

Inventions from the Nineteenth Century

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(‘Abdu’l-Bahá in Some Answered Questions, page 163)

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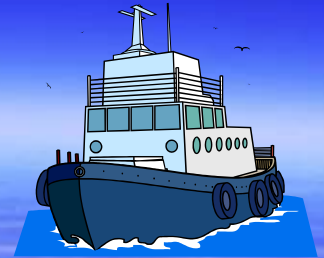
- 1800, ELECTRIC LIGHT, Sir Humphry Davy (1778-1829)
 - The first incandescent electric light was made in 1800 by Humphry Davy, an English scientist. He experimented with electricity and invented an electric battery. When he connected wires to his battery and a piece of carbon, the carbon glowed, producing light. This is called an electric arc.
 - Much later, in 1860, the English physicist Sir Joseph Wilson Swan (1828-1914) was determined to devise a practical, long-lasting electric light. He found that a carbon paper filament worked well, but burned up quickly. In 1878, he demonstrated his new electric lamps in Newcastle, England.
 - The inventor Thomas Alva Edison (in the USA) experimented with thousands of different filaments to find just the right materials to glow well and be long-lasting. In 1879, Edison discovered that a carbon filament in an oxygen-free bulb glowed but did not burn up for 40 hours. Edison eventually produced a bulb that could glow for over 1500 hours. The incandescent bulb revolutionized the world.

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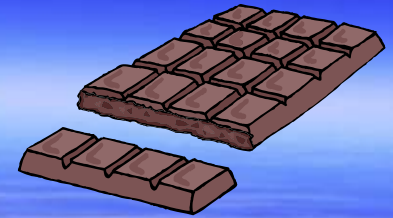
- 1810, METAL CAN, Peter Durant
 - A metal can (or canister) for preserving food was invented in 1810 by a Peter Durand, of London, England. Metal cans (also called tins) could preserve food for a long period of time. To open a can, a person had to use a hammer and chisel; the can opener wasn't invented for another 50 years.

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- 1812, STEAM-POWERED BOAT, Henry Bell (1767-1830)
 - Henry Bell (1767-1830) was a Scottish engineer and inventor who built a steam-powered boat in 1812. His 12-foot (3.5-meter) steamboat, called the Comet, was the first commercially successful steamship in Europe. This boat regularly sailed between Greenock and Glasgow (Scotland) along the River Clyde. The Comet was the beginning of a revolution in navigation.

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- 1828, DUTCH CHOCOLATE, Coenraad Johannes Van Houten (1801-1887)
 - Coenraad Johannes Van Houten (1801-1887) was a Dutch chemist and chocolate manufacturer who in 1828 invented the process that is used to turn roasted cacao beans (the source of chocolate) into cocoa powder (this process is now called Dutching, Dutch processing or alkalisation). His method was an inexpensive way of removing much of the cocoa butter from the nib (center) of the beans, using a hydraulic press, and adding alkaline salts (potassium carbonate or sodium carbonate) so that the cocoa powder would mix readily with water or milk (the alkali neutralized the acidic chocolate). The resulting cocoa powder can be used to make chocolate milk and other delicacies.

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- 1829, BRAILLE, Louis Braille (1809-1852)
 - Louis Braille (1809-1852) invented a coded system of raised dots that are used by the blind to read. He was blinded as a child, and invented his extraordinary system in his early teens. In 1829, Braille published "The Method of Writing Words, Music, and Plain Song by Means of Dots, for Use by the Blind and Arranged by Them." His method, called Braille, is still in use around the world today. Louis Braille is buried in the Pantheon in Paris, as a French national hero.

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- 1830, LAWN MOWER, Edwin Beard Budding (1795-1846)
 - The first lawn mower was invented in 1830 by Edwin Beard Budding. Budding (1795-1846) was an engineer from Stroud, Gloucestershire, England. His reel mower was a set of blades set in a cylinder on two wheels. When you push the lawn mower, the cylinder rotates, and the blades cut the grass. Budding patented his lawn mower on August 31, 1830. Before his invention, a scythe was used (or sheep or other grazing animals were allowed to graze on the grass). The first reel lawn mower patent in the US (January 12, 1868) was granted to Amariah M. Hills, who formed the Archimedean Lawn Mower Co.

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- 1835, **TELEGRAPH**, Samuel Finley Breese Morse (1791-1872)
 - Samuel Finley Breese Morse (1791-1872) was an American inventor and painter. After a successful career painting in oils (first painting historical scenes and then portraits), Morse built the first American telegraph around 1835 (the telegraph was also being developed independently in Europe).
 - A telegraph sends electrical signals over a long distance, through wires. In 1830, Joseph Henry (1797-1878) made the first long-distance telegraphic device - he sent an electronic current for over a mile on wire that activated an electromagnet, causing a bell to ring.
 - Morse patented a working telegraph machine in 1837, with help from his business partners Leonard Gale and Alfred Vail. Morse used a dots-and-spaces code for the letters of the alphabet and the numbers (Morse Code was later improved to use dots, dashes and spaces: for example E is dot, T is dash, A is dot-dash, N is dash-dot, O is dash-dash-dash, I is dot-dot, S is dot-dot-dot, etc.). By 1838, Morse could send 10 words per minute. Congress provided funds for building a telegraph line between Washington D.C. and Baltimore, Maryland, in 1843 Morse sent the first telegraphic message (from Washington D.C. to Baltimore) on May 24, 1844; the message was: "What hath God wrought?" The telegraph revolutionized long-distance communications.

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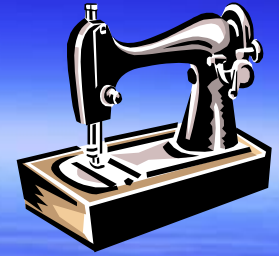
- 1837, KINDERGARTEN, Friedrich Wilhelm August Froebel (1782-1852)
 - Friedrich Wilhelm August Froebel (also written Fröbel) (1782-1852) was a German educator and educational reformer who invented the kindergarten (which means "garden of children"). He opened the first kindergarten in Bad Blankenburg (near Keilhau) in 1837. Froebel founded a kindergarten training school at Liebenstein, Germany in 1849. After some conflicts and mistaken charges of treason, the German government banned the establishment of kindergartens in 1851. In 1860, the government repealed the ban, and kindergartens re-opened (unfortunately, this was after Froebel's death). Froebel's kindergartens included pleasant surroundings, self-motivated activity, play, music, and the physical training of the child.

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- 1845, RUBBER BAND, Stephen Perry
 - The first rubber band was made in 1845 by Stephen Perry of the rubber manufacturing company Messers Perry and Co., in London, England. This rubber band was made of vulcanized rubber. Perry invented the rubber band to hold papers or envelopes together.

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- 1846, SEWING MACHING, Elias Howe (1819-1867)
 - Elias Howe (1819-1867) was American inventor who patented an improved sewing machine in 1846. His revolutionary machine used two separate threads, one threaded through the needle, and one in a shuttle; it was powered by a hand crank. A sideways-moving needle with its eye at one end would pierce the fabric, creating a loop of thread on the other side; a shuttle would then push thread through the loop, creating a tight lock stitch. Earlier sewing machines used only one thread and a chain stitch that could unravel. Howe's business did not thrive. Others, like Isaac Singer made slight modifications in the machine and built successful businesses. Howe sued those who had infringed on his patent and won royalties on all machines sold (he was paid \$5.00 for each sewing machine sold). Howe died the year his patent expired.

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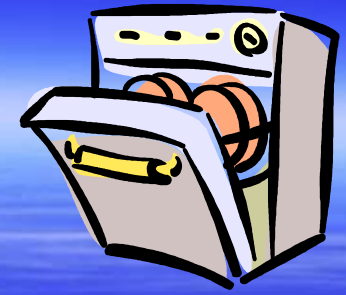
- 1849, SAXOPHONE, Antoine-Joseph Sax (1814-1894)
 - Antoine-Joseph (Adolphe) Sax (1814-1894) was Belgian musical instrument manufacturer and musician (he played the clarinet) who invented the saxophone. Sax first exhibited his newly-invented woodwind instrument at the 1841 Brussels Exhibition, and patented it in 1846. Sax also invented the saxhorn (a family of bugles with 3 or 4 valves), which he first exhibited in 1844.

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- 1849, **SAFETY PIN**, Walter Hunt (1795-1859)
 - The safety pin was invented by Walter Hunt in 1849. Hunt (1795-1859) patented the safety pin on April 10, 1849 (patent No. 6,281). Hunt's pin was made by twisting a length of wire. Hunt invented the safety pin in order to pay a debt of \$15; he eventually sold the rights to his patent for \$400.

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- 1850, DISHWASHER, Joel Houghton
 - The first dishwasher was patented in 1850 by, Joel Houghton; his machine was a hand-turned wheel that splashed water on dishes - unfortunately, it wasn't very effective at washing dishes. The first working automatic dishwasher was invented by Mrs. Josephine Garis (W. A.) Cochran, of Shelbyville, Illinois, in 1889. Her dishwasher was a wooden tub with a wire basket in it - the dishes went in the basket, and rollers rotated the dishes. As a handle on the tub was turned, hot, soapy water was sprayed into the tub, cleaning the dishes. Cochran's machine was first shown at the 1893 World's Fair in Chicago, Illinois. At first, her machine was only bought by some restaurants and hotels. Cochran's small company was eventually associated with the KitchenAid company. The dishwasher didn't become widespread as a labor-saving machine until the 1960's.

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- 1858, CAN OPENER, Ezra Warner
 - The can opener was invented in 1858 by Ezra Warner of Waterbury, Connecticut, USA. Warner's device used a lever and chisel. Until then, cans were opened using a hammer and chisel; the can opener was invented 50 years after the metal can was invented.
 - The can opener was improved in 1870 by William Lyman of West Meridian, Connecticut, USA. Lyman's device used a rotating wheel and a sharp edge. His can opener only fit one size of can, and first had to pierce the center of the can.
 - The modern-day type of can opener (using a serrated wheel) was invented in 1925.

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- Other Inventions from the Nineteenth Century
 - 1800, Battery, Alessandro Volta
 - 1852, Umbrella, Samuel Fox (1815-1887)
 - 1853, Potato Chips, George Crum
 - 1854, Elevator Brake, Elisha Graves Otis (1811-1861)
 - 1859, Re-chargeable Battery, Raymond Gaston Plante (1834-1889)
 - 1867, Motorcycle, Sylvester Howard Roper
 - 1867, Toilet Paper, Joseph Gayetty
 - 1867, Typewriter, Christopher Latham Sholes (1819-1890)
 - 1873, Blue Jeans, Levi Strauss (1829-1902)
 - 1876, Telephone, Alexander Graham Bell (1847-1922) and Thomas Watson
 - 1877, Records, Thomas Alva Edison
 - 1879, Cash Register, James Ritty (1836-1918)

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- Other Inventions from the Nineteenth Century (continued)
 - 1882, Electric Iron, Henry W Seeley
 - 1884, Fountain Pen, Lewis E Waterman
 - 1886, Coca-Cola, John Pemberton (1830-1888)
 - 1888, Camera, George Eastman
 - 1890, Metal Zipper, Whitcomb L Judson
 - 1891, Basketball, James Naismith (1861-1939)
 - 1891, Escalator, Jesse W Reno
 - 1892, Tractor, John Froehlich
 - 1895, Radio, Guglielmo Marconi (1874-1937)
 - 1895, X-Rays, Wilhelm Konrad von Roentgen
 - 1897, Cotton Candy, William Morrison and John C Wharton
 - 1899, Paper Clip, Johann Vaaler
 - 1899, Vacuum Cleaner, John S Thurman

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