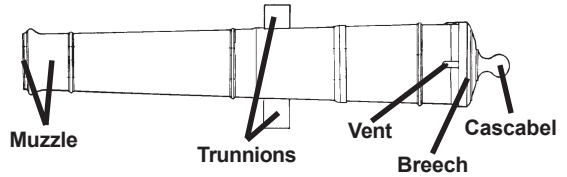
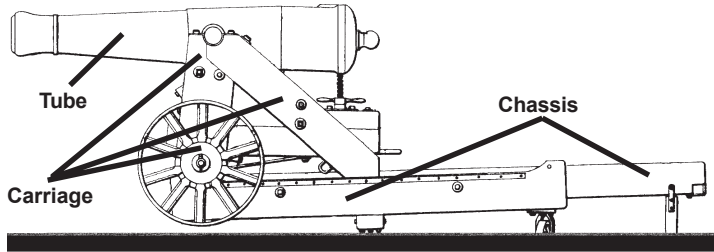


# How Does A Cannon Work?



People have been fascinated with guns since the invention of artillery during the Middle Ages. This basic guide explains how a 19th Century seacoast cannon operated, and the types of projectiles that were used.

These guns are muzzle-loaders. Everything entered and left them through the muzzle. Most were made of cast iron. They consist of three basic components: the tube, the carriage, and the chassis.

The tube rested on the carriage, supporting it for firing and controlling recoil (energy released when the gun fired). The tube and carriage rested on a chassis. A chassis permitted the movement of the cannon left or right, forward or back to aim, load, and fire. All together, this weapon was called a "piece."

## Smoothbore Cannon

Smoothbore guns typically fired spherical projectiles; the classic round cannonball. Ammunition consisted of five kinds: solid shot, shell, case shot, canister, and grape shot.

Solid shot were used for puncturing walls and decks of ships. When heated, they became "hot

shot," used for setting fires.

Shells were hollow with a charge of gunpowder inside. The powder was ignited by a timed fuse which lit when the gun fired. Shells were used to set fires and as signal shots.

A third type, case shot, were

similar to shells, but also contained shrapnel (small iron or lead balls). These were anti-personnel rounds, timed to explode in front of the target.

Canister and grape shot turned a cannon into a shotgun, killing men and destroying objects.



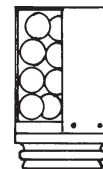
Shot



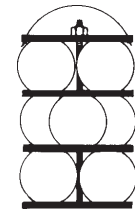
Shell



Case Shot



Canister

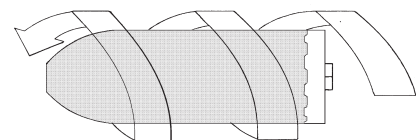


Stand of Grape

## Rifled Cannon

Rifled cannon fired cylindrical, bullet-shaped projectiles. Rifling was a process where the gun's bore was cut with spiraling grooves. This spun the projectile as it was fired, adding great

accuracy and range. Rifled shells were used, for example, to burrow into a brick wall, then explode, causing much more damage than a simple solid shot.



Rifled Projectile

## Load ....

The process of loading and firing began with the cannon "out of battery," meaning that the tube and carriage would be as far back on the chassis as possible. Up to eight artillerymen made up a gun crew.

The first order of business was to extinguish any sparks remaining in the bore after the last firing. This was done with a *sponge*, a long wooden pole with a head about one inch smaller than the

bore. The sponge-head was covered with wool, and dipped in water. The sponge was driven to the bottom of the bore, turned three times each way, and withdrawn.

The next step was to insert a *cartridge*. This was simply a bag of black powder (gunpowder). The bag was commonly made from wool, flannel, or paper. The amount of powder varied with the gun's size, range of target, and

type of projectile. Then the cartridge was rammed to the breach with a *rammer* (much like the sponge).

Spherical shot, shell and case shot were strapped to a *sabot*, a wooden block recessed to fit the projectile. The sabot kept the projectile stable while in the tube, and protected the fuses of shell and case shot. The projectile and sabot were inserted in the bore and rammed home.

---

### ... Ready ...

On top of the tube, at the rear of the gun, a small hole called a vent opens into the gun's bore. A *priming wire* (much like an ice pick) was driven into the vent and withdrawn, puncturing the cartridge and exposing some powder. The cannon was run forward until the tube and carriage rested on the front end of the chassis, "in battery."

Traversing, or aiming, the piece was done by moving the chassis right or left. A *breech sight* was used to give the cannon proper

elevation for the range of the target.

A *friction primer* was the trigger. The primer consisted of two brass tubes joined with a serrated wire key. Surrounding the key in the short tube was a sparking compound, like the substance on a match tip. The long tube was filled with gunpowder. The end of the wire key was looped in a circle. A hook, tied to a lanyard (a long sturdy string), was inserted in this loop. Next the friction primer was

inserted in the vent. The long end of the primer made contact with the exposed powder in the cartridge. The lanyard was uncoiled and pulled taut.

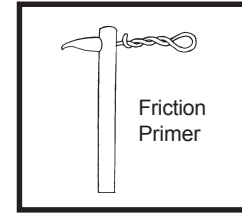


Image courtesy of Warren Ripley

---

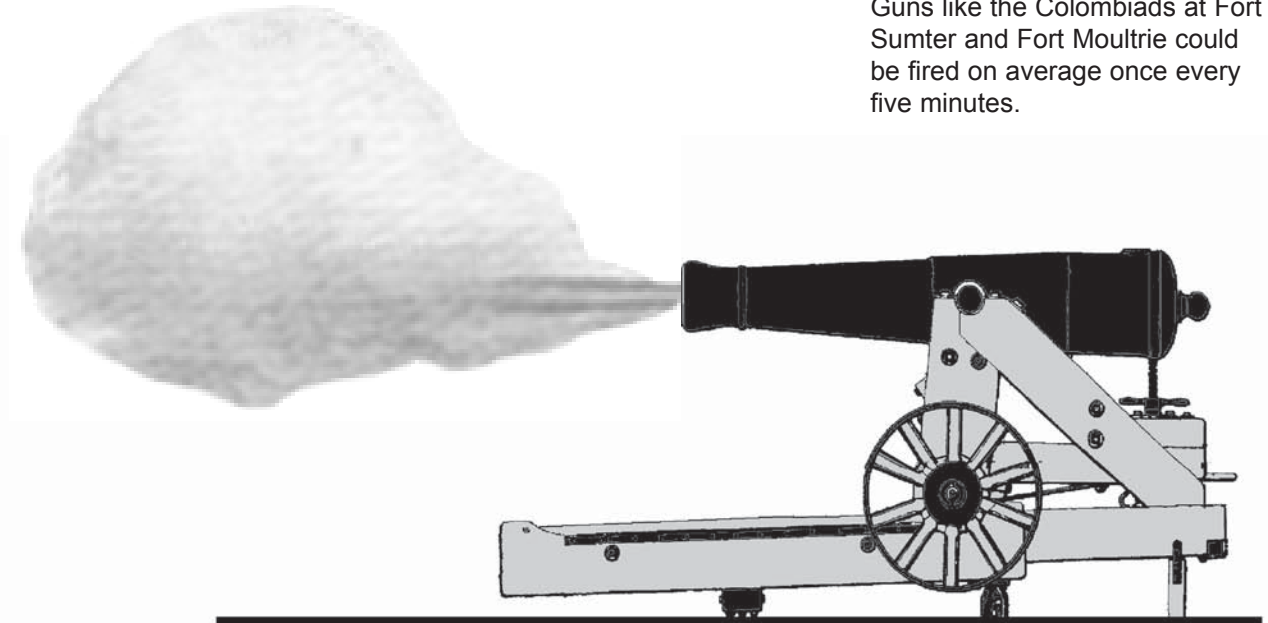
### ... Fire !

The final step was performed upon this command. The lanyard was pulled, ripping the wire key out of the primer. This friction ignited the powder inside the

primer tube. The resulting explosion ignited the cartridge, and the cannon fired. Recoil automatically rolled the cannon out of battery. Friction brought

the carriage and tube to a stop, once again resting at the rear of the chassis. Then the tube was sponged...

Guns like the Colombiads at Fort Sumter and Fort Moultrie could be fired on average once every five minutes.



---

### The Modern Era

By the turn of the century, the United States had upgraded coastal defense with breech-loading steel guns. These guns were easier to load, had far

greater range and accuracy, and were more efficient than their predecessors. The age of the old iron muzzle-loader was at an end.

---

### For Your Safety

Today, these guns are artifacts, preserved for all to enjoy. They are displayed, wherever possible, in their original style settings and

mounts. For your safety no climbing is permitted on the guns, their carriages, or mounts.



Fort Moultrie is a part of Fort Sumter National Monument, a unit of the National Park System. The National Park Service is dedicated to preserving our nation's heritage through cultural

and natural resources. For additional information write to the Superintendent, Fort Sumter National Monument, 1214 Middle Street, Sullivan's Island, South Carolina, 29482.