The development of rail transport

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- *In the 19-th century, people wanted to create a machine that would help transporting goods and passengers to long distances.*
- *In the 20-th century, people wanted to improve the engine to make it more effective and faster. Such solution became diesel engine and diesel-train.*
- *The goal of 21-st century is to make transport less polluting and noiseless. This solution has already been found by making Maglevs, though there are some drawbacks that have to be reduced*.

The 'history of rail transport' dates back nearly 500 years, and includes systems with man or horse power and rails of wood or stone. Modern rail transport systems first appeared in England in the 1820s. These systems which used steam locomotives remained the first practical forms of mechanized land transport for the last 100 years [1]. Soon diesel locomotives replaced the steam ones. The diesel engine was invented and constructed by German mechanical engineer Rudolph Diesel in 1897, but the first locomotive using this engine was built only in 1912, in Switzerland, what wasn’t a commercial success at first [2]. **The diesel locomotives are more efficient than steam ones because:**

- The diesel locomotives can be safely operated by one person.
- Besides, diesel locomotives can be started and stopped instantly without any other operations.
- Moreover, the diesel locomotives can carry more goods than steam ones. The coefficient of efficiency is higher, about 36%.

The train of the future: Nowadays, people try to improve the features of the railways transport; the goal is to make it less polluting and cheaper. One of these solutions can be Maglev. (Magnetically Levitated Trains). Today, this type of rail transport is used in some European countries. The first commercial maglev line made its debut in December 2003.

The principle of functioning: a Maglev train floats about 10mm above the magnetic field. It is propelled with the guide ways by changing magnetic fields rather than an onboard engine. Once the train is pulled into the next section the magnetic field switches on, so that the train is pulled again. The Electro-magnets run the length of the guide way.

Maglev's disadvantages:

- High cost of installing and maintenance of tracks.
- The electromagnetic field can be harmful to the train crews or local residents.
- Maglev's rail roadways are not suitable for other types of trains that move slowly.
- Maglev's rail roadways require smooth surfaces and no turnings.

Maglev's advantages:

- It has no contact with the ground and therefore no need for any moving parts. As a result there are no components that would wear out which simplify the maintenance of the railways.
- The second advantage: there is no local friction between the train and the rails. Note: there will be air resistance only.
- A third advantage is less noise, because there are no wheels running along.
- The final advantage is speed. As a result of the three previous listed, maglev trains travel extremely fast, i.e. 500 km/h or 300 mph.

Conclusion: This type of train is very advantageous to travel at small distances, for ex. between cities (no more than 1000 km). This is more secure and efficient than air transport. It is faster, because in such case people do not spend time on taking off and landing aircraft. Maglev will be able to take passengers directly from the cities, what means that there will be no time spent in traffic jams for arriving to the airports.

Bibliography:

1. Peter Donovan, *Basic English for Science*: Oxford University press, Oxford, 1995, p. 147.
2. www.wikipedia.org/wiki/MAGLEV_train 19.02.20010.