

Design And Implementation of Power Generation And Passenger Alerting System For Indian Railways

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Abstract- This paper brings new possibility of production of electricity by using the concept of rotation of wind turbine due to wind caused by running trains. This paper deals with design & development of wind turbine system with the concept of generation of electricity as an auxiliary source in the train. And also we include the passenger alerting system to alert the particular passenger alone without disturbing the fellow passenger by making their berths to vibrate a few minutes before the train reaches their destination.

Keywords- Traincontrolblock, Vibrator, IRsensors

I. INTRODUCTION

The Indian Railways has the world's fourth largest network in the world, after that of the United States, Russia and china. The Railways traverse the length and breadth of the country and carry over 20 million passenger and 2million tens of freight daily .The main objective is to develop a technique relate generally to electricity generation system along rail road track with the aim of contributing to present power generation system as a need of energy is growing continuously. Easy availability of wind induced by moving trains have high wind pressure generated in moving vehicles. These are independent of seasonal winds having variation in wind speed & direction and that too neither at all times& not having necessary forces to operate wind mill to generate electricity it can lead to reduction in global concern of greenhouse emission. The gentle rocking motion of a train is enough to lull the weariest of travelers off to sleep on a journey, meaning you miss your stop but now we are introducing a system will apparently now let you set a vibrator, which can alert the passenger to reach the destination.

II. EXISTINGSYSTEM

2.1. POWER GENERATION:

In this method piezo sensor is mounted on speed breaker, whenever the vehicle cross the speed breaker, the

piezo-sensor produces current. The current stored to the battery by using transmission line is stored the pantograph.

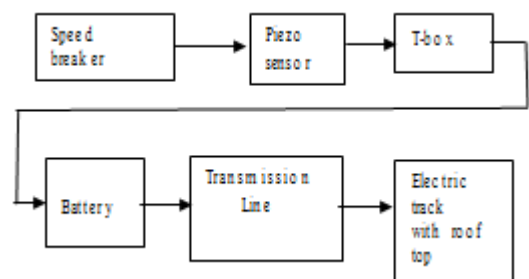


Fig 2.1. Block diagram of power generation

2.2. PASSENGER ALERTING SYSTEM

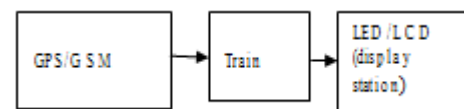


Fig .2.2.Block diagram of passenger alerting system

A Global Positioning System (GPS)-enabled Station Name Display System (SNDS) has been introduced in the AC coach of Vanchinad Express for displaying the approaching railway station in advance along with the time to the commuters.

Half a km before the railway station where an express train has a stop, the LED display system placed above the inside door of the AC coach would display the time along with the approaching railway.

III. PROPOSED SYSTEM

3.1. T-Box:

Box wind power generator basically new concept of non-conventional energy generation. This inversion relates to generating electricity by pressurized wind by fast moving train. In order to optimize energy, here we are implementing T-box to generate energy from train motion. T-Box spins with the effect of the wind after the train passes with huge speed

and produce, electricity. Figure3.1. shows block diagram for power generation.

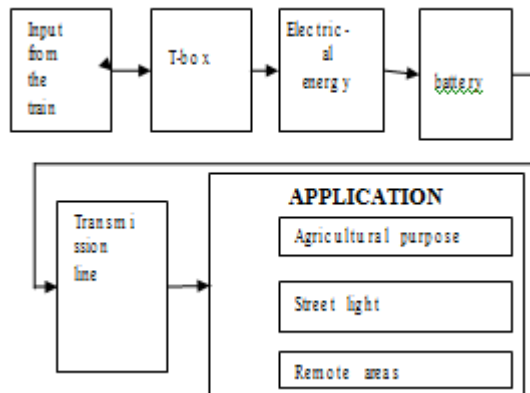


Fig 3.1 Block diagram for power generation

3.2. T-BOX WORKING:

Due to the pressure drop near the train, the turbulent air moves towards the train. As we are placing the vertical axis wind turbine near the train, the wind passes over the turbine blades and rotates. In this process the kinetic energy of the wind is converted into mechanical energy and then it is converted into electrical energy by the use of dc motor. The DC current is stored in the battery. The inverter is used to convert DC current into AC current and the AC current is transmitted to the power stations for supply. Figure 3.2 shows T-box



Fig 3.2.T-Box

3.3. FUNCTIONAL BLOCK DAIGRAM:

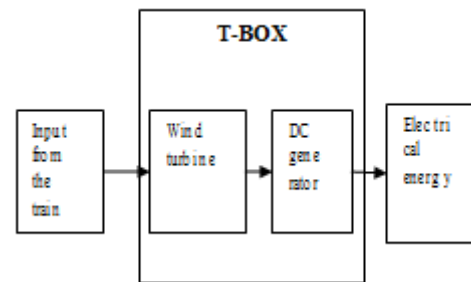


Fig 3.3.functional block diagram of T-box

IV. INNER PARTS OF T-BOX

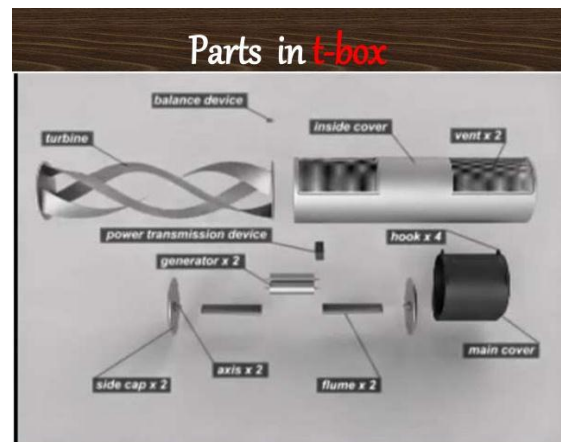


Fig 4. Inner parts of T-box

V. POWER CALCULATION

A train moving at 125mph would speed equivalent to 50feet/sec.wind blowing with such speed will let a normal wind power generator harness about 3500w of power. If a train is about 656 feet long, running at the pace of 187mph, and it moves along a 0.62mile railway track in about 18sec, the power generated in this small period by the T-boxes laid on the tracks will be2.6KW.

The train moves 125mph, the t-box produce 3500wz.

$$125\text{miles}=201\text{km} \quad 1\text{miles} =1.6\text{km}$$

VI. PASSENGER ALERTING SYSTEM

To alert the particular passenger alone without disturbing the fellow passenger by making their berths to vibrate a few minutes before the train reaches their destination.

6.1 BLOCK DIAGRAM OF PASSENGER ALERTING SYSTEM:

passenger will be alerted and fellow passengers will not be disturbed. Passenger can sleep without the fear that he/she will miss their destination.

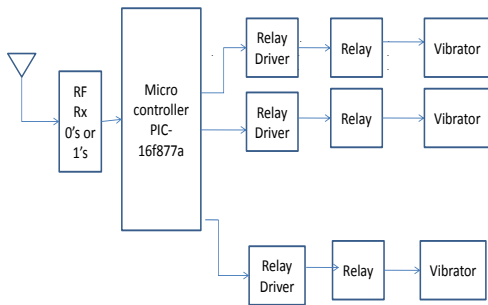


Fig. 7 . Block Diagram of the Receiver at the Compartment

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FOR EXAMPLE:

BINARY DATA			STATION NO
0	0	1	S1
0	1	0	S2
0	1	1	S3
1	0	0	S4

VII. HARDWARE REQUIREMENT

- Power supply unit
- Microcontroller
- IR sensor
- Keypad
- Relay
- Motor
- LED light

VIII. SOFTWARE REQUIREMENT

- Software- Micro C Pro for PIC
- Language- embedded c

IX. ADVANTAGES

Cost of implementation is very cheap, so that no need to collect extra fare from the passengers for this service.They can be produced more electricity. Only the respective

X. APPLICATION

- It can be used for Railways.
- It used for street light, remote areas, agricultural lands.

XI. CONCLUSION

T-BOX WIND POWER GENERATOR is a device which can help in parallel with the Wind Mills across the World. As we already know that in the Setup of those large Wind Mills we need to invest so much of money. Also, they need a large area for it because in Wind Farms they should be in large in numbers, then only they will produce electricity. Also, one drawback is that they are variable and totally depends upon winds and that is why they can't produce continuous electricity. As INDIAN RAILWAYS NETWORK is very large and denser. The tracks are in every city, village of the country, as it is in every part of the country then if T-BOXES are installed in India then there will be a huge production of electricity because in Indian Railways there are 1000's of trains and they runs continuously and it will produce large amount of power.

Passenger himself can make alerts in his/her electronic gadgets based on the time needed for his/her journey. But the journey timing may extend due to some unfortunate problems. To overcome these drawbacks our system is the optimum solution.

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