"T-BOX POWER GENERATION"

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ABSTRACT

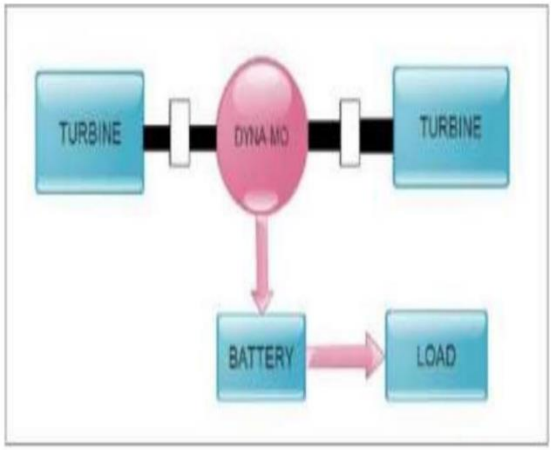
The intention of this project is at production of electricity by using the concept of the rotation of wind turbine due to the wind caused by the moving train and also by using an electrical power generation system. As anyone living near railway tracks will tell you, speeding trains generate quite a bit of wind as they whoosh past. The idea is to design a wind turbine that can be installed between the sleepers on a track, and as the train passes overhead, the wind drives a turbine to generate electricity. This device could be placed along railway or subway lines, and make good use of an otherwise wasted resource. An electrical power generation system comprises a variable capacitor and a power source. The power source is used in the form of a generator to prime the variable capacitor that effectively multiplies the priming energy of the power source by extracting energy from the passing vehicle. By alternately priming the variable capacitor using charge from the power source and discharging it at a later time in a cyclic manner to change the capacitance, a significantly large amount of electrical energy is produced due to change in capacitance.

KEYWORDS- Windmill, Railroad track, Generate electricity, Sustainable energy source, Pollution free.

1.1 INTRODUCTION

Energy resources in our modern fast paced country are fast depleting, hence it is indispensable that we find new ways of generating energy which is both self-starting as well as easily manageable. Wind energy has long been used to generate electricity through wind turbines and has proved to be one of the most reliable renewable sources of energy in many countries. However, since there are very few regions in the world that experience windy conditions throughout a year, this method becomes restricted to only a few chosen regions. The same concept is used in this project, but with a different perspective. Any locomotive be it train, car or even a bicycle when in motion produces wind currents along the direction of their motion. This happens because of the disturbance in air produced by the moving body of the vehicle. This wind if tapped efficiently over duration of time can lead to production of substantial amount of power. The idea of a train being able to utilize its very infrastructure to generate electricity is very fascinating. Generating power by harnessing the wind energy created by fast moving trains is not an idea that may occur to the average researcher. Now days the need of energy resources is increasing at a much faster rate. We need to capitalize all the available options to complete all our needs with ease. As the hunger for alternative forms of energy continues, the T-box has generated hope. This device presents a new generation of wind power generators, and has created quite a sensation among techno buffs. However, it is important to remember that the design is still in the conceptual stage and has not taken into account all of the preservation and maintenance issues that are likely to pose a problem in any future use of this device. Wind presents a vast source of renewable energy. Wind energy is in fact an indirect form of solar energy. Wind regenerated due to heating of air by solar Radiations during the day. Heated not have to be defined. Do not use abbreviations in the title or heads unless they are unavoidable.

Fig. shows the basic block diagram of T-box wind power generator which includes to two wind turbine. Turbines are kept in two side of dynamo. Dynamo converts mechanical energy into electrical power. Power generated by dynamos Direct Current in nature. In this we use two side shaft dynamos for generation. Dynamo is placed between two turbines and coupled to turbine with the help of rigid shaft coupling.



Block Diagram:-

The whole assembly is installed on train at bottom side of train. When train start moving ate air pressure is developed which rotates turbine ultimately turbine rotate dynamo as they are coupled and electrical power is developed at terminals of dynamo.

1.2 PRINCIPLE AND THEORY-

Today many industries are rapidly growing to the wind energy generation. Nowadays, the need of energy resources is increasing at a much faster rate. We need to capitalize all the available options to complete all our needs with ease. For this, inventions such as T-BOX are very helpful. As it needs only wind from passing trains to produce the energy. Since fasting is going on for alternative forms of treatment, T-box has created hope. This device introduces a new generation of wind energy generator producing very prominent in techno buffs. That's it however, it is important to remember, that the design is still in a conceptual state, so that in the future, the 'use and maintenance' of this device has not been resolved. Our evolution shows that (i) Constructing electricity Using the concept of rotation of wind turbine by hawking rail. (ii) Using air-tight coat to reduce large pressure and use it to control wind flow. The mouth of casing provided with valve to control the wind flow. To provide full mechanical support to the Train.

1.3 T-BOXASSEMBLY-

U Firstly take Metal Steel strip having 50mm width and 4mm thickness. Cut the strip in 4 pieces of 360mm length. Drill all 4 strips of 20.2mm for bearing mounting. The drill at 200mm from one end of strip this is for all strips. Then fix bearing in strip and weld it. Then take turbine and insert its shaft in bearing on both sides. The length of shaft kept 20mm outside the strip on both side & 25mm inside the strip. The 200mm length side of strip kept at bottom for both sides i.e. 160mm side is at top. To hold the strip at same distance rod is welding to bottom side. Same assembly does for another turbine. To provide support to dynamo a strip is welding between two turbines and kept distance between turbine 130mm. Take coupling and fit on shaft of turbine and another one is on second turbine shaft. Fix dynamo mounting support and make sureties mounting. Shaft of dynamo is inserting in both side coupling then tight the screws of couplings. Two turbines are coupled by a strip welding at top of it also hold the turbine covers. A semi-circular cover is made for turbine having length 400mm and diameter 320mm. two individual cover is made for two turbines. The material used for is punctuated within the parentheses.

1.4 Dimensions details of T-box

Total length 1000mm details in Table

Length of turbine / Quantity	350mm/2
Bearing thickness / Quantity	12mm/2
Gap between turbine and bearing	25mm each side (4 place)
Thickness of dynamo stator	60mm
Distance between dynamo stator and turbine bearing	45mm(2place)

Table 1: Dimensions detail T-box

1.5 METHODOLOGY-

The technique provides an electric power co-generation system for use with a railroad network. The system includes a power source, such as a power generation device or an external power source. The power cogeneration system includes first and second electrical capacitance portions that are electrically coupled to the power source and that are configured to carry positive and negative charges, respectively. The power cogeneration system further includes a biasing device that is configured to separate the first and second capacitance portions with respect to one another. Thus, by varying the distance between the capacitance portions in response to a vehicle on the rail, the capacitance portions cooperate to act as a variable capacitor that facilitates the co-generation of power with respect to the system. That is to say, the mechanical energy of the biasing device is converted into electrical energy for the system. In accordance with above technique, a method of co-generating power via a vehicle travelling on a rail is provided. The method includes the act of driving first and second capacitor plates with respect to one another in response to the vehicle that is travelling on the rail. The method also includes the act of charging the first and second capacitor plates via a power source, such as a power generation device or an external power source. The method further includes biasing the first and second plates apart from one another, thereby displacing the plates with respect to one another. This displacement changes the electrical capacitance between the first and second plates and, resultantly, increases the electric potential between the first and second plates. In turn, this displacement of the first and second plates facilitates the co-generation of electrical energy from the kinetic and potential energy of the vehicle on the rail.

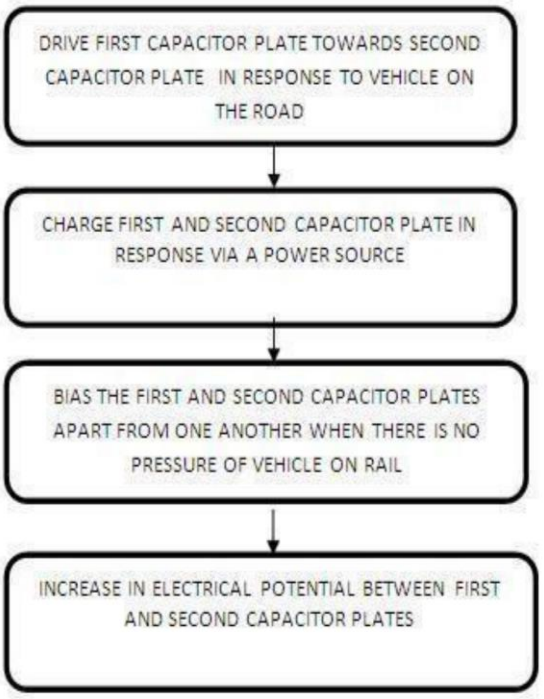


Figure - METHODOLOGY

1.6ANALYSIS-

(i) The capacitance of the capacitor is calculated in accordance withtherelationship:

$$C = \varepsilon A/d$$

(ii) Voltage across the plates in open position iscalculatedas:

$$Vo = Cc/co \times Vc$$

Where Ccis the capacitance in the closed position in farads, Cois the capacitance in open position

in farads, Vcis the voltage across the plates in closed position, and Vois the voltage across the plates in the open position.

Consider, let dielectric permittivity k=2.5, ε0=8.55picofarads/m,ε=kε0=2.2×10-11-11farads/m, A=0.1 m2,t=1 micron.

(10-6m) is the thickness of the dielectric layer, d=1 mm (10-3m) is the space between the plates.

Cc = -A =2.2x10-11-11farad/m /10-6 m x 0.1m2 = 2.2x10-6farad=2.2μf;

Thus, when the exemplary variable capacitor is in the closed position, the capacitor has a capacitance value of 2.2 microfarads, and the

distance between the plates is defined by the thickness of the dielectric material. When the distance between the plates is increased, the capacitance of the variable capacitor is changed to:

Co= εo/d x A=8.55x10-12/10-3 x0.1≅0.0009 µf;

Where d>t. In this system, the electrical potential across the plates is inversely proportional to the capacitance of the device and is:

Vo = Cc/Co x Vc≅ 2400

where Vo is the voltage or electric potential across the plates when the plates are in the open position and Vc is the electric potential across the plates when the plates are in the closed position.

0=2.2×10

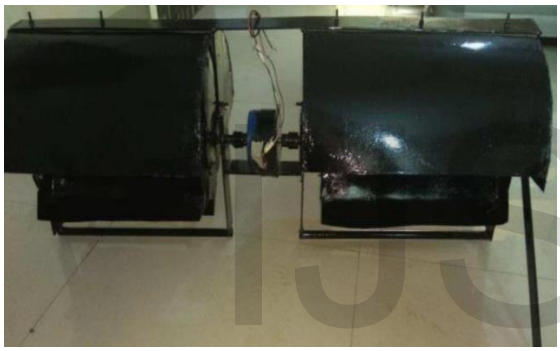


Figure-Model

1.7 CALCULATIONS-

Total distance of one compartment: - 32ft.

Distance between ground to bottom side of train:-4ft.

T-box installed in one compartment: - 10 T-box.

Load between one compartments: - (20 Fan for 60 watt and 22 FL for 18 watt).

Train travelled by 60 Kmph Air pressure 1.5 to 1.9 bar (1 bar = 14.5 psi).

Train travelled by 80 Kmph Air pressure max 3 bar (3 bar = 43.5 psi).

Compartment for actual load:-fan 20,FL 22(Total 18 Watt).

Total Watt =20x60+22x18=1596.

Watt Total compartment Load 1596x20=31920.

Watt 60Kmph =Generated 550.

Watt in 1 Km(150 T-box).

Total Generated Power 550x60 =33000 Watt.

1 T-Box 60km=220Watt.

Energy Stored=33000-31920 =1080 Watt.

ADVANTAGES-

- It is very easy to install.
- Needs less maintenance & has less chances of Failure.
- It is Efficient.
- Clean source of energy.
- It is Cheaper, Construction of T-Box is very easy and also it does not cost so much.
- Virtually silent operation.
- Friction less energy generation.
- In public place to charge mobile free of cost.

LIMITATIONS-

- The Effect of T-Box for Dust, Dirt.
- Proper Observation.
- The more than speed for the T-Box more changes damage.
- Also, grease and grime deposits escaping from underneath will contribute to contaminating the device.

APPLICATIONS-

Railways.

General Transports.

CONCLUSION-

Increasing the electrical potential of the variable capacitor also increases the electrical energy of the system, as the mechanical energy of separating the plates is converted into electrical

energy. Thus, in the above example, the electrical energy of the capacitor is increased by 2400 times. The power generation device effectively primes the variable capacitor, and the energy of this priming is multiplied by varying the distance between the capacitor plates. By alternately priming the variable capacitor using power from the power source and discharging it at a later time in a cyclic manner to change the capacitance, a significantly large amount of electrical energy is produced due to change in capacitance in comparison to the electrical energy and power from the power source itself. A number of such systems are connected together for greaterenergydelivery. Advantageously, communication between the power ties facilitates sharing of resources and also facilitates the development of certain data types, such as block occupancy detection, distance to train, detection of broken rail, or the like, Additionally, by monitoring various properties of the variable capacitor, certain properties regarding the vehicle passing on the rail can be determined. For example, determining the time, the capacitor is in the closed position or the open position provides an indication of the speed of thevehicle. Thus the property of variable capacitance and also utilizing the winds during the movement of train is used to trap energy (kinetic and potential) of the vehicle movement in the rail. By alternately priming the variable capacitor using the charge from the power source and discharging it at a later time in a cyclic manner to change the capacitance, a significantly large amount of electrical energy is produced due to change in capacitance. Though the theory appears to be neat and clean, the system is only proposed and is yet to bedesignedexperimentally.

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