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Design and Implementation of Borewell Child Rescue Machine

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Abstract

Bores that delivered water and subsequently got water they're left exposed, exhausted. These bore wells, in turn, began to take the innocent lives of many. Bores that yielded water and water, after being exhausted, they are left exposed. This is because of the landlords and borewell constructors' irresponsibility. The Small children without realising the high capacity hole dug for the slip in and get stuck by Borewell. A suitably strong cap of bright light such incidents can prevent colour to cover the mouth of the bore. We suggested a computer here called the Borewell Child Rescue Computer when one who fell into the borewell to rescue the boy. This computer is capable of getting inside the narrow borewell and finding the child using the camera. After that, it offers oxygen and can interact with the using the help of two-way communication mode in children camera. The flip lock operation begins to start after these processes, operate and serve and grabs the child and pulls out of the borewell safely.

Keywords*: Borewell holes, Camera, Primary setup, Secondary setup.*

1. Introduction

As India is an agricultural country, our farmers rely primarily on India around groundwater for irrigation. With the population growing, deeper borewells are dug, smaller land holdings and urbanisation, for abstracting groundwater. The Borewells and the Tubewells are very comparable. Basically, both are vertical drilled wells, bored into an underground aquifer at the surface of the earth, to extract water for diverse uses. The discrepancy between the two lies in the form of the use of the casing, the width of this casing and the form of soil where they are drilled. Casing for the help of the outer surfaces at certain depths, borehole against collapse may be required, and usually, PVC pipes are composed.

Usually, electrical pumps are used to drain the water out. Excessive borewell exploration has contributed to the exploitation of borewells. At higher rates than the rate of water recharge and regeneration, groundwater. The groundwater levels caused depletion. To monitor it many states have adopted legislation, such as Karnataka & Kerala, and a legislative authority to manage and maintain tabs on the utilisation of groundwater. Preventing the borewell from drilling scarce in water without the permission of government bodies areas. Some states, however, allow drilling only for drinking, borewells of water without the need to seek permission. It is therefore recommended to explore the specifics of it before borewell drilling. If you have a borewell and it's not a borewell you need to be enrolled to have it enrolled, If you are scheduled to you need to dig a borewell with a permit from the Department of Mines and Geology, and the borewell should be documented.

2. Proposed System

A. Primary Setup

When the baby drops into the borewell, the rescue operation. The baby needs more human resources and more time to do so. Raise the baby outside the borewell. But by this it is reduced Main installation. It has

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a single-phase AC induction motor (1⁄2 induction motor) HP, 1150 W, 20 rpm, 25 Nm) is connected to the pulley and it is connected to4 mm thick steel rope with a height of 25 metres. An arrest at the edge of the rope, which is coupled with the hook, Using this primary component, we can use the secondary setup to be able to boost your weight to 500Kg. This engine is driven by a DPDTT Switch that governs the activity forwards and backwards. This hoist assembly is mounted to a 1.8 metre high stand. And 1 metre in width. This key configuration is prevalent for all the intention of lifting only by altering the secondary setup alone we more rescue mission types can be performed.

B. Secondary Setup

This secondary design contains a 250 mm circular disc. The circular arm is attached with diameter and three constant arms. Every constant arm is of a plate with an angle of inclination of 1200, (700 mm long, 6 mm thick). At the end of the constants of each, the arm is attached to a spur and worm gear system. This design of the spur and worm gear is paired with the DC (12 v, 0.8Nm, 60 rpm) engine.

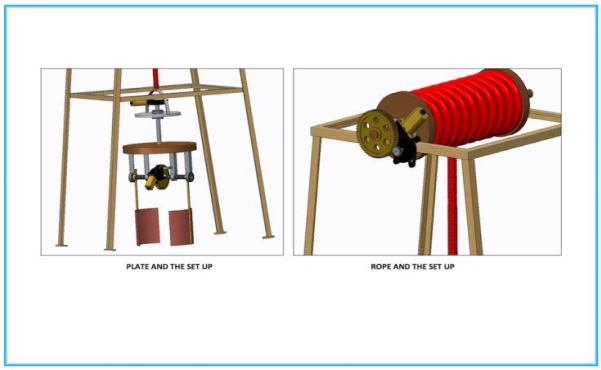

Fig.1. Flat and Rope setup

If the DC motor begins to spin, also, the worm that is coupled with the motor rotates and it conducts an open and close process. This activity is governed by the controller of the RF transmitter and receiver. This configuration goes through into the well of the bore and discovers the child using the camera. After the it provides oxygen and can interact with the child by the use of the assistance of the camera's two-way contact mode. After the flip lock activity begins to act and operate these processes. He grabs the child and pushes the borewell outside. These were the ones that working Secondary Setup process.

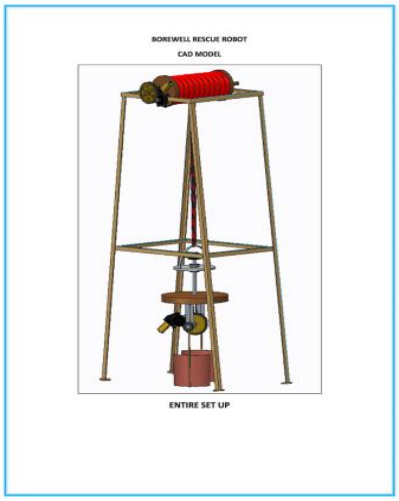

Fig.2. Entire setup

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3. Literature Review

Since September 2001, forty-five child deaths have been reported in the country. We only have nineteen of those with the newspaper evidence shown below. Owing to exposed dry bore wells, their deaths are induced. Even a six inch bore became wider and trapped an unwary child when the casing pipes costing barely Rs.2000-3000/- were cut. In the recent history of the nation, on April 11, 2002, only one boy, Sandhya of Bellary, and Prince of Haryana, was rescued alive from the well-born. On June 8, 2004, six-year - old boy Deivaraj was rescued from the well, but later died in the hospital due to rescue operation injuries and lack of medical assistance. The Rescue team's standard strategy is to first locate the child's depth in the bore well using a rope. Using earthmoving machines, a parallel pit is dug after finding the depth. This rescue procedure has the following difficulties. It would take up to 30 hours to dig the parallel pit and the child would have died by that point. Lack of oxygen in the well inside the bore. The key problem during the rescue operation is caused by the lack of visualisation. No such special equipment is required to save the child stuck within the borewell.

4. Hardware Description

A. Single Phase AC Induction motor

The single phase induction motors are simple in construction, High torque, low cost, reliable and easy to maintain and repair. The engine is used because of all

Fig.3. Single phase AC induction motor

B. Steel rope

Galvanized steel rope is a flexible 25 metre, 4 mm gauge rope that has undergone the chemical galvanization process. It includes coating a protective, rust-preventive metal, such as zinc, with stainless steel cord. Galvanize rope is strong, multi-purpose, and rust resistant.

Fig.4. Steel rope

C. Pulley

A pulley is an axle or shaft wheel designed to facilitate the movement and change of direction of a taut cable or belt, or to transfer power between the shaft and the cable or belt. The supporting shell is referred to as a block in the case of a pulley supported by a frame or shell that does not pass power to a shaft but is used to direct the cable or exert a force, and the pulley may be called a heave.

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A pulley can have a groove or grooves around its circumference between flanges to locate it.

Fig.5. Pulley

D. Lifting Hook

Using a device such as a hoist or crane, a lifting hook is a device for catching and lifting loads. A lifting hook is normally fitted with a safety latch to prevent the sling, chain or rope to which the load is attached from disengaging the lifting wire rope.

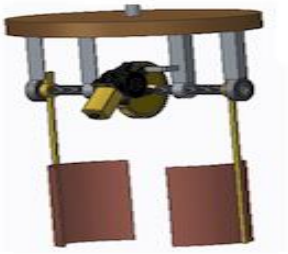

Fig.6. Lifting hook

E. DC Motor

A DC motor is one of a class of rotary electrical machines that converts mechanical energy into direct current electrical energy. The most popular forms depend on the forces that magnetic fields produce.

Fig.7. DC motor

F. Lithium polymer battery

A lithium-ion polymer battery, or, more accurately, a lithium-ion polymer battery, is a lithium-ion rechargeable battery that uses a polymer instead of a liquid electrolyte. Semisolid polymers with high conductivity form this electrolyte. Such batteries have greater specific energy than other types of lithium batteries and are used in applications where a critical feature is weight.

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Fig.8. Lithium battery

G. Gear Setup

A gear or cogwheel is a spinning component of the mechanism that has cut teeth, or inserted teeth (called cogs) in the case of a cogwheel, which means that another toothed component transmits torque. A power source's speed, torque, and direction can be adjusted by geared devices.

Fig.9. Gear setup

H. Camera

This wireless camera can be used to interact with a child and we can see the child's location. It allows us to make audio video interaction with kids. It has a night vision function that enables us to see in the dark.

Fig.10. Camera

I. GSM Module

With advanced electronics such as MOSFETS, VIPER 2x35 is an easy-to-use Motor Driver to make the control smoother, allow speed control and also generate the required combination of signals for you (i.e. pushing the front throttle on your remote is enough to move your robot forward). It also gives your robot full control by offering 9 functions: forward, reverse, spot left, spot right, forward right, forward left, reverse left, reverse right and stop with the extra option.

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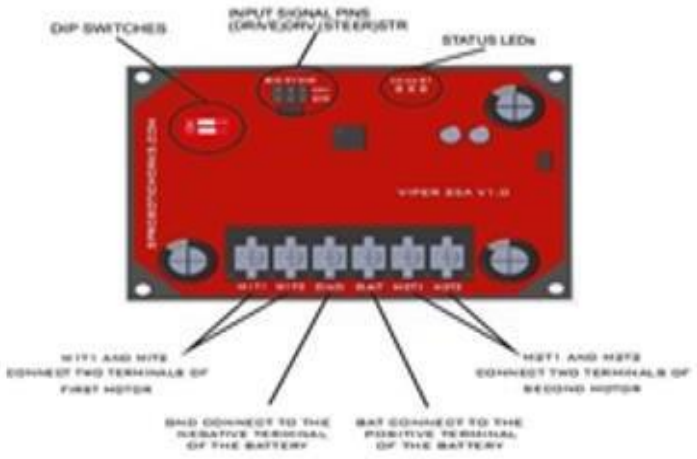

Fig.11. GSM Module

5. Result & Conclusion

By using this unit, with less manpower, we can reach the narrow borewell inside and rescue the child safely in a short time. So by using this borewell child rescue machine, it will reduce the death rate of children who fall into the borewell and save lots of innocent lives.

Fig.12. Hardware setup

References

[1] G. Kavianand, K. Gowri Ganesh, P. Karthikeyan, "Smart child rescue system from borewell," Emerging Trends in Engineering, Technology and Science (ICETETS), International Conference on, 24-26 Feb.2017.

[2] Raj Manish, P. Chakraborty, G. C. Nandi, Rescue systemic in bore well Environment, Cornell university library, June2017.

[3] Sridhar Palaniswamy "Life Saving Machine" The First International Conference on Interdisciplinary Research and Development, 31 May- 1 June 2011, Thailand.

[4] Manish Raj, P.Chakraborty And G.C.Nandi "Rescue robotics In Bore Well Environment" Cornel

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University Library [V1] Mon, 9 Jun 2014 10:51:44 Gmt(244kb).

[5] Venmathi, V., E. Poorniya, And S. Sumathi. "Borewell Rescue Robot." International Journal of Computer Applications 113.14 (2015).

[6] Sridhar, K. P., and C. R. Hema. "Design and Analysis of a Bore Well Gripper System for Rescue." ARPN Journal of Engineering and Applied Sciences 10.9 (2015).

[7] Nithin, G., Et Al. "Design and Simulation of Bore Well Rescue Robot- Advanced." ARPN Journal of Engineering and Applied Sciences 9.5 (2014): 3101-3104

[8] Kurukuti, Nish Mohith, Et Al. "A Novel Design Of Robotic System For Rescue In Bore Well Accidents." 2016 International Conference on Robotics and Automation for Humanitarian Applications (Raha). IEEE, 2016.

[9] Shah Vrunda, R., Chirag S. Dalal, and Rajeev Dubey. "Automate Machine For Rescue Operation For Child." International Journal of Research in Engineering and Technology (2015).

[10] Rajesh, Singuru, Gamini Suresh, and R. Chandra Mohan. "Design And Development of Multi-Purpose Prosthetic Bore Well System-An Invincible Arm." Materials Today: Proceedings 4.8 (2017): 8983-8992.

[11] Retnakumar, Joselin G., Et Al. "Automated Bore Well Rescue Robot." Far East Journal of Electronics and Communications 16.4 (2016): 909.

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