

Electricity Generative Train

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Abstract –This is new technique of electricity production. We can produce the power in the form of electricity by the train. This technique is based on the principle of mutual induction. We used motors which are fitted at the bottom of the train's bogie for the production of electricity. Motors takes input power form the shaft which is in the form of rotating energy produce by the forward motion of the train and convert it into the electricity by the principle of mutual inductance.

Key Words: principle of motor, principle of generator, construction, working, storage, cooling, controlling.

1.FIELD OF INVENTION

For the development of our country the availability of energy in vast range is very important. Energy is present in many form like heat, wind & more on. The most important form of energy is electrical energy because our modern society is so much depends upon the use of electrical energy. Due to this production of electricity in large scale is become necessity. For the large production of electricity we need to developed new techniques by which we produce electricity efficiently and economically. This paper introduced a new technique of production of electricity by train.

This paper aims at production of electricity by using the concept of the rotation of motor due to the forward motion of train.

In simple word we convert rotating energy which is produce by the forward motion of train engine into the electrical energy with the help of motor.

2. BACKGROUND OF INVENTION

The power plants present for the production of electricity which converts kinetic energy present in the nature into the rotational energy except solar power plant. By using the turbine we again convert this rotational energy into electrical energy.

In our new technique we also used this basic principle of production of electricity. We convert the kinetic energy produced by forward motion of train into the electrical energy, only difference is that we used motor for the conversion of kinetic energy into electrical energy.

Consider a motor which is fitted bottom side of the rail bogie near or between the rail wheels. One rotating disc which is simply like the wheel of the rail as shown in fig. 1 which is connected to the shaft of the motor and this rotating disc is placed on the rail. As the engine go forward the wheel of bogie as well as rotating disc of the motor which is connected to the shaft also rotates in the direction of engine. Due to this disc rotation shaft also rotates and EMF is induced in the stator winding of the motor. As this way we converted rotation energy form by motion of engine into electrical energy

3. STATEMENT OF INVENTION

When a conductor is placed in rotating magnetic field then EMF is induced In the conductor by Faraday's law of electromagnetic induction. The direction of produced EMF is given by Fleming's right hand rule. It state that , when we put the conductor In the rotating magnetic field then first finger show the direction of line of force, thumb indicated the direction of conductor motion & middle finger indicates the direction of induced EMF(or current), and this 3 fingers are perpendicular to each other.

For the induction of EMF it is necessary that either producing rotating magnetic field or rotates the coil. Coil is nothing but a copper winding. Which are mounted on the shaft or stationary. The voltage produced by the motor is depend upon :-

1. No. Of turns in copper winding
2. The strength of magnetic field
3. The speed at which magnet or coils are rotates.

Using above principle we produced electricity from the train. This produce electricity is stored in the

battery. This stored energy are used for many applications.

We produced electricity using train at the time of train working period.

4. OBJECTS

In the working period of train most of energy is wasted which is form by motion of train.

The interesting fact about India railway is there is a point away from the station which know foul mark, which is situated 1200 m away from the station. From this point rail engine driver cut off the speed of the train (which is also depend on the type of train) to stop a train exactly on the station. So train only move by it's inertia from the foul mark to station. So we can think how many amount of power is generated by moving train, which is we are not used.

The main aim of this invention is to convert this waste energy into the electrical energy. This converted electrical energy is used for other application. If we are able to produced energy which is equal to the energy used by railway engine then efficiency of this invention is 100%. But this is ideal condition, we produced energy which is near to this ideal condition.

We convert this wasteful energy into rotating energy and then electrical energy with the help of motors.

5. SUMMERY OF INVENTION

A motor converts electrical energy into mechanical energy of rotation. Some motors can be operated as generators to convert mechanical energy into electrical energy.

Generation of electricity :-

Motor is used as a generator. We connect the rotating disc which is simply like wheel of the train bogie. By using this circular rotating disc we give rotational motion to copper coil or magnets. If we give rotational motion to the coil by connecting coil to the shaft which cuts the lines of force & by mutual induction there is formation of electricity is take place. If we want to give circular motion to the magnet then mount the magnets on the shaft of motor.

Construction & working:-

We connect this motor at the bottom of the rail bogie. Shaft of the motor is connected to the rotating disc. As shown in fig. As the engine of train is move forward the rotating disc is rotates & shaft of the motor also rotates due to this rotation EMF is induced in the motor.

Storage of generated EMF:-

EMF generated in the motor is carried out by wires towards the batteries. Generally low voltage wire is used for carry the EMF from motor to batteries. The EMF generated by motor is in the ac form. But battery only stored direct current. For conversion of ac to dc we used invertor.

5. DIAGRMS



Fig-1: Rotating disc (which is connected to motor shaft) with motor

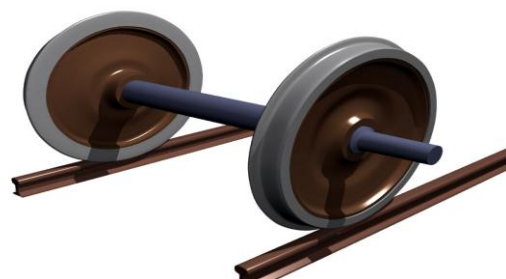


Fig-2: Pair of rotating disc

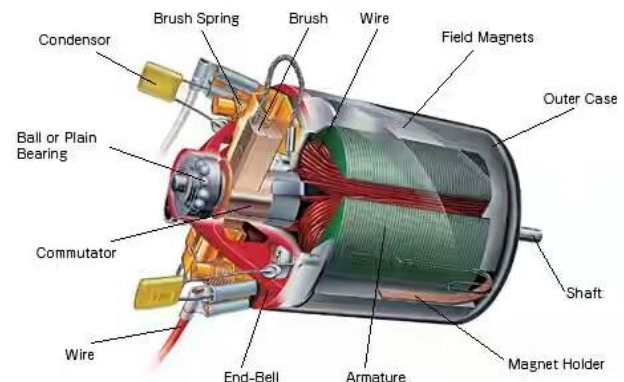


Fig-3: Inside the motor

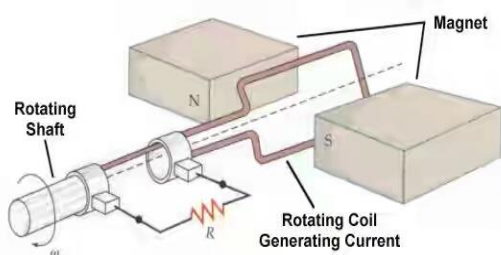


Fig.-4: Working principle of motor when mechanical energy give as input

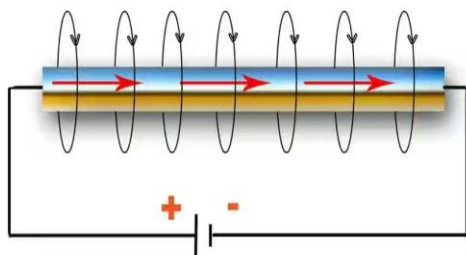


Fig.-5: Working of transmission lines

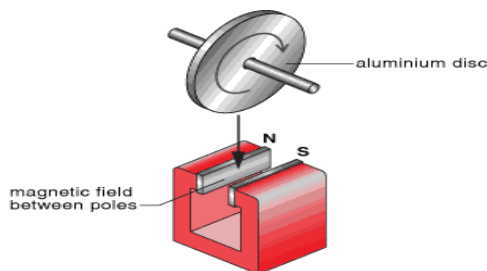


Fig-6: Electromagnetic breaking system

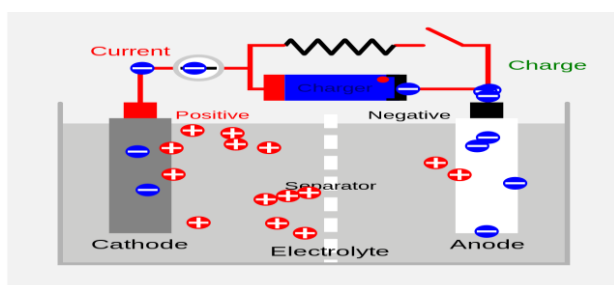


Fig-7: Energy stored by batteries

6. COMPLETE DISCRIPTION OF INVENTION:-

3 Questions important to understand this invention:-
WHAT IS POWER GENERATIVE TRAIN?

A train by which we produce power in form of electricity at the time of trains working period.

ON WHICH PRINCIPLE IT WORKS?

It works on that principle

When electrical conductor placed in the strong magnetic field & with the help of external energy we rotates the conductor then EMF induced in that conductor.

HOW POWER GENERATIVE FORM A TRAIN?

We used a motor for generation of electricity. Placed/assemble this motor at the bottom of the train bogie. The shaft of the motor is connected to a rotating disc ,this disc is similar to the wheel of the train. As train move forward the disc is rotating. This disc give rotational motion to the shaft of motor. Due to shaft rotation conductor(Which is connected to the shaft) also rotates. Due to this EMF induced on the surface of the conductor. In this way we produce electrical power form the train at train's working period.

MAIN UNIT OF POWER GENERATIVE TRAIN :-

1. Power (Electricity) production unit
2. Power transmission unit.
3. Power Storage unit
4. Controlling unit
5. Cooling unit

Electricity production unit

This unit is used for production of electricity.

This unit assemble at bottom of the rail bogies. Near the wheels of the bogie.

This unit consist of motor, shaft, rotating disc like rail wheel.

Construction of this unit:-

1. Take a motor which is fitted or assemble at bottom of the bogie in such a way that the shaft of motor is make exactly upper side of rail.
2. A rotating disc is fitted in the shaft of the motor and put this rotating disc on upper side of rail such like a wheel of bogie.
- Rotating disc:- rotating disc is nothing but a wheel exactly like a wheel of the train.
- 3.This type of motors are placed both right and left side of the bogie and each bogie of the train.

Working of this unit:-

A motor with a circular disc is fitted at the bottom side of bogie & placed circular disc on the rail. As train move forward the circular disc is slight on the rail and start rotating. Due to this shaft of the motor is also rotates and the coil which is mounted on the rotor is also rotate. While rotating the shaft with cu coil, coil cuts the magnetic line of force produced by the stationary magnets which are fitted around the coil. By the principle of mutual induction there is production of EMF take place on the surface of coil.

Another way of production of electricity by motor. We can produced electricity by giving rotation motion to the magnets. Magnets mounted on the shaft as shaft rotates magnets also rotates and producing rotating magnetic field(RMF). This RMF cuts the stationary cu coil which is placed around the magnets or shaft in circular way. By principle of mutual Induction EMF induced in the copper coil.

Power transmission unit

Electric power transmission is the bulk movement of electrical energy from a generating site, such as a power plant, to an electrical substation. The interconnected lines which facilitate this movement are known as a transmission network. This is distinct from the local wiring between high voltage is high voltages substations and customers, which is typically referred to as electric power distribution.

Power generated by motors (which work as the generator) is necessary to store for used this power. For this purpose we require transmission line for transmission of power generated form motors towards the batteries where it stored.

There are many types of transmission lines i.e. high voltage, low voltage transmission lines. The voltage produce by motors is not so high. So we used low voltage transmission lines. Power transmission method is shown in fig.

Power storage unit

Energy can not be destroyed or created, but it can be stored in various forms. One way to store energy is chemicals. With the help of chemicals we produce energy or stored energy i.e. battery.

The generated energy is necessary to store for reuse of this energy. For this we used lead acid battery for storing electricity.

Lead-acid**Advantages:**

- 1 It's efficiency is high.
- 2 Maintenance free.
- 3 Battery is available in all shapes and sizes.
- 4 It has longest life cycle.
- 5 Disposal of this battery not harm the nature.

Controlling unit

It's not necessary to provide controlling unit to this system. But for avoid accident we provide electromagnetic breaking system for the wheels of motors.

The electromagnets are placed on both side of the wheel which is connected to the motors shaft. As we give electrical current they activated and due to electromagnets attraction force they control the speed of the wheel. The main advantage of tis breaking system is we reduced the speed as we desire.

Cooling unit

In this innovation heat is produced is not so much large.

Here the heat is generated by

1. Motors:- The motors we used for power generation produced heat. Heat is form due to the friction between the copper brushes and winding.

This heat generation is avoided by using the induction motor. Because there is not friction between 2 components.

2. Rotating disc:- Rotating discs are slide on the rail. Due to this contact there is heat form. The amount of heat generation is small. This heat is dissipated by air.

3. Transmission wires:- when current flow in the wires there is heat generated because of wires resistance. Due to the wires negligible heat form, this is avoided by using

low resistance wires for current transmission I.e. copper wires.

7. ADVANTAGES:-

- 1) Low initial cost.
- 2) We can produce electricity 24×7 hours from the train
- 3) There are no reduction in the speed of train.
- 4) Maintenance cost is low:- There is no requirement to check assembly on regular basis. So avoid extra cost of maintenance.
- 5) This technique not harm the nature because there is no generation of particular matter into the air, water or soil which is harm the nature.

8. DISADVANTAGES:-

- 1 We can't produce electricity when train is in stationary condition.

9. CONCLUSION:-

From this innovation we produced electricity from a moving train without effecting train speed & not doing any type of pollution.

The amount of production of electricity is depend on motion of a train and it's speed. As the speed increased efficiency of electricity generation also increased.

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