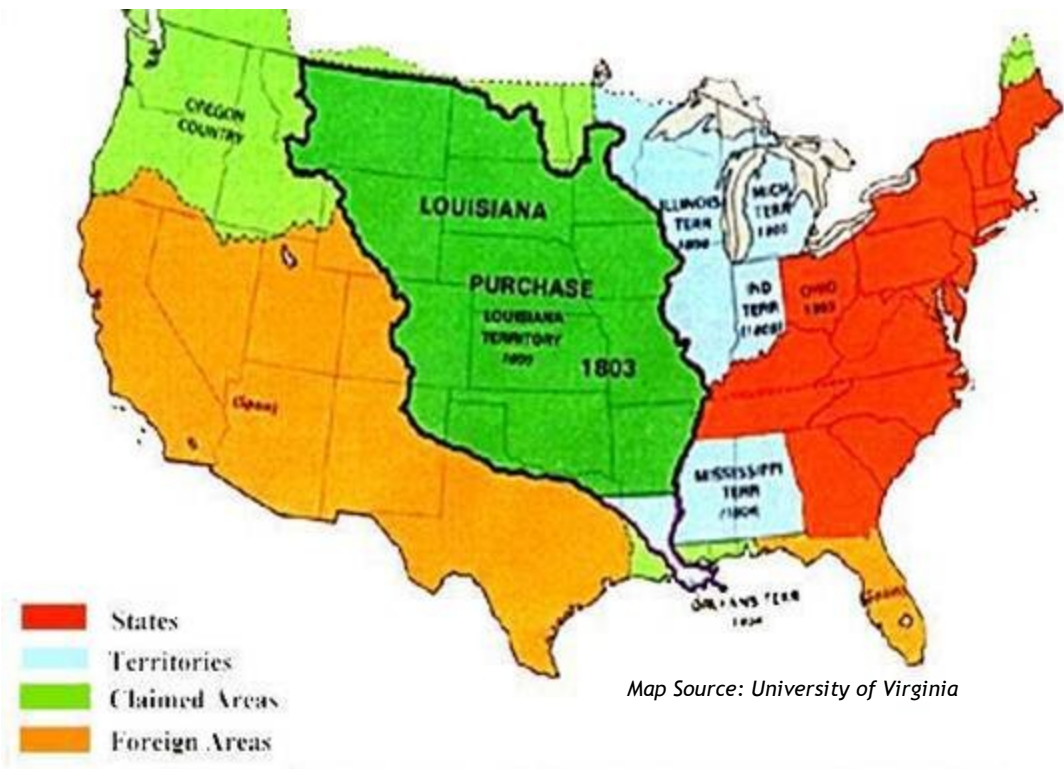


Transportation

1801 - 1859



U.S. States and Territories



1810

1803 Louisiana Purchase

1810 West Florida Annexed

1816

Cast-Iron Tunnel Shield

Who: Isambard Kingdom Brunel
(Inventor)

Where: England

Why: Brunel's shield makes it possible to tunnel where it was previously impossible.

Isambard Kingdom Brunel invented the cast-iron tunneling shield—a device that supports the earth while miners dig tunnels. The shield makes it possible to tunnel under water and soft earth - previous obstacles to tunnels—and protects workers from cave-in by placing them in a protective shell. It was first used to build his father Marc Brunel's most notable engineering achievement—the Thames Tunnel under the Thames River in London. Construction of the tunnel began in 1825 but it would not be completed until 1843. Most modern tunnels are still cut in this way. Brunel's economic incentive for creating the shield was profit for his family's business.

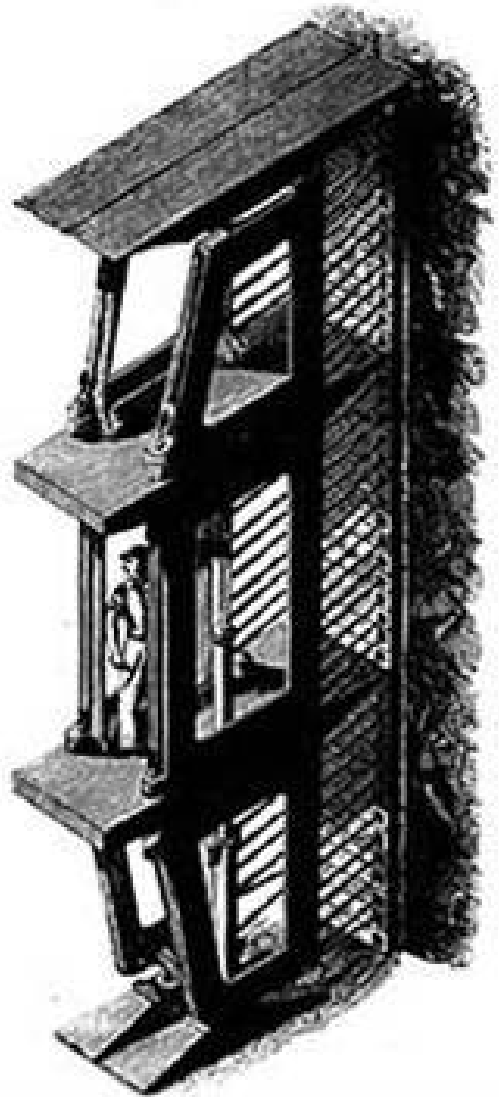


Image Source: PBS



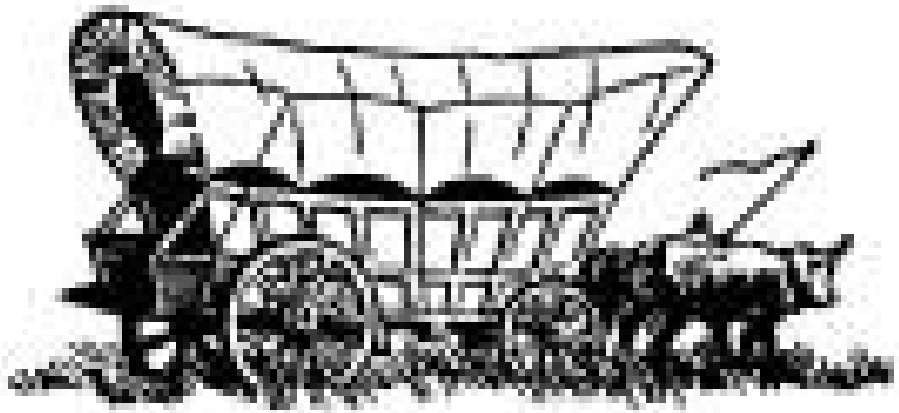
1830

Preemption Act

Congress grants settlers the right to purchase up to 160 acres of public land which they have cultivated for at least 12 months at \$1.25 per acre, The Act offers "squatters" some protection against speculators who purchase lands they have already improved..

1841

Emigration across the Rocky Mountains



John Bidwell leads the first wagon train of settlers over the Rocky Mountains. Half go to California while the rest go to Oregon. It takes about six months to make the approximately 2,000-mile route.

1848

Gold Discovered in California

FOR CALIFORNIA!
DIRECT

EXTRAORDINARY INDUCEMENTS!!
THIRTY-FIVE DAYS TO GOLD REGIONS!

The "California Steam Navigation Co."
Will dispatch their first vessel from New York, the NEW and SPLENDID

STEAM SHIP!
NICARAGUA

DAVID JERROLD, Master, positively
On FRIDAY, MARCH 23d, 1849,
Via the River St. Juan and Lake Nicaragua, across the Isthmus of Panama.

Capt. BRANSON, of the U. S. Topographical Engineers.

200 JACK ASSES!

The Quickest, Safest and Cheapest!!
Price of Passage Through Ninety Dollars!
To be paid in SPECIE, Dollars and Half Dollars, taken only.

For further particulars apply on board, at the foot of South Street, N. Y. or to the undersigned Agents for the Company. Applications by mail, in most situations, must be post paid, addressed to the Company's Agents.
HOBSON, BROTHERS & Co., 127 Wall Street, (opposite the Bullhead.)

Image Source: Wikipedia

1848

Reinforced Concrete

Who: Jean-Louis Lambot
(Inventor)

Where: France

Why: Reinforced concrete reduces the cost of building large structures such as tunnels and bridges.



Image Source: Connecticut Dept. of Transportation

This photo shows construction of an early reinforced concrete bridge during the early 1900s. Concrete is a mixture of sand, stone and cement that hardens into a rock-like mass when mixed with water. Reinforced concrete has metal bars or fibers that add strength. Today most reinforcement is made of steel. The first known use of reinforced concrete is credited to Jean-Louis Lambot in 1848 by. An advantage of reinforced concrete is that both the concrete and the steel are relatively inexpensive yet strong materials for building large structures. Concrete also promises lower maintenance costs when compared with exposed metal which requires frequent painting and replacement of rusted components. Higher profits through reduced production costs and the ability to produce larger structures were the economic incentives leading to the use of reinforced concrete.

1856

Bessemer Process

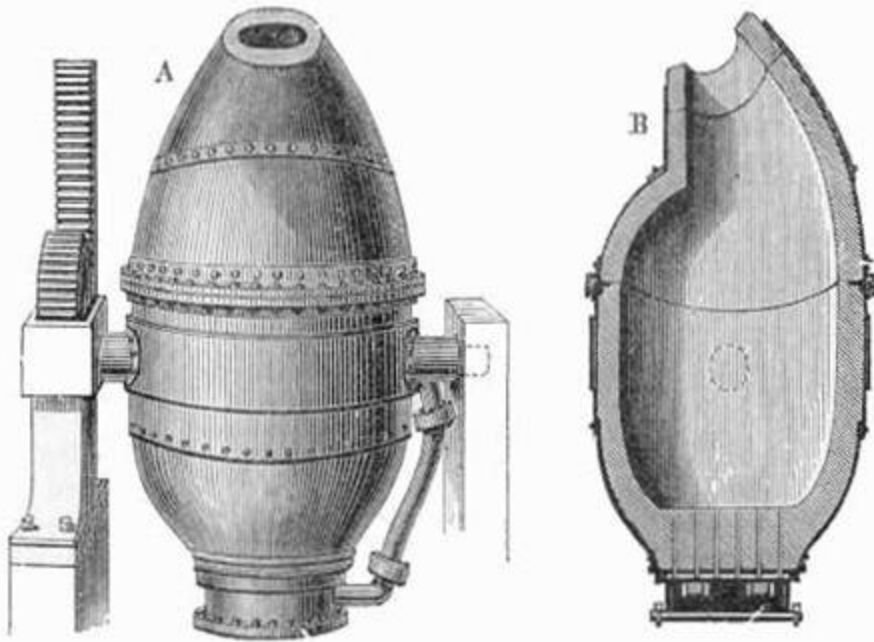


Image Source: Wikipedia

Who: Henry Bessemer (Inventor)

Where: USA

Why: The ability to mass produce steel provided an inexpensive replacement for wrought iron.

Steel is iron with a carbon alloy that allows the metal to be plastically formed (pounded, rolled, etc.). Prior to 1855, steel was expensive to produce and used only for a limited number of purposes where a particularly hard or flexible metal was needed, as in the cutting edges of tools and springs. Henry Bessemer solved the problem of mass-producing steel by injecting air through the molten iron. A typical Bessemer converter could convert 25 ton of pig iron to steel in half an hour. The advancements of Bessemer and others during the 19th century made steel an inexpensive commodity that replaced wrought iron for most purposes. Higher profits were the incentive for Bessemer's efforts—the mass production of steel reduced production costs in many industries.

1859

Oil Well (U.S.)



Image Source: Pennsylvania Historical & Museum Commission

Who: Edwin Drake

Where: USA--Pennsylvania

Why: The first U.S. oil strike opens way for fuel-powered machinery.

“Colonel” Edwin Drake is credited as being the first to drill for and strike oil in the U.S. Petroleum oil was known prior to this but there was no real market for it. Drake’s employers were seeking enough crude oil to establish a new enterprise—providing kerosene for lamps. They had no idea how it would also revolutionize transportation as a fuel source.

1859

Internal Combustion Engines and Tractor

Who: Etienne Lenoir

Where: Belgium

Why: First internal combustion engine produced in a significant quantity spurs many to make improvements result in engines used today.



In 1859, Lenoir's begins producing a two cylinder, two-stroke internal combustion engine. The first to be produced in numbers—less than 500—it has an electric ignition and uses illumination gas (not gasoline). The next year, Lenoir introduces the Hippomobile - a tractor - using the world's first hydrogen internal combustion engine. The 1-cylinder engine generated hydrogen via the electrolysis of water. Most applications of the internal combustion engine at this time were as a stationary power plant—powering printing presses, water pumps, or machine tools. Other engineers began making improvements in internal combustion technology which soon rendered the Lenoir engines obsolete.