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Magnetic powered engine

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Abstract *— In modern science and technology there is a demand in expensive fuels. Now days scientists are searching for an alternative fuels. This project is one of the main power sources for the engine. This project is to describe the construction and design of a magnetic powered engine, which operate with the help of magnetic force. This mechanism is entirely different from normal IC engine mechanism. It works with magnetic effect and repulsion of magnetic force instead of fuels. It works on properties of magnet. It consists of, two permanent magnet. One magnet is mounted on the cylinder head and the other magnet is mounted on the piston head. By considering two cylinders, when one magnet pair will create repelling, other will be pushed to the TDC, now this magnet will creates repelling force as it will come to mate its pair, it will also pushed down with the help of energy released by flywheel and this is how the cycle will repeat. Here there will be no use of spark plug and valve arrangement. The piston itself will be a permanent magnet moves from TDC to BDC and BDC to TDC which will result into conversion of reciprocating motion into rotary motion.*

Keywords*-Magnetic engine, eco-friendly power generation, magnetic repulsion force, IC engine,*

I. INTRODUCTION

The electricity in present days is being generated by building power plants operating on different solid and liquid fuels like petrol, diesel, coal, nuclear fuel etc. These plants are the major sources from where electricity is being transmitted to cities and villages. The cost (initial cost and running cost) of every plant is very high due to its fuel consumption and use of typical components. Also the pollution level has extremely increased due to combustion of fuels. However several plants have implemented their buildings by adding some additional features of the purification of exhaust gases before emitting it to the air. Due to this discontinuities the world have looked forward to the conventional sources (solar energy, wind energy, ocean energy etc.) for generating electricity. But still there are some rural places where neither fuel nor electricity is available. It is very obvious that in present world every human needs electricity to light up their living premises. So, for those areas, we need a small power source which can be used without any fuel. This project can be used on those places to eliminate the darkness at night. The basic principle of this project involves the conversion of reciprocating motion into rotary motion by means of magnetic repulsion. The idea of placing magnet on piston head and on cylinder head was came out by observing the repulsion of magnets, which is basically a force, generating when same poles of two magnets are mated, which pushes the magnets towards the opposite direction to each other. Firstly the idea was presented taking single cylinder vertical engine, but by further research we implemented the design as V –type 6-cylinder (90 degrees) engine.

II. OBJECTIVE AND AIM

This project is about a main power generation sources which does not requires fuel nor it creates harmful effects. The present world depends upon the fossil fuels which is used in those presently available power generators. Since the amount of speed and torque may be moderate by theoretical assumptions, the main AIM will be to build an engine which can generate electricity without harming human nature. It will be made for generate power only, instead of involving it to the automobile applications.

The entire project is to be made with those light weight material since we have used magnets as a main power source. So the mobility of the system becomes easy. Also one of the main objectives are to Save fuel which is being used in presently available fuel generator and to overcome the problems of noise pollution, air pollution, purchase cost and running cost. The entire system is to be “An ecofriendly” system which is completely based on power (electricity) generation. In present scenario, India is producing and transmitting a large amount of electricity but still some rural place do not have electricity, Also there may be no fuel there. So AIM will be to create a generator which can be helpful to lighten up the houses of those people who don’t get electricity.

III. MAGNETS

Fig. 1 Magnets

A magnet is an object having different sizes and shapes which have a capability of producing magnetic field. The magnets are entirely used in electronics as well as mechanical components. The properties and capabilities of magnets are used majorly for achieving ease in different applications. Neodymium (N35) permanent magnets have been used in the project which is one of the rarest and strongest magnets available on earth.

3.1 Permanent magnets

Fig. 2 permanent magnet

The permanent magnets are the ones which always hanging on to our metallic wardrobe. The permanent word comes for the means that once they have magnetized, they retain a level of magnetism. These magnets are classified with the matters like how easily they demagnetized, how strong they can be or how their strength will varies with increasing its temperature. A permanent magnet is an object made from a material that is magnetized and creates its own persistent magnetic field. An everyday example is a refrigerator magnet used to hold notes on a refrigerator door. Materials that can be magnetized, which are also the ones that are strongly attracted to a magnet, are called ferromagnetic. These include iron, nickel, cobalt, some alloys of rare-earth metals, and some naturally occurring minerals such as lodestone. Although ferromagnetic materials are the only ones attracted to a magnet strongly enough to be commonly considered magnetic, all other substances respond weakly to a magnetic field, by one of several other types of magnetism. Ferromagnetic materials can be divided into magnetically "soft" materials like annealed iron, which can be magnetized but do not tend to stay magnetized, and magnetically "hard" materials, which do. Permanent magnets are made from "hard" ferromagnetic materials such as alnico and ferrite that are subjected to special processing in a strong magnetic field during manufacture to align their internal microcrystalline structure, making them very hard[citation needed] to demagnetize. To demagnetize a saturated magnet, a certain magnetic field must be applied, and this threshold depends on coercivity of the respective material. "Hard" materials have high coercivity, whereas "soft" materials have low coercivity

IV. DESIGN

The stroke length of the piston magnet depends on a length of repulsion area. We observed that when same poles of magnets are mated together the repulsion occurs in between the length of 70 mm. so we decided to consider length of stroke as 70 mm.

4.1 Magnets

Magnet shape	Cylindrical
Magnet grade	N35
Magnet diameter	50 mm
Magnet thickness	10 mm
Distance between two magnets	5 mm

4.1.1 Repulsion force between two magnets

The graph mentioned is generated online with the help of magnet calculator. The repelling force gained by above mentioned data is equal to 57.20 lb. & that is equal to 257.88 newton.

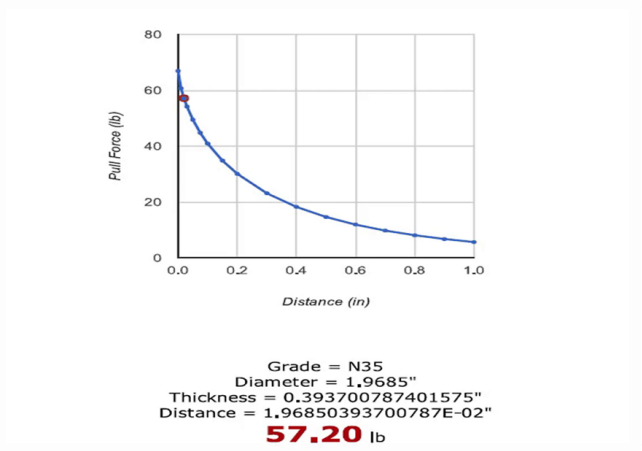

Fig. 3 Graph of pull force vs. distance…[4]

4.2 Dimensions of components

Diameter of magnets	70 mm
Thickness of magnets	10 mm
Repulsion length between magnets (Length of stroke)	70 mm
Crank radius	35 mm
Connecting rod length	70 mm
Outer diameter of cylinder	60.32 mm
Inner diameter of cylinder	51 mm
Length of cylinder	90 mm

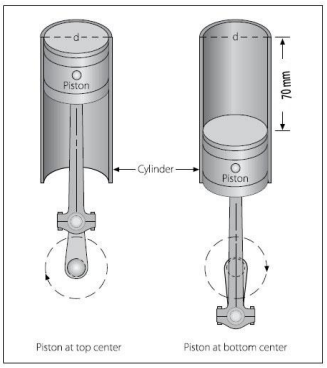

Fig. 4 Stroke length

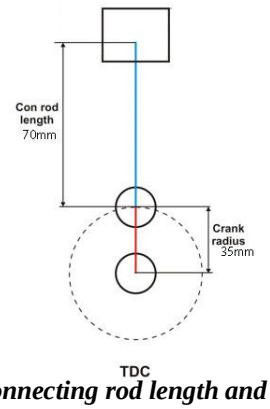

Fig. 5 Connecting rod length and crank radius

V. CONSTRUCTION

5.1 Components

5.1.1 V-base

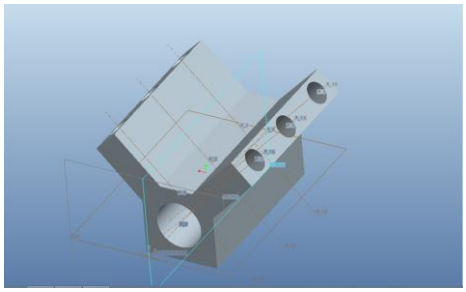

Fig. 6 V engine cylinder base

A V-type cylinder case is to be designed and used in the system. The V type engines have some advantages over normal engines. Also the sports automobile companies like Lamborghini, ferrari, buggati etc. have made that much of amount of power, speed and torque by constructing V type 12 cylinder engines. As in the system, the neodymium magnets is going to be used, the material of cylinder must be non-magnetic, So that the magnets do not attract towards cylinder walls and so that plywood is used for v-base and PVC pipe for cylinders.

5.1.2 Piston

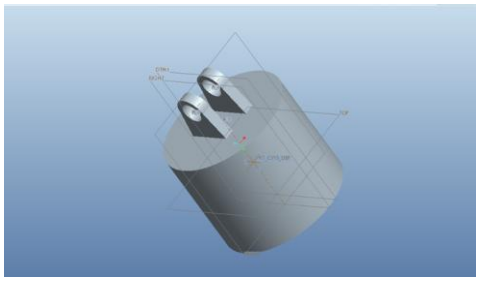

Fig. 7 Piston

A Piston is the component on which a magnitude of force exerts under which it undergoes a linear movement relative to the cylinder. The movement of piston is always restricted from TDC to BDC and vice versa. In our project, the piston itself is to be a magnet on which a repelling force exerts. Below piston a mild steel round plate is connected which handles locators of piston pins. The reciprocating movement due to repelling will rotate the crank shaft and that is how the rotation is to be gained.

5.1.3 Connecting rod and crankshaft

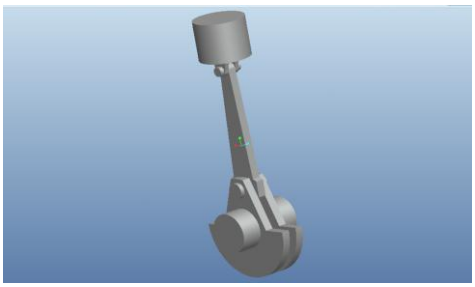

Fig. 8 Connecting rod and crankshaft

A connecting rod is a moving component which oscillates along the cycle of engine and helps to transmit the reciprocating motion of piston into rotary motion of crank. A compressive force on both the sides of the connecting rod occurs. The crank shaft is basically made from a bended steel rod. Steel gives massive strength so it is capable for overcoming the loads exerted by all of the connecting rods on it, while the connecting rod is made from aluminum.

5.1.4 Flywheel

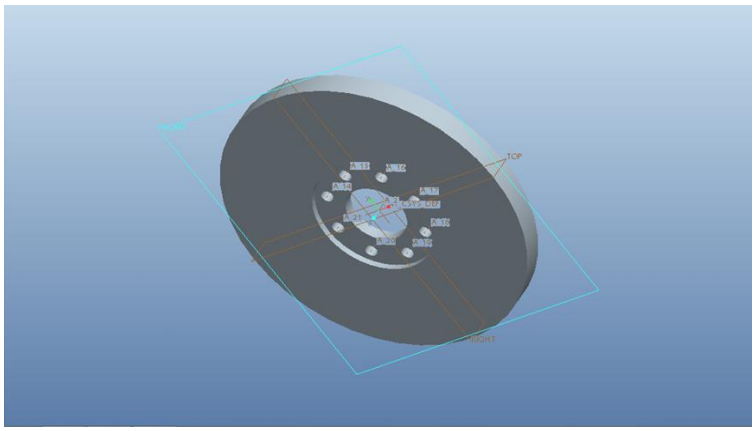

Fig. 9 Flywheel

A flywheel is a rotating member which absorbs energy and releases it when it is needed. This flywheel is to be mounted on the working shaft as it is the main driving shaft. This flywheel will absorb the energy on the 1st stroke and release it on the second stroke when it is to be needed. The flywheels are available in different sizes and patterns depending upon the function. In our project a light but enough mass weighing flywheel is used. As shown in final assembly, this flywheel is mounted on the rear end of the engine shaft.

5.2 Assembly

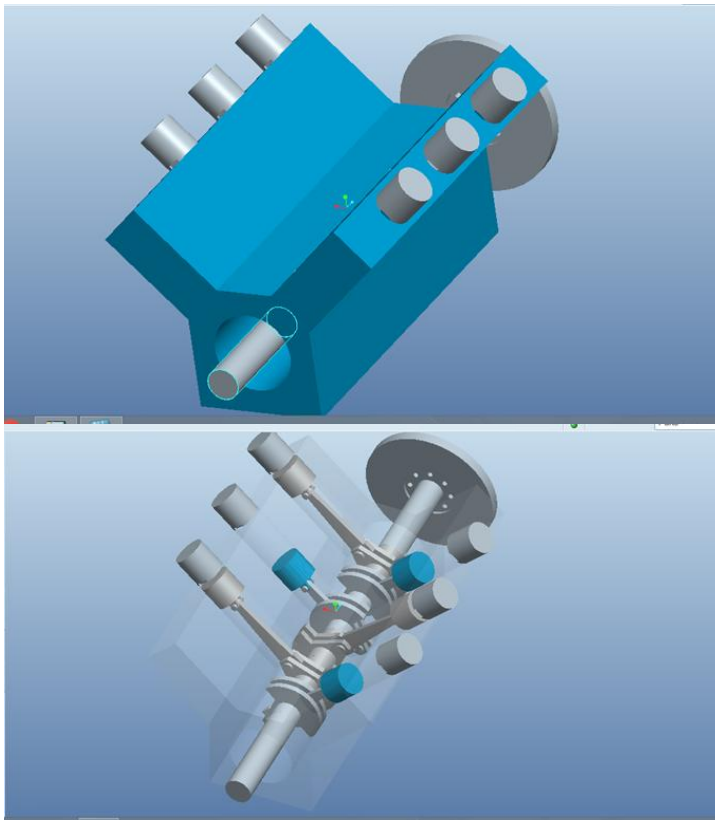

Fig. 10 Assembly of all the components

As shown in fig. 9, each cylinder contains magnets on its head which will be mounted in such a way that it mate same pole with its corresponding piston magnet. The components are made of different units and then it is assembled. The crank shaft is made in such a way that at an instant only one v-side had maximum repulsion (repulsion of two magnets) and other side had a single repulsion. The component models shown above are created in engineering modelling software PTC creo. In the assembly model we made the v-base disappeared so that inner parts get appeared.

VI. WORKING

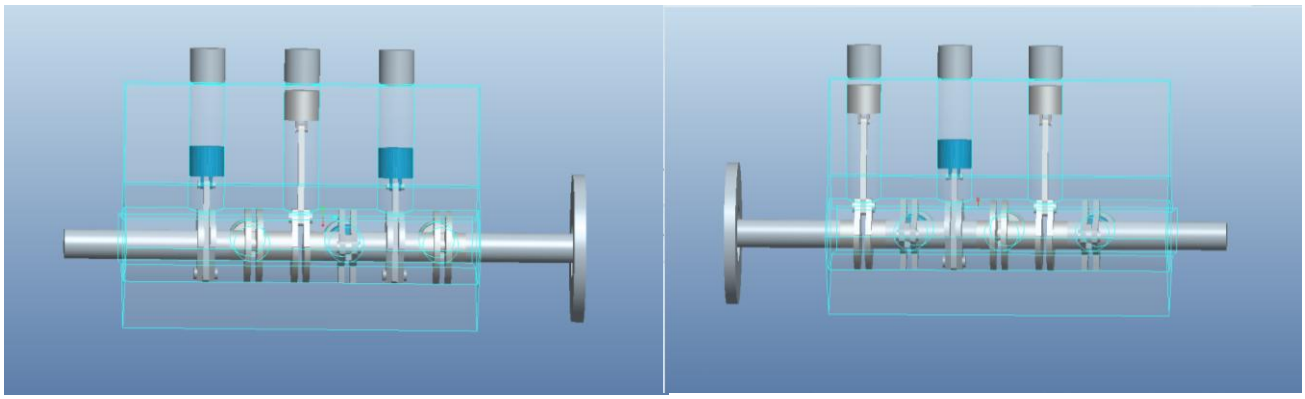

Fig. 11 (A) V-side 1 at an instant

Fig. 11 (B) V-side 2 at same instant

1. The starting push will be given by the motor. As shown in figure, on the 1st stroke, on 1st V side, the piston 1 and 3 is at BDC and piston 2 is at TDC, at that time, on the 2nd V side, the corresponding piston 1,2 and 3 will be at opposite position of the 1st V side pistons.
2. Now, as it seems that the repelling is more at V side 2, it will push the V side 1 and complete a half rotation.
3. Also during this stroke, some amount of energy will be absorbed by flywheel.
4. Now on the 2nd stroke, the 1st V side will give more repel force as it will have 2 repelling pistons. This will push the piston to 2nd V side.
5. During this stroke the energy absorbed by flywheel will be released and it will become easy to push 2nd V side pistons.
6. As the energy is sufficient for repeat the cycle, the 2nd V side piston will have more repelling force & it will push the 1st V side pistons.
7. This is how the cycle will repeated until we move any one of the V engine side piston head magnets out of the repelling area of piston magnets.

VII. CONCLUSION

The engine can successfully work and create an amount of speed and torque but at moderate level. The use of neodymium magnets can give better results than any permanent magnets. The principle described above in working section can work it out and by manufacturing accurate components, enough speed and torque can be achieved. Also in future we can produce even massive amount of electricity, by building huge magnetic engines.

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