Civil War and the Reconstruction Era (1861–1877)

1865 Cowboy hat

- The cowboy hat is a high-crowned, wide-brimmed hat best known as the defining piece of attire for the North American cowboy. Today it is worn by many people, and is particularly associated with ranch workers in the western and southern United States, western Canada and northern Mexico, with country-western singers, and for participants in the North American rodeo circuit. It is recognized around the world as part of Old West cowboy lore. The shape of a cowboy hat's crown and brim are often modified by the wearer for fashion and to protect against weather. The cowboy hat was invented in 1865 by John Batterson Stetson during a hunting trip, showing his companions how he could make fabric out of fur without weaving. Using the fur collected during the trip, his bare hands, and boiling water, Stetson made a piece of felt and then shaped it into a hat with a large brim which could protect him and his hunting party from weather elements such as rain, wind, and snow.[167]

1865 Rotary printing press (web)

- In 1865, William Bullock invented a printing press that could feed paper on a continuous roll and print both sides of the paper at once. Used first by the *Philadelphia Ledger*, the machine would become an American standard. It would also kill its inventor, who died when he accidentally fell into one of his presses.[168]

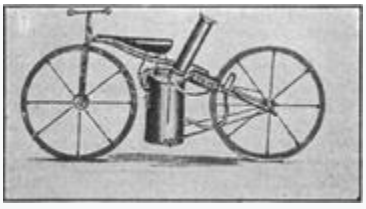
1866 Urinal (restroom version)

- Not to be confused with the urinal in bottle form that is used in healthcare, a urinal is a specialized toilet for urinating only, generally by men and boys. It is wall-mounted, with drainage and automatic or manual flushing. The urinal was patented by Andrew Rankin on March 27, 1866.[169]

1866 Chuckwagon

- The chuckwagon is a wagon that carries food and cooking equipment on the prairies of the United States and Canada. They were part of a wagon train of settlers to feed nomadic workers like cowboys or loggers. While mobile kitchens had existed for generations, the invention of the chuckwagon is attributed to Texan rancher Charles Goodnight who introduced the concept in 1866.[170]

1867 Motorcycle (steam-powered)



An 1860s drawing of the Roper steam velocipede

- The motorcycle is a single-track, two-wheeled motor vehicle powered by an engine. Although the first gasoline/petrol motorcycle powered by an internal combustion engine was built in 1885 by a German named Gottlieb Daimler, his may not have been the first motorcycle. Ironically, Daimler's motorcycle used a four-stroke internal combustion engine that wasn't of his own creation, instead having to rely upon an engine built by Nicolaus August Otto which he simply

mounted onto the frame of a bicycle. Furthermore, if the definition of a motorcycle is inclusive of a steam engine and not exclusive to an internal combustion engine, then the world's first motorcycle may either have been American; a coal-powered, two-cylinder, steam-driven motorcycle known as the **Roper steam velocipede** invented by Sylvester Howard Roper in 1867;[171][172] or perhaps a French one, independently invented by a competing claim by French blacksmith Pierre Michaux and engineer Louis-Guillaume Perreaux, who invented the **Michaux-Perreaux steam velocipede** in 1868.[173]

1867 Paper clip

- The paper clip attaches sheets of paper together, allowing them to be detached as necessary. The first patent for a bent wire paper clip was awarded to its inventor, Samuel B. Fay, in 1867.[174]

1867 Barbed wire

- Barbed wire is a type of fencing wire constructed with sharp edges or points arranged at intervals along the strands. It is used to construct inexpensive fences and is used atop walls surrounding secured property. It is also a major feature of the fortifications in trench warfare. A person or animal trying to pass through or over barbed wire will suffer discomfort and possibly injury. Barbed wire fencing requires only fence posts, wire, and fixing devices such as staples. On June 25, 1867, Lucien B. Smith of Kent, Ohio, patented barbed wire. Shortly thereafter, several other inventors, such as Joseph F. Glidden of DeKalb, Illinois, patented inventions for similar products, but Smith patented his first, allowing him to claim that he invented barbed wire.[175]

1867 Ticker tape

- Ticker tape is a means of transmitting stock price information over telegraph lines. It consists of a paper strip which ran through a machine called a stock ticker, which printed abbreviated company symbols followed by price and volume information. Ticker tape was invented in 1867 by Edward A. Calahan, an employee of the American Telegraph Company.[176]

1867 Water-tube boiler

- A water-tube boiler is a type of boiler in which water circulates in tubes heated externally by the fire. Water-tube boilers are used for high-pressure boilers. Fuel is burned inside the furnace, creating hot gas which heats up water in the steam-generating tubes. The water-tube boiler was co-invented and co-patented by George Herman Babcock and Stephen Wilcox in 1867.[177]

1867 Refrigerator car

- A refrigerator car or "reefer" is a refrigerated boxcar, designed to carry perishable freight at specific temperatures. Refrigerator cars differ from simple insulated boxcars and ventilated boxcars, neither of which are fitted with cooling apparatus. They can be ice-cooled, or use one of a variety of mechanical refrigeration systems, or utilize carbon dioxide as a cooling agent. In the 1860s, slaughtered cattle from the Great Plainswere preserved in barrels of salt. Regular box cars were loaded with ice in another effort to preserve fresh meat that had limited success. Generally, it was found more economical in the early days of refrigeration to cool the cars with ice or frozen brine which was periodically replenished at icing stations along rail routes. In 1857, the first shipment of refrigerated beef was made from the Chicago stockyards to the East Coast in an ordinary box car packed with ice. Finally in 1867, the first patent (U.S. Patent #71,423) for a specialized refrigerator car was issued to its inventor, J.B. Sutherland of Detroit, Michigan.[178]

1868 Paper bag

Two paper bags

- A bag is a non-rigid or semi-rigid container usually made of paper which is used to hold items or packages. In 1868, Margaret E. Knight while living in Springfield, Massachusetts invented a machine that folded and glued paper to form the brown paper bags familiar to what shoppers know and use today.[179]

1868 Tape measure

- A tape measure or measuring tape is a flexible form of ruler. It consists of a ribbon of cloth, plastic, fiber glass, or metal strip with linear-measurement markings. The design on which most modern spring tape measures are built was invented and patented by a New Haven, Connecticut resident named Alvin J. Fellows on July 14, 1868.[180]

1869 American football

A quarterback preparing to throw a pass

- American football, known in the United States simply as football, is a spectator sport known for combining strategy with competitive physical play. The objective of the game is to score points by advancing the ball into the opposing team's end zone. The ball can be advanced by carrying it (a running play) or by throwing it to a teammate (a passing play). Points can be scored in a variety of ways, including carrying the ball over the opponent's goal line, catching a pass thrown over that goal line, kicking the ball through the goal posts at the opponent's end zone, or tackling an opposing ball carrier within his end zone. The winner is the team with the most points when the time expires. The very first game of American football, a collegiate one, was held on November 6, 1869, between Rutgers University and Princeton University with a final score of Rutgers 6 Princeton 4.[184] The first professional game of American football was held on November 12, 1892, between the Allegheny Athletic Association and the Pittsburgh Athletic Club ending in a 6–6 tie.[185] As a descendant of rugby, the modern sport now known as American football is generally credited to its inventor, Walter Camp, who beginning in the 1880s, devised the play from scrimmage, the numerical assessment of goals and tries, the restriction of play to

eleven men per side, set plays, sequences, and strategy features which led to the gradual evolution of the regulated game. Camp also was the leader of the American Football Rules Committee which devised the set of codified and regulated rules as to which American football continuously uses.[186]

1869 Pipe wrench

- The pipe wrench, or Stillson wrench, is an adjustable wrench used for turning soft iron pipes and fittings with a rounded surface. The design of the adjustable jaw allows it to rock in the frame, such that any forward pressure on the handle tends to pull the jaws tighter together. Teeth angled in the direction of turn dig into the soft pipe. The pipe wrench was invented by Daniel C. Stillson in 1869.[187]

1869 Clothes hanger

- A clothes hanger, or coat hanger, is a device in the shape of human shoulders designed to facilitate the hanging of a coat, jacket, sweater, shirt, blouse, or dress in a manner that prevents wrinkles, with a lower bar for the hanging of trousers or skirts. The shoulder-shaped wire hanger, was inspired by a coat hook invented in 1869 by O. A. North of New Britain, Connecticut.[188]

1870 Bee smoker

Firing a bee smoker

- A bee smoker, usually called simply a smoker, is a device used in beekeeping to calm honey bees. It is designed to generate smoke from the smouldering of various fuels, hence the name. The first bee smoker, which incorporated a bellows with a fire pot, was invented in 1870 by the renowned American beekeeper, Moses Quinby.[189]

1870 Can opener (rotary)

- The can opener is a device used to open metal cans. Most non-electrical can openers today use the hand-cranked rotary version consisting of a wheel with serrated edges in order to pierce and cut the top of tin cans. The first rotary can opener with a cutting wheel was invented in 1870 by William W. Lyman, of Meriden, Connecticut, who received a U.S. Patent 105,346 on July 12, 1870. In 1925 the Star Can Opener Company of San Francisco improved on Lyman's wheel blade by adding a second, serrated or toothed wheel, called a "feed wheel" or "turning gear" to ride below the rim of the can and rotate the can against the cutting wheel.[190]

1870 Sandblasting

- Sandblasting or bead blasting is a generic term for the process of smoothing, shaping, and cleaning a hard surface by forcing solid particles across that surface at high speeds. Sandblasting equipment typically consists of a chamber in which sand and air are mixed. The mixture travels through a hand-held nozzle to direct the particles toward the surface or workpiece. Nozzles come in a variety of shapes, sizes, and materials. Boron carbide is a popular material for nozzles because it resists abrasive wear well. In 1870, the sandblasting process was invented and patented by Benjamin Chew Tilghman.[191]

1870 Feather duster

- A feather duster is an implement used for cleaning. It consists typically of a wooden-dowel handle and feathers that are wound onto the handle by a wrapped wire. In 1870, the original idea for the feather duster was conceived in a broom factory in Jones County, Iowa. A farmer brought a bundle of turkey feathers into the factory asking if they could be used to assemble a brush. E.E. Hoag used these feathers to invent the first feather duster. Using a short broom stick and splitting the feathers with a pocket knife, the duster was found to be too stiff for use. In 1874, the Hoag Duster Company was founded, which became a pioneer of feather dusters in the U.S. state of Iowa.[192]

1871 Rowing machine

- A rowing machine or indoor rower is a machine used to simulate the action of watercraft rowing for the purpose of exercise or training for rowing. Indoor rowing has become established as a sport in its own right. The term also refers to a participant in this sport. Rowing machines have been in use for bout 140 years. The earliest patent for such a machine was filed in the United States by William B. Curtis.[193] Curtis was issued U.S. patent #116,417 on June 27, 1871.[194]

1872 Railway air brake

A valve on a railway air brake

- A railway air brake is a conveyance braking system which applies the means of compressed air which modern locomotives use to this day. George Westinghouse, a pioneer of the electrical industry, invented the railroad air brake in 1872.[195]

1872 Diner

- A diner is a restaurant characterized by a wide range of foods, a casual and often nostalgic atmosphere, a counter, and late operating hours. The precursor to the fast food eatery began in 1872 when Walter Scott, a myopic pressman for the *Providence Journal*, became serious about selling food and refreshments in the streets. Scott had a plan. Instead of wearing out the soles of his shoes and roaming the streets of Providence, Rhode Island, he decided to buy a horse-drawn delivery van. Rolling on four wagon wheels, he would take his food to the people.[196]

1873 Earmuffs

- Earmuffs cover a person's ears for thermal protection. Earmuffs consist of a thermoplastic or metal head-band, that fits over the top of the head, and a pad at each end, to cover the external ears. Earmuffs were invented by Chester Greenwood in 1873.[197]

1873 Silo

Two farm silos

- A silo is a structure for storing bulk materials. Silos are used in agriculture to store grain, see grain elevators, or fermented feed known as silage. Silos are more commonly used for bulk storage of grain, coal, cement, carbon black, woodchips, food products and sawdust. The first modern silo, a wooden and upright one filled with grain, was invented and built in 1873 by Fred Hatch of McHenry County, Illinois.[198][199]

1873 Jeans

Jeans are trousers generally made from denim. Jeans became popular among teenagers starting in the 1950s which remains as a distinct icon of American fashion. In 1873, Levi Strauss and Jacob Davis co-invented and co-patented the idea of using copper rivets at the stress points of sturdy work pants. After one of Davis' customers kept purchasing cloth to reinforce torn pants, he had an idea to use copper rivets to reinforce the points of strain, such as on the pocket corners and at the top of the button fly. Davis did not have the required money to purchase a patent, so he wrote to Strauss suggesting that they both go into business together. Early Levis, called "waist overalls", came in a brown canvas duck fabric and a heavy blue denim fabric. His business became extremely successful, revolutionizing the apparel industry.[200]

1873 Knuckle coupler

Two railway cars interlocked and joined together by a knuckle coupler

Also known as a Janney coupler and the buckeye coupler, the knuckle coupler is the derivative of a coupling device that links and connects rolling railway cars such as passenger, refrigerator, freight, and stock cars together on railroad track. The knuckle coupler have a bifurcated drawhead and a revolving hook, which, when brought in contact with another coupler, automatically interlocks with its mate. Knuckle couplers replaced the much more dangerous link-and-pin couplers and became the basis for standard coupler design for the rest of the 19th century. The knuckle coupler was invented and patented by Eli H. Janney in 1873.[201][202][203]

1874 Fire sprinkler (automated)

A fire sprinkler is the part of a fire sprinkler system that discharges water when the effects of a fire have been detected, such as when a pre-determined temperature has been reached. Henry S. Parmelee of New Haven, Connecticut invented and installed the first closed-head or automated fire sprinkler in 1874.[204]

1874 Spork

A spork or a foon is a hybrid form of cutlery taking the form of a spoon-like shallow scoop with three or four fork tines. The spork is a portmanteau word combining *spoon* and *fork*. The spork was invented in 1874 by Samuel W. Francis. U.S. patent #147,119 was filed on January 22, 1874, and issued to Francis on February 3, 1874.[205]

1874 Ice cream soda

- An ice cream soda is a beverage that consists of one or more scoops of ice cream in either a soft drink or a mixture of flavored syrup and carbonated water. Variations of the ice cream soda are as countless as the varieties of soda and flavors of ice cream. An example of ice cream soda is the root beer float. In 1874, the ice cream soda was invented by Robert M. Green of Philadelphia. Green's invention paved the way for the soda fountain industry to flourish and for many new spoon novelties such as ice cream sundaes to be created.[206]

1874 Quadruplex telegraph

- A quadruplex telegraph is a type of electrical telegraph which allows a total of four separate signals to be transmitted and received on a single wire at the same time. With two signals in each direction, quadruplex telegraphy thus implements a form of multiplexing. The quadruplex telegraph was invented by Thomas Alva Edison in 1874, which enabled Western Union to save money by greatly increasing the number of messages the company could send without building new lines. It also allowed the company to use its existing lines more efficiently to meet seasonal increases in message traffic and to lease excess capacity for private lines.[207]

1874 Forstner bit

Forstner bits, also known as Forstner flange bits or webfoot augers, bore precise, flat-bottomed holes in wood, in any orientation with respect to the wood grain. Forstner bits can cut on the edge of a block of wood, and can cut overlapping holes. Because of the flat bottom to the hole, they are useful for drilling through veneer already glued to add an inlay. Forstner bits were invented and patented by Benjamin Forstner in 1874.[210]

1874 QWERTY

QWERTY is the most used modern-day keyboard layout on English-language computer and typewriter keyboards. It takes its name from the first six characters seen in the far left of the keyboard's top row of letters. The QWERTY design was invented and patented by Christopher Sholes in 1874.[211]

1875 Biscuit cutter

- A biscuit cutter a tool to cut out a biscuit from bread dough in a particular shape before they are put into an oven to bake. On May 11, 1875, Alexander P. Ashbourne filed the first patent for the biscuit cutter that consisted of a board to roll the biscuits out on and hinged to a metal plate with various biscuit cutter shapes mounted to it. It was later issued on November 30, 1875.[212]

1875 Dental drill (electric)

- A dental drill is a small, high-speed drill used in dentistry to remove decayed tooth material prior to the insertion of a dental filling. George F. Green of Kalamazoo, Michigan invented the first electric powered device to drill teeth in 1875.[213]

1875 Mimeograph

- The stencil duplicator or mimeograph machine is a low-cost printing press that works by forcing ink through a stencil onto paper. Once prepared, the stencil is wrapped around the ink-filled drum of the rotary machine. When a blank sheet of paper is drawn between the rotating drum and a pressure roller, ink is forced through the holes on the stencil onto the paper. Thomas Alva Edison invented the mimeograph in 1875.[214]

1876 Synthesizer

- A synthesizer is an electronic instrument capable of producing sounds by generating electrical signals of different frequencies. These electrical signals are played through a loudspeaker or set of headphones. Synthesizers can usually produce a wide range of sounds, which may either imitate other instruments ("imitative synthesis") or generate new timbres. The first electric synthesizer was invented in 1876 by Elisha Graywho accidentally discovered that he could control sound from a self vibrating electromagnetic circuit and in doing so, invented a basic single note oscillator. This musical telegraph used steel reeds whose oscillations were created and transmitted, over a telephone line, by electromagnets. Gray also built a simple loudspeaker device in later models consisting of a vibrating diaphragm in a magnetic field to make the oscillator audible.[215][216]

1876 Airbrush

- An airbrush is a small, air-operated tool that sprays various media including ink and dye, but most often paint by a process of nebulization. Spray guns developed from the airbrush and are still considered a type of airbrush. The first airbrush was invented in 1876 by Francis Edgar Stanley of Newton, Massachusetts.[217]

1876 Tattoo machine

- A tattoo machine is a hand-held device generally used to create a tattoo, a permanent marking of the skin with ink. The basic machine, which was called Stencil-Pens, was invented by Thomas Alva Edison and patented in the United States in 1876. It was originally intended to be used as an engraving device, but in 1891, Sean Casey discovered that Edison's machine could be modified and used to introduce ink into the skin, and later patented it as a tube and needle system serving as an ink reservoir.[218]

1877 Phonograph

Thomas Edison's talking machine

The phonograph, record player or gramophone is an instrument for recording, reproducing and playing back sounds. The earliest phonographs used cylinders containing an audio recording engraved on the outside surface which could be reproduced when the cylinder was played. Later, the gramophone record with modulated spiral grooves set atop a rotating turntable. The phonograph was invented in 1877 by Thomas Alva Edison at his laboratory in Menlo Park, New Jersey.[219][220][221][222] On February 8, 1878, Edison was issued the first patent (U.S. patent #200,521) for the phonograph.[223]

1877 District heating

District heating distributes heat generated in a centralized location for residential and commercial heating requirements. The heat is often obtained from a cogeneration plant burning fossil fuels but increasingly biomass, although heat-only boiler stations, geothermal heating and central solar heating are also used, as well as nuclear power. A system was built in France in the 14th Century and the United States Naval Academy in Annapolis, Maryland began steam district heating service in 1853. However, the first commercially successful district heating system was launched in Lockport, New York, in 1877 by American hydraulic engineer Birdsill Holly, considered the founder of modern district heating.[224]

Gilded Age (1878–1899)

1878 Carbon microphone

- The carbon microphone is a sound-to-electrical signal transducer consisting of two metal plates separated by granules of carbon. When sound waves strike this plate, the pressure on the granules changes, which in turn changes the electrical resistance between the plates. A direct current is passed from one plate to the other, and the changing resistance results in a changing current, which can be passed through a telephone system, or used in other ways in electronics systems to change the sound into an electrical signal. After a lengthy court battle over patent rights filed in 1877, a United States federal court as well as a British court in 1878 ruled in favor of Thomas Alva Edison over a claim held by Emile Berliner since Edison indisputably preceded Berliner in inventing the transmission of speech as well as the use of carbon in a transmitter.[225]

1878 Free jet water turbine

- A free jet water turbine or impulse water turbine, also commonly known as a Pelton's wheel, is a wheel that uses cups, or buckets, that are split down the middle by a metal divider, so that in effect two cups are mounted side-by-side at each "spoke" in the wheel. A high-pressure water jet aimed at the center of each bucket is split by the divider to hit each of cup, one on the left, the other on the right. The design of this water turbine takes advantage of a mechanics principle known as impulse, a force defined as the product of the force and the time during which it acts.

In 1878, Lester Pelton invented his prototype known as the Pelton's wheel, first demonstrating it to miners in the Sierra Nevada. In 1880, Lester Pelton received a patent for his invention.[226]

1878 Bolometer

- A bolometer measures the energy of incident electromagnetic radiation. It was invented in 1878 by American astronomer Samuel Pierpont Langley.[227]

1879 mechanical production of Photographic plate

- Photographic plates preceded photographic film as a means of photography. A light-sensitive emulsion of silver salts was applied to a glass plate. This form of photographic material largely faded from the consumer market in the early years of the 20th century, as more convenient and less fragile films were introduced. The wet collodion process was replaced by dry plates at the start of the 1870s.[228] The mechanical production of dry photographic plates were invented by George Eastman who filed U.S. patent #226,503 on September 9, 1879, for (in his own words "An Improved Process for Preparing Gelatine Dry-Film Plates") which was issued to him on April 13, 1880.[157][229]

1879 Carton

- A carton is the name of certain types of containers typically made from paperboard or cardboard. Many types of cartons are used in food packaging. Sometimes a carton is also called a box. The history of the carton goes as far back as 1879 when it was invented in a Brooklyn, New York factory. The inventor of the folded carton was Robert Gair. He cast a die-ruled, cut, and scored paperboard into a single impression of a folded carton. By 1896, the National Biscuit Company was the first to use cartons to package crackers.[230]

1879 Cash register

An example of a cash register in Japan

The cash register is a device for calculating and recording sales transactions. When a transaction was completed, the first cash registers used a bell that rang and the amount was noted on a large dial on the front of the machine. During each sale, a paper tape was punched with holes so that the merchant could keep track of sales. Known as the "Incorruptible Cashier", the mechanical cash register was invented and patented in 1879 by James Ritty of Dayton, Ohio. John H. Patterson bought Ritty's patent and his cash register company in 1884.[231]

1880 Oil burner

An oil burner is a heating device which burns fuel oil. The oil is directed under pressure through a nozzle to produce a fine spray, which is usually ignited by an electric spark with the air being forced through by an electric fan. In 1880, Amanda Jones invented the oil burner in the oil fields of northern Pennsylvania where Jones completed her trial and error efforts of heating furnaces.[232]

1880 Candlepin bowling

Candlepin bowling is a North American variation of bowling that is played primarily in the Canadian Maritime provinces, Quebec, Maine, Massachusetts, and New Hampshire. A candlepin bowling lane

somewhat resembles lanes used in tenpin bowling. However, unlike tenpin bowling lanes that are flat, candlepin lanes are slightly depressed ahead of the pindeck. The candlepins themselves take on a cylindrical shape which are tapered at the tops and bottoms, thus giving them a resemblance to wax candles. In 1880, candlepin bowling was invented by Justin White of Worcester, Massachusetts.[233]

1881 Electric chair

- Execution by electrocution is an execution method which the person being put to death is strapped to a specially built wooden chair and electrocuted through electrodes placed on the body. In 1881, Buffalo, New Yorkdentist and inventor Alfred Southwick heard about an intoxicated man dying instantly after touch a live electric generator. Dr. Southwick concluded that electricity could be used as an alternative to hanging for executions. Southwick's dental work meant he was accustomed to performing procedures on subjects in chairs, and so he designed an "electric chair". It took nine years of development and legislation before the first person was executed via the electric chair, William Kemmler in New York's Auburn Prison on August 6, 1890.[234]

1881 Metal detector

- Metal detectors use electromagnetic induction to detect metal. In 1881, the Scots-American named Alexander Graham Bell invented the first metal detector as President James Garfield lay dying from a fatal gunshot wound. Despite an effort to locate the lodged bullet, Bell's invention proved to be unsuccessful as the metal detector was confused by the metal-framed bed which the assassinated president laid on.[235]

1881 Iron (electric)

- An iron is a small appliance used to remove wrinkles from fabric. The electric iron was invented in 1881 and patented in 1882 by Henry W. Seely of New York. A second electric iron, a "cordless" one instead heated on a stand powered by electricity, was developed with his partner Dyer in 1883.[236]

1881 peristaltic pump

A peristaltic pump was first patented in the United States by Eugene Allen in 1881 (U.S. Patent number 249285) for the transfusion of blood.

1882 Fan (electric)

- An electric fan contains an arrangement of blades usually powered by an electric motor in order to produce airflow for the purpose of creating comfort (particularly in the heat), ventilation, or exhaust. Between the years 1882 and 1886, New Orleans resident Schuyler Skaats Wheeler invented the first electric fan.[237]

1883 Salt water taffy

- Salt water taffy is a variety of soft taffy. Despite the name, it does not contain sea water. The legend of how salt water taffy got its name is disputed. The most popular story, although unconfirmed, concerns a candy-store owner, David Bradley, whose shop was flooded during a major storm in 1883. His entire stock of taffy was soaked with salty Atlantic Ocean water. When a young girl came into his shop and asked if he had any taffy for sale, he is said to have offered some "salt water taffy". At the time it was a joke, because all his taffy had been soaked with salt water, but the girl was delighted, she bought the candy and proudly walked down to the beach to show her friends. Bradley's mother was in the back and heard the exchange. She loved the name and so Salt Water Taffy was born.[238]

1883 Solar cell

Solar panels at Nellis Air Force Base in Nevada generating and absorbing the sun's natural light

A solar cell is any device that directly converts the energy in light into electrical energy through the process of photovoltaics. Although French physicist Antoine-César Becquerel discovered the photovoltaic effect much earlier in 1839, the first solar cell, according to Encyclopædia Britannica, was invented by Charles Fritts in 1883, who used junctions formed by coating selenium with an extremely thin layer of gold. In 1941, the silicon solar cell was invented by another American named Russell Ohl. Drawing upon Ohl's work, three American researchers named Gerald Pearson, Calvin Fuller, and Daryl Chapin essentially introduced the first practical use of solar panels through their improvement of the silicone solar cell in 1954, which by placing them in direct sunlight, free electrons are turned into electric current enabling a six percent energy conversion efficiency.[239]

1883 Thermostat

A thermostat is a device for regulating the temperature of a system so that the system's temperature is maintained near a desired setpoint temperature. The thermostat does this by switching heating or cooling devices on or off, or regulating the flow of a heat transfer fluid as needed, to maintain the correct temperature. The thermostat was invented in 1883 by Warren S. Johnson.[240]

1884 Machine gun

Maxim's machine gun on display at the Military Museum of Finland

The machine gun is defined as a *fully automatic* firearm, usually designed to fire rifle cartridges in quick succession from an ammunition belt or large-capacity magazine. The world's first true machine gun, the Maxim gun, was invented in 1884 by the American inventor Hiram Stevens Maxim, who devised a recoil power of the previously fired bullet to reload rather than the crude method of a manually operated, hand-cranked firearm.[161][241] With the ability to fire 750 rounds per minute, Maxim's other great innovation was the use of water cooling to reduce overheating. Maxim's gun was widely adopted and derivative designs were used on all sides during World War I.[242]

1884 Dissolvable pill

A dissolvable pill is any pharmaceutical in tablet form that is ingested orally, which are crushable and able to dissolve in the stomach unlike tablets with hard coatings. The dissolvable pill was invented in 1884 by William E. Upjohn.[243]

1884 Skyscraper

A skyscraper is a tall building that uses a steel-frame construction. After the Great Fire of 1871, Chicago had become a magnet for daring experiments in architecture as one of those was the birth of the skyscraper. The edifice known as the world's first skyscraper was the 10-story Home Insurance Company Building built in 1884. It was designed by the Massachusetts-born architect William Le Baron Jenney.[244]

1885 Popcorn machine

- A popcorn machine, also called a popcorn maker, is a device used to pop popcorn. Commercial popcorn machines are usually found in movie theaters and carnivals, producing popcorn of the oil-popped type, which has approximately 45% of its calories derived from fat. The first commercial popcorn machine was invented by Chicago resident Charles Cretors in 1885. His business that he founded, C. Cretors & Company, still to this day manufactures popcorn machines and other specialty equipment.[245]

1885 Photographic film

- Photographic film is a sheet of material coated with a photosensitive emulsion. When the emulsion is sufficiently exposed to light or other forms of electromagnetic radiation such as X-rays and is developed it forms an image. George Eastman and his company, Eastman Kodak, invented the first flexible photographic film as well as the invention of roll film in 1885. This original "film" used a paper carrier. The first transparent plastic film was produced in 1889. Before this, glass photographic plates were used, which were far more expensive and cumbersome, although of better quality due to their size. Early film was made from flammable nitrocellulose with camphor as a plasticizer.[246]

1885 Mixer (cooking)

- An electric mixer is a kitchen appliance used for whipping, beating, and folding food ingredients. It typically consists of a handle mounted over a large enclosure containing the motor, which drives one or two beaters. The beaters are immersed in the food to be mixed. The first electric mixer was invented by Rufus M. Eastman in 1885.[247] U.S. patent #330,829 for the first electric mixer was filed by Eastman on March 6, 1885, and issued on November 17, 1885.[248]

1885 Fuel dispenser

A man using a fuel dispenser by pumping gasoline into plastic fuel containers

A fuel dispenser is used to pump gasoline, diesel, or other types of fuel into vehicles or containers. As the automobile was not invented yet, the gas pump was used for kerosene lamps and stoves. Sylvanus F. Bowser of Fort Wayne, Indiana invented the gasoline/petrol pump on September 5, 1885.[249] Coincidentally, the term "bowser" is still often used in countries such as New Zealand and Australia as a reference to the fuel dispenser.[250]

1886 Filing cabinet (horizontal)

A filing cabinet is a piece of office furniture used to store paper documents in file folders. It is an enclosure for drawers in which items are stored. On November 2, 1886, Henry Brown patented his invention of a "receptacle for storing and preserving papers". This was a fire- and accident-safe container made of forged metal, which could be sealed with a lock and key. It was special in that it kept the papers separated.[251]

1886 Telephone directory

A telephone directory is a listing of telephone subscribers in a geographical area or subscribers to services provided by the organization that publishes the directory. R. H. Donnelleycreated the first official telephone directory which was referred to as the Yellow Pages in 1886.[252]

1887 Screen door

A screen door can refer to a hinged storm door (cold climates) or hinged screen door (warm climates) covering an exterior door; or a screened sliding door used with sliding glass doors. In any case, the screen door incorporates screen mesh to block flying insects from entering and pets and small children from exiting interior spaces, while allowing for air, light, and views. The screen door was invented in 1887 by Hannah Harger.[253]

1887 Gramophone record

A selection of gramophone records and an album

A gramophone record, commonly known as a record, or a vinyl record, is an analog sound storage medium consisting of a flat disc with an inscribed, modulated spiral groove. The groove usually starts near the periphery and ends near the center of the disc. Ever since Thomas Edison invented the phonograph in 1877, it produced distorted sound because of gravity's pressure on the playing stylus. In response, Emile Berliner invented a new medium for recording and listening to sound in 1887 in the form of a horizontal disc, originally known as the "platter".[254]

1887 Slot machine

A slot machine is a casino gambling machine. Due to the vast number of possible wins with the original poker card based game, it proved practically impossible to come up with a way to make a machine capable of making an automatic pay-out for all possible winning combinations. The first "one-armed bandit" was invented in 1887 by Charles Fey of San Francisco, California who devised a simple automatic mechanism with three spinning reels containing a total of five

symbols – horseshoes, diamonds, spades, hearts and a Liberty Bell, which also gave the machine its name.[255]

1887 Softball

As a bat-and-ball team sport, softball is a variant of baseball. The difference between the two sports is that softball uses larger balls and requires a smaller playing field. Beginning as an indoor game in Chicago, softball was invented in 1887 by George Hancock.[256]

1887 Comptometer

- A comptometer is a mechanical or electro-mechanical adding machine. The comptometer was the first adding device to be driven solely by the action of pressing keys, which are arranged in an array of vertical and horizontal columns. Although the comptometer was designed primarily for adding, it could also do division, multiplication, and subtraction. Special comptometers with varying key arrays were produced for a variety of purposes, including calculating currencies, time and Imperial measures of weight. The original design was invented and patented in 1887 by Dorr Felt.[257]

1888 Induction motor

Examples of modern induction motors

An induction motor is an AC electric motor in which the electric current in the rotor needed to produce torque is induced by electromagnetic induction from the magnetic field of the stator winding instead of using mechanical commutation (brushes) that caused sparking in earlier electric motors. They are also self-starting. The Serbian-American inventor Nikola Teslaexplored the idea of using a rotating magnetic induction field principle, using it in his invention of a poly-phase induction motor using alternating current which he received a patent for on May 1, 1888.[258][259] The rights to Tesla's invention were licensed by George Westinghouse for the AC power system his company was developing.

The induction motor Tesla patented in the U.S. is considered to have been an independent invention since the Europe Italian physicist Galileo Ferraris published a paper on a rotating magnetic field based induction motor on 11 March 1888, almost two months before Tesla was granted his patent.[260][261][262][263] A working model of the Ferraris inductionmotor may have been demonstrated at the University of Turin as early as 1885.[264][265][266]

1888 Kinetoscope

The Kinetoscope was an early motion picture exhibition device. It was designed for films to be viewed individually through the window of a cabinet housing its components. The Kinetoscope introduced the basic approach that would become the standard for all cinematic projection before the advent of video, creating the illusion of movement by conveying a strip of perforated film bearing sequential images over a light source with a high-speed shutter. First described in

conceptual terms by Thomas Alva Edison in 1888, his invention was largely developed by one of his assistants, William Kennedy Laurie Dickson, between 1889 and 1892.[267]

1888 Trolley pole

An example of a trolley pole used in Japan

A trolley pole is a tapered cylindrical pole of wood or metal placed in contact with an overhead wire to provide electricity to the trolley car. The trolley pole sits atop a sprung base on the roof of the trolley vehicle, the springs maintaining the tension to keep the trolley wheel or shoe in contact with the wire. Occasionally, a Canadian named John Joseph Wright is credited with inventing the trolley pole when an experimental tramway in Toronto, Ontario, was built in 1883. While Wright may have assisted in the installation of railways at the Canadian National Exhibition (CNE), and may even have used a pole system, there is no hard evidence to prove it. Likewise, Wright never filed or was issued a patent.[268] Official credit for the invention of the electric trolley pole has gone to an American, Frank J. Sprague, who devised his working system in Richmond, Virginia, in 1888.[268] Known as the Richmond Union Passenger Railway, this 12-mile system was the first large-scale trolley line in the world, opening to great fanfare on February 12, 1888.[269]

1888 Drinking straw

The drinking straw is a tube used for transferring a liquid to the mouth, usually a drink from one location to another. The first crude forms of drinking straws were made of dry, hollow, rye grass. Marvin Stone is the inventor of the drinking straw. Stone, who worked in a factory that made paper cigarette holders, did not like this design because it made beverages taste like grass. As an alternative, on January 3, 1888, Stone got a piece of paper from his factory and wrapped it around a pencil. By coating it with wax, his drinking straw became leak-proof so that it would not get waterlogged.[270]

1888 Stepping switch

An example of a Strowger-type selector assembly

In electrical controls, a stepping switch, also known as a stepping relay, is an electromechanical device which allows an input connection to be connected to one of a number of possible output connections, under the control of a series of electrical pulses. The major use for these devices was in early automatic telephone exchanges to route telephone calls. It can step on one axis

(called a uniselector), or on two axes (a Strowger switch). As the first automated telephone switch using electromagnets and hat pins, stepping switches were invented by Almon Brown Strowger in 1888. Strowger filed his patent application on March 12, 1889, and it was issued on March 10, 1891.[271]

1888 Revolving door

A revolving door has three or four doors that hang on a center shaft and rotate around a vertical axis within a round enclosure. In high-rise buildings, regular doors are hard to open because of air pressure differentials. In order to address this problem, the revolving door was invented in 1888 by Theophilus Van Kannel of Philadelphia, Pennsylvania. Van Kannel patented the revolving door on August 7, 1888.[272]

1888 Ballpoint pen

The tip of a ballpoint pen

A ballpoint pen is a writing instrument with an internal ink reservoir and a sphere for a point. The internal chamber is filled with a viscous ink that is dispensed at its tip during use by the rolling action of a small sphere. The first ballpoint pen is the creation of American leather tanner John Loud of Weymouth, Massachusetts in 1888 which contained a reservoir for ink and a roller ball to mark up his leather hides. Despite Loud being the inventor of the ballpoint pen, it wasn't a practical success since the ink often leaked or clogged up.[273][274][275] Loud took out a patent (British patent #15630) in the United Kingdom on October 30, 1888.[276] However, it wasn't until 1935 when Hungarian newspaper editor László Bíró offered an improved version of the ballpoint pen that left paper smudge-free.[275]

1888 Telautograph

The telautograph, an analog precursor to the modern fax machine, transmits electrical impulses recorded by potentiometers at the sending station to stepping motors attached to a pen at the receiving station, thus reproducing at the receiving station a drawing or signature made by sender. It was the first such device to transmit drawings to a stationary sheet of paper. The telautograph's invention is attributed to Elisha Gray, who patented it in 1888.[277]

1888 Touch typing

- Touch typing is typing on a keyboard without using the sense of sight to find the keys. Specifically, a touch typist will know their location on the keyboard through muscle memory. Touch typing typically involves placing the eight fingers in a horizontal row along the middle of the keyboard (the home row) and having them reach for other keys. Touch typing was invented in 1888 by Frank Edward McGurrin, a court stenographer from Salt Lake City, Utah.[278]

1888 Salisbury steak

- Salisbury steak is a dish made from a blend of minced beef and other ingredients, which is shaped to resemble a steak, and is usually served with gravy or brown sauce. The Salisbury

steak was invented in 1888 by American doctor and chemist James Salisbury, who prescribed his "meat cure" for such ailments like rheumatism, gout, colitis, and anemia.[279]

1889 Flexible flyer

A boy atop a flexible flyer sled in 1945

A flexible flyer or steel runner sled is a steerable wooden sled with thin metal runners whereby a rider may sit upright on the sled or lie on their stomach, allowing the possibility to descend a snowy slope feet-first or head-first. To steer the sled, the rider may either push on the wooden cross piece with their hands or feet, or pull on the rope attached to the wooden cross-piece. The flexible flyer was invented in 1889 by Philadelphia resident Samuel Leeds Allen.[280] U.S. patent #408,681 was issued to Allen on August 13, 1889.[281]

1889 Payphone

A payphone or pay phone is a public telephone, usually located in a stand-alone upright container such as a phone booth, with payment done by inserting money (usually coins), a credit or debit card, or a telephone card before the call is made. Pay telephone stations preceded the invention of the pay phone and existed as early as 1878. These stations were supervised by telephone company attendants or agents who collected the money due after people made their calls. In 1889, the first coin-operated telephone was installed by inventor William Gray at a bank in Hartford, Connecticut. However, it was a "postpay" machine that only accepted coins deposited after the call was placed.[282][283]

Progressive Era (1890–1919)

1890 Stop sign

A stop sign is a traffic sign, usually erected at road junctions such as a four-way intersection, that instructs drivers to stop and then to proceed only if the way ahead is clear. The idea of placing stop signs at road junctions was first conceived in 1890 when William Phelps Eno of Saugatuck, Connecticut proposed and devised the first set of traffic laws in an article published in *Rider and Driver*. However, the first use of stop signs did not appear until 1915 when officials in Detroit, Michigan installed a stop sign with black letters on a white background. Throughout the years and with many alterations made to the stop sign, the current version with white block-lettering on a red background that is used in the United States as well as emulated in many other countries around the world today, did not come into use until the Joint Committee on Uniform Traffic Control Devices adopted the design in 1975.[13]

1890 Tabulating machine

The tabulating machine is an electrical device designed to assist in summarizing information and, later, accounting. The results of a tabulation are electrically coupled with a sorter while displayed on clock-like dials. The concept of automated data processing had been born. In 1890, Herman Hollerith invented the mechanical tabulating machine, a design used during the 1890 Census which stored and processed demographic and statistical information on punched cards.[14][15]

1890 Shredded wheat

- Shredded wheat is a type of breakfast cereal made from whole wheat. Shredded wheat also comes in a *frosted* variety, which has one side coated with sugar and usually gelatin. Shredded wheat was invented in 1890 by Henry Perky of Watertown, New York.[16]

1890 Babcock test

- The Babcock test was the first inexpensive and practical test which were used to determine the fat content of milk. Invented by Stephen Moulton Babcock in 1890, the test was developed to prevent dishonest farmers who could, until the 1890s, water down their milk or remove some cream before selling it to the factories because milk was paid by volume.[17]

1890 Smoke detector

- A smoke detector is a device that detects smoke and issues a signal. Most smoke detectors work either by optical detection or by physical process, but some of them use both detection methods to increase sensitivity to smoke. Smoke detectors are usually powered by battery while some are connected directly to power mains, often having a battery as a power supply backup in case the mains power fails. The first automatic electric fire alarm was co-invented in 1890 by Francis Robbins Upton and Fernando J. Dibble. Upton and Dibble were issued U.S. patent #436,961. Upton was an associate of Thomas Alva Edison, although there is no evidence that Edison contributed to this invention.[18]

1891 Ferris wheel

The original Ferris Wheel at the 1893 World's Columbian Exposition in Chicago

A Ferris wheel is a non-building structure, consisting of an upright wheel with passenger gondolas attached to the rim. Opened on June 21, 1893 at the Chicago World's Fair, the original Ferris Wheel was invented two years earlier by the Pittsburgh, Pennsylvania bridge-builder George Washington Gale Ferris Jr. in 1891.[19]

1891 Dow process

The Dow process is the electrolytic method of bromine extraction from brine, and was Herbert Henry Dow's second revolutionary process for generating bromine commercially in 1891.[20]

1891 Tesla coil

A Tesla coil is a type of resonant transformer circuit invented by Nikola Tesla around 1891. Nikola Tesla used these coils to conduct innovative experiments in electrical lighting, phosphorescence, x-ray generation, high frequency alternating current phenomena, electrotherapy, and the transmission of electrical energy without wires for point-to-point telecommunications, broadcasting, and the transmission of electrical power.[21]

1891 Rotary dial

- The rotary dial is a device mounted on or in a telephone or switchboard that is designed to send electrical pulses, known as pulse dialing, corresponding to the number dialed. The early form of the rotary dial used lugs on a finger plate instead of holes. The rotary dial was invented

by Almon Brown Strowger in 1891.[22] Strowger filed U.S. patent#486,909 on December 21, 1891 that was later issued on November 29, 1892.[23][24]

1891 Pastry fork

- A pastry fork, also known as a "pie fork", is a fork designed for eating pastries and other desserts while holding a plate. The fork has 3 or 4 tines. The 3 tine fork has a larger, flattened and beveled tine on the side while the 4 tine fork has the 1st and 2nd tine connected or bridged together and beveled. On July 7, 1891, Anna M. Mangin of Queens, a borough of New York City, filed the first patent for the pastry fork. U.S. patent #470,005 was later issued on March 1, 1892.[25]

1891 Schrader valve

A Schrader valve consists of a hollow cylindrical metal tube, typically brass, with the exterior end threaded. The interior end takes a variety of forms depending on its application. In the center of the exterior end is a metal pin pointing along the axis of the tube; the pin's end is flush with the end of the valve body. Generally, all Schrader valves are used on tires. They have threads and bodies of a single standard size at the exterior end, so caps and tools generally are universal for the valves on all automobile and bicycle pneumatic tires. Also, pressure valves can be used on Schrader valves in place of caps in order to measure the pressure of pneumatic tires. In 1891, George Schrader, the son of German-American immigrant August Schrader, invented the Schrader valve. A patent was issued on April 11, 1893.[26]

1892 Bottle cap

- Bottle caps, or closures, are used to seal the openings of bottles of many types. They can be small circular pieces of metal, usually steel, with plastic backings, and for plastic bottles a plastic cap is used instead. Caps can also be plastic, sometimes with a pour spout. Flip-Top caps like Flapper closures provide controlled dispensing of dry products. The crown cork, the first form of a bottle cap, possessed flanges bent over a sealed bottle to compress the liquid inside. It was invented and patented in 1892 by William Painter of Baltimore, Maryland.[27][28]

1892 Dimmer

- Dimmers are devices used to vary the brightness of a light. By decreasing or increasing the RMS voltage and hence the mean power to the lamp it is possible to vary the intensity of the light output. Although variable-voltage devices are used for various purposes, a dimmer is specifically those devices intended to control lighting. Dimmers are popularly used in venues such as movie theatres, stages, dining rooms, restaurants, and auditoriums where the need or absence of light during activities requires constant change. The dimmer was invented in 1892 by Granville Woods.[29]

1892 Bicycle seat (padded)

- A bicycle seat, unlike a bicycle saddle, is designed to support the rider's buttocks and back, usually in a semi-reclined position. First known as the "Garford Saddle", the padded bicycle seat was invented in 1892 by Arthur Lovett Garford of Elyria, Ohio.[30]

1892 internal combustion-powered tractor A tractor is a distinctive farm vehicle specifically designed to deliver a high tractive effort at slow speeds, for the purposes of hauling a trailer or machinery used in agriculture or construction. Agricultural implements may be towed behind or mounted on the tractor, and the tractor may also provide a source of power if the implement is mechanized. While steam powered tractors had been built earlier, In 1892, John Froelich invented and built the first gasoline-powered tractor in Clayton County, Iowa.[9][9][31][32][33][34]

1893 Zipper

Three zippers: Metal, plastic, and nylon

The zipper is a popular device for temporarily joining two edges of fabric. Zippers are found on trousers, jeans, jackets, and luggage. Whitcomb L. Judson was an American mechanical engineer from Chicago who was the first to invent, conceive of the idea, and to construct a workable zipper.[35] Using a hook-and-eye device, Judson intended for this earliest form of the zipper to be used on shoes. He also conceived the idea of the slide fastener mechanism in conjunction with the invention of the zipper. Patents were issued to Judson for the zipper in 1891, 1894, and 1905.[36][37]

1893 Spectroheliograph

The spectroheliograph is an instrument used in astronomy that captures a photographic image of the Sun at a single wavelength of light, a monochromatic image. The spectroheliograph was invented in 1893 by George Ellery Hale and independently later by Henri Alexandre Deslandres in 1894.[38]

1893 Pinking shears

- Pinking shears are a type of scissors that have blades of which are sawtoothed instead of straight. Used to cut woven cloth, pinking shears leave a zigzag pattern instead of a straight edge. The earliest patent for pinking shears was U.S. patent #489,406 which was issued to Louise Austin of Whatcomb, Washington on January 3, 1893.[39]

Early 1890s Phantoscope

- A film projection machine created by Charles Francis Jenkins in the early 1890s. Jenkin's machine was the first projector to allow each still frame of the film to be illuminated long enough before advancing to the next frame sequence.[40]

1894 Stadimeter

Quartermaster 3rd Class Jaren Briggs uses a stadimeter to measure range during an underway replenishment aboard the guided-missile cruiser USS *Leyte Gulf*

A stadimeter, a type of optical rangefinder, is an optical device for estimating the range to an object of known height by measuring the angle between the top and bottom of the object as observed at the device. It is similar to a sextant, in that the device is using mirrors to measure an angle between two objects but differs in that one dials in the height of the object. The stadimeter was invented in 1894 by Bradley Allen Fiske, a Rear-Admiral in the United States Navy.[41] The first sea tests, conducted in 1895, showed that it was equally useful for fleet sailing and for navigation.[42] Likewise, the stadimeter proved useful during the Battle of Manila Bay during the Spanish–American War. U.S. patent #523,721 was issued to Fiske on July 31, 1894.[43]

1894 Mousetrap

A mousetrap is a specialized type of animal trap designed primarily to catch mice. However, it may also trap other small animals. Mousetraps are usually set in an indoor location where there is a suspected infestation of rodents. The first mouse trap was invented by William C. Hooker of Abingdon, Illinois, exactly three years before James Henry Atkinson developed a prototype called the "Little Nipper". Atkinson probably saw the Hooker trap in shops or in advertisements, and copyied it as the basis for his own model.[44] Hooker received US patent #528671 for his invention, the mousetrap, in 1894.[45][46]

1894 Medical glove

A disposal surgical glove

Medical gloves are disposable gloves used during medical examinations and procedures that help prevent contamination between caregivers and patients. Medical gloves are made of different polymers including latex, nitrile rubber, vinyl and neoprene; they come unpowdered, or powdered with cornstarch to lubricate the gloves, making them easier to put on the hands. In 1894, William Stewart Halsted, the Surgeon-in-Chief of Johns Hopkins Hospital, invented the medical glove in an effort to make medical care safer and more sterile for patients and health care workers.[47]

1895 Cyclocomputer

A cyclocomputer or cyclometer is a device mounted on a bicycle that calculates and displays trip information, similar to the instruments in the dashboard of a car. The computer with display, or head unit, usually is attached to the handlebar for easy viewing. In 1895, Curtis Hussey Veeder invented the cyclometer.[48]

1895 Clipless pedal

- Clipless pedals are bicycle pedals that require a special cycling shoe with a cleat fitted to the sole, which locks into a mechanism in the pedal and thus holds the shoe firmly to the pedal. Most clipless pedals lock onto the cleat when stepped on firmly and unlock when the heel is twisted outward, although in some cases the locking mechanism is built into the cleat instead of the pedal. The clipless pedal was invented in 1895 by Charles Hanson of Peace Dale, Rhode Island.[49]

1895 Volleyball

Three volleyball players performing a block

Volleyball is an Olympic sport in which two teams of 6 active players are separated by a net. Each team tries to score points against one another by grounding a ball on the other team's court under organized rules. William G. Morgan invented the sport first known as "Mintonnette" in 1895 while studying at a YMCA in Holyoke, Massachusetts. It was later renamed volleyball by Alfred S. Halstead.[50]

1897 Cotton candy

Cotton candy is a soft confection made from sugar that is heated and spun into slim threads that look like a mass of cotton. It was co-invented in 1897 by William Morrison and John C. Wharton, candy-makers from Nashville, Tennessee.[51]

1897 Muffler

A muffler is a device for reducing the amount of noise emitted by a machine. On internal combustion engines, the engine exhaust blows out through the muffler. The internal combustion engine muffler was invented by Milton O. Reeves[52] who received a patent in 1897.[53]

1897 Tapered roller bearing

- Tapered roller bearings are bearings that can take large axial forces as well as being able to sustain large radial forces. They were co-invented by German-American Henry Timken and Reginald Heinzelman.[54] On August 27, 1897, Timken and Heizelman filed U.S. patent #606,635 which was issued to them jointly on June 28, 1898.[55]

1897 Ice cream scoop

- An ice cream scoop is any specialized spoon used to dish and serve ice cream. Most ice cream scoops are hemispherical-shaped and contain a mechanical device to force the ice cream out of the scoop. The ice cream scoop was invented by African-American Alfred L. Cralle who was issued U.S. patent #576,395 on February 2, 1897.[56]

1897 Charcoal briquette

- A charcoal briquette, or briquet is a block of flammable charcoal matter which is used as fuel to start and maintain a fire, mainly used for food preparation over an open fire or a barbecue. Charcoal briquettes are made by using a process which consists of compressing charcoal, typically made from sawdust and other wood by-products, with a binder and other additives. The binder is usually starch. Some charcoal briquettes may also include brown coal, mineral carbon, borax, sodium nitrate, limestone, raw sawdust, and other additives like paraffin or petroleum solvents to aid in ignition. The design of the charcoal briquette was invented and patented by Ellsworth B. A. Zwoyer in 1897.[57]

1897 Billiards cue chalk

- Cue chalk is a calcite or carbonate base applied to the tip of the cue stick used in billiards in order for players to reduce friction between the cue and bridge hand during shooting, as well as for a smoother stroke. Cue tip chalk was co-invented in its modern form by straight rail billiard pro William A. Spinks and chemist William Hoskins in 1897.[58] U.S. patent #578,514 for cue chalk was issued to Spinks and Hoskins on March 9, 1897.[59]

1898 Candy corn

Candy corn is a popular treat for American children during Halloween

Candy corn is a confection in the United States and Canada, popular primarily in autumn around Halloween, that mimics the shape and coloration of corn kernels—a broad yellow end, a tapered orange center, and a pointed white tip. Candy corn is made primarily from sugar, corn syrup, artificial coloring and binders. It is generally thought that George Renninger, an employee of the Wunderlee Candy Company, invented candy corn in the 1880s.[60] However, the earliest references credit the Goelitz Confectionery Company, now known as the Jelly Belly Candy Company, for introducing candy corn or "chicken feed" to the American public in 1898.[61]

1898 Remote control

A remote control is an electronic device used to operate any machine, such as a television, remotely. Many of these remotes communicate to their respective devices through infrared signals and radio control. In Madison Square Garden, at the Electrical Exhibition, Nikola Tesla gave the first demonstration of a boat propelling in water, controlled by his remote control which he designed using radio signals. Tesla received a patent for his invention in 1898.[62]

1898 Semi-automatic shotgun

- A semi-automatic, or self-loading shot gun is a firearm that requires only a trigger pull for each round that is fired, unlike a single-action revolver, a pump-action firearm, a bolt-action firearm, or a lever-action firearm, which all require the shooter to chamber each successive round manually. In 1898, John Moses Browning invented the first semi-sutomatic shot gun, later patenting it in 1900. Naming it the Auto-5, Browning's semi-automatic relied on long recoil operation. This design remained the dominant form in semi-automatic shotguns for approximately 50 years, being widely used and the preferred weapon of choice among soldiers fighting in World War I. Production of the Auto-5 ceased in 1999.[63]

1898 Semi-truck

- A type of truck connected to a detachable semi-trailer that carries freight. Developed by Alexander Winton as a means of transporting cars without wasting their mileage.

1898 Filing cabinet (vertical)

- A filing cabinet is a piece of office furniture usually used to store paper documents in file folders. In the most simple sense, it is an enclosure for drawers in which items are stored. A vertical file cabinet has drawers that extend from the short side (typically 15 inches) of the cabinet. The vertical filing cabinet was invented by Edwin G. Seibels in 1898, thus revolutionizing efficient record-keeping and archiving by creating space for offices, schools, and businesses.[64]

1898 Installer bit

- Installer bits are a type of twist drill bit for use with a hand-portable power tool. Installer bits are also known as bell-hanger bits or fishing bits. The key distinguishing feature of an installer bit is a transverse hole drilled through the web of the bit near the tip. Once the bit has penetrated a wall, a wire can be threaded through this transverse hole, and the bit pulled back through the drilled hole. The installer bit was invented and patented by Sinclair Smith of Brooklyn, New York in 1898.[65]

1898 Sousaphone

- The sousaphone, sometimes referred to as a marching tuba, is a wearable tuba descended from the hélicon. It was designed such that it fits around the body of the wearer and so it can be easily played while being worn. The sousaphone is named after John Philip Sousa but was invented by C.G. Conn in 1898.[66]

1899 Wing warping

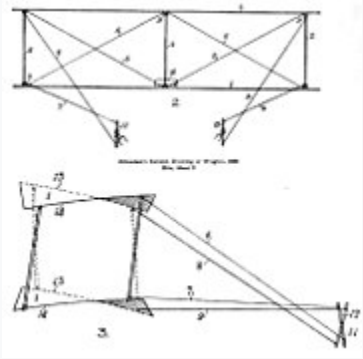


Diagram of the Wright brothers' 1899 kite, showing wing bracing and strings attached to hand-held sticks used for warping the wing while in flight

Wing warping consists of the twisting motion of the wings of an aircraft to produce lateral control. The entire wing structure twists slightly in a helical motion in the desired direction. The concept of wing warping is attributed to Wilbur Wright who in 1899, came up with the idea and with the conclusion that the roll of an aircraft could be controlled by the motion of that aircraft's wings. Exemplified by the twisting of a long, narrow box, the Wright brothers incorporated wing warping on their 1899 glider that used ropes to pull on the wings. Later on, the young French engineer Robert Esnault-Pelterie replaced wing warping in 1904 with the aileron on a copy he made of a 19th-century Wright glider. However, it was Henry Farman, a French aviator, who was the first to use the aileron as an integral part of the wing structure in place of wing warping in 1908.[67]

1899 Flash-lamp

The electric flash-lamp is a device that uses an electrical circuit to trigger a fuse to ignite explosive powder such as magnesium, for a brief sudden burst of bright light "flash" from a chemical reaction of flash powder burning. It was principally used for flash photography in the early 20th century, but had other uses as well. The flash-lamp was invented and patented on November 7, 1899 by New York City resident Joshua Lionel Cowen.[68]

1900 Duckpin bowling

Duckpin bowling is a variation of bowling that uses balls which are significantly smaller than those used in ten-pin bowling, weighing 1–3 kg (2.2–6.6 lb) each, which are devoid of finger holes. The pins are correspondingly shorter and lighter than their ten-pin equivalents. Hence, when the pins are knocked down, they resemble a "flock of flying ducks". While the rules remained almost identical to

those of the Ten-pin game, one rule change was made: A bowler is allowed to use three bowls on each turn. Strikes would still be strikes and spares still spares, but when all pins were knocked down on the third ball, it counts as a score of ten. During the summer of 1900, some bowlers at Diamond Alleys in Baltimore, Maryland thought it might be interesting to resize the pins to match the 6-inch ball. Thus, the inventor of duckpin bowling, John Van Sant, used a wood turner to do exactly that.[69]

1900 Nickel-zinc battery

- A nickel-zinc battery is a type of rechargeable battery that may be used in cordless power tools, cordless telephone, digital cameras, battery operated lawn and garden tools, professional photography, flashlights, electric bike, and light electric vehicle sectors. In 1900, Thomas Alva Edison filed U.S. Patent #684,204 for the nickel-zinc battery. It was issued on October 8, 1901.[70]

1900 Merrill-Crowe process

- The Merrill-Crowe process is a separation technique for removing gold from a cyanide solution. The basic process was conceptualized and patented by Charles Washington Merrill around 1900, then later refined by Thomas B. Crowe, working for the Merrill Company.[71]

1900 Carbide lamp

- Carbide lamps, also known as acetylene gas lamps, are simple lamps that produce and burn acetylene which is created by the reaction of calcium carbide with water. The first carbide lamp was invented and patented in New York City on August 28, 1900 by Frederick Baldwin.[72]

1900 Fly swatter

- A fly swatter is a hand-held device for swatting and killing flies and other insects. The first modern fly-destruction device was invented in 1900 by Robert R. Montgomery, an entrepreneur based in Decatur, Illinois.[73]On January 9, 1900, Montgomery was issued U.S. patent #640,790 for the "Fly-Killer".[74]

1900 Thumbtack

- A thumbtack is a short nail or pin with a large, slightly rounded head made of metal which is used to fasten documents to a background for public display and which can easily be inserted or removed by hand. The thumbtack was invented by Edwin Moore around 1900, the year in which he founded the Moore Push-Pin Company.[75]

1901 Key punch

- A keypunch is a device for manually entering data into punched cards by precisely punching holes at locations designated by the keys struck by the operator. Early keypunches were manual devices. Later keypunches were mechanized, often resembling a small desk, with a keyboard similar to a typewriter, and with hoppers for blank cards and stackers for punched cards. In 1901, Herman Hollerith invented and patented the mechanical key punch that was operated by keys, like a typewriter, and that advanced the card automatically to the next column after each punch. Later models would be motor driven with rudimentary programming features.[76]

1901 Mercury-vapor lamp

- A mercury-vapor lamp is a gas discharge lamp which uses mercury in an excited state to produce light. The arc discharge is generally confined to a small fused quartz arc tube mounted within a larger borosilicate glass bulb. The outer bulb may be clear or coated with a phosphor. In either case, the outer bulb provides thermal insulation, protection from ultraviolet radiation, and a

convenient mounting for the fused quartz arc tube. In 1901, Peter Cooper Hewitt invented and patented the mercury-vapor lamp.[77]

1901 Assembly line

1913 Ford Model T assembly line production.

Used globally around the world, an assembly line is a manufacturing process in which interchangeable parts are added to a product in a sequential manner in order to create a finished product more quickly than with older methods. This type of manufacturing greatly reduces the amount of time taken to assemble a product, thus reducing production, material, and labor costs so that an affordable product cost can be passed onto consumers. According to a book entitled *Michigan Yesterday & Today* authored by Robert W. Domm, the assembly line and its basic concept is credited to Ransom Olds, who used it to build the first mass-produced automobile, the Oldsmobile Curved Dash.[78] Olds patented the assembly line concept, which he put to work in his Olds Motor Vehicle Company factory in 1901.[79] This development is often overshadowed by Henry Ford, who perfected the assembly line by installing driven conveyor belts that could produce a Model T in ninety-three minutes.[78]

1901 Safety razor (disposable)

A safety razor protects the skin from all but the edge of the blade while shaving skin. King Camp Gillette, a traveling hardware salesman of Fond du Lac, Wisconsin invented the double-edged, disposable safety razor attached to a re-usable razor handle. Beforehand, dull razors were taken to barbers for sharpening. With Gillette's double-edged and disposable blades, a uniform shave on a man's face could be achieved with a fresh blade and disposed after it was used. Gillette applied for a patent in 1901. It was granted in 1904.[80]

1901 Windowed envelope

An example of a windowed envelope

A windowed envelope is a conventional envelope with a plastic window to allow the recipient's address to be printed on the paper contained within. Windowed envelopes save the expense of printing or labor of addressing, and in addition save time in preparing the message for dispatch when the customary addresses are already on the letter paper itself. Calling it the "outlook envelope", Americus F. Callahan of Chicago was the first to patent the windowed envelope.[81] U.S. patent #701,839 was filed on December 9, 1901 and issued on June 10, 1902.[82]

1901 Radio direction finder

A radio direction finder (RDF) is a device for finding the direction to a radio source. Due to radio's ability to travel very long distances and "over the horizon", it makes a particularly good navigation system for ships, small boats, and aircraft that might be some distance from their destination. The radio direction finder is the earliest form of radio navigation. It was first patented by American physicist John Stone Stone. He filed on January 23, 1901 and was granted the patent (U.S. Patent 716,134) on December 16, 1902.[83]

1902 Hearing aid

- A hearing aid is an electro-acoustic body-worn apparatus which typically fits in or behind the wearer's ear, and is designed to amplify and modulate sounds for the wearer. Although hearing aids in some form or fashion such as the ear trumpet were developed in previous years, the first electric hearing aid was invented by Miller Reese Hutchison in 1902.[84]

1902 Postage meter

- A postage meter is a mechanical device used to create and apply physical evidence of postage, or franking, to mailed matter. Postage meters are regulated by a country's postal authority; for example, in the United States, the United States Postal Service specifies the rules for the creation, support, and use of postage meters. A postage meter imprints an amount of postage, functioning as a postage stamp, a cancellation and a dated postmark all in one. The postage meter was invented by Chicago inventor Arthur Pitney, receiving a patent for the invention on October 14, 1902.[85]

1902 Teddy bear

- A teddy bear is a stuffed toy bear. They are usually stuffed with soft cotton and have smooth and soft fur. It is an enduring form of a stuffed animal that has become a collector's item. The first teddy bear was invented in 1902 by Morris Michtom, owner of a Brooklyn toy store, who was inspired by Clifford Berryman's political cartoon *Drawing the Line in Mississippi* that depicted President Theodore "Teddy" Roosevelt on a hunting trip in Mississippi who spared the life of a Louisiana black bear cub. Michtom asked for and received President Roosevelt's permission to use his name for the hand-sewn bears called "Teddy bears" that he invented and his wife helped construct.[86]

1902 Periscope (collapsible)

- A periscope is an instrument for observation from a concealed position, known for use in submarines. In a simple form, it is a tube in each end of which are mirrors set parallel to each other and at an angle of 45 with a line between them. Periscopes allow a submarine, submerged at a shallow depth, to search for targets and threats in the surrounding sea and air. When not in use, the periscope is retracted into the hull. A sub commander in tactical conditions must exercise discretion when using his periscope, since it creates an observable wake and may be detectable to radar, giving away the sub's position. The invention of the collapsible periscope for use in submarine warfare is credited to Simon Lake in 1902, who called his device the omniscope or skalomniscope. Later, it was made to be raised and turned by hand.[87]

1902 Mercury arc valve

- A mercury arc valve is a type of electrical rectifier which converts alternating current into direct current. Rectifiers of this type were used in electric motor power supplies for industry, in electric railways, streetcars, and diesel-electric locomotives. They also found use in static inverter

stations and as rectifiers for high-voltage direct current power transmission. Mercury arc rectifiers were invented by Peter Cooper Hewitt in 1902.[88]

1902 Air conditioning

Air conditioning units outside a classroom building

Air conditioning is the cooling and de-humidification of indoor air for thermal comfort. Using a system of coils as a solution to cool and remove moisture from muggy air in a printing plant that was wrinkling magazine pages, Willis Carrier invented and manufactured the world's first mechanical air conditioning unit in 1902.[89] Carrier's invention – encompassing the first system to provide man-made control over temperature, humidity, ventilation and air quality, was first installed as a solution to the quality problems experienced at a Brooklyn printing plant, Sackett-Wilhelms Lithographing and Publishing Company. Air conditioning not only spawned a company and an industry, but also brought about profound economic, social and cultural changes.[11]

1903 Tea bag

A tea bag is a small, porous paper, silk or nylon sealed bag containing tea leaves for brewing tea. Tea bags were invented by Thomas Sullivan around 1903. The first tea bags were made from silk. Sullivan was a tea and coffee merchant in New York who began packaging tea samples in tiny silk bags, but many customers brewed the tea in them.[90]

1903 Offset printing press

- Offset printing is a commonly used printing technique where the inked image is transferred from a plate to a rubber blanket, then to the printing surface. Ira Washington Rubel invented the first offset printing press in 1903.[91]

1903 Airplane

The Wright Flyer II flying almost four circles over Huffman Prairie, about 2 and 3/4 miles in 5 minutes and 4 seconds on November 9, 1904.

A fixed-wing aircraft, or airplane, is a heavier-than-air craft whose lift is generated by air pressure differential between the upper and lower wing surfaces. The Wright brothers, Wilbur and Orville Wright of Dayton, Ohio, made the first powered and sustained airplane flights under control of the pilot in the Wright Flyer I on December 17, 1903 in Kitty Hawk, North Carolina.[92][93][94] In the two years afterward, they developed their flying machine into the world's first practical fixed-wing aircraft.[95] By October 1905, the Wright Flyer III was capable and proven to circle in the air 30 times in 39 minutes

for a total distance of 24.5 miles.[96] The brothers' fundamental breakthrough was their invention of "three-axis control", which enabled the pilot to steer the aircraft effectively and to maintain its equilibrium. This required method has become standard on all fixed-wing aircraft. From the beginning of their aeronautical work, the Wright brothers focused on unlocking the secrets of control to conquer "the flying problem", rather than on developing more powerful engines as some other experimenters did. Charles Edward Taylor built the first aircraft engine and was a vital contributor of mechanical aspects in the building and maintaining of early Wright engines and airplanes.[97] Although there were many earlier attempts at heavier-than-air powered flight, some of which achieved successful short hops,[98] and disputed earlier claims of sustained flight,[99] the Wright brothers are officially credited by the Fédération Aéronautique Internationale, the international record-setting body for aeronautics and astronautics, as achieving "the first sustained and controlled heavier-than-air powered flight".[100] In addition, U.S. patent number #821393 for the airplane, was filed by Orville Wright on March 23, 1903 and was issued in May 1906.[101]

1903 Windshield wipers

A windshield wiper with motorized arm

The windshield wiper is a bladed device used to wipe rain and dirt from a windshield. In 1903, Mary Anderson is credited with inventing the first operational windshield wiper.[102][103] In Anderson's patent, she called her invention a window cleaning device for electric cars and other vehicles. Operated via a lever from inside a vehicle, her version of windshield wipers closely resembles the windshield wiper found on many early car models. Anderson had a model of her design manufactured. She then filed a patent (U.S. patent number 743,801) on June 18, 1903 that was issued to her by the U.S. Patent Office on November 10, 1903.[104][105]

1903 Wood's glass

Wood's glass is a light filter used in communications during World War I. An "invisible radiation" technique which worked both in infrared daylight communication and ultraviolet night communications, it does not transmit visible light, leaving the 'invisible radiation' as a signal beam. Wood's glass was invented by Robert Williams Wood in 1903.[106]

1903 Wood's lamp

A Wood's lamp is a diagnostic tool used in dermatology which shines ultraviolet light onto the skin of the patient; a technician then observes any subsequent fluorescence. Though the technique for producing a source of ultraviolet light was devised by Robert Williams Wood in 1903 using "Wood's glass", not until 1925 was the technique used in dermatology by Margarot and Deveze for the detection of fungal infection of hair.[107]

Round hay bales near Elbląg Canal, Poland

1903 Baler (round)

A baler is a piece of farm machinery used to compress a cut and raked crop (such as hay, straw, or silage) into compact bales that are easy to handle, transport and store. Several different types of balers are commonly used, each producing a different type of bales – rectangular or cylindrical (round), of various sizes, bound with twine, netting, or wire. The round hay baler was invented by Ummo F. Luebben of Sutton, Nebraska, which he conceived with his brother Melchior in 1903, and then patented in 1910. The invention of the round hay baler revolutionized the laborious task of haying into a one-man, low-cost operation with a machine that automatically gathered the hay, rolled into a round bale, and ejected it.[108]

1904 Automatic transmission

An automatic transmission is an automobile gearbox that changes gear ratios automatically as the vehicle moves, freeing the driver from having to shift gears manually. Modern automatic transmissions trace their origins to an early "horseless carriage" gearbox that was developed in 1904 by the Sturtevant brothers of Boston, Massachusetts.[109]

1904 Banana split

- A banana split is an ice cream-based dessert. In its classic form it is served in a long dish called a boat. A banana is cut in half lengthwise (hence the split) and laid in the dish. There are many variations, but the classic banana split is made with scoops of vanilla, chocolate and strawberry ice cream served in a row between the split banana. Although the banana as an exotic fruit was introduced to the American public in the 1880s, it was later in 1904, that the banana split was invented in the town of Latrobe, Pennsylvania by 23-year-old pharmacy apprentice David Strickler, who was inspired to create a new sundae after seeing a soda jerk during a visit to Atlantic City. According to *The Food Chronology*, written in 1995 by James Trager, Strickler concocted his sundae to include three scoops of ice cream on a split banana, topped with chocolate syrup, marshmallow, nuts, whipped cream, and a cherry that sold for a dime. Other soda jerks soon imitated Strickler's banana split, albeit in other forms.[110]

1904 Pantograph (diamond-shaped)

- A pantograph is a device that collects electric current from overhead lines for electric trains or trams. The term stems from the resemblance to pantograph devices for copying writing and drawings. In 1904, the diamond-shaped roller pantograph was invented by John Q. Brown of the Key System shops for their commuter trains which ran between San Francisco and the East Bay section of the San Francisco Bay Area in California. A patent was issued on July 5, 1904.[111]

1904 Dragline excavator

- Drag-line excavation systems are heavy equipment used in civil engineering and surface mining. In civil engineering the smaller types are used for road and port construction. The larger types are used in strip-mining operations to move overburden above coal, and for tar-sand mining. A

drag line bucket system consists of a large bucket which is suspended from a boom, a large truss-like structure, with wire ropes. The bucket is maneuvered by means of a number of ropes and chains. The hoist rope, powered by large diesel or electric motors, supports the bucket and hoist-coupler assembly from the boom. The drag rope is used to draw the bucket assembly horizontally. By skillful maneuvre of the hoist and the drag ropes the bucket is controlled for various operations. The dragline excavator was invented in 1904 by John W. Page.[112]

1905 Batting helmet

A batter wearing a batting helmet

A batting helmet is the protective headgear worn by batters in the game of baseball or softball. It is meant to protect the batter's head from errant pitches thrown by the pitcher. A batter who is "hit by pitch", due to an inadvertent wild pitch or a pitcher's purposeful attempt to hit him, may be seriously, even fatally, injured. In 1905, a New York Giants (the team now known as the San Francisco Giants) baseball player named Roger Bresnahan, after missing thirty days of the baseball season and lying in a hospital bed due to a head injury (or beaning), created, with assistance from the A.J. Reach Company, a crude, leather, vertically sliced football helmet over his cap that is considered to be the first batting helmet. The headgear was unpopular, even with Bresnahan at the time, and it wasn't until the mid-1950s that his idea was accepted.[113]

1905 Liquid ring pump

A liquid ring pump is a rotating positive displacement pump that is powered by an induction motor and is typically used as a vacuum pump or as a gas compressor. The liquid ring pump was invented in 1905 by Lewis H. Nash. Production soon began thereafter at the Nash Engineering Company.[114] Nash filed U.S. patent #1,091,529 on February 24, 1910 and was issued to him on March 31, 1914.[115]

1905 Ice pop

- An ice pop is a frozen water-based dessert on a stick. It is made by freezing a colored, flavored liquid around a stick. Once the liquid freezes solid, the stick can be used as a handle to hold the ice pop. The ice pop was invented by 11-year-old Frank Epperson in 1905. Living in San Francisco, California, Epperson had left a fruit drink out overnight, with a stirrer in it, thus making it freeze. In 1923, Epperson got a patent on his "frozen ice on a stick". Epperson also invented the twin ice pop, with two sticks so it could be shared by two children. The most famous brand name associated with the ice pop is *Popsicle*.[116]

1906 Typesetting

- Typesetting is the retrieval of the stored letters and the ordering of them according to a language's orthography for visual display. Typesetting was invented by John Raphael Rogers of Brooklyn, New York who filed U.S. patent #837127 on October 8, 1906 and issued to him on November 27, 1906.[117][118]

1906 Flushometer

- A flushometer, or royal flushometer is a water pressure system that uses an inline handle to flush toilets and urinals. By using pressurized water directly from the supply line, there is a faster recycle time between flushes. The flushometer is still in use today in homes and public restrooms around the world. The flushometer was invented in 1906 by American businessman and inventor William Elvis Sloan.[119][120]

1906 Audion tube

- The Audion is an electronic amplifier device and was the forerunner of the triode, in which the current from the filament to the plate was controlled by a third element, the grid. A small amount of power applied to the grid could control a larger current from the filament to the plate, allowing the Audion both to detect radio signals and to provide amplification. The Audion tube was invented by Lee De Forest in 1906.[121]

1907 Curtain rod

- A curtain rod or traverse rod is a device used to suspend curtains, usually above windows or along the edges of showers, though also wherever curtains might be used. The flat, telescoping curtain rod was invented by Charles W. Kirsch of Sturgis, Michigan, in 1907. However, they were not in use until the 1920s. Kirsch also invented the traverse curtain rod in 1928.[122]

1907 Electrostatic precipitator

- An electrostatic precipitator (ESP), or electrostatic air cleaner is a particulate collection device that removes particles from a flowing gas (such as air) using the force of an induced electrostatic charge. Electrostatic precipitators are highly efficient filtration devices that minimally impede the flow of gases through the device, and can easily remove fine particulate matter such as dust and smoke from the air stream. In 1907, the California physicist Frederick G. Cottrell invented and received a patent for the electrostatic precipitator.[123]

1907 Paper towel

- A paper towel has the same purposes as conventional towels such as drying hands, wiping windows, dusting, cleaning up spills. However, paper towels can only be used once after they blot wet surfaces. A school teacher in Ashland, Ohio, named Kurt Klier, gave students individual paper squares, so that the single towel in the bathroom would not be infected with germs. When Arthur Scott, head of the Scott Paper Companyheard about it, he decided to try to sell a load of paper that had been made too thick to use as toilet paper.[124]

1908 Candy apple

A candy apple

Candy apples, also known as toffee apples outside of North America, are whole apples covered in a hard sugar candy coating. While the topping varies from place to place, they are almost always served with a wooden stick of sorts in the middle making them easier to eat. Toffee apples are a common treat at autumn festivals in Western culture in the Northern Hemisphere, such as Halloween and Guy Fawkes Night because these festivals fall in the wake of the annual apple harvest. Dipping fruits into a sugar syrup is an ancient tradition. However, the origin of the red candy apple is attributed to Newark, New Jersey candymaker who conceived the idea of dipping apples into a red cinnamon candy mixture he had on hand. In addition, dipping apples in hot caramel a 1950s American invention attributed to Kraft salesman Dan Walker.[125]

1909 Skee ball

Skee ball is a common game found in arcades and one of the first redemption games. Skee ball is similar to bowling except it is played on an inclined lane and the player aims to get the ball to fall into a hole rather than knock down pins. The object of the game is to collect as many points as possible by rolling balls up an incline and into the designated point value holes. Skee ball was invented and patented in 1909 by J.D. Estes of Philadelphia.[126]

1909 Paper shredder

Paper shredders are used to cut paper into chad, typically either strips or fine particles. Government organizations, businesses, and private individuals use shredders to destroy private, confidential, or otherwise sensitive documents. The first paper shredder is credited to prolific inventor Abbot Augustus Low of Horseshoe, New York. His patent for a "waste paper receptacle" to offer an improved method of disposing of waste paper received a U.S. patent on August 31, 1909.[127]

1909 Suppressor

- A suppressor or silencer is a device either attached to or part of the barrel of a firearm to reduce the amount of noise and flash generated by firing the weapon. It generally takes the form of a cylindrically shaped metal tube with various internal mechanisms to reduce the sound of firing by slowing the escaping propellant gas, and sometimes by reducing the velocity of the bullet. Hiram Percy Maxim, the son of famous machine gun inventor Hiram Stevens Maxim, is credited with inventing the suppressor in 1909.[128]

1909 Gin rummy

- Gin rummy, or Gin for short, is a simple and popular two-player card game with a standard 52-card pack. The objective of Gin Rummy is to score more points than your opponent improving one's hand by forming melds and eliminating deadwood. Gin rummy was invented by Elwood T. Baker and his son, C. Graham Baker in 1909.[129]

1910 Headset

- A headset is a headphone combined with a microphone. Headsets provide the equivalent functionality of a telephone handset with hands-free operation. They are used in call centers and by people in telephone-intensive jobs. The first-ever headset was invented in 1910, by a Stanford University student named Nathaniel Baldwin.[130]

1911 Fifth wheel coupling

- The fifth wheel coupling provides a pivoting link between a semi-trailer and the towing truck, tractor unit, leading trailer or dolly. Some recreational vehicles have a fifth wheel configuration, requiring the coupling to be installed in the bed of a pickup truck as a towing vehicle. The coupling consists of a coupling pin (or kingpin) on the front of the semi-trailer, and a horseshoe-shaped coupling device called a fifth wheel on the rear of the towing vehicle. In 1911, Charles Martin invented the fifth wheel coupler consisting of a round plate with a hole in it, attached to a frame mounted on his tractor.[131]

1911 Erector Set

- An Erector Set is a toy construction set that consists of collections of small metal beams with regular holes for nuts, bolts, screws, and mechanical parts such as pulleys, gears, and small electric motors. Popular in the United States, the brand name is currently used for Meccano sets (themselves patented in 1901). The erector set was invented in 1911 by Alfred Carlton Gilbert and was manufactured by the A. C. Gilbert Company at the Erector Square factory in New Haven, Connecticut. The first sets were called by A.C. Gilbert "The Erector / Structural Steel & Electro-Mechanical Builder". Accessory sets were also available to allow children to upgrade basic sets.[132]

1911 Binder clip

A single, large sized binder clip

A binder clip, or a banker's clip or foldback clip, is a simple device for binding sheets of paper together. It leaves the paper intact and can be removed quickly and easily unlike the staple. The binder clip was invented in 1911 by Washington, D.C. resident Louis E. Baltzley who was motivated by a desire to help his father, Edwin, a prolific writer and inventor, keep manuscripts in order. The original design was modified five times, but the essential mechanism has never changed.[133]

1911 Automobile self starter

An automobile self-starter is an electric motor that initiates rotational motion in an internal combustion engine before it can power itself, therefore eliminating the hand crank used to start engines. In 1911, Charles F. Kettering invented the automobile self-starter while working at National Cash Register and then sold them for installation on cars at the Cadillac company. There had been many attempts at producing an electric starter before, but none of them were successful. Most designs at that time called for the use of an electric motor attached to the engine's flywheel. However, in order to fit in the car's engine compartment, the device would have to be small, and therefore it would be unable to produce a sufficient enough amount of torque.[134][135]

1911 Road surface marking

Dead Man's Curve along the Marquette–Negaunee Road in Michigan shown in 1917 with the first hand-painted centerline

A road surface marking is any kind of device or material that is used on a road surface in order to convey official information for drivers and pedestrians. Edward N. Hines originated the concept of painting a line down the center of a road to separate traffic in opposing directions. They were first used in Wayne County, Michigan in 1911.[136]

1912 Autopilot

An autopilot is a mechanical, electrical, or hydraulic system used to guide a vehicle without assistance from a human being. Most people understand an autopilot to refer specifically to aircraft, but self-steering gear for ships, boats, space craft, and missiles is sometimes also called *autopilot*. The first aircraft autopilot was invented by Lawrence Sperry in 1912. Sperry demonstrated it in 1914, and proved the credibility of the invention by flying the aircraft with his hands away from the controls and visible to onlookers.[137]

1912 Electric blanket

An electric blanket is a blanket with an integrated electrical heating device usually placed above the top bed sheet. The first electric blanket was invented in 1912 by American physician Sidney I. Russell. This earliest form of an electric blanket was an 'underblanket' under the bed that covered and heated from below. In 1937, Electric 'overblankets which lie on top of the sleeping person were introduced in the United States.[138][139]

1912 Traffic light (electric)

Traffic lights in Spain

The traffic light, also known as traffic signal, is a signaling device positioned at a road intersection, pedestrian crossing, or other location. Its purpose is to indicate, using a series of colors, the correct moment to stop, drive, ride or walk, using a universal color code. The color of the traffic lights representing stop and go are likely derived from those used to identify port (red) and starboard (green) in maritime rules governing right of way, where the vessel on the left must stop for the one crossing on the right. In Salt Lake City, Utah, policeman Lester Wire invented the first red-green electric traffic lights.[140]

1913 Formica (plastic)

Formica is a hard durable plastic laminate used for countertops, cupboard doors, and other surfaces which are heat-resistant and easy to clean. Formica was invented in 1913 by Herbert A Faber and Daniel J. O'Connor of Westinghouse Electric.[141]

1914 Regenerative circuit

The regenerative circuit allows an electronic signal to be amplified many times by the same vacuum tube or other active component such as a field effect transistor. A regenerative circuit is often an AM detector, converting the RF signal on the antenna to an audio waveform. Their use of positive feedback greatly increases both the selectivity and sensitivity of a simple receiver. Positive feedback builds up the input signal to very high levels. Edwin Armstrong, invented and patented the regenerative circuit while he was a junior in college, in 1914.[142]

1914 Traffic cone

- Traffic cones, also called toddlers, road cones, safety cones, construction cones, pylons, or Witches' Hats, are usually cone-shaped markers that are placed on roads or sidewalks to temporarily redirect traffic in a safe manner. Traffic cones were invented in 1914 by Charles P. Rudabaker.[143]

1914 Fortune cookie

- A fortune cookie is a crisp cookie usually made from flour, sugar, vanilla, and oil with a "fortune" wrapped inside. A "fortune" is a piece of paper with words of faux wisdom or a vague prophecy. In the United States, it is usually served with Chinese food in Chinese restaurants as a dessert. The message inside may also include a list of lucky numbers and a Chinese phrase with translation. Contrary to belief, the fortune cookie associated as a Chinese invention is a fallacy. In 1914, the Japanese-American named Makoto Hagiwara of the Japanese Tea Garden in San Francisco, California, introduced the fortune cookie and is thus recognized as its inventor.[144]

1915 Skeet shooting

- Skeet shooting is an Olympic sport where participants attempt to break clay disks flung into the air at high speed from a variety of angles. The firearm of choice for this task is usually a high quality, double-barreled over and under shotgun with 28/30 inch barrels and open chokes. The event is in part meant to simulate the action of bird hunting. The shooter shoots from eight positions on a semicircle with a radius of 21 yards (19 m), and an 8th position halfway between stations 1 and 7. There are two houses that hold devices known as "traps" that launch the targets, one at each corner of the semicircle. Skeet shooting began in Andover, Massachusetts in 1915, when grouse hunter Charles Davis invented a game he called "shooting around the clock" to improve his wingshooting.[145]

1915 Single-sideband modulation

- Single-sideband modulation (SSB) is a refinement of amplitude modulation that more efficiently uses electrical power and bandwidth. Single-sideband modulation produces a modulated output

signal that has a bandwidth identical to that of the original baseband signal, unlike amplitude modulation which has double the bandwidth. Although John Renshaw Carson invented SBB in 1915, his patent was not granted until March 27, 1923.[*citation needed*]

1916 Hamburger bun

- A hamburger bun is a bread roll sliced horizontally containing a hamburger, usually a patty consisting of ground meat that also typically contains lettuce, bacon, tomato, onion, pickles, cheese and condiments such as mustard, mayonnaise, ketchup and relish. The hamburger bun was invented in 1916 by a fry cook named Walter Anderson, who co-founded White Castle in 1921.[146]

1916 Lincoln Logs

- Lincoln Logs is the name of a children's toy consisting of notched miniature wooden logs, used to build miniature forts, cabins, and buildings. Lincoln Logs were invented in 1916 by John L. Wright, son of famous American architect Frank Lloyd Wright.[147]

1916 Supermarket

The interior of a supermarket in Toronto, Canada

A supermarket is a self-service store offering a wide variety of food and household merchandise, organized into departments. It is larger in size and has a wider selection than a traditional grocery store. The concept of a "self-service" grocery store was invented by American entrepreneur Clarence Saunders and his Piggly Wiggly stores. Beforehand, customers would shop at a general store where a clerk behind a counter would fetch inventory in limited quantity for customers to purchase. With Saunders' new innovation of self-service, customers would be able to choose a wider selection of goods at competitive prices. Saunders' first store opened in Memphis, Tennessee, in 1916.[148]

1916 Cloverleaf interchange

A cloverleaf interchange is a two-level interchange in which left turns, in countries that drive on the right, are handled by loop roads. To go left, in right-hand traffic, vehicles first pass either over or under the other road, then turn right onto a one-way three-fourths loop ramp (270°) and merge onto the intersecting road. The cloverleaf was first patented in the United States by Arthur Hale, a civil engineer in Maryland, on February 29, 1916.[149]

1916 Tow truck

- A tow truck is a vehicle used to transport motor vehicles to another location, generally a repair garage, or to recover vehicles which are no longer on a drivable surface. Vehicles are often towed in the case of breakdowns or collisions, or may be impounded for legal reasons. The tow truck was invented in 1916 by Ernest Holmes, Sr., of Chattanooga, Tennessee. He was a garage worker who was inspired to create the invention after he was forced to pull a car out of a creek using blocks, ropes, and six men. An improved design led him to manufacture wreckers.[150]

1916 Condenser microphone

- A condenser microphone, also called a capacitor microphone or electrostatic microphone, is a microphone containing a capacitor that has two plates with a voltage between them. In the condenser microphone, one of these plates is made of very light material and acts as the diaphragm. The diaphragm vibrates when struck by sound waves, changing the distance between the two plates and therefore changing the capacitance. Specifically, when the plates are closer together, capacitance increases and a charge current occurs. When the plates are further apart, capacitance decreases and a discharge current occurs. A voltage is required across the capacitor for this to work. This voltage is supplied either by a battery in the mic or by external phantom power. The condenser microphone was invented in 1916 at Bell Laboratories by Edward Christopher 'E.C.' Wente, which became possible with the advent of the vacuum tube (valve) to act as an amplifier of the low signal output.[151]

1916 Light switch (toggle)

An example of on/off toggle light switches mounted on a wall

A toggle light switch is a switch, most commonly used to operate electric lights, permanently connected equipment, or electrical outlets whereby the switch handle does not control the contacts directly, but through an intermediate arrangement of internal springs and levers. The toggle light switch is safe, reliable, and durable, but produces a loud "snap" or "click" noise when a person's finger manually flips the toggle light switch into the on/off position. The design for the toggle light switch was patented in 1916 by William J. Newton and Morris Goldberg of Lynbrook, New York.[152]

1917 Stream cipher

In cryptography, a stream cipher is a symmetric key cipher where plaintext bits are combined with a pseudorandom cipher bit stream, typically by an exclusive-or (xor) operation. In a stream cipher the plaintext digits are encrypted one at a time, and the transformation of successive digits varies during the encryption. Also known as a state cipher, the stream cipher was invented in 1917 by Gilbert Sandford Vernam at Bell Labs.[153]

1917 Marshmallow creme

- Marshmallow creme, better known as marshmallow "fluff" in the United States, is a food item that is a sweet, spreadable, marshmallow-like confection. It is typically used with peanut butter on the fluffernutter sandwich. In addition, marshmallow creme and Nutella can be spread on graham crackers to emulate s'mores. Marshmallow creme is a New England creation invented in 1917 by Archibald Query of Somerville, Massachusetts.[154][155]

1918 Superheterodyne receiver

- In electronics, a superheterodyne receiver uses frequency mixing or heterodyning to convert a received signal to a fixed intermediate frequency, which can be more conveniently processed than the original radio carrier frequency. Virtually all modern radio and television receivers use

the superheterodyne principle. The superheterodyne receiver was invented in 1918 by Edwin Armstrong. It was introduced to the market place in the late 1920s.[156]

1918 French dip sandwich

- A French dip sandwich, also known as a beef dip, is a hot sandwich consisting of thinly sliced roast beef (or, sometimes, other meats) on a "French roll" or baguette. It is usually served *au jus* ("with juice"), that is, with beef juice from the cooking process. Beef broth or beef consommé is sometimes substituted. Despite the sandwich's name, the French dip sandwich was not invented in France, but in the United States. Both *Philippe the Original's* and *Cole's Pacific Electric Buffet*, two restaurants in Los Angeles, claim to have invented the French dip sandwich. Philippe Mathieu may have possibly invented the sandwich by accident around the year 1918, who according to one story, accidentally dropped a sandwich in a pan of *au jus'*. Another story is that a fireman to Philippe's restaurant found his roast beef sandwich roll to be too hard. Thus, Philippe had it dipped in juice. Whatever the origin, *Cole's Pacific Electric Buffet* also claims to have invented the French dip sandwich as well.[157]

1918 Torque wrench

- A torque wrench is a tool used to precisely apply a specific torque to a fastener such as a nut or bolt. It is usually in the form of a socket wrench with special internal mechanisms. It was invented by Conrad Charles Bahr in 1918.[158] However, it wasn't until much later on March 16, 1937, that Bahr received U.S. patent #2,074,079 for the invention of the torque wrench.[159]

1918 Crystal oscillator

- A crystal oscillator is an electronic circuit that uses the mechanical resonance of a vibrating crystal of piezoelectric material to create an electrical signal with a very precise frequency. This frequency is commonly used to keep track of time as used in quartz wristwatches, to provide a stable clock signal for digital integrated circuits, and to stabilize frequencies for radio transmitters and receivers. The first crystal-controlled oscillator, using a crystal of Rochelle Salt, was invented by Alexander M. Nicholson. However, it is generally accepted that Dr. Walter Guyton Cady was the first to use a quartz to control the frequency of an oscillator circuit. Nevertheless, Nicholson is still regarded as the inventor of the crystal oscillator.[160]

1918 Grocery bag

- Shopping bags are medium-sized bags, typically around 10–20 litres (2.5 to 5 gallons) in volume, that are often used by grocery shoppers to carry home their purchases. They can be single-use (disposable), used for other purposes or designed as reusable shopping bags. The grocery bag with handles was invented in 1918 by Walter Deubener of St. Paul Minnesota.[161] U.S. patent #1,305,198 was issued to Deubener on May 27, 1919.[162]

1918 Hydraulic brake

- The hydraulic brake is an arrangement of braking mechanism which uses brake fluid, typically containing ethylene glycol, to transfer pressure from the controlling unit, which is usually near the operator of the vehicle, to the actual brake mechanism, which is usually at or near the wheel of the vehicle. In 1918, the hydraulic brake was invented by Malcolm Loughead, which replaced the mechanical brake which was used previously on automobiles.[163]

1919 Blender

- A blender is an upright, stationary kitchen appliance used to mix alcoholic beverages and puree food. Blenders are also used to prepare emulsions, such as mayonnaise, and cream soups. In 1919, Polish-American Stephen J. Poplawski of Racine, Wisconsin invented, designed, and manufactured beverage mixers used in preparation for malted milk served at soda fountains. It consisted of a spinning blade on a long rod extending down into a cup. Poplawski patented his invention of the blender in 1922.[164][165]

1919 Silica gel

- Silica gel is a granular, porous form of silica made from sodium silicate. Silica gel is a solid. The synthetic route for silica gel was invented and patented by chemistry professor Walter A. Patrick at Johns Hopkins University, Baltimore, Maryland in 1919.[166]

1919 Toaster (pop-up)

- The toaster is typically a small electric kitchen appliance designed to toast multiple types of bread products such as sliced bread, bagels, and English muffins. Although not the first to invent the toaster, the pop-up toaster was invented by Charles Strite in 1919, consisting of a variable timer and springs in order to prevent burnt toast. Strite received a patent for his invention on May 29, 1919.[167]