Abstract—Throughout the day we come across many accidents occurring near the railway crossings due to the proper functioning of the obstructing leveling gates and in some areas due to lack of the gates itself. In many of the cases there occur human errors in controlling these gates at appropriate time which leads in a huge loss for a family. So to look into this issue we have come up this project involving automated railway gates which can work on itself without any human interference. In this project we use simple electronic components to achieve the task. Here we place a train detection equipment at a distance away from the crossing on both the sides of the crossing. This equipment consists of an LDR sensor and a laser focusing light towards the LDR. When the train comes, it obstructs the light from falling on the LDR thus generating a change in the resistance giving rise to a parameter. Now the output voltage of LDR is given to the Op-Amp IC741 and thus the signal is amplified and this amplified voltage is given to the motors to control the gate action, now the gates are closed since a train is approaching. At the other end when the train passes the crossing and reaches the second detector, this detector helps in opening the previously closed gates. The IC555 is used for triggering warning LEDs placed at the crossing as an indication of danger sign.

Keywords—LDR.

I. INTRODUCTION

In this project we use simple electronic components to achieve the task. Here we place a train detection equipment at a distance away from the crossing on both the sides of the crossing. This equipment consists of an LDR sensor and a laser focusing light towards the LDR. When the train comes, it obstructs the light from falling on the LDR thus generating a change in the resistance giving rise to a parameter. Now the output voltage of LDR is given to the Op-Amp IC741 and thus the signal is amplified and this amplified voltage is given to the motors to control the gate action, now the gates are closed since a train is approaching. At the other end when the train passes the crossing and reaches the second detector, this detector helps in opening the previously closed gates. The IC555 is used for triggering warning LEDs placed at the crossing as an indication of danger sign.

The IC 741 is an operational amplifier. It is generally available in Dual-Inline package which consists of 8pins. Out of these 8 pins available each in is used for a specific purpose depending on the application. The main pins in an Op-Amp are the inverting & non-inverting terminals. If any applied input at the non-inverting terminal is greater than the input applied at the inverting terminal then the Op-Amp gives +ve saturation voltage as the output, if the input voltage applied at the inverting terminal is greater than the voltage applied at the non-inverting terminal then the Op-Amp produces –ve saturation voltage as the output. It can be used for many applications such as adder, subtractor, comparator etc.
ii: IC 555

The IC 555 is a timer IC which is generally used for generating the clock pulses and helps in setting the baud rate. It is an oscillator which basically works on the Barkhausen criteria and is used in many timing circuits.

For our project we are using this timer IC in astable mode as a free running oscillator to trigger the output indicator LEDs.

Astable mode:

In astable mode of operation the circuit switches on its own between two quasi stable without waiting for any triggering input. The other mode of operation refers to the stable mode which requires a triggering input to be applied to the circuit to operate between one or more stable states.

iii. LDR:

An LDR (Light Dependent Resistor) is a photosensitive resistor which changes the value of the depending on the intensity of the light falling on it. Hence it finds many applications in various photocircuity devices.
The working principle of the LDR:

![Graph showing variation in resistance with changing light intensity in LDR.](image)

i. Sensory unit:
This unit consists of the LDR sensor which detects the presence of the train based on the intensity of the light falling on it. If the train comes, then it obstructs the LDR sensor preventing the light to fall on it, thus now we generate the High voltage in this case (+5V) inorder to bias the processing unit with sufficient triggering.

ii. Processing unit:
This unit is the brain behind the working of the circuitry, the IC745 OP-AMP in this project does the same as a comparator and provides the corresponding output, when the sensory unit detects no light then the non-inverting input of the OP-AMP gets higher voltage than the inverting terminal and thus the IC741 produces +Vsat as the output voltage. This output thus produced triggers the actuating circuit.

iii. Actuating unit:
This unit is the one which finally produces the output. Here consists of IC555 timer operating in astable mode. Once the output from the IC741 is +Vsat then the timer gets activated and the output is indicated in the form of an LED as visible indication which makes blinks and a Buzzer which produces audio output.

Then once this indication is received, then we control the railway gate which is a servo motor with help of the function generator by varying frequency in between 350Hz – 1KHz.

III. ADVANTAGES
With the help of this simple circuit we can prevent the accidents near the railway crossing gates to a larger extent. And can also easily control the flow of the traffic.

IV. RESULTS
V. CONCLUSION

As stated the project has been developed successfully and has been tested. Observed the results of the circuit as matching with the conditions. Thus the circuit is detecting the train coming and giving an indication for closing the gates and after sensing the train leaving it is giving an indication for opening the gates.

REFERENCES