. In this research, speed breaker is introduced as a small generating unit for minor needs such as street lights and traffic signals. By adopting this arrangement, the future demands of electricity can be minimized to some extent. Power generated from designed assembly is can be used as supplementary source of power for road lamps. The source of power generation is ecofriendly i.e., no air, noise, water or land pollution. The power generated

is useful in reducing load over power grid, which convey electricity from long distance and produced from thermal or nuclear power plants. In remote areas where electricity supply from conventional method is not possible, this power is useful.

4.1ADVANTAGES

- At the present generation of power is the cheapest as compared by the power generated by other source such as oil, coil, etc.
- Low budget electricity production.
- Non-polluting
- Less floor area
- No obstruction to traffic

4.3 DISADVANTAGES

- The system should be used in heavy traffic location only.
- Electricity generation is not same for all type of vehicles passing over speed breaker

5.REFERENCES

[1] IRC: 99 - tentative guidelines for the provision of speed breakers for control of vehicular speeds on minor roads. 1988

[2] “Speed Breakers – Unjustified & Dangerous Obstruction on approach of Level Crossings.” (Indian Railway Technical Bulletin – 2002, RDSO’s Technical bulletin).

[3] “Every speed breaker is now a source of power”, IPCBEE Vol.1, 2011.

[4] Ashwathamah V Priyadharshini M., “International Journal of Recent Research and Review,” Vol. I, ISSN 22778322, March 2012.

[5] Ashok Kumar Sharma, Omkar Trivedi, Umesh Amberiya, Vikas Sharma

“Development of speed breaker device for generation of compressed

air on highways in remote areas” March 2012

[6] R. Gupta, S. Sharma, "A Revolutionary Technique of Power Generation from speed breaker,” International Journal of Engineering Research and technology, 2013.