

# Manufacturing And Development Of Tricycle Drive

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**Abstract** - To reduce the human effort and to improve the efficiency of tricycle the modification in tricycle has done. The chain & sprocket drives with the addition of Fixed & Moving Magnet the tricycle drive are designed. The Magnetic flywheel adjustment improves the efficiency of mechanism. The magnetic principle i.e., "The **magnetic moment** of a magnet is a quantity that determines the force that the magnet can exert on electric currents and the torque that a magnetic field will exert on it," is used. The initial torque is given to mechanism, at a specific state or condition the mechanism runs continuously with less input torque due to rotation of magnetic flywheel or repulsive force between the magnets. By means of using various mechanisms we can easily do the development of tricycle drive.

the ball and transmit the loads through the balls.

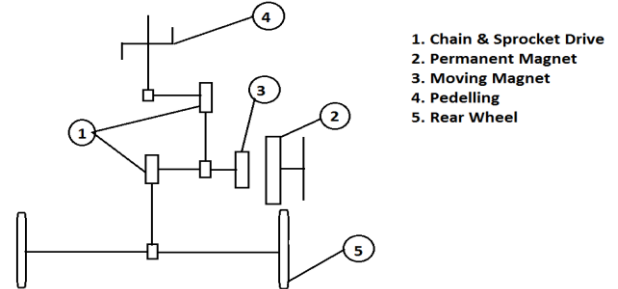


Fig- 1 Line Dig of Design & Development of Tricycle Drive

**Key Words:** Chain & Sprocket Drive, Fixed & Moving Magnet, Pedestal Bearing etc.

## 1. INTRODUCTION

The first tricycle was built by a disabled man who wanted to be able to maintain his mobility. The efficiency of that tricycle is much less. The tricycle drive includes the following Mechanisms:-

Chain & Sprocket Drive

Fixed & Moving Magnet

Pedestal Bearing

Chain and Sprocket mechanism is used to transmit the motion from pedaling to the rear wheel with the improved output. The pedestal Bearings are used for the mounting purpose of shafts on the frame. The bearings are used to reduce rotational friction and support radial and axial loads. It achieves this by using at least two races to contain

## 2. LITERATURE SURVEY

A tricycle is a three-wheeled vehicle. The position of the wheels can be either one wheel is positioned on the front or the other two wheels positioned on the rear or vice versa. While tricycles are often associated with the small three-wheeled vehicles used by pre-school age children, they are also used by adults for a variety of purposes. In the United States and Canada, adult-sized tricycles are used extensively by older persons for recreation, shopping, and exercise. In Asia and Africa, tricycles are used mainly for commercial transportation either of passengers in pedicels or of freight and deliveries. Human-powered tricycles are usually powered engine four stroke through pedals, although some models have hand cranks. Motorized tricycle can be powered with a variety of methods, including motorcycle engines, smaller automatic transmission scooter motors and electric motors. The design of the tricycle been improved year by year towards getting the convenience vehicle that meeting the customer or user expectation in term of mobility, maneuverability, performance and operating comfort and safety.

## 3. DESCRIPTION OF COMPONENTS

### 3.1 Chain & sprocket drive

A sprocket or sprocket-wheel is a profiled wheel with teeth, cogs, or even sprockets that mesh with a chain, track or other perforated or indented material. The name

'sprocket' applies generally to any wheel upon which are radial projections that engage a chain passing over it. It is distinguished from a gear in that sprockets are never meshed together directly, and differs from a pulley in that sprockets have teeth and pulleys are smooth. Sprockets are used in bicycles, motorcycles, cars, tracked vehicles, and other machinery either to transmit rotary motion between two shafts where gears are unsuitable or to impart linear motion to a track, tape etc. Perhaps the commonest form of sprocket is found in the bicycle, in which the pedal shaft carries a large sprocket-wheel which drives a chain which in turn drives a small sprocket on the axle of the rear wheel.

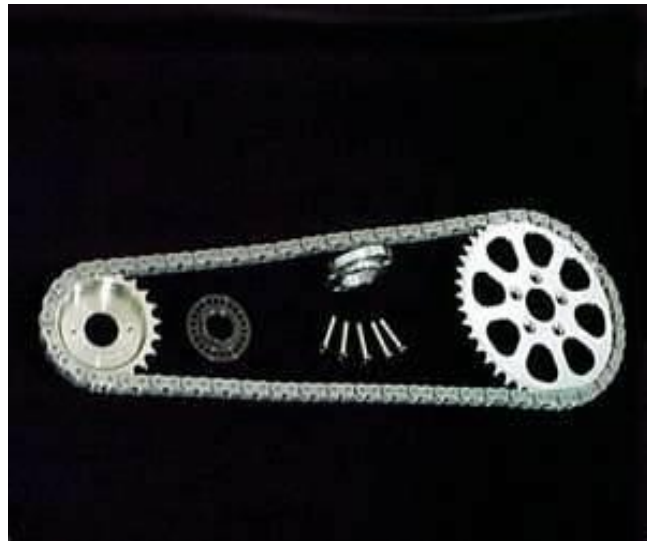


Fig.- 2. Chain and Sprocket Drive

### 3.2 Magnet

The **magnetic moment** of a magnet is a quantity that determines the force that the magnet can exert on electric currents and the torque that a magnetic field will exert on it. A loop of electric current, a bar magnet, an electron, a molecule, and a planet all have magnetic moments.

### 3.3 Flywheel

Flywheel energy storage (FES) works by accelerating a rotor (flywheel) to a very high speed and maintaining the energy in the system as rotational energy. When energy is extracted from the system, the flywheel's rotational speed is reduced as a consequence of the principle of conservation of energy; adding energy to the system correspondingly results in an increase in the speed of the flywheel.

### 3.4 Bearing

A ball bearing is a type of rolling-element bearing that uses balls to maintain the separation between the bearing races. The purpose of a ball bearing is to reduce rotational friction and support radial and axial loads. It achieves this by using at least two races to contain the

balls and transmit the loads through the balls. In most applications, one race is stationary and the other is attached to the rotating assembly (e.g., a hub or shaft). As one of the bearing races rotates it causes the balls to rotate as well. Because the balls are rolling they have a much lower coefficient of friction than if two flat surfaces were sliding against each other.

## 4. EXPERIMENTAL SETUP WORKING

In our project we are using Magnetic Flywheel, Chain & sprocket mechanism, pedaling, and Pedestal Bearing for mounting purpose. The line diagram shows the systematic arrangement of the mechanism, when the Manual effort is applying on the pedal, chain and sprocket drive transmits the power from running shaft to another shaft. On the same shaft the two magnets i.e. Magnetic flywheel one is Fixed magnet and another is Moving magnet. The fixed magnet is mounted on the frame, and the moving magnet is mounted on the bearing and which maintain some distance in between them for rotating purpose. When the power is transferred to running shaft the magnets mounted on them i.e. moving magnet also rotates but the arrangement is given in between the magnets that the same poles of magnets are given due to this magnetic property of repulsion in between the both the moving and fixed magnet the moving magnet moves continuous with improved efficiency and from this the another chain and sprocket arrangement is given to the rear wheel of tricycle. From this property of magnet some amount of improved efficiency of mechanism gets. This mechanism is also implements in the wheel chair for disabled people to reduce their effort.

Project images



Fig.-3 Side view



Fig.- 4 Actual Project Image

**Case 2: With The adjustment of Magnetic Flywheel**

Also the observation taken with the help of adjusting the magnets on the Moving Magnetic Flywheel and setting the distance between the both flywheels and Magnets, We have got the improved revolutions per min and the reduced the manual power i.e

N =65

P = 1.5 kw



Fig.- 6 With the adjustment of Magnetic Flywheel

**5. RESULT AND DISCUSSION**

**Case 1: Without Movable Magnetic Flywheel**

In our Project firstly we have taken the observations without movable Magnetic Flywheel.

With the help of speedometer we have got the observations as follows:-

N= 55 rpm

P= 1.5 kw



Fig. 5. Without Movable Magnetic Flywheel

**Table -1:** Specification of experimental setup

Parts Name	Dimension	Quantity
Sprocket	No. of teeth 44 & 21	4
Chain	-	2
Wooden flywheel	R 15 cm	2
Magnet	-	8
Speedometer	-	1
Wheel	R 22 cm	2
Seat	-	1
Pedestal Bearing	-	4

Shaft	Dia. 27 mm	2
Pedal	-	1
M.S. Tubular Bar	25 mm	

## 6. CONCLUSIONS

With the help of above information in the paper we can easily conclude that this mechanism of tricycle drive has large range of applications. And we also easily do the development of tricycle drive. With this conclusion we can use this mechanism in exercise cycle equipment, for disabled people etc.

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