



# International Journal of Multidisciplinary Research in Science, Engineering and Technology

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## International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET)

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# Design & Development of Movable Headlight with Steering Mechanism

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**ABSTRACT:** The aim Of this project is to develop a bending machine which is useful to bend a grill in workshop or in Fabrication shop. This project is to design and construct a portable bending machine. This machine is used to bend grill or rod into curve and the Other curvature shapes. The size of machine is very convenient for portable work. It is fully made by Mild steel. Moreover, it is easy to be carry and use at any time and any place. It reduces human effort and also required low less skill to operate this machine. We are designing manually operated bending machine with the use Of bearings, sprockets, chain and support (frame). The bending machine is manually operated. Therefore, our objective is to increase accuracy at low prize without affecting the bending productivity. This machine works on simple kinematic system instead Of complicated design. This machine can bend up-to 8 mm thickness Of grill or 2 mm Of rod. Due to its portability it can be used by small workshop or fabrication shop. Bending machine is a common tool in machine shop that is used to bend a metal. It is widely used in various industrial operations such as bending a pipe in required shape & size. In this project, designing Of bending machine for bending a pipe machine is specifically for portable bending machine.

**Keyword:** manually operated, defoil tablet, portable

## I. Introduction

Car safety is the avoidance of automobile accidents or the minimization of harmful effects of accidents, in particular as pertaining to human life and health. Special safety features have been built into cars for years, some for the safety of car's occupants only, and some of the safety of others. One of the choices available is Design and fabrication of steering controlled head light system. This device relates to a headlight arrangement for vehicles, and, more particularly, to a head light arrangement operably connected to the steering mechanism of the vehicle for illuminating the proposed path of travel including support brackets operable to support head light members thereon connectable to a frame portion of the vehicle, linkage means interconnecting the brackets for conjoint movement thereof, and means interconnecting one of the brackets to the connector rod of the vehicle whereupon the brackets and headlight members are moved in relation to the direction of vehicle travel. Still, more specifically, this device relates to a headlight arrangement operably connected to the steering and front wheel assembly.

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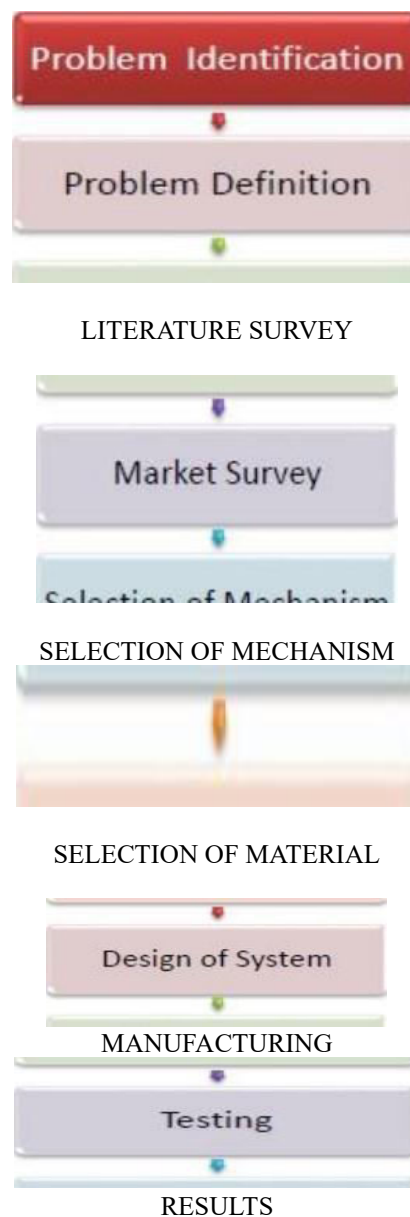


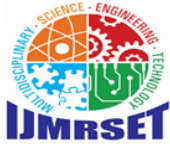
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Project Aim is to design and fabricate a simple steering controlled head light system, this device relates to a headlight arrangement operably connected to the steering and front wheel assembly of an automobile operable to maintain headlight members and the front wheels pointed in the same direction at all times and it should be an effective replacement for existing conventional methods. If we steer the vehicle in right direction, the headlights will also focus to the right. Similarly if we steer vehicle towards left the headlights focus to left with respect to the rack and pinion mechanism.

### II. METHODOLOGY





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### III. CONSTRUCTION & WORKING

#### 3.1. Base supporting frame:

It is made by plywood & M.S. frame. It is use for the foundation of system means on the base we fitted all system components. The frame Is of MS material. The frame of our machine is basically used to support the components mounted on it. That is steering wheel, controls, switches are mounted on frame. In this system we have mounted two clamps on rack as shown in figure. Two connecting rods are mounted between each headlight and each clamp. Connecting rods are pivoted at clamp end and are simply supported in the slots of headlight back plate. Here in each back plate of headlight one slot is provided for desired movement of headlight. Headlight back plates are pivoted on two vertical rods to have an angular movement. When driver rotates steering left or right this motion is transmitted to pinion through steering shaft and universal joint. Rotary motion of pinion is converted into liner motion of rack. It causes clamps to move linearly with rack. Connecting rods are having rotary motion at pivoted end and having sliding motion in slots at other end. Back plates of headlight have rotary motion on pivoted rods. So, when we move steering left the connecting rod the left side pulls the left back plate and causes the headlight to turn left on pivoted rod. The connecting rod the right side pushes the right back plate and causes the headlight to turn left on pivoted rod. In the same way, when we move steering right the connecting rod the right side pulls back the left back plate and causes the headlight to turn right on pivoted rod. The connecting rod the left side pushes forward the right back plate and causes the headlight to turn right on pivoted rod. Slots are provided to select the variable change in angle of headlight orientation. Slots are to give some allowance to headlight. So, till steering does not move from center position through some particular angle headlights' orientation does not change. As shown in fig.3.1. Conceptual model of movable headlight mechanism with headlight.



Fig.3.1 Working model of movable headlight mechanism with headlight.

#### 3.2. Ball bearings

This type of bearing consists of i) a cast iron pedestal, ii) gun metal, or brass bush split into two halves called “brasses”, and iii) a cast iron cap and two mild steel bolts. The detailed drawing of a bearing is shown in image below. The rotation of the bush inside the bearing housing is arrested by a snug at the bottom of the lower brass. The detailed part drawings of another ball bearing with slightly different dimensions are also shown in image below.



Fig.3.2 Ball bearings.



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### 3.3. Shaft:

Shaft is a common and important machine element. It is a rotating member, in general, has a circular cross-section and is used to transmit power. The shaft may be hollow or solid. The shaft is supported on bearings and it rotates a set of gears or pulleys for the purpose of power transmission. Material for Shafts is ferrous, non-ferrous materials and non-metals are used as shaft material depending on the application.



Fig3.4 Shaft.

### 3.4. Nut and Bolt:

As nuts and bolts are not perfectly rigid, but stretch slightly under load, the distribution of stress on the threads is not uniform. In fact, on a theoretically infinitely long bolt, the first thread takes a third of the load, the first three threads take three-quarters of the load, and the first six threads take essentially the whole load. Beyond the first six threads, the remaining threads are under essentially no load at all. Therefore, a nut or bolt with six threads acts very much like an infinitely long nut or bolt.

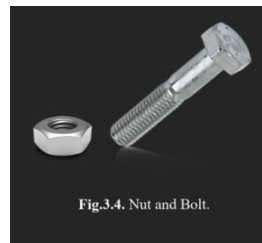


Fig3.4 Nut and Bolt.

### 3.5. Washer:

A washer is a thin plate (typically disk-shaped) with a hole (typically in the middle) that is normally used to distribute the load of a threaded fastener such as a screw or nut. Other uses are as a spacer, spring (wave washer), wear pad, preload indicating device, locking device, and to reduce vibration (rubber washer). Washers usually have an outer diameter (OD) about twice the width of their inner diameter (ID). Washers are usually metal or plastic. High quality bolted joints require hardened steel washers to prevent the loss of pre-load due to Brinelling after the torque is applied. Rubber or fiber gaskets used in taps (or faucets, or valves) to stop the flow of water are sometimes referred to colloquially as washers; but, while they may look similar, washers and gaskets are usually designed for different functions and made differently. Washers are also important for preventing galvanic corrosion, particularly by insulating steel screws from aluminum surfaces.

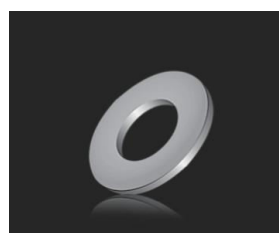


Fig.3.5. Washer.



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### 3.6. Steering set:

Steering set is generally used in system to show actual steering performance of the vehicle during steering.



Fig.3.6. Steering set.

### 3.7. Rack & Pinion:

A rack and pinion is a type of linear actuator that comprises a pair of gears which convert rotational motion into linear motion. A circular gear called “the pinion” engages teeth on a linear “gear” bar called “the rack”; rotational motion applied to the pinion causes the rack to move relative to the pinion, thereby translating the rotational motion of the pinion into linear motion.



Fig.3.7 Rack & Pinion.

### 3.8. 12 Volt Battery:

An electric battery is a device consisting of one or more electrochemical cells that convert stored chemical energy into electrical energy. Each cell contains a positive terminal, or cathode, and a negative terminal, or anode. Electrolytes allow ions to move between the electrodes and terminals, which allows current to flow out of the battery to perform work.



Fig.3.8 12 Volt Battery.



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### 3.9. Head light:

A headlamp is a lamp attached to the front of a vehicle to illuminate the road ahead. Headlamps are also often called headlights, but in the most precise usage, headlamp is the term for the device itself and headlight is the term for the beam of light produced and distributed by the device.



Fig.3.9. Head light.

### IV. ADVANTAGES

1. Enhanced Road Illumination
2. Improved Curve Lighting
3. Increased Safety
4. Reduced Glare for Oncoming Traffic
5. Technological Integration and Adaptability
6. Energy Efficiency and Durability
7. Aesthetic and Market Appeal
8. Future-Proofing and Scalability.

### V. CONCLUSION

While concluding this report, we feel quite fulfill in having completed the project assignment well on time, we had enormous practical experience on fulfillment of the manufacturing schedules of the working project model. We are therefore, happy to state that the in calculation of mechanical aptitude proved to be a very useful purpose.

Although the design criterions imposed challenging problems which, however were overcome by us due to availability of good reference books. The selection of choice raw materials helped us in machining of the various components to very close tolerance and thereby minimizing the level of balancing problem. Needless to emphasis here that we had lift no stone unturned in our potential efforts during machining, fabrication and assembly work of the project model to our entire satisfaction.

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