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Instigation of Electrical Energy from Tiring Roads

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ABSTRACT

The extensive usage of energy has resulted in an energy crisis, and there is a need to develop methods of optimal utilization, which will not only ease the crisis but also preserve the environment. The focus now is shifting more and more towards the conventional energy, which are essentially, non-polluting. In this paper we approach a new mechanism to generate power from speed breaker, because the number of vehicles passing over the speed breaker in roads is increasing day by day. This proposed system is to extract the kinetic energy of vehicle flow in the streets entitled as generating power from speed breaker through Roller mechanism. It is more efficient than other existing models, which enable to accommodate conventional, both in terms of balancing electricity supply and demand in energy across the global. Instruction from the panel will be send to the IOT model which in-turn controls the Load. IoT based notification app developed to notify the technician about the raised issues.

Keywords: Internet Of Thing, Roller Mechanism, Rack Pinion Mechanism

I. INTRODUCTION

The world is facing electricity crisis with the difference in demand and deliver and restricted range of natural sources. So there is a need for saving energy and requirement of other non-conventional resources that is cheap and feasible. Electric energy may be generated from busy street with the use of speed breaker. In huge metro cities the quantity of automobiles will increase tremendously every year. The other way to generate the energy through tapping on the normal speed breaker with the simple mechanism. The power generated is stored for street lighting and to be used in rural areas. The attempt is to show how energy can be tapped and used at a commonly used road speed breakers. To construct a unit which is capable of producing electricity using kinetic energy of vehicles passing over the speed breakers with the help of rack and pinion arrangement beneath it. As the requirement of electricity is increasing dayby day, we have to develop an alternate conventional source of energy to tackle the problem of energy crisis and reduce the dependency on power plants to some extent. The energy obtained from it can be stored in batteries and then transmitted to nearby street lights.

II. PROBLEM STATEMENT

A. Existing System

The mechanism used in existing system is rack-pinion mechanism, which reduces the efficiency. This mechanism gives the low electric output. In a rack-pinion mechanism, the maintenance is required of the high level. Material selection is also a time consuming task for the rack-pinion type mechanism. Vehicles may slip by using pinion mechanism. Spring mechanism also used in the present system major disadvantage is low electric output.

B. Proposed System

In this Mechanism, a roller is fitted in between a speed breaker and some kind of a grip is provided on the speed breaker so that when a vehicle passes over speed breaker it rotates the roller. This movement of roller is used to rotate the shaft of D.C. generator by the help of chain drive which is there to provide different speed ratios. As the shaft of D.C. generator rotates, it produces electricity. This electricity is stored in a battery. Then the output of the battery is used to lighten the street lamps on the road using IoT. Software model gets the battery level from the source and identifies total energy stored level in a battery and sends data to the cloud and wait for the decision from the administrative console. At the console project should display energy level and allow to turn load ON/OFF based on the requirement. Instruction from the panel will be send to the IOT model which in-turn controls the Load. Later the notification is sent to the technician if any issue arises.

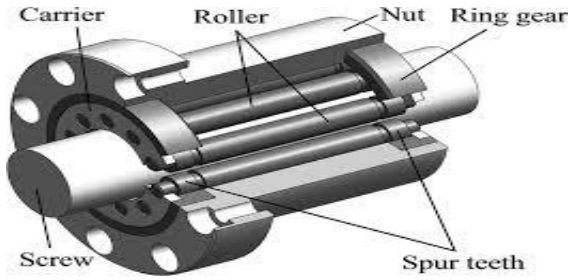

Figure 1. Roller Mechanism

III. LITERATURE SURVEY

In large metro cities, the amount of vehicles increases gradually. Another way to generate the power by tapping this energy is possible by replacing normal speed breaker with this simple mechanism. The energy generated is stored for lighting street lights [1].As vehicles pass over the speed breakers, they spin the rollers which are connected to a generator which in turn generate electricity [2].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 [3]. This method provides an efficient way to generate electricity from the kinetic energy of moving vehicles in roads, highways that is the very compatible with the other mechanism [4]. A prototype model of the existing system (Rack and Pinion) needs modification for large-scale electricity generation [5]. For obtaining the electricity through the flip plate mechanism a prototype model is developed and studied. This D.C. voltage is stored to the lead 12-volt battery. Electricity stored in battery is used to activate the light, fan etc. By increasing the capacity of the battery power rating is increased [6].Hydraulic mechanism is more efficient than other existing models, which enable to accommodate conventional, both in terms of balancing electricity supply and demand in energy across the global [7]. The roller is connected in between a speed breaker and some kind of grip is connected on the roller so that when a vehicle passes over it it rotates the roller. This roller rotates the shaft of dc generator by the help of chain drive in the ratio 0f 1:5. This project aims at producing the electricity using chain drive and roller mechanism [8].

IV. METHODS AND MATERIAL

A. Roller Mechanism

A mechanism converts rotational motion to linear motion. In this Mechanism, a roller is fitted in between a speed breaker and some kind of a grip is provided on the speed breaker so that when a vehicle passes over speed breaker it rotates the roller. This movement of roller is used to rotate the shaft of D.C. generator by the help of chain drive which is there to provide different speed ratios. As the shaft of D.C. generator rotates, it produces electricity. This electricity is stored in a battery. Then the output of the battery is used to lighten the street lamps on the road. Now during daytime we do not need electricity for lightening the street lamps so we are using a control switch which is manually operated .The control switch is connected by wire to the output of the battery. The control switch has ON/OFF mechanism which allows the current to flow when needed.

B. Administrator Console

Administration Console is an interface granting access to the functions Administration Server both

locally and via net. Here the administrator have a login credential and the notification of issues send to the technician via administrator.

C. Cloud

It is a part of network through which data passes between two end points. Here the battery status from the energy source will be stored in cloud and access by the administrator.

D. Rectifier

An electrical device consisting of one or more diodes converts alternating current to direct current.

E. Control Circuit Relay

It is a computer type circuits to switch high current or voltages either ON or OFF.

F. Advantages

- Low Budget Electricity Production.
- No Obstruction to Traffic.
- Easy Maintenance.
- Charging Batteries Are Used To Light Up The Streets.
- Gear Ratio Is Used To Increase Efficiency.

V. RESULTS AND DISCUSSION

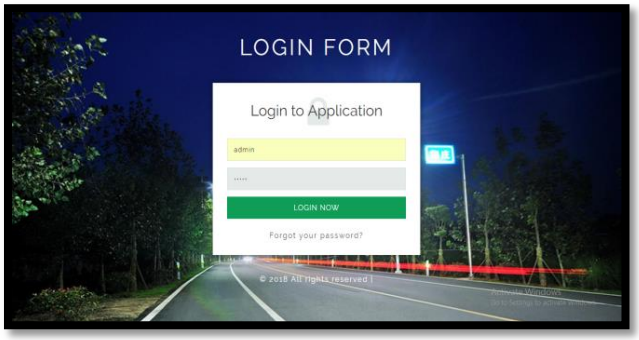

Figure 1. Admin Login Page

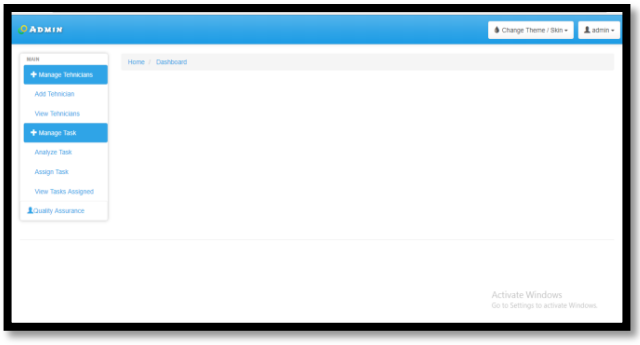

Figure 2. Home Page

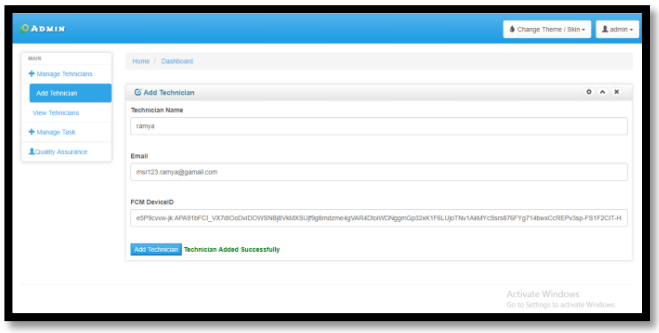

Figure 3. Adding Technician

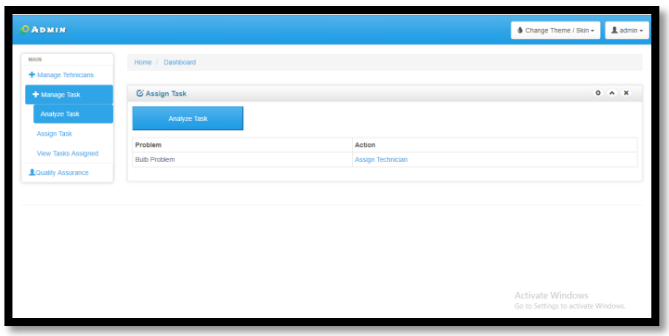

Figure 4. Analyze Task

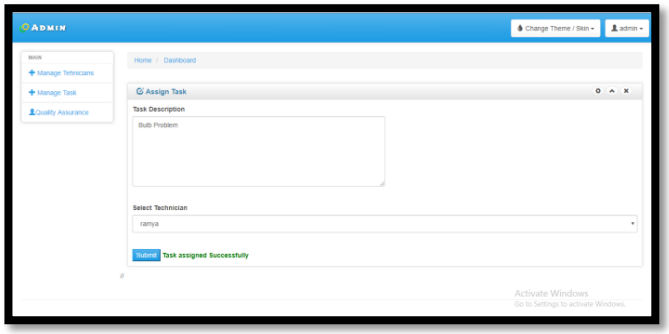

Figure 5. Assigning task to Technician

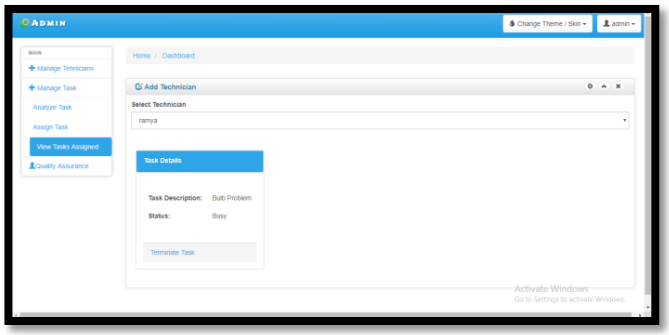

Figure 6. Quality Assurance

V. CONCLUSION

As the demand for electricity is increasing day by day due to rapid industrialization & urbanization, load on power plant is increasing rapidly. Due to this,

power plant could not meet the requirement of industries as well as domestic requirement. This has resulted in load shedding problem in many areas. There is insufficient supply of electricity. To meet this requirement, research are going on to find alternative methods of power generation by using different sources like solar, wind, thermal, tidal, kinetic energy, Geothermal energy etc. Thus, our project aims at future requirement of electricity by using non-conventional source of energy i.e. kinetic energy of vehicles passing over the speed breaker.

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