



DESIGN AND FABRICATION OF BORE WELL TRAPPED CHILD RESCUE SYSTEM

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Abstract— In the past few years, there have been several accidents of children falling into abandoned bore wells in India. Abandoned bore wells that have turned into death pits for children. The problem is all over India. Rescue teams spend hours and sometimes days in futile attempts to save these little kids. A lot of money is also spent in these missions. In most cases they are unable to save the kids. Such events have happened umpteen times in the past, and every time either the government or the bureaucracy is blamed. The rescue process to save the child from bore well is a long and complicated process now. The rescue team tries to approach the victim from a parallel well that take about 20-60 hours to dig. This complicated process makes 70% of the rescue operations fail. The design of handling system is made in such a way that the baby/victim never gets hurt and this rescue system is sent through the same well where the victim is felt inside to bring back the victim safe through an autonomous control of drives. Our design constitutes a best Ergonomic Design and performs safest rescue operation

Key Words: Digital camera; Oxygen Concentrator; Design, pulley;

I INTRODUCTION

Today's major problem faced by human is water scarcity, which leads to a large number of bore wells being sunk. These bore wells in turn have started to take many innocent lives. Bores which generate water and subsequently got depleted are left uncovered. Small children without noticing the hole dug for the bore well slip in and get trapped. There is no befitting technique to rescue victims of such accidents. When the make shift local arrangements does not work, Army is called in. In most cases reported so far, a parallel hole is dug up and then a horizontal path is made to reach to the victim's body. It is not only a time taking process, but also risky in various ways. Moreover it involves a lot of energy and expensive resources which are not easily available everywhere and in this process we need big space around the trapped bore that we can dig a parallel bore. These ad-hoc approaches involve heavy risks including the possibility of injuries to the victim's body during the rescue operations. Also, the body may trap further in the debris and the crisis deepens even more means death. In most cases, we trust on some makeshift arrangements. This does not assure us of any long term solution. In such methods some kind of hooks are employed to hold the sufferers clothes and body. This may cause wounds on the body of the subject. A single accident creates a big hue and cry spreading a sense of panic among the masses. It draws a lot of undue attention and criticism of the civil administration. Heavy expenses have also reportedly obtain in most cases. It is pertinent to mention that a proper technical solution for such emergency crisis is the needed. More so in times of technical advancements and continuous research, technician should take the responsibility to find an easy way out.

It is an issue of national as well as social concern and an early step in the way of developing an instrument for the rescue of victims of such cases is desirable. After studying all the cases we found a serious issue to do, to make a machine which can go through the trapped bore well without any support and hold the trapped body in least minimum time. With this machine, there is no chance of damaging victim's body and other minor damages, and we called that machine as "Bore Well Child Rescue System".

II MAJOR COMPONENTS

- 1 SHAFT
- 2 ROPE
- 3 GRIPPER
- 4 METAL STRIP
- 5 BALL BEARING
- 6 D C MOTOR
- 7 BATTERY
- 8 SCREW ROD
- 9 SPUR GEAR
- 10 GEAR NOMENCLATURE

Shaft

Shaft is a common and important machine element. It is a rotating member, in general, has a circular cross-section and is used to transmit power. The shaft may be hollow or solid. The shaft is supported on bearings and it rotates a set of gears or pulleys for the purpose of power transmission. The shaft is generally acted upon by bending moment, torsion and axial force. Design of shaft primarily involves in determining stresses at critical point in the shaft that is arising due to aforementioned loading.

Rope: Wire rope is several strands of metal wire twisted into a helix forming a composite "rope", in a pattern known as "laid rope". Larger diameter wire rope consists of multiple strands of such laid rope in a pattern known as "cable laid".



Gripper



A mechanical gripper is used as an end effect or in a robot for grasping the objects with its mechanically operated fingers. In industries, two fingers are enough for holding purposes. More than three fingers can also be used based on the application. As most of the fingers are of replaceable type, it can be easily removed and replaced.

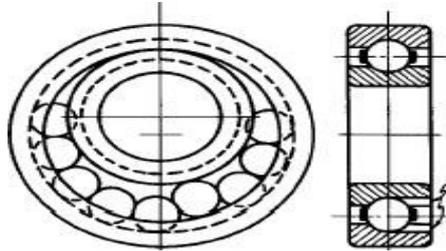
Metal Strip



Metal strip is narrow, thin stock that is usually 3/16 in. (4.76 mm) or less in thickness and under 24 in. (609.6 mm) in width. Metal strips are formed to precise thicknesses and/or width requirements.

Ball 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 three 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).

D C Motor

The electrical motor is an instrument, which converts electrical energy into mechanical energy. According to



Faraday's law of Electromagnetic induction, when a current carrying conductor is placed in a magnetic field, it experiences a mechanical force whose direction is given by Fleming's left hand rule.

Battery



Batteries seem to be the only technically and economically available storage means. Since both the photo-voltaic system and batteries are high in capital costs. It is necessary that the overall system be optimized with respect to available energy and local demand pattern.

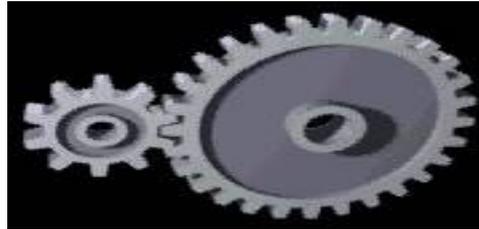


Screw Rod

A screw rod, also known as a stud, is a relatively long rod that is threaded on both ends; the thread may extend along the complete length of the rod. They are designed to be used in tension. Threaded rod in bar stock form is often called all-thread. The screw is really a twisted inclined plane. A screw can also act to hold things together in some cases. Some examples of the uses of a screw are in a jar lid, a drill, a bolt, a light bulb, faucets, bottle caps and ball point pens.

Spur Gear

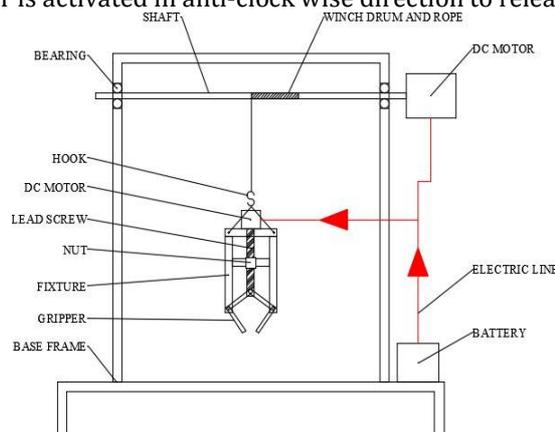
A gear or cogwheel is a rotating machine part having cut like teeth, or cogs, which mesh with another toothed part to transmit torque. Geared devices can change the speed, torque, and direction of a power source.



The gears in a transmission are analogous to the wheels in a crossed, belt pulley system. An advantage of gears is that the teeth of a gear prevent slippage.

III WORKING PRINCIPLE

The rescue system arrangement is placed near the bore well where the victim is felt inside and it is verified that the gripper is properly inserted into the bore well without any distractions. Initially the dc motor for powering the winch drum is turned on to rotate counter clock wise, thus the rope wound on the drum get released with respect to the rotation experienced on the drum. The extension of rope causes the gripper which is tied with it to travel inside the bore well due to the gravitational force, thus the gripper arrangement reaches victim. At that position the winch drum motor gets turned off and the motor to power the gripper is turned on to rotate clock wise thus the victim get gripped by the gripper and once the victim get held tightly the gripper motor is stopped and again the winch drum motor is activated in clock wise direction. This causes the rope to wound on the winch drum and makes the gripper with victim to move up. Once the victim had reached ground level the motor is turned off and the gripper motor is activated in anti-clock wise direction to release the victim.



IV CONCLUSION

Human life is precious. Our smart bore well child rescue system is a significant attempt to save the life of the victim of bore well accidents. Besides this, the unique capability of climbing through vertical and inclined pipes makes wide scope of application for this machine in manufacturing industries and other relevant fields. In the current design of bore well child saver machine is has been made to suit every possible situation may occur in rescuing operation. We like to conclude with the help our project, we able to rescue without any damage.

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