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ALTERNATIVE ENERGY SOURCEFOR AUTOMOBILE VEHICLE

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ABSTRACT
Alternate energy source of magnetic levitation propulsion used in automobile, with self-generation of electricity for charging the battery. This is a four wheel vehicle with drive mechanism being propelled by the magnetic levitation which is used in maglev trains. Here the piston is moving within the coil to effect the to and fro motion when energized, to effect the cranking and rotations which drives the vehicle. The control circuit is provided for giving the acceleration, the batteries are provided for the control circuit and the battery meant for energizing the coils is to be arranged externally.

KEYWORD:-"Magnetic levitation car, or Magnetic propulsion drive automobile."

INTRODUCTION

"Today's theories shape tomorrow's reality" and "tomorrow's standard of living will depend on the success of today's theories". These old truths, having proved themselves so many times in our history, should make us responsible for the creation, development, distribution and implementation of new scientific theories.

The distinctive feature of our civilization today, one that makes it different from all others, is the wide use of mechanical power. At one time, the primary source of power for the work of peace is war was chiefly man's muscle. Later, animals were trained to help and afterwards the wind and the running stream were harnessed. But, the great step was taken in this direction when man learned the art of energy conversion from one form to another. The machine which does this job of energy conversion is called engine.

IMPORTANCE

We are taken step to use this principle i.e, maglev principle in an IC engine with some modification to run an engine & to acquire a certain speed which is done by diesel or a petrol engine. Though this principle has certain advantage when compared to diesel or a petrol engine like

HISTORICAL BACKGROUND

Michael Faraday, the discoverer of electro-magnetic Induction was born in Newington Butts (London) on 22 September 1791. In 1805 at the age of fourteen Faraday was apprenticed as a bookbinder to George Riebau of Bland ford Street. During his seven year apprenticeship Faraday developed his interest in science and in particular chemistry. He was there able to perform chemical experiments and built his own electro-static machine.

Faraday joined the City Philosophical Society in 1810. In this society, which was devoted to self-improvement, a group of young men met every week to hear lectures on scientific topics and to discuss scientific matters. This is where Faraday would give his first scientific lectures. Towards the end of his apprenticeship, in 1812, Faraday was given, by one of Riebau's customers, William Dance, four tickets to hear Humphry Davy's last four lectures at the Royal Institution. Faraday attended these lectures took notes and later in the year presented them to Davy asking for a position in science. Davy interviewed Faraday, but said that he had no position available.

Early in 1813 there was a fight in the main lecture theatre of the Royal Institution between the Instrument Maker and the Chemical Assistant which resulted in the dismissal of the latter. Davy was asked to find a replacement for him and he remembered Faraday. Davy called Faraday for a second interview the result of which was that Faraday was appointed Chemical Assistant at the Royal Institution on 1 March 1813. Faraday, in effect, started a second apprenticeship in chemistry.

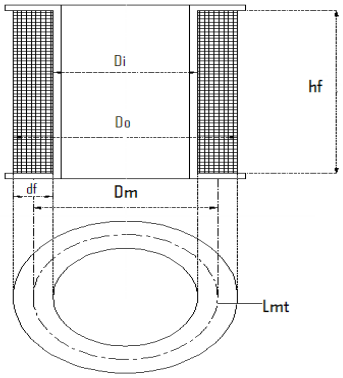
APPARATUS

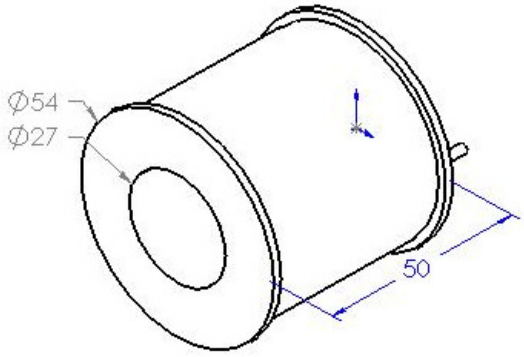
There is no steering mechanism in this model since it is at the initial stage of the technology. The vehicle has to be pushed for the starting momentum; it will continue the drive by magnetic propulsion. The batteries for the circuit is inbuilt in the vehicle and the battery used to drive the energizing of coils is external connected through the wires.

PARAMETERS INVOLVED

Designing coils to generate electromagnetic force to pull the piston.
Effecting cranking to rotate the drive gear which drives the driven gear mounted on the drive axle.
Designing the circuit for speed control
It is simple in construction. It consists of following parts.

MAGNET COIL SET



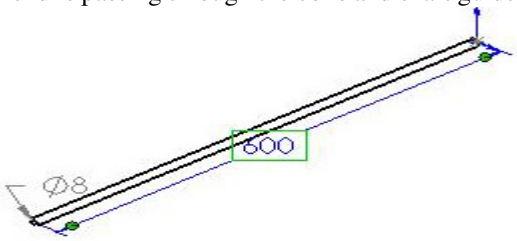


Coil Front and Top view

Di = Inside Diameter of the coil,
Do = Outside Diameter of the coil,
Dm = Mean Diameter of the coil,
df = Radial depth of coil,
hf = Axial length of coil,
Lmt = Length of mean turn.
Mean dia. Dm = (Do + Di) / 2
Depth of winding df = (Do - Di) / 2
Coil number of turns----------230
Diameter of the wire--------1.4mm

MOVING SHAFT:

It is made out of C30 steel of diameter of 12mm and length of 600mm being turned on the lathe machine for the size of 10mm and one end is inserted within the bush of the clamp which is connected to crank by pin and locked by the M6 screw. The other end is passing through the coils and shaft guides.

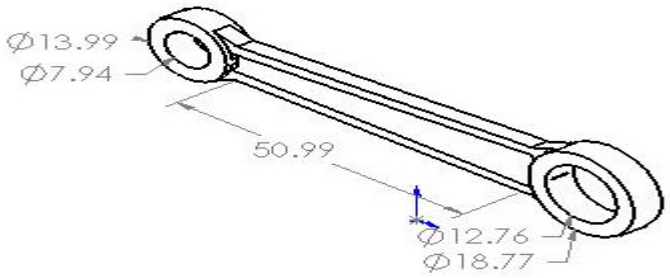


Moving Shaft

Length of shaft---------- 600 mm
Diameter of the shaft---------- 10 mm

CRANK LEVER:

It is made out of mild steel machined on the milling machine and drilling and machining and boring is done to house the roller bearing inside it to hold the shaft.
Length of crank lever----------120mm



Crank lever arrangement

SHAFT GUIDE

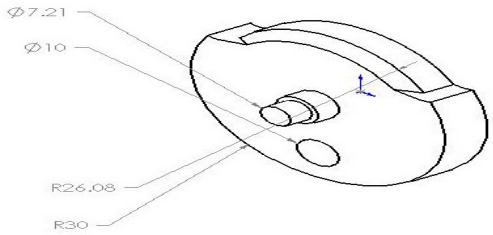
It is made out of 25mm rod of the length of 15mm being turned on the lathe machine to make a diameter of 20mm and length of 15mm and internal drilling is done for the diameter of 10mm to make the moving shaft to slide in this. The base support of 10mm square bar is welded to this which in turn fixed on a flat of 20x3x60mm. 6mm holes—2nos are drilled on this flat to accommodate the fixing of this assembly on the frame. Such two number guides are made.

CRANK SHAFT

It is made out of C 30 steel of diameter 20mm and turned on the lathe machine for the
Length of 22 to house the crank wheel as per drawing.
Diameter of the crank shaft: 15mm

CRANK WHEEL

It's a MS Plate being machined and fitted to the spindle this is of 60 mm diameter.
Diameter of crank wheel: 60mm
Thickness of crank wheel: 10mm



CRANK WHEEL.

It is made out of C30steel of diameter 65mm and of thickness 15mm being turned for the diameter of 60mm and thickness and milled to get the shape of the crank. It is then bored to suit the crank pin diameter of 10mm and offset bore of diameter 10mm is also done on the milling machine Such two number of wheels are processed.

CRANK PIN

It is made out of C30 steel of diameter 16mm of the length of 32mm being turned on the lathe machine to make a diameter of 12mm for the length of 32mm being slide fit clearance of crank lever and coupling.

CRANK HOUSING

It is made out of mild steel round of diameter 55mm being cut for the length of 25mm and then turned on lathe machine to make the diameter as 50mm and drilling of 18mm and bore of 21mm and counter bore of 40mm to suit the ball bearing outside diameter of 40mm for the depth of 12mm. This housing is faced from the other sideto make the length as 20mm and chamfered at the edges to remove the sharp corners. Such two number of housings are made for this project.

CRANK LEVER

It is made out of brass casting being machined on milling machine and being bored on lathe machine maintaining the center distance and hole diameter to suit the roller bearing and pin diameter.

BASE FRAME

It is made out of angle 25x25x4mm being cut for the size of 600mm length, two numbers and 100mm, two numbers and are joined together by welding to make the box structure are per the sketch and on this crank housing is fixed by drilling.

COIL HOLDER

It is made out of mild steel flat 20mmx5mm being cut for the size of 45mm and bend to suit the radius of the coil outer surface. A round washer of size 8mmhole, 15mm outer diameter is welded on this to locate the end of the clamping bolt. Such 4numbers are made to clamp two number of coils.

BATTERY BOX

It is made out of mild steel flat 20x3mm being cut and bend to make the form of the box to accommodate the two number of batteries within it as per the drawing.

CIRCUIT HOLDER

It is a flat strip of mild steel of size 12x3x100mm being cut and drilled for the hole of size 4mm at two places and being welded on the frame, so that circuit is clamped on this.

SWITCH ACTIVATING BUSHES

These are totally two number made out of mild steel round bar of size 22mm being turned on the lathe machine to make the size of 20mm outer diameter and 10mm inner diameter and faced to make the length of 15mm and on the circumference, 5mm hole is drilled and M6 tapping is done for locking purpose.

COIL ENERGIZING CIRCUIT EXPLANATION

The circuit is made on the basis of supply of constant voltage to the IC-UM606 at the input pin number 7. Pin number 2 and 3 are connected to the variable resistance through a capacitor by which inverted output is given at pin number 6 which is triggered by transistor BC 547, again transistor BC 547 (twice because we are using heavy relay). The relay is connected to the coil by the triggering of the transistor. The coils are connected and disconnected by the DPDT switch and the relay will switch on/off the coils which gives the output as the rotations and speed control. Initially the motor is put on by the button which drives the propulsion or cranking while rotating the rear wheels simultaneously moving the piston rod to effect the cranking and when the coil energizing button is put on the supply to the coils is effected and the relay puts off the motor supply to stop the motor since the coil energized is driving the propulsion.Torque derived from the coils is to be considered and redesigned with your method.

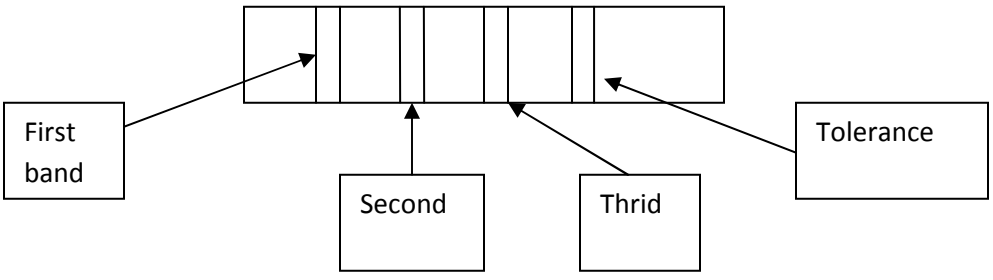
ELECTRONIC PARTS

RESISTORS

According to ohms law "Electrical resistance of a conductor is the effective opposition offered by the conductor to the now of charges through it and is defined as the rate of p.d between the ends of the conductor to the current flowing through the conductor. The SI unit of resistance is the Ohm (Ω)

COLOR CODE OF RESISTER

Resistors are available in various shapes and sizes. Among them carbon composition resistors are most commonly used. Carbon composition resistors are physically very small and hence it is difficult to print the resistance value on the component. Instead it is indicted by a colour code in the form of circular colour bands round the resistor. The tolerance i.e., the percentage deviation from the rated value is also indicated in figure



Color bands of Resistors

In the color band system, generally a resistor has 4 bands on it. The band at the end of the resistor indicates the first digit, the next band (moving towards the center of the resistor) indicates the second digit, while the 3rd band indicates the number of Zeros. Which follow the two previous digits. The fourth band indicates the tolerance.

TRANSFORMER

A transformer is a static electrical device, which transfer electrical power from one electrical circuit to the other which are magnetically coupled together with or without change of voltage and without any change in power and frequency. The basic use of transformer is to increase or decrease A.C. voltage. If it is used to increase the voltage, it is called a step-up transformer, if it is used to decrease the voltage, it is called a step down transfer. If the voltage is not changed, it is called one to one transformer.

As the transformer is a static apparatus, there are no moving parts. Hence, there are no mechanical losses in a transformer. Hence, there are no mechanical losses in a transformer. Hence 'η' is of order 95% to 98%. There are no slots, no teeth, and no air gaps. Hence the maintenance of transformer is very easy.

It works on the principle of mutual induction between two magnetically coupled coils.

POWER SUPPLY:-

Our entire circuit operates using 12 Volts DC

INTEGRATED CIRCUITS:-

An integrated circuit (abbreviated as IC) is a small Silicon semiconductor crystal, called a Chip, containing electrical components such as transistors, diodes, resistors and capacitors. The various components are interconnected inside the chip to form a electric circuit.The chip ismounted on a metal or plastic package, and connections are welded to external pins to form the IC.Integrated circuits differ from other electronic circuits composed of detachable components in that individual components in the IC cannot be separated or disconnected and the circuit inside the package is accessible only through the external pins.

Integrated circuits come in two types of packages, the3 flat package and the dual-in-line (DIP) packageThe Dual in Line Package is the most widely used type because of the low price and easy installation on circuit boards. The envelope of the IC package is made of plastic or ceramic. Most packages have standard sizes and the number of pins ranges from 8 to 64. Each IC has a numeric designation printed on the surface of the package for identification.

The size of IC packages is very small. For example, four AND gates are enclosed inside a 14 pin dual in line package with dimensions of 20 x 8 x 3 millimeters.

Besides a substantial reduction in size, ICs offer other advantages and benefits compared to electronic circuits with discrete components. The cost of ICs is very low, which makes them economical to use. Their reduced powder consumption makes the digital system more economical to operate. They have high reliability against failure. So the digital system needs less repairs. The operating speed is higher, which makes them suitable for high-speed operations. The use of ICs reduces the number of external wiring connections because
many of the connections are internal to the package. Because of all these advantages digital systems are always constructed with integrated circuits.

ICs are classified in two general categories, linear and digital. Linear ICs operate with continuous signals to provide electron functions such as amplifiers and voltage comparators. Digital ICs operate with binary signals and are made up of interconnected digital gates.

IC 7400 :- (7400 Quad NAND)

DIODE:-

It is a combination of P-type and n-type semiconductors. Or a P-n junction is called a crystal diode or a semiconductor diode. Symbolically it has shown above figure.

Note: Arrow indicates the direction of conventional current
i.e., hole current

In p type semiconductor Holes are the majority charge carriers and electrons minority carriers.

In n type semiconductor electrons are the majority charge carriers and holes are the applied voltage opposes the junction p.d and for values of the applied voltage greater than the junction p.d. the charge carries easily cross the junction from either side. The motion of the majority carries constitutes a current in the external circuit. This current rises sharply with the applied voltage. Thus a forward based p-n junction offers a small resistance.

TRANSISTOR:-

A transistor is a 3 terminal two junction semi-conducting device whose basic action is amplification. There are two types of transistors (i) npn transistor. (ii) pnp transistor.

In our circuit we have use npn transistor. Symbolically it can be represented as below

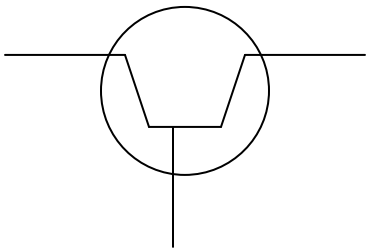
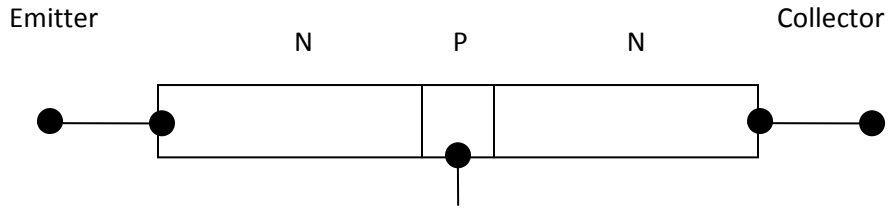


Fig.2.4 Transistor

In an npn transistor a very narrow p-region is sandwiched between two n-regions. It is represented as below:



Here note that emitter is heavily doped than collector.

TRANSISTOR ACTION:

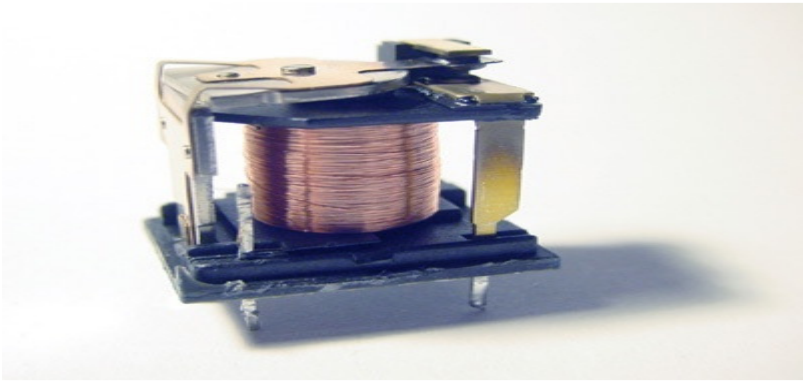
In the normal operation of a transistor, emitter junctions forward biased while collector base junction is reverse biased. The polarities of the applied voltage in the case of an npn transistor are shown above in figure. Emitter being an n-type material, it possesses electrons as majority carriers. Since emitter base junction is forward biased, electrons from the emitter cross the junction and enter the base region. This constitutes the emitter current I_c. As there electrons flow through p type base regions they tend to combine with holes in that region. This loss of charge from the base results in base current I_s,. The number of electrons combining with the holes in the base region is very small as the base is very thin and is lightly depend. The remaining electrons cross the base collector junction and are collected by collector. This results in collector current I_c.

Thus $I_c=I_c$, Also $I_c=I_b+ I_c$

By controlling the fare current the collector current can be controlled. Thus transistor is a current controlled device.

RELAY

A relay is a simple electromechanical switch made up of an electromagnet and a set of contacts. Relays are found hidden in all sorts of devices. In fact, some of the first computers ever built used relays to implement Boolean gates.



Relay Construction

Relays are amazingly simple devices. There are four parts in every relay:

- Electromagnet
- Armature that can be attracted by the electromagnet
- Spring
- you can see that a relay consists of two separate and completely independent circuits. The first is at the bottom and drives the electromagnet. In this circuit, a switch is controlling power to the

- electromagnet. When the switch is on, the electromagnet is on, and it attracts the armature (blue). The armature is acting as a switch in the second circuit. When the electromagnet is energized, the armature completes the second circuit and the light is on. When the electromagnet is not energized, the spring pulls the armature away and the circuit is not complete. In that case, the light is dark.

When you purchase relays, you generally have control over several variables:
The voltage and current that is needed to activate the armature
The maximum voltage and current that can run through the armature and the armature contacts
The number of armatures (generally one or two)
The number of contacts for the armature (generally one or two -- the relay shown here has two, one of which is unused)
Whether the contact (if only one contact is provided) is normally open (NO) or normally closed (NC)

TOGGLE SWITCH

A toggle switch in the "on" position.

In the simplest case, a switch has two pieces of metal called contacts that touch to make a circuit, and separate to break the circuit

ACTUAL WORKING DIAGRAM

WORKING PRINCIPLE

Two solenoid coils have been held one after the other and a shaft is being housed between them. The basic definition of a solenoid is a cylindrical coil of wire which creates a magnetic field within itself when an electric current passes through it to draw a core of iron or steel within the coil. The solenoid generally uses electrically conductive, non-magnetic and insulated wire of specific length that is coiled or wrapped around a tube or hollow cylinder. The core, in general terms, is a magnetic object, a portion of which moves in at least a portion of the tube's interior. The passing of an electrical current through the wire coiled around the tube generates a corresponding magnetic field or force around the tube/wire coil. This effect, commonly known as the Electro Motive Force (EMF), denotes that the polarity and strength of the electrical current passing through the wire coil will correspondingly determine the polarity and strength of the resulting magnetic field or force. In this manner, the manipulation of the various

attributes of the electrical current (e.g., polarity, duration and strength, etc.) respectively controls the attributes of the resulting magnetic field and the movement of the magnetic object in relation to the magnetic field. In controlling the electrical current to the solenoid or inducer, the subsequently created magnetic field draws, holds or expels the magnetic or polar object in relation to the interior of the wire wrapped tube. When the first coil is energized it will pull the shaft which in turn makes half rotation of the crank wheel.In the second set of coil the coil is energized in opposite direction which in turn makes another half rotation of the crank wheel and hence completes one full rotation. The speed is controlled by the accelerator through the circuit. The timing of energizing the coil is done by control circuit, which is activated by accelerator sector which governs the speed of spindle. The spindle is coupled on the rear axle of the vehicle, which drives the axle resulting the forward motion/movement. The chassis is made of mild steel flat and two number of wheels are fixed on the hub of the front axle and two number of wheels are fixed to the rear axle..

ADVANTAGES& DISADVANTAGES

ADVANTAGES

- Less wear & tear
- To acquire max speed
- Less lubrication
- Less maintenance
- Time saving

- Low initial investment.
- Virtually no wear. Main cause of mechanical wear is friction, magnetic levitation requires less contact, and hence no friction.
- Components normally subjected to mechanical wear are on the whole replaced by electronic components which do not suffer any wear.
- Specific energy consumption is less than all other comparable means of transportation.
- Without using any fossil fuels.
- Pollution free environment.
- Simple in design.

DISADVANTAGES

- The energizing of coil is by DC Batteries which needs to be recharged.
- Coils used are of heavy gauge due to which coil gets heated very fast which needs cooling system.

APPLICATION

- In Automobile Vehicle.
- In Light Vehicle.
- In maglev Train

FUTURE SCOPE

- Design firms are currently experimenting with improvements in this submarine to improve its work ability.
- In future we can make same advancement such as follows.
  - Increase the capacity of vehicle to carry load.
  - We also try to improve efficiency of vehicles.

CONCLUSION

So finally it is conclude that, this concept of magnetic levitation car or magnetic propulsion drive automobile is useful in future and we know day by day the quantity of fossil fuels is degrading in ocean and earth, so we took some step to change the concept of movement of vehicle into concept of electromagnets which will use electromagnets to run engines.

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