



AUTOMATIC FERRULE CONCEALMENT FOR BORE WELL

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Abstract

India is the fast emergent country, where majority of the people depend on natural resources like water, petrol, gas, that is available inside earth's surface. Most of the people are prone to accidents in diverse ways while using these resources. These accidents occur due to open bore wells. This design consists of a sensor and a buzzer kept at a particular radius from the bore well. Once it identifies anyone coming nearby the bore well, the sensor detects the object or a person within the radius and covers/closes up the bore well with cap or lid and the buzzer sound warns people initially that there is a bore well ahead. Kids are the builders of the nation. Hence accidents faced by them should be immediately handled to save their lives. Kids are the future builders of the nation; hence accidents faced by them should be immediately handled to save their lives.

Keyword— Alerts, Bore-Well, Servo Motor, Sensor.

I. INTRODUCTION

In India, many bore wells are being drilled every day either for water, gas, petroleum or for other resources. 100 percent safety measures are not espoused and the bore-wells are left open most of the times after completing their work. Installation of the Bore Well Safety Rescue System at the respective bore-well will help people from accidents. It also helps in creating awareness among people and also sees that no more incidents happen nearby the vicinity of the bore well. Installation of the Safety Rescue System at the respective bore-well will help to save the life from danger and deaths. The text

message will be sent to the main persons in that area, police station, fire station and nearby hospital and 108 ambulance so that they will be informed about the incidents or accidents happened at the bore-well and hence will be able to take precautions or immediate action to save the life. . Along with this when an object, a child or any other small creatures slips into the bore-well an alarm gets activated and starts ringing until someone comes and stops that. As soon as the child falls into the bore well, sensor identifies that someone fell into bore well, it automatically activates the motor attached to the system and pulls up the carrier that is kept at the distance of 8 feet. , By using IoT we can easily increase the responsiveness of authorities to many issues, to provide awareness and involves the citizens in public matters. Now a days robots are designed to help the human operators in the rescue mission.

These robots are very expensive and not guaranteed in saving the lives of kids as we cannot predict at what depth the kid is inside the bore well. In the proposed system, there is no chance of going deeper than 8 feet as the carrier is mounted at that distance. This system is also very inexpensive when compared to other rescue systems and would definitely save the precious lives of kids who fell into bore wells. The sensor identifies a person walking towards the bore well and automatically activates the sensor attached to the system and with the help of the motor, the lid cover-up the bore well. There already exists a system named as "Smart rescue system from bore well". This system consists of an Ultrasonic sensor kept on a bore-well. Once the sensor identifies anyone falling into the bore-well, it sends an alarm to the nearby police station or the

village head, fire station president and the owner of the bore-well. Key feature about this system is, if it senses anything falling into the bore well then automatically the child or object inside the well is pulled up with the help of carrier which is mounted inside at 5 feet distance. The automatic action is carried out with the help of dc motor.

II. MOTIVATION

In India for past few years, there have been several accidents of children falling into abandoned bore-wells that are left uncover neglected bore-wells seem to be death pits for children. These bore-wells in turn have started to take many innocent lives. Child rescue is done by using big machines with large manpower. The rescue process to save the child from bore-well is a very long and complicated process. It is time taking process and also risky in various ways. Lives are not guaranteed by using these existing systems. The aim of our work is to rescue the children from the open bore-well. This work brings out a new design which has a sensor kept at top of bore-well hole which helps to sense any object or the child if he/she fell inside. If the system senses the child the servo motor automatically gets on and the child gets rescued. It also alerts by giving some buzzer sound and messages to rescue team along with ambulance, fire engine, police station etc. Hence this system will definitely save the lives of kids.



Fig.1: Conventional Method of Rescue Operation

III. DESCRIPTION AND METHODOLOGY



Fig. 2: Graphical Rescue by Indian Army



Fig. 3: Mahi After Dead 86 Hours of Rescue[10]

3.1. Arduino Software (IDE)

The Arduino Software (IDE) - contain a text editor for scripting code, a message area, a text console, a toolbar with buttons for common functions and a series of menus. It bond to the Arduino and Genuino hardware to upload programs and communicate with them. Programs written using Arduino Software (IDE) are called sketches. These sketches are written in the text editor and are saved with the file extension .in. The editor has features for cutting/pasting and for searching/replacing text. The message area gives feedback while saving and exporting along with displaying errors. The console displays text output by the Arduino Software (IDE), including complete error messages and other information.

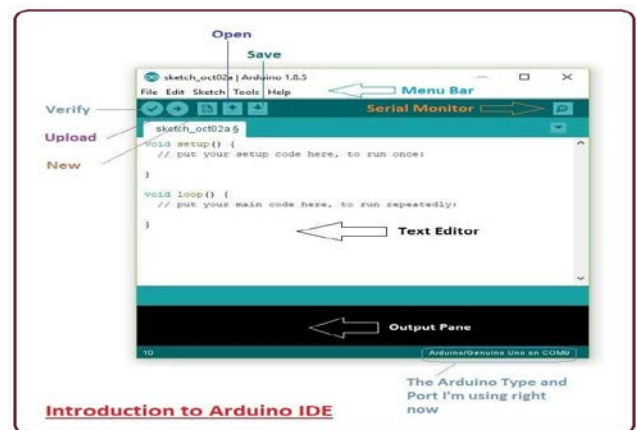


Fig. 4: Arduino IDE

3.2 Ultrasonic Sensor

An ultrasonic sensor is an instrument that measures the distance to an object using ultrasonic sound waves. An ultrasonic sensor uses a transducer to send and receive ultrasonic pulses that relay back information about an object’s proximity. High-frequency sound waves reflect from boundaries to produce distinct echo patterns.

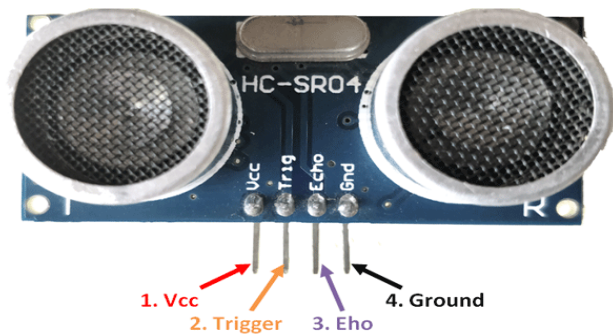


Fig. 5 : Ultrasonic Sensor

3.3 Servo Motor

Pin Number	Pin Name	Description
1	Vcc	The Vcc pin powers the sensor, typically with +5V
2	Trigger	Trigger pin is an Input pin. This pin has to be kept high for 10us to initialize measurement by sending US wave.
3	Echo	Echo pin is an Output pin. This pin goes high for a period of time which will be equal to the time taken for the US wave to return back to the sensor.
4	Ground	This pin is connected to the Ground of the system.



Fig.6: Servo Motor

3.4 Working principle of Servo Motors

A servo consists of a Motor (DC or AC), a potentiometer, gear assembly and a controlling circuit. First of all we use gear assembly to reduce RPM and to increase torque of motor. Say at initial position of servo motor shaft, the position of the potentiometer knob is such that there is no electrical signal generated at the

output port of the potentiometer. Now an electrical signal is given to another input terminal of the error detector amplifier. Now difference between these two signals, one comes from potentiometer and another comes from other source, will be processed in feedback mechanism and output will be provided in term of error signal. This error signal acts as the input for motor and motor starts rotating. Now motor shaft is connected with potentiometer and as motor rotates so the potentiometer and it will generate a signal. So as the potentiometer's angular position changes, its output feedback signal changes. After sometime the position of potentiometer reaches at a position that the output of potentiometer is same as external signal provided. At this condition, there will be no output signal from the amplifier to the motor input as there is no difference between external applied signal and the signal generated at potentiometer, and in this situation motor stops rotating.

Servo motor can be rotated from 0 to 180 degree, but it can go up to 210 degree, depending on the manufacturing. This degree of rotation can be controlled by applying the **Electrical Pulse** of proper width, to its Control pin. Servo checks the pulse in every 20 milliseconds. Pulse of 1 ms (1 millisecond) width can rotate servo to 0 degree, 1.5ms can rotate to 90 degree (neutral position) and 2 ms pulse can rotate it to 180 degree. All servo motors work directly with your +5V supply rails but we have to be careful on the amount of current the motor would consume, if you are planning to use more than two servo motors a proper servo shield should be designed.

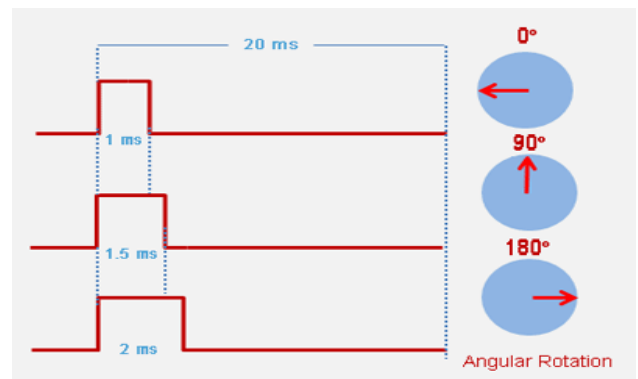


Fig 7: Working principle of Servo Motors

3.5 Flow Chart:

Initially the status of the sensor is checked. If the status is found to be 0 that is no one is identified in the bore well. If the sensor is found to be 1 then it is identified as a person or any object comes near to the bore well immediately the

buzzer mounted outside the system will get activated and starts ringing. Servo motor gets initiated automatically and closes the ferrule on the top bore well. Then concern authorities to take rescue operation. Until someone comes and help the buzzer keeps on ringing. Once the buzzer is off again the system is set to normal state.

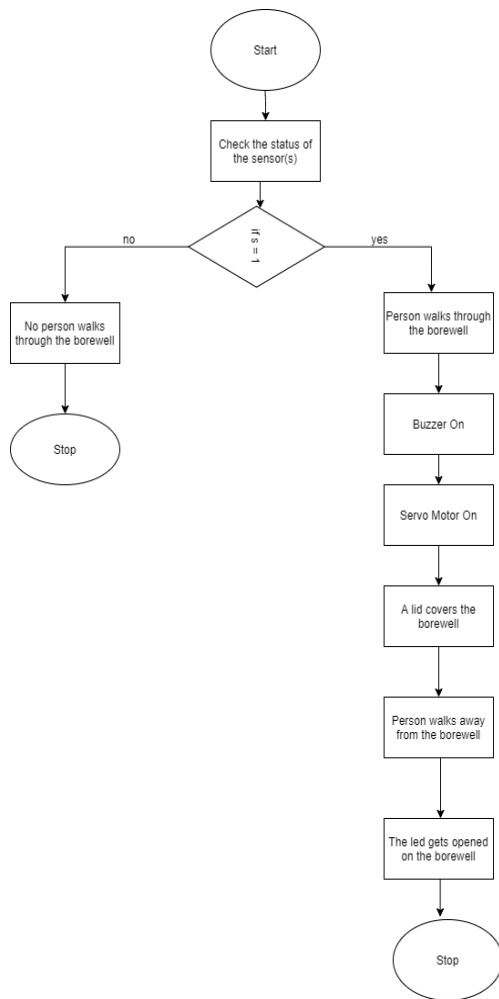


Fig.8: Flowchart of working model

3.6 Hardware Components:



Fig.9: Arduino UNO Board



Fig.10: Servo Motor

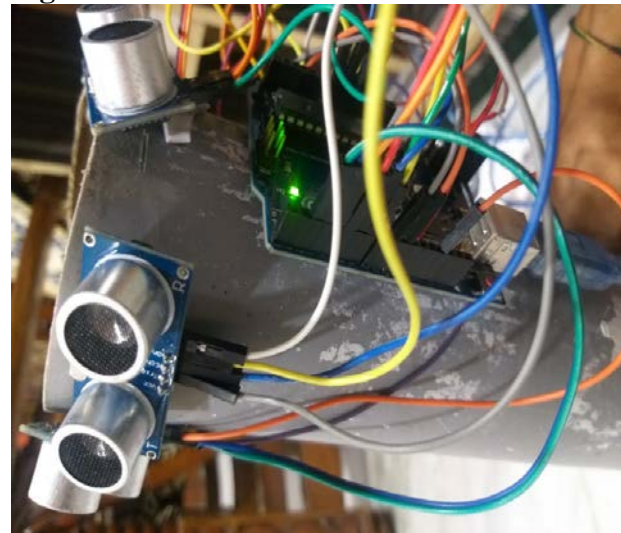


Fig.11: UltraSonic Sensor

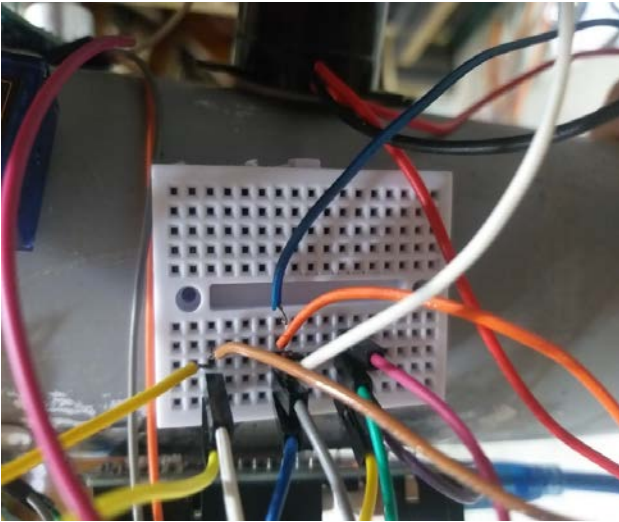


FIG.12: BUZZER



Fig. 14: Bore well Rescue System



Fig. 13: Alarm and Reset



Fig.15: Carrier mounted inside

IV. EXISTING SYSTEM

Our Objective is to detect whether the child fell into the bore-well or not. If the child fell into the open bore-well hole automatically buzzer gets on and produces sound so that the nearby localities can hear the sound. The child is pulled up with the help of carrier which is operated using DC motor. Buzzer sound stops only when the external switch is pressed and also the carrier gets back to its normal position. Alert messages are also sent to the nearby people, police station, rescue team.

V. PROPOSED SYSTEM

The ultrasonic sensor detects the object or person in certain radius near to the bore well radius near to the bore well and automatically buzzer start ringing until comes and stops it simultaneously a ferrule was closed with the help of servo motor. With the help of Arduino IDE (software development tool) the Arduino is programmed and the code is uploaded on the Arduino by connecting the microcontroller to the system with USB cable. It sends SMS to the mobile number which has been pre-programmed to the device.

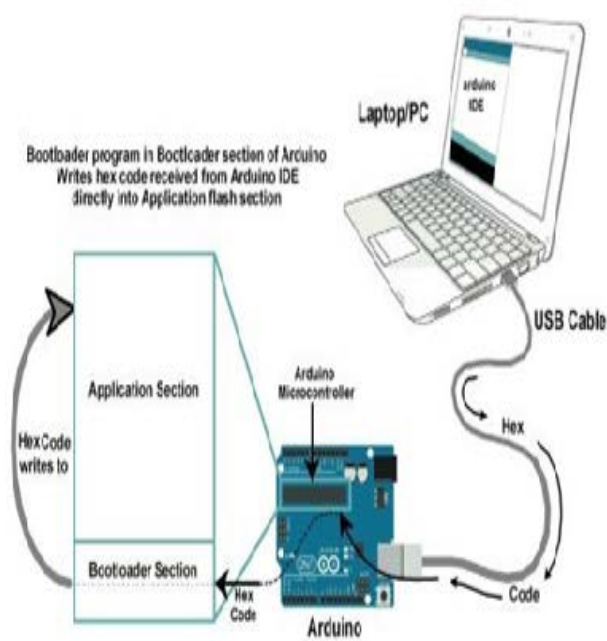


Fig.16: Working of servo with ferrule

VI. CONCLUSION

Accidents by open bore well and man-hole count is being increased day to day. Especially kids are dying due to the open man-hole and bore-well which are going unnoticed. In order to prevent the same from happening the idea proposed in this paper would definitely lend a helping hand. The proposed system is very useful to society in saving the lives of children from bore wells. It detects the object or a person within a nearby radius using ultrasonic sensor and automatically it covers up the bore well with a lid using servo motor. Moreover, there is also a buzzer installed in this system. When a person passes by, the buzzer sound indicates that there is a bore well ahead and warns the person to be cautious. Since kids who are the future of India should be saved from these dangers.

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