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Thomas Alva Edison

February 11, 1847 - October 18, 1931



Thomas Alva Edison (February 11, 1847 - October 18, 1931) was an American inventor, scientist, and businessman who developed many devices that greatly influenced life around the world, including the phonograph, the motion picture camera, and a long-lasting, practical electric light bulb. Dubbed "The Wizard of Menlo Park" (now Edison, New Jersey) by a newspaper reporter, he was one of the first inventors to apply the principles of mass production and large teamwork to the process of invention, and therefore is often credited with the creation of the first industrial research laboratory.

Edison is considered one of the most prolific inventors in history, holding 1,093 US patents in his name, as well as many patents in the United Kingdom, France, and Germany. He is credited with numerous inventions that contributed to mass communication and, in particular, Telecommunications. These included a stock ticker, a mechanical vote recorder, a battery for an electric car, electrical power, recorded music and motion pictures. His advanced work in these fields was an outgrowth of his early career as a telegraph operator. Edison originated the concept and implementation of electric-power generation and distribution to homes, businesses, and factories - a crucial development in the modern industrialized world. His first power station was on Manhattan Island, New York.

Early life

Thomas Edison was born in Milan, Ohio and grew up in Port Huron, Michigan. He was the seventh and last child of Samuel Ogden Edison, Jr. and Nancy Matthews Elliott. His father had to escape from Canada because he took part in the unsuccessful Mackenzie Rebellion of 1837. Edison considered himself to be of Dutch ancestry. In school, the young Edison's mind often wandered, and his teacher, the Reverend Engle, was overheard calling him "addled". This ended Edison's three months of official schooling. Edison recalled later, "My mother was the making of me. She was so true, so sure of me; and I felt I had something to live for, someone I must not disappoint." His mother homeschooled him.

Much of his education came from reading R.G. Parker's School of Natural Philosophy and The Cooper Union. Edison developed hearing problems at an early age. The cause of his deafness has been attributed to a bout of scarlet fever during childhood and recurring untreated middle-ear infections. Around the middle of his career Edison attributed the hearing impairment to being struck on the ears by a train conductor when his chemical laboratory in a boxcar caught fire and he was thrown off the train in Smiths Creek, Michigan, along with his apparatus and chemicals. In his later years he modified the story to say the injury occurred when the conductor, in helping him onto a moving train, lifted him by the ears.

Edison's family was forced to move to Port Huron, Michigan, when the railroad bypassed Milan in 1854, but his life there was bittersweet. He sold candy and newspapers on trains running from Port Huron to Detroit, and he sold vegetables to supplement his income. This began Edison's long streak of entrepreneurial ventures as he discovered his talents as a businessman. These talents eventually led him to found 14 companies, including General Electric, which is still in existence and is one of the largest publicly traded companies in the world.

Telegrapher

Edison became a telegraph operator after he saved three-year-old Jimmie MacKenzie from being struck by a runaway train. Jimmie's father, station agent J.U. MacKenzie of Mount Clemens, Michigan, was so grateful that he trained Edison as a telegraph operator. Edison's first telegraphy job away from Port Huron was at Stratford Junction, Ontario, on the Grand Trunk Railway. In 1866, at the age of 19, Thomas Edison moved to Louisville, Kentucky, where, as an employee of Western Union, he worked the Associated Press bureau news wire. Edison requested the night shift, which allowed him plenty of time to spend at his two favorite pastimes-reading and experimenting. Eventually, the latter pre-occupation cost him his job.

One night in 1867, he was working with a lead-acid battery when he spilled sulfuric acid onto the floor. It ran between the floorboards and onto his boss's desk below. The next morning Edison was fired. Some of Edison's earliest inventions were related to telegraphy, including a stock ticker. His first patent was for the electric vote recorder, (U. S. Patent 90,646), which was granted on June 1, 1869.

Marriages and children

On December 25, 1871, Edison married 16-year-old Mary Stilwell, whom he had met two months earlier as she was an employee at one of his shops. They had three children:

- Marion Estelle Edison (1873-1965), nicknamed "Dot"
- Thomas Alva Edison, Jr. (1876-1935), nicknamed "Dash"
- William Leslie Edison (1878-1937) Inventor, a graduate of the Sheffield Scientific School at Yale,

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Mary Edison died on August 9, 1884, possibly from a brain tumor.

On February 24, 1886, at the age of thirty nine, Edison married 20-year-old Mina Miller in Akron, Ohio. She was the daughter of inventor Lewis Miller, co-founder of the Chautauqua Institution and a benefactor of Methodist charities. They also had three children:

- Madeleine Edison (1888-1979), who married John Eyre Sloane.
- Charles Edison (1890-1969), who took over the company upon his father's death and who later was elected Governor of New Jersey. He also took charge of his father's experimental laboratories in West Orange.
- Theodore Edison (1898-1992), (MIT Physics 1923), had over 80 patents to his credit. Mina outlived Thomas Edison, dying on August 24, 1947.

Beginning his Career



Edison with his phonograph in 1877

Thomas Edison began his career as an inventor in Newark, New Jersey, with the automatic repeater and his other improved telegraphic devices, but the invention which first gained him notice was the phonograph in 1877. This accomplishment was so unexpected by the public at large as to appear almost magical. Edison became known as "The Wizard of Menlo Park," New Jersey. His first phonograph recorded on tinfoil around a grooved cylinder, but had poor sound quality and the recordings could only be played a few times. In the 1880s, a redesigned model using wax-coated cardboard cylinders was produced by Alexander Graham Bell, Chichester Bell, and Charles Tainter. This was one reason that Thomas Edison continued work on his own "Perfected Phonograph."

Menlo Park (1876-1881)

Edison's major innovation was the first industrial research lab, which was built in Menlo Park, New Jersey. It was built with the funds from the sale of Edison's quadruplex telegraph. The quadruplex telegraph was Edison's first big financial success, and Menlo Park became the first institution set up with the specific purpose of producing constant technological innovation and improvement. Edison was legally attributed with most of the inventions produced there, though many employees carried out research and development under his direction. His staff was generally told to carry out his directions in conducting research, and he drove them hard to produce results.



Edison's Menlo Park Laboratory, removed to Greenfield Village at Henry Ford Museum in Dearborn, Michigan.





Thomas Edison's first successful light bulb model, used in public demonstration at Menlo Park, December 1879.

Edison did not invent the first electric light bulb, but instead invented the first commercially practical incandescent light. Many earlier inventors had previously devised incandescent lamps including Henry Woodward, and Mathew Evans. Others who developed early and not commercially practical incandescent electric lamps included Humphry Davy, James Bowman Lindsay, Moses G. Farmer, William E. Sawyer, Joseph Swan and Heinrich Göbel. Some of these early bulbs had such flaws as an extremely short life, high expense to produce, and high electric current drawn, making them difficult to apply on a large scale commercially.

In 1878, Edison applied the term filament to the element of glowing wire carrying the current, although the English inventor Joseph Swan had used the term prior to this. Swan developed an incandescent light with a long lasting filament at about the same time as Edison, but it lacked the high resistance needed to be an effective part of an electrical utility. Edison and his co-workers set about the task of creating longer-lasting bulbs. In Britain, Joseph Swan had been able to obtain a patent on the incandescent lamp because of an oversight in the drafting of Edison's patent application. Unable to raise the required capital in Britain because of this, Edison was forced to enter into a joint venture with Swan (known as Ediswan).

By 1879, Edison had produced a new concept: a high resistance lamp in a very high vacuum, which would burn for hundreds of hours. While the earlier inventors had produced electric lighting in laboratory conditions, dating back to a demonstration of a glowing wire by Alessandro Volta in 1800, Edison concentrated on commercial application, and was able to sell the concept to homes and businesses by mass-producing relatively long-lasting light bulbs and creating a complete system for the generation and distribution of electricity.

Carbon telephone transmitter

In 1877-78, Edison invented and developed the carbon microphone used in all telephones along with the Bell receiver until the 1980s. After protracted patent litigation, in 1892 a federal court ruled that Edison-and not Emile Berliner-was the inventor of the carbon microphone. The carbon microphone was also used in radio broadcasting and public address work through the 1920s.

Electric light

Building on the contributions of other developers over the previous three quarters of a century, Edison made significant improvements to the idea of incandescent light, and wound up in the public consciousness as "the inventor" of the light bulb. After many experiments with platinum and other metal filaments, Edison returned to a carbon filament. The first successful test was on October 22, 1879; it lasted 40 hours. Edison continued to improve this design and by November 4, 1879, filed for U.S. patent 223,898 (granted on January 27, 1880) for an electric lamp using "a carbon filament or strip coiled and connected to platina contact wires".

Although the patent described several ways of creating the carbon filament including "cotton and linen thread, wood splints, papers coiled in various ways", it was not until several months after the patent was granted that Edison and his team discovered a carbonized bamboo filament that could last over 1,200 hours. The idea of using this particular raw material originated from Edison's recalling his examination of a few threads from a bamboo fishing pole while relaxing on the shore of Battle Lake in the present-day state of Wyoming, where he and other members of a scientific team had traveled so that they could clearly observe a total eclipse of the sun on July 29, 1878, from the Continental Divide.

Electric power distribution

Edison patented a system for electricity distribution in 1880, which was essential to capitalize on the invention of the electric lamp. On December 17, 1880, Edison founded the Edison Illuminating Company. The company established the first investor-owned electric utility in 1882 on Pearl Street Station, New York City. It was on September 4, 1882, that Edison switched on his Pearl Street generating station's electrical power distribution system, which provided 110 volts direct current (DC) to 59 customers in lower Manhattan. Earlier in the year, in January 1882 he had switched on the first steam generating power station at Holborn Viaduct in London. The DC supply system provided electricity supplies to street lamps and several private dwellings within a short distance of the station. On January 19, 1883, the first standardized incandescent electric lighting system employing overhead wires began service in Roselle, New Jersey.

Fluoroscopy

Edison is credited with designing and producing the first commercially available fluoroscope, a machine that uses X-rays to take radiographs. Until Edison discovered that calcium tungstate fluoroscopy screens produced brighter images than the barium platinocyanide screens originally used by Wilhelm Röntgen, the technology was capable of producing only very faint images. The fundamental design of Edison's fluoroscope is still in use today, despite the fact that Edison himself abandoned the project after nearly losing his own eyesight and seriously injuring his assistant, Clarence Dally.

Media inventions

The key to Edison's fortunes was telegraphy. With knowledge gained from years of working as a telegraph operator, he learned the basics of electricity. This allowed him to make his early fortune with the stock ticker, the first electricity-based broadcast system. Edison patented the sound recording and reproducing phonograph in 1878. Edison was also granted a patent for the motion picture camera or "Kinetograph". He did the electromechanical design, while his employee W.K.L. Dickson, a photographer, worked on the

photographic and optical development. Much of the credit for the invention belongs to Dickson.[30] In 1891, Thomas Edison built a Kinetoscope, or peep-hole viewer. This device was installed in penny arcades, where people could watch short, simple films. The kinetograph and kinetoscope were both first publicly exhibited May 20, 1891. On August 9, 1892, Edison received a patent for a two-way telegraph. In April 1896, Thomas Armat's Vitascope, manufactured by the Edison factory and marketed in Edison's name, was used to project motion pictures in public screenings in New York City. Later he exhibited motion pictures with voice soundtrack on cylinder recordings, mechanically synchronized with the film.

West Orange and Fort Myers (1886-1931)

Edison moved from Menlo Park after the death of Mary Stilwell and purchased a home known as "Glenmont" in 1886 as a wedding gift for Mina in Llewellyn Park in West Orange, New Jersey. In 1885, Thomas Edison bought property in Fort Myers, Florida, and built what was later called Seminole Lodge as a winter retreat. Edison and his wife Mina spent many winters in Fort Myers where they recreated and Edison tried to find a domestic source of natural rubber.

Henry Ford, the automobile magnate, later lived a few hundred feet away from Edison at his winter retreat in Fort Myers, Florida. Edison even contributed technology to the automobile. They were friends until Edison's death.

Thomas Edison died of complications of diabetes on October 18, 1931, in his home, "Glenmont" in Llewellyn Park in West Orange, New Jersey, which he had purchased in 1886 as a wedding gift for Mina. He is buried behind the home.

Edison's last breath is reportedly contained in a test tube at the Henry Ford Museum. Ford reportedly convinced Charles Edison to seal a test tube of air in the inventor's room shortly after his death, as a memento. A plaster death mask was also made.

Honors and awards given to Edison

The President of the Third French Republic, Jules Grévy, on the recommendation of his Minister of Foreign Affairs Jules Barthélemy-Saint-Hilaire and with the presentations of the Minister of Posts and Telegraphs Louis Cochery, designated Edison with the distinction of an 'Officer of the Legion of Honour' (Légion d'honneur) by decree on November 10, 1881;

In 1983, the United States Congress, pursuant to Senate Joint Resolution 140 (Public Law 97-198), designated February 11, Edison's birthday, as National Inventor's Day.

In 1887, Edison won the Matteucci Medal. In 1890, he was elected a member of the Royal Swedish Academy of Sciences.

In 1889, Edison was awarded the John Scott Medal.

In 1899, Edison was awarded the Edward Longstreth Medal.

Edison was awarded Franklin Medal of The Franklin Institute in 1915 for discoveries contributing to the foundation of industries and the well-being of the human race.

Edison was ranked thirty-fifth on Michael H. Hart's 1978 book *The 100*, a list of the most influential figures in history. *Life* magazine (USA), in a special double issue in 1997, placed Edison first in the list of the "100 Most Important People in the Last 1000 Years", noting that the light bulb he promoted "lit up the world". In the 2005 television series *The Greatest American*, he was voted by viewers as the fifteenth-greatest. In 2008, Edison was inducted in the New Jersey Hall of Fame.

