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Automatic Headlight Dipper with Respect to Upcoming Vehicles Response

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ABSTRACT: This paper presents Automatic Dipper using Light Dependent Resistor (LDR) .While driving a car in the night many drivers do not dip the head lamps of their vehicles in night while approaching. Several switching operation is used to dip the head light which may distract the concentration. One of the essential safety feature that need to be installed is automatic upper dipper control of headlight. This feature can mainly use during night drive. Human eyes are very sensitive to light .If eyes suddenly get in contact with light after darkness, cornea present in the eyes gets contract i.e. vision gets blank and require some time to recover the vision. Much time the situation comes when suddenly vehicle approaches from front with headlight in upper mode causes blindness to the eyes of the driver, during that time vehicle cover some distance and accident may occur. This temporary blindness of eyes is called as glaring effect. It is a sheer luck if person goes safely through that situation. To overcome these manual dipping problems, an automatic mechanism has made which notifies the upcoming vehicle that, their headlight is affecting our eyes and according to their response our circuit decides whether our headlight should be in dipper mode or upper mode. Construction, Working and design of circuit is briefly discussed in this paper

Keywords: Glaring effect, Automatic control, Upper-dipper, LDR, Temporary Blindness

I. INTRODUCTION

With the enormous advancement in the field of science and technology everyone is enjoying there luxurious life in 21st centuary. Due to this day by day number of vehicles are increasing as well as accidents are increasing. Most of the accidents are happened in night due to glaring effect to eyes due to upper mode of headlight of upcoming vehicle. To overcome this glaring effect an average human eye needs 3 to 8 sec which may be one of reason for accidents. Fig. 1 shows the high beam of headlight which causes glaring effect on
driver eye and if on that time vehicle speed is more than 60km/hr causes the vehicle goes out of road or strikes on upcoming vehicle. In the Paper [2], there is on arrangement for dipper connection as per circuit diagram they shown so the dipper beam cannot be able ON to and in the paper [3] they demonstrate using LED's for upper and dipper beam here no actually headlight beam is used [2][3]. To overcome these problems of both paper [2][3].

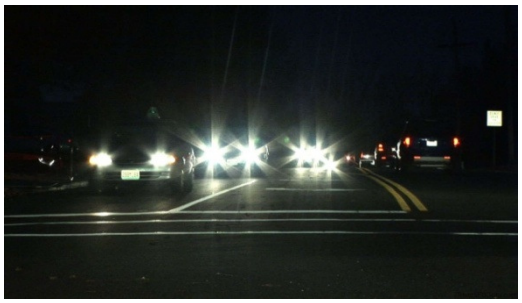

Fig. 1. Glaring Effect due to Upper Mode of Headlight.

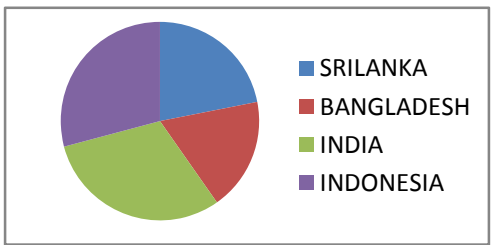

Fig. 2. Accidents report of Asia due to Troxler effect in 2015.

We designed a new circuit which will directly operate the headlight beam. Some must be added and changes in the wiring. In both the paper there is common problem is occurred while driving in cities , Street lights or lights of shops are affecting on the systems and reduce the life of relay and headlamp. To reduce that the manual mode which is always present in vehicle is used [2][3].

Advantages of automatic dipper: The main advantage of automatic dipper is that we are not supposed to use manual dipping because there are many problems related to manual dipping. These problems are disused below-In current practice, to control dipper beam manually by using switch this is place on the steering column or in old vehicle it is given exactly below the steering looks like a rod. Use of manual dipper control is not done by most of the drivers due to many reasons because the operation of dipper control switch is hundreds of times at night driving. Other reason is the driver wants to pay more attentation to the steering control instead of upper or dipper of headlight beam. Another major cause is 'ego problem', which makes each one wait till the other persons initiates dipping, which may not happen [4].

II. DETAILS OF HEADLIGHT OF VEHICLE

Headlight of vehicle is composed of two filaments, one for high beam and another for low beam as shown in fig. 3. In this the intensity of high beam is about 1200 lumens whose range is 70 m and intensity of low beam is 700 lumens whose range is nearly equal to 25 m. In India requirement of light is essential from 6 pm to 5 am and the conversion of high beam to low beam is done by manually [1]. Usually headlights of vehicles area of two types halogen and xenon bulb.

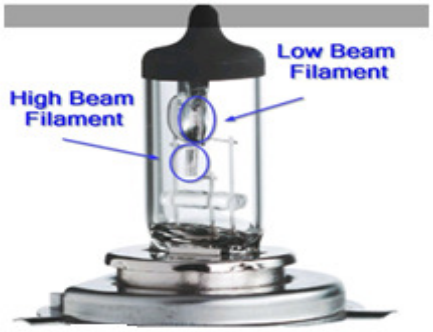

Fig. 3. Double Filament Headlight.

III. CIRCUIT DEVELOPMENT

In fig. 4 the circuit diagram is shown below.
Now let us see the main components of the device in above circuit diagram and their general description:

A. Headlamps
A headlamp is a lamp attached to the front of a vehicle to light the road ahead. Headlight is a synonym for headlamp.

Headlamp performance has steadily improved throughout the automobile age, spurred by the great disparity between daytime and nighttime traffic fatalities: the US National Highway Traffic Safety Administration states that nearly half of all traffic-related fatalities occur in the dark, despite only 25% of traffic traveling during darkness.

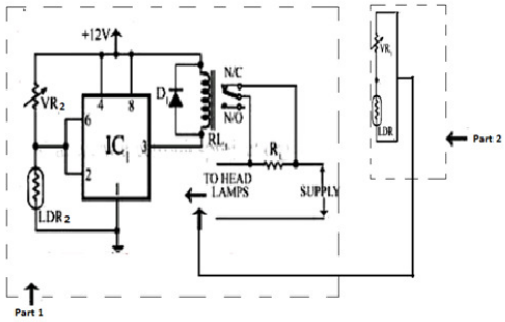

Fig. 4. Circuit Diagram for dipper Controller.

B. Battery
A supply of 12 volts is required for the circuit. It is taken from the vehicle's battery box. This is preferred for two reasons. First, it is a constant DC supply and second, there is no need for introducing a separate electrical supply source.

C. Relay
Relay circuit is main part of the model which is use to automatic change from high beam to low beam of head lamp. This circuit is governed by an IC (555 timer) and relay.

D. Rectifier-Circuit
Rectifier circuit is used to safety purpose of the device mainly IC of the relay circuit it avid the reverse connection of the input. In this project we use "full wave bridge rectifier". In which 5 diode and one capacitor are used.

E. IC-555
The eight pins carry out the following functions: 1. Ground, which acts as a safety measure as with electrical plugs 2. Trigger, which passes on voltage to start the timing operations, Pin 2 is called the Trigger input as it is this input that sets the output to the high state. 3. Output, which carries voltage to the device using the timer, Pin 3 is the digital output of the 555. It can be connected directly to the inputs of other digital ICs, or it can control other devices with the help of a few extra components. 4. Reset, this is used to end the timing operation 5. Control voltage, an optional pin used for controlling the timer from outside the main circuit set-up 6. Threshold, which determines how long the timer should output voltage in each on/off cycle – in other words, how long the timing interval should be 7.

Discharge, connected to a capacitor which also influences the timing interval 8. V+, which is the voltage input, Pin 8 is where you connect the positive power supply (Vs) to the 555. This can be any voltage between 3V and 15V DC, but 5V DC when working with digital ICs. Pin 1 is the 0V connection to the power supply.

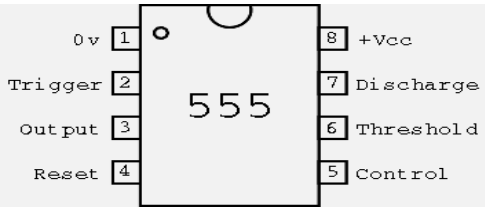

Fig. 6. Pin out Diagram of IC555 timer.

F. Capacitor

Capacitors Store electrical energy by separating positive and negative charges. They store electrons by attracting them to a positive voltage. When the voltage is reduced or removed the electrons move off as well. When the capacitor removes or adds electrons to the circuit it can work to smooth out voltage fluctuations. Capacitor passes AC signal and blocks DC signal.

G. Resistor

Resistors limit the amount of current that reaches a component such as an LED. In some circuits different voltages need to be supplied to different parts of a circuit which can be done with resistors.

H. Diodes

Diodes are two terminal devices that exhibit low resistance to current flow in one direction and high resistance to current flow in the other. The direction in which the current flow is often referred to as the forward direction while in the negligible current flows is known as the reverse direction. When the diode is conducting a small voltage is dropped across it and this is known as the forward voltage drop. The diode is one of the simplest forms of semiconductor and it is used to control the flow of electrons.

I. LDR-1,2

It is nothing but a photo sensor or photo resistor i.e. when the light falls on these LDR's then the resistance of the circuit changes accordingly with the change in intensity of the light.

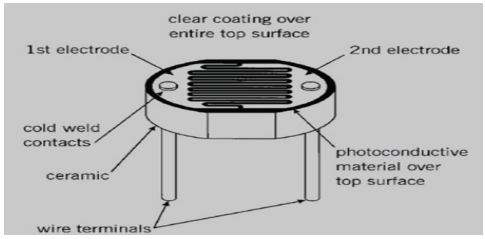

Fig. 5. General Diagram of LDR.

IV. PRINCIPLE

The basic principle of our circuit is, the various intensities of light i.e. high beam or low beam of headlight falling on the opposite vehicles headlight and the basic general idea of manual dipping and this same idea is converted into electronic format with this circuit.

V. WORKING

As seen in fig. 4 that the circuit diagrams is divided into two parts 1 & 2. Now in [2], Part -1 circuit is used for automatic headlight dipping. So let us see its working and problem according to us. Now let us consider that our vehicle is compatible with [2]. Suppose we are driving a vehicle at night and a vehicle is approaching towards us and its headlight is in upper mode this circuit i.e. its intensity is very sharp and it is straight direction which strikes drivers eye directly. Now according to this circuit [2] and its function is to dipp our vehicle. own vehicles headlight in dipper mode due to this we can't see anything because of glaring or troxler effect by upcoming Consider two vehicles (a)&(b) where vehicle (a) is approaching towards vehicle(b) In which intensity of the vehicle (b) is very high i.e. it is in upper mode. If vehicle (a) want to notify vehicle(b) that , his headlights intensity is affecting to the driver of vehicle (a) then vehicle(a) makes upper-dipper switch /rod up down 3-4 times then vehicle(b) gets notified that he should make his headlight in dipper mode. We do same thing when we are driving. This is what happening currently in India.
This is the principle of our circuit which is based on the current phenomena of indication. Now exactly what our circuit does is mentioned here, consider a truck is coming towards our car. Headlights of truck is in upper mode then the LDR $_1$ is activitated which is mounted on the glass of car where our eye sight is maximum focused and this LDR is responsible for the headlight to make it in upper – dipper modes consequently 3-4 times. Then if trucks headlight goes in dipper mode after giving this notification then the LDR is activitated which is mounted on the bumper of the car, so our headlights also goes in dipper mode [2]. If the headlights of truck are in upper mode even after giving notification to truck then our headlights should be in upper mode because if our headlights becomes dipper then it will dangerous for our car which results to accident.

VI. CONCLUSIONS

Sensing the opposite vehicles bright headlights automatically and after giving them a notification and according to their response whether they dipps their headlight or not our circuit decides whether our headlight should be in upper mode or dipper mode.

The extent to which glare is a problem for night driving is not easily quantified. In the fig.2 the statistical data of accidental report of Asia due to troxler effect or glaring effect. By using this circuit our driving will result in smooth and happy driving with negligible risk of accidents.

REFERENCES

[1]. Tejas Vijay Narkar, "Automatic Dipper Light Control For Vehicles".Volume:**05**,Issue: 03, Mar 2016, pp.97-101.

[2]. Sushil Kumar Choudhary, "Electronic Head Lamp Glare Management System for Automobile Applications", International Journal of Research in Advent Technology, Vol. **2**, No.5, May 2014, pp. 402- 416.

[3]. Muralikrishnan.R, "Automatic Headlight Dimmer a Prototype for Vehicles", *International Journal of Research in Engineering and Technology*, Vol. **3**, Issue: 02, Feb-2014, pp. 85-90.

[4]. www.autodipper.com/concept.html/