THE STEEL PLOW

Who invented the steel plow? John Deere invented the steel plow.

What was it used for? It was used for farming to break up tough soil without soil getting stuck to it.

When was it invented or first used? John Deere invented the steel plow in 1837 when the Middle-West was being settled. The soil was different than that of the East and wood plows kept breaking.

Where was it created or discovered ? He invented it in Grand Detour, Illinois where he had settled.

Why was it invented? Wood plows couldn't plow the rich soil of the Middle-West without breaking. John Deere thought about it and was convinced that only a plow with mould board, made of good steel that isn't rusted would solve this problem.

How was it invented or discovered? He made his first plow out of an old blade saw. He then did tests on different types of soil.

Trivia John Deere was born in Vermont in 1804. In 1825 he started his career as a blacksmith. He moved west in the 1830's when times got tough. Many problems prevented the making of the steel plows. Steel was hard to find. In the beginning steel had to come from Great Britain. Ten years after the first plow was made, Deere's company was making 1000 plows a year. The steel plow was the first step to making farm equipment that we know today. A single plow shank led to making a plow with more and more shanks to cover more ground. Americans were able to plant enough crops to take care of our growing nation.

Sources used:

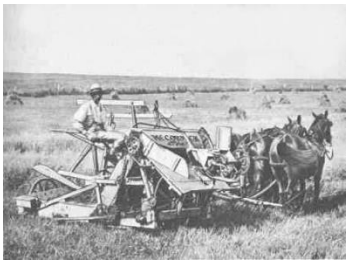
http://inventors.about.com/library/bldeere.htm http://www.monfortsa.be/johndeere/histo_jd.htm http://en.wikipedia.org/wiki/Steel_plow

THE MCCORMICK REAPER

By Mary Bellis

Cyrus McCormick of Virginia was responsible for liberating farm workers from hours of back-breaking labor by introducing the farmers to his newly invented mechanical reaper in July, 1831. By 1847, Cyrus McCormick began the mass manufacture of his reaper in a Chicago factory.

Extracts from:
Nature Bulletin No. 759 June 6, 1964
Forest Preserve District of Cook County
Seymour Simon, President
Roberts Mann, Conservation Editor



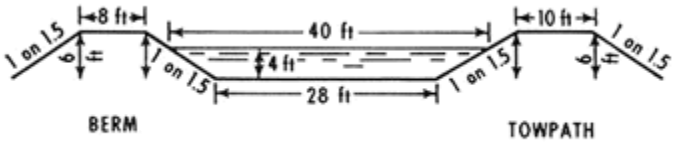
The invention of two successful reaping machines - independently by Obed Hussey in Ohio, who obtained the first patent in 1834, and by Cyrus Hall McCormick in Virginia - brought about an end to tedious handiwork and encouraged the invention and manufacture of other labor-saving farm implements and machinery. The first reapers cut the standing grain and, with a revolving reel, swept it onto a platform from which it was raked off into piles by a man walking alongside. It could harvest more grain than five men using the earlier cradles. The next innovation, patented in 1858, was a self-raking reaper with an endless canvas belt that delivered the cut grain to two men who riding on the end of the platform, bundled it. Meanwhile, Cyrus McCormick had moved to Chicago, built a reaper factory, and founded what eventually became the International Harvester Company. In 1872 he produced a reaper which automatically bound the bundles with wire. In 1880, he came out with a binder which, using a magical knotting device (invented by John F. Appleby a Wisconsin pastor) bound the handles with twine.

The reaper was eventually replaced by the self-propelled combine, operated by one man, which cuts gathers, threshes, and sacks the grain mechanically. The reaper was the first step in a transition from hand labor to the mechanized farming of today. It brought about an industrial revolution, as well as a vast change in agriculture.

The Erie Canal or "Clinton's Big Ditch"

The Erie Canal is famous in song and story. Proposed in 1808 and completed in 1825, the canal links the waters of Lake Erie in the west to the Hudson River in the east. An engineering marvel when it was built, some called it the Eighth Wonder of the World.

In order to open the country west of the Appalachian Mountains to settlers and to offer a cheap and safe way to carry produce to a market, the construction of a canal was proposed as early as 1768. However, those early proposals would connect the Hudson River with Lake Ontario near Oswego. It was not until 1808 that the state legislature funded a survey for a canal that would connect to Lake Erie. Finally, on July 4, 1817, Governor Dewitt Clinton broke ground for the construction of the canal. In those early days, it was often sarcastically referred to as "Clinton's Big Ditch". When finally completed on October 26, 1825, it was the engineering marvel of its day. It included 18 aqueducts to carry the canal over ravines and rivers, and 83 locks, with a rise of 568 feet from the Hudson River to Lake Erie. It was 4 feet deep and 40 feet wide, and floated boats carrying 30 tons of freight. A ten foot wide towpath was built along the bank of the canal for the horses and/or mules which pulled the boats and their driver, often a young boy (sometimes referred to by later writers as a "hoggee").



SECTION OF ORIGINAL ERIE CANAL

In order to keep pace with the growing demands of traffic, the Erie Canal was enlarged between 1836 and 1862. The "Enlarged Erie" was 70 feet wide and 7 feet deep, and could handle boats carrying 240 tons. The number of locks was reduced to 72. Most of the remaining traces of the Old Erie Canal are from the Enlarged Erie era.

In 1903, the State again decided to enlarge the canal by the construction of what was termed the "Barge Canal", consisting of the Erie Canal and the three chief branches of the State system -- the Champlain, the Oswego, and the Cayuga and Seneca Canals. The resulting canal was completed in 1918, and is 12 to 14 feet deep, 120 to 200 feet wide, and 363 miles long, from Albany to Buffalo. 57 Locks were built to handle barges carrying up to 3,000 tons of cargo, with lifts of 6 to 40 feet. This is the Erie Canal which today is utilized largely by recreational boats rather than cargo-carrying barges.

TELEGRAPH AND MORSE CODE

In 1844, Morse sent his first telegraph message, from Washington, D.C., to Baltimore, Maryland; by 1866, a telegraph line had been laid across the Atlantic Ocean from the U.S. to Europe. Although the telegraph had fallen out of widespread use by the start of the 21st century, replaced by the telephone, fax machine and Internet, it laid the groundwork for the communications revolution that led to those later innovations.

The Electric Telegraph

In the early 19th century, two developments in the field of electricity opened the door to the production of the electric telegraph. First, in 1800, the Italian physicist Alessandro Volta (1745-1827) invented the battery, which reliably stored an electric current and allowed the current to be used in a controlled environment. Second, in 1820, the Danish physicist Hans Christian Oersted (1777-1851) demonstrated the connection between electricity and magnetism by deflecting a magnetic needle with an electric current. While scientists and inventors across the world began experimenting with batteries and the principles of electromagnetism to develop some kind of communication system, the credit for inventing the telegraph generally falls to two sets of researchers: Sir William Cooke (1806-79) and Sir Charles Wheatstone (1802-75) in England, and Samuel Morse, Leonard Gale (1800-83) and Alfred Vail (1807-59) in the U.S.

In the 1830s, the British team of Cooke and Wheatstone developed a telegraph system with five magnetic needles that could be pointed around a panel of letters and numbers by using an electric current. Their system was soon being used for railroad signaling in Britain. During this time period, the Massachusetts-born, Yale-educated Morse (who began his career as a painter), worked to develop an electric telegraph of his own. He reportedly had become intrigued with the idea after hearing a conversation about electromagnetism while sailing from Europe to America in the early 1830s, and later learned more about the topic from American physicist Joseph Henry (1797-1878). In collaboration with Gale and Vail, Morse eventually produced a single-circuit telegraph that worked by pushing the operator key down to complete the electric circuit of the battery. This action sent the electric signal across a wire to a receiver at the other end. All the system needed was a key, a battery, wire and a line of poles between stations for the wire and a receiver.

Morse Code

To transmit messages across telegraph wires, in the 1830s Morse and Vail created what came to be known as Morse code. The code assigned letters in the alphabet and numbers a set of dots (short marks) and dashes (long marks) based on the frequency of use; letters used often (such as "E") got a simple code, while those used infrequently (such as "Q") got a longer and more complex code. Initially, the code, when transmitted over the telegraph system, was rendered as marks on a piece of paper that the telegraph operator would then translate back into English. Rather quickly, however, it became apparent that the operators were able to hear and understand the code just by listening to the clicking of the receiver, so the paper was replaced by a receiver that created more pronounced beeping sounds.

Did You Know?

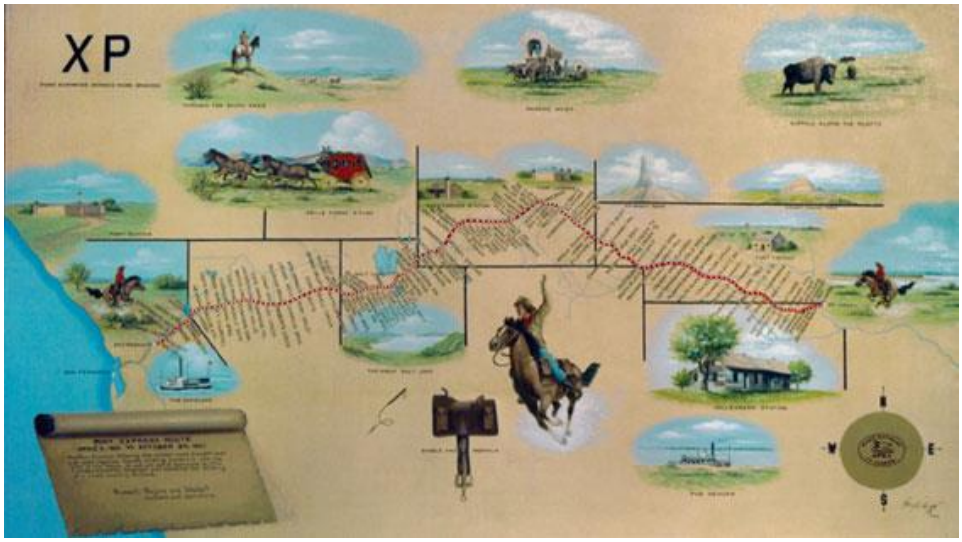
SOS, the internationally recognized distress signal, does not stand for any particular words. Instead, the letters were chosen because they are easy to transmit in Morse code: "S" is three dots, and "O" is three dashes.

On May 24, 1844, Samuel Morse sends the telegraph message "What hath God wrought?" from the Supreme Court chamber in the Capitol in Washington, D.C., to the B & O Railroad Depot in Baltimore, Maryland.

THE PONY EXPRESS

The Pony Express was founded by William H. Russell, William B. Waddell, and Alexander Majors. Plans for the Pony Express were spurred by the threat of the Civil War and the need for faster communication with the West. The Pony Express consisted of relays of men riding horses carrying saddlebags of mail across a 2000-mile trail. The service opened officially on April 3, 1860, when riders left simultaneously from St. Joseph, Missouri, and Sacramento, California. The first westbound trip was made in 9 days and 23 hours and the eastbound journey in 11 days and 12 hours. The pony riders covered 250 miles in a 24-hour day.

Eventually, the Pony Express had more than 100 stations, 80 riders, and between 400 and 500 horses. The express route was extremely hazardous, but only one mail delivery was ever lost. The service lasted only 19 months until October 24, 1861, when the completion of the Pacific Telegraph line ended the need for its existence. Although California relied upon news from the Pony Express during the early days of the Civil War, the horse line was never a financial success, leading its founders to bankruptcy. However, the romantic drama surrounding the Pony Express has made it a part of the legend of the American West.



STEAMBOATS

In 1769, the Scotsman James Watt patented an improved version of the steam engine that ushered in the Industrial Revolution. The idea of using steam power to propel boats occurred to inventors soon after the potential of Watt's new engine became known.

John Fitch was granted his first United States patent for a steamboat on August 26, 1791. However, he was granted his patent only after a battle with James Rumsey over claims to the same invention. Both men had similar designs.

John Fitch constructed four different steamboats between 1785 and 1796 that successfully plied rivers and lakes and demonstrated, in part, the feasibility of using steam for water locomotion. His models utilized various combinations of propulsive force, including ranked paddles (patterned after Indian war canoes), paddle wheels, and screw propellers. While his boats were mechanically successful, Fitch failed to pay sufficient attention to construction and operating costs and was unable to justify the economic benefits of steam navigation. Robert Fulton (1765-1815) built his first boat after Fitch's death, and it was Fulton who became known as the "father of steam navigation."

Then came American inventor, Robert Fulton, who successfully built and operated a submarine (in France) in 1801, before turning his talents to the steamboat. Robert Fulton was accredited with turning the steamboat into a commercial success. On August 7, 1807, Robert Fulton's Clermont went from New York City to Albany making history with a 150-mile trip taking 32 hours at an average speed of about 5 miles-per-hour.

In 1811, the "New Orleans" was built at Pittsburgh, designed by Robert Fulton and Robert Livingston. The New Orleans had a passenger and freight route on the lower Mississippi River. By 1814, Robert Fulton together with Edward Livingston (the brother of Robert Livingston), were offering regular steamboat and freight service between New Orleans, Louisiana and Natchez, Mississippi. Their boats traveled at the rates of eight miles per hour downstream and three miles per hour upstream.

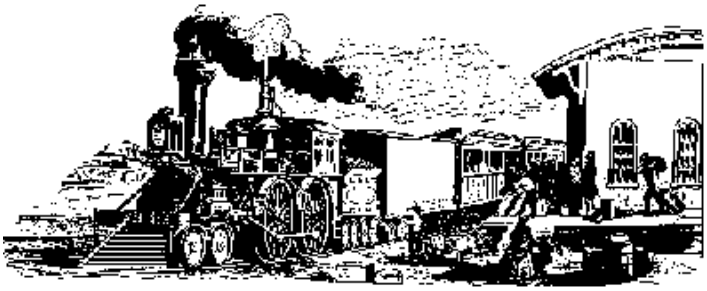
In 1816, Henry Miller Shreve launched his steamboat Washington, which completed the voyage from New Orleans to Louisville, Kentucky in twenty-five days. Vessel design continued to improve, so that by 1853, the trip to Louisville took only four and one-half days.

Between 1814 and 1834, New Orleans steamboat arrivals increased from 20 to 1200 a year. The boats transported cargoes of cotton, sugar, and passengers. Throughout the east, steamboats contributed greatly to the economy by transporting agricultural and industrial supplies.

RAILROAD

By Mary Bellis

The invention of the steam engine was critical to the invention of the modern railroad and trains. In 1803, a man named Samuel Homfray decided to fund the development of a steam-powered vehicle to replace the horse-drawn carts on the tramways. Richard Trevithick (1771-1833) built that vehicle, the first steam engine tramway locomotive. On February 22, 1804, the locomotive hauled a load of 10 tons of iron, 70 men and five extra wagons the 9 miles between the ironworks at Pen-y-Darron in the town of Merthyr Tydfil, Wales to the bottom of the valley called Abercynnon. It took about two hours.



In September, 1825, the Stockton & Darlington Railroad Company began as the first railroad to carry both goods and passengers on regular schedules using locomotives designed by English inventor, George Stephenson. Stephenson's locomotive pulled six loaded coal cars and 21 passenger cars with 450 passengers over 9 miles in about one hour.

George Stephenson is considered to be the inventor of the first steam locomotive engine for railways. Richard Trevithick's invention is considered the first tramway locomotive, however, it was a road locomotive, designed for a road and not for a railroad. Stephenson was extremely poor growing up and received little formal education. He worked in local collieries and was self-taught in reading and writing. In 1812, he became a colliery engine builder, and in 1814 he built his first locomotive for the Stockton and Darlington Railway Line. Stephenson was hired as the company engineer and soon convinced the owners to use steam motive power and built the line's first locomotive, the Locomotion. In 1825, Stephenson moved to the Liverpool and Manchester Railway, where together with his son Robert built (1826-29) the Rocket.

Colonel John Stevens is considered to be the father of American railroads. In 1826 Stevens demonstrated the feasibility of steam locomotion on a circular experimental track constructed on his estate in Hoboken, New Jersey, three years before George Stephenson perfected a practical steam locomotive in England. The first railroad charter in North America was granted to John Stevens in 1815. Grants to others followed, and work soon began on the first operational railroads.

Designed and built by Peter Cooper in 1830, the Tom Thumb was the first American-built steam locomotive to be operated on a common-carrier railroad.

The Pullman Sleeping Car was invented by George Pullman in 1857. Pullman's railroad coach or sleeper was designed for overnight passenger travel. Sleeping cars were being used on American railroads since the 1830s, however, early sleepers were not that comfortable and the Pullman Sleeper was very comfortable.

TURNPIKES

A toll road (also tollway, turnpike, toll highway, or express toll route) is a privately or publicly built road for which a driver pays a toll (a fee) for use.

Early Turnpikes in America

The first American turnpike road was a state enterprise, authorized by a Virginia act of 1785. The first American turnpike to be constructed and operated by a private corporation was the Lancaster Turnpike built (1792) in Pennsylvania. Thereafter turnpikes were regularly private enterprises, and turnpike corporations held the leadership in the development of the American corporation system. The construction of turnpikes proceeded rapidly, and by 1825 a map of the Eastern states showing the turnpikes would have looked much like a present-day map showing the railroads. Famous turnpikes included the post road from New York to Boston (now part of U.S. 1), the two roads from New York to Albany (on the two sides of the Hudson River), and the roads from Albany to Buffalo, main lines of communication with the developing West.

Construction and Traffic in the Early Nineteenth Century

Construction of one of the early roads usually began with felling trees and uprooting stumps. Swamps were crossed by corduroy, i.e., logs laid side by side. The surface of the turnpike was sometimes of earth, but often of broken stone or of planks. American turnpikes thrived from c.1800 to c.1840, as did the passenger stagecoach and the Conestoga wagon. The coach had places for 8 to 14 passengers and was drawn by four or six horses; the wagon, for freight, was drawn by six or eight horses. The traffic over the turnpikes also included droves of horses, cattle, and sheep. Settlers going West often used turnpikes on the first part of their route. Tollgates were 6 to 10 mi (9.7–16.1 km) apart, and tolls were commonly from 10¢ to 25¢ for a vehicle, depending on its type. Turnpikes that were not profitable were turned over to the states. After the coming of canals and railroads, abandonment became general.

THE STEAM ENGINE

Thomas Newcomen (1663-1729)
Thomas Newcomen was an English blacksmith, who invented the atmospheric steam engine, an improvement over Thomas Slavery's previous design.The Newcomen steam engine used the force of atmospheric pressure to do the work. Thomas Newcomen's engine pumped steam into a cylinder. The steam was then condensed by cold water which created a vacuum on the inside of the cylinder. The resulting atmospheric pressure operated a piston, creating downward strokes. In Newcomen's engine the intensity of pressure was not limited by the pressure of the steam, unlike what Thomas Savery had patented in 1698. In 1712, Thomas Newcomen together with John Calley built their first engine on top of a water filled mine shaft and used it to pump water out of the mine. The Newcomen engine was the predecessor to the Watt engine and it was one of the most interesting pieces of technology developed during the 1700's.

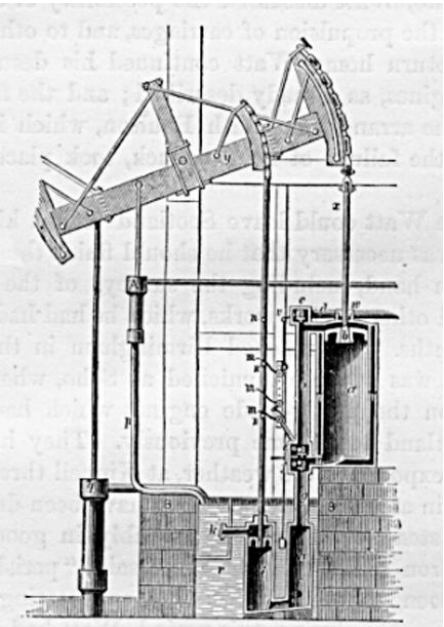


FIG. 26.—Watt's Engine, 1774.

James Watt (1736-1819)
In 1765, James Watt while working for the University of Glasgow was assigned the task of repairing a Newcomen engine, which was deemed inefficient but the best steam engine of its time. That started the inventor to work on several improvements to Newcomen's design. Most notable was Watt's 1769 patent for a separate condenser connected to a cylinder by a valve. Unlike Newcomen's engine, Watt's design had a condenser that could be cool while the cylinder was hot. Watt's engine soon became the dominant design for all modern steam engines and helped bring about the Industrial Revolution. A unit of power called the Watt was named after James Watt. the Watt symbol is W, and it is equal to 1/746 of a horsepower, or one Volt times one Amp.

Since the early 18th century, steam power has been applied to a variety of practical uses. At first it was applied to reciprocating pumps, but from the 1780s rotative engines (i.e. those converting reciprocating motion into rotary motion) began to appear, driving factory machinery such as spinning mules and power looms. At the turn of the 19th century, steam-powered transport on both sea and land began to make its appearance becoming ever more dominant as the century progressed.

Steam engines can be said to have been the moving force behind the Industrial Revolution and saw widespread commercial use driving machinery in factories, mills and mines; powering pumping stations; and propelling transport appliances such as railway locomotives, ships and road vehicles. Their use in agriculture led to an increase in the land available for cultivation.

Very low power engines are used to power models and toys, and specialty applications such as the steam clock.

THE COTTON GIN

In 1793, Eli Whitney invented a simple machine that influenced the history of the United States. He invented a cotton **gin** that was popular in the South. The South became the cotton producing part of the country because Whitney's cotton **gin** was able to successfully pull out the seeds from the cotton bolls. Eli Whitney was born in Westboro, Massachusetts on December 8, 1765 and died on January 8, 1825. As a young boy he liked to work in his father's workshop taking things apart, like clocks, and putting them back together again. When he was a young man, he worked on a Georgian plantation tutoring children. He noticed the trouble the slaves were having picking seed from cotton bolls. In his spare time, he put together an instrument that would allow the slaves to clean more cotton in a shorter amount of time. The cotton **gin** was a very simple invention. First, the cotton bolls were put into the top of the machine. Next, you turn the handle, which turns the cotton through the wire teeth that combs out the seeds. Then the cotton is pulled out of the wire teeth and out of the cotton gin. Farmers were able to plant more cotton. Cotton is easy to grow but because it was so difficult to clean, cotton was not a cash crop. Tobacco and indigo were the South's cash crops. Tobacco is difficult to grow. Tobacco wears out the land and the land must be given a rest once every 7 years. But cotton can grow anywhere, even on land that is drained of its nutrients. Now that cotton is easier to clean and since it grows easily, cotton became the number one cash crop in the South. The farmers needed more land to grow cotton. They took the land from the Native Americans. The farmers needed more workers. Slaves were the free labor that the farmers needed to **harvest** the cotton. This growth of cotton production affected the world. The Northern part of the United States bought more cotton and built more textile mills. England built more textile mills and demanded much more cotton. These were two big markets to which the South sold their cotton. The South was not able to build textile mills because their **capital** was tied up in their slaves so that they could produce more cotton. The South also did not have the need or the **capital** to build up a good transportation system, such as canals and railroads. During the Civil War, the South had many disadvantages over the North. A large portion of their population were uneducated slaves. They had no factories to produce goods and to become self sufficient when they separated from the North. Because the South had not built up a good transportation system, they were not able to move men and supplies easily across the country, as the North was able to do. By 1860, cotton was a cash crop. Cotton production in the South had increased. The number of slaves in the United States had increased. The dependency on slaves had increased. **Capital** had been **invested** in slaves, not in transportation or factories. All this happened because of a very simple machine, the cotton **gin**.