

Gatling gun

The **Gatling gun** is one of the best-known early rapid-fire spring loaded, hand cranked weapons and a forerunner of the modern machine gun and rotary cannon. Invented by Richard Gatling, it saw occasional use by the Union forces during the American Civil War in the 1860s, which was the first time it was employed in combat. Later, it was used again in numerous military conflicts, such as the Boshin War, the Anglo-Zulu War, and the assault on San Juan Hill during the Spanish–American War.^[4] It was also used by the Pennsylvania militia in episodes of the Great Railroad Strike of 1877, specifically in Pittsburgh.

The Gatling gun's operation centered on a cyclic multi-barrel design which facilitated cooling and synchronized the firing-reloading sequence. Each barrel fired a single shot when it reached a certain point in the cycle, after which it ejected the spent cartridge, loaded a new round, and, in the process, allowed the barrel to cool somewhat. This configuration allowed higher rates of fire to be achieved without the barrels overheating.

The Gatling gun was itself an early form of rotary cannon, and today modern rotary cannons are often referred to as *Gatling guns*.

Contents

History

- American Civil War and the Americas
- In Africa and Asia
- Spanish–American War

Basic design

Development of modern Gatling-type guns

See also

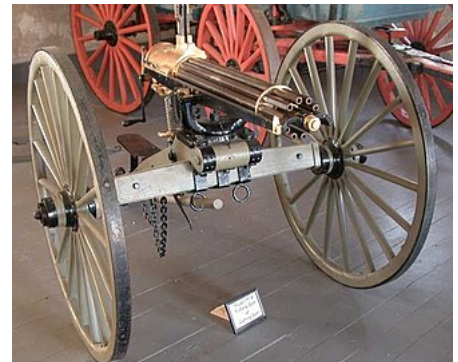
References

External links

History

The Gatling gun was designed by the American inventor Dr. Richard J. Gatling in 1861 and patented on November 4, 1862.^{[5][6]} Gatling wrote that he created it to reduce the size of armies and so reduce the number of deaths by combat and disease, and to show how futile war is.^[7]

Gatling gun



1876 Gatling gun kept at Fort Laramie National Historic Site

Type	Rapid-fire gun, <div></div> hand cranked <div></div> Machine gun
Place of origin	United States
Service history	
In service	1862–1911
Used by	United States <div></div> Russian Empire <div></div> British Empire <div></div> France <div></div> Empire of Japan <div></div> Qing Empire <div></div> Siam Empire <div></div> Korean Empire
Wars	American Civil War <div></div> Anglo-Zulu War <div></div> Indian Wars <div></div> Spanish–American War <div></div> Philippine–American War <div></div> Boxer Rebellion
Production history	
Designer	Richard Jordan Gatling
Specifications	

Although the first Gatling gun was capable of firing continuously, it required a person to crank it; therefore it was not a true automatic weapon. The Maxim gun, invented and patented in 1883, was the first true fully automatic weapon, making use of the fired projectile's recoil force to reload the weapon. Nonetheless, the Gatling gun represented a huge leap in firearm technology.

Prior to the Gatling gun, the only weapons available to military forces capable of firing many projectiles in a short space of time were mass-firing volley weapons, like the Belgian and French mitrailleuse of the 1860s and 1870s, and field cannons firing canister shot, much like an upsized shotgun. The latter were widely used during and after the Napoleonic Wars. Although the maximum rate of fire was increased by firing multiple projectiles simultaneously, these weapons still needed to be reloaded after each discharge, which for multi-barrel systems like the *mitrailleuse* was cumbersome and time-consuming. This negated much of the advantage of their high rate of fire per discharge, making them much less powerful on the battlefield. In comparison, the Gatling gun offered a rapid and continuous rate of fire without having to be manually reloaded by opening the breech.

The original Gatling gun was a field weapon which used multiple rotating barrels turned by a hand crank, and firing loose (no links or belt) metal cartridge ammunition using a gravity feed system from a hopper. The Gatling gun's innovation lay in the use of multiple barrels to limit overheating, a rotating mechanism, and a gravity-feed reloading system, which allowed unskilled operators to achieve a relatively high rate of fire of 200 rounds per minute.^[6]

The US Army adopted Gatling guns in several calibers, including .42 caliber, .45-70, .50 caliber, 1 inch, and (M1893 and later) .30 Army, with conversions of M1900 weapons to .30-03 and .30-06.^{[8][9]} The .45-70 weapon was also mounted on some US Navy ships of the 1880s and 1890s.^[10]

American Civil War and the Americas

The Gatling gun was first used in warfare during the American Civil War. Twelve of the guns were purchased personally by Union commanders and used in the trenches during the siege of Petersburg, Virginia (June 1864 – April 1865).^[11] Eight other Gatling guns were fitted on gunboats.^[12] The gun was not accepted by the American Army until 1866, when a sales representative of the manufacturing company demonstrated it in combat.^[13]

On July 17, 1863, Gatling guns were purportedly used to overawe New York anti-draft rioters.^[14] Two were brought by a National Guard unit from Philadelphia to use against strikers in Pittsburgh.

Gatling guns were famously *not* used at the Battle of the Little Bighorn, also known as "Custer's Last Stand", when Gen. George Armstrong Custer chose not to bring Gatlings with his main force.

Weight	77.2 kg (170 lb) ^[1]
Length	107.9 cm (42.5 in)
Barrel length	67.3 cm (26.5 in)
Crew	Four-man crew
Barrels	6–10
Action	Crank handle
Rate of fire	200 rounds per minute in .58 caliber, 400-900 rounds per minute in .30 caliber ^{[2][3]}



Mitrailleuse Gatling modèle APX 1895

In April 1867, a Gatling gun was purchased for the Argentine army by minister Domingo F. Sarmiento under instructions from president Bartolomé Mitre.^[15]

Captain Germán Astete of the Peruvian Navy took with him dozens of Gatling guns from the United States to Peru in December 1879 during the Peru-Chile War of the Pacific. Gatling guns were used by the Peruvian Navy and Army, especially in the Battle of Tacna (May 1880) and the Battle of San Juan (January 1881) against the invading Chilean Army.

Lieutenant A.L. Howard of the Connecticut National Guard had an interest in the company manufacturing Gatling guns, and took a personally owned Gatling gun to Saskatchewan, Canada, in 1885 for use with the Canadian military against Métis rebels during Louis Riel's North-West Rebellion.^[13]

Early multi-barrel guns were approximately the size and weight of artillery pieces, and were often perceived as a replacement for cannons firing grapeshot or canister shot.^[13] Gatling guns were even mounted aboard ships. Compared with earlier weapons such as the *mitrailleuse*, which required manual reloading, the Gatling gun was more reliable and easier to operate, and had a lower, but continuous rate of fire. The large wheels required to move these guns around required a high firing position, which increased the vulnerability of their crews.^[13]

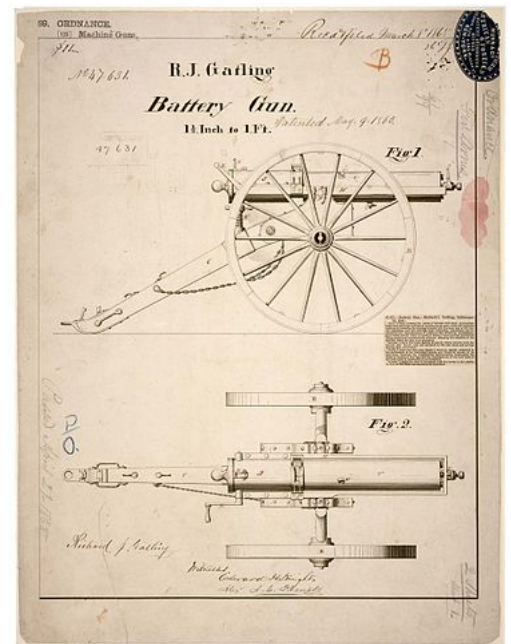
Sustained firing of gunpowder cartridges generated a cloud of smoke, making concealment impossible until smokeless powder became available in the late 19th century.^[16] When operators were firing Gatling guns against troops of industrialized nations, they were at risk - vulnerable to artillery they could not reach and targeted by snipers they could not see.^[13]

In Africa and Asia

The Gatling gun was used most successfully to expand European colonial empires by defeating indigenous warriors mounting massed attacks, including the Matabele, the Zulu, the Bedouin, and the Mahdists.^[13] Imperial Russia purchased 400 Gatling guns and used them against Turkmen cavalry and other nomads of central Asia.^[17] The British Army first deployed the Gatling gun in 1873-4 during the Anglo-Ashanti wars, and extensively during the latter actions of the 1879 Anglo-Zulu war.^[18] The Royal Navy used Gatling guns during the 1882 Anglo-Egyptian War.^[16]

Spanish–American War

Because of infighting within army ordnance, Gatling guns were used by the U.S. Army during the Spanish–American War.^[19] A four-gun battery of Model 1895 ten-barrel Gatling guns in .30 Army, made by Colt's Arms Company, was formed into a separate detachment led by Lt. John "Gatling Gun" Parker.^[20] The detachment proved very effective, supporting the advance of American forces at the Battle of San Juan Hill. Three of the Gatlings with swivel mountings were used with great success against the Spanish



Patent drawing for R. J. Gatling's "battery gun", 9 May 1865



Two British Army Gatling guns from the Second Anglo-Afghan War

defenders.^[3] During the American charge up San Juan and Kettle hills, the three guns fired a total of 18,000 .30 Army rounds in 8 1/2 minutes (an average of over 700 rounds per minute per gun of continuous fire) against Spanish troop positions along the crest of both hills, wreaking terrible carnage.^{[3][21]}

Despite this remarkable achievement, the Gatling's weight and cumbersome artillery carriage hindered its ability to keep up with infantry forces over difficult ground, particularly in Cuba, where roads were often little more than jungle footpaths. By this time, the U.S. Marines had been issued the modern tripod-mounted M1895 Colt–Browning machine gun using the 6mm Lee Navy round, which they employed to defeat the Spanish infantry at the battle of Cuzco Wells.

Basic design

The Gatling gun operated by a hand-crank mechanism, with six barrels revolving around a central shaft (although some models had as many as ten). Each barrel fires once per revolution at about the same position. The barrels, a carrier, and a lock cylinder were separate and all mounted on a solid plate revolving around a central shaft, mounted on an oblong fixed frame. Turning the crank rotated the shaft. The carrier was grooved and the lock cylinder was drilled with holes corresponding to the barrels.

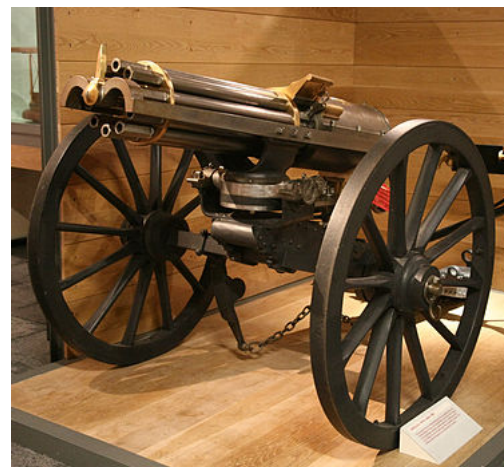
The casing was partitioned, and through this opening the barrel shaft was journaled. In front of the casing was a cam with spiral surfaces. The cam imparted a reciprocating motion to the locks when the gun rotated. Also in the casing was a cocking ring with projections to cock and fire the gun. Each barrel had a single lock, working in the lock cylinder on a line with the barrel. The lock cylinder was encased and joined to the frame. Early models had a fibrous matting stuffed in among the barrels, which could be soaked with water to cool the barrels down. Later models eliminated the matting-filled barrels as being unnecessary.

Cartridges, held in a hopper, dropped individually into the grooves of the carrier. The lock was simultaneously forced by the cam to move forward and load the cartridge, and when the cam was at its highest point, the cocking ring freed the lock and fired the cartridge. After the cartridge was fired the continuing action of the cam drew back the lock bringing with it the spent cartridge which then dropped to the ground.

The grouped barrel concept had been explored by inventors since the 18th century, but poor engineering and the lack of a unitary cartridge made previous designs unsuccessful. The initial Gatling gun design used self-contained, reloadable steel cylinders with a chamber holding a ball and black-powder charge, and a percussion cap on one end. As the barrels rotated, these steel cylinders dropped into place, were fired, and were then ejected from the gun. The innovative features of the Gatling gun were its independent firing mechanism for each barrel and the simultaneous action of the locks, barrels, carrier and breech.

The ammunition that Gatling eventually implemented was a paper cartridge style round charged with black powder and primed with a percussion cap. because self-contained brass cartridges were not yet fully developed and available. The shells were gravity-fed into the breech through a hopper or simple box "magazine" with an unsprung gravity follower on top of the gun. Each barrel had its own firing mechanism.

Despite self-contained brass cartridges replacing the paper cartridge in the 1860s, it wasn't until the Model 1881 that Gatling switched to the 'Bruce'-style feed system (U.S. Patents 247,158 and 343,532) that accepted two rows of .45-70 cartridges. While one row was being fed into the gun, the other could be reloaded, thus allowing sustained fire. The final



A British 1865 Gatling gun at Firepower - The Royal Artillery Museum

gun required four operators. By 1886, the gun was capable of firing more than 400 rounds per minute.

The smallest-caliber gun also had a Broadwell drum feed in place of the curved box of the other guns. The drum, named after L. W. Broadwell, an agent for Gatling's company, comprised twenty stacks of rounds arranged around a central axis, like the spokes of a wheel, each holding twenty cartridges with the bullet noses oriented toward the central axis. This invention was patented in U. S. 110,338. As each stack emptied, the drum was manually rotated to bring a new stack into use until all 400 rounds had been fired. A more common variant had 240 rounds in twenty stands of fifteen.

By 1893, the Gatling was adapted to take the new .30 Army smokeless cartridge. The new M1893 guns featured six barrels, later increased to ten barrels, and were capable of a maximum (initial) rate of fire of 800–900 rounds per minute, though 600 rpm was recommended for continuous fire.^{[3][22]} Dr. Gatling later used examples of the M1893 powered by electric motor and belt to drive the crank.^[23] Tests demonstrated the electric Gatling could fire bursts of up to 1,500 rpm.

The M1893, with minor revisions, became the M1895, and 94 guns were produced for the U.S. Army by Colt. Four M1895 Gatlings under Lt. John H. Parker saw considerable combat during the Santiago campaign in Cuba in 1898. The M1895 was designed to accept only the Bruce feeder. All previous models were unpainted, but the M1895 was painted olive drab (O.D.) green, with some parts left blued.

The Model 1900 was very similar to the model 1895, but with only a few components finished in O.D. green. The U.S. Army purchased a quantity of M1900s. All Gatling Models 1895–1903 could be mounted on an armored field carriage. In 1903, the Army converted its M1900 guns in .30 Army to fit the new .30-03 cartridge (standardized for the M1903 Springfield rifle) as the M1903. The later M1903-'06 was an M1903 converted to .30-06. This conversion was principally carried out at the Army's Springfield Armory arsenal repair shops. All models of Gatling guns were declared obsolete by the U.S. military in 1911, after 45 years of service.^[24]

Development of modern Gatling-type guns

After the Gatling gun was replaced in service by newer recoil or gas-operated weapons, the approach of using multiple externally powered rotating barrels fell into disuse for many decades. However, some examples were developed during the interwar years, but only existed as prototypes or were rarely used. The concept resurfaced after World War II with the development of the Minigun and the M61 Vulcan. Many other versions of the Gatling gun were built from the late 20th century to the present, the largest of these being the 30mm GAU-8 Avenger autocannon.

See also

- Agar gun
- Centrifugal gun
- Gorgas machine gun
- List of multiple barrel firearms

References

1. Weight listed for Colt's Model 1877 10-barrel gun, w/o carriage or mount.
2. "Gatling Gun - Facts & Summary - HISTORY.com" (<http://www.history.com/topics/gatling-gun>). Archived (<https://web.archive.org/web/20160224213315/http://www.history.com/topics/gatling-gun>) from the original on 2016-02-24.
3. Parker, John H. (Lt.), *The Gatlings At Santiago*, Middlesex, UK: Echo Library (reprinted 2006)

4. Chambers, John W. (II) (2000). "San Juan Hill, Battle of" (<http://www.encyclopedia.com/doc/1O126-SanJuanHillBattleof.html>). *The Oxford Companion to American Military History*. HighBeam Research Inc. Archived (<https://web.archive.org/web/20091126021542/http://www.encyclopedia.com/doc/1O126-SanJuanHillBattleof.html>) from the original on 2009-11-26. Retrieved 2009-11-24.
5. Richard J. Gatling, "Improvement in revolving battery-guns," (<http://pdfpiw.uspto.gov/piw?Docid=00036836&homeurl=http%3A%2F%2Fpatft.uspto.gov%2Fnetacgi%2Fnph-Parser%3FSect1%3DPTO1%2526Sect2%3DHITOFF%2526d%3DPALL%2526p%3D1%2526u%3D%25252Fnetahhtml%25252FPTO%25252Fsrchnum.htm%2526r%3D1%2526f%3DG%2526l%3D50%2526s1%3D0036836.PN.%2526OS%3DPN%2F0036836%2526RS%3DPN%2F0036836&PageNum=&Rtype=&SectionNum=&idkey=NONE&Input=View+first+page>) Archived (<https://web.archive.org/web/20170120053800/http://pdfpiw.uspto.gov/piw?Docid=00036836&homeurl=http%3A%2F%2Fpatft.uspto.gov%2Fnetacgi%2Fnph-Parser%3FSect1%3DPTO1%2526Sect2%3DHITOFF%2526d%3DPALL%2526p%3D1%2526u%3D%25252Fnetahhtml%25252FPTO%25252Fsrchnum.htm%2526r%3D1%2526f%3DG%2526l%3D50%2526s1%3D0036836.PN.%2526OS%3DPN%2F0036836%2526RS%3DPN%2F0036836&PageNum=&Rtype=&SectionNum=&idkey=NONE&Input=View+first+page>) 2017-01-20 at the Wayback Machine. U.S. Patent No. 36,386 (issued: Nov. 4, 1862).
6. Greeley, Horace; Leon Case (1872). *The Great Industries of the United States* (<https://books.google.com/books?id=KSEaAAAAYAAJ&pg=PA944>). J.B. Burr & Hyde. p. 944. ISBN 1-85506-627-0.
7. Paul Wahl and Don Toppel, *The Gatling Gun*, Arco Publishing, 1971.
8. Paul Wahl and Don Toppel, *The Gatling Gun*, Arco Publishing, 1971, p. 155.
9. Randolph, Captain W. S., 5th US Artillery *Service and Description of Gatling Guns, 1878* (<http://www.allworldwars.com/Gatling-Guns-Service-and-Description-1878.html>) Archived (<https://web.archive.org/web/20160131225717/http://www.allworldwars.com/Gatling-Guns-Service-and-Description-1878.html>) 2016-01-31 at the Wayback Machine.
10. Friedman, Norman (1984). *U.S. Cruisers: An Illustrated Design History*. Annapolis, Maryland: United States Naval Institute. pp. 457–463. ISBN 0-87021-718-6.
11. *Civil War Weapons And Equipment* by Russ A. Pritchard Jr.
12. "The Gatling Gun In The Civil War" (<http://www.civilwarhome.com/gatlinggun.htm>). civilwarhome.com. Archived (<https://web.archive.org/web/20151025112639/http://civilwarhome.com/gatlinggun.htm>) from the original on 2015-10-25. Retrieved 2015-11-03.
13. Emmott, N.W. "The Devil's Watering Pot" *United States Naval Institute Proceedings* September 1972 p. 70.
14. Julia Keller, *Mr. Gatling's Terrible Marvel* (2008), p. 168-170
15. Rauch, George v (1 January 1999). "Conflict in the Southern Cone: The Argentine Military and the Boundary Dispute with Chile, 1870-1902" (<https://books.google.bg/books?id=1PTZaud0ekcC&printsec=frontcover#v=onepage&q=gatling%20gun&f=false>). Greenwood Publishing Group. Archived (<https://web.archive.org/web/20170109184232/https://books.google.bg/books?id=1PTZaud0ekcC&printsec=frontcover#v=onepage&q=gatling%20gun&f=false>) from the original on 9 January 2017 – via Google Books.
16. Emmott, N.W. "The Devil's Watering Pot" *United States Naval Institute Proceedings* September 1972 p. 72.
17. Emmott, N.W. "The Devil's Watering Pot" *United States Naval Institute Proceedings* September 1972 p. 71.
18. Laband, John (2009). *Historical Dictionary of the Zulu Wars* (https://books.google.co.uk/books?id=Pnf1BC_XORoC&pg=PA102&dq=First+gatling+gun+use+zulu+war&hl=en&sa=X&ved=0ahUKEwedis3Jk8HeAhUMLMAKHfaDA5IQuwUIPjAD#v=onepage&q=First%20gatling%20gun%20use%20zulu%20war&f=false). Maryland, USA: Scarecrow Press. p. 102. ISBN 978-0-8108-6078-0. Retrieved 7 November 2018.
19. Patrick McSherry. "Gatling" (<http://www.spanamwar.com/Gatling.htm>). spanamwar.com. Archived (<https://web.archive.org/web/20131615255700/http://www.spanamwar.com/Gatling.htm>) from the original on 2018-05-01. Retrieved 2015-11-03.
20. Parker, John H. (Lt.), *History of the Gatling Gun Detachment*, Kansas City, MO: Hudson-Kimberly Publishing Co. (1898), pp. 20, 23–32
21. Parker, John H.: Cranked by hand at its highest speed until the first magazine of ammunition had been emptied, the M1895 .30 Gatling Gun had an initial rate of fire of 800–900 rounds per minute.
22. U.S. Ordnance Dept., *Handbook of the Gatling Gun, Caliber .30 Models of 1895, 1900, and 1903*, Washington, D.C.: Government Printing Office, (1905) p. 21

23. "Archived copy" (<http://img294.imageshack.us/img294/2433/eleckeygatling.jpg>). Archived (<https://web.archive.org/web/20110725152641/http://img294.imageshack.us/img294/2433/eleckeygatling.jpg>) from the original on 2011-07-25. Retrieved 2010-09-01.
24. Wahl and Toppel, 1971, p. 155
- Ordnance Department, United States (1917). *Handbook of the Gatling Gun, Caliber .30* (<https://archive.org/details/handbookgatling00statgoog>). Washington, D.C.: Government Printing Office.

External links

- Randolph, Captain W. S., *5th US Artillery Service and Description of Gatling Guns, 1878* (<http://www.allworldwars.com/Gatling-Guns-Service-and-Description-1878.html>)
- 19th Century Machine Guns (<http://www.ibiblio.org/hyperwar/USN/ref/MG//MG-2.html>)
- List of Military Gatling & Revolver cannons (<http://www.canit.se/~griffon/aviation/text/akandata.htm>)
- Austro-Hungarian Gatling Guns (<https://web.archive.org/web/20090804011933/http://sunblest.net/gun/Gatling.htm>)
- U.S. Patent 36,836 (<https://www.google.com/patents/US36836>) -- *Gatling gun*
- U.S. Patent 47,631 (<https://www.google.com/patents/US47631>) -- *improved Gatling gun*
- U.S. Patent 112,138 (<https://www.google.com/patents/US112138>) -- *revolving battery gun*
- U.S. Patent 125,563 (<https://www.google.com/patents/US125563>) -- *improvement in revolving battery guns*
- U.S. Patent 110,338 (<https://www.google.com/patents/US110338>) -- *feeder for repeating firearms*
- [1] (<https://books.google.com/patents/US1328230>)
- Description of operating principle (with animation) from HowStuffWorks (<http://science.howstuffworks.com/machine-gun4.htm>)
- CGI animated GAU-17/A (<http://www.techeblog.com/index.php/tech-gadget/feature-cg-animation-shows-gatling-gun-cycle-of-operation>)
- Animations and technical descriptions of 1862, 1865 and 1874 models (<http://www.victorianshipmodels.com/antitorpedobootguns/Gatling/index.html>) (Requires QuickTime and not suitable for slow-speed links)
- Presentation by Keller about *Mr. Gatling's Terrible Marvel: The Gun That Changed Everything and the Misunderstood Genius Who Invented It* at the Printers Row Book Fair, June 8, 2008 (<https://www.c-span.org/video/?205837-6/mr-gatlings-terrible-marvel>)

Retrieved from "https://en.wikipedia.org/w/index.php?title=Gatling_gun&oldid=867644697"

This page was last edited on 7 November 2018, at 02:21 (UTC).

Text is available under the Creative Commons Attribution-ShareAlike License; additional terms may apply. By using this site, you agree to the [Terms of Use](#) and [Privacy Policy](#). Wikipedia® is a registered trademark of the [Wikimedia Foundation, Inc.](#), a non-profit organization.