Aspesi Federico Class 5 F

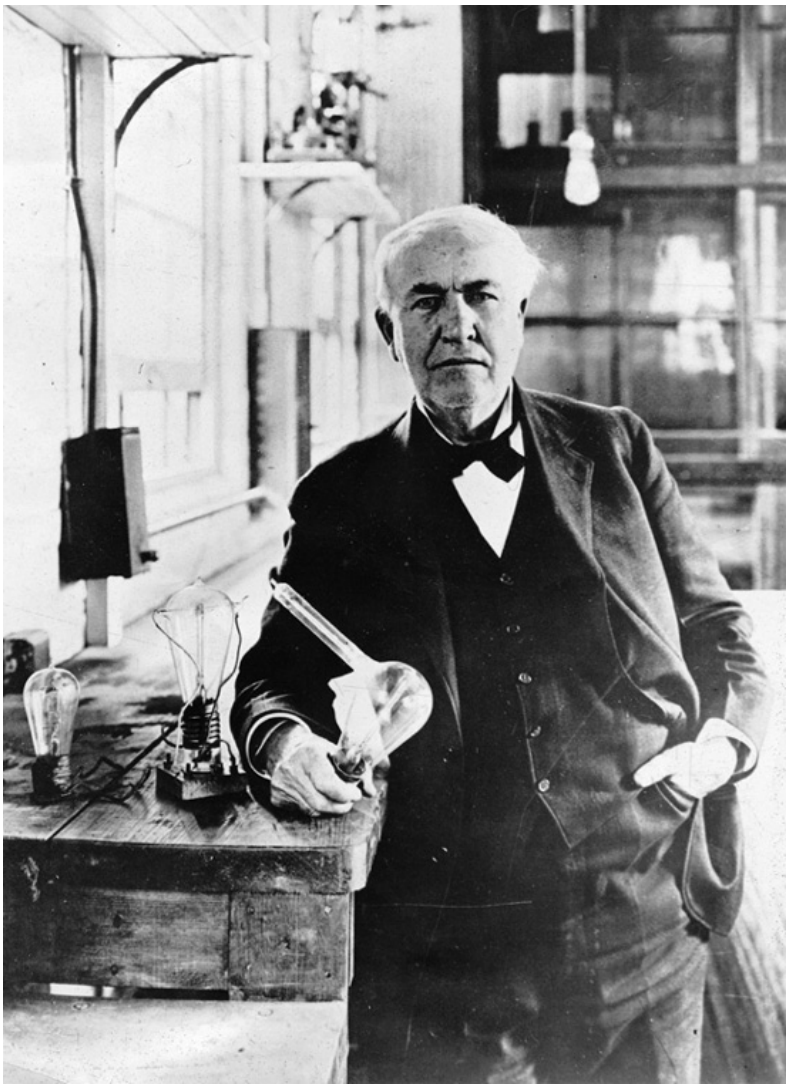
Thomas Alva Edison's Inventions

Thomas Alva Edison was Born in 1847 at Milan (Ohio), only 10 years later he set up a chemical laboratiry in the cellar of his home: this was the beginning of a brilliant career that led him to patent 1093 inventions in his name in the U.S.A. and severals in all over the world (France, Englad and Germany): 1368 altogether. He managed to do all this even if he had been homeschooled by his mother and he suffered from hearing impairment.
At the age of 15 he was already famous because he gave birth to the first newspaper that was printed on a moving train, ''The Weekly Herald'', and for this reason he was noticed by The London Times. Working on trains he saved a child in a train accident: this event represented a turning point in his life but also in his carrer; in fact this child was son of a station agent that, in gratitude towards Edison, taught him telegraphy. Later he patented several inventions connected to telegraphs and in general communication. In fact he had been working for 6 years as a telegraph operator and then as superintendent; in this period he developed studies about duplex system of telegraphy, and, in 1868, he came up with his first patented invention the **Electrical Vote Recorder**. From 1872 to 1877[1] he patented the **motograph**, the **quadruplex, sextuplek and multiplex telegraphs** (different automatic telegraphs) and a low quality **phonograph** that reproduced sounds.
Anoher great invention of this period was the **carbon telephone transmitter button** very important for telephony. But in this period Edison invented a more fundamental item: the **light bulb**; in these years he worked in an high tech lab in Menlo Park. This lab, as Edison claimed, had every conceivable material (for example needle, wires, cord and even hair); in it a group of Edison's assistants, his staff, used to work including the brilliant electrical engineer William Hammer. Is important to stress the fact that Edison didn't invented the light bulb because Woodraw, Evans, Davy and Sawyer had already created it, but he managed to create a bulb that was long lasting and a commercially practical incandescent light. Edison used for the first time the term ***filament*** to describe the element that carried the current, and made it, at the biginning, of several different metals, then he used carbon filaments, that, as we can read in the patent, could be obtained in different ways. Then, Jenuary 27 1880, Edison patented a **carbonized bamboo filament** that lasted 1200 hours (instead the carbon filament lasted 40 hours, 30 times less). This idea came after observing a bamboo fishing pole during a trip in occasion of a total eclipse of the sun. This patent was the object of a dispute in which at first a judge claimed that the lamp was created by Sawyer not by Edison, at the end, in 1889, another judge recognized the originality of Edison's invention.
In 1880[2] Edison also patented a **system for electricity distribution** after he had invented different **ways to generate, regulate and measure electric current and voltage**. In the same year this great inventor founded the Edison Illuminating Company in the U.S.A. but Edison's system was used for the first time in London (1882), it provided to a few customers and to streets lamps a

110 volt direct current: these were only the basis for the modern society, in which we consider common to have electricity available in our homes.
Edison's system was based on direct current, but in this years another great inventor, Nikola Tesla (one of Edison's collaborators), created another way to distribute current: the alternate current, that could reach very high voltages during the transmission and then it could be stepped down when it reached the customer; moreover its wires were cheaper than the one that **D.C.** used. The A.C. could carry electricity hundreds of miles instead D.C. could reach customers only near the generating station (2,4 km). A positive aspect of D.C. was the fact that the power could be mantained continuos thanks to battery banks. Moreover Edison thought that A.C. was very dangerous, and, to show its negative aspects, he electrocuted animals, even an elephant, and created the electric chair which used A.C..
In 1882-1883 Edison made another great discovery about electricity, as he named it, the ''Etheric Force'', nowadays known as the **''Edison effect''**; according to this, a grid put between the 2 components of the filament of an incandescent lamp worked as a valve that can control the flow of current. Later he patented a more foundamental thing the **diode** that opened the gates to today's electronical devices. This great invention had been possible only after the creation of the light bulb, the discovery of the Edison Effect and the carbon button.Edison after a fiew years understood that electric waves, which moove in free space, were the cause of this phenomenon and became the foundation of **wireless telegraphy:** he created a system, based on the Edison Effect and on induction, to communicate to and from trains and ships.
In the period 1887-1890[3] Edison created the **cilinder phonograph** and the **dictating machines**. In 1891 he created the **motion picture camera** that took and reproduced images thanks to a continuos tape-like film and invented the **kinetoscope** or peep-hole viewer installed in arcades. People could watch a brief film for one penny while they were listening to music with Edison's phonograph.
During the following 10 years Edison patented the **fluoroscope** that, thanks to X-rays, could take radiographs and improved the **X-ray tube**. Later, in the first 10 years of the 20th century, he improved the producing process of **pre-cast buildings**, invented the s**teel alcaline storage battery** and a new type of **dictating machine**. In 1912 he invented the **kinetophone** a talking motion picture in which images of kinetoscope were combined with sounds produced by a phonograph.
During the First World War he invented a new way to produce synthetically the **carbolic acid** (C_6H_6O), that is the base of explosives, in severals plants that provided 6350 kg per day. In the last 2 years of the WWI Edison worked for the government and invented systems to destroy periscopes with **machine guns**, to detect airplane, to **block torpedoes with nets,** to locate positions of guns **by sound ranging,** to camouflage ships. Moreover he created **underwater searchlight**, more **powerfull torpedoes** and even he thought out a **strategic plan** to save cargo boats from harm by enemy submarines.
Thomas Alva Edison died on October 18th 1931 (the anniversary date of the invention of the incandescent bulb) at age 84 in West Orange.

Other inventions

1 in this period (1872-1877) he invented the forerunner of the present day **mimeograph machine**, the **paraffin paper** (used for wrapping candies), the **carbon rheostat**, the **microtasimeter**, the **electric pen**.
2 in 1879 and 1880 he invented and constucted the **first electric motor** (120 volt), the i**nsulating tape**, **gummed paper tape** and an **electric railway**.
3 in 1887-1890 he created **shaving machines**.



Thomas Alva Edison (1847-1931)