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Bullock Cart Locking System in Reverse direction by Using Gear Mechanism

Prof. Pondkule S.M.[1], Prof. Kakade S.R.[2], Sumit Pawar[3], Karan Khodake[4], Sanket Shinde[5], Sagar Durgade[6]

Assistant Professor[1] , Mechanical Department SPCOET Someshwarnagar College, Baramati, Pune, India
Assistant Professor[2], Mechanical Department SPCOET Someshwarnagar College, Baramati, Pune, India
Student[3], Mechanical Department SPCOET Someshwarnagar College, Baramati, Pune, India
Student[4], Mechanical Department SPCOET Someshwarnagar College, Baramati, Pune, India
Student[5], Mechanical Department SPCOET Someshwarnagar College, Baramati, Pune, India
Student[6], Mechanical Department SPCOET Someshwarnagar College, Baramati, Pune, India

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Abstract -.

India is a country where the main occupation is agriculture. More than 3/5 of India's population is employed in this sector. Sugarcane is the largest crop cultivated in Indian farms. Bullock cart is the one of the two main transportation media used to transport sugarcane from agricultural land to the sugar factories. Bullocks used for this purpose suffer various problems. The main problem related with bullock cart is speed control. It is observed that to control speed of cart, cart riders do dangerous experiments like application of brake manually by directly putting wood in of wheels, sitting backside of cart, applying tremendous force on bulls

Key Words: Bullock cart, Gear mechanism , Braking Effort, Bulls Safety, Axle, Half , Bearing

1.INTRODUCTION

Ratchets and pawls are mechanical gearing assemblies that are used to transmit intermittent rotary motion, or to permit a shaft to rotate in one direction but not the other. They are used in many applications effectively which includes a Giant Wheel in the amusement parks, Clocks, Shaping machines etc. The current invention relates to the automatic locking of a vehicle against the rearward motion except when the vehicle is in the reverse gear. In general, automatically locking rear or drive wheels of a vehicle against reverse rotation so as to prevent accidents. In a recent analysis of fatal accident statistics showed that reversing activities were involved in 12% of all the fatal transport accidents. Accidents during reverse movement results less in injury but, more damage to vehicles and other human properties.

2. Literature Survey

1. Paper Name - A study on bullock carts Author Name - M.R. Raghavan, D. L. Prasanna Rao

A strain gauge load cell with separate bridges for measurement of the pull and the bending moment in the plane containing the net neck load and pull was developed and fixed in the longitudinal member of an experimental cart. A cart fitted first with pneumatic wheels and then with steel-rimmed wooden wheels was tested on three terrains—tar road, mud road and grassy terrain. Pull vs time and moment vs time records were obtained in each test and analyzed. It is found that the bullocks pull the cart rather discontinuously at the low velocities at which these carts normally operate.

On the tar road and the grassy terrain, the mean static coefficient of friction is significantly higher for the cart with steel rimmed wooden wheels. The dynamic frictional resistance of the terrain for the cart with steel-rimmed wooden wheels is lower than for the cart with pneumatic wheels so long as the wheels do not dig or sink into the terrain. The fluctuation in the neck load is lower in the cart fitted with pneumatic wheels. Also, the ground-induced low-amplitude high-frequency vibratory load content in the neck load is lower in the cart with pneumatic wheels.

2. Paper Name - Rural transport in India Author Name - N. S. Ramaswamy

The paper emphasizes the role of rural roads and rural transport in the country's development. Drawing on the experience of Kerala it explains how attention to these two matters could improve economic conditions in rural India and reduce migration to cities. Current Science is a fortnightly journal published since 1932 by the Current Science Association, Bangalore (India) in collaboration with the Indian Academy of Sciences. The journal covers all branches of pure/applied science and technology such as physics, chemistry, life sciences, medicine, earth sciences, engineering and technology. Full length research articles and shorter research communications, review articles, scientific correspondence and commentaries, news and views, comments on recently published research papers, articles on universities and institutions, interviews with scientists, , book reviews, etc are published in the journal. The Association is registered as a Society in India under the Societies Registration Act. The main activity of the Association is publication of a fortnightly multidisciplinary journal.

3. Paper Name - Performance evaluation of bullock cart on various roads using various loading materials Author Name - D.S. Karale, U.S. Kankal, S.H. Thakare

This paper covers work carried out at Department of Farm Power and Machinery, This paper discussed about the performance of the exiting bullock cart on various roads by using the different kind of materials. Drawbar test, track test and haulage test were carried and evaluated the performance of bullock cart. It was found that the pull increased as the laden mass of cart increased on various kinds of roads with the different types of loading materials.

3. Problem Statement

When the cart is going uphill, sometimes if the bullocks are not able to bear the load, the cart may go into a ditch and cause an accident, causing injury to the bullocks and the driver, the drag that occurs when the cart is going uphill will be reduced by using gear locking mechanism. The most common problem in the hilly terrains is to park the vehicles in the slope and to start up. While waiting in traffic on mountain roads the vehicles had to move very slowly step by step, this situation is difficult for drivers to make the car not move back and may lead to accidents.

4. Methodology

Manufacturing is the backbone of any industrialized nation. Manufacturing and technical staff in industry must know the various manufacturing processes, materials being processed, tools and equipments for manufacturing different components or products with optimal process plan using proper precautions and specified safety rules to avoid accidents. Beside above, all kinds of the future engineers must know the basic requirements of workshop activities in term of man, machine, material, methods, money and other infrastructure facilities needed to be positioned properly for optimal shop layouts or plant layout and other support services effectively adjusted or located in the industry or plant within a well planned manufacturing organization.

Ratchet Type Gear Design Calculator	
Rurning moment (in-lbs, N-mm) M =	600.0000
Length of tooth face (in, mm) L =	0.1250
Safe stress acting on ratchet (psi, Mpa) S =	6000.000
Number of teeth in ratchet wheel N =	12.10
Ratchet gear factor F =	35.000
Results Circular Pitch	
Circular pitch at outside circumference (in, mm) P =	1.5212

Ratchet Type Gear Design Calculator	
Circular pitch at outside circumference (in, mm) P =	1.5212
Length of tooth face (in, mm) L =	0.125
Safe stress acting on ratchet (psi, Mpa) S =	6000.000
Number of teeth in ratchet wheel N =	12.10
Ratchet gear factor F =	35.000
Results Moment	
Rurning moment (in-lbs, N-mm) M =	600.000

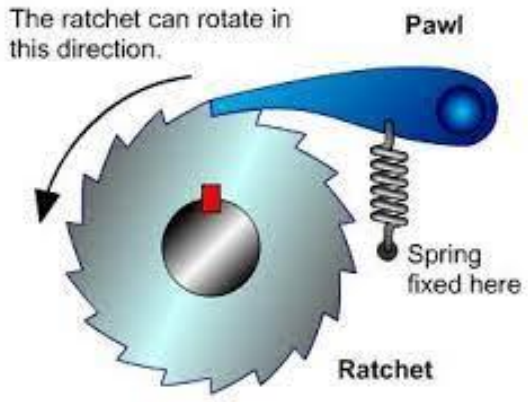
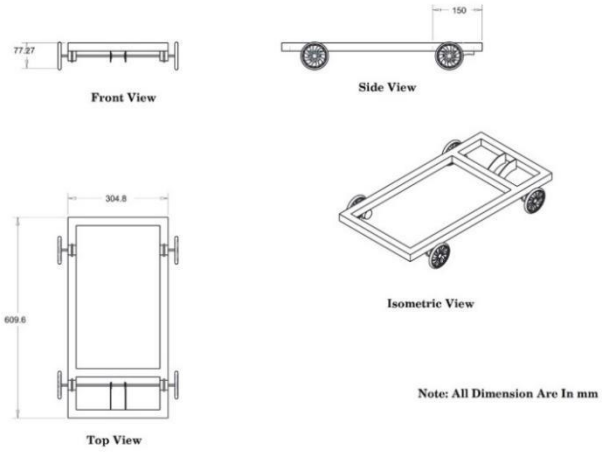


Fig -1:Ratchet and Pawl

Table -1: Ratchet Calculations

5. RESULT



6. CONCLUSION

The fluctuation in the neck load is lower in the cart fitted with pneumatic wheels. Also, the ground-induced low-amplitude high-frequency vibratory load content in the neck load is lower in the cart with pneumatic wheels. This solution provided economic solution to bullock cart problem. Bullock carts make sugarcane transportation safer. It also provides some kind of relief to bulls during downhill and uphill. Even single operator is able to control loaded cart on any kind of surface. Bullock Friendly Cart leads to understand the various solutions which will help in minimizing the efforts of bulls. Locking system implemented on the cart will help the bulls to avoid dangers in down hilling and accidental situations.

ACKNOWLEDGEMENT

We are very much delighted to present this project this project on topic **"Bullock Cart Locking System, In Reverse Direction By Using Gear Mechanism "**. This project help to understand how to improve Bullock Cart Locking System In Reverse Direction By Using Gear Mechanism.

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