JOHN DAHLGREN
And
THE PLYMOUTH RIFLE

Marc Gorelick, VGCA

The author thanks Tim Prince of College Hill Arsenal (www.collegehillarsenal.com) and Cliff Sophia of CS Arms (www.csarms.com) for the use of their photographs.

Few Americans today know who John Dahlgren was, or the role he played in the Civil War. Most Civil War and navy history buffs who recognize his name identify him as a Union Admiral and ordnance expert who developed a number of naval cannon. Indeed, for his achievements in developing naval cannon he became known as the "father of American naval ordnance." But to the gun collecting community Dahlgren was also a small arms expert and the inventor of the unique Plymouth Rifle.

Photo courtesy Tim Prince, College Hill Arsenal, www.collegehillarsenal.com

DAHLGREN'S NAVY CAREER

John Adolphus Bernard Dahlgren was born on November 13, 1809 in Philadelphia, the son of Bernhard Ulrik Dahlgren, the Swedish Consul in Philadelphia. Like another Swedish-American, John Ericsson, the inventor of the screw propeller, turret and ironclad monitor, Dahlgren was to have a profound effect on the U.S. Navy.

Dahlgren joined the United States Navy in 1826 as a midshipman. He served in the U.S. Coastal Survey from 1834 to 1837 where he developed his talents for mathematics and scientific theory. He was promoted to lieutenant, and after a number of cruises was assigned as an ordnance officer at the Washington Navy Yard in 1847. Dahlgren was in his element as an ordnance officer. He excelled as a brilliant engineer and was soon

given more and more responsibility. Within a year he was in charge of all ordnance matters in the yard, including developing rockets, and inspecting ordnance, locks, shells and powder tanks. He also began to improve and systematize the procurement and supply system for weapons.

Rear Admiral John A. Dahlgren, Library of Congress

Over the next 15 years he practically revolutionized the Navy's ordnance department. In the early 1850s, Dahlgren helped launch the Ordnance Establishment, the first sustained weapons Research & Development (R&D) organization and program in American naval history. Its work fell into four broad categories: manufacturing ordnance and equipment, inspecting ordnance produced at private foundries, testing ordnance and inventions, and research and development. The facilities that Dahlgren set up at the Washington Navy Yard included a firing range along the Anacostia River, foundries, machine shops, and expanded office spaces. The facilities became the seed of the Naval Gun Factory, a heavy industrial plant primarily concerned with the development, construction and testing of naval guns that armed the fleet during two world wars. He

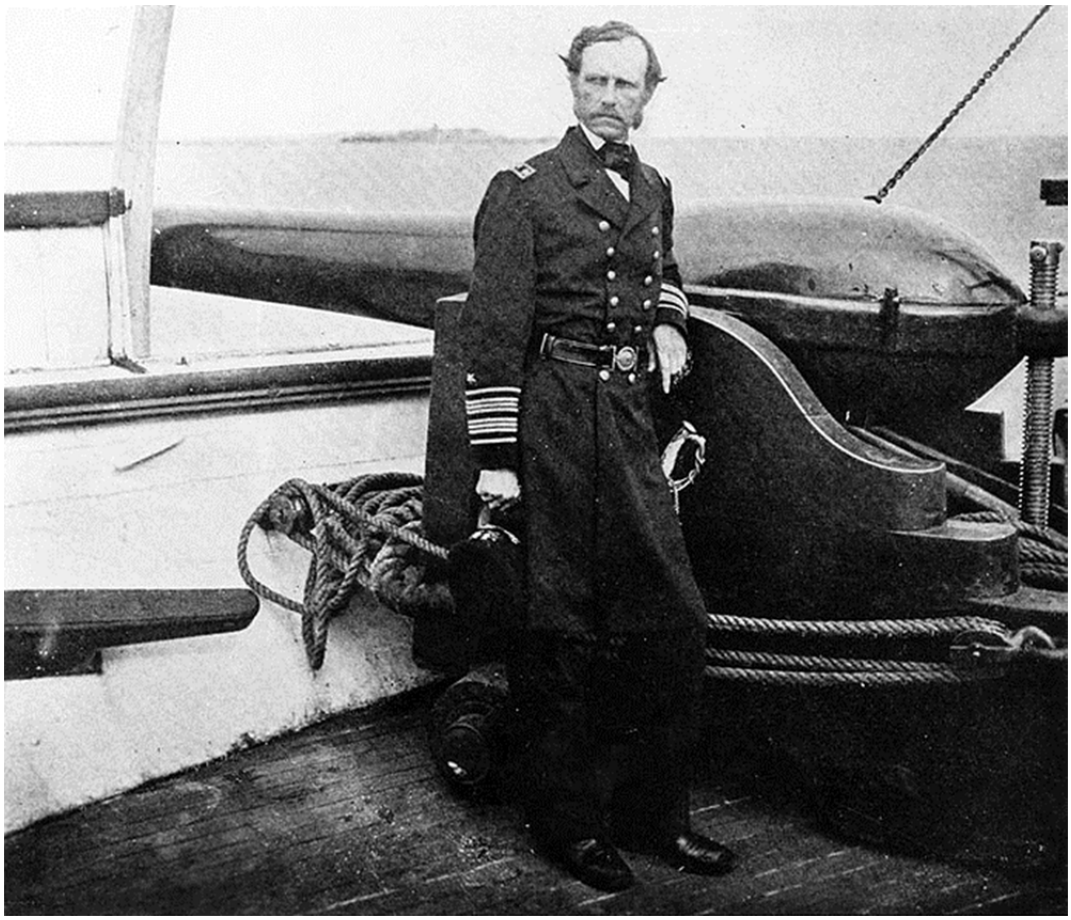
was also a prolific writer who produced a number of manuals and books, including *The System of Boat Armaments in the United States Navy*, *Shells and Shell Guns*, and *Naval Percussion Locks and Primers*. He won world-wide recognition as an ordnance expert and was promoted to Commander in 1855.

In 1856, while Acting Chief of the Navy's Bureau of Ordnance, Dahlgren turned his attention to small arms and began work to develop the Navy's own rifle musket. His efforts culminated in the Model 1861 Navy Rifle, or "Plymouth Rifle" which equipped U.S. Navy and Marine boarding and landing parties during the Civil War. In 1858 he commanded the *U.S.S. Plymouth*, a sail sloop of war that was used as a training and ordnance testing ship for which the rifle was informally named. During his voyages on the *Plymouth*, Dahlgren tested both artillery ordnance of his design as well as the first model of the Plymouth Rifle.

Lt. Dahlgren
Library of Congress

The Civil War brought Dahlgren's career into even more prominence. When his commander, Captain Franklin Buchanan, resigned to join the Confederacy, Dahlgren stepped into his position. He made the acquaintance of Abraham Lincoln and the two became close friends. Dahlgren, who was as ambitious as the next man, used that friendship to advance his career. Dahlgren was promoted to captain in 1862 and continued as Chief of Ordnance and Commander of the Washington Navy Yard where he worked tirelessly to arm and equip a rapidly expanding Union Navy. However, while he was making high-level friends in the White House he was making important enemies in Congress, the Army and in the Navy. One of those he antagonized was his immediate superior, Secretary of the Navy Gideon Wells.

As a war-time naval officer, Dahlgren knew that he needed sea duty and combat experience in order to attain higher rank. He persistently lobbied the White House for a sea command. In June 1863, Lincoln arranged his promotion to Rear Admiral and, in July, arranged for him to be given command of the Atlantic Blockade Squadron. This was against Welles' wishes. The previous commander, Admiral Samuel DuPont, had failed in his attempt to capture Charleston, and Dahlgren was only partially successful in that endeavor. Conflicts with the Army commander, General Quincy Gillmore, undermined his effectiveness and Gillmore worked to undermine and discredit him, partly to shift blame for his own failures. Although Dahlgren's courage was beyond question, part of his problem at Charleston was he never figured out how to counter the Confederate underwater defenses. Lincoln ignored the criticism of Dahlgren and the pressure to relieve him. During the rest of his sea command, Dahlgren led an expedition up the St. John's River in Florida, cooperated with Sherman in the capture of Savannah and participated in the final occupation of Charleston. According to one biographer, as a combat commander, Dahlgren took care of his enlisted men but failed to inspire his officers.



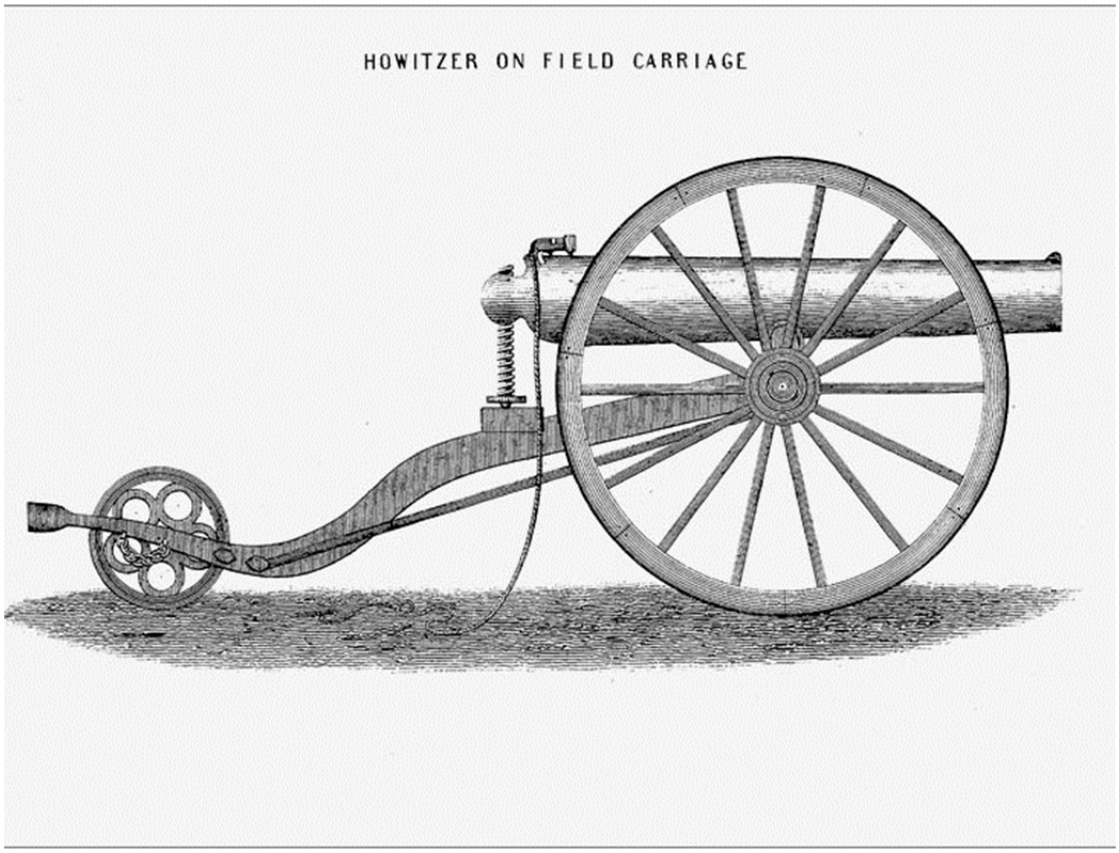
Rear Admiral Dahlgren on Flagship USS Pawnee off Charleston, SC
Dahlgren 50-pder Rifled Cannon, Library of Congress

After the war Dahlgren was appointed to the command of the South Pacific Squadron off the West Coast of South America. In early 1869, he took up his old positions as Chief of Ordnance and Commander of the Washington Naval Yard. While there he convened the Small Arms Trial Board which selected the Remington Rolling Block rifle, caliber .50-70, as the Navy's standard rifle and approved its selection and procurement. This Rolling Block Model of 1870 was a better (stronger) design than the Allin (Trapdoor) action adopted by the Army (in 1866), and was to serve the Navy for many years. Dahlgren died of a heart attack on July 12, 1870.

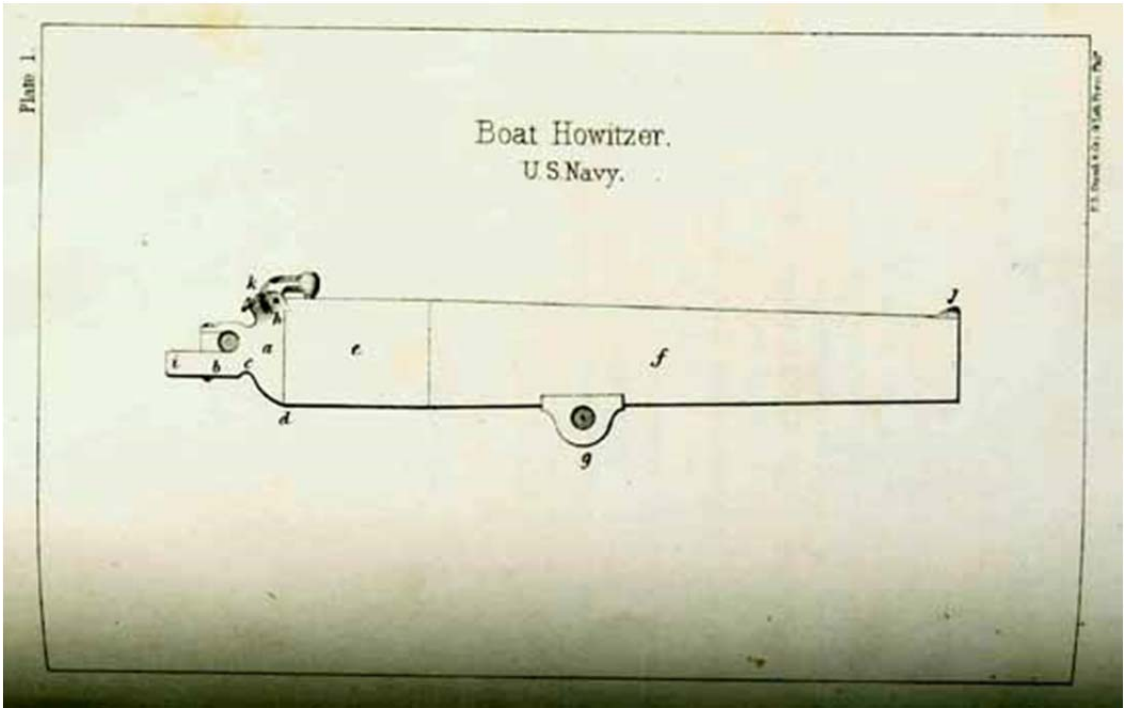
DAHLGREN'S ORDNANCE

Dahlgren is perhaps best known as a designer of naval cannon that contributed to the Union victory in the Civil War and were standard equipment in the U.S. Navy through the 1880's. His first cannon were what would today be called an "integrated weapons system." During the Mexican-American War the U.S. found itself lacking in light guns that could be fired from ships' boats and landed to be used as light artillery in support of landing parties. In 1849, then Lieutenant, Dahlgren began to design a family of smoothbore muzzle loading boat howitzers that could be mounted in ships' launches and cutters as well as being mounted onto field carriages. The first boat howitzers to be designed were a light 12-pounder, a heavy 12-pounder (originally designated a "medium"), and a 24-pounder. Later a lighter 12-pounder (the "small") and a rifled 12-pounder heavy howitzer were introduced. All of the boat howitzers were very similar in design, cast in bronze, with a mounting lug or loop on the bottom of the barrel instead of trunnions, and an elevating screw running through the cascabel (knob at the rear of the cannon). Having the single mounting lug expedited moving the howitzer from the

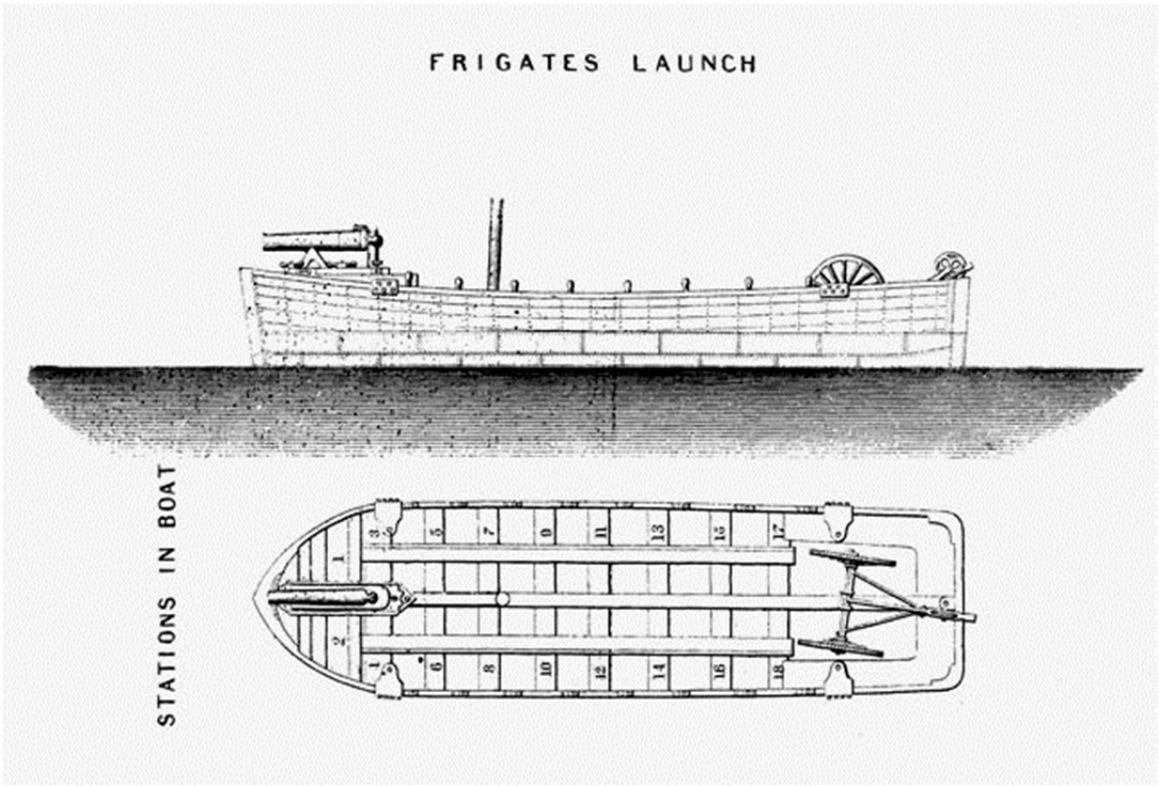
launch to the wrought iron field carriage and back. These guns were extensively used on land and sea before, during and after the Civil War.



Bureau of Ordnance, USN - Ordnance Instructions for the United States Navy. 1866. Fourth edition.



Dahlgren, J. A. Lieut. U.S.N., Assistant Inspector of Ordnance. Form of Exercise and Manœuvre for the Boat-Howitzers of the U.S. Navy. Philadelphia, PA: Printed by A. Hart, 1852. Navy History & Heritage Command



Bureau of Ordnance, USN - Ordnance Instructions for the United States Navy. 1866. Fourth edition.

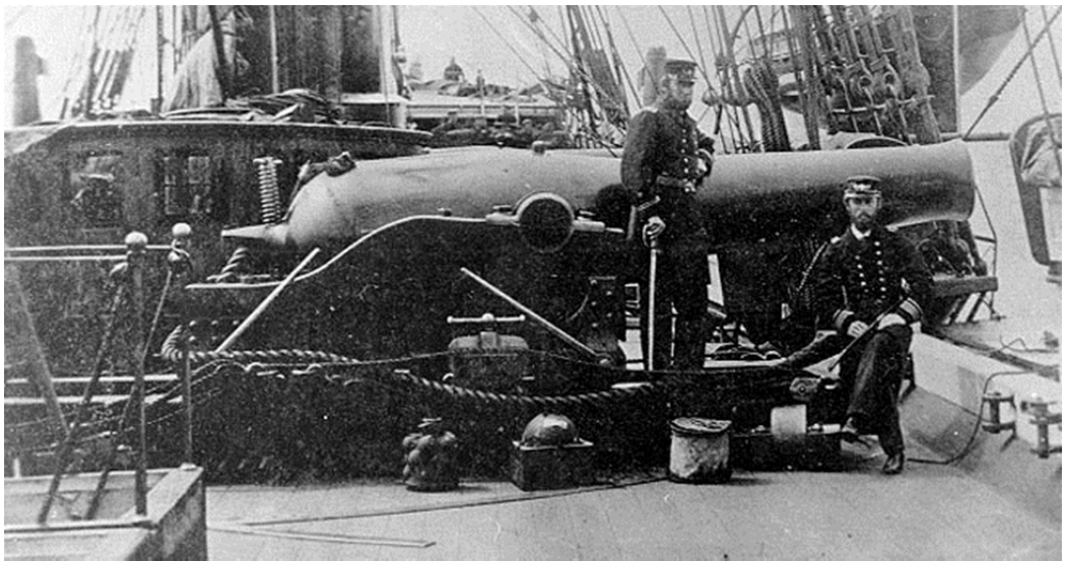
But it was his designs for heavy artillery that made him famous. Throughout the 18th and early 19th century, the primary ship to ship weapons were muzzle loading smoothbore cannons that fired broadsides at comparatively short distances. When the French Navy adopted the shell-gun design of Colonel Henri-Joseph Paixhans it introduced a game changer. The Paixhans 8.7-inch shell gun fired a 59-pound explosive shell in a reasonably flat trajectory that made kindling of a warship's wooden sides. In 1841 the U.S. Navy adopted an 8-inch Paixhans style shell gun.

Dahlgren was determined to design a new generation of shell gun that would be capable of firing explosive shells safely at higher velocities and greater ranges. They would also have the capacity to effectively fire solid shot which would become increasingly important as armored warships were introduced during the Civil War.

According to Dahlgren:

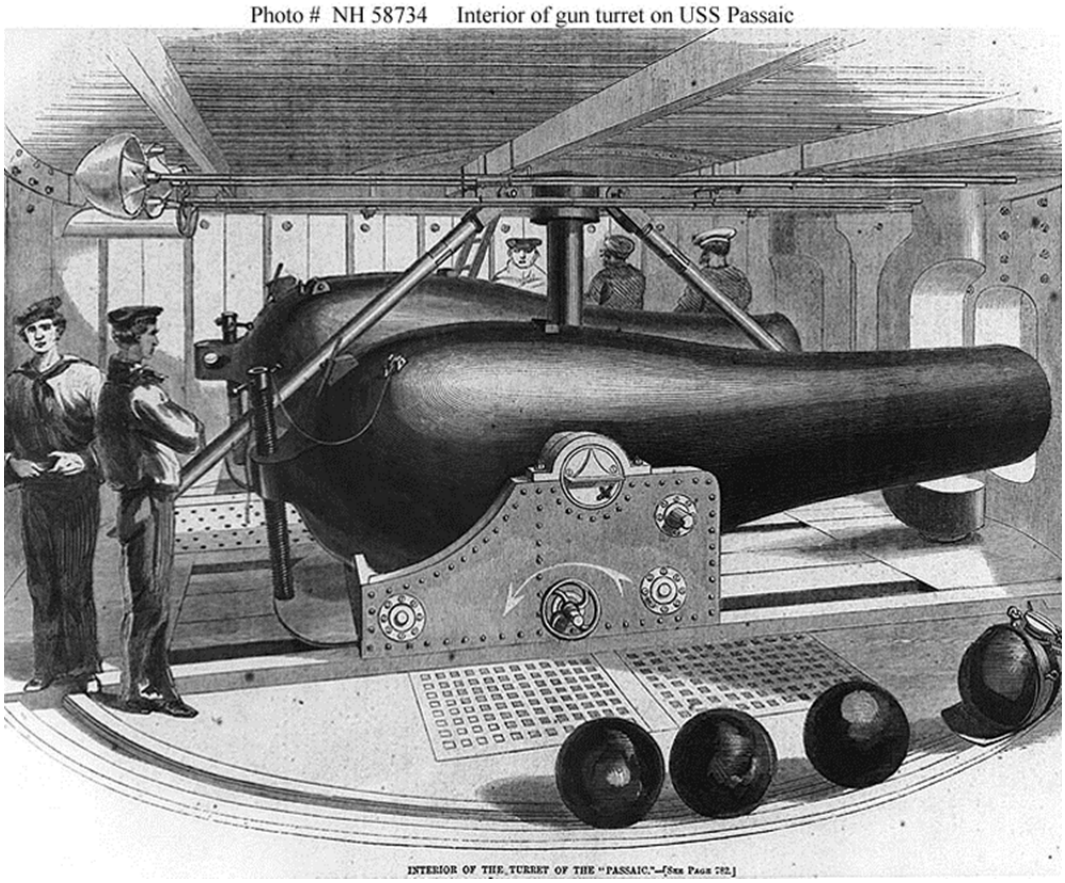
> *"The difference between the system of Paixhans and my own was simply that Paixhans guns were strictly shell guns, and were not designed for shot, nor for great penetration or accuracy at long ranges. They were, therefore, auxiliary to, or associates of, the shot-guns. This made a mixed armament, was objectionable as such, and never was adopted to any extent in France... My idea was, to have a gun that should generally throw shells far and accurately, with the capacity to fire solid shot when needed. Also to compose the whole battery entirely of such guns."*

Dahlgren developed a family of heavy smoothbore and rifled cannon that were identified by their distinctive soda bottle shape. They were the product of Dahlgren's scientific research in ballistics and metallurgy, and were manufactured and tested under the most comprehensive program of quality control in the Navy up to that time. They became commonly known as "Dahlgrens" and were the Navy's standard shipboard armament during the Civil War.



U.S.S. Kearsarge 11-in Dahlgren Shell Gun on Pivot, 1864 USN History & Heritage Command,

All of the Dahlgren shell guns were cast iron and although some were tested to failure, none of the smoothbores burst during service, a notable record for that time. The "Dahlgrens" were capable of firing shot, shell, shrapnel, and (with the exception of the 15-inch shell gun) grape-shot. (Note: Canister was chiefly for field artillery at close range.)



U.S.S. Passaic Turret with 15-inch Dahlgren Shell Guns, USN History & Heritage Command

Dahlgren's smoothbore guns were: the 32-pounder gun of 27 cwt. M1855, the 32-pounder gun of 4500 pounds, 8-inch Dahlgren Shell Gun, 9-inch Dahlgren shell gun, 10-inch Dahlgren shell gun (heavy & light), 11-inch Dahlgren shell gun (carried on monitors and large conventional warships like the *U.S.S. Kearsage*), 15-inch Dahlgren shell gun (short & long versions for *Passaic, Canonicus* and *Tecumseh* class monitors), and 20-inch Dahlgren shell gun (only four manufactured). In 1854 the six *Merrimack* class

steam frigates were armed with 9-inch Dahlgrens and by 1856 the Dahlgren had become the standard shipboard artillery of the U.S. Navy.

Dahlgren's rifled cannon were: 20, 50, 80, and 150-pounder rifles. The 50-pounder was popular but by the end of the Civil War had been supplanted by the Parrott rifled gun. The 80-pounder was well received at first but soon showed an unfortunate tendency to burst. Because Dahlgren doubted the quality of the iron, the 150- pounders were not placed in service. Three 12-inch rifled guns were made from 15-inch Dahlgren shell gun blanks and were tested to bursting after the war.

U.S. NAVY PLYMOUTH PATTERN PERCUSSION RIFLE DESIGN AND DEVELOPMENT

During the 1800's and well into the 20th century sailors performing as infantry, and sometimes providing land-based artillery support, was an integral part of the Navy's operations and mission. The use of sailors as infantry (and for serving artillery ashore) was common during the 19th century. While at sea boarding was a recognized ship-fighting tactic, amphibious landings and operations ashore were also common. Landings were generally a ship's company evolution, involving both marines and sailors, with marines usually in the minority. Using sailors as infantry ashore was what the Navy primarily did during the Seminole Wars and the War with Mexico. Marines were mostly used as ship guards, and it was not until the 1930s, with the establishment of the Fleet Marine Force that the Marines fully took the lead in amphibious assault operations.

Despite the Navy's role in providing infantry for land operations, in the mid-1850s the Navy did not possess a single rifled musket in its inventory. Sailors were still armed with old, percussion conversion .69 caliber smoothbore muskets. On February 7, 1856, Commander Dahlgren requested permission from the Acting Chief of the Bureau of Ordnance and Hydrography to develop a rifle musket and hold trials in order to determine the proper design for naval service. Dahlgren contacted several firms about developing a naval rifle musket but only Eli Whitney Jr. of New Haven, Connecticut responded, saying that he would produce a sample gun for $25. Dahlgren provided a number of specifications, including the ability to take both a yataghan saber bayonet and a Bowie knife bayonet, but when the sample gun arrived Dahlgren rejected it. The barrel was too short and light to take the required heavy charge, the lock did not conform to the Army's Maynard tape primer and the gun could not take the Bowie knife-type bayonet that Dahlgren had specified.

Dahlgren started working on his own design, using the French Model 1846 Carabine à Tige as a model. The external design, including barrel length, sights, bands, sling swivel positions, heavy ramrod and side bayonet lug, closely corresponded to the French gun. He did not use the Carabine à Tige chamber design of Colonel Louis-Etienne de Thouvenin with its steel stem inside and at the center of the powder chamber that was designed to obdurate the projectile into the rifling in the bore. However, by 1856 the Minié ball (and its American derivative developed by James Henry Burton) had already supplanted the de Thouvenin system to engage the rifling. Although he discarded the Thouvenin chamber design, Dahlgren kept the heavy thick steel ramrod of the French gun. Dahlgren believed that the short 34-inch barrel and the large .69 caliber would better suit the Navy's requirements than the standard, 40-inch barreled .58 caliber rifle musket that had been adopted by the Army. The short barrel was better for climbing in and out of small boats, climbing up masts to a ship's fighting

tops, boarding and landing actions. The large heavy ball could deal with a ship's wooden bulwarks. Dahlgren was not concerned about the extra weight of the .69 caliber rifle and ammunition since sailors acting as naval infantry would not normally be called upon to make long marches. He also favored the larger caliber as it was more amenable to take a load of buckshot. Dahlgren believed that buckshot would often be better suited to the close quarters fighting that sailors would be likely to engage in.

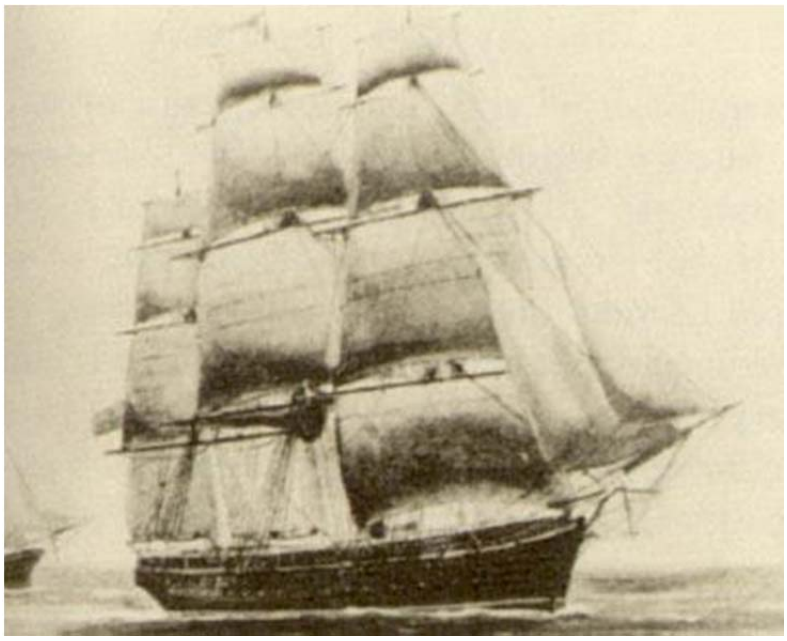
The French Model 1859 is almost identical to the Model 1846 Carabine a Tige. Private Collection

In August 1856, Dahlgren had completed his design and submitted his model to Harpers Ferry Armory for rifling of the 34 ½ inch long steel barrel. The model rifle used the standard Model 1842 percussion lock and stock. The furniture – barrel bands, trigger guard, buttplate, sideplate and lower swivel bar – were brass. A sample Bowie knife-type bayonet accompanied the sample rifle. The Navy Bureau of Ordnance requested that Harpers Ferry provide an estimate to produce 3,000 rifles using either the Maynard tape primer lock or the standard Model 1842 lock. Harpers Ferry and Springfield were then gearing up to manufacture the new Model 1855 rifle musket and responded that the cost to produce 3,000 rifles with the Model 1842 lock plus Bowie knife-type bayonet would be $15 each plus $2,000 tooling costs, while the cost of producing the same amount of rifles with the Maynard Tape Primer lock would be $20 each plus $12,000 machinery costs.

Since Dahlgren felt that he needed only 100 trials rifles, the Navy considered the Harpers Ferry cost estimate to be excessive and since civilian manufacturers were unwilling to produce such a small order, the Navy Ordnance Bureau decided to contract out for the parts and assemble the trials rifles itself. In March $2,000 was appropriated for the design and production of the trials rifles.

E. Remington & Sons is not normally associated with the Whitney manufactured Model 1861 Plymouth Rifle. However, Remington is linked to the initial pattern rifles that the Model 1861 is based on. Remington supplied 150 decarbonized steel barrels at $4.50 each, which were rifled at Harpers Ferry. The Navy contracted with the N.P. Ames Manufacturing Company of Chicopee, Massachusetts to supply 75 sword bayonets and 75 Bowie knife bayonets. Springfield and Harpers Ferry supplied various parts from the Model 1842 musket.

Dahlgren initially wanted the rifles to be equipped with the Maynard tape primer. However, Springfield informed him that it did not manufacture the lock in .69 caliber and so he ordered them from Remington, which was then producing Maynard tape primer locks for Frankford Arsenal's conversion of Model 1816 and 1822 flintlock muskets to percussion rifled muskets. When the Navy tried to order the locks from Remington the company informed it that the Remington .69 caliber Maynard tape primer locks could only be fitted to the Model 1822 bolster and not to the Model 1842 barrels that Remington had produced for the Navy. So Dahlgren decided to forgo using the Maynard tape primer and went with the standard Model 1842 percussion lock.



U.S.S. Plymouth during the 1844 Perry Expedition to Japan
US Navy Historical Center

In the meantime, the *U.S.S. Plymouth* under Dahlgren's command sailed on June 24, 1857 in order to test heavy ordnance, including those of Dahlgren's design. When it returned to port in November, Dahlgren went back to work on the trials rifles. Harper's Ferry rifled the barrels for the Navy and the Washington Navy Yard went to work producing the brass fittings and assembling 55 trials rifles. When the *Plymouth* set sail on May 29, 1858 under Dahlgren's command on its second voyage to test Dahlgren-designed 9 and 11-inch shell guns, there were 54 Plymouth pattern trials rifles on board. The rifles were tested during the voyage and when the *Plymouth* returned to Washington in December 1858 the rifles were put in storage. During the Civil War, these pre-war Plymouth pattern rifles were issued to the sloop of war *U.S.S. Jamestown* where they saw combat against blockade runners and during amphibious operations.

The pattern rifles are .69 caliber, 50 inches long, with a 34-inch barrel with brass mountings and the Model 1842 musket type bolster and standard Model 1842 locks. Harpers Ferry supplied the stocks and the locks, which are stamped:

HARPERS
FERRY
1854 or 1855

It has standard Model 1842 long range sights and the barrels are marked:

PLYMOUTH
PATTERN
1858

Although Remington produced 150 barrels, it is generally believed that only 55 Plymouth pattern trials rifles were assembled and only 54 were entered into the Plymouth's logbook. Despite this conventional wisdom it is possible that additional rifles were fabricated during and after the *Plymouth's* voyage. According to John McAulay, when the *U.S.S. Jamestown* was being fitted out for war service, its log entry for April 16, 1861 indicated that among the small arms issued to it were "70 Muskets w/ Bayonets" and "7,000 Navy Rifle Musket Cartridges (for the prewar Plymouth Rifle)." At this time the Model 1858 Plymouth trials rifles were the only adopted Navy rifle muskets in the Navy. Needless to say, whatever the number fabricated these rifles are extremely rare and correspondingly expensive.

WHITNEY MODEL 1861 NAVY "PLYMOUTH" RIFLE PRODUCTION

When the Civil War started the rapidly expanding Navy found itself woefully short of modern small arms. The Navy contacted the Whitney Arms Company in New Haven, Connecticut on May 2, 1861 asking if the company would be interested in a contract to manufacture 3,000 Navy muskets. In June, the Navy provided one of the 1858 Plymouth trials rifles to Whitney as a model and after further negotiations the Navy and Whitney signed a contract in July for Whitney to produce 10,000 .69 caliber rifles. The new rifle would differ from the 1858 trials rifle principally in that it would use the standard U.S. Springfield Model 1861 rifle musket lock and iron furnishings. It would also have a long-range rear sight patterned after the French sight used on the Model 1859 rifle. The contract called for Whitney to manufacture the rifles, equipped with a saber bayonet, for $25 each.

Model 1861 Navy Plymouth Rifle with Bowie knife type bayonet and saber bayonet.
Photo – US Military Academy (West Point) Museum

There is an interesting side story to Remington's involvement with the Plymouth rifle. When Whitney naturally turned to Remington to supply the barrels for the 10,000 rifles (Remington had provided barrels for the trials rifles), Remington responded that it could not produce the barrels because its manufacturing facilities were tied up with its own government orders. Whitney had to look for another supplier and made little progress that year on meeting the contract. In June 1862 Whitney received 2,000 barrels from a subcontractor but rejected them because they were flawed. Whitney then decided to produce the barrels themselves with cast steel. In October 1862 Whitney sent five sample rifles to Dahlgren at the Washington Navy Yard. Upon inspection Dahlgren felt that the rifles, which weighed between 9.68 and 9.84 pounds, were too light to handle the heavy recoil of the .69 caliber cartridge. The Model 1858 Plymouth trials rifle had weighed 11.5 pounds. Although reducing the powder charge in order to reduce recoil would also reduce range, Dahlgren decided to accept the lighter weight rifle and use a lighter charge because of the Navy's urgent need for the rifles. Whitney then started manufacturing the rifles in earnest and regular deliveries began in 1863. It appears that the first delivery of 100 rifles was in early February 1863 to the New York Navy Yard. Some early rifles may have lockplates dated 1862. Others may have ungraduated rear sights. Apparently, the sample sight that the Navy sent to Whitney did not have range graduations, so Whitney produced ungraduated rear sights. After some discussion Whitney agreed to graduate the sights if the Navy would provide a pattern sight with graduations. The Navy did, as well as sending back ungraduated sights, and Whitney graduated those sights. However, some ungraduated rear sights appear to have slipped past this correction process. If the collector comes across a Plymouth rifle with an ungraduated rear sight this is why.

Later that year the Navy assigned Frank C. Warner as the inspector on the Whitney Plymouth rifle contract.

One of the first Union vessels to receive the Plymouth rifle was the side-wheel steamer *U.S.S. Nansemond*, receiving 25. Others were the gunboat *U.S.S. Eutaw* (60 rifles) and the *U.S.S. William Bacon* (30 rifles). Whitney delivered a total of 5,300 Model 1861 Navy Plymouth rifles to the Navy in 1863 and 4,695 in 1864. The following table provides the deliveries of the Plymouth rifles by month. When the 5 sample rifles delivered in October 1862 are counted, the total contract number of 10,000 is reached.

1863		1864	
February	100	January	1,000
June	600	February	500
July	1,000	March	1,500
August	500	April	1,000
September	1,100	May	695
October	500		
November	1,000		
December	500		
TOTAL	**5,300**	**TOTAL**	**4,695**

WHITNEY MODEL 1861 NAVY "PLYMOUTH" RIFLE DESCRIPTION

The Model 1861 Navy Plymouth Rifle is a handsome .69 caliber, single shot, percussion muzzleloader. It weighs 9 pounds, 10 ounces. The overall length is 50 inches and it has a 34-inch long bright finished barrel and two spring-fastened barrel bands. It has iron mountings and furniture and a thick steel ramrod with a large cylindrical tip that is pierced by a small hole. All metal is finished bright, or in the white. There is a finger spur on the guard plate behind the trigger guard bow. The rear sling swivel is attached to the bottom of the stock near the buttplate and the front sling swivel is on the bottom of the rear barrel band. It has an oil finished, black walnut stock.

Navy Model 1861 Plymouth Rifle Photo courtesy Tim Prince, College Hill Arsenal, www.collegehillarsenal.com

The thick barrel has 3-groove rifling and a small iron blade front sight. The barrel has a large bayonet lug on the right side near the muzzle. The large, long-range rear sight leaf, copied from the French Model 1859, is graduated to 1,000 yards range. Some rear sight leafs have been observed without any graduations.

Inspector's initials will be stamped in a cartouche on the left side of the stock opposite the lock plate. They will be either **FCW** inside a rectangle or **W** for Frank C. Warner, or **JHG** for John H. Griffiths. The buttplate is stamped **U.S.**

The barrel also has identifying stamps. These are the letters **V,P** over a stamped **Eagle head**. Barrels are also stamped on the top flat with the year, **1863** or **1864.**

There are two types of lockplates. Variations between them depend on when they were manufactured.

Type 1 lockplates are usually found on rifles delivered in 1863. The lockplate is stamped with year **1862** or **1863** vertically behind the hammer. The 1862 stamp indicates that the lockplate itself was probably produced in 1862 while the rifle may not have been assembled until 1863. The Type 1 lockplate is also stamped with a large eagle with a shield and flags in front of the hammer. Also in front of the hammer but underneath the bolster is stamped:

U.S.
WHITNEY-VILLE.

These lockplates will also often have inspectors initials stamped on them – **JHG, FCW, W** or **HW**.

Type 2 lockplates are usually found on rifles delivered in 1863 and 1864. The lockplate is stamped with year **1863** or **1864** vertically behind the hammer. There is a small eagle with a shield stamped in front of the hammer over the letters **U.S.** Also in front of the hammer but underneath the bolster is stamped the words: **WHITNEY-VILLE**.

Type 1 Lockplate. Photo courtesy Tim Prince, College Hill Arsenal, www.collegehillarsenal.com

Type 2 Lockplate. Photo Courtesy Cliff Sophia, CS Arms, www.csarms.com

Top – Rear sight, date 1863, barrel proof marks serial number.
Photo Courtesy Cliff Sophia, CS Arms, www.csarms.com

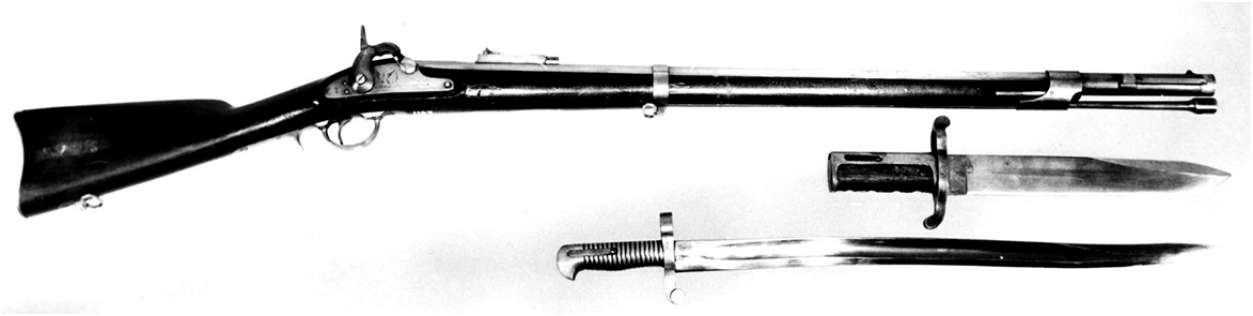
Plymouth rifles are also marked with what appears to be a serial number stamped on the barrel tang. These numbers corresponded to the serial numbers stamped on the saber bayonets, which were produced by Collins and Co., of Hartford, Connecticut. Because the saber bayonets were produced by a firm other than Whitney, the bayonets were not interchangeable between rifles. Each bayonet required hand fitting to a particular rifle and was serial numbered to that rifle.

Top - Serial Number & Inspector Initial "W" on barrel.
Photo courtesy Tim Prince, College Hill Arsenal, www.collegehillarsenal.com

The .69 caliber Model 1861 Navy Rifle, like most Union muzzleloading rifles and rifle muskets that fired Minie balls during the Civil War, used paper cartridge ammunition. The standard Union cartridge for .69 caliber ammunition contained 70 grains of powder and a 730 grain bullet. The standard for buckshot was 110 grains of powder.

PLYMOUTH RIFLE BAYONETS

Two entirely different types of bayonets are associated with the Model 1861 Navy "Plymouth" Rifle. A long, yataghan-style saber bayonet and a short, Bowie knife type bayonet, which was really a formidable knife masquerading as a bayonet. Not content with designing various cannon and a rifle, Dahlgren exhibited his inventive versatility by also designing these edged weapons.



Model 1861 Navy Plymouth Rifle with Bowie knife type bayonet and saber bayonet.
Photo – US Military Academy (West Point) Museum

Saber Bayonet

The Model 1861 US Navy Rifle saber bayonet was designed by Dahlgren and closely modeled on the French bayonet for the Model 1846 Carabine a Tige. These production bayonets were manufactured by Collins & Co.

Photo – Private Collection

The bayonet is 27 ½ inches long. The hilt, cross guard and ring are made from one piece of brass. The slightly curved blade is 22 ½ inches long and 1 ¼ inches wide at its widest part. It is grooved to the end of the blade, the groove at the end being 3/8 inches wide and 7/16 inches deep. The bayonet weighs almost two pounds. The inspector's initials are stamped on the pommel of the hilt.

Photo – Private Collection

The bayonets are stamped on the left ricasso of the blade:

COLLINS & CO
HARTFORD
CONN.

Collins would ship the completed bayonets to Whitney, which would hand fit them to a particular rifle. Both rifle and bayonet would then be stamped with identical numbers and shipped together to the Navy. The bayonet's serial number is stamped on the top flat of the brass hilt, next to the groove for the bayonet lug key. The Navy considered the non-interchangeability of the bayonets to be a defect because if the rifle and bayonet were separated, the bayonet would have to be hand fitted to a new rifle. In early 1864 the New York Navy Yard tried to correct the problem by repairing bayonets to make them interchangeable with any Plymouth rifle. However, only 200 bayonets were repaired by mid-April.

Saber Bayonet hilt. Photo Courtesy Cliff Sophia, CS Arms, www.csarms.com

The scabbard is black leather with a brass throat and tip.

Bowie Knife-Type Bayonet

Much has been written about Dahlgren's famous design of the Bowie knife type bayonet, which is generally considered to be the first U.S. knife bayonet. He initially designed it at the same time he conceived of the Plymouth rifle. In a letter to Whitney dated March 3, 1856 he briefly described his idea for it as, *"The bayonet, an elongated Bowie knife, weighing about 1 ¾ lbs. Fixed and carried like the new French yataghan bayonet, but bearing more of a resemblance to a Bowie knife – the number and depth of grooves, the general character, etc., you will suggest."*

Dahlgren never really intended for the Bowie knife to be used as a bayonet on the end of a rifle; the saber bayonet fulfilled that role. Rather he intended for it to be used as what it was, a large heavy knife that could be put to a multitude of ship board uses, particularly as a formidable close-quarters weapon. He believed that bayonets on the end of rifles were useless and that the Navy really needed was a large knife.

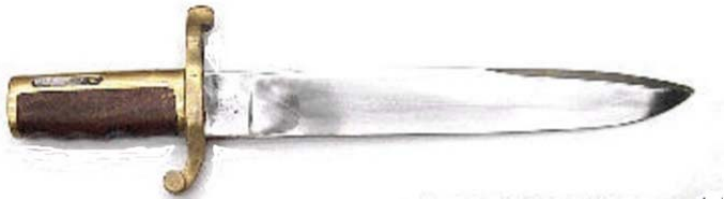


Photo – Private Collection

There is a story that he initially tried to order the Bowie knives as knives but the always frugal Navy did not agree to his request. So he redesigned the knife to supposedly fit on the end of a rifle, called it a bayonet and resubmitted his request but this time for a short bayonet. The Navy approved the order. However, the Bowie knife bayonets, unlike the saber bayonets, were never factory-fitted to the Plymouth rifles and will not attach without significant alteration.

The N.P. Ames Manufacturing Company of Chicopee, Massachusetts produced 1800 of the Bowie knife bayonet. The bayonet is 16-11/16 inches long and the heavy blade is a bit over 12 inches long, 1-11/16 inches wide, and 11/32 inches thick. The bayonet weighs a little over 2-1/3 pounds. The backstrap of the hilt, cross guard and ring are made of one piece of brass. The walnut grip is one piece.

Photo – Private Collection

The right ricasso of the blade is stamped:
U.S.N.
D.R.
(Date – 1861, 1862, 1863 or 1864)

Photo – Private Collection

The left ricasso of the blade is stamped:
AMES MFG CO
CHICOPEE,
MASS.

There are two Navy inspectors associated with this bayonet; Daniel Reynolds (DR) and Commander Guert Gansevoort (GG).

Surprisingly, despite the small number produced (1800) at least four variations of the Plymouth rifle Bowie knife bayonet have been identified.

1) Marked 1861 on the blade, three heavy copper pins secure the hilt and grip, no markings on the pommel
2) A brass screw set vertically through the pommel secures the hilt, no markings on the pommel
3) Marked 1862 or 1863 on the blade, sometimes an anchor stamped on the blade, a single screw secures the hilt and grip, **DR** is stamped on the pommel
4) Marked 1864 on the blade, right side ricasso often overstamped **P** over **G.G.**, a single screw secures the hilt and grip, **DR** is stamped on the pommel.

The scabbard is black leather with a brass throat and tip.

DEPLOYMENT AND USE

Almost as soon as they were received from Whitney the Navy Yards issued the Plymouth rifles to ships and stations where they were well received. In fact, on several occasions ships and stations requested Plymouth rifles in place of other arms, including Spencer repeating rifles. For instance, during the summer of 1864 several ships of the Potomac flotilla were granted permission to turn in their Spencer rifles in exchange for Plymouth rifles.

Dahlgren's ideas about the design and use of his rifles and bayonets, were expressed in a memorandum or letter to he wrote to the officers of the South Atlantic Blockading Squadron on August 8, 1865 while on board his flagship, *U.S.S. Philadelphia,* while it was off Port Royal, South Carolina. The following excerpts illustrate his vision:

"Boat artillery and infantry, South Atlantic Blockading Squadron"

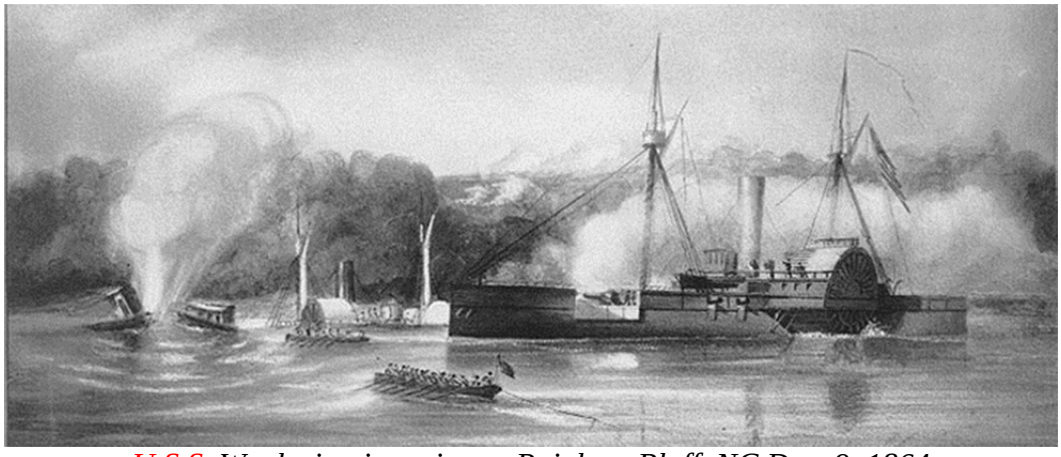
"It has frequently happened that the peculiar nature of the duties in this command has required the service of bodies of men to be landed from vessels to act for a short time as infantry, assisted by light fieldpieces.
In order to meet similar exigencies commanders of vessels will take pains to select from their crews such men as may seem to have a turn for this kind of duty and have them drilled with small arms until they have attained the necessary proficiency.
In so doing it is to be borne in mind that the drill and the maneuverings are to be few and exceedingly simple.
The men should be thoroughly skilled in the loading and firing of their weapon, and firing at a mark is to be encouraged. The light-infantry drill will be best adapted to this service, and to the habits of the seamen.
The preferable arm, when it can be had, will be the new navy rifled musket, known as the Plymouth musket, because the first of the kind were made for the U. S. ship Plymouth when under my command, the pattern of which was got up by myself as most suitable for sea service.
It is a short musket, about 34 inches in the barrel, bore 0.69 inch, and rifled.
Its special bayonet is a short, broad, and stout knife, of the well-known Bowie pattern, the principal use of which I designed to be in the hand in close conflict, such as boarding. In campaigning it would also serve many wants; but it may be fixed and used as a bayonet.
There is also a sword bayonet similar to that of the French, making the total length of weapon, from butt to point, about equal to that of the army musket with the ordinary bayonet.
The musket is perfectly balanced for aim when the bayonet is not fixed; and its large bore gives great effect to buckshot, which, at short distances, is always to be preferred.
As a general rule we have too much neglected the use of this formidable ammunition for small arms.
The men should be landed occasionally for practice, especially as skirmishers."

Dahlgren also took particular care to ensure that his Bowie knife bayonet was used as a knife. On June 6, 1864 he ordered, *"Boat crews must have small arms loaded with buckshot and have their Bowie knives."* On June 14 he ordered that the watch on deck had *"to have their Bowie knives in their belts."* And he later issued another order, *"In changing the watch let each man show his Bowie knife. Remember that the play of this weapon is the thrust."*

Plymouth rifles were used in ship to ship actions against blockade runners and especially distinguished themselves in numerous amphibious and land operations. While commanding the South Atlantic Blockading Squadron, Admiral Dahlgren established a Naval Brigade, made up of 350 sailors and 150 Marines drawn from the ships in his squadron. They were sent to an encampment on Phillips Island, Port Royal Bay where they were instructed in battalion drill so they could operate in the field with the Army. Their main function would be that of skirmishers and they would be accompanied by two four-gun naval howitzer batteries. One noteworthy operation occurred in late November/early December 1864, during a six-week long operation a combined Union Army-Navy force attempted to cut the Charleston and Savannah Railroad. Dahlgren supplied one Marine battalion armed with .58 caliber rifle muskets and two battalions of sailors armed with Plymouth rifles and boat howitzers from the Naval Brigade under the command of Commander George Preble. After fighting at the Battle of Honey Hill, the Confederates (including cadets from The Citadel) repulsed the Union force at Tulifinny Crossroads, South Carolina, the Federals retreated to prepared

positions. The Confederates attacked the Union lines, which were held in part by the Marines and the two naval battalions. The Marines and sailors, using their Plymouth rifles, threw back the Confederates in fierce fighting.

More typical activity was the smaller actions of the *U.S.S. Winona*, a 691-ton *Unadilla Class* screw steam gunboat and the *U.S.S. Wyalusing*, a *Sassacus Class* double-ended paddle-wheel gunboat, both of which had Plymouth rifles in their armories. In mid-1863 the *Winona* was involved in inland waterway campaigns against Port Hudson and Vicksburg on the Mississippi River. In February 1864 she became part of the South Atlantic Blockading Squadron, operating along the coast from South Carolina to Florida. Among her exploits were the destruction of a blockade runner in March 1864, attacks on enemy forts near Savannah, Georgia, and participation in an amphibious landing at Bulls Bay, S.C., in February 1865. During the Civil War the *U.S.S. Wyalusing* was assigned to the North Atlantic Blockading Squadron and participated in the following actions: a battle against the Confederate ironclad *C.S.S. Albemarle* at the mouth of the Roanoke River on May 5, 1864; action at Fort Williams and the capture of Plymouth, N.C. on October 27-29, 1864; action at Rainbow Bluff, N. C. on December 9, 1864; expeditions up the Roanoke River in December 1864; and the boarding and capture of two Confederate schooners in early 1865.

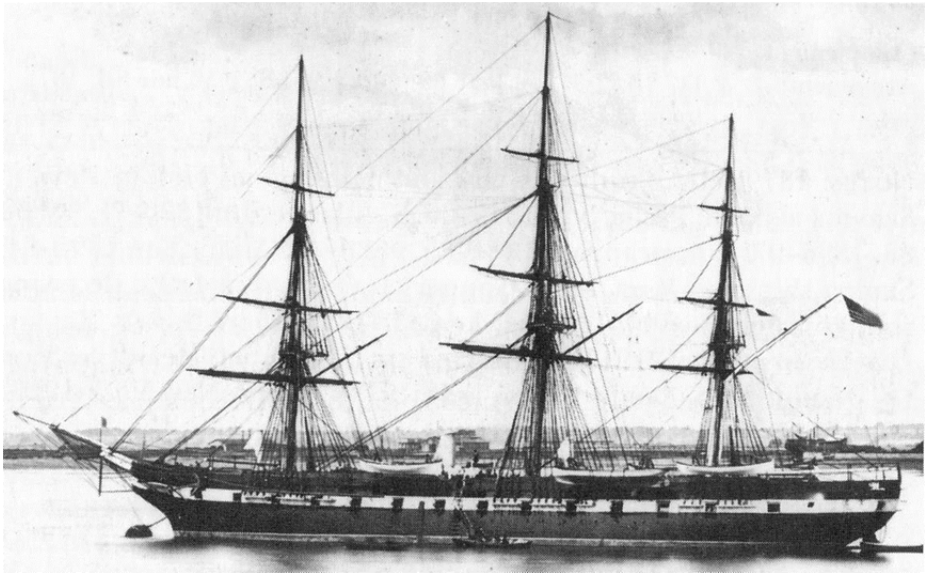


U.S.S. Wyalusing in action at Rainbow Bluff, NC Dec. 9, 1864
U.S.N. History and Heritage Command

Although Marines on occasion used Plymouth rifles, the Marine Corps never adopted it, instead preferring their .58 caliber Model 1855 and 1861 rifle muskets. The Navy twice tried to get the Marines to adopt the .69 caliber Model 1861 Navy rifle. Secretary of the Navy Gideon Welles suggested to Col. John Harris, Commandant of the Marines, on March 30, 1864 that the Marines consider standardizing their small arms on the Plymouth rifle. Harris convened a board to test the Plymouth against a Springfield rifle musket. The board concluded that the Plymouth was two pounds heavier than the Springfield, and although shorter, was not easily handled, especially during bayonet drill. The board said that the Navy rifle's recoil was too heavy and that it was not as accurate as the Springfield at long range. When he read the board's report Rear Admiral Dahlgren asked the new Commandant, Col. Jacob Zeilin, to reconsider the Marine decision. Zeilin convened a new board which tested the guns and confirmed the conclusions of the first board. The new board also pointed out that although it would be advantageous to have the Navy and Marine Corps use the same caliber weapon, it would cost the Marines $83,000 to acquire enough Plymouth rifles to equip the Corps, while there was no cost involved with equipping the Corps with .58 caliber Springfield rifle muskets because they were "drawn directly from public armories." Zeilin approved the board's report and the matter was dropped.

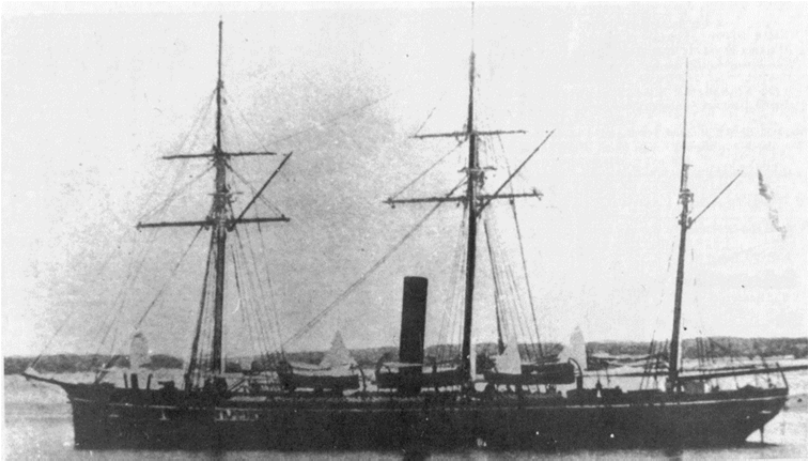
When the Civil War ended, the Navy started decommissioning vessels and many Plymouth rifles were turned in to be put into storage. Navy records indicate that by December 1866 Naval Stations reported 7,264 Plymouth rifles in their stores.

However, even though the Navy had presumably standardized on the breech loading Sharps and Hankins carbine, and later adopted the .50 caliber Remington rolling block carbine and rifle, muzzleloading Plymouth rifles continued to see heavy service well into the 1870's. The *U.S.S. Oneida*, a screw sloop of war, was assigned to the Asiatic Squadron between 1867 and 1870. Her small arms included 30 Plymouth rifles. In February 1868, when Japanese troops fired on the foreign compound at Hiogo, Japan, the *Oneida* fired a few broadsides and landed three boatloads of sailors and marines to protect the American and other foreign facilities and personnel.

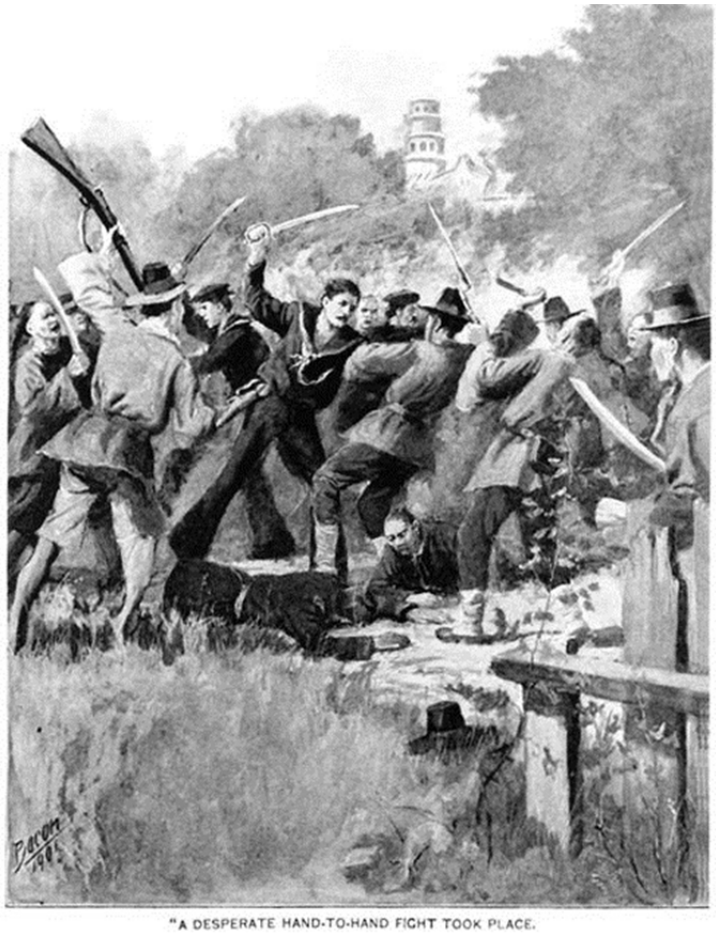


U.S.S. Brooklyn as she looked in the 1870's with a full spar deck.
U.S.N. History and Heritage Command

The screw sloop of war, *U.S.S. Brooklyn*, flagship of the European Squadron, reported 180 Plymouth rifles on board in 1871 and 1872. The South Atlantic Squadron reported 138 Plymouth rifles in the inventory of four of its five warships during 1868 and 1869. The squadron flagship, *U.S.S. Guerriere*, carried 58 Plymouth rifles in its armory. The *U.S.S. Polaris* carried 12 Plymouth rifles on her attempt to reach the North Pole in 1871. And the ships of the Darien Expedition (1870-71), including the gunboat *U.S.S. Resaca*, carried Plymouth rifles. The *Resaca* reported 20 Plymouth rifles in her inventory.



U.S.S. Resaca. *U.S.N. History and Heritage Command*



Plymouth rifles were also carried by sailors from the Asiatic Squadron, which saw a large amount of action after the Civil War. When the frigate *U.S.S. Wyoming* took part in an amphibious punitive expedition against natives of Formosa in March 1867, she had 50 Plymouth rifles in her inventory. After the Korean Expedition of June 10-11, 1871, in which sailor and marines from the Asiatic Squadron stormed the Korean forts on Kangawa Island, the *U.S.S. Benicia* and the *U.S.S. Colorado* reported that 3,000 Plymouth rifle cartridges were expended during two days of fighting. And sailors reportedly used their empty Plymouth rifles and Remington rolling block carbines as clubs during fierce hand-to-hand fighting in the forts.

U.S. Sailors & Koreans in hand to hand fighting for the Kangawa Island forts.
USN History & Heritage Command

The Navy began to issue Remington rolling block Model 1870 Navy Rifles to the fleet in early 1871, and over the next three years most of the Navy's ships turned in their Civil War era small arms (and Remington carbines) and were rearmed with the new .50-70 caliber rifle. The muzzle-loading, percussion Model 1861 Navy "Plymouth" rifle appeared to have seen the end of its active service life. But perhaps not.

Colonel Robert Rankin, in his book, "Small Arms of the Sea Services," recounts the story that during the Second World War the U.S. Office of Strategic Services purchased several hundred Model 1861 Navy "Plymouth" rifles for distribution to friendly natives in New Guinea and on South Pacific islands. According to Rankin, New Guinea and the islands fell under Australian mandate and Australian law prohibited natives from using breech-loading weapons. Presumably some bright lad sitting behind a desk in Washington also believed that the "primitive" natives would not know how to operate breechloaders. Never mind that New Guineans and Pacific Islanders who operated with British and Australian coast watchers were apparently quite proficient with their Lee-Enfield rifles and Sten sub-machine guns. Thus ends the saga of the Plymouth rifle.

SOURCES

Print

Flayderman, Norm; **Flayderman's Guide to Antique American Firearms …and Their Values, 9th Edition**; Gun Digest Books, Iola WI

Fuller, Claud E.; **The Rifled Musket**; The Stackpole Company, Harrisburg, PA

Gluckman, Arcadi; **Identifying Old U.S. Muskets, Rifles and Carbines;** Bonanza Books, New York, NY

Hibben, Henry B, Chaplain, USN; **Navy Yard, Washington, History from Organization, 1799 to Present Date**; Government Printing Office, Washington, DC 1890

Janzen, Jerry L.; **Bayonets from Janzen's Notebook**; Cedar Ridge Publications, Broken Arrow, OK

Keisling, Paul; **Bayonets of the World, The Complete Edition**; S.I. Publications, Oosterbeek, The Netherlands

Lewis, Col. Berkely R. (Ret.); **Notes on Ammunition of the American Civil War 1861-1865**; American Ordnance Association, Washington, DC

McAuley, John D.; **Civil War Small Arms of the U.S. Navy and Marine Corps**; Andrew Mowbray Publishers, Lincoln, RI

McAuley, John D.; **U.S. Military Carbines**; Andrew Mowbray Publishers, Woonsocket, RI

Ordnance Instructions for the United States Navy 1864, 3rd Edition; The Navy Department, Government Printing Office, Washington, DC

Ordnance Instructions for the United States Navy 1866, 4th Edition; The Navy Department, Government Printing Office, Washington, DC

Rankin, Robert H., Col., USMC (Ret); **Small Arms of the Sea Services**; N. Flayderman & Co., Inc., New Milford, CT

Reilly, Robert; **United States Military Small Arms 1816-1865**; The Eagle Press. Baton Rouge, La.

Report of the Secretary of the Navy with an Appendix Containing Reports from Officers, December 1865, Government Printing Office Washington, DC;

Sullivan, David M.; **Rear Admiral Dahlgren's "Plymouth" Rifle Musket and the Marine Corps**; Journal of the Company of Military Historians, Vol. 62, No. 1, Spring 2010

Internet

Dahlgren Gun; Academic Dictionaries and Encyclopedias; http://en.academic.ru/dic.nsf/enwiki/718908

Mr. Lincoln's White House: The Generals and Admirals – John Dahlgren (1809-1970); http://www.mrlincolnswhitehouse.org/inside.asp?ID=132&subjectID=2

National Park Service, Springfield Armory Museum Website; http://www.rediscov.com/spring

NavSource Naval History; www.navsource.org

Prince, Tim; College Hill Arsenal Website; www.collegehillarsenal.com

Syracuse University John A. Dahlgren Collection;
http://library.syr.edu/digital/guides/print/dahlgren_ja_prt.htm

U.S. Navy History and Heritage Command; John Dahlgren Biography;
www.history.navy.mil/bios/dahlgren.htm

U.S. Navy History and Heritage Command; WARFIGHTING FIRST – The Civil War Fighting Innovations of John Dahlgren;
http://www.navalhistory.org/2014/04/13/warfighting-first-the-civil-war-fighting-innovations-of-john-dahlgren

U.S. Navy History and Heritage Command; Various pages including The Dictionary of American Naval Fighting Ships, http://www.history.navy.mil/danfs/