Wind Power Train

Anup Parmar*, Omsmruti Gaikar*,Nikhil Nivalkar*,Gajanand Nandagiri*
*Department of Electronics Engineering, K.C.C.E.M.S.R,
Kopri,Thane(East)

***Abstract*---In this era, saving electricity is the need of hour. Currently trains use DC electricity, which is used extensively. This leads to scarcity of electricity that is a major problem going on nowadays. To overcome this scarcity this paper proposes a system which is based on wind energy as well as solar energy. A windmill on the train which can be mounted so that the energy is supplied to the coaches, lights and fans. Existing system is not economic and in terms of safety it proves to be non convenient. This system proves to be efficient in terms of electricity generation and is harmless, ecofriendly and cost effective. A l s o dynamo sensor is used as battery backup for train. On the wheel the dynamo sensor is placed that convert motion into electrical energy, and this energy is used as Battery backup.**

I. INTRODUCTION

For the extensive Railway network in India, an efficient management system is required to avoid train accidents. Although the current safety system is appreciable yet owing to motorman negligence or bad atmospheric conditions can lead to unavoidable accidents. This intended system aims at decreasing the margin of error of the system in existence and thereby making it safer. It is eco friendly with no usage of fuels and diesels. It is with the help of acceleration mechanism and stator rotation we can generate electric energy for energy provision of coaches, lights and fans. Here dynamo sensors is used as battery backup for train. On the wheel dynamo sensor is placed that convert motion into electrical energy, and this energy is used as battery backup.

SPECIFICATIONS:

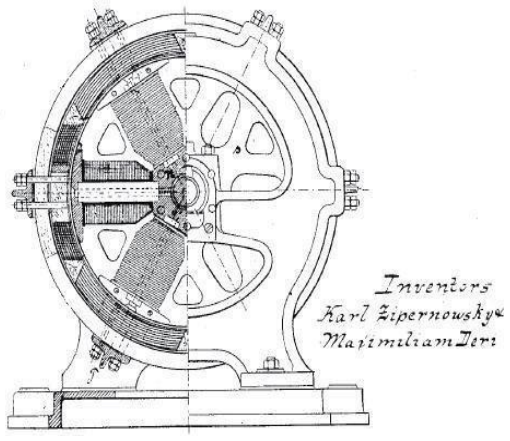


fig.1: Dynamo

A dynamo is an electrical generator that produces direct current with the use of a commutator. Dynamos were the first electrical generators capable of delivering power for industry, and the foundation upon which many other later electric-power
conversion devices were based, including the electric motor, the alternating-current alternator, and the rotary converter. Today, the simpler alternator dominates large scale power generation, for efficiency, reliability and cost reasons. A dynamo has the disadvantages of a mechanical commutator. Also, converting alternating to direct current using power rectification devices (vacuum tube or more recently solid state) is effective and usually economic.

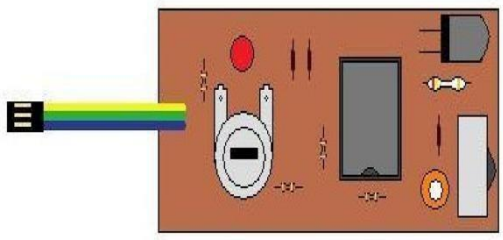


fig 2: Obstacle sensor

Front side head on collision

A head-on collision is one where the front ends of two ships, trains, planes or vehicles hit each other, as opposed to a side-collision or rear-end collision."With rail, a head-on collision often implies collision on a single line railway. This usually means that at least one of the trains has passed a signal at danger, or that a signalman has made a major error. Head-on collisions may also occur at junctions, for similar reasons. In our proposed system it will discard the above following drawbacks and will generate new trend in enhancing the management of railway governments.

It consists of three major components. The first is an Infra-Red (IR) transmitter (usually an IR LED), the second is a TSOP (an Infra-Red receiver) and third IC 555.The main difference between LED and IR LED is that IR LED emits Infrared Radiations, which we cannot see by our naked eyes. TSOP requires the incoming data to be modulated at a particular frequency and would ignore any other signals. It is also immune to ambient IR light. They are available for different carrier frequencies from 32 kHz to 42 kHz.

II. BACKGROUND OVERVIEW:

1. Existing System

A. Manual Signal Monitoring:

The motorman has to manually observe the upcoming signal and take decision accordingly.

B. Auxiliary Warning System(AWS):

The Auxiliary Warning System is an intelligent auto-braking system. In case of the failure of the motorman to act according to the upcoming signal, the AWS comes into play. This AWS is implemented in the railway network of Mumbai and suburbs and not in hilly, remote areas owing to the less frequency of trains.

Features

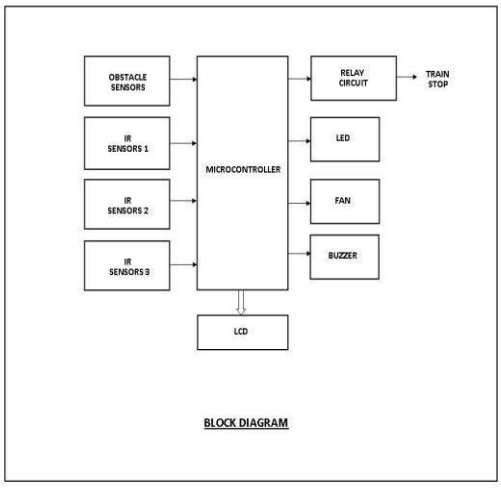
Dynamo sensors for (2 tyre driven and 2 dead tyre)for generation energy in battery backup. Windmill on the train (2 tyre driven and 2 dead tyre)for the provision of energy to lights and fans in the coaches. Obstacle sensors to avoid collisions of thetrain.

Drawback of the existing system:

Motorman Mishap:

If anything happens to the motorman's health while he is driving the train, it puts all the passengers in the train to a risk. This is the risk which AWS primarily eliminates.

fig 3: Proposed System block Diagram:



III. WORKING:

Here dynamo sensors is used as battery backup for train. On the wheel dynamo sensor is placed that convert motion into electrical energy, and this energy is used as battery backup. A windmill is placed on the top of the train is used. When wind is sensed, it will rotate the stator of the windmill. This generates a signal which is given to microcontroller. From microcontroller, the signal is then given to the compartment's lights, fans etc.

Obstacle sensor is used to detect obstacle /trains in the same railway track,which on detection gives command to the motor driver circuit via microcontroller to stop the train.

DESCRIPTION:

1. *Micro Controller:* Microcontroller is low power, high performance 8bit CMOS microcomputer with 4kb of EPROM. Signal from every sensors or detectors is applied to the microcontroller for processing. Microcontroller gives the corresponding signal to every respected block for field operations.
2. *Windmill*: It is used to give energy to the Lights and Fans of the coaches in the train which is generated by wind which tends to move the stator of the windmill for generating energy.
3. *Dynamo sensors*: It is placed on the two wheels which is converting the motion into electrical energy for storing in the battery of the train.
4. *Obstacle sensor*: Generally it is used for avoiding the collision of the two trains which is placed in front of the train.

IV. ADVANTAGES:

1. Modelling of existing railway techniques and implementing their improvements.
2. All features can be projected in a small area(toy train).
3. Study equipment designed to meet working conditions of railway operations.
4. Compact apparatus with high degree of operational reliability.

V. LIMITATIONS:

1. Implementation of real world Railway system into Toy Train model.
2. Existing system includes single and double yellow signals which are not implemented.
3. Speed of train cannot be varied in the model.

VI. CONCLUSION :

This system deals with using a renewable source of energy and converting that energy to generate electricity. The main aim is to develop a windmill on train which can be mounted so that energy is supplied to coaches, lights and fans. As renewable source of energy is utilised the system is eco-friendly and safety level is also high. Integration is also easy

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