











Transport Operation
Technology –
Short history of Transport

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BME Faculty of Transportation Engineering and Vehicle Engineering

- Department of Material handling and Logistic Systems
- Department of Automotive Technologies
- Department of Vehicle and and Vehicle Structure Analysis
- Department of Control for Transport Vehicle System
- **Department of Transport Technology and Economics**
- Department of Railway Vehicles, Aircraft and Ships
- Technical Training Center



Transport history

History of:

- Urban transport (Budapest)
- Water transport
- Railway transport
- Air transport
- Vehicle traffic

1. History of Urban transport

■ 1.1 Beginnings

Horse towed coaches



- Transporting more people simultaneously:
public transport

Omnibus: (1832) more horse → bigger
passenger volume



- XIX. s. due to its industrial revolution, the size of cities is significantly increased → major demands on public transport:
Horse Railway (1866)



Appearance of a steam engine: Funicular (1870)



Decrease in the size of steam engines – use on mobile vehicles

- *Svábhegy cog railway(1874)*



The HÉVs also appear as a result of industrialization

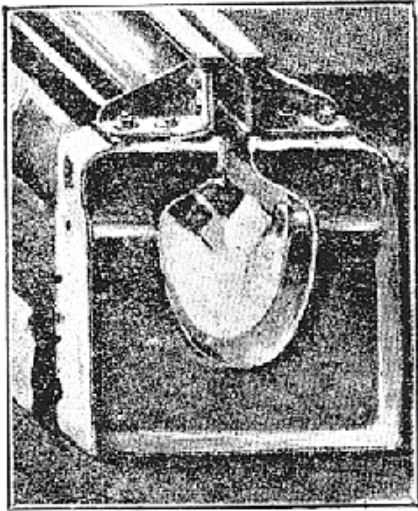
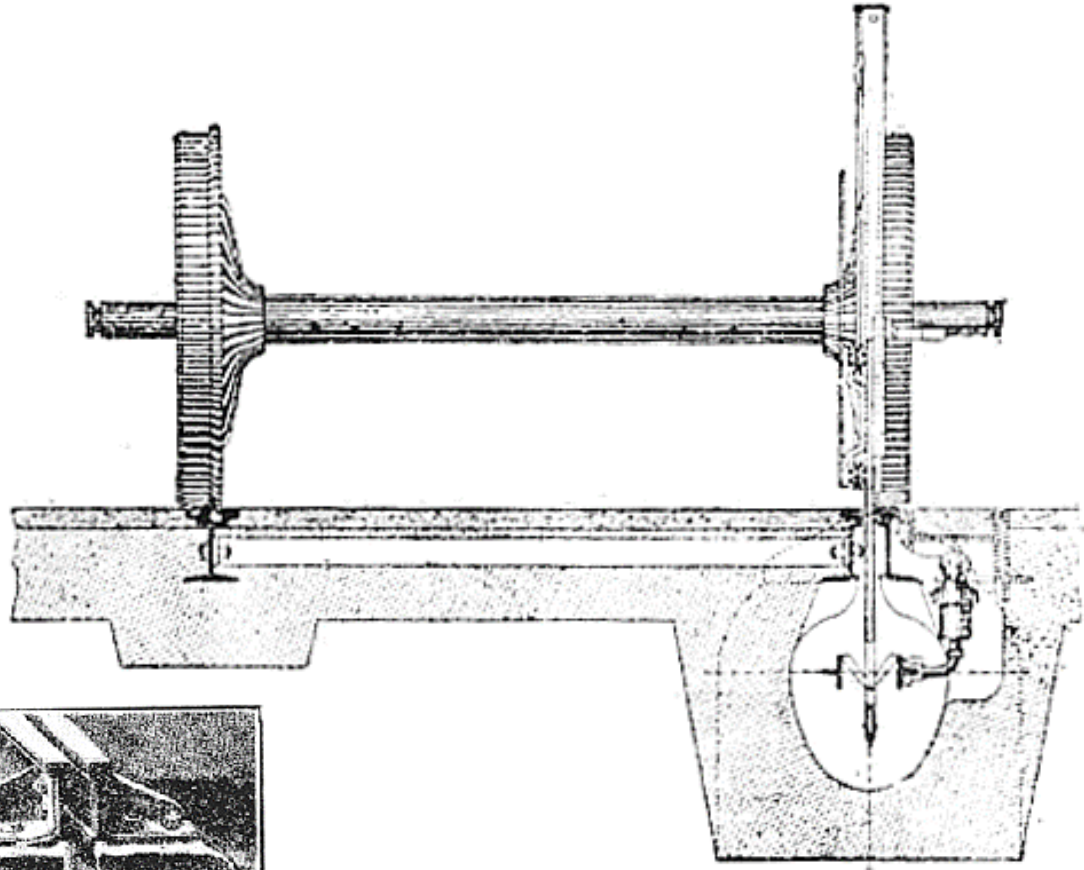
They mainly deliver agricultural produce to the capital (1887)



1.2 The appearance of electricity

- *1887 - Nyugati pu – Király utca*
- *max. 10 km/h; 145 V*







- Trolibus Berlin: 1892, Óbuda (Part of Budapest): 1933





■ 1.3 Internal combustion engine - Bus

- End of 19th century – Firstly bigger car with 5-6 person
- Beginning of 20th century vehicles with 30-40 people double.
- At first, there were wooden vehicles with wooden seats.
- IKARUS a major bus company.



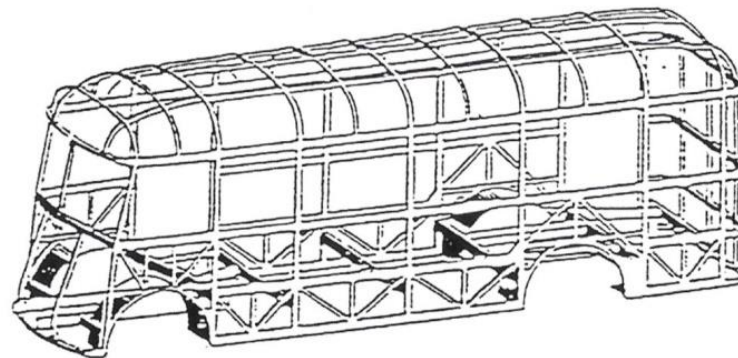
First bus Karl Benz (1896)



Bus, made by Rába factory (1932)



Ikarus 30: the first self-supporting bodywork vehicle



Self-supporting structure



Ikarus 66



Trailer for buses



The first articulated bus



Ikarus 200 series

■ 1.4 Metro

Line 2.

- Planning 1950-1954; and from 1963
- First track: 1970. Fehér út – Deák Ferenc tér (in 1972 the whole line)



Metro line 3.

- 1976: Deák Ferenc tér – Nagyvárad tér
- 1980: Kőbánya-Kispest
- 1981: north to Lehel square
- 1984: Árpád híd
- 1990: Újpest központ

Metro line 4.

- Building: 2006-2014
- Price: 452 billion Ft (1.5 billion Euro);
that is 332 billion Ft (1.1 billion Euro) more than planned





2. History of shipping

2.1 Creation of ships

- Among all transport sub-sectors, the history of shipping dates back to the oldest – Wood floats in the water
- In the Tigris and Euphrates rivers, as there are few wood-animal-made vessels in desert countries



Santa Maria, Cristoforo Colombo



Rowing-sailing boat

- XVIII. century, capitalism needs more accurate and reliable vessels
- appearance of steam engines – shipbuilding
- At first, steam engines are only auxiliary (secondary)





■ 2.2 Inland waterway transport

- Even though the steamship is the conqueror of the rivers, the history of the ships is still related to the seas
- River ships are usually smaller, and water scarcity is more restrictive than navigability.

- Downhole rafts - rafts
- Maneuvering towards a flow - maneuvering with animal force (possibly with a locomotive)





Teilansicht von d



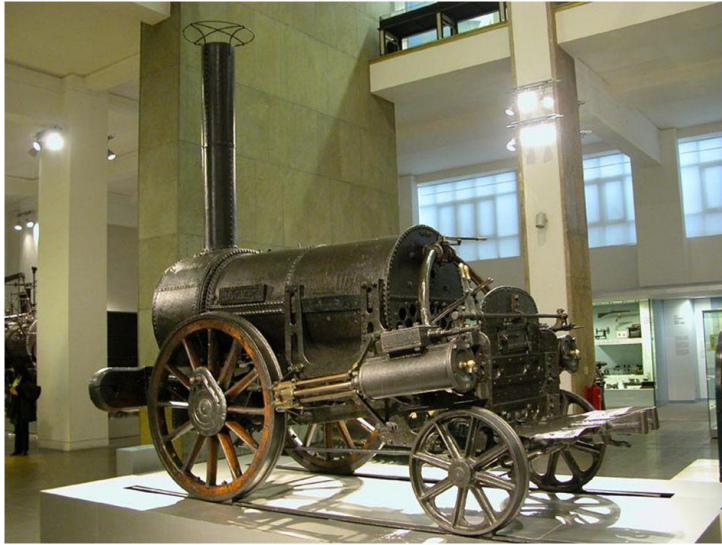
Teilansicht von der Treidelbahn.

■ 2.3 Shipping nowad



3. The history of the railway

- The first steam locomotive was built by a certain R. Trevithick: in 1804 he was able to remove a loaded silhouette
- However, George Stephenson's name was better preserved: the steam engine of his "Rocket" was towed between Stockton and Darlington on 27 September 1825 on the first train
- 1830: Year of the Manchester-Liverpool steam-powered train from which rail traffic can be calculated

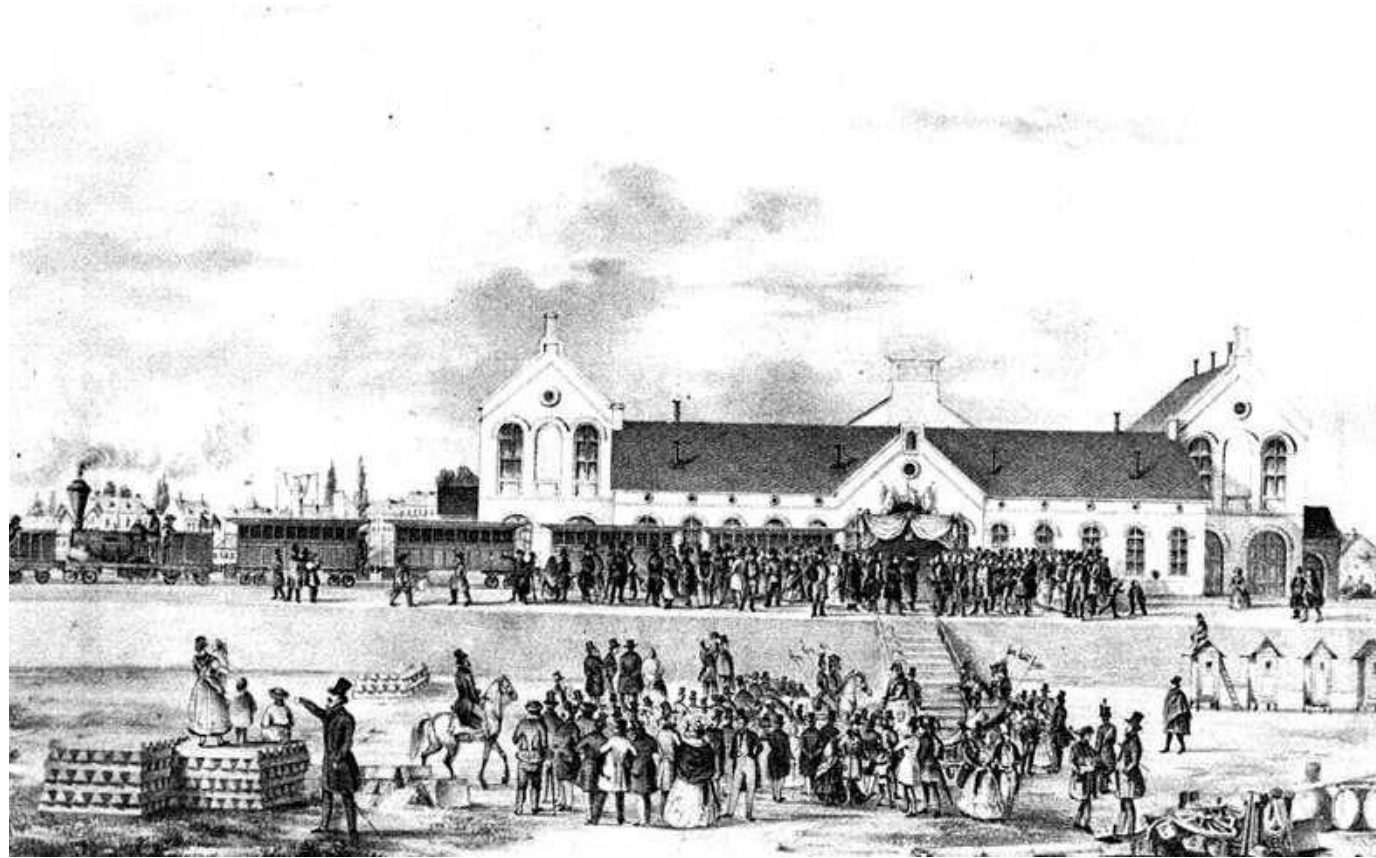


„Rocket” steam engine

A Stockton Darlington
opening a line



- In Hungary, the first railway line opened in 1846 between Pest and Vác, as part of the Pest-Vienna railway line.





The recorder is a locomotive named "Mallard"



Steam engine „424”

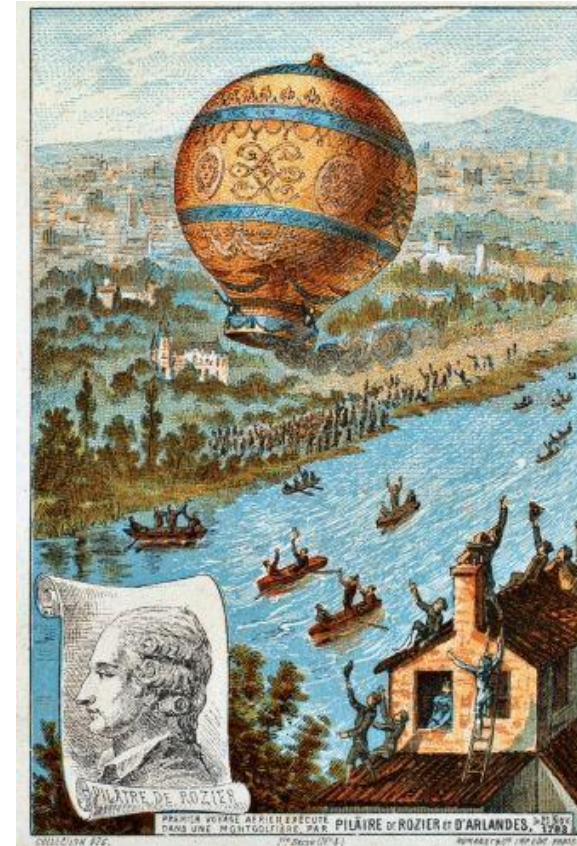




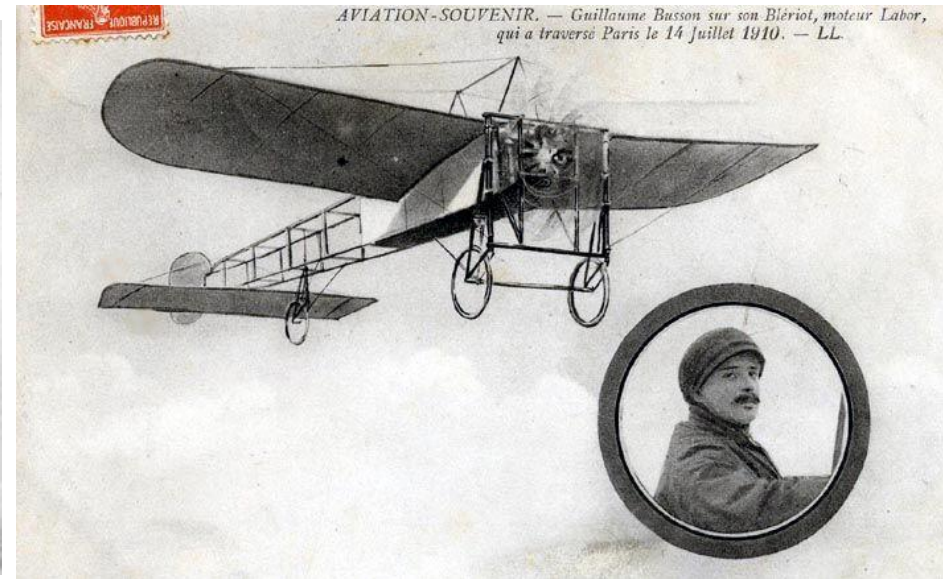
4. History of flight

■ 4.1 Technical development

- 1783 France's first hot-air balloon
- Lighter gases than air use - airship



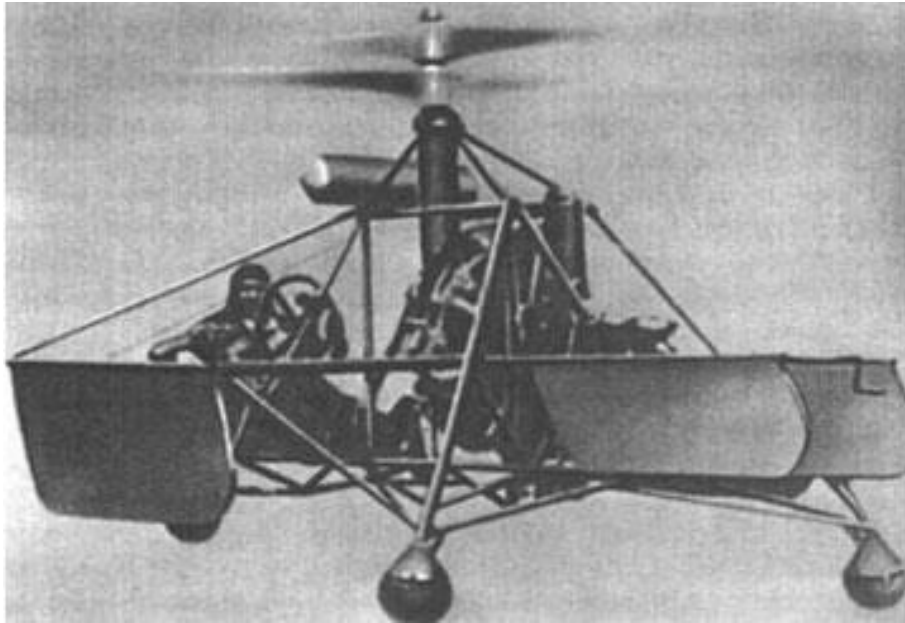
- **Wright brothers** 1903 propeller aircraft
- In 1909 the Frenchman Bleriot managed to navigate the La Manche channe



- Technological development - Stronger aircraft engines → larger and faster aircrafts
- First passenger airplane have also appeared
- Oceans fly over for the first time 1919 two people, 1927 Charles Lindbergh



Helicopters before World War II years



Asbóth Oszkár


- Propeller-driven machines 7-800 km/h
- Radiation gears - supersonic flying 1947





■ 4.2 Development of air control

- Initially in good weather - orientation with land vision
- Taking over from shipping: air navigation, aeronautics, air-navigation.
- Around 1920 in America on Night Route (mail flight) on light deducted route like lighthouse shelters

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- I. world war has brought significant technical upheaval
 - The name of a larger building must be written on top
 - Radio on board of airplanes
 - Desided on earth the position of airplanes
 - Determination of Route Network and Aerial Caps
 - In 1927, frequency allocation

Radar control

- II. World War Achievement is the radar
- Systems for bombing bombers allowed regular intercontinental flights
- The spread of short and ultra-short wave radio waves → the morze signals are replaced by the loudspeaker
- Radar control is used to control process control
- Reply sensors




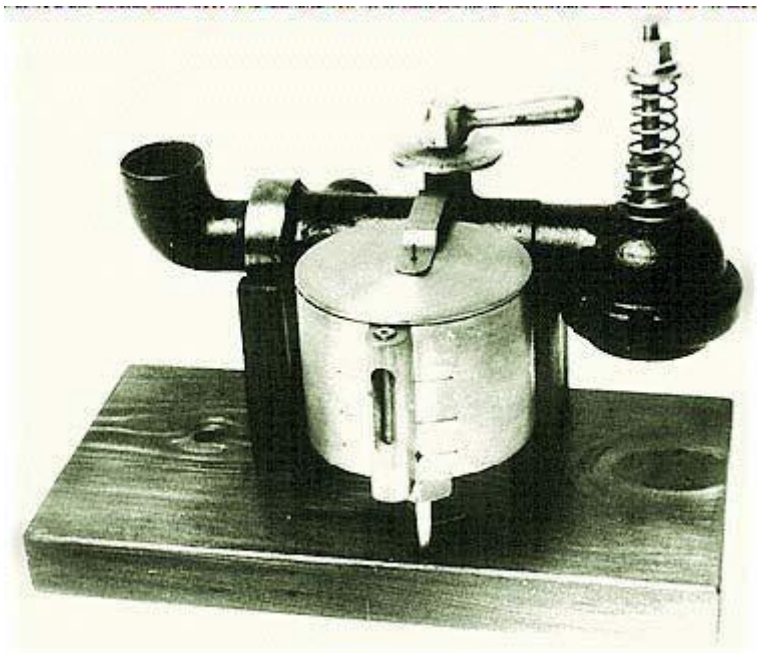
5. The history of car

- Cugnot 1769

It was born earlier than the steam locomotive




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- XIX. s. combustion engine
 - at first gas vaporation
 - then carburation: Donát Bánki - János Csonka
 - (W. Maybach's invention lasted half a year ago)
 - First Petrol Vehicle 1884, France.
 - Quite like a horse carriage



Bánki-Csonka carburator


1886 first car of Carl Benz

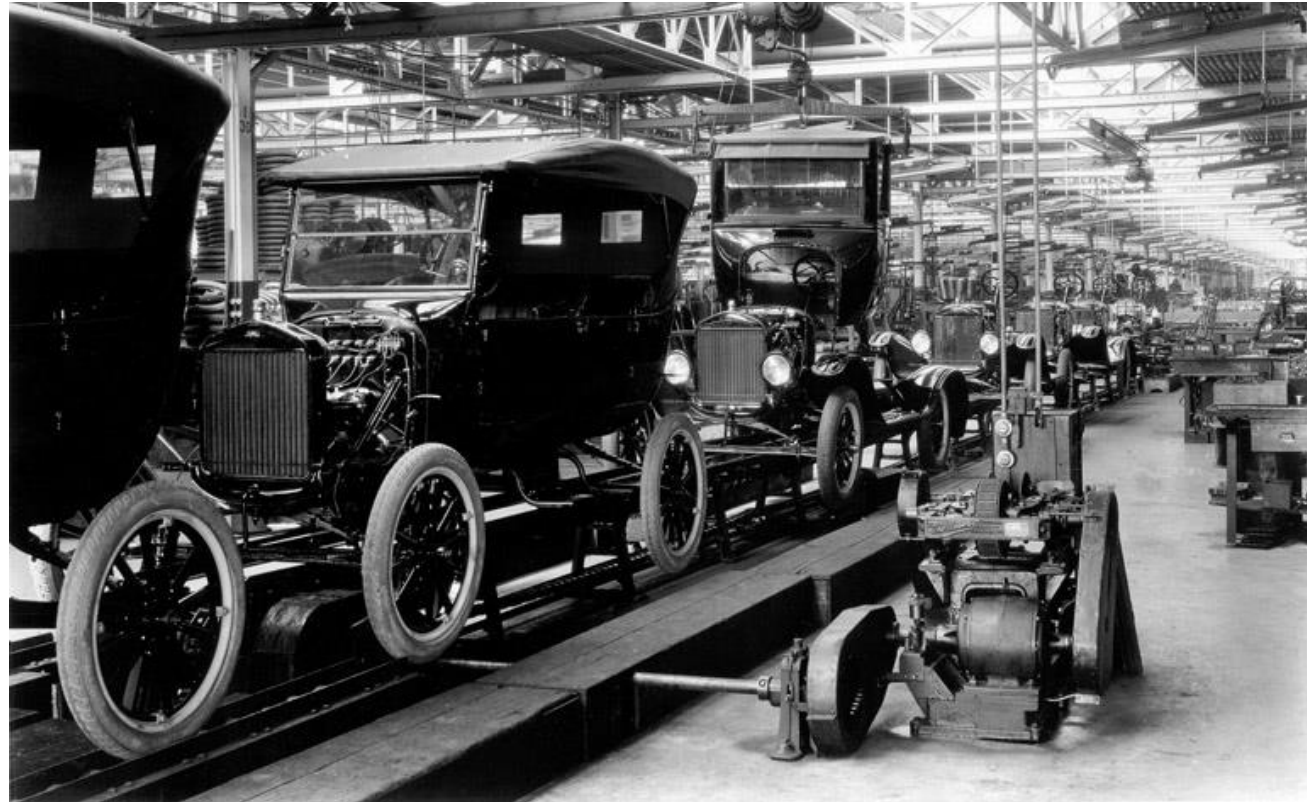


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- For stronger engines, ladder-shaped steel frames have been built
 - The body was also made of wood (filth injuries); metal enclosure and metal fabrication.
 - From 1930 on, smaller cars did not have a chassis - self-supporting structure.
 - XIX. s. even open cars (typical "driver" dress)
 - 1890 lamps at the front of the car (at first petrol lamp or oil lamp; early carb., 1910 electric)



Post car by Csonka János the only one peace in BME „J” building

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- Ford T Model - Series Production (There were also A-S models)
 - Chief Constructor, Chief Engineer, Director Galamb József:
 - Today, comfort, security, support electronics, emission control programs ...



Ford T modell