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Inverter Operated Electric Bell

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Abstract - This project is an innovative idea which is developed and implemented as an inverter operated electric bell. Electric bells plays important role in our day to day life. We use different types of electric bells in schools, colleges, offices, homes, in industries etc. It is a one type of simple, user-friendly mass communication device. In communication Electric bells plays a vital role and according to requirements we can see changes in electric bells. Changes in design, working principles, size and shapes. Use of Electric bell in schools and colleges are huge and if we observed many of bells are operating on Electric supply. But at the time of power failure or when electric power supply not available, we face inconvenience e.g. at the time of examinations if we face power failure, we cannot operate such bells without power supply. With consideration of this fact we made an Inverter Operated Electric bell. This invertor operated electric bell can works without power supply and became portable since we can operate it by battery. With further modifications we made it such that, it can operate with power supply and without power supply. For that we used an inverter in that and named "Inverter operated electric bell".

I. INTRODUCTION

The electric doorbell is a simple circuit that triggers a sound on the completion of the circuit by pressing the button. It is this simplicity that makes the doorbell such a marvel. The simple devices in the doorbell but the scientific principle of electromagnetism into action in a useful way. In order to understand the operations of an electric bell, you first need to understand what an electromagnet is. Well, to put it in simple words, an electromagnet is basically a type of magnet in which the magnetic field is produced with the help of an electric current. When electrical current flows through an electromagnet it works as a standard magnet (generating magnetic fields). When the power generation to an electromagnet stops, the production of the magnetic field also stops. So, in an electric bell, an electromagnet forms an important part along with Armature, spring, Armature rod, Hammer and a Gong. The inverter is a device that converts DC electricity (battery, storage battery) into AC power with a fixed frequency and voltage or with frequency modulation and voltage management (usually 220V, 50Hz sine wave). It is made up of semiconductor power devices as well as drive and control circuits for inverters, the creation of new high-power semiconductor devices and drive control circuits has been aided by the advancement of microelectronic and power electronics technologies. Insulating gates are now often used in inverters, Polar transistors, power field-effect transistors, MOS controller thermistors, and intelligent power modules are examples of advanced and easy-to-control high-power technologies.

II. LITERATURE SURVEY

Mechanical doorbell systems-This type of doorbell system is the simplest, due to the fact that it uses no electricity. Bells are attached to the inside of the door and there is a level on the outside of the door. When the level is turned, the bells ring inside. If you are going for an old fashion look to your curb appeal, a mechanical doorbell is

Ideal. Mechanical doorbells became popular in the Victorian era because of their simplicity of design and remain popular today for the same reason and because they are a unique addition to any front door. A mechanical doorbell is simple design that is installed directly into the door (not adjacent to the door like most modern bells). A simple "turn" knob on the exterior rings a bell that is located on the interior side of the door. These 6 bells were usually ornate in design and varied styles were available. Wired doorbell systems-These wired doorbells are the most common kind in use.

The doorbell consists of the actual doorbell unit and a transformer. The transformer reduces normal120-volt power. This adaptation of regular current to a lower voltage makes it possible for the doorbell to work. When you press the doorbell button, an electrical circuit closes, allowing the household current to flow through the device's electromagnet through the use of the transformer. Most homes have these. If you live in a small or medium sized house, then this type of doorbell system is perfect. For traditional wired systems, sometimes the wiring, a certain chime mechanism or a transformer may get fuddled, so replacement is required with the help of a professional.

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III. CONSTRUCTION

In nearly all electric appliances, particularly in those, we are about to describe, the electromagnetism an all-important feature. It was early discovered that when a current of electricity circulated through a coil of wire, magnetic poles, having the same properties of attraction and repulsion as a permanent steel magnet were developed at each end of the coil. It consists of a U shaped electromagnet in front of which is a soft iron strip or armature supported by a spring. The springs connected with an adjustable screw. An iron hammer is attached to the armature or iron strip which can move to and fro depending on the movement of the iron strip. The armature carries at its back a strip of flexible steel which in normal position remains in contact with a screw. Metallic gong is fixed to the baseboard and a hammer (striker) may strike on it. One end of the coil of the electromagnet is connected to terminal T1 and the other end is connected with the spring which through the adjustable screw is connected to the terminal T2. When the terminals are connected to a battery and the switch is pressed, the current flows through contact point's viand electromagnet.

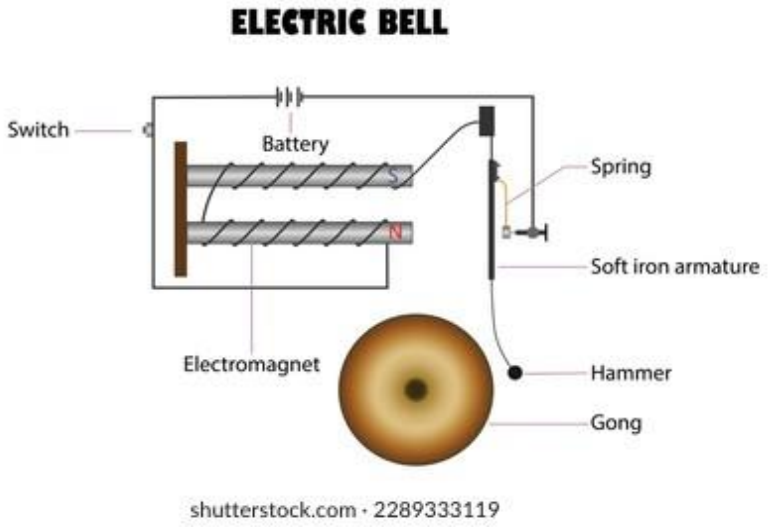

Fig .1 Diagram of Electric Bell

Working mechanism: when a push button fitted in the battery is pressed, the current flows through the contact points via an electromagnet. The u shaped electromagnet is magnetized and it attracts the armature towards it. The hammer fitted with a strip gives a strike on the gong producing sound. The moment this happens, contact of the attached spring with screw is broken, i.e. the circuit is broken. As a result, current stops flowing and the electromagnet is demagnetized. Due to this action of the spring, the armature comes to its previous position, i.e. Comes in contact with the screw and the circuit is again completed. Each approach of the armature or strip causes the hammer to strike the gong. Thus, the same process is repeated many times and the bell goes on ringing.

Components of an electric bell

Important parts of an electric bell are:

- Electromagnet
- Battery
- Inverter
- Gong
- Hammer

Electromagnet

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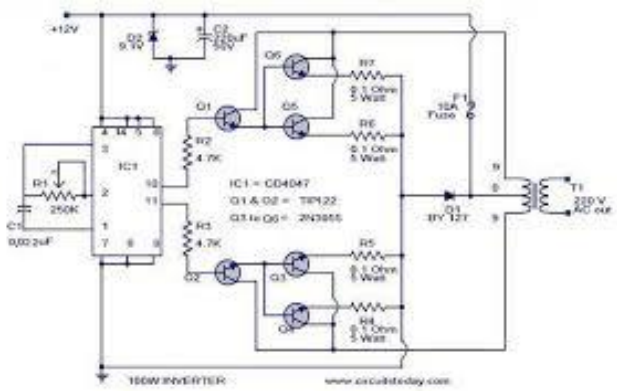
An electromagnet is a type of magnet in which the magnetic field is produced by an electric current. The magnetic field disappears when the current is turned off. Electromagnets usually consist of insulated wire wound into a coil. A current through the wire creates a magnetic field which is concentrated in the hole in the centre of the coil. The wire turns are often wound around magnetic core made from a ferromagnetic or ferromagnetic material such as iron; the magnetic core concentrates the magnetic flux and makes a more powerful magnet.

Battery

A dry-cell battery is a device made of one or more electrochemical cells that convert stored chemical energy into electrical energy. It contains an electrolyte that is contained within a paste or other moist medium. A Standard dry cell battery includes a zinc anode and a carbon cathode within a central rod.

Inverter



One of tesla's legacies (and that of his business partner George Westinghouse, boss of the Westinghouse Electrical Company) is that most of the appliances we have in our homes are specifically designed to run from AC power. Appliances that need DC but have to take power from AC outlasts need an extra piece of equipment called a rectifier, typically built from electronic components called diodes, to convert from AC to DC.

An inverter does the opposite job and it's quite easy to understand the essence of how it works. Suppose you have a battery in a flashlight and the switch is closed so DC flows around the circuit, always in the same direction, like a race car around a track. Now what if you take the battery out and turn it around assuming it fits the other way, it'll almost certainly still power the flashlight and you won't notice any difference in the light you get-but the electric current will actually be flowing the opposite way. Suppose you had lightning-fast hands and were deft enough to keep reversing the battery 50- 60times a second. You'd then be a kind of mechanical inverter, turning the battery's DC power into AC at a frequency of 50-60 hertz. Of course the kinds of inverters you buy in electrical stores don't work quite this way, though some are indeed mechanical: they use electromagnetic switches that flick on and off at high speed to reverse the current direction. Inverters like.

Gong

The bell or gong (B), which is often in the shape of a cup or half-sphere, is struck by a spring-loaded arm (A) with a metal ball on the end called a clapper, actuated by an electromagnet (E). In its rest position the clapper is held away from the bell a short distance by its springy arm.

Hammer

The arm which strikes the gong is connected to a spring at one end and an iron ball at the other end. This is called a hammer or a striker. The arm is attached to an iron strip which is attracted to the electromagnet when the circuit is complete and the current flows.

Application

- railroad crossings,
- in telephones,
- fire and burglar alarms,
- as school bells,
- doorbells,
- and alarms in industrial areas

Advantages

- Modern technology preserving traditional values.
- Replacement of classical church bells.
- Variety of applications with numerous useful features.
- Live broadcasting via microphone.
- Low weight without the risk of structural failure.
- Back-up in case of power failure.

IV. CONCLUSION

The basic design of the "inverter Operated Electrical Bell".It will ring the school bell at pre-scheduled times of periods on each day. There are different times per period varying from one school to the other.

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