STEERING CONTROLLED HEADLIGHT

Ajay Vishwakarma[1], Pankaj Mishra[2], Rajeev Pandey[3], Vishal Gupta[4]
Abhay Kumar Dubey[5]
[1234]UG Students, [5]Assistant Professor, Department of Mechanical Engineering Institute of Technology and Management, Gida, Gorakhpur, India

ABSTRACT

This project's major goal is to design and construct a "Steering Controlled Headlight Mechanism" that acts as directed headlights. This is accomplished by linking the headlamps and steering. The lighting system in today's autos is ineffective. As a result, many accidents occur at night, particularly in the ghat areas. By integrating a Steering Control Headlight Mechanism, accidents can be averted.
This project employs the rack and pinion steering gear mechanism. The rack and pinion mechanism converts rotational motion to translatory motion as the steering wheel is moved. When the front wheels are directed, the headlights follow a similar route, focusing the light on a more dispersed area..

Keywords: *Headlight, Steering, Rack and Pinion, Wheel*

1. INTRODUCTION

Modern automobiles lack an appealing lighting system. As a result, several catastrophes occur during the dark hours, especially in ghat parts.
Regular headlights will frequently illuminate the roadside while curving or completely obliterate the street, creating a potentially dangerous situation.
The "Guiding Controlled Headlights Mechanism" has been proposed as a solution to this problem. The Guiding Controlled Headlight Mechanism consists of headlights and a steering system that are linked together.
We can instead use links to connect the headlights to the control. When compared to mechanical linkages, the use of links has a significant advantage in terms of space consumption. Apart from precisely turning the headlights with links, we can also do it electrically with automobiles, allowing the country to have accident-free streets to some extent.
By including a force window engine into this architecture, we can easily connect headlights to the controlling system electrically. Links are used to connect the power window engine and the headlights once again.
The Headlights cast their pillar toward curve and ensure enhanced visibility during night drives on ghat streets by offering this Steering Controlled Headlights Mechanism.

2.OBJECTIVE

The goal of this project is to develop and build a simple steering-controlled headlight system. This device refers to a headlight arrangement operably connected to the steering and front wheel assembly of an automobile, and it should be an effective alternative for existing conventional techniques.

The headlights will also focus to the right if we steer the vehicle in the appropriate direction. Similarly, with respect to the rack and pinion mechanism, if we steer the vehicle to the left, the headlights will focus to the left.

2.1 The major objectives of the project can be summarized as:

- This is the increased safety feature that has been implemented in automobiles.
- In roads, especially curved roads, it provides a smooth and safe ride.
- The motorist can enjoy a stress-free ride.

3. METHODOLOGY

Our task is to switch the right light section to the right when the car goes to the right passing on the passed-on section to stay in the standstill position, and vice versa. A sprocket connected to the controlling bar pivots when the cows are directed to one side, and this sprocket is linked to the other sprocket through a chain. The sprocket spans were designed so that if the smaller sprocket completes four full total revolutions, the larger sprocket pivots once.
The smaller sprocket, which is connected to the same shaft as the larger sprocket, pivots in tandem with the sprocket.
A larger version of the previous item is chosen, which is double its width, and is suitable for sending the movement.
After that, the cam is rotated by securing it in a comparable shaft of larger material. The cam is connected to a round edged supporter that is used to convert the rotational movement of the cam into responsive movement.
As a result, the right light part travels in accordance with the progress of the supporter. Simultaneously, the cam at the opposite end remains in the abide phase, causing the light portions to come to a stop.
Using the spring instrument attached to it, the light section will return to its original position.

4. LITERATURE SURVEY

Czech Tatra
The Czech Tatra and 1920s Cadillacs were among the first to use this technique, giving a vehicle with a focal directed headlamp in the 1930s.
American Tucker Sedan
The American Tucker Sedan of 1948 was also equipped with a third focal headlamp that was perfectly linked to the guiding framework. [1].

5. WORKING PROCESS

MEASUREMENT:
First, we determine the length of the rod. We'll need two rods with a length of 4 feet and three rods with a length of 3 Feet 9 Inch. We measure the rod according to our requirements.

CUTTING:
Using a cutting tool, we cut a rod according to needs**.**

DRILLING:
The plates are drilled according to the requirements. We utilize a drilling machine for this.
On the plates, we drilled ten holes**.**

WELDING:
We weld the rods to our specifications. The frame is 4 feet long and 3.9 feet wide.
With the help of the welding process, we created a frame.

ASSEMBLY:
During this step, we assemble all of the parts according to the project's design.
We begin by assembling the wheel with the frame then the steering with the frame, and finally the steering and frame with the plates.
The headlamp is mounted on the plate, which is then connected to the wheel plate.

Cutting Operation

Drilling Operation

Welding Operation

SKETCH VIEW:-

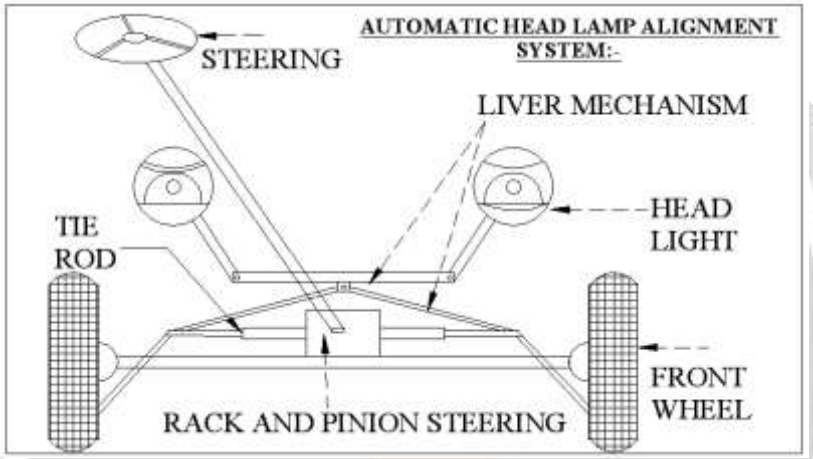

Fig: - Sketch Drawing of Actual Model

FINAL VIEW:

6. COMPONENTS USED

S.No.	Part Name	DIMENSION	Quantity
1	MS ANGEL	25X25X5 MM	25 FEET
2	FLAT BAR	25X5 MM	6 FEET
3	STEERING SYSTEM	4 FEET	1
4	CAR WHEEL	12 INCH DIA.	4
5	HEADLIGHT		2
6	BATTERY	12 VOLT	1
7	NUT AND BOLT	2.5 INCH	10
8	WIRE	3 AMP.	3 M
9	SWITCH	1.5 AMP.	1

7. RESULT AND CONCLUSION

Our knowledge of directional headlights was limited before we started this project.
After conducting a thorough investigation for this endeavor, we now have a more in-depth understanding of this subject of automotive innovation and have learned useful information about numerous types of directional headlights.
We searched the school library for important literature and the internet for further information.
We have further refined our DIY abilities and specialized critical thinking capacity in the form of a test model of directed headlights on a vehicle.
Testing with a task car has shown that this concept works, despite the fact that such lights are not commonly used today.

8. FUTURE SCOPE

Because there is always room for improvement in everything. Similarly, by replacing the linkage mechanism with wire similar to clutch wire or gear wire used in automobiles to rotate the headlight, the above-mentioned system may be made more flexible and easier to accommodate in less available area.
The use of wires instead of linkage allows for
smoother movement of the lamp and enhances the mechanism's effectiveness. Furthermore, by employing wire, the overall weight of the mechanism is lowered, resulting in less wear and tear.
By combining the above-mentioned mechanism with position-based sensors, it may be made more adaptable. The steering movement will be measured by position-based sensors, and this information will be used.

9. REFERENCES

1. International 1. Dr. KIRPAL SINGH's AUTOMOTIVE ENGINEERING VOL-I. DISTRIBUTORS OF STANDARD PUBLISHER
2. R.B GUPTA's AUTO ENGINEERING
3. AUTOMOBILE ENGINEERING KHANNA PUBLISHERS, DELHI, 1991, PP671. 3. G.B.S. NARANG, AUTOMOBILE ENGINEERING KHANNA PUBLISHERS, DELHI, 1991, PP671.
4. WILLIAM CROUSE, AUTOMOTIVE ENGINEERING
5. K.K RAMALINGAM, SciTech Publishers, Automobile Engineering.