7th - 14th Century

Ca. 846:
In the ‘liber ignium ad comburendas hostes’, Marcus Graecus describes a black powder mixture of six parts saltpeter, one part sulfur, two parts charcoal.

Ca. 1055:
According to Vosius delicate Chinese artillery was made in bronze.

1147:
Arabs used firearms against Spaniards and Normans in Lisbon.

1193:
The so called Greek fire was used in the Port of Dieppe against English ships. It was used without artillery.

Ca. 1260:
In the book ‘Opus Majus’ the Franciscan monk Roger Bacon from Ilchester, England, (1214 to 1294) a recipe for black powder is men-tioned: Seven parts saltpeter, five parts sulfur, five parts charcoal.

Ca. 1280:
In ‘De mirabilibus mundi’ Alberta Magnus, bishop of Regensburg descri-bes rockets with propellant powder and fire ignition compound. The compound consisted of saltpeter, sulfur and linseed oil with high saltpeter content and less sulfur.

1324:
The city of Venice contracts the making of Cannoni and iron balls to defend the city.

Ca. 1310:
Presumably first application of firearms.

1326:
IIn the two manuscripts ’De Nobilitatibus, Sapientiis et Prudentiis Regum’ and ‘De Secretis Secratorum’of chaplain Walter de Milemete, written in 1326 for King Eduard III of England, there are illustrations on the edges, depicting armored knights with a hook shaped rod that is held to a vase shaped barrel. Presumably there is glowing coal or moss attached to this rod. Arrows are shot from the muzzle of the vase shaped barrel. This is possibly the oldest illustration of a firearm.

1330-33:
Arrows for Cannons in the Castle of Eltz.

Ca. 1340:
The oldest still existing firearm, the so called Loshult-Büchse was found in the Swedish place of Loshult in 1861. Theodor Jakobson is the first person to refer to the similarities of the Milemete illustration.

1343:
Application of iron Lotbüchsen in Toulouse.

1346:
First mention of firearms in documents of Venice.

1347:
Handguns traceable in England.

Ca. 1350:
First artillery with barrels cast from bronze, are used to shoot round chiseled rocks.

Ca. 1350:
Making of the largest known mortar from forged iron with a caliber of 882 mm with the name: “Der grosse Pumphart’ von Steyer”.

1356:
Use of firearms in Nuremberg..

1358:
Handguns in Dijon/Burgund.

1364:
Handguns used in Perugia, Italy.

Ca. 1370:
One of the oldest small wall guns in the Historic Museum in Bern. The barrel is held with two rings. It is presumed that the hooks were attached into a vertical gap later.

Ca. 1575:
First application of timber stocks.

Ca. 1375:
Oldest known fist cannon forged from iron, with large reinforcement in the area of the powder chamber and shrunk on reinforcement ring at the muzzle. The touch hole with cross-shaped flash pan on the top side. The Barrel is split in the handle area. (City museum of Moravska Czech Republic)

Ca. 1375:
Igniting of firearms by hand with an iron glowing at the tip.

Ca. 1380:
Introduction of the tinder polypore to ignite the priming powder in the flash pan. This was fungus growing on various trees i.e. Beech.

Ca. 1385:
First appearance of timber stocks.

Ca. 1390:
Organ guns with handgun barrels.

Ca. 1395:
Bowl-shaped cavity on added to touch hole.

1398:
Breech loader made in Wrought iron in Geldern.

Before 1399:
Tannenberg hand cannon from bronze with a small flash pan slightly to the right on the topside. Integral receptical at the breech to insert a wooden rod. Found in the fortress of Tannenberg in Hessen, destroyed in 1399. Oldest precisely dated pole gun.

15th Century

Ca. 1400:
First appearance of wall guns.

1408:
Braunschweig has a cannon the “Faule Metze” that shoots 300 pound rocks.

Ca. 1420:
Invention of the match: Hemp string of finger thickness, soaked in lead acetate, with the capability of glowing for a long time.

Ca. 1420:
The technique of sizing black powder grains for even burning is developed.

Ca. 1425:
Introduction of the wall gun. It has a larger caliber and a longer barrel than the hand cannon. An attached hook was placed over the parapet to absorb the recoil.

Ca. 1430:
Multi-layered forged iron barrel. Early hand cannon with barrel for-ged from rods in layers. Eight reinforcement rings are shrunk on. Found in the Tiber by Rome, now at the Historic Museum in Berne.

Ca. 1435:
Bronze Pole gun with original pole, dug up in 1871 in Kurdischen Haff. The touch hole in the top of the octagonal barrel can be covered with a rotating lid. There is a longitudinal hole in the oak stock to insert a ramrod.

1439:
Breech loading handgun with 6 pouder chambers, Frankfurt on the Main.

Ca. 1450:
First Matchlocks with trigger bar. The matchlock has a cock, the so called serpentine. At the upper end the match is secured in a clamp with a screw. The trigger bar slowly lowered the match onto the flash pan.

Ca. 1450:
Introduction of organ artillery with up to 40 barrels on a two wheeled carriage. Firing is done individually, by hand with a match, or combined with a common flash pan.

Ca. 1460:
Illustration of horseman with handgun.

Ca. 1460:
Deployment of barrels the length of a hand span, called Scopizus with matchlocks, used by the Italian light cavalry. Firing was done forwardly from the horse with a forked support attached to the saddle.

Ca. 1460:
Appearance of first sights in the shape of a bead front sight

1461:
First mention of a flash pan lid in writings from Nürnberg.

1464:
Possibly the largest cannon with a bronze barrel length of 5 meters, a caliber of 66 mm and a weight of 18 ¾ tones. The so called Dardanellen artillery was made at the siege of Constantinople in front of the city's walls, by Mohamed the II the Turk. 13 cannons were successfully used for the siege. One of them split. The powder chamber could be threaded off and had a thread diameter of approximately 60cm. Weight of the balls 720 pound.

Ca. 1490:
Leonardo Da Vinci draws plans for a wheel lock with a coil spring and a friction rod lock. It is not clear if this mechanism was a tool to light fires or if it was a lock for firearms.

Ca. 1490:
Introduction of the hammer spring with button release on match-locks.

Ca. 1490
First use of the breech plug with external thread to close the barrel at the breech.

16th Century

Ca. 1500:
The Vicar of the St. Sebalds church, Georg Hartmann, invents the cali-ber system based on the relation of the diameter of the bore to the weight of the ball.

Ca. 1500:
Oldest still preserved hand cannon with spark producing ignition mechanism. It is known by the name of 'Monks Gun' and is displayed at the 'Rüstkammer' in Dresden.

Ca. 1500:
First appearance of rifled barrels.

Ca. 1500:
Introduction of the tube sight.

Ca. 1515:
First use of the wheel lock, presumably in Nürnberg.

Ca. 1520:
Introduction of the pin shaped trigger.

Ca. 1520:
Use of bandoliers by musketeers, with powder portions, ball bag and priming powder flask.

Ca. 1536:
In the battle of Arles, soldiers throw hand grenades.

1537:
In his scripture 'Della nuova Scienca' Tartaglia describes among other things: " That the trajectory is arched and not straight as presumed until then and that when the powder is burned before the bullet leaves the barrel, the barrel is too long. If a part of the powder is ejected unburned, it is too short."

Ca. 1540:
Introduction of breech loading hand cannons, with removable chamber and side swing lock.

Ca. 1540:
First appearance of revolver or wender systems on firearms with flintlocks.

Ca. 1540:
Invention of the cheek stock.

Ca. 1550:
Introduction of paper cartridges containing lead bullets and black powder.

Ca. 1550:
Invention of the snaphaunce lock.

Ca. 1550:
First use of wheel lock carbines and pistols in the cavalry.

Ca. 1550:
Introduction of over under pistols with two barrels on top of each other.

Ca. 1560:
First appearance of Dutch snaphaunce locks on guns. They have an internal mechanism, forward rotating firing steel and a movable flash pan cover.

Ca. 1560:
The so called petrinel, a firearm with a downward curving stock supported on the chest, is used mainly in the cavalry.

Ca. 1560:
First barrels with spiral rifling are most likely produced in Nürnberg.

1564:
Prove stamps introduced in Suhl, Thüringen.

1566:
In the 'Fronsperger Warbook', tromblons, weapons with trumpet shaped muzzles are mentioned for the first time.

Ca. 1570:
First use of flintlocks with the Spanish snap lock, in the Spanish army. The spark is created by striking a pyrite onto the firing steel combined with the flashpan cover. The mechanism is external.

Ca. 1580:
Invention of the old German Set Trigger.

Ca. 1580:
Handgun with 10 loads behind each other in the barrel is tested.

Ca. 1580:
In southern Germany, so called Nürnberg snaphaunce locks are used in small numbers on hunting rifles and pistols. They are replaced by wheel locks and later by flintlocks.

Ca. 1580:
Handgun with Matchlock and manually rotating loading cylinder.

Ca. 1589:
Cavalry rifles, the so called carbines, are used in large numbers in the French army for the first time.

Ca. 1590:
Wender rifles with wheel locks, are manufactured in Germany.

Ca. 1590:
Indian and Arab gunsmiths manufacture very thin walled, long barrels for the first time. Because of their accuracy they were very common with the Bedouins. Usually these rifles have a strongly bent, flat stock, decorated with ivory and silver inlays. Early models were equipped with snaphaunce locks.

Ca. 1590:
Introduction of the Scandinavian snaphaunce lock.

Ca. 1590:
Manufacturing of fine rifling by Augustin Kutter from Augsburg.

1597:
Oldest preserved and dated snaphaunce revolver rifle with a cylinder for eight shots, Nürnberg.

17th Century

Ca. 1600:
Air guns with compressed air as propellant in a pressure reservoir are used occasionally.

Ca. 1609:
Dambach uses grenades filled with lead balls.

Before 1615:
Apparently the invention of the battery or flintlock by Martin le Bourgeo is from Lisieux in Normandie.

1618 - 1632:
Paper cartridges and ammunition bag introduced by King Gustav II. Adolf in the swedish army.

1620:
First hinged sights on target rifles.

Ca. 1620:
The ‘Tschinken’, a light wheel lock gun is becoming popular

Ca. 1626:
Introduction of leather cannons in the Swedish army, by the English baron Robert Scott. These did not prove successful in the battle of Leipzig and were abolished in 1631.
Ca. 1630:
Beginning of the replacement of the pyrite for friction locks, by flint or French sylex, for strike (battery) ignition.

Ca. 1630:
First use of the battery or flintlock, in France.

Ca. 1630:
Oldest known flintlock repeater rifle by Caspar Kalthof of England, lock with vertical cylinder.

Ca. 1640:
First manufacturing of bayonets to attach to rifles, in Bayonne, France.

1638:
Wheellock rifle with chimney on flashpan cover

Ca. 1640:
Pistols with twist-off barrels, socalled »Turn-off-Pistols«

1641:
Dutch patent for rifle with cartridg magazin with 30 cartridges by Hendrick Baertmans.

Ca. 1640:
First manufacturing of bayonets to attach to rifles, in Bayonne, France.

Ca. 1650:
Application of bridle as a bearing for the tumbler in the flintlock.

Ca. 1660:
Flitlock pistol with integrated magazine by Mathias Kalthoff, Kopenhagen

Ca. 1660:
Flintlock revolver with four barrels each having 2 charges introduced by Cornelius Klett, Salzburg.

1668:
Holst invents a small mortar that is later called Coehorn. Multiple barrels are attached to a board parallel or behind each other and fired simultaneously.

Ca. 1670:
Introduction of rifles with double locks (Match- and flintlock in the Austrian Army.

1673:
Prove marks: In Liège Belgium, a law is implemented that: ‘All Liège weapons have to undergo a testing control by the city and have to be tested and stamped by a sworn in controller.

1680-1690:
Lorenzoni rifle with magazin beneath fthe barrel or 14 shots in lead balls and black powder.

1680-1690:
Flintlock handguns with turnable magazin in the middle of the stock by Giacomo Berselli and by Michele Lorenzoni.

1690:
The cartridge is introduced in the French infantry. The filling of the flash pan with priming powder is still carried out with the powder horn.

18th Century

Ca. 1700:
Wider use of the sprout bayonett.

1704:
Screw-in-lock by Isaac de la Chaumette.
1704:
Introduction of tapered touch holes for Pistols by Gottfried Hantzsch, Nürnberg

1717:
France is the first country to equip its army with the flintlock musket M.1717.

1718:
Introduction of iron ramrods in the Prussian infantry.

1720:
Introduction of infantry rifle »Brown Bess« in England

Ca. 1720:
Probably in France, the hooked breach to attach the end of the barrel to the tang is introduced. This allowed a faster barrel change.

1726:
Development of a special ignition material in Prussia. It ist been used in paper cartridges.

1732:
Introduction of breech loaders with twist-on brech lock in a few troops in France.

1738:
Introduction of uniform cartridges, by Ludwig XV in France.

Ca. 1750:
Increased use of pistols with »boxlock« in England.

Ca. 1750:
Introduction of the socalled Kentucky-Rifle with flintlock in Amerika.

1760:
Introduction of a tapered touch hole for rifles of the sharp shooter in Hannover.

1760-1770:
Breech loader with hinched lock by Guiseppe Crespi, Italy.

1763:
Introduction of the first French flintlock cavalry pistol M. 1763, based on the Charlesvillemusket. Scaled down musket lock.

1770:
Paartially transformatin of the infantry rifels to breech loaders with hinged locks system Crespi.

1779:
Patenting of a military repeater air gun by Bartholomäus Girandoni.

1780:
Revolver riflle with ignition magazine at the battery system B. Kalesnikow, Tula

1780:
In India, Hyder Ali uses rocket launchers, against the English General Munro.

1780:
Mathias Wisshofer develops electrical ignition for firearms.

Ab 1780:
The »Pepperbox« is in wide use in England.

1781:
Introduction of the tpered touch hole in the Prussian Infantry.

1788:
The Frenchman **Claude Louis Berthollet,** discovers **fulminating silver.**

1796:
Charles Eduard Howard invents mercury fulminate in England.

19th Century

1803:
First tests with so called Granatenkartätschen by the inventor, the English colonel Shrapnel (1761-1842). Besides the explosive charge they contained lead balls and were called Shrapnels.

1804:
First experiments with a war rocket by the admiralty in Wollrich, England.

1807:
The scotch pastor Alexander Forsyth is granted a patent for the prede-cessor of the percussion lock, the so called chemical lock, flacon lock or Forsyth lock. For the ignition he used mercury fulminate.

1808:
Samuel Johannes Pauly, a Swiss gunsmith from Bern, living in Paris, is the first to have a metal cartridge with center fire patented. In addition he designed a suitable breech loader system.

1814:
Invention of the percussion cap by the gunsmith J. Shaw in London England. (Disputed)

1816:
J. Manton uses a firing tube with an ignition pellet and a firing pin. The ignition cylinders were prepared in advance. When loading, the shooter puts the ignition tube in a depression of the dog head. Because of a successful complaint by Forsyth, the production of these weapons was halted.

1818:
Invention of the percussion ignition cap in England by Joseph Egg of Solothurn, Switzerland. Mix: 10 parts hunting powder, 5 parts Potassium chlorate.

1824:
The Englishman Perkins, constructed a steam artillery. Kadenz 240 bullets per minute. Its problem was hauling and operating the steam produ-cing apparatus.

1826:
Invention of a magazine lock for 60 to 100 Igbition caps by the mathematition Paazig in Dresden.

1831:
Use of the artillery Monster Morter, with 22 inch caliber, at the siege of Antwerpen. The powder chamber holds 30 pounds of black powder. The bomb weighs 900 pounds, loaded 1000 pounds. The artillery weighs 14,000 pounds. One shot cost 500 Swiss Francs (aprox. $500) at the time.

1835:
Development of the first needle ignition rifle by Johann Nikolaus Dreyse from Sömmerda by Erfurt. (Beginning of the development around 1826)

1835:
The Belgian Colonel Bohrmann manufactures a timed ignition; the shrapnel ignition, that allowed an exact regulation of the burning time.

1835:
Manufacturing of paper cartridges with brass head for break open breach loaders, by gunsmith C. Lefaucheux in Paris.

1836:
Nikolaus von Dreyse combines the needle ignition system with the breach loading action.

1838:
Most weapons factories carried out conversions from flintlocks to percussion locks by enlarging and threading the touch hole to install a bolster for the nipple.

1841:
Dreyse delivers 60,000 Dreyse needle ignition rifles to the Prussian army.

1845:
The American dentist E. Maynard, is granted the patent for ignition pellet strips for the use in percussion firearms. When setting the hammer, the ignition pellet strip is automatically moved forward over the ignition nipple.

1846:
Invention of gun cotton, by the professors Schönbein in Basel, Switzerland and Böttcher in Frankfurt, Germany. Clean and dry cotton is put for 15 minutes in a bath of 100 parts of nitric acid and 79 parts of sulfuric acid by weight. It is then wrung, pressed and rinsed until blue litmus paper does not turn red anymore. Gun cotton was apparently ideal for shooting.

1846:
C. Lefaucheux gunsmith in Paris is granted a patent for the metal cart-ridge with side pin igniter.

1848:
Claude Etienne Minie develops an expansion bullet called the Minie expansion conical bullet.

1849:
L.N.A. Flobert of Paris has a metal ignition cap with attached bullet and rim fire ignition patented. Over a long period of time the Flobert cartridge was popular for use with private Flobert rifles and handguns.

1860:
Tyler Henry is granted a patent for a repeater with tube magazine. It was later known as the Henry rifle.

1861:
First series of the magazine repeaters of the new generation by C.M. Spencer are delivered to the Confederates in America.

1864:
Construction of swing block lock with center fire ignition for the conversion of percussion muzzle loaders to breech loaders by J. Snider, America.

1869:
Switzerland is the first country to introduce a repeater rifle, the M.1869. Its construction is based on the system Vetterli. It has a tube magazine in the front part of the stock. Improved models follow in 1871, 1878 and 1881.

1871:
The Mauser rifle with cylinder lock is introduced in Germany.

1886:
Manufacturing of nitrocellulose powder in Veille, France.

1887:
The smokeless powder, also called Rottweiler chemical powder, is acqui-red by the Prussian war ministry and is improved further in Spandau.

1889:
Paul Mauser develops a repeating rifle with rotating bolt action lock. The barrel is protected by a steel shroud. The solid magazine is in the mid section of the stock. Caliber 7.65 mm.