

Laser Security System

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Abstract— The project we have worked on is a wireless security system that can be controlled through a wireless remote or a touch tone phone from any place. The main component of this system are the infrared motion sensors and basic alarm unit. It works on detecting heat of any human body when there is any technical fault, in turn the alarm unit is triggered. The security makes the person monitoring security alert and may be the concerned local law enforcement body also, by sirening a high pitched sound. Here there are two types of laser beam that work: green beam, infrared beam. The infrared beam is not visible to naked to eyes whereas the green beam the visible.

Index Terms— LDR, IC 555 Timer, POT, Reset.

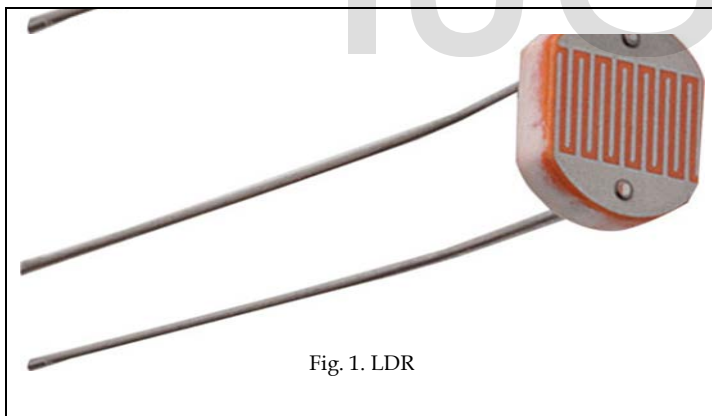
1 INTRODUCTION

This can be used in any place for security purposes in banks, any plants, any professional places like multinational companies, offices, etc. It may be used in jails, hostels, etc.

LASER means Light Amplification by Stimulated Emission of radiation. It has 900 nm energy wave length with a beam divergence of 3 million radians. For short pulses of infrared light laser technology products will calculate distance by measuring the time of flight. A certain percentage of emitted light energy will be reflected back by the solid object. We can measure the time it takes for a laser pulse to travel to the target & back with the reflection. By knowing the constant speed of light we can calculate the distance it travels.

2 COMPONENTS

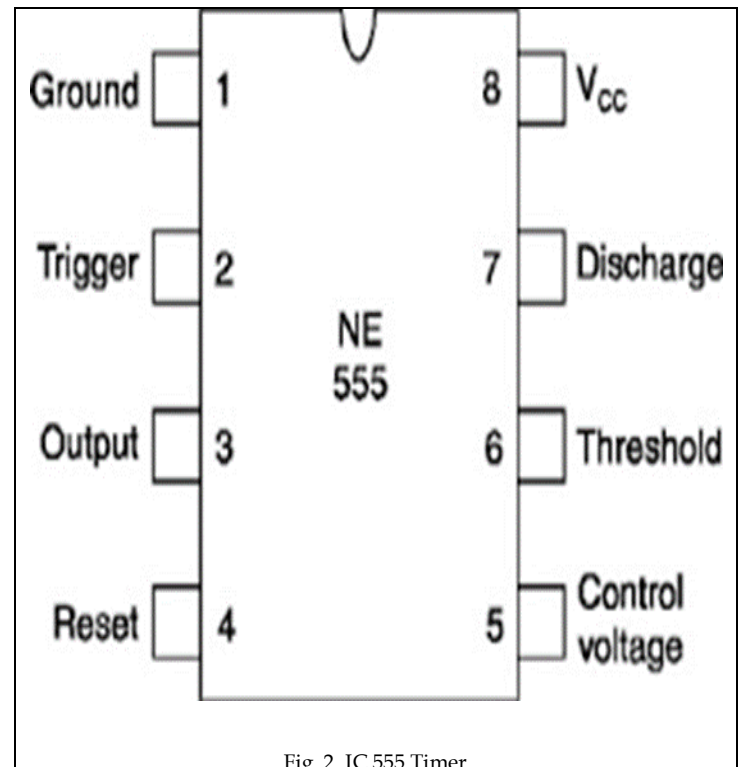
- LDR- The full form of LDR is light dependent resistor. It is a photo-resistor and is controlled by variable resistor. The resistance is inversely proportional increasing light intensity i.e. it exhibits photoconductivity.



- IC555-The 555 timer IC is an integrated circuit used in various timer, pulse generation and oscillator applications. It can be used provide timer delays, and as an oscillator and as a flip flop element. Derivatives provide up to four timing circuits in one package.

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- POT/PRESET-It is a three terminal resistor that has a sliding or rotating contact that forms an adjustable voltage divider. It can also be used as rheostat, when any two terminals are used i.e. an end and the wiper.
- RESISTANCE- It is defined as the ratio of voltage across it to the current passing through it, $R=V/I$



3 MOTIVATION

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any plants, any professional places like multinational companies, offices, etc. It may be used in jails, hostels, etc.



Fig. 3. POT

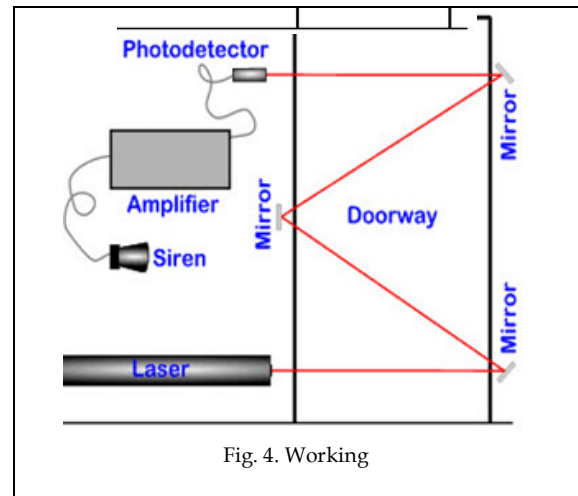


Fig. 4. Working

4 CIRCUIT DIAGRAM

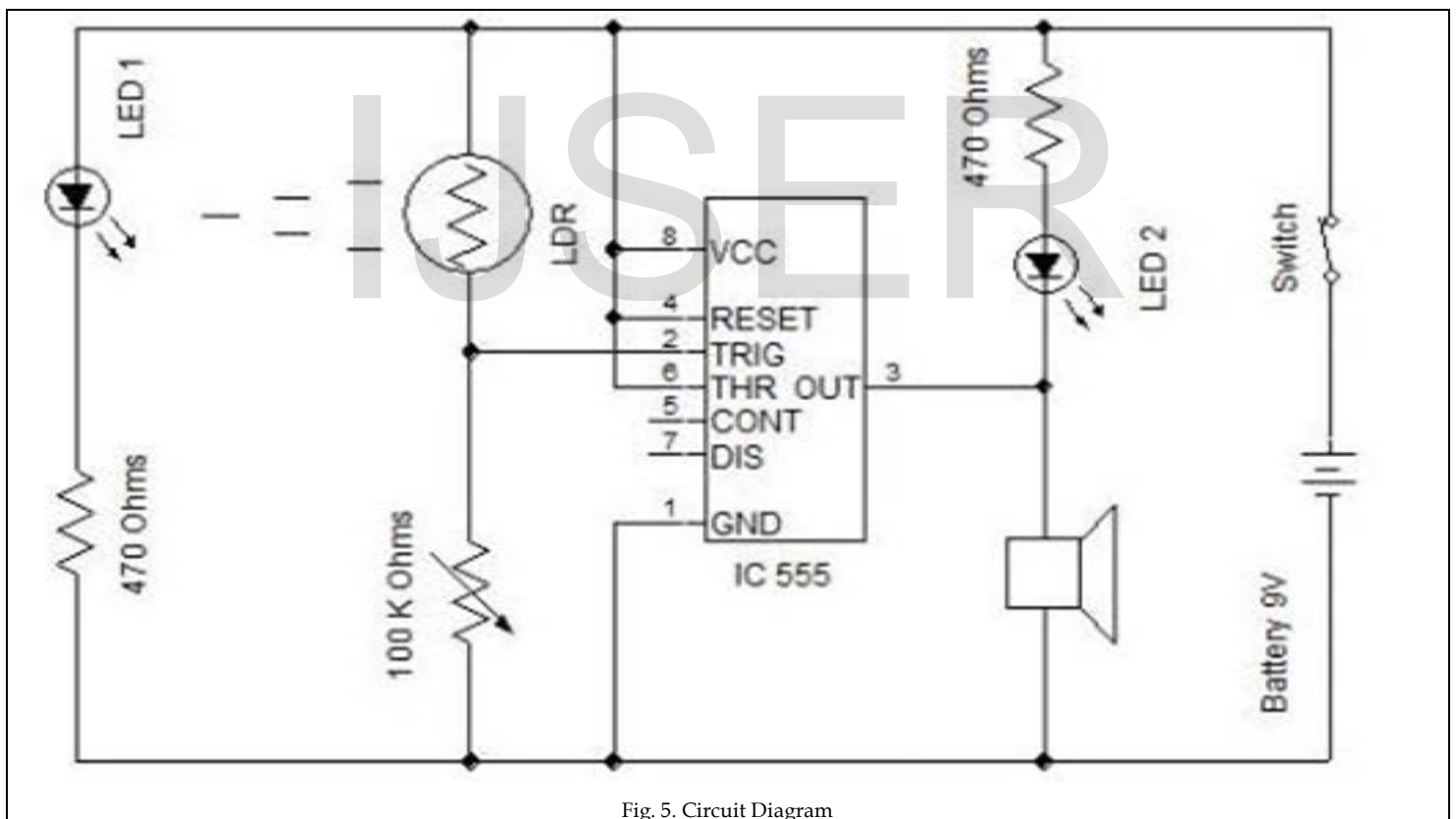


Fig. 5. Circuit Diagram

5 CIRCUIT ANALYSIS

Based on the conduction of the T1, the non-inverting voltage receives a variable voltage. Opposite to it the receiver should be properly aligned to the laser beam. It then illuminates the photo transistor and it then starts conducting the voltage. So, it keeps the voltage at pin3 lower than pin2 of the IC. At this

stage the LED and BUZZER remains off. When a person cross the beam is obstructed and T1 cease to conduct. In turn, when the voltage of the pin3 rises, the output rises [1]. The LED & buzzer is activated. In the situation the base of the T2 is kept high by the capacitor c1 for few second till the IC1 becomes

low. After T2 is turned off the C2 gives current to the buzzer for few second.

6 ADVANTAGES OF A LASER SECURITY SYSTEM

This security system can used both inside and outside houses. These work as effective perimeter systems around properties. We can utilise normal power outlets and jacks in indoor systems making them inconspicuous. Talking about outdoors this can be hidden without causing any damage and very easily behind the bushes. The power consumed very less as compare to the laser system as whole, which is expensive.

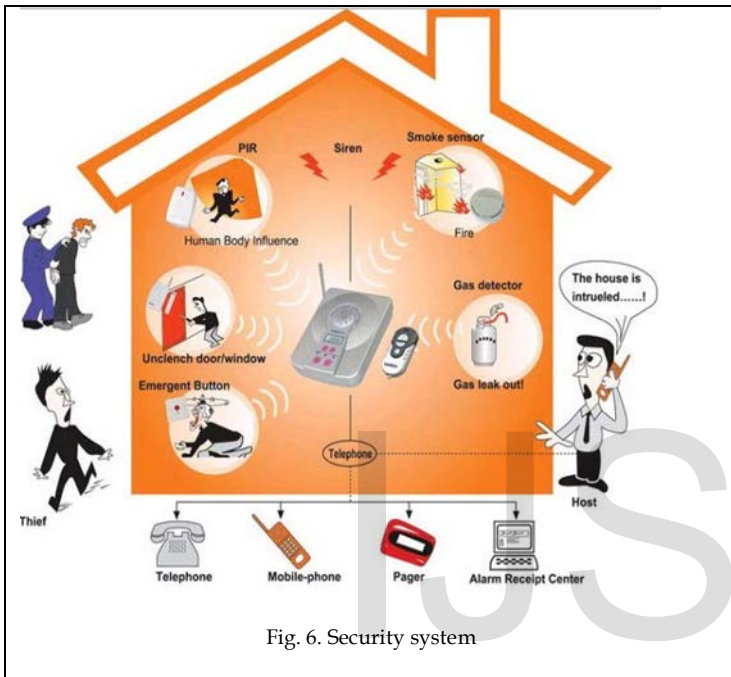


Fig. 6. Security system

It can be easily installed even without by practiced technicians. A large technological innovation cost has been cut to large extent for this security system. So, ultimately we come forward with a very affordable and very safe security system.

7 RESULT

This system is based on the interruption of laser beam. If somehow the laser path is broken the alarm will be generated for few seconds. It generally has two sections. One is the 3v dc supply laser transmitter. The receiver has a photo transistor in front end and it acts as a laser sensor. Here IC1 is used as a voltage comparator with its inverting input tied to a potential divider. The inverting input is used to keep the supply voltage half.

Nowadays security is a very important factor. The technology is improving day by day so is the crime gang improving their technology. So, security is an important factor today. We know that laser light travels a long distance without scattering. Though generally it is invisible but is visible at its source point [2].

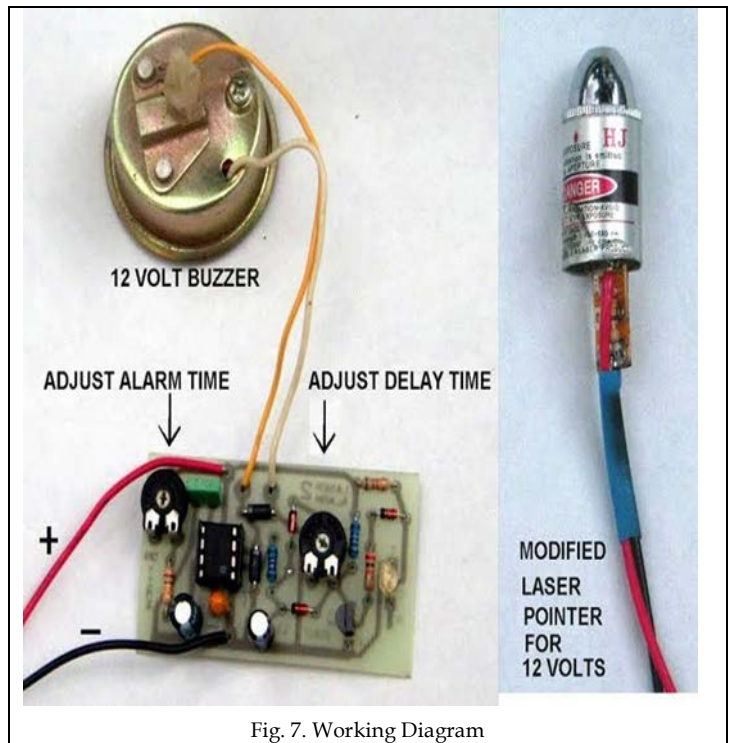


Fig. 7. Working Diagram

Any unknown person crossing this invisible boundary triggers the alarm in system making us aware of the unknown person. So that we can take the required steps to protect ourselves.

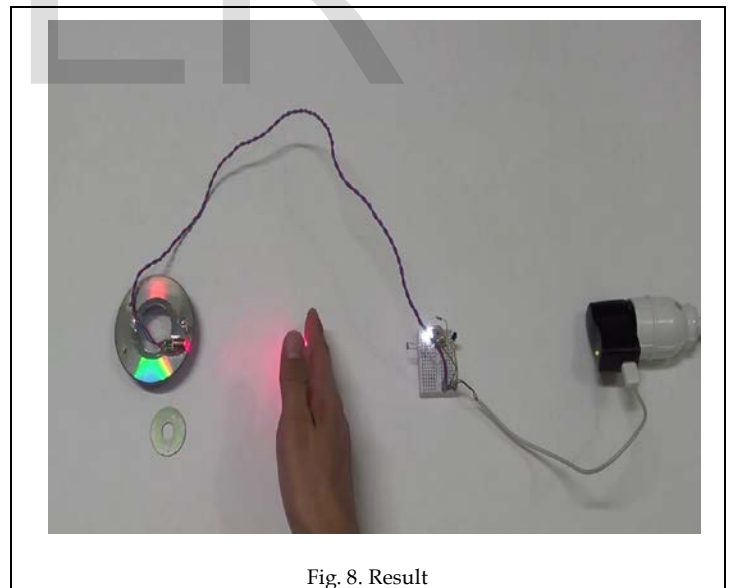


Fig. 8. Result

CONCLUSION

Lasers have a strong beam width & can be focused on the perfect target. One can be safe in case of harmful effects on the body by using laser security system. Not only so. This cheap security system can be used in different commercial buildings mainly banks.

Laser security system is ultimately a high tech security system that is both easily available and has a low budget providing protection in full security. It is nothing but a manually switch dependent sensor and a basic alarm unit. This alarm unit sounds a loud siren and also signals by lighting.

ACKNOWLEDGMENT

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REFERENCES

- [1] Oliver, B.M, "Thermal and quantum noise".
- [2] Teich, M.C., "Infrared heterodyne detection".

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