Steering Control Headlight Mechanism

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Abstract- *The aim is to design and develop a "Steering Controlled Headlight Mechanism" which acts as directional headlights. This is done by connecting headlights and steering. Present day automobiles don't have effective lighting system. Due to this many accidents are taking place during night times especially in ghat sections. The accidents can be avoided by incorporating Steering Control Headlight Mechanism. The rack and pinion steering gear mechanism are used for this project. When the steering wheel is rotated and rotary motion is converted to translatory motion through the rack and pinion mechanism. When the front wheels are steered, the headlights follow the same path and the light is focused on more divergent area. In the present project, it is planned to design "Steering Controlled Headlight Mechanism" and a live model unit is fabricated.*

Keywords- Frame, Steering, Sprocket. Chain drive. LED Light., Nut & Bolts.

I. INTRODUCTION

- Present day automobiles don't have effective lighting system. Due to this many accidents are taking
- place during night times especially in ghat sections. Conventional Head lights tend to illuminate the side of the road while cornering or shine off the road entirely, which can lead to unsafe condition. To overcome this problem an idea has been developed by introducing "Steering Controlled Head Light Mechanism".
- Steering Controlled Head Light Mechanism includes Headlights, Steering System which are interconnected by using linkages. The actual Steering Controlled Headlight Mechanism is the headlights follow the motion of front wheels. For this the headlights are connected to the rack of the steering system but not directly to the steering. Generally, thiscan be done by using Mechanical linkages. We can also use cables to connect headlights to the steering. Usage of cables has a great advantage of occupying less space compared to mechanical linkages.
- Apart from turning the Headlights using cables mechanically, we can also turn this electrically using switches and cables as well. Electrically we can connect headlights directly to the steering by arranging a power window motor in this system. Here again, cables are used to connect power window motor and headlights. By introducing this Steering Controlled Headlights Mechanism, the Headlights cast their beam in the direction of curve and ensure better visibility during night drives on ghat roads. This provides smooth and safety ride, mind free ride for the motorist, and it is a safety system for automobile. By implementing this in the automobiles, we can provide the nation with accident-free roads for some extent.
- The present invention relates to headlights of an automobile, more particularly to a direction turning device for headlights of an automobile which enables to turn direction synchronously with the rotation of the steering and hence increasing the safety for driving at night or in the darkness.
- In the known technology of the prior art, a headlight of an automobile has a fixed line of emission which is aligned with the front direction of the automobile. Although the effects of "high beam" or "low beam" can be achieved by adjusting the angle of elevation of the headlight, the direction of emission is not adjustable as to the left or right. When the road curves or turns, the corner on time when the car turns, thereby creating a dead angle of illumination and such lack of visibility poses danger in driving at night or in darkness.
- Therefore, it is highly desirable to invent a device to solve this problem and such device is of high utility. An object of the present invention is to provide a direction turning device for a headlight of an automobile which renders to emission direction of a headlight of an automobile in synchronization with steering and thus increases the illuminated area upon changes of direction of the automobile when the automobile makes turns.
- In ancient Directional headlights, when the steering steers to right or left direction, then both the right and left headlights will steer to the perspective directions. It results in altering the optical axis of the head light to the vehicle speed and the front rood-shape. But according to our project, when the steering steers to right then the right side of the headlight bracket steers to right side and the left side headlight bracket remains stationery by cam mechanism and it is similar for the other side also. Because of this, the optical axis of the headlight is widened and it is useful for the drivers for safety ride.

II. PROBLEM IDENTIFICATION

Headlight Alignment: The headlights are not aligned properly with the direction of travel, causing reduced visibility or glare for other drivers. This misalignment could be due to a fault in the steering-controlled headlight adjustment mechanism or improper installation.

Intermittent Headlight Operation: The headlights intermittently turn on or off while steering, indicating a possible wiring issue, loose connection, or malfunction in the steering column switch or headlight control module.
Headlight Flickering: The headlights flicker or dim when turning the steering wheel, suggesting an electrical problem such as a faulty relay, corroded wiring, or a defective headlight bulb connection.

III. OBJECTIVE

Improved Visibility: By automatically swiveling in the direction of the vehicle's turn, steering- controlled headlights illuminate the road ahead more effectively, especially around curves and bends. This improves visibility for the driver and helps them anticipate potential hazards or obstacles.

Enhanced Safety: Steering-controlled headlights help drivers see farther into corners and navigate winding roads more confidently, reducing the risk of accidents caused by limited visibility. By illuminating the path ahead more effectively, these headlights contribute to overall road safety, especially during nighttime driving.

IV. WORKING PRINCIPLE

Our project is to the turn the right light bracket to the right, when the vehicle turns to right leaving the left bracket to remain in standstill position, and vice versa.

When the steering steers to the right, a sprocket attached to the steering rod rotates which in turn connected to the other sprocket through a chain. The sizes of the sprockets were designed in such a way that, if the smaller sprocket rotates four full complete rotations the larger sprocket will rotate once. Also the small gear, which is attached to the same shaft as of the larger sprocket, also rotates along with the sprocket.

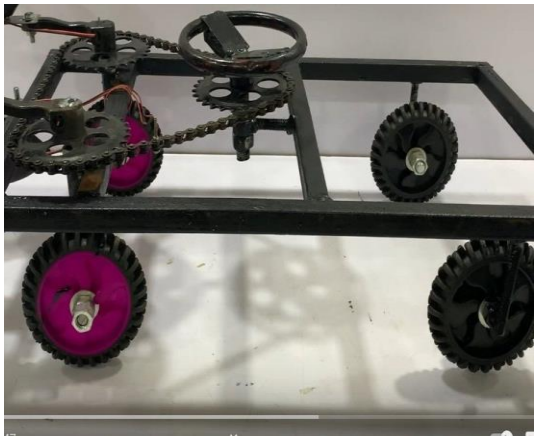
A larger gear of the former is chosen, which is twice its diameter, is meshed to transmit the motion. So the right light bracket moves according to the movement of the follower. At the same time, the cam at the other end remains in the dwell period, which results in the stand stillposition of the light brackets**.**People to earn more money

Fig. steering control headlight mechanism

V. FOLLOWING ARE THE MAIN COMPONENTS OF MACHINE

(1) Frame
(2) Sprocket
(3) Steering
(4) Head light
(5) Chain drive
(6) Nut & Bolts

1.Frame



2. Sprocket

3. Steering

4. Head light

5. Chain drive

CHAIN DRIVE

6. Nut & Bolts

VI. CONCLUSION

Before we undertook this project our knowledge about directional headlights was limited. After doing an extensive research for this project we have a wider knowledge of this field in automotive technology, learnt useful information about different types of directional headlights. We have searched the library of the college for relevant books and the internet for additional information.

VII. FUTURE SCOPE

Integrate steering control headlights with ADAS technologies such as lane-keeping assistance and adaptive cruise control. Enable automatic adjustment of headlight direction and intensity based on vehicle speed, steering input, and road conditions to optimize visibility and safetyImplement advanced sensing and recognition systems, such as LIDAR (Light Detection and Ranging) or camera-based systems, to detect and recognize road conditions, traffic, and obstacles. Enable adaptive lighting algorithms that adjust headlight patterns and intensity to optimize visibility and minimize glare for other road users. Utilize connected vehicle technology to enable communication between vehicles and infrastructure (V2X) and enhance situational awareness Enable cooperative adaptive lighting systems that coordinate headlight operation with other vehicles to improve visibility and safety in complex traffic environments. Develop energy-efficient lighting technologies, such as LED (Light-Emitting Diode) or OLED (Organic Light- Emitting Diode), to reduce power consumption and extend battery life . explore renewal energy sources, such as solar or kinetic energy harvesting, to power steering control headlights and reduce dependence on traditional power**.**

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