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Magnetic levitation with ionic propulsion

Afeefa Sharieff [1], Bhuvaneshwari.K[2], Chaitanya.K[3], Darshan.K[4], Mr.Satish Kumar B[5]

Student, ECE, KSIT, Bengaluru, India[1-4]

Assistant professor, Dept. Of ECE, KSIT, Bengaluru, India[5]

ABSTRACT: As the world continues to grow and as cities continue to become more crowded and congested, our normal modes of transportation will not be able to handle these overpopulated areas. The answer to this transportation problem lies in the world of electro magnetism and superconducting magnets. Electromagnets and superconducting magnets have allowed us to create a magnetic levitating train nicknamed "MAGLEV" that floats on the track instead of being directly on it. This has a lot of potential to create trains that are super fast with low maintenance requirements. China is the first country in the world to commercially use MagLevs, and has already helped ease the congestion on the six lane highway leading from the Pudong Shanghai International Airport to Shanghai Lujiazui financial district. This new technology has already helped China in a short period of time and can certainly help other cities around the world that are just as congested as Shanghai.

Ion thrusters have proven to be an appropriate and efficient alternative to standard propulsion systems. With very low demand on fuel thanks to very high specific impulse generation, ion thrusters can easily compete with chemical propulsion systems, the produced thrust is far lower. The system is often used
for various mission demands like orbiting station keeping for geostationary satellites, orbit and attitude controlling and multi-goal missions.

Keywords: Magnetic Levitation, Ionic Propulsion, Thrusters, Magnets.

I. INTRODUCTION

A method of supporting and transporting objects or vehicles based on a physical property that is the force between two magnetized bodies inversely proportional to their distance. Using this magnetic force balances gravity, stable and non-contact suspension between the magnet (magnetic body) and the fixed guide (magnetized body). can be received. In magnetic levitation (Maglev), also known as magnetic suspension, this basic principle is used to suspend (or lift) vehicles. weighing 40 tons or more, producing a controlled magnetic force. The elimination of friction allows these vehicles to move at higher speeds than wheel trains with significantly better propulsion and reduce noise.

METHODOLOGY

The train will be initially balanced with help of extension provided to it. The electromagnets provided below the train will be activated through power supply which are repelled by the magnets provided on the track , this causes the train to levitate on the track Two propellers are provided on the either end of the train , one of them will be activated to push the train in either of the directions. To stop the train the propeller which was initially active will be deactivated and another propeller will be slowly activated which acts as a braking force to bring the train to a pause.

HARDWARE IMPLEMENTATION:

This maglev train is made up of numerous different materials such as strong neodymium magnets, and great importance is given to the conductors and non-conductors of electricity. The different hardware components used in the implementation of the project are listed as follows:

1.Super strong Neodymium magnets: The Neodymium magnets are placed at the base of the train model and on the track of the train. They are placed in such away that they repel from each other and help the train to levitate above the tracks.

2.Perspex sheets: Perspex sheets or acrylic sheets are good conductors of electricity and it's a light weight material.

3.Power source: A supply of 12 volts is given with a voltage multiplier as the main component so as to give a high voltage supply in order to produce the required ionic thrust.
4.Copper windings and tubules: They are used as conductors to produce the required ionic thrus and to produce ionic wind in order to propel(move) the maglev train.

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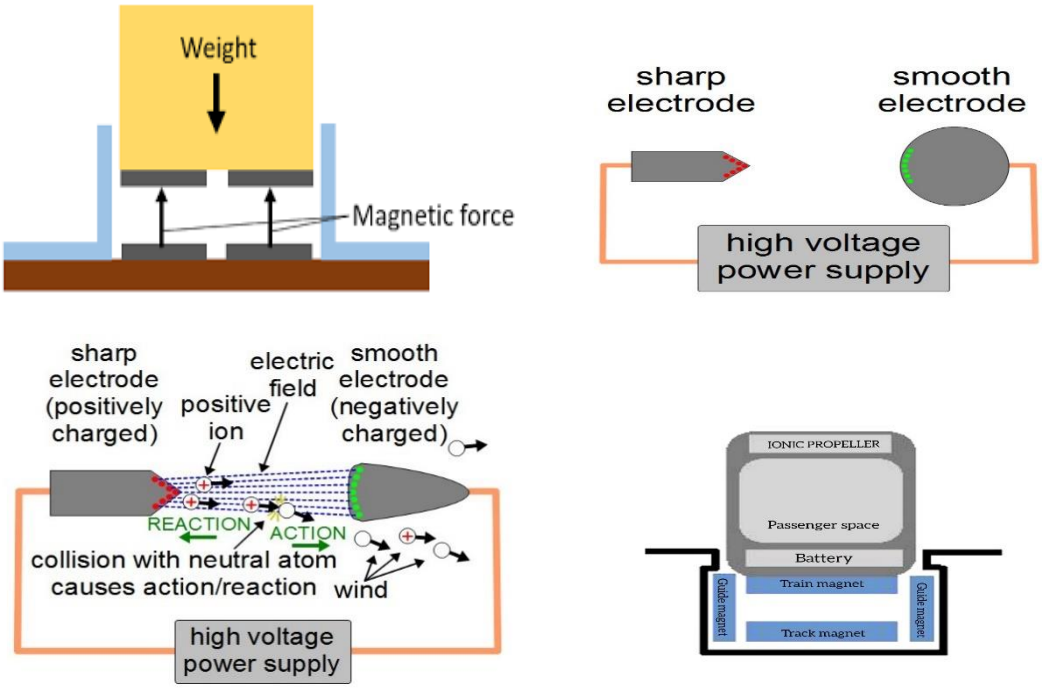
BLOCK DIAGRAMS



CONCLUSION

As a result we will achieve levitation of the train through magnetic repulsive force and its movement through ionic propulsion. Maglev trains have the potential to revolutionize transportation in the future. They work on the principle of electromagnetic suspension, which allows them to travel at high speeds with minimal friction and noise. Maglev trains can reduce travel time significantly, and they are more environmentally friendly than traditional trains. They also have advanced safety features that can prevent collisions. However, the main challenge facing the development of maglev technology is high costs. Despite this, maglev technology holds great promise for the future and has the potential to be a cheaper, faster, safer, and environment friendly form of transportation than we have today.It is more efficient and faster than the present conventional trains.

FUTURE SCOPE

[1].Higher Speeds: Maglev trains can travel at speeds faster than 300 miles per hour while hovering a few inches above the rail. By eliminating friction, maglev trains use less energy and can significantly reduce costs.
[2].Reduced Travel Time: Maglev trains can reduce travel time significantly. For example, the Chuo Shinkansen line in Japan is expected to reduce travel time between Tokyo and Nagoya from 90 minutes to just 40 minutes.
[3].Reduced Environmental Impact: Maglev trains produce less noise and vibration than traditional trains, and they do not emit greenhouse gases. This makes them a more environmentally friendly mode of transportation.
[4].Improved Safety: Maglev trains have fewer moving parts than traditional trains, which reduces the risk of mechanical failure. They also have advanced safety features, such as automatic train control systems, that can prevent collisions.

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