Maglev Trains

The year is 1802, and a man named Richard Trevithick has just patented the first steam locomotive (Britannica). This action would lead towards the creations of the engineering masterpieces around the world to create new ways to transporting people and things in large quantities across massive distances. The engines at the time were quite basic, with a Stirling Engine Generator and a boiler powering it. However, trains would soon evolve as more technology was researched and new breakthroughs would occur, however it would take a little more than a century until a diesel engine model was tried in 1917. This model initially failed but was not *the end of the line* for this type of engine, as in the 1960s diesel locomotives had almost fully replaced all of its steam predecessors (Britannica). There have been many improvements to diesel engines since then, however at it’s base it has mostly been the same.

There was another group of trains that was being developed in the 1800s as well that was not powered by coal or diesel, as they instead used electricity. The first model of such was battery powered in 1835 and would eventually go commercial in 1895. Many countries began using electric lines by 1938, with many being intercity lines such as subways, with Japan having 100% of trains being powered by such. There are two common ways electric trains receive their power, one is through alternating current, while the other is through direct current (Britannica). Direct current models were typically powered via a wire above the line that the train connected to directly carrying about 1500 to 3000 volts, while in contrast, alternating current models had a third rail that was about 600 to 750 volts. There are advantages and disadvantages to both, however, are moot to the point of this paper.

While development on electric and diesel trains was progressing, there was a fourth type in the works as well. These modified electric trains are known as Magnetic Levitating Trains, or Maglev Trains for short, with the first patent being issued to a man named Albert C. Albertson. Not a lot is known about who he is or his background, however he was a US citizen in New York City at the time he did receive the patent for magnetic levitation designed for railroads in 1902. (Patents1). Within the schematic he displays how magnetic propulsion can be used to keep its propulsion forward. This was furthered by Alfred Zehden who created the motor system for it three years later that moved linearly instead of doing revolutions. Additionally, a man named Polgreen Geoffrey Richard would go on to patent the information and research pertaining to an early version of a magnetic levitating train system in 1959.

With these patents, many other patents, additional technologies, and countless researchers advancing around the technologies regarding electromagnetism, it would not be much longer until the first Maglev train was in the testing phase. In 1969 Japan would be developing and testing various prototypes of maglev trains and their carriages, with their average speed hitting 517 km/h