

Magnetic Engine

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Abstract— In Engine combustion are takes place & produce heat which converts into mechanical energy is called as IC engine. Generally used in Automobile, but the combustion produces some harmful gas. Because of using fuel as petrol & Diesel and the exhaust gases contain numerous pollutants that are extremely harmful though in chronic condition. Which is one main cause of air pollution. Modern science & technology has been taken many positive steps for emission control like using CNG's & LPG. Instead of petrol & diesel. Using "Reciprocating Magnetic Engine" will fulfill the problem. This method provides an environment friendly and Non-polluting. But this engine does not suitable for long run and does not carry more loads. So basically we have to prefer Engines for more power & more running capacity.

Key words: Magnetic Piston, Multi Cylinder Engine

I. INTRODUCTION

A. Definition of Magnetic Engine:

The engine in which Magnet are responsible for movement of the piston is called as Magnetic Engine. In this operation of piston propelled engines by attaching the device individually to the piston, causing the pistons to perform the up and down. The Magnetic engines are also defines as 2-phases engine which has no exhaust emission, higher efficiency such characters are seen in these kind of engines. There is no inlet & exhaust valve or ports & no spark-plug also. In this system we will used 2 Solenoids at Top dead centre (TDC) & Bottom Dead centre (BDC). The main advantages of magnetic engine are that it is pollution free. Also it is easy to design an magnetic engine because there are no complicated parts. Since the engine does not have combustion, valves, water cooling system, fuel pump, fuel lines, air and fuel filters and inlet and exhaust manifolds etc. can be eliminated from the engine. The main challenge faced in designing an magnetic engine is that it has to be an efficient as an internal combustion engine.

II. PRINCIPLE

The reciprocating magnetic engine work in the principal of "like poles repel and unlike poles attract" of magnetism. This engine is also known as Magnetic Piston engine. These engine uses very low power to generate very high power. Hence, these engine works at very high efficiency with the possibility of reaching unity-over operation mode. Some important parts used in Reciprocating Magnetic Engine are as follows.

A. Magnetic Piston:

The hollow piston casing is made up of non-magnetic stainless steel, titanium or similar materials of high resistance and low electrical conductivity. Piston casing can also be made up of non-metallic, thermal resistant materials

as well as can be made by integrating both non-magnetic and non-metallic materials. One end of the hollow case is fitted with a powerful permanent magnet made of neodymium iron-boron, samarium-cobalt or similar high field strength magnetic materials. The permanent magnet acts as the core of the piston. The flat surface (which is also the pole of the magnet) of the piston that is nearer to the pole the magnet is called the magnetic head or piston head of the piston. The flat surface of the piston head can be completely exposed or it may be covered by a thin layer of non-magnetic material of sufficient thickness. The other end of the piston case connects to the piston rod that connects to the crankshaft. The crankshaft and the piston rod convert the linear reciprocating movement of the piston to the circular movement.



Fig. 1: Neodymium iron-boron

B. Ferromagnetic Material:

Ferromagnetic materials have a large, positive susceptibility to an external magnetic field. They are highly attracted to magnets and can become permanently magnetized. They get their strong magnetic properties due to presence of magnetic domains. When ferromagnetic material is in the unmagnetised state, domains are randomly organized and the magnetic material field for the part as a whole is zero. Iron and nickel are good examples.

C. Multi-Cylinder:

A typical kind of cylinder construction that is needed in Magnetic piston engine. This is in contrast to the cylinders normally used in other reciprocating engines. Since these engine uses only magnets for its operation, the cylinder must take care of unwanted magnetic fields and other losses. Further, the cylinder material itself should not get attracted to the magnets and resist the movement of the piston. The cylinder must be only made up of non-magnetic materials such as stainless steel, titanium or similar materials of high resistivity and low electrical conductivity. Alternatively, cylinder can also be made up of non-metallic, thermal resistant materials as well or can be made by integrating both nonmagnetic and non-metallic materials. In case of non-magnetic metallic material and whenever needed, the cylinder will have inner tube, outer tube and intermediate semi-cylindrical shaped concentric laminations. Also, the

inner tube of the cylinder will have small, linear slots around it.

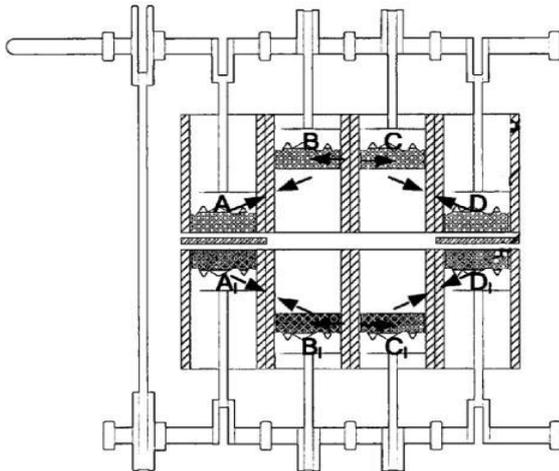


Fig. 2: Multi-Cylinder

D. Flywheel:

Flywheel is made up of mild steel and it is used to convert reciprocating energy into rotational energy. It regulates the engine's rotation, making it operate at a steady speed. Flywheels have a moment of inertia and thus resist changes in rotational speed. The energy stored in a flywheel is proportional to the square of its rotational speed. Energy is transferred to the flywheel by applying torque to it. It is used to store the kinetic energy.

E. Battery:

Where high values of load current are necessary, the lead-acid cell is most commonly used. The electrolyte is a dilute solution of sulfuric acid (H_2SO_4). In the application of battery power to start the engine in an automobile, for example, the load current to the starter motor is typically 200 to 400A. One cell has a nominal output of 2V, but lead-acid cells are often used in a series combination of three for a 6-V battery and six for a 12-V battery.

III. WORKING

- 1) Magnetic engine works in a simple manner, Magnetic engine consists of two engines which are mounted vertically and held using a clamp.
- 2) When the acceleration is given for 90° in the engine 1 the piston moves to the Top Dead Center (TDC) for the first time then the piston in the engine 2 has to be ready at the Top Dead Center (TDC) for the power stroke.
- 3) Due to magnetic repulsion the piston in the engine 2 moves to Bottom Dead Center (BDC).
- 4) Then with the aid of flywheel at the movement of piston from Bottom Dead Center (BDC) to Top Dead Center (TDC) takes place.
- 5) Finally the output power is obtained from the crankshaft.
- 6) For continuous rotation the acceleration has to be provided adequately.
- 7) Due to this continuous process the engine is powered and runs.

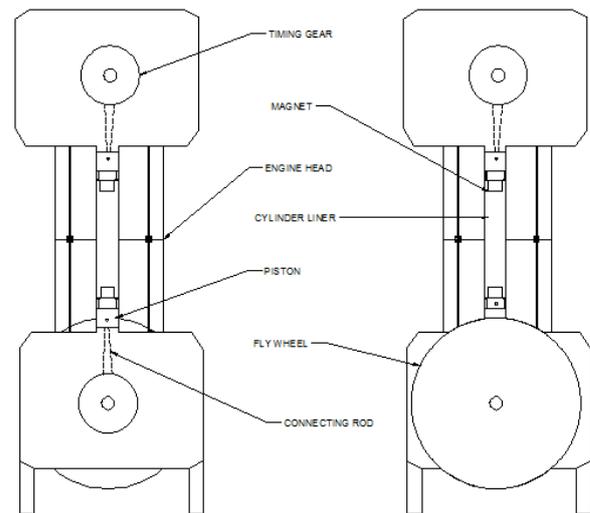


Fig. 3: Working of Magnetic Engine

IV. APPLICATIONS

- 1) Two wheeler Application.
- 2) Automatic guided vehicle.
- 3) Pump applications.
- 4) Power generating applications.

V. ADVANTAGES

- 1) Reducing pollution from one source, as opposed to the millions of vehicles on the road.
- 2) Transportation of the fuel would not be required due to drawing power of the electrical grid. This presents significant cost benefits. Pollution created during fuel transportation would be eliminated.
- 3) no need to build a cooling system, fuel tank, Ignition Systems or silencers.
- 4) The mechanical design of the engine is simple.
- 5) Low manufacture and maintenance costs as well as easy maintenance.
- 6) The price of fueling magnetic powered engine will be significantly cheaper than current fuel.
- 7) No pollution is obtained.
- 8) Consumption of fossil fuel is reduced.
- 9) Initial crank is enough to start the engine.
- 10) Life time of the magnet is high, so it can run for a long period.
- 11) No combustion takes place inside the engine, which reduces the evaluation of heat and toxic gases from the engine.
- 12) Reduces global warming.
- 13) Green environment is established.

VI. DISADVANTAGES

- 1) It cannot produce power like an engine.
- 2) It can provide less uniform torque at crank-shaft than engine.
- 3) its high initial cost.
- 4) The engine is not as flexible as the internal combustion engine.
- 5) The batteries need to be charged regularly which is difficult and time consuming.

VII. CONCLUSION

Since the fossil fuel rate is reducing day-by-day we have come with a magnetic reciprocating engine which can fulfill the use of fossil fuel in a reduced manner. On the whole, the technology is just about modifying the engine of any regular IC engine vehicle into an Magnetic Powered Engine. The Magnetic Powered Engine technology is cheaper in cost and maintenance, can be easily adapted by the masses and it doesn't cause any kind of harm to the environment. Instead, its widespread use will help mankind in controlling the serious problem of global warming and produce a green environment in the world.

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