Design & Fabrication of Rocker Bogie Mechanism

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Abstract— The Rocker-Bogie design Consist have a no springs and stub axles for every wheel, allowing the rover to climb over obstacles, such as rocks, it was up to twice. It have any suspension system, the hill stability is the limited by the height of the centre of gravity. In which system we use spring tend to tip more easily as the applied load side yields. The mechanism is design to be used at Minimum speed of around 09 cm/s, it was help to avoid the damage of vehicle with minimum shock & it also stable to centre of gravity. The term "rocker" comes from the rocking aspect of the biggest links on every side of the suspension system. The rockers is connected to each other and the vehicle chassis through a differential. Rocker another to the chassis, when one rocker Moves up, the other Moves down. The chassis maintains the Average of pitch angle of all mechanism. One end of a rocker bogie mechanism is fitted with the drive wheel and the other end is connected to a bogie. It is similar to train wagon suspension member. The rocker bogie mechanism has no spring suspension. The rocker bogie mechanism is based on degree of freedom system.in which of rocker bogie mechanism has consist of some mechanism. The rocker bogie mechanism first wheel was the rocker & another wheels are bogie. When rocker moves in their direction then bogie was support & push the rocker. Then the rocker moves very fast at any type of surface. The name of rocker bogie mechanism is rovers. The mars rovers is used NASA. The rocker bogie mechanism & mars rovers are same.

Keywords: Rocker Bogie Mechanism

I. INTRODUCTION

The Rocker-Bogie design Consist have a no springs and stub axles for every wheel, allowing the rover to climb over obstacles, such as rocks. It have any suspension system, the hill stability is the limited by the height of the centre of gravity. In which system we use spring tend to tip more easily as the applied load side yields. The mechanism is design to be used at Minimum speed of around 09 cm/s, it was help to avoid the damage of vehicle with minimum shock & it also stable to centre of gravity. The term "rocker" comes from the rocking aspect of the biggest links on every side of the suspension system. The rockers is connected to each other and the vehicle chassis through a differential. Rocker another to the chassis, when one rocker Moves up, the other Moves down. The chassis maintains the Average of pitch angle of all mechanism. One end of a rocker bogie mechanism is fitted with the drive wheel and the other end is connected to a bogie. Robots using rocker bogie mechanism make use of degrees of freedom (DOF. This Ready to move along uneven terrain without losing contact with the ground. It consist of suspension of 6 wheels with symmetric structure for all sides. One side has 3 wheels which are connected another two links. The main Joining called rocker has 2 joints. While first joint connected to front wheel, another joint assembled to other wheels called bogie, it is similar to train wagon suspension member. The rocker bogie mechanism has no spring suspension. The rocker bogie mechanism is based on degree of freedom system.in which of rocker bogie mechanism has consist of some mechanism. The rocker bogie mechanism first wheel was the rocker & another wheels are bogie. When rocker moves in their direction then bogie was support & push the rocker. Then the rocker moves very fast at any type of surface. The name of rocker bogie mechanism is rovers. The mars rovers is used NASA. The rocker bogie mechanism & mars rovers are same. The NASA is used rovers is used their mission. The rover send in satellite. The on the rover placed the different instruments. The rocker bogie mechanism is also used to moves small equipment at high speed with saves times at any surface. The rocker bogie mechanism working model consist of 12V Dc motor , 12V Dc battery (lead acid) , 6 Wheels (7x4cm) , Bluetooth transceiver , PVC elbow 45^0 , PVC elbow 90^0 , PVC pipe 6 feet , PVC cap , Arduino programming bard , jumper wire , spiral or telephone wire etc. The rocker bogie mechanism is test in our institute workshops & observe the working of rocker bogie mechanism. We make some documents for note down the working of rocker bogie mechanism. The rocker bogie mechanism test on the sand, stone, hill etc. The rocker bogie mechanism work successfully work at any surface.

II. LITERATURE REVIEW

The rocker bogie mechanism drive is based on NASA's. The rocker bogie mechanism is based on Degree of freedom (DOF). The rocker bogie mechanism. The mechanism is design to be used at Minimum speed of around 09 cm/s, it was help to avoid the damage of vehicle with minimum shock & it also stable to centre of gravity. The term "rocker" comes from the rocking aspect of the biggest links on every side of the suspension system. The rockers is connected to each other and the vehicle chassis through a differential. Rocker another to the chassis, when one rocker Moves up, the other Moves down. The chassis maintains the Average of pitch angle of all mechanism. One end of a rocker bogie mechanism is fitted with the drive wheel and the other end is connected to a bogie. It is similar to train wagon suspension member. The rocker bogie mechanism has no spring suspension. The rocker bogie mechanism is based on degree of freedom system.in which of rocker bogie mechanism has consist of some mechanism. The rocker bogie mechanism first wheel was the rocker & another wheels are bogie. When rocker moves in their direction then bogie was support & push the rocker. Then the rocker moves very fast at any type of surface. The name of rocker bogie mechanism is rovers. The mars rovers is used NASA. The rocker bogie mechanism & mars rovers are same. The rocker bogie mechanism has no spring suspension. The rocker bogie mechanism is based on degree of freedom system.in which of rocker bogie mechanism has consist of some mechanism. The

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III. METHODOLOGY

We are visit the nearest Industry like Lama engineering workshop malapert , Oxfam horticulture & engineering technology Dasarkhed , Gurukrupa motors malkapur, Shetkari tayer remolding malkapur etc. we discus with all industry supervisor about their transporting problem like material move to ground floor to 1st floor. Rocker bogie mechanism has six-wheeler suspension Front Wheel are rocker another wheel are bogie. The rocker bogie mechanism has best suspension hence they are easily run on stapes, hill, rocker surface, any ground surface it run easily. Hence, we decide to solve the industrial problem by using this rocker bogie mechanism technology. We discuss with Prof.Mr.S.R.Mundale & plan to design & fabrication of Rocker bogie mechanism.so we decide the make compact study model of rocker bogie mechanism. So, we select suitable material like Polyvinyl chloride (PVC) , 12V Dc geared motor 100 rpm, 12V Dc lead acid battery , ardiuno programming board , spiral wire etc. we make structure of pipe by using 45^0 elbow , 90^0 elbow different size of pipe like 18cm,15cm,13cm,10cm,9cm,5cm.We assemble all piping joint & make the structure of rocker bogie mechanism. After that we fit the 12V Dc geared motor 100 rpm, programming board & motor driver module. Then we start the rocker bogie mechanism it runs on every ground surface. Then we test some experiment like run on stapes, run on rocker surface etc. Now we start the fabrication of rocker bogie mechanism. We purchased the raw material for making rocker bogie mechanism. Now we select the required machinery for fabrication of rocker bogie mechanism. We use radial drill machine, engine lathe, hex-saw blade, hex-saw frame, nut & bolts, self-locking screw, circular saw etc. Now we make rough drawing of rocker bogie mechanism. Select suitable dimension for design & fabrication of rocker bogie mechanism. Now we cut the raw material with the specific dimension by using measuring instruments like steel rule, tape etc. Create hole by using radial drill machine. Now we are assemble the all parts of raw material & make the structure of rocker bogie mechanism. Now we purchased the all electrical & electronic instruments for require for making of rocker bogie mechanism. We open the ardiuno software. Create the programme for give the instruction for rocker bogie mechanism. Now we connect the programming board to laptop for installing programme in the Arduino board. Now verify the board & installed the programme. Now we assemble all object of require for making rocker bogie mechanism. Then we place the 12V DC geared motor 150 rpm, 12V DC (Lead acid) Battery, rubber & plastic wheel (7x4cm). Now connect all joints of wires by using soldering machine. Join the other electronic instruments by using jumper wire. Now check the all parts of rocker bogie machine. Now rocker bogie mechanism is ready to run. Now start the rocker bogie mechanism. The rocker bogie mechanism work successfully. Now that time to test & evaluate the rocker bogie mechanism. The test rocker bogie mechanism on sand, stone, steps, hill, off-road area, soil etc. The rocker bogie mechanism work successfully at any surface.

IV. OBSERVATION

Fig. 1: The rocker bogie mechanism test on steps & off road area

The rocker bogie mechanism are work properly.it run on steps of college building. The bogie has six-wheel front wheel are rocker & another wheels are bogie. The speed of rocker bogie mechanism is 09 cm/s. the rocker bogie mechanism are required less or negligible maintenance. The rocker bogie mechanism are oscillate too much causing rolling, pitching and yawing of the vehicle. The rocker mechanism body are highly precious & accurate. The rocker bogie mechanism wheels are work properly we check alignment of wheel properly. The rocker bogie mechanism have spring suspension. It is based on DOF .This Ready to move along uneven terrain without losing contact with the ground. It consist of suspension of 6 wheels with symmetric structure for all sides. One side has 3 wheels which are connected another two links. The main Joining called rocker has 2 joints. While first joint connected to front wheel, another joint assembled to other wheels called bogie, it is similar to train wagon suspension member.

V. RESULT

- The rocker bogie mechanism run on every surface like hill , Dirty road , steps, rocks etc.
- The speed of rocker bogie mechanism is 9cm/sec
- It consist of no spring suspension
- Front wheel are rocker
- Another wheel are bogie
- It was very useful for army use.

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