

GENERATION OF POWER BY TRAIN WHEELS

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ABSTRACT

In this paper, electrical power is generated by running the train on the railway track. Drive mechanism such as the wheel is rotated on the track, it will generate the electrical power from the power generating wheel. The principle of conversion of the rotational energy into electrical energy is used for generation of Electrical energy. The control mechanism carries the D.C generator, battery, Arduino Controller, LCD Display and inverter Module. So, this technique is implemented to railways where the power generation is very high. Our paper focuses on generating electricity in a new and simple way. In this paper electrical power is generated by forward motion of train, here rotating energy is converted into electrical energy.

Keywords: Energy Conversion, Train Wheels, Generator Arduino Etc.

I. INTRODUCTION

In order to generate more electricity the new strategies are develop for producing electricity more efficiently and economically. This project introduces a way to generate electricity by train. Normally, (Indian railway line) when entering a train station, train speed (regardless of type of service) is limited to FOUL MARK. (It is a point, located 1200 meters from the station - Indian railway rules). The train will only travel during its inertia period. Power stored in the train cannot be fully recovered by re-braking. So converting it into electrical energy, wasteful energy is going to be a tap. In this paper principle of generating electricity is applied. To convert the kinetic energy produced by the forward motion of train into electrical energy, the only difference is that generator is use to convert kinetic energy into electrical energy. In simple terms the rotating power generated by the front of a train engine is converted into electrical energy. Today there is a need to develop unique power system in our nation. The power generated from the railway is one of the most common sources of energy production as there is no need of fuel as input to generate electricity and this is done by using a gear drive. Dynamo takes the power to install a clay shaft that is capable of generate to rotating power through the train's proportions and converting it into electricity.

II. PROPOSED WORK

Block Diagram

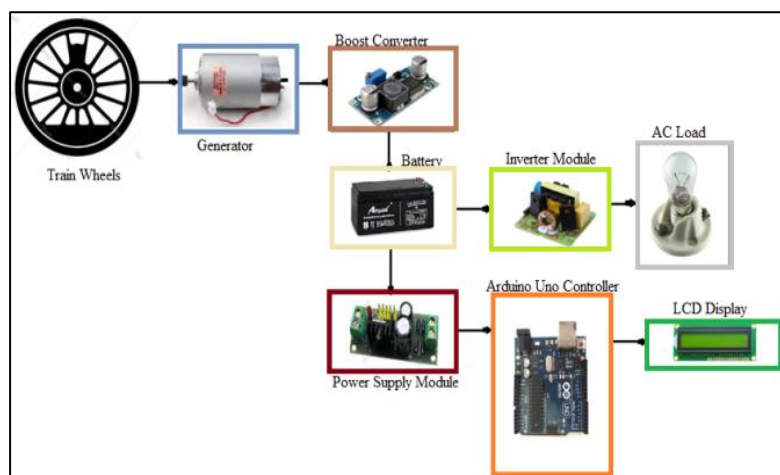


Fig 1: Block Diagram

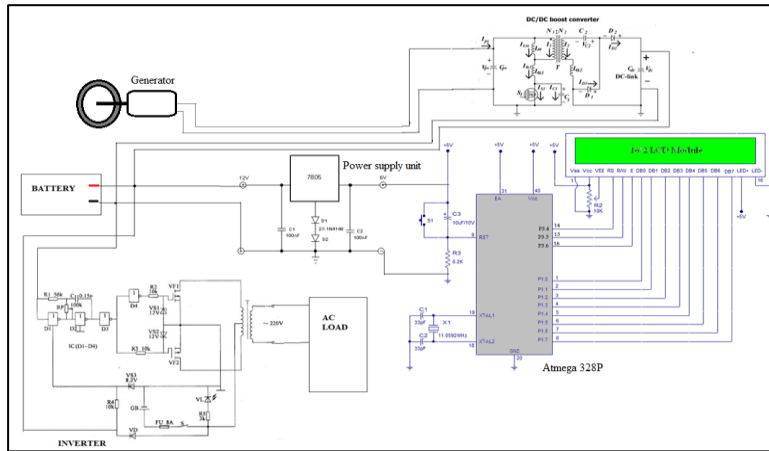


Fig 2: Circuit diagram

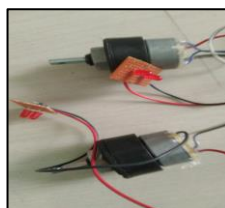
- The vision of the proposed project is to make all work automated, without the need for any handmade / staff contributions .The requirement is to produce power or energy, not from any external source but from within.
- Power can be generated internally by rotating the wheels of the equipment. The goal of the DC Generator is to convert mechanical energy into electrical energy. So the output of the DC generator is electric power. (DC power), stored In a 12 volt DC battery.
- The stored electricity has the potential to discharge over the ground, so that whenever there is a need for electricity, the stored energy can be transferred directly to any location in a very short time.

1. Hardware Implementation

The various components are used in this paper as follows:-

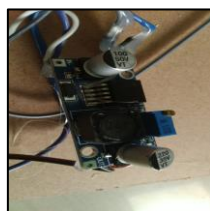
Dynamo power generation system

- A **dynamo** is an electrical machine whose main function is to convert mechanical energy into electricity.
- The electric dynamo uses rotating coils of wire and magnetic fields to convert mechanical rotation into a pulsing direct electric current through Faraday's law of induction.
- 1v -12v DC , 1-2 Ah



Dc to Dc to boost Converter

- A boost converter is sometimes called a step-up converter since it "steps up" the source voltage.
- 12v DC unregulated to 12v Regulated Voltage.



Inverter Module

- As we know that most of the electrical appliances require AC voltage, so first the DC output of the batteries will be converted into AC voltage with the help of an inverter and then it will be transferred to the loads.
- 12v DC to 220 AC conversion.



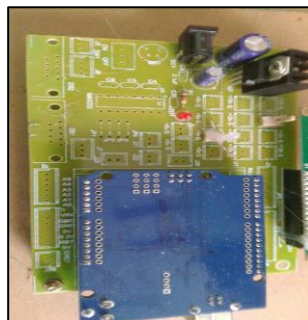
LCD Display

- LCD stands for Liquid Crystal Display.
- LCD is thin flat panel which is used to displaying information such as name of the project and voltage throughout the project.
- It is electronic device which has 16 columns and 2 rows .it shows 32 character (16*2)
- The operating voltage for LCD display is 5V.

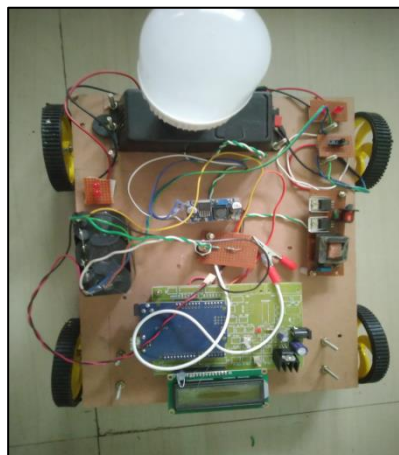


Arduino Uno

- Arduino UNO is programmable open source microcontroller board.
- It is based on ATmega328P microchip.
- It has 14 digital I/O.
- It requires 9V-12V dc.



Project Images



2. Advantages

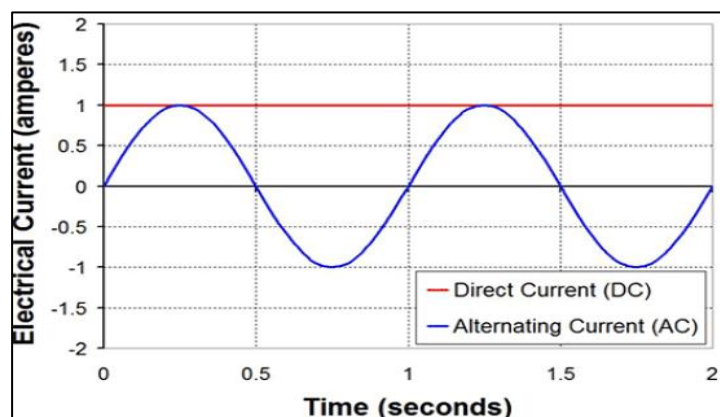
- 1) Low initial cost.
- 2) We can generate electricity 24 hours a day on the train
- 3) There is no reduction in train speed.
- 4) The cost of repairs is low: - There is no need to look for regular meetings. So avoid additional costs.
- 5) This process does not harm the environment because there is no generation of something in the air, water or soil that harms the environment.

3. Disadvantages

- We cannot generate electricity when the train is stopped.

III. RESULTS AND DISCUSSION

- An interesting fact about the Indian railway line is that there is a place far from the station that knows the bad sign, which is 1200 meters from the station.
- From this point the train engine driver has reduced the train speed (which also depends on the type of train) to stop the train directly at the station. The train therefore travels only in its inertia from the dirty area to the station.
- We can therefore estimate how much energy a moving train produces, which means it is not used.
- The main purpose of this establishment is to convert the waste into electricity. This converted power is used by other applications.
- If we are able to produce the equivalent of the power used by the train engine the efficiency of this invention is 100%. But this is a good situation, producing energy close to this good situation.
- We turn this waste energy into circulating energy and then electricity with the help of motors.
- Then the electricity is generated from the dynamometer, motor is also connected to the dynamometer.
- Engine produces D.C. power. then the upgraded power is stored in the battery storage area.
- A battery used to store a lithium-ion type that stores a large amount of electricity produced and can be used whenever needed.
- Ammeter and voltmeter are also connected to the battery and displayed above the ground.
- Meters show current level and indicate the weather at which electricity is generated or not.
- Power reserves have the potential to discharge above ground, so that whenever there is a need for electricity, the stored energy can be transferred directly to any location in a very short time.



Current Produce by dynamometer

- Since our project is to generate electricity using the railway line and according to our established model we light the LED indicating that the electricity generated is approximately equal to 5 volts. And we also save energy on the battery by using the toggle switch. Can be used in any app.

- In our project we turn on the LED immediately when the train passes over the roller and some energy is stored in the battery at the same time. And by using a toggle switch we use pumps in the irrigation system. And on top of all the power generated in our model is 8volts.
- These new projects are leading to more electricity generation. And it is much better and more reliable in use. The integrated design of the building leads to its simple and compact design wherever needed. And the small number of contact peels leads to the development of friction. This will lead to an abnormal power generation that will also be used in the nearby infra railway building.
- A train weighing 1,000 kg upwards 10 cm high on a rumble strip produces about 0.98KW power by setting such a speed on a busy highway, where about 100 trains pass each minute, about one kilogram of electricity can be generated per minute.

IV. SCOPE OF PROJECT

From this redesign we generate electricity in the form of a moving train without making the train speed and not making any kind of rotation. The amount of electricity generation depends on the movement of the train and its speed. As speed increases the efficiency of power generation also increases.

V. CONCLUSION

It is recognized that electricity is very much needed, we as electrical engineers need to be available to get a new idea of generating energy. Since energy cannot be created or destroyed, we must transform it into a form that we can use to provide light to the train station equipment, fan, signal light etc. We can use this system at both the entrance and exit points of the train station. the layout can be used in a separate application such as a foot step or speed breaker at the school, colleges and highway to generate electrical power systems. In order for the level of energy production to increase and the need in a particular area to be met.

VI. REFERENCES

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