

ELECTRICITY GENERATION USING RAILWAY TRACK

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Abstract - Today's key worry is energy. Electric current production in large quantities is a requirement in today's environment. There are a few a variety of methods for producing conventional and non-conventional energy methods. I'll show you how to make electric power in a nontraditional way in this article. We generated power in this study using an energy collecting setup that was simply operating on the train track for power uses. Our country now requires a nonconventional energy grid. The energy obtained from railway tracks is one source of non-conventional energy because no fuel is required as an input to generate an output in the form of electrical power, and this is accomplished through the use of a basic gear drive mechanism. The flap, rack and pinion, gears, DC generator, and battery are all carried by these mechanisms. The main goal of this setup is to harvest a huge quantity of energy from railway tracks, which may then be utilized to power trackside facilities with power ratings of 8 to 10 watts or higher.

Key Words: Electricity Generation, Rack and Pinion gear, Dynamo, Battery, Inverter.

1. INTRODUCTION

This project to show how energy can be tapped and used at a commonly used railway track. In railway track, large amount of energy wasted during train are passing through the track due to the dissipation of heat and friction when trains are moving through track. Here we can use railway track as a power generation unit. In the present situation power is main need of every human life. In this project when train moves on the track, due to load exerted by the train bogies the tracks are vertically deflected. The track displacement under the weight of moving train can be connected regenerative devices. And this project using simple drive mechanism such as rack and pinion assembly and chain drive mechanism. Here battery can be used as storage equipment and power track side equipment Availability of regular conventional fossil fuels are main source of power generation, but there is a fear that they get exhausted by next few decades. Due to this lots of research using renewable resources to generate power. In our project generated power can be used for street lamp, lamp lights near the track, and irrigation system to near the lands and fields. It does not requires any fuel input to generate power as output. This can be implemented to anywhere in the railway track. Increasing the amount of power we can extract from the rail is the major goal of our strategy. We are using the power track side to capture a lot of energy equipment which has power rating up 8 to 10 watts or more. An electromagnetic-based harvester will be used to achieve this could be suitable.

2. Block diagram

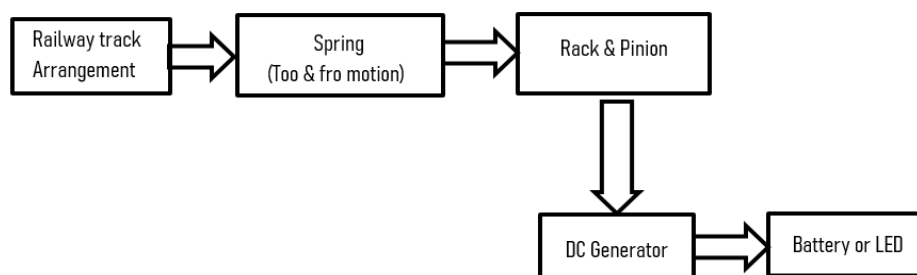


Fig -1- Block diagram

2.1 Hardware description

1. Railway Track Arrangement

An automobile runs over two parallel steel bars, referred to as rails, on a railroad or railway. The wheels of the machines, which are typically either trains or trams, are supported and guided by the rails.

2. Spring(Too & fro motion)

Due to the load that the train is exerting, the track deflects downward. When the load is discarded, the track deflects upward. The too & fro motion is generated by the spring.

3. Rack & Pinion

Through the use of a rack and pinion assembly, rack and pinion utilizes a rotary motor to influence linear motion. They are frequently used in long journey applications that demand high rigidity & precision.

4. DC Generator

A machine that transforms mechanical energy into electrical energy often employs electromagnetic induction is called an electrical generator. An internal combustion engine, a wind turbine, a waterwheel, a reciprocating or turbine steam engine, a hand crank, or any other form of mechanical energy may be the source of mechanical energy.

5. Battery or LED

An electric battery is a gadget made up of one or more electromechanical cells that transform chemical energy that has been stored into electrical energy. Both a cathode, or positive terminal, and an anode, or negative terminal, are present in every cell. LED is a two-lead semiconductor light source is a light-emitting diode. It is a p-n junction diode that turns on to produce light.

3. Circuit diagram

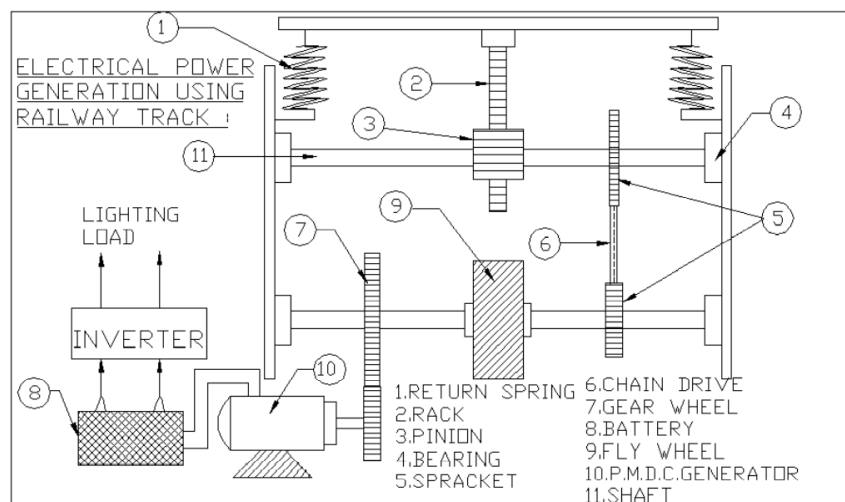


Fig -2: Circuit for Generation of Power using Railway Track.

4. Proposed System

The weight put on the track by the train's bogies causes it to deflect downward as a train passes over it. Additionally, the deflection of the track causes the timber that is positioned beneath the track to sag, which causes the flap to move downward. Because the flap is coupled to a spring that compresses downward when the flap moves downward, the rack moves downhill as well, which causes the pinion to revolve and the larger freewheel to rotate because both are mounted on the same shaft. Since the larger freewheel is rotating, chain drive is also used to turn the smaller freewheel. The flywheel rotated because it was installed on the same shaft as the free wheel. The flywheel is connected to the generator's shaft; as a result, as the flywheel rotates, the generator generates power, which is subsequently stored in the battery.

Result & Discussion

More electricity is generated as a result of this innovative design. It's also more efficient and dependable in use. The structure's compact design allows for easy and appropriate installation wherever it's needed. Frictional forces grow less when there are

fewer contact pairings. This will result in the generation of non-conventional energy, which will be utilized in the surrounding railway infrastructure.

Conclusion

Railway track power generation is a novel sort of energy source. This is done by repurposing the energy that would otherwise be squandered by moving cars. It transforms the kinetic energy generated by moving cars into electric energy. RPG could be a viable solution for both battery charging stations and street light lighting. Higher capacity is provided by a higher frequency of passing vehicles. In fact, just 11% of renewable energy is used to generate primary energy. If this initiative is implemented, we will not only be able to solve the energy crisis, but we will also be contributing to a healthy worldwide environmental transformation.

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