DESIGN AND IMPLEMENTATION OF ADVANCE FIRE DETECTION AND ENERGY SAVING RAILWAY SYSTEM

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ABSTRACT
In transport system, Railways plays a vital role because it is very cheapest mode of transport. So we have to enhance the railway system in various ways. Nowadays, the fire accident has been occurred and it leads to several human losses. In a year, around 800 people were died due to this incident. The prevention of train fire has become a serious concern in our country. Currently, Our Indian Railways doesn't use any sophisticated fire prevention methods. The objective of our paper is to avoid fire accident in advance method. In this system, if the fire has been occurred, that particular compartment will be automatically disconnected and information will be sent to the driver as well as nearby station, before this water will peep out from the top of the train and it will off the fire. Another feature of our project is,   light and fan will be controlled with the help load scale. Based on this, energy can be saved in the train.

Keywords: Load scale, Fire detection, Railway Fire Accident

INTRODUCTION
Departmental Undertaking of the Ministry of Railways, Government of India. Slogan -"lifeline of the nation". Adding value to Indian Railways` slogan, we are proposed our project to improve the comfort to passengers. The following systems of Train Lighting are in use on Indian Railways BG coaching stock.Depending upon the train lighting systems, the coaches are of following types. The following system of train light and fan are used on Indian railways BG coaching stocks. In this chapter the train light and fan system of Non-AC and AC SG coaches will be discussed.

EXISTING SYSTEM
Maintenance and lack of awareness are major reasons of the in train .The loss of human lives in the fire accidents in passenger coaches steeply increased from 2 (or) 3 years .It also found that the Research Designs and Standers Organization, the national auditor also noticed that the RAILWAYS did not enforces its instruction on shifting of junction boxes. At present there was no proper step to prevent the train as well as passenger from the fire accident which is happened unfortunately If fire accident happens we can't able to off the fire, due to this many persons were died. Due to fire accident 800 peoples were died. High capital costs that may be uneconomic lightly power waste. Electro diesel locomotion and electro diesel multiple units are waste. This problem somewhat as they are capable of running on diesel power during on non-electrified routers.

Fig.1: Insert load scale in train seat

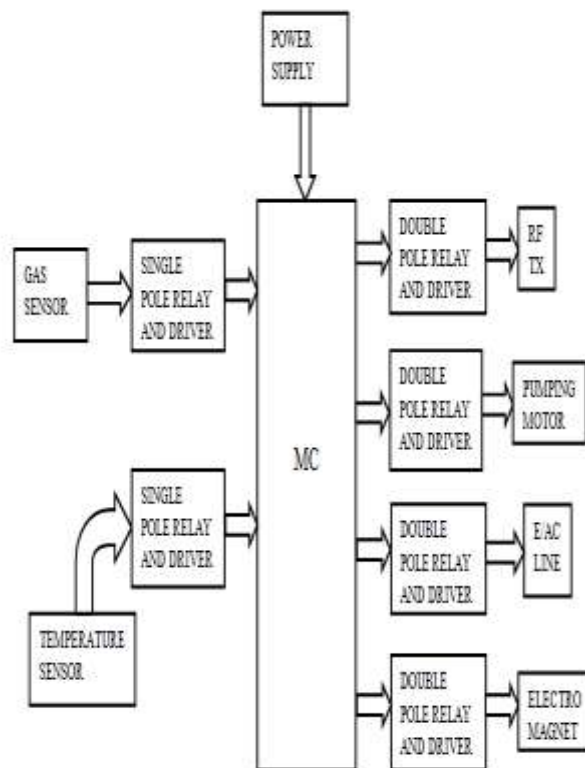***Research Article** (Open Access)*

Fig 2: fire accident in train

Fig 3: Fire monitoring unit

PROPOSED SYSTEM

In method to improve the safety of passenger, number of steps is being taken by the Indian railways to prevent fire accident in train. The framework tried utilizing smoke sensors independently at the room temperature. If the temperature is more than 80 degree 'c' and the output value from the temperature and smoke sensor is real than the Microcontroller sends an alert message in engine driver as well as nearby station. The fire detection system in all coaches will be connected by hardwire to the central monitoring

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system. Another feature of our proposed system, load scale senses when a user is using the seat and only then switches on the light also allows user to operate the fan as user is sitting on the seats. After sensing user the system gives signal to the microcontroller and switches on light and fan automatically. After getting up even user if the forgets to switch off the fans or lights. The system automatically detects this and switches off the light and fans are automatically off. Thus it saves a lot of power while providing an automate light, fan switching system.
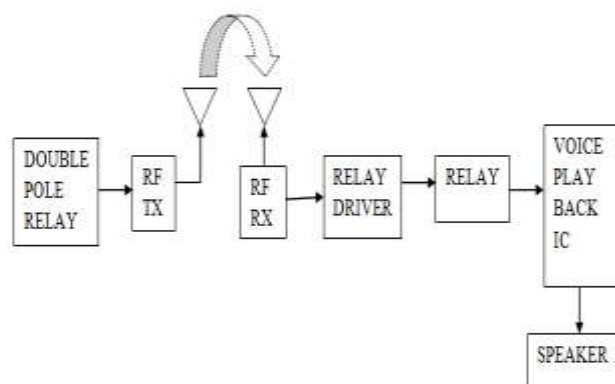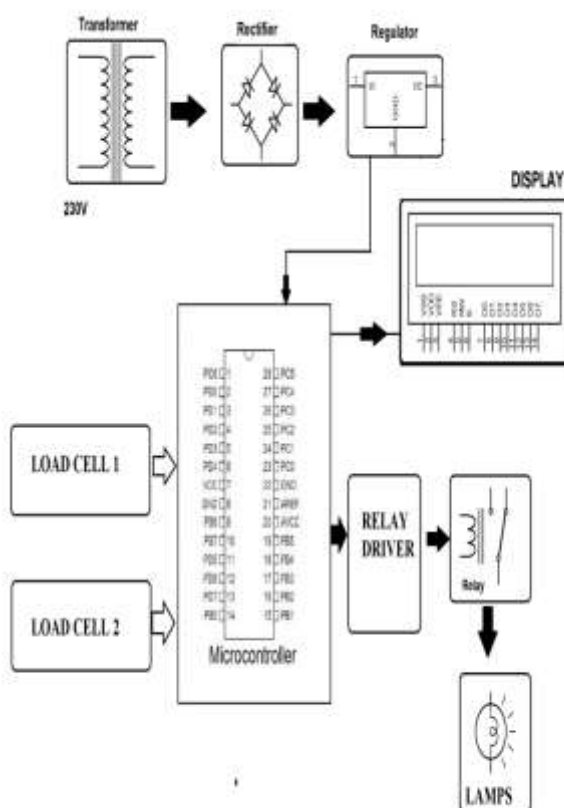

Fig 4: MODULE AT TRAIN ENGIN

Fig 5 :Load cell

MATERIALS AND METHODS

SMOKE SENSOR- This is a very easy to use low cost semiconductor gas sensor module with analog and digital output. This module uses MQ2 smoke and flammable gas sensor as a gas sensing element.It requires no external components just plug in Vcc and ground pins and you are ready to go.A smoke detector is device senses smoke ,typically has indicator of fire .commercial security devices issue a signal to a fire alarm control panel as part ofa


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Fire alarm system

TEMPERATURE SENSOR- A temperature sensor is a device, typically,a thermocouple or RTD, that provides for temperature measurement through an electrical signal .A thermocouple (T/C)is made from two dissimilar metals that generate electrical voltage in direct proportion to changes in temperature.

RELAY- A relay is an electrically operated switch. It consists of a set of input terminals for a single and multiple control signals, and a set of operating contact terminals. The switch may have any number of contacts in multiple contact forms, such as make contacts, break contacts or combination thereof. It has three pins namely normally open, normally closed, and common. It act as magnet only the current is passed on the relay. It is used to transfer the information to the train coach into engine driver.

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MICROCONTROLLER-The NoadMCU is an open source software and hardware development environment that is build around a very inexpensive system on chip.NoadMCU is an open source development board and firmware based in the widely used ESP8266-12E Wi-Fimodule. It allows you to program the ESP8266 Wi-Fi module with the simple and powerful LUA program or arduino IDE.NoadMCU is an open source IOT platform, whose firmware runs on Espressif's SoC WI-FI ESP8266, based on the ESP8266 nonOS SDK its hardware is based on the ESP-12 module.The scripting language is Lua which allows using many open source projects like lua-cjson and spiffs.
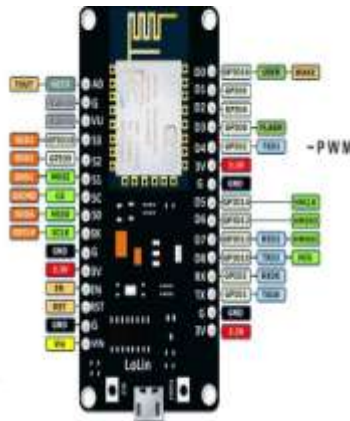
LOAD SCALE- A load cell is a transducer that is used to create an electrical signal whose magnitude is directly proportional to the force being measured. The various types of load cells include hydraulic load cells, pneumatic load cells and strain gauge load cells. This is a standard load cell for measuring weight up to 3kg.The output of the load cell is in mili-volts and cannot be directly measured by a microcontroller .So an ADC with high resolution or an instrumentation amplifier is required to make the output of the load cell readable to a micro-controller.

PUMPING MOTOR-The pump is powered by an eclectic motor that drives an impeller, or centrifugal pump .The impeller moves water ,called drive water, from the water tank through a narrow orifice, or jet, mounted in the train in the impeller it function is to slow down the water and increase the pressure . centrifugal pumps are the most popular and commonly used type of pump for the transfer of fluids.In simple words, it is a pump that uses a rotating impeller to move or other fluids by using centrifugal force.

RESULTS AND DISCUSSION

Fig 6: Side view of train movement

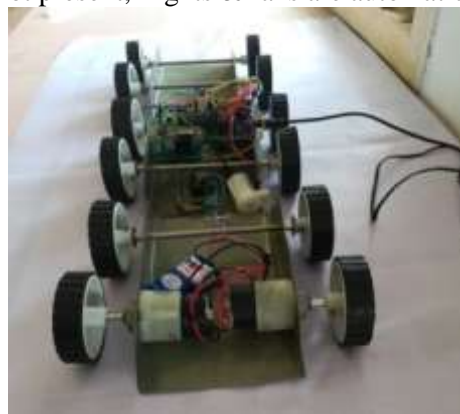Fig 8: If load is not present, Lights & fans are automatically switched off.
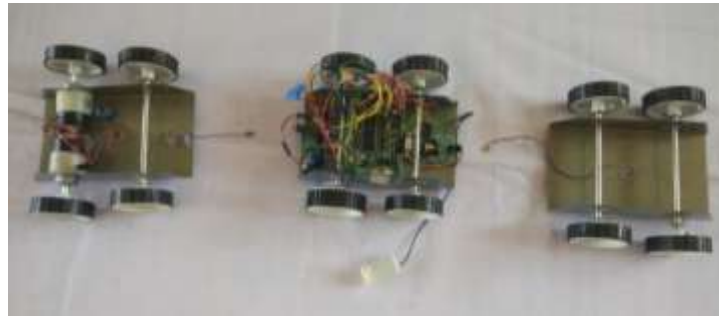

Figure7: Train in running condition.

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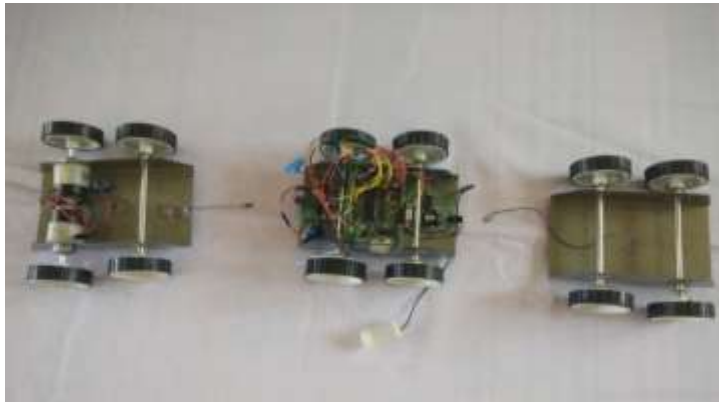Fig 9: Train meet an accident and coaches are disconnected

Fig 10: If train meets an accident and coaches are automatically disconnected

CONCLUSION
This paper is the initial step to reduce the fire accidents in the railways. If we implement this idea, we will save the human lives & can save the power in the railways.

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