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Design and Fabrication of Power Generation through Speed Breaker

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Abstract

In the present scenario energy is the primary need for human life. Energy is responsible for development of any country?s economy. But in this fast-moving world, population is increasing day by day and the conventional energy sources are diminishing. Moreover, these non-renewable energy sources are polluting and responsible for global warming. Therefore, to overcome this problem we need to implement the technique of optimal utilization of conventional sources for conversion of energy. So non-conventional sources are needed to be developed for power generation which are clean environment friendly and sustainable. So, this project includes how to utilize the energy which is wasted when the vehicle passes over a speed breaker. Our project is to enlighten the street utilizing the jerking pressure which is wasted during the vehicle passes over speed breaker in roadside. We can tap the energy generated and produce power by using the speed breaker as power generating unit.

Index terms— design, simulation and fabrication, renewable energy.

1 Design and Fabrication of Power Generation through Speed Breaker

Vishal Gupta ? , Vishal Singh ? , Akhilesh Kumar ? , Vivek Agnihotri ? & Mayank Kumar ¥ Abstract-In the present scenario energy is the primary need for human life. Energy is responsible for development of any country's economy. But in this fast-moving world, population is increasing day by day and the conventional energy sources are diminishing. Moreover, these non-renewable energy sources are polluting and responsible for global warming. Therefore, to overcome this problem we need to implement the technique of optimal utilization of conventional sources for conversion of energy. So non-conventional sources are needed to be developed for power generation which are clean environment friendly and sustainable. So, this project includes how to utilize the energy which is wasted when the vehicle passes over a speed breaker. Our project is to enlighten the street utilizing the jerking pressure which is wasted during the vehicle passes speed breaker in roadside. We can tap the energy generated and produce power by using the speed breaker as power generating unit. The kinetic energy of moving vehicle can be converted into mechanical energy of the shaft through rack and pinion mechanism, then this mechanical energy can be converted into electrical energy using dynamo which will be saved with the use of a battery. The energy we save can be used in the night time for lighting street lights. Therefore, for this arrangement we can save lot of energy which can be used for the fulfilment of future demands and if implemented then it will be very beneficial for government. The principle involved is potential energy to electrical energy conversion. When the vehicle moves over the inclined plates. It gains height resulting in increase in potential energy, when the breaker comes down, then rack moves and rotate the pinion which is connected to shaft. The output of this shaft is coupled to a dynamo to convert potential energy into electricity.

Introduction n today's growing world, the use of renewable energy is increases as non-renewable resources are decreasing. Pollution and global warming are increasing by using more conventional sources. In my paper, I have talked about the power generation through speed breaker and every component and mechanism involved in making it. As we are seeing the consumption of the energy is continuously increasing, and electricity production is constant. Due to which there is shortage of electricity. According to Ward's auto journal, 1. On the other

hand, pollution such as noise pollution and air pollution is increasing and badly affecting our life and mother earth. The need for energy has created many powers stations due to which the pollution is increasing even more. So, we did and figured out from our idea per thought that we can generate effective power with the help of the speed breaker system without any fossil fuels without any harmful gases. First, we will prepare a base on which the whole mechanism will rest. With the help of square pipe, the base of rectangular shape is prepared. Use welding or clamps to join the pipes. On top of that rectangular base, we will prepare the base of the spring mechanism. And make the hump movable with the help of sliding rack rail. Rack is attaching to the sliding rack rail then due to motion in rack, it rotates the pinion in rotatory motion. Pinion will attach directly to the dynamo and the output of the dynamo will be directly connected to the battery and the power stored in the battery will be used for street lights. When the vehicles are moving, it has kinetic energy and if the vehicle is at height, it has potential energy which is being wasted. This potential energy can be utilized to produce power by using a special arrangement which is called "Power Hump". It is an electro-mechanical system which works on electrical and mechanical technology and generates power. When a vehicle passes through a speed breaker, the power hump moves in a downward direction, due to which the spring is pressed and the rack moves downward. Rack has teeth that mesh with pinion gear. The reciprocating motion of the rack causes the rotating motion in the pinion. The pinion is connected to the shaft and the same shaft is also connected to the dynamo. When the shaft rotates with the certain RPM, it transfers Mechanical Energy to the dynamo. This mechanical energy is converted into electrical energy because of the dynamo. The generated power can be amplified and stored by using different electrical devices such as battery. Advantages 1. Less area is required for installation of the power system. 2. Pollution will not generate as it is renewable energy. 3. Transportation and maintenance will be a favor and any damage can be easily repaired. 4. Accidents on the road will decrease. 5. By using this system, electricity can be easily generated throughout the year. 6. Power can be generated at very low cost and future demand can be easily met VI.

2 II.

3 Proposed Methodology

4 Result

Obtained result: We are using 5-watt LED bulbs because gives same brightness as incandescent. In one kilometer 50 bulbs are needed ?Total power required = 5 × 50 = 250watt This power generated by vehicle is sufficient for 10 street lights in night time.

5 VII.

6 Conclusion

The demand for electricity will increase in the coming time and if seen, it is increasing every day. Speed breaker power generation is able to reduce this demand to some extent. The aim of our research that we should make a system which is not polluting and energy can be produced without manpower. There are many countries where electricity is not present properly, so with the help of this, the power shortages happening in the country can be removed. This research paper can also be modified when we directly connect pinion to dynamo, so as to minimize the difficulties and complexities. [1]

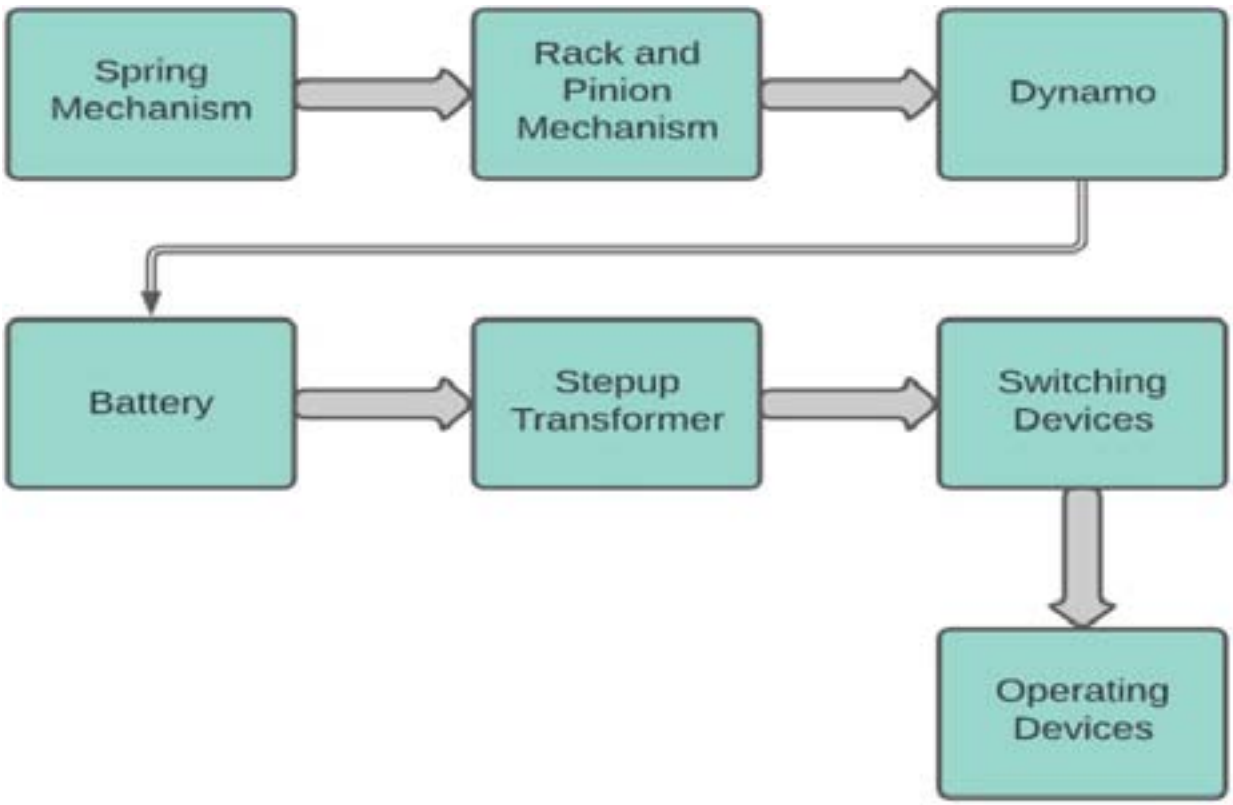

Figure 1:

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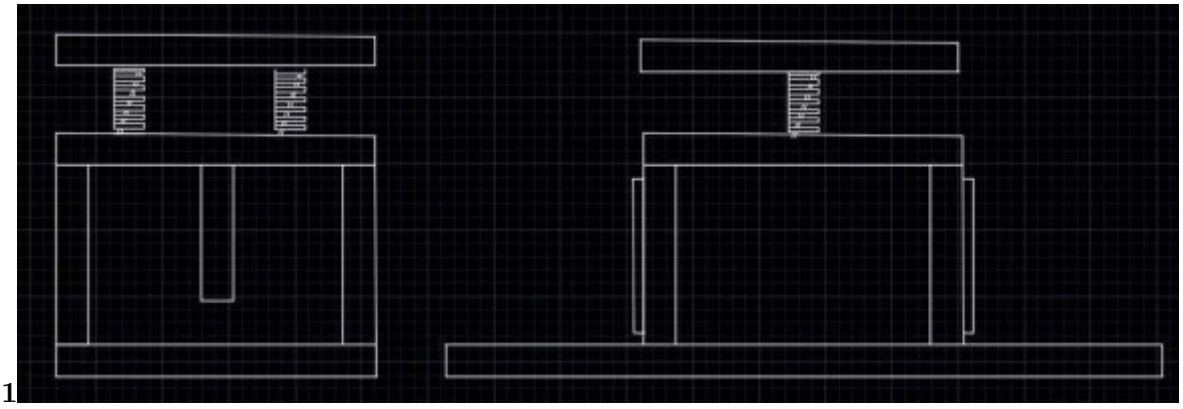

Figure 2: Fig. 1 :

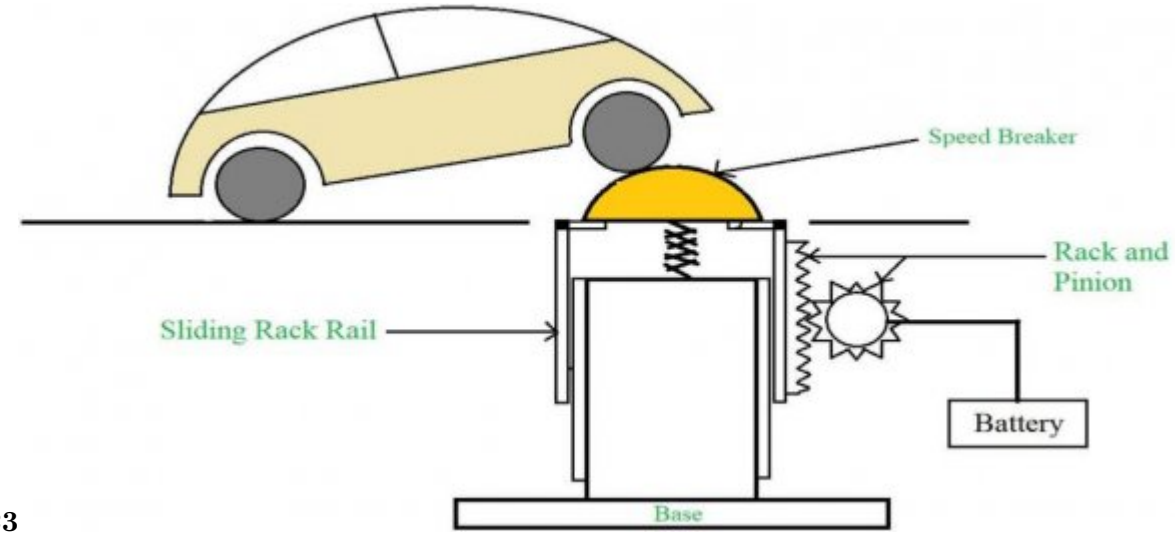

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Figure 3: Fig. 2 :Fig. 3 :

Figure 4:

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