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Railway tracks based hybrid power generation

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Abstract
In this paper, we are generated power by energy harvesting arrangement simply running on the railway track for power applications. Today there is a need of Nonconventional energy system to our nation. The energy obtain from railway track is one source of to generate non-conventional energy because there is no need of fuel as a input to generate the output in the form electrical power and these is done by using simple gear drive mechanism. These mechanism carries the flap, rack and pinion, gears, freewheel, flywheel, DC generator, battery. The main focus of this arrangement is the harvesting large amount of power from railway track which can be used to power the track side infrastructures which has power rating up 8 to 10 watts or more. Additionally the focus is on renewable energy and the hybrid nature increases the reliability and reduces the dependence on one single source. The set-up consists of a photo-voltaic solar-cell array, a mast mounted wind generator, lead-acid storage batteries, an inverter unit to convert DC power to AC power, electrical lighting loads and electrical heating loads, several fuse and junction boxes and associated wiring, and test instruments for measuring voltages, currents, power factors, and harmonic contamination data throughout the system.

Keywords: energy, energy harvesting, non-conventional method, rail road, solar power

Introduction

Man has required and used energy at an increasing rate for his requirment. Man needed energy primarily within the sort of food. He derived this by consumption plants or animals, that he afraid. With additional demand for energy, man began to use the wind for sailing ships and for driving windmills, and therefore the force of falling water to show water for sailing ships and for driving windmills, and therefore the force of falling water to show water wheels. Until now, it might not be wrong to mention that the sun was supply all the energy desires of man either directly or indirectly which man was mistreatment solely renewable sources of energy. Commuter rail and subway are together with railway transportation that play a crucial role within the economy and quality existence. To facilitate policymakers and transportation into creating educated choices on operative transportation systems, it's essential that railway track-side instrumentality (signal lights, wireless communication observance devices, positive train management, etc.) are well maintained and operated. once train moves over the track, the track deflects vertically thanks to load exerted by the train's bogies. The vertical displacement of the track beneath the load of a passing train will connected regenerative devices i.e. a vibration energy harvester. The generated power will be keep into the battery and accustomed power track facet equipments. Railroad energy harvest home isn't any trivial disturbance. The mechanical motion convertor in our style feature a regulator integrated on output shaft.

Given typical track input, the regulator is intended for maintain the generator speed near optimum worth. The electrical generator cannot operate at discontinuous speeds, manufacturing additional energy expeditiously. The cut back impact force on part throughout operation, commerce off for larger initial beginning force. The regulator is additionally sanctioning the harvester to supply additional never-ending DC power output while not convertor part once train give way the track. This kind of continual power output is additional simply used and born-again. the most focus of our aim is to reap a bigger quantity of power from the rail. we have a tendency to ar harvest home great amount of energy from power track facet instrumentality that has power rating up eight to ten watts or additional. To accomplish this goal, an magnetic force primarily based harvester is also acceptable

Hybrid power system consist of a combination of renewable energy source such as wind generators, solar etc of charge batteries and provide power to meet the energy demand, considering the local geography and other details of the place of installation. These types of systems are not connected to the main utility grid. They are also used in stand-alone applications and operate independently and reliably. The best application for these type of systems are in remote places, such as rural villages, in telecommunications etc. The importance of hybrid systems has grown as they appear to be the right solution for a clean and distributed energy production. As an initial step towards the development, we shall run the street lighting around the main blocks of the college, which presently draw power from the electricity board supply lines.

Block Diagram

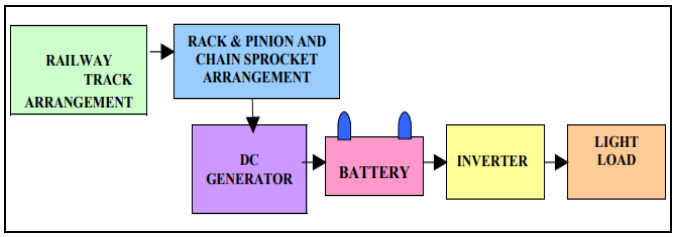

Fig 1: Block Diagram of Generation of Power Using Railway Track

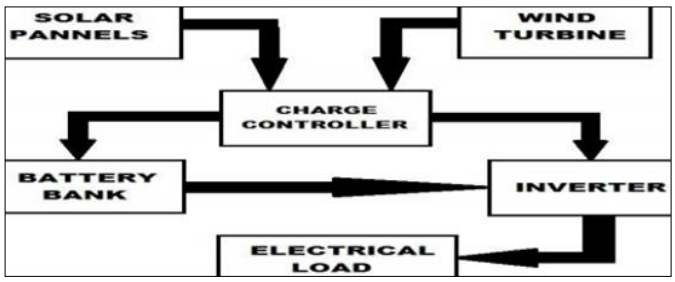

Fig 2: Block Diagram of Hybrid Power Unit

Principle

The principle of this project is conversion of energy within the variety of force into voltage.

Proposed System

When a train ease up the track, the track deflects in downward direction attributable to the load exerted by the train's bogies. additionally due the deflection of track there's a deflection of timber that is place below the track and thus the flap is occupation downward direction because the flap is occupation a downward direction the spring that is connected to flap get compress in downward direction and thus rack is additionally move in downward direction and attributable to these pinion get rotates and thus larger freewheel turned as a result of each square measure mounted on same shaft. As there's a rotation of larger freewheel then the smaller freewheel is additionally turned through chain drive. The freewheel and regulator square measure mounted on same shaft thus the regulator additionally turned. The regulator is connected to the shaft of the generator therefore if the regulator can turned then there's a rotation shaft generator and power get generated which power is keep into the battery

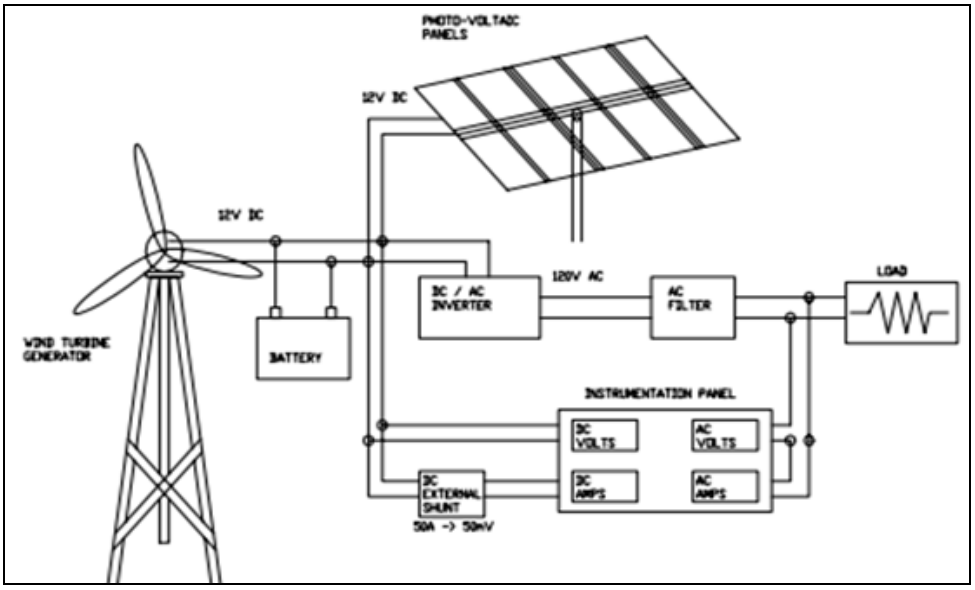

Fig 3: Proposed System

Advantages

- Power generation is solely running the vehicle on this arrangement
- Power additionally generated by running or exercise on the brake.
- No want fuel input
- This could be a Non-conventional system
- Battery is employed to store the generated power

Disadvantages

- Slight inclination is needed within the railway track
- Mechanical moving elements is high
- Initial value of this arrangement is high.
- Care ought to be taken for batteries

Applications

Power generation exploitation railway track system will be employed in most of the places like

- All highways road speed breaker
- All Railway track

Conclusion

It is ascertained that the electric power is in nice demand, we tend to as applied scientist ought to be in discovered for brand spanking new plan of power generation. As energy will ne'er be created or destroyed, we should always rework it into the shape that we will wont to provide for railroad station instrumentation light-weight, fan, beacon etc. we will implement this method at each entry and going away purpose

within the railroad station This arrangement will be employed in completely different application like in foot step or speed breaker in school, faculties and main road for generation ways in which of voltage. so the facility production rate is raised and demand at explicit space will be consummated

Future Scope

This arrangement is slightly changed to construct in foot step and this arrangement is mounted in • colleges, • cinema theatres, • searching advanced and • several different buildings

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