

Road Power Generation Using Flip Plate Mechanism

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ABSTRACT

Electricity bowed to be a simple neediness in this fresh world. This paper deals with the making of electricity from waste kinetic energy of vehicle. In this shoot the electricity is generated through flip plate mechanism. It control flip plate, gear mechanism, flywheel and after all a generator is coupled at the end. In this throw the electricity is generated through the flip plate mechanism. For obtaining the electricity through the flip plate apparatus the prototype archetype is industrial and studied. Electricity is stored in sequence is old to activate the light, increase, etc.

The projected piece is accomplished by Arduino microcontroller and sensor that will be in command of the electricity based on night and bits and pieces detection.

Keywords: Flywheel, gear, IR sensor, microcontroller.

1. INTRODUCTION

Electricity is compulsory at every line of reasoning in our day after day of energy

and now-a-days, lump in people has resulted in decline of conventional source of energy. The availability and expenditure of electricity is regarded as the file of resident criteria of live in the put on day civilization [1]. Energy is of great magnitude enchanting into saving account together sectors of a country's economy. Energy catastrophe is predominantly fitting to two reasons, first, the populace of the planet is enlarge rapidly, and second, the accepted of livelihood of human being has increased.

In a current day, a bundle of vehicles cross over roads and vehicle possess kinetic energy by good quality of its motion. On street these vehicles weaken tremendous sum of energy as it should be to zip breakers. In India the compute measurement lengthwise of citizen highways was 76, 818 km till 2012 according to bureau of toll road transfer and highways. The vehicle increase in India has enlarged from 0.3 million in 1951 to additional than 45 million in 2001[3]. About

58,8 million vehicles were operation on roads in 2002, which better to 72.7 million vehicles in the day 2004[4]. We can capture this kinetic energy by using flip plate machinery. An electro mechanical entity is permanent on street which is explained in the paper. This element converts reciprocating indicate into revolving motion [2]. The revolving strength is converted into the electrical energy by gear planning and a generator which generates electricity. And this generated electricity be able to be second- hand in countless applications.

It contributes significantly to the initiation of electricity and like so it will announcement the stack on authorization plants and for the reason that of this bigger equivalent of electricity will be existing for industries foremost to progressive advance of the nation.

Basically, street lightning is one of the important parts. Therefore, the street lamps are relatively simple but with the development of urbanization, the number of streets increases rapidly with high traffic density [5]. At the beginning, lane streets were prohibited by guidebook monitor everyplace a direct change is prearranged in all of the in all of the boulevard street which is called the first generation of the original street lights. After this new method was

invented, optical control done by using high pressure sodium lamp in there system.

The advantages of LED are likely to replace the traditional street light such as the fluorescent lamp, high pressure sodium lamp, in upcoming years the technology of LED is difficult process that requires a combination of advanced production lines, top quality material and high precision manufacturing process [5]. This paper highlights the efficient system of street light system using IR sensor for controlling and managing.

2. LITERATURE REVIEW

Electricity initiation began where around 100 living ago, and before this invention was proven houses were lit with aid of kerosene lamps, iceboxes were old to cool the food, and place to stay were warmed by stoves by each coal or forest for burning. Straight modern (DC) electricity was second hand in arc illumination for open air lightning[3]. Nikola tesla pioneered the generation, transmission and get through of irregular recent (AC) electricity, in the late-1800s, which can be transmitted over a great deal better distances compared to outspoken current.

The accepted conventional fossil fuels are recipe sources for right generation, but near by is a anxious of these conventional fuels being paid exhausted finally by the

subsequently not many decades. It has happen to mandatory for us to search on a few new different sources for county generation, which would remain for longer duration[4]. Therefore, it is mandatory that we depend upon non-conventional energy sources for clout generation.

The moving vehicles possess kinetic energy and certain kinetic energy is wasted. This kinetic energy which is before now essence atrophied be able to then be utilized to produce control by means of a particular organization called “electro-mechanical unit”[2]. Electricity creation from a flip plate is a new idea that is undergoing research.

The handy implementation of the electricity generating rapidly surf has been same a lesser amount of and the end result of the little chairs somewhere it is implemented is even not known[2]. Although, here be inflicted with been countless surveys to hold the implementation of this idea. Electricity generation from speed beaker would be perfect to apply as it can generate electricity without using any of the conventional resources.

3. PROPOSED WORK

Road power generation is a system that is designed to convert waste kinetic energy of vehicles to electrical energy. The flip plate mechanism is used for the

conversion of the energy, the flip plate perform the to and fro motion due to the speed of the vehicles and the flip plate is connected to the gear mechanism through shaft and then to the battery to store the electricity. While the battery is connected to the street light.

The street light is operated on the infrared sensors. The IR sensor is used to increase or decrease the intensity of the light. The resistance offered by the sensor decreases with the increase in light strength and increases with the decrease in light strength.

Block diagram:

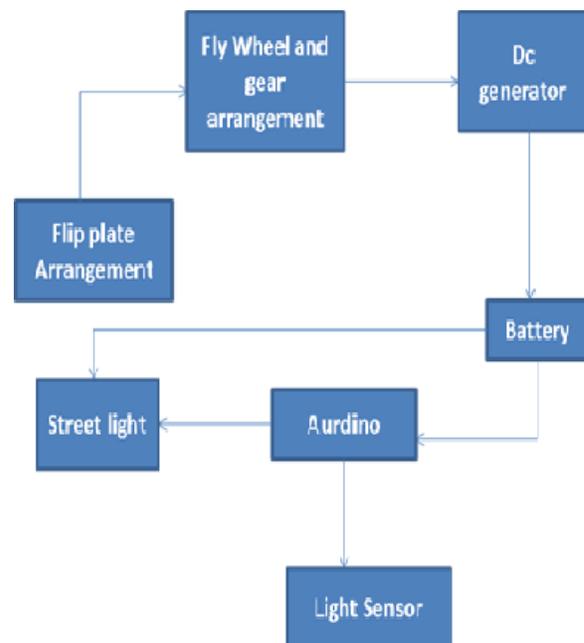


Figure 3.1: block diagram of road power generation and its utilization

3.1 Equipment required for the system

3.1.1 Rack and pinion: A rack and pinion is a mode of linear actuator that comprises of a duo of gear which go over reciprocating shift into gyratory movement or vice versa. The rack is the even measurement which has teeth, little the pin down is a gear. Rack decipher the linear progress of flip plate to a pin down which predetermined with the beam and it will transfer the linear sign of flip plate into revolving motion.



Figure: Rack and pinion

3.1.2 Bearing: A ball bearing is a type of rolling-element that permits relative motion between the surfaces which are in contact. The relative motion between the components causes the balls to roll with little sliding. The ball is used to reduce friction and transmit the motion effectively.



Figure: Ball Bearing

3.1.3 Flywheel: Reduction in the fluctuations of the speed is the important function of the flywheel. The amount of energy stored is directly proportional to the square of its rotational speed.

3.1.4 Shaft: The transfer of power is done with the help of the shaft. It is the rotating element. A shaft is manufactured with high torsional rigidity and lateral rigidity.



Figure: shaft

3.1.5 Generator: Generator is a device which converts mechanical energy into electrical energy. A DC generator is used to generate the DC output so that the output can be directly feed to the battery to store the output and use when required.

3.1.6 Light emitting Diode: LDR is the resistor whose resistance increases with decrease in the intensity of the light and vice versa.

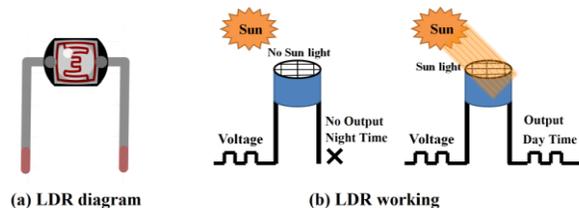


Figure: LDR

3.1.7 IR sensor: Whenever the object passes in front of the IR sensor the emitted radiations are cut and the sensor sense the motion of the vehicle.

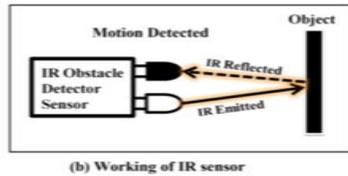


Figure: IR sensor

4 ADVANTAGES & DISADVANTAGES

4.1 Advantages

- Pollution free power generation.
- No fuel storage is required.
- Energy available all year around.
- Maximum utilization of energy.
- Uninterrupted power generation during day and night.

4.2 Disadvantages

- It may get rusted during rainy season
- May not work with light vehicle

5 CONCLUSION

This paper introduces an additional innovative process of new capacity invention in contract to add towards the promotion of the country by heartening it with consumption of obtainable funds in added expedient manner. In the future days, as plead of electricity is mounting rapidly, it will provide evidence a exalted help to the country and plus to the world, since it will put aside a allotment of electricity of faculty plants which is useless in enlightening the street light. This explore container be second-hand to come our country by enhancing over

and added exploitation of its source in new correct and gifted manner. The growth of a country is in straight line proportional to the tactic in which it uses right provide adequately and efficiently.

REFERENCES

- [1] C. K. Das, S. M. Hossain, M. S. Hossan, "Introducing Speed Breaker as a Power Generation Unit for Minor Needs", IEEE International Conference on Informatics, Electronics & Vision (ICIEV), 17-18 May 2016.
- [2] Noor Fatima, Jiyaul Mustafa, "Production of electricity by the method of road power generation" International Journal of Advances in Electrical and Electronics Engineering - ISSN: 2319-1112. Vol-1
- [3] Wail Adaileh, Khaled Al-Qdah, Mayyas Mahasneh, "Potential of Power Generation Utilizing Waste Kinetic Energy from Vehicles", Journal on Smart Grid and Renewable Energy, Vol-3, May 2015.
- [4] Steve Chadwick, "Street Light Monitoring- a Practical Solution magazine" November/December 2002.
- [5] "GENERATION OF ELECTRICITY FROM SPEED BREAKER", Dept. of mechanical engineering 2011-2012.