

“Review on Bore Well Pipe Lifting and Transportation Machine”

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Abstract

Now a day's Bore well is very popular and major water source in India for domestic as well as agriculture field. The bore well drilling is carried out with the available highly cost machine. The average size of bore well drilling in India varies from 2 to 5 inches. 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.

Keywords—*Lifter, Chain pulley mechanism, Gear, Bore well, Motor.*

1 INTRODUCTION

Now a day's Bore well is very popular and major water source in India for domestic as well as agriculture field. The bore well drilling is carried out with the available highly cost machine. The average size of bore well drilling in India varies from 2 to 5 inches. 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.

2 INSTALLATIONS AND LIFTING PROCESS

After complete the bore well drilling process we have to install the submergible motor to lift the water for ground. Also to lower the water lifter pipe in the drilled hole. When we lower the pipe with considering human safety is must. The pipe installation is the important process in bore well water lifting mechanism. There are many types of machine are available in market. Ancient day the process is carried out with help of chain pulley mechanism. The process cost is less but more time required to carried the process. The lifting process is heavy it will create human health problem. The working person feeling the backbone problem after the long duration of services. The most important task of this process is to match the center of bore well. All the problem can be solve by using latest mechanism the main problem is the cost is high so everyone afford this. The many step can be added due to the mechanism and machines. The all activity should be taken by considering human safety and effective installation. The some of the step are carried out during the process are mention in chart diagram in below. The lifting process is carried out by using above steps. The Mechanism of this machine is same as that of the chain pulley mechanism. The difference between both are chain pulley mechanism work manually and developed

mechanism work automatically. The bore well motor pump lifter has main three parts. Bottom plate, top plate, Supported pipe etc. For lifting purpose we mounting some mechanical component on top plate. For power transmission purpose we mounted gear box, electrical motor and bearing on top plate. By using v-belt and pulley the electric motor transmit the power to gear box. Gear box used for increased the torque and reduced the rpm. The rpm reduction is from 1440 to 23 rpm for effective and safer operation the less rpm must required. The worm gear box are used in this machine for proper gripping and to hold the pipe while lowering pipe. In this machine we used circuit for upward and downward movement of pipe. We provide four pressure roller to support the pipe for lowering and lifting purpose. Also used pressure adjuster to adjust the pressure of pipe according to diameter of pipe. Chain are used between to two roller. Electrical supply provided to one roller it will rotated another roller with help of chain mechanism. It help to the lifting the bore well pipe. The benefit of this machine is it can work in restricted space available as dimension bottom plate or fixture is small. Two or three man required for operating the machine. Process is simple to operate. One is required to operate motor and other one is to carry and remove the pipes. Skill person not required. The machine lifting capacity ranges from 100 to 1000kg as per design.

3. CONSTRUCTION OF MACHINE

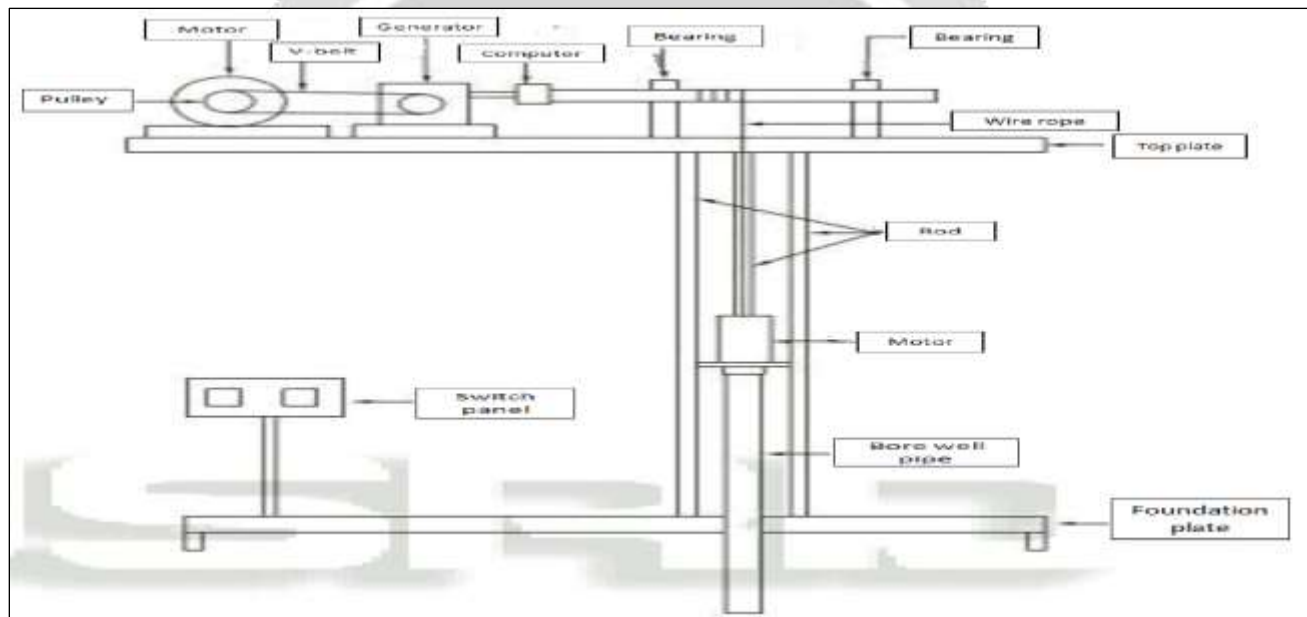


Figure 3.2: Bore Well Lifter Machine

Machine consists of the following system:

1. Feed roller shaft-1: This sub assembly comprises of ball bearing 6201 on both sides housed inside respective housing, wheel, shaft and locknut. The sprocket is mounted on the one end of the shaft.
2. Feed roller shaft-2: This sub assembly comprises of ball bearing 6201 on both sides housed inside respective housing, wheel, shaft and locknut. The sprocket is mounted on the one end of the shaft. This shaft also carries the gear which is driven by the motor.
3. Motor and gear pair: The motor is 12 volt DC motor which carries an integral pinion of 9 teeth that drives the gear with 58 teeth mounted on the feed roller shaft.

4. The pressure roller sub assembly: This sub assembly comprises of roller shaft held in ball bearings 6201 and the rollers (two on each shaft are freely rotating about it). The Pressure roller pressure is adjusted using the pressure adjuster mechanism.
5. The pressure adjuster mechanism comprises of the screw and nut that are driven by the handle. When screw is rotated the nut will slide on the slide to push the pressure roller forward to increase the pressure and vice versa.
6. Frame: The frame is the support structure that holds the entire sub assembly of the system in place

4. WORKING OF MACHINE

Load pipe between the pressure roller and feed rollers. Adjust the contact pressure using pressure adjuster screw. Select the direction of rotation of motor depending upon the raising or lowering operation using 2-pole -2-way switch. Start motor. Motor rotates the pinion which drives the gear which then drives the roller shaft-1. Roller shaft-1 rotation is transferred to roller shaft-2 via chain drive. Motion of the feed rollers will cause the pipe to move up or down simultaneously the pressure rollers will also rotate. Stop motion of the motor when desired height of the pipe is reached.

5. ADVANTAGES

1. Machine is simple to operate.
2. Does not require skilled labor to operate.
3. Low manufacturing cost
4. Compact in space.
5. Low maintenance cost.
6. Fast in operation.
7. Low noise.
8. Easy to install.
9. Low weight makes it portable.

6. CONCLUSION

We conclude that our project bore well pipe lifter and transportation machine will reduce human effort, manual operated errors, it helps to improve time economics, i.e. Reduction in the time required for installation and lifting procedure also improves the performance of worker. We tried our best level to create a successful bore-well pipe lifter and transportation machine. Since the actual machine cost is high, we designed in computer and we made it as a model with few features excluded from the original proposed machine.

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