

Manufacturing of Bore Well Lifting Machine

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Abstract— Bore well submersible pump – motor lifting machine is mainly developed to lift the submersible pump and motor from the bore well. This machine is improved from of old chain block mechanism which is mainly used to reduced human effort, time and cost as compare to this machine. Speed of motor is converted into torque so we can lift high weight by using minimum horse power motor and saves electricity. Height required for actual machine is 78cm. it is sufficient for removing 200 ft continuous pipe (HDPE) from bore well. Due to low weight and easy to assemble and disassemble it can be easily transport from one side to another. This machine requires low space for mounting. We use to motor to lift the continuous pipe from bore well instead of chain block; it can save remarkable time as well as human effort by changing the power of motor we can change the weight lifting capacity of bore well motor lifting machine. From the tests, it is observed that developed bore well submersible pump motor lifting machine very useful for society. It is easy to operate; time and cost saving as comparing to existing chain block machine. In the ancient days these process carry out with the help of chain pulley mechanism. This method is traditional method and very time consuming. The main purpose behind this project is to lift the pump and motor in less time and human efforts with very simple and convenient mechanism. The bore well pipe lifter and transportation machine gives more than 3m /min transfer rate which makes the mounting and dismounting of the submersible pump in bore wells very fast and very easy.

Keywords: Wheels, Gear, Bearing, Frame, Motor, Chain & Sprocket

I. INTRODUCTION

There will be shortage of labor in future in the agriculture field, because of these the labor coast will raise; hence there is need of bore well lifting machine. it is necessary to design semi-automatic machine ,which helps for to reduce the human efforts ,time requirement and requirement of skillful labor etc. now a day's some mechanism are developing, but the initial and operating cost is too high. Because of high weight it is difficult to transport, so it require special vehicle like tractor, truck etc.

The primary aim of our project is to design, develop and implement the bore well lifting machine which helps to reduce the human efforts, operating cost and time requirement during installation and un-installation of submersible pump. The conventional method is difficult to installation and un-installation of submersible pump .in our machine i.e. easy to operate adjust the center of whole mechanism by using nut bolt method.

Bore wells are deep and the submersible pump is at the bottom of the long bore well pipe. Conventionally the bore well pipe and pump are lifted out of the bore well using which and pulley block. This is a very time consuming and laborious work. The bore well pipe lifter and transportation machine gives more than 3m /min transfer rate which makes

the mounting and dismounting of the submersible pump in bore wells very fast and very easy. So that the total integrated information and steps to be followed during Bore well installation and lifting is to be focused. In the ancient days these process carry out with the help of chain pulley mechanism. This method is traditional method and very time consuming. This chain pulley mechanism also required no of labor to carry out the process. The main purpose behind this project is to lift the pump and motor in less time and human efforts with very simple and convenient mechanism.

II. BLOCK DIAGRAM



Fig. 1: Block Diagram of Project

Figure shows the fundamental parts of Bore Well Lifting Machine which we are going to model and implement. The main four parts are Frame, Motor, Bearing, Chain & Sprocket, Gear.

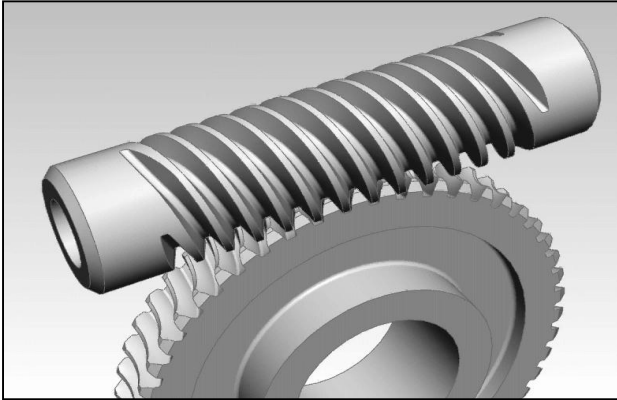
A. Wheels:



Tires are made of different types of rubber. Softer rubber is used in summer or when the tires need better traction, for example, in auto racing. Tires made of harder rubber are made for long lasting performance, like long-distance truck carriers. There are many different types of tires. They come

in different sizes and have different tread patterns. There are many different sizes of tires. On car and truck tires, they are marked with 3 numbers and might look like: 225/60R16. The first number is the width in millimeters of the tire at the widest point when it is mounted and inflated. The second number is the sidewall (side of the tire) height as a ratio or percentage of the width. The last number is the wheel diameter in inches.

B. Gear:



A gearbox designed using a worm and worm-wheel is considerably smaller than one made from plain spur gears, and has its drive axes at 90° to each other. With a single start worm, for each 360° turn of the worm, the worm-wheel advances only one tooth of the gear wheel. Therefore, regardless of the worms size (sensible engineering limits notwithstanding); the gear ratio is the "size of the worm wheel - to - 1". Given a single start worm, a 20 tooth worm wheel reduces the speed by the ratio of 20:1. With spur gears, a gear of 12 teeth must match with a 240 tooth gear to achieve the same 20:1 ratio. Therefore, if the diametrical pitch (DP) of each gear is the same, then, in terms of the physical size of the 240 tooth gear to that of the 20 tooth gear, the worm arrangement is considerably smaller in volume.

C. Chain & Sprocket:



Sprocket 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 most common form of sprocket may be 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. Early automobiles were also largely driven by sprocket and chain mechanism, a practice largely copied from bicycles.

D. Motor:



An electric motor is an electrical machine that converts electrical energy into mechanical energy. Most electric motors operate through the interaction between the motor's magnetic field and winding currents to generate force in the form of rotation. Electric motors can be powered by direct current (DC) sources, such as from batteries, motor vehicles or rectifiers, or by alternating current (AC) sources, such as a power grid, inverters or electrical generators. An electric generator is mechanically identical to an electric motor, but operates in the reverse direction, accepting mechanical energy (such as from flowing water) and converting this mechanical energy into electrical energy. Electric motors may be classified by considerations such as power source type, internal construction, application and type of motion output. In addition to AC versus DC types, motors may be brushed or brushless, may be of various phase.

E. Frame:

The fixed frame forms the base of the 360 degree wheel rotation vehicle. This frame is made of Mild Steel (MS). It has four wheels attached to its two sides by sprocket bolt and iron pipe.

F. Bearing:



A bearing is a machine element that constrains relative motion to only the desired motion, and reduces friction between moving parts. Many bearings also facilitate the desired motion as much as possible, such as by minimizing friction.

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III. CONCLUSIONS

We conclude that our project bore well lifting machine will to reduce human effort manual operated errors it helps to improvement in time economics i.e. reduction in the time required for lifting procedure also improve the performance of worker we tried our best level to create a successful bore well pipe lifting machine.

Since the actual machine cost is high, we made it as a model with few features excluded from the original proposed machine.

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