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In-Depth Explanation of Firearms and Ammunition

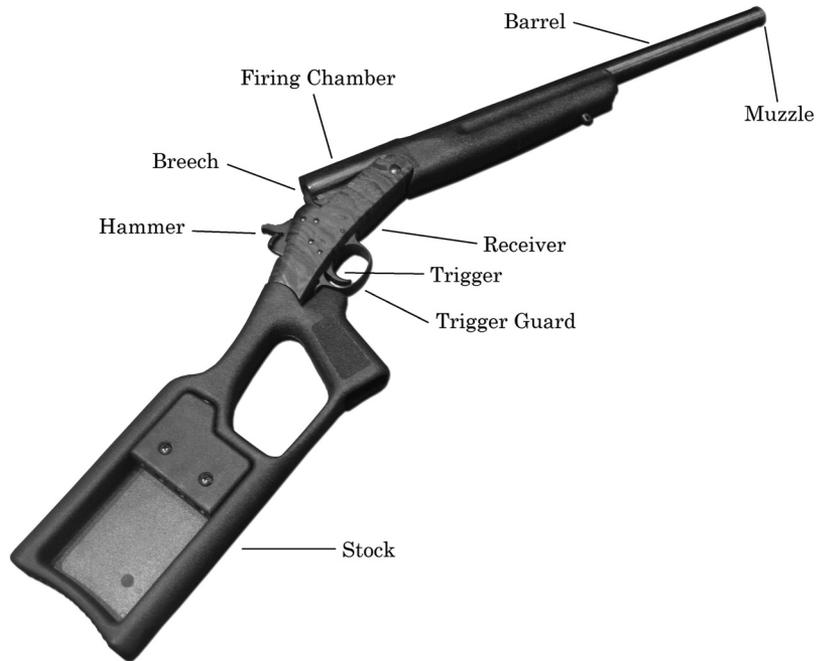
*This is online Chapter 15 of the law school casebook *Firearms Law and the Second Amendment: Regulation, Rights, and Policy*, by Nicholas J. Johnson, David B. Kopel, George A. Mocsary, and Michael P. O’Shea. The printed book, consisting of Chapters 1 through 11, is available at the [website of Aspen Publishers](#). The printed book is also available from [Amazon.com](#) and [Barnes & Noble \(bn.com\)](#). The [public website for this casebook](#) contains the four online chapters (Chapters 12 through 15), plus podcasts on each chapter, resources for student research papers, and more.*

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Chapter 1 of the printed textbook provided a brief overview of how firearms and ammunition function, the different types of firearms, the most important gun laws, and information about the beneficial and harmful uses of firearms. In this online Chapter 15, we provide a much more detailed explanation of firearms and ammunition. We also offer some basics about the many types of nonfirearm “arms.”

A. Introduction to the Parts of a Firearm

A firearm uses the energy created by ignition of a chemical compound (gunpowder) to launch one or more projectiles out of a metal tube called a barrel. Consider a simple firearm, a single-shot rifle.

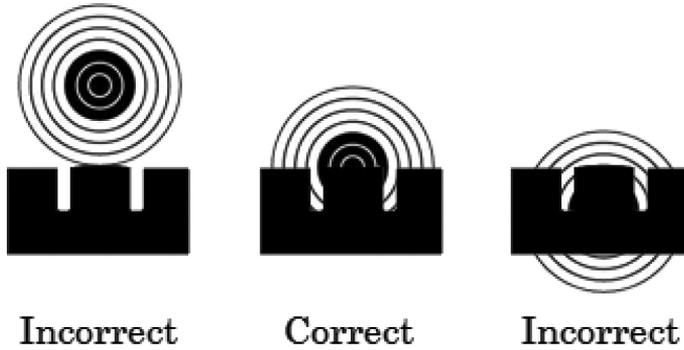


Single-shot rifle, with breech open.

The major parts of a firearm are labeled in the diagram. The firearm is fired by pressing the *trigger* with a finger. The trigger is linked to a spring-loaded *hammer*; once the trigger is pressed as far back as it will go, the hammer is released, and so the hammer is pulled forward by the spring. At the front of the hammer is the *firing pin*. When the hammer has sprung all the way forward, the firing pin strikes the *ammunition cartridge*, which is held in the gun's *firing chamber*. The impact of the firing pin ignites the cartridge (as explained further below), and the gun fires.

The cartridge consists of a metal *casing*, a *primer* (which is ignited by the blow from the firing pin), *gunpowder* (which is ignited by the primer), and a bullet — a conical or cylindrical projectile.

The ignition of the gunpowder causes an expansion of gasses that propels the *bullet* down the *barrel* and causes the bullet to fly at high speed out the barrel's open end, the *muzzle*, which has been aimed at the target. When firing the rifle, the shooter braces its *stock* against the shoulder of the same arm she uses to operate the trigger. By lining up the *sights* that are attached to the top of the rifle, the shooter can aim the rifle accurately, controlling where the bullet will strike when the gun is fired.



Incorrect and correct sight alignments for an open-style sight (typically used on handguns, but available for rifles as well). The tops of the three posts must form a line through the point of aim. In the leftmost image, the bullet will strike the target below the point of aim. In the center image, it will strike the bull's eye. In the rightmost image, it will strike above the point of aim.

Almost all the moving parts of a gun are housed in its *receiver*, which is a metal frame that surrounds the firing chamber and connects it to the barrel. The receiver contains the *action* of the gun, which is the group of moving parts that allow the gun to be loaded, fired, and unloaded. Once the bullet has been fired, the empty casing is left behind in the firing chamber. To reload the gun, the user opens the action, manually removes the empty casing from the firing chamber, and inserts a fresh cartridge in order to fire again, if she desires. The cartridge is inserted at the *breech*, the rear of the barrel.

The rifle just described is simple in its functions. As we will discuss, most modern firearms have additional features that give them greater capability than the basic single-shot rifle, while also making them more complicated. Most of these features relate to the gun's use of ammunition. Most modern firearms are *repeaters*: they can be fired more than one time before manual reloading. They have various mechanisms that allow fired cartridges to be ejected, and fresh cartridges to be moved into the firing chamber, rather than requiring the user to open up the gun and replace each fired cartridge by hand. In order to understand these features, we first need to briefly discuss ammunition and how it works.

B. Ammunition

Modern rifles and handguns use *metallic cartridges*. That is, the casing is made of metal, rather than paper or some other substance. A single unit of ammunition is called a *cartridge* or a *round*. (Below, we will explain how shotgun ammunition is different from rifle or handgun ammunition. One unit of shotgun ammunition is called a *shell*, or it may also be called a “cartridge” or “round.”) Approximately 4 billion cartridges are produced commercially in the United States each year. While a serious competitive shooter may expend tens of thousands of rounds of ammunition every year in practice and competition, most gun owners consume ammunition at a much lower rate.

Ammunition is commonly sold at retail in boxes of 20 to 100 cartridges, as well as in cases of 500 or 1,000 cartridges. In the United States, ammunition is sold at gun stores, sporting goods stores, large retail stores, and gun shows. A large volume of ammunition is also sold and shipped using the Internet or mail-order catalog.



On the left, a rifle bullet. On the right, a complete cartridge (or “round”), containing the bullet. The brass casing holds the bullet and (underneath the bullet) the gunpowder. The primer is in the bottom center of case; like the gunpowder, the primer is not visible in this photo. The upper part of the case is tapered; this is common for rifle cartridges, much less so for handgun cartridges. The lead bullet is covered with copper alloy jacket. The jacketing improves performance, and reduces lead fouling in the gun.

Like manufacturers of firearms, persons or companies who wish to manufacture ammunition for sale must obtain a Federal Firearms License (FFL) from the federal Bureau of Alcohol, Tobacco, Firearms, and Explosives (which calls itself “ATF”).

No federal license is required to manufacture a firearm or ammunition for personal use. A person who wishes to sell firearms manufactured by someone else needs a FFL; a person who only sells ammunition manufactured by someone else does not.

An ammunition cartridge has four major components: the *bullet*, the *case*, the *primer*, and the *gunpowder*.

1. Bullet

Bullets are metal projectiles. Some people use the word “bullet” casually to refer to a complete ammunition cartridge (“there were no bullets in the gun”), but such language is imprecise and can lead to misunderstandings. Properly speaking, one loads a gun with *cartridges* or *rounds*, not with bullets. A bullet is simply one part of a cartridge — the metal projectile, inert in itself, that is launched at high speed from the gun upon firing.

Bullets differ in their shapes and material composition, but the vast majority consist mostly of lead. Different types of bullets are used in ammunition intended for different purposes.

For example, the most common handgun bullet shape is a *round nose*, which has good aerodynamics but is not the most effective at transferring kinetic energy to a target. *Flat-nosed* bullets, also called *wadcutter*s, are traditional for some types of target shooting because they cut a clean, round hole in a paper target that makes keeping score easy. Some shooters use *semi-wadcutter* bullets, which have a partially flattened nose that increases the bullet's striking power, but with more aerodynamic stability.



Cartridges loaded with different bullet shapes. From left to right, round-nose, hollow-point, and wadcutter bullets.

The most common type of handgun bullet for self-defense and police work, which is also very popular for hunting use, is the *hollow point*. Such a bullet has a hollow cavity in the tip that causes the bullet to flatten and expand when it strikes a target. This makes the bullet more effective at incapacitating a human adversary or game animal because it increases the amount of tissue damage caused by the bullet. It also tends to reduce the risk of *overpenetration*: a hollow point bullet is more likely to expend all its energy in its target and come to rest there, instead of piercing through the target and emerging from the other side, still traveling at a dangerous velocity.



When bullets hit their targets, the soft lead deforms. The high-performance, expensive, bullet on the left has “opened up” almost perfectly.

Hollow point *rifle* ammunition is popular for hunting small to medium game. A very few jurisdictions restrict the use of hollow point ammunition for self-defense. See N.J. Stat. Ann. §§2C:39-3f(1), :39-3g(2), :39-6f (prohibiting individuals from possessing hollow point ammunition, except on their own property or when hunting, target shooting, or traveling to and from a target range).

Most bullets are constructed of lead alloy. They are often coated with a thin jacket of copper or brass. Some bullets are made of metals other than lead, such as copper, steel, and tungsten. (See *infra*, Section D.5, for information on armor-piercing ammunition.)

Most military ammunition is *full metal jacketed*: it employs a pointed or round-nosed bullet with a copper coating that covers the entire exposed portion of the bullet. Cartridges with fully jacketed bullets are popular for practice shooting by civilians as well. The copper coating reduces the lead residue (which can impede accuracy) in the barrel when the gun is fired. Full-metal-jacket ammunition penetrates deeply into a target and does not expand when it hits (although some military rounds break into fragments when they strike a target, which can increase wounding potential).

Soft point ammunition is often used by rifle hunters. It is simply a jacketed bullet with an exposed, nonjacketed lead tip. It strikes a balance between full-metal-jacketed and hollow point ammunition, expanding more on impact than the former but penetrating more than the latter.

2. Case

The components of a cartridge are held together by a hollow *case* of brass, aluminum, or steel. After a shot is fired, the empty case remains. Repeating firearms use a mechanical protrusion called an *ejector* to remove the spent case from the gun's firing chamber in order to make room for a fresh cartridge. Handgun cases are usually straight-walled, while rifle ammunition often uses *bottlenecked* cases whose tapered shape allows large powder charges to be used and improves the loading of fresh ammunition from a magazine (see below).

A brass case recovered after firing can usually be reused. After the case is cleaned, it can be refilled with gunpowder, a primer, and a bullet to create another cartridge. This process of recycling is called *hand loading* or *reloading*.¹ Many gun owners reload their own ammunition at home, using tools that are created for this purpose. Competitive target shooters, who may fire 5,000 rounds a month in practice, reload out of economic necessity. Some hunters reload in order to produce a small number of high-quality rounds precisely tailored to particular conditions. Other reloaders simply enjoy making things.

The bottom surface (or *head*) of the case will usually be marked with the name of the cartridge it fires. For safety, it is essential that a gun only be loaded

1. Thus "reloading" has two meanings. One is the manufacture of a new cartridge from a used case. The other meaning is the placement of a fresh cartridge in the firing chamber after the gun has been fired.

with a matching cartridge. The appropriate cartridge type will be stamped on the barrel or receiver.

A firearm's caliber is essentially a measure of the diameter of the barrel and bullet that it accepts. Within a single caliber, different types of ammunition may have widely varying loads of gunpowder. For example, by far the most common type of ammunition in the United States is .22LR. (The "LR" stands for "long rifle," but .22LR is used in both rifles and handguns.) Other types of .22 caliber ammunition include the .22 Long, .22 Short, .22 Spitfire, and the .22 Winchester Magnum Rimfire (also called .22 WMR, .22 Magnum, or .22 Mag.) The .22 WMR uses much more gunpowder than a .22LR. Accordingly, if a firearm has ".22LR" stamped on its barrel, and no other caliber/type stamp, you must not use, for example, .22WMR in that gun. The extra gunpowder could expose the firing chamber to pressures for which it was not designed, thereby causing a dangerous explosion. If you ever have doubts about a cartridge's suitability for a particular firearm, do not fire the cartridge, and wait until you can ask a reliable source. As the following figure illustrates, each of these succeeding cartridges is much larger, and is much more powerful, than the one succeeding it.



Different types of ammunition. From left to right, .223 Remington, .22 WMR, and .22 LR. Note that the bullet (the top part) for the .223 Remington is only 3/1000 of an inch wider than the .22 caliber bullets. But the .223 Remington's case is much wider and larger, allowing more room for gun powder, making it far more powerful than the other two.

3. Primer

The primer has often been described as the spark plug of the cartridge. When a gun is loaded with a cartridge and the hammer falls, the gun's firing pin sharply strikes the primer. The blow causes a pressure-sensitive chemical compound in the primer to ignite and emit an instantaneous hot flash. The flash then ignites the gunpowder inside the case. The gunpowder burns in a fraction of a second, releasing expanding hot gasses, whose pressure pushes the bullet free from the case, and launches the bullet down the barrel.

Cartridges are primed in two different ways. *Centerfire priming* is used for all modern cartridges of larger than .22 caliber (as well as some smaller caliber cartridges, such as .17 caliber). In this system, the priming compound is enclosed inside a thin metal casing to form a *primer cup*. The cup, in turn, fits into a hollow pocket in the center of the bottom face of the cartridge. Thus, a primer is in line with the firing pin when a cartridge is loaded into the gun's firing chamber. When the gun's trigger is pressed, the firing pin sharply strikes the primer and compresses the priming compound, igniting it. The primer's flash passes through a *flash hole* between the primer cup and the cartridge case and ignites the gunpowder there.

The older system of *rimfire priming* does not use a separate primer cap. Instead, priming compound is applied directly to the inside of the bottom of the cartridge case, inside a cavity in the cartridge rim. The firing pin of a rimfire gun does not strike the rear of the cartridge in the center, but instead on the edge of the rim (hence the name). Again, once the firing pin impact the primer, the priming compound ignites, and in turn ignites the gunpowder, firing the round. Unlike centerfire cartridge cases, rimfire cartridge cases are not reloadable.



Rimfire vs. centerfire cartridges. At left is a round of .22 Long Rifle, a rimfire cartridge.

At right is a round of .38 Special, a centerfire cartridge, seen from below. Note the telltale, circular primer cup that sits at the bottom of the centerfire cartridge's case head.

The rimfire cartridge lacks this. Instead, it has a layer of priming compound (not visible) applied to the inside of the brass rim of the cartridge.

Rimfire priming is still used for some small cartridges, including the extremely common .22 Long Rifle cartridge, introduced in 1887. Despite its name, the .22 Long Rifle is a small, inexpensive cartridge that is widely used in both handguns and rifles. It is the most popular cartridge in the world by a wide margin, used extensively for practice, small game hunting, and formal target shooting, including Olympic pistol and rifle shooting events. Approximately 2 billion rounds of .22 LR ammunition are manufactured each year in the United States. Some shooting events are divided into centerfire and rimfire divisions, corresponding to the division between the larger, more powerful centerfire cartridges and the smaller rimfires.

The most common priming compound used in ammunition today is lead styphnate. Firing ammunition with lead styphnate-based primers emits minute particles of lead compounds into the surrounding air. In indoor shooting ranges, adequate ventilation is necessary in order to prevent these lead compounds from building up. Sustained indoor exposure without ventilation could create a risk of lead poisoning. Health and environmental concerns about conventional primers have led manufacturers to develop lead-free primers that do not emit compounds containing lead or other heavy metals. Ammunition with lead-free primers is commercially available, and is gaining in popularity, but still comprises only a minority of ammunition sold in the United States.

4. Gunpowder

A major innovation in firearms technology was the development in the 1880s of modern *smokeless gunpowder*, based on nitrocellulose and nitroglycerin. Before then, all firearms were powered by *black powder*, a mixture of saltpeter (potassium nitrate), charcoal, and sulfur.

Smokeless powder is much less volatile in storage than black powder.² In addition, smokeless powder burns more uniformly and consistently, produces less smoke, and delivers far more energy when ignited, combusting in thousandths of a second. Smokeless powder made possible the development of rifle ammunition that launches bullets at more than twice the speed of sound—a far greater velocity than had been possible with black powder. It also allowed a shooter to deliver repeated fire from a single location, because his vision was not obscured by the thick clouds of smoke characteristic of black powder. Commercial ammunition today overwhelmingly uses smokeless powder.

Black powder is obsolete for most purposes, but is still used today by hobbyists and hunters, who often fire it in antique or replica firearms. For example, a hobbyist firing an exact replica of an old-fashioned flintlock rifle might use standard black powder. Modern uses of old-fashioned muzzle-loading guns are discussed below. Today, most people who shoot muzzle-loaders use one of the many black powder substitutes, which are much less volatile, and produce less smoke, than traditional black powder. Smokeless powder and black powder

2. The volatility of old-fashioned black powder is why in colonial America and the Early Republic, large quantities of black powder were typically stored in a communal “powder house,” made of brick. Chapter 3.c.1 describes the “powder alarms” that took place in 1774 when the British seized some of these American powder houses.

substitutes are nearly impossible to produce at home, while black powder is readily manufactured at home — as it frequently was before, during, and after the American Revolution.

For further information on ammunition, see the Reference page of the International Ammunition Association website, <http://cartridgecollectors.org/?page=reference>. The site also has a very long [Bibliography of books on Cartridges or Ammunition](#). La Asociación Española de Coleccionistas de Cartuchería (AECC)³ provides a tremendous amount of graphical and Spanish-language textual information at <http://www.municion.org>. For a history of black powder, see Ulrich Bretscher’s Black Powder Page, <http://www.musketeer.ch/blackpowder/history.html>.

C. *Firearm Features*

Now that we have covered the basics of ammunition, we can discuss the features of modern firearms.

1. **Firing Mechanism**

The firearm is fired by pressing the trigger with a finger. In a typical design, the trigger is connected to a mechanical linkage called a *sear*. Pressing the trigger moves the sear, which releases a spring-loaded hammer. The hammer falls, and its force causes a firing pin to strike the primer in an ammunition cartridge. (Some firearms use a similar spring-loaded mechanism called a *striker*.) In a modern handgun or rifle, the barrel is *rifled*. That means its inside surface has been cut with a pattern of spiral grooves that cause the bullet to spin around its long axis as it travels through the barrel. The rotation, like the spin on a properly thrown football, makes the bullet fly in a straighter path when it emerges from the *muzzle* of the gun — the open end of the barrel.

2. **Magazine**

Most modern firearms are *repeating arms*, or *repeaters*: in other words, they can be fired multiple times before it is necessary to manually insert more ammunition into the gun. (A “repeater” is not the same as a “machine gun” or an “automatic,” which are discussed below.) The location where a repeating arm stores its ammunition, and from which ammunition is fed during use, is called a

3. “Spanish Association of Cartridge Collectors.”

magazine. With some guns, the magazine is a hollow compartment or tube that is permanently attached to the gun. The *tubular magazine* is typical in *pump-action* and *lever-action* rifles or shotguns (discussed below).

Other guns, especially semi-automatic and fully automatic firearms, use *detachable magazines*, rectangular, parallelogram, or curved boxes that can be filled with ammunition, temporarily attached to the gun during use, and then removed when empty and replaced with a freshly loaded magazine, allowing continued firing. Another common device for storing several rounds in a gun is the *revolving cylinder* of a *revolver* handgun, discussed below.



Detachables magazines for semi-automatic firearms.

3. Safety Devices

A modern firearm will only fire when the trigger is pressed. (Older firearms were also designed to fire only when the trigger was pressed, but they lacked many of the safety features detailed below.) If the gun fires under any other circumstance (e.g., if the gun is dropped), the gun is defective, and would be the target of a product liability lawsuit. Product liability suits have driven many such defective firearms out of the market. *See* Chapter 8 (discussing product liability and other lawsuits against firearms manufacturers).

Accordingly, the most elementary safety device, found on nearly all modern firearms, is the trigger guard. The trigger guard protects the trigger from accidental motion, such as when a gun is being pulled out of a holster. The trigger guard also makes it easier for the gun user to obey one of the three fundamental rules of gun safety: “Keep your finger off the trigger until you are ready to shoot.” (The Safety Rules are discussed in the next section.)



Trigger guard.

For firearms design and for firearms user training, a key principle is redundancy. So even though keeping one's finger outside the trigger guard is excellent protection against accidental discharge (unless the firearm is defective), modern firearms typically include additional safety features.

The most common of these is called the *safety*. The safety blocks the trigger or hammer from moving. The safety is typically activated by pressing a button, small slide, or lever that is located near the action.



Button safety.



Lever safety.

When the safety is in the “safe” position, the gun will not fire even when the trigger is pressed. To fire the gun, the user must move the safety to the “fire” position.

Virtually all modern rifles, shotguns, and semi-automatic handguns have external safeties. (Glock and some other semi-automatic handguns have a different type of safety, and revolver handguns do not have safeties, as we will detail in the discussion of handguns, below.)

The safety devices discussed so far are intended to be operated while the gun is being used. For example, a bird hunter carrying a shotgun would keep the safety engaged while walking through a field, to reduce the chance of an accidental discharge if he stumbles or if his hand slips. When he needs to fire, he can quickly push the safety to the “fire” position.

An entirely different class of safety devices is employed when the gun is *not* being used. The purpose of these devices is to prevent use by an unauthorized user. The most obvious of these is a gun safe. Many gun owners store several firearms in a large safe. Alternatively, guns may be stored in a locked room. There are also smaller safes meant to hold one or two handguns.

Likewise, there are devices that can be attached to the gun itself to prevent unauthorized use. One of the simplest is a *trigger lock*, which wraps around the trigger guard, and (depending on the design of the lock and of the gun) keeps the trigger from moving, or at least from being touched.

The *cable lock* threads through the action, and sometimes also through the barrel. It prevents the action from completing its movement, and thereby renders the gun inoperable. Trigger locks and cable locks are typically unlocked with keys, although some use combination locks.



Cable lock on Hecker & Koch semi-automatic rifle.

Recently, some manufacturers have begun building firearms in which a key-controlled locking mechanism is built into the gun itself.



North American Arms offers an optional integral locking system on its semi-automatic pistols.

Since the 1990s, some researchers have been investigating much more sophisticated integral locking mechanisms, such as palm-print readers built into the grip of a handgun. Sometimes these are called *smart guns*. Thus far, no smart gun technology has become sufficiently reliable to be commercially viable. Even a 1 percent failure or delay rate would not be considered acceptable by anyone who wants the gun to be usable for self-defense, or, for that matter, by a hunter who may have a two-second window of opportunity for the right shot.

Locking devices can be defeated. A trigger lock can be smashed with a hammer, a cable lock can be cut, a safe can be broken open, and the mini-computer in a smart gun can be destroyed by baking the gun in an oven.

All of the locking devices involve tradeoffs. A gun that is locked is more secure from an unauthorized user but harder to deploy in a sudden emergency, such as a home invasion. Whether to use locks and what kinds of locks to use depend on individual circumstances and on whether the gun is intended to be available for self-defense. Finally, we caution that trigger locks are not infallible: particularly with some low-quality trigger locks, the gun can be fired anyway.

4. Firearms Safety Rules and Education

Firearms safety education stresses the importance of careful adherence to gun-handling rules to avoid accidents. While the user must also know how to operate mechanical safety devices, safety training emphasizes that reliance on mechanical devices is never a substitute for rigorously following all safety rules.

A common formulation of the elementary rules of gun safety is as follows:

- (1) *Treat every gun as if it is loaded.* So even if you are certain that a gun is unloaded, you must still obey all other safety rules.
- (2) *Always point the gun in a safe direction.* This is sometimes called the rule of *muzzle discipline*, referring to the end of the gun's barrel that is pointed toward the target. It means that under no circumstances can a gun ever be pointed at any human being, unless the gun is being used for lawful self-defense. The safe-direction rule means, too, that the user must positively identify her target, and also know what is behind it. For example, a hunter at the bottom of a hill would not shoot an animal on the crest of the hill, because the hunter would not know if there were a person on the other side of the hill, where a bullet might land.
- (3) *Keep your finger off the trigger until you are ready to shoot.* This is the rule of *trigger discipline*, and it is critical to avoid unintentionally firing the gun. Movies and television often promote irresponsible gun use by showing supposedly expert shooters violating trigger discipline. There is no reason *ever* to violate trigger discipline. Even when a gun is being drawn for instant self-defense, the proper motion is to keep the index finger outside the trigger guard until the gun is pointed at the target. With proper training, trigger discipline does *not* delay a defensive shot by even a fraction of a second.

If you currently own a firearm or think that you might wish to own a firearm, we strongly recommend that you take a firearms safety class. Indeed, even if you are certain that you will never own a firearm, safety education can be useful—

just as people who do not like swimming or boating should still know the elementary rules of water safety.

You can find classes and other educational safety materials from the [National Rifle Association \(NRA\)](#), the [National Shooting Sports Foundation \(NSSF\)](#), the [4-H Clubs](#), some sheriff offices or police departments, gun clubs, and sporting-goods stores. Many have introductory classes that can be completed in an afternoon, as well as longer classes on particular topics such as pistol or rifle shooting.

In addition, all state Fish & Game departments sponsor or oversee hunter safety classes. One is usually required to complete such a class in order to obtain a hunter safety card, which is a prerequisite for getting a hunting license. The classes are fairly elaborate, often spanning multiple days, and cover a wide range of material, including firearm safety. [The International Hunter Education Association](#) offers an online hunter safety class for free, and the class includes several modules purely on firearm operation and safety. To obtain a hunter safety card, most states require at least one in-person class session after the completion of an online class.

5. Eye and Ear Protection

When engaged in recreational shooting, a person should wear safety glasses and ear protection.



Safety glasses. Note the wrap-around design, protecting the eyes from flying debris at all angles.



Disposable foam earplugs provide hearing protection.



Ear muffs have always provided the best hearing protection. Today, electronic ear muffs are broadly affordable. The electronic speakers in muffs transmit human speech at normal levels; but when there is a sharp spike of sound — such as from a gunshot — the speakers shut down, instantly shielding the ear from the intense sound.

6. The Major Types of Firearms

A large-scale survey conducted in 1994 estimated that there were approximately 192 million functional firearms in private hands in the United States. Philip J. Cook & Jens Ludwig, *Guns in America: Results of a Comprehensive National Survey on Firearms Ownership and Use* (1996). Since then, tens of millions more guns have been added to the supply. In 2012 alone, roughly 8 million new guns were produced for domestic sale in the United States.

The total number of privately owned guns in the United States today is estimated to be more than 300 million. By way of comparison, the U.S. Census Bureau estimated that the total population of the United States as of January 2013 was 315 million.

A [2011 Gallup Poll](#) asked, “Do you have a gun in your home? Do you have a gun anywhere else on your property such as in your garage, barn, shed or in your car or truck?” Forty-five percent of American adults answered that they had a gun in the home, and 2 percent said that the gun was elsewhere on their property. (See Chapter 12 for more precise data.)

Polling-based estimates of individual or household gun ownership are probably underestimates, because some gun owners refuse to disclose themselves to a stranger on the telephone.

The vast majority of privately owned firearms fall into one of three basic categories: handguns, rifles, and shotguns.

D. Handguns

The handgun is the most controversial category of firearm, due to three traits. Unlike *long guns* such as rifles and shotguns, a handgun can be conveniently carried on one’s person for long periods of time. Handguns are also more convenient to store than long guns, and take up little room inside a dwelling or vehicle. Finally, handguns (particularly smaller models) can be carried concealed from detection by others, whereas long guns are virtually impossible to carry concealed.

On one hand, these traits make the handgun, in the words of the United States Supreme Court, the firearm that “is overwhelmingly chosen by American society for th[e] lawful purpose” of self-defense, and “the most preferred firearm in the nation to ‘keep’ and use for protection of one’s home and family.” *District of Columbia v. Heller*, 554 U.S. 570, 628-29 (2008) (invalidating a ban of handguns as a violation of the Second Amendment) (Chapter 9).

Millions of Americans are licensed to carry handguns for personal protection outside the home.

Yet the handgun also epitomizes the crime gun. At least 68 percent of all murders committed with firearms in the United States in 2013 were perpetrated with handguns. Across the board, handguns are employed more often in violent crimes than rifles or shotguns, in proportion to their numbers in circulation.

The ATF’s [Annual Firearms Manufacturing and Export Report](#) for 2012 shows that in 2012, American manufacturers produced 3,487,883 pistols and 667,357 revolvers. (The pistol/revolver distinction is explained in the next section.) Nearly 150,000 handguns were exported. The totals in the report do not include production for the United States military.

There were also over 3 million handguns imported into the United States in 2013. The leading exporters to the United States were Austria, Germany, Brazil, Croatia, and Italy. U.S. Dep’t of Justice, Bureau of Alcohol, Tobacco, Firearms, and Explosives, *Firearms Commerce in the United States Annual Statistical Update 2014*, at 5, 9.

1. Semi-Automatic Pistols

In recent years, more than three-quarters of new handguns produced in the United States have been *semi-automatic pistols*, also frequently referred to simply as *pistols*.⁴ The vast majority of handguns of this type feed their ammunition

4. Federal regulations define as a “pistol” any handgun that has a firing chamber that is “an integral part[] of, or permanently aligned with, the bore[]”, in contrast to a “revolver,” which is a handgun whose firing chambers are part of a rotating cylinder. [27 C.F.R. §479.11](#). The vast majority of handguns classified as “pistols” under this definition are semi-automatics. However, there are a few types of specialty handguns, such as derringers and single-shot hunting handguns, that are also considered “pistols.” ATF records indicate that these types of handguns represented less than 20,000 of the total output of pistols in 2008; the rest were semi-automatic pistols. In common parlance, “pistol” is often used to refer to all handguns, including revolvers. It is better usage, however, to distinguish pistols and revolvers, as the federal regulations do.

from a detachable magazine inserted in the gun's grip, although a few have magazines which are inserted elsewhere.

It is important at this point to explain the distinction between *semi-automatic* operation, which is found in many types of common pistols, rifles, and shotguns, and *fully automatic* operation, which is found in machine guns and heavier military weapons, all of which are subject to especially strict legal regulation. *Semi-automatic* guns fire only one round of ammunition per each press of the trigger. However, each time the gun is fired, the semi-automatic action uses part of the energy from firing the cartridge to automatically eject the spent casing, re-cock the firing mechanism, and load a fresh cartridge into the firing chamber. For example, in the semi-automatic pistol pictured on the next page, the energy of firing the gun causes the metal slide that forms the top of the pistol to cycle back and forth one time. The slide's motion backward causes the empty case to be ejected out of the side of the gun, and the slide's return forward brings the top cartridge in the magazine into the firing chamber, ready to be fired with another press of the trigger. Thus, the user of a semi-automatic firearm does not need to manipulate the gun by hand in order to load the next round. The gun loads itself. This is why semi-automatic guns are also often referred to as *self-loading* or *auto-loading* guns.

In contrast, a *fully automatic* gun, such as a machine gun, can fire multiple times with a single press of the trigger. The mechanism of a fully automatic firearm works similarly to a semi-automatic gun, up to the point when the returning slide loads a fresh cartridge from the magazine into the firing chamber. However, from that point, the two types of actions behave very differently. A semi-automatic firearm simply loads the fresh round and stops: the trigger must be pressed again to fire the gun. In contrast, a fully automatic firearm automatically strikes the freshly loaded cartridge with the firing pin, which fires the gun again and starts over the whole cycle of ejection and feeding described above, as long as the trigger is held back and there is ammunition in the gun. As long as the user keeps the trigger pressed, the fully automatic gun will continue to fire until all the ammunition is gone. Some automatic firearms use *burst fire*, a mode in which they fire two or three rounds per trigger press, then stop until the trigger is pressed again. However, this difference is not as important as the difference between semi-automatic action (one round per trigger press), on the one hand, and fully automatic or burst fire actions, on the other. Under federal law, any firearm that can fire more than one round per trigger press is deemed a machine gun. See Chapter 7 for the main federal law on the topic, the National Firearms Act of 1934 (NFA); see Chapter 8 for *Staples v. United States*, 511 U.S. 600 (1994) which deals with the status of a malfunctioning semi-automatic rifle that sometimes fired two rounds.

The use of detachable magazines makes reloading a semi-automatic pistol fast and simple. When the gun is empty, the slide locks back. The user can press a magazine release button or lever, causing the empty magazine to drop free. He or she can then simply insert a fresh magazine into the *magazine well*, then cycle the slide back (or depress a slide release button) to chamber a fresh round and continue firing, if desired.

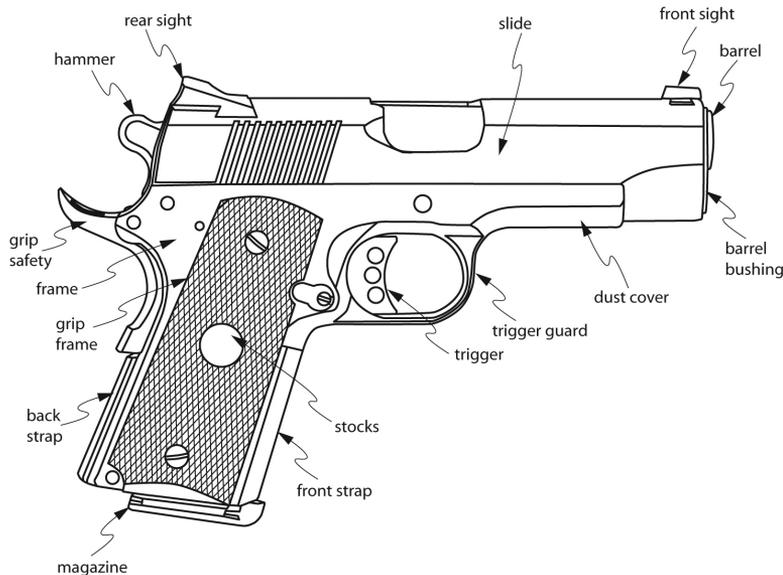
For this reason, as well as the relatively large ammunition magazine capacity of most semi-automatic pistols, this type of handgun has become the dominant type used for military issue, law enforcement, self-defense, and many types of pistol competition. The most common ammunition chamberings for full-sized, semi-automatic

pistols are 9mm Luger, .40 Smith & Wesson, and .45 ACP.⁵ Small, lightweight pistols chambered in the .380 ACP cartridge have recently gained great popularity for concealed carry. Many of these pistols weigh less than ten ounces and are no larger in size than a typical wallet. Finally, numerous semi-automatic pistols used for target shooting and recreation are chambered in the .22 Long Rifle cartridge.

The typical magazine capacity for today’s full-sized semi-automatic pistols is 11 to 19 rounds, although compact or sub-compact pistols typically have fewer, sometimes as few as six.

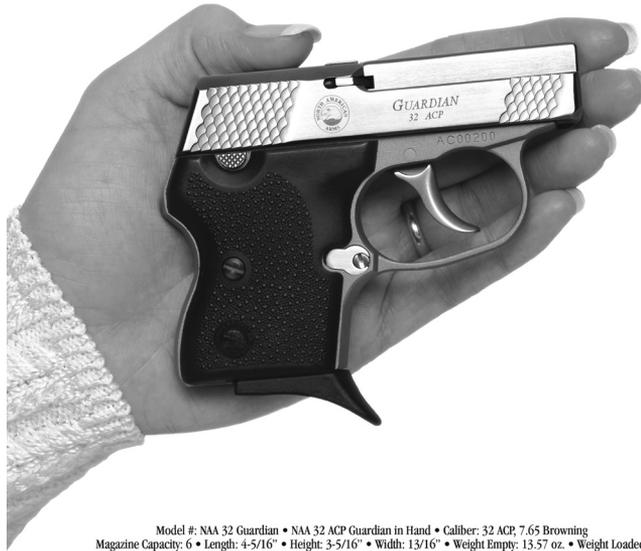


This .45 caliber semi-automatic centerfire pistol is made by Colt’s Manufacturing. It is a “Model 1911,” meaning that its design is based on the Colt .45 pistol invented in 1911. The 1911-type pistol has remained popular for over a century. Today, it is manufactured by many different companies, and remains one of the most popular pistols for self-defense and target shooting.



The major external parts of a semi-automatic handgun (a/k/a pistol).

5. “ACP” stands for “Automatic Colt pistol.” Semi-automatic pistols are sometimes called “automatics,” even though their action is semi-automatic, not automatic.



Model #: NAA 32 Guardian • NAA 32 ACP Guardian in Hand • Caliber: 32 ACP, 7.65 Browning
 Magazine Capacity: 6 • Length: 4-5/16" • Height: 3-5/16" • Width: 13/16" • Weight Empty: 13.57 oz. • Weight Loaded:
 14.86 oz. Barrel Length: 2-3/16" • Sights: Low profile fixed • Rifling: 1 in 15", RH, 6 Groove • Trigger Pull Avg.: 10 lbs.

This .32 caliber semi-automatic pistol from North American Arms is considered an “ultra-compact” because of its small size. If carried for protection, it would be put in a small holster, and the holster would be attached to the inside of a belt, or placed into a pocket or purse.

2. Revolvers



The two main types of revolvers. Left: Double-action revolver (Smith & Wesson Model 19). Right: Single-action revolver (Colt Single Action Army, colloquially known as the “Peacemaker”). An observer will note that on any single action, the trigger will be very close to the back of the trigger guard because the trigger pull has only to release the already cocked hammer, while on a double action the trigger pull must pull the hammer back.

The first commercially viable *revolvers* were produced by [Samuel Colt](#) in the 1830s, and revolvers are still popular for many purposes. These handguns carry their ammunition in chambers cut into a revolving cylinder that is located

behind the barrel of the gun. Working the gun's action rotates the cylinder, causing the next chamber to come into line with the barrel and hammer, allowing the user to fire the round loaded in that chamber. While revolvers of the twenty-first century take advantage of improvements in metallurgy, the basic design has changed little since the late nineteenth century.

Revolvers are generally simpler to load, operate, and unload than semi-automatic pistols. For many users, this simplicity, combined with their greater reliability, is an important asset. Some of the best-selling revolvers today are small, lightweight guns with short "snubnose" barrels, often used for concealed carry. Revolvers with especially long barrels are popular for target shooting, or informal "plinking." These can be chambered in the .22 Long Rifle rimfire cartridge or in centerfire calibers.

Finally, handgun hunting is lawful in every state, and for hunting, revolvers are far preferred to semi-automatic pistols, because revolvers are sturdier for accommodating the large powder charges that are necessary to fire a large bullet at hunting distances. Hunting revolvers are long barreled and bulky and generally weigh in excess of three pounds. They are frequently used with a mounted telescopic sight. It is also common for hunters who may be carrying a rifle or shotgun for actual hunting to carry a revolver as a sidearm for self-defense, in case of an attack by a bear or other large predator.

In earlier generations, revolvers were the most common type of handgun produced in America, and were standard sidearms for police. However, a major shift to semi-automatic pistols occurred in the final quarter of the twentieth century. Although semi-automatic pistols comprised only 28 percent of new handguns produced in the United States in 1973, semi-automatics today account for more than 75 percent of handguns produced domestically. Today, the large majority of all police officers use semi-automatic pistols as sidearms.

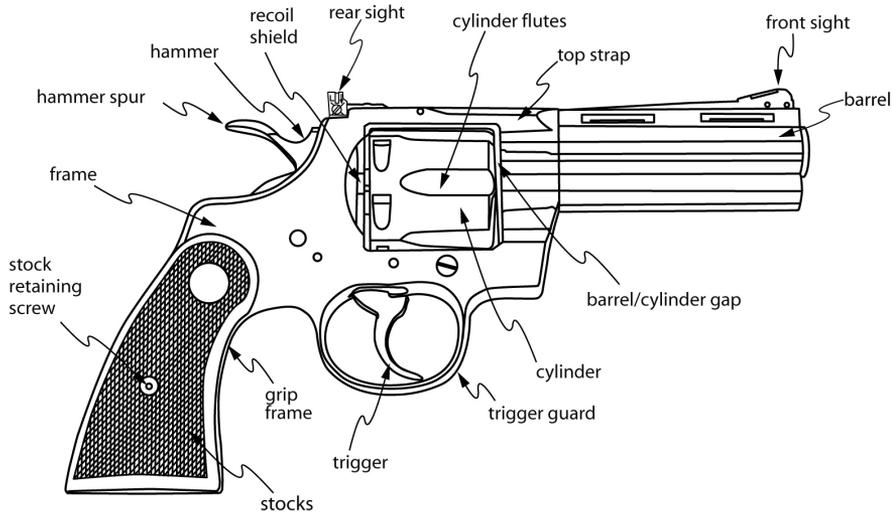
Modern centerfire revolvers typically hold five or six rounds of ammunition, although some models hold more. Rimfire revolvers can hold ten or more rounds.

To remove empty shells from a revolver cylinder, the user presses an *ejector rod* on the front of the cylinder. The rod pushes the empty cases out the back of the cylinder.

The most common centerfire chamberings for revolvers are the .38 Special and the more powerful, high-velocity .357 Magnum, introduced in 1935.⁶ For hunting deer and larger game, popular revolver cartridges include .357 Magnum, .44 Magnum, and .500.

Revolvers divide into two categories according to how the action is operated.

6. Revolvers chambered for the .357 Magnum can also chamber and fire .38 Special cartridges. The reverse is *not* true. A gun that has a ".38 Special" stamp on the barrel must never be loaded with .357 Magnum. "Magnum" is a term of art in cartridge manufacture indicating that the cartridge has a relatively large amount of gun powder for its caliber.



The major external parts of a revolver.

a. Single-Action Revolvers

The first revolvers were *single-action revolvers*, such as the Colt Navy Model of 1851 and the famous Colt Single Action Army (“Peacemaker”) of 1873, popularized for modern audiences by Western movies and television programs. The user of a single-action revolver must cock the gun’s hammer by hand before firing each shot. Cocking the hammer rotates the cylinder and brings a fresh round under the hammer to be fired. Pressing the trigger simply drops the cocked hammer to fire the gun—a single action. Single-action revolvers are slower to load and unload than any other type of repeating handgun. Once all the cartridges are fired, the revolver is unloaded by using a rod to punch the fired cases free of the cylinder, one at a time, through the revolver’s loading gate. The revolver is reloaded through the same gate.

Although obsolete for self-defense purposes, single-action revolvers remain in production, and are popular for recreational shooting and handgun hunting. Single-action revolvers are also required equipment for the sport of cowboy action shooting, in which participants dress up in historic American Western garb and shoot themed target courses with firearms of nineteenth-century design. See Abigail A. Kohn, *Shooters: Myths and Realities of America’s Gun Cultures* (2004).

b. Double-Action Revolvers

Double-action revolvers date from the 1880s. Pressing back the trigger of a double-action revolver performs two actions: it cocks the hammer back (thereby rotating the cylinder), then drops the hammer to fire the gun. To fire again, the user simply presses the trigger again. Cocking by hand is not necessary, although most double-action revolvers can also be manually cocked like a single-action.

Most double-action revolvers have a latch or button that allows the whole cylinder of the handgun to swing out from the gun frame, so that the user can access all of the chambers in the cylinder at the same time. This makes double-action revolvers faster to load and unload than single-action revolvers, though still slower than semi-automatic pistols.

3. Legitimate Uses of Handguns

Handguns are commonly owned and used for home defense, concealed carry, recreational target shooting, competition, and hunting.

Handguns are more likely to be acquired for the purpose of self-defense than are long guns such as rifles and shotguns. Surveys consistently report that the majority of handgun purchasers are motivated at least in part by personal protection. Cook & Ludwig, *supra*. In a 1998 National Gun Policy Survey conducted by the National Opinion Research Center, 65 percent of handgun owners reported protection against crime was one of their reasons for owning a gun.

Americans hold at least 8 million active, state-issued permits to carry concealed handguns for self-defense outside the home. U.S. Gov't Accountability Office, *States' Laws and Requirements for Concealed Carry Permits Vary Across the Nation*, GAO-12-717, at 3 (July 2012). [Most states today will issue](#) a permit to carry a concealed handgun to an adult who passes a fingerprint-based background check and a safety class. (Chapter 1 details how some states vary from the standard practice.) Licensed carry provides a growing consumer market for small, easily carried handguns.

Many modern handguns are constructed in part from lightweight plastic polymers, rather than metal. As a result, these guns are more comfortable for long-term carry, and are popular with both police and ordinary citizens. By federal law, the guns must include at least four ounces of metal, and the shape of the metal must visibly show a gun to x-ray metal detectors. *See* Chapter 8.



The frame of this pistol is made from plastic polymers. Note the double trigger, a safety mechanism on some modern pistols. The forward trigger is a safety. The rear trigger operates the gun like a standard trigger. To fire the gun, the shooter presses both triggers in one continuous motion.

Another popular use for handguns is target shooting. There are 18.4 million Americans who “currently participate” in target shooting with handguns, according to a [Harris Survey](#) for the NSSF.

Informal target shooting or “plinking” can be conducted at commercial shooting ranges and clubs, at public ranges, on undeveloped public lands, or on private property. Organized target shooting with handguns takes numerous forms. In bulls-eye competition, participants stand in place and shoot at paper targets up to 50 yards away.

In action pistol shooting, participants move through a course set up to simulate defensive shooting scenarios, and are scored based upon time and accuracy in shooting “bad guy” targets, with large penalties for shooting the wrong target.

Target pistol shooting is an international sport, with Olympic competition, and indeed was one of the original sports of the modern Olympics.

Hunting with handguns is allowed in every state, generally as part of the general firearms hunting season. All types of land animals can be successfully hunted in this way. For larger game, hunting handguns are typically large and powerful revolvers, often mounted with a telescopic sight. Scopes are also popular for handguns that are used for target shooting.



Ruger Mark III .22 Caliber Semi-automatic pistol, with scope.

4. Criminal Uses of Handguns

Gun crime is predominantly committed with handguns. Of 12,253 murders in the United States in 2013, 8,454 (over two-thirds) were committed with firearms, and of those, at least 5,782 (68 percent of firearm murders) were committed with handguns. Similarly, in 1997 interviews of prison inmates, 18.4 percent of state prisoners and 14.8 percent of federal prisoners reported being armed with a firearm during the offense for which they were incarcerated. Of those

offenders who were armed, more than 80 percent reported being armed with a handgun. Thus, while handguns comprise a (large) minority of privately owned firearms, they are disproportionately used in gun crimes.

E. Rifles

The ATF’s Annual Firearms Manufacturing and Export Report for 2012 shows that in 2012, American manufacturers produced 3,168,206 (not including rifles for the U.S. military). Of those rifles, 81,355 were exported. The ATF’s Firearms Commerce in the United States 2014 Annual Statistical Update shows that 1,243,924 rifles were imported into the United States in 2012, with Brazil, Canada, and Russia the leading sources.

Federal law defines a rifle as:

a weapon designed . . . and intended to be fired from the shoulder and . . . to use the energy of the explosive in a fixed cartridge to fire only a single projectile through a rifled bore for each single press of the trigger.

[28 U.S.C. §5845\(c\)](#). Thus, a rifle is defined by two main traits.

- It is a *long gun*: it has a stock and is designed to be used with the stock braced against a shoulder.
- And it has a *rifled bore*: the inside of the gun’s barrel is cut with a pattern of spiral grooves that rotate the bullet as it travels down the barrel.

The parts of the barrel that do not have the groove cuttings are called the *lands*. Caliber is a measure of barrel diameter from the lands. The rotation, like the spin on a properly thrown football, makes the bullet fly in a straighter path when it emerges from the muzzle of the gun—the open end of the barrel. Most modern handguns have rifled bores as well.

Most rifles today fall into a few common types.

1. Bolt-Action



Bolt-action rifle.

Bolt-action rifles, introduced as military weapons in the late nineteenth century, are now the type of rifle most commonly used for hunting deer and other large game. Approximately 44 percent of the rifles purchased in the United

States in the first four months of 2010 were bolt-action rifles. Debbie Thurman, *Target Long Guns*, Shooting Indus., Aug. 2010, at 33, available at <http://fmgpublications.ipaperus.com/FMGPublications/ShootingIndustry/Aug2010>.

A bolt-action rifle holds several cartridges in its magazine. By manually lifting a handle attached to the bolt, pulling the handle back, and then returning the bolt to its starting place, the user can eject an empty case from the firing chamber, and load a fresh round into the chamber from the magazine.

Along with single-shot rifles (discussed below), bolt-action rifles are usually the most accurate, especially at long distances.

2. Semi-Automatic

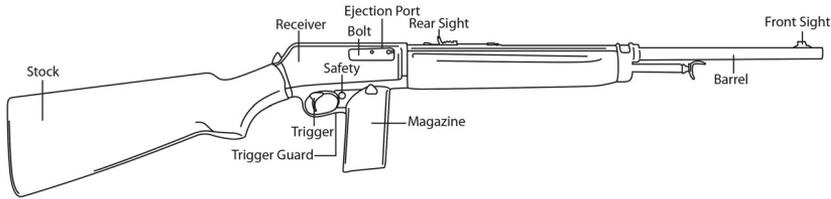
The other leading type of rifle is the *semi-automatic* (also called *self-loading*) rifle. In recent years, sales of semi-automatic rifles have been comparable to bolt-action rifle sales: about 42 percent of the rifles sold in early 2010 were semi-automatic. *Id.* A semi-automatic rifle functions in a manner similar to a semi-automatic pistol, discussed in Section D.1., *supra*.

Some of the energy produced by the burning gunpowder pushes the bullet forward, while other energy dissipates in other directions, and is felt by the user as recoil. However, the semi-automatic also uses some of this energy — either from the recoil or from a portion of the burning gas — to cycle the rifle’s action. Typically, the bolt moves backward inside the rifle’s receiver, then returns back into place. The bolt’s movement automatically ejects the now-empty cartridge case, cocks the hammer or other firing mechanism, and loads a fresh cartridge into the firing chamber, ready to be fired with the next press of the trigger.

Semi-automatic rifles store and feed their ammunition from a magazine. Some use fixed internal magazines that are part of the rifle; these are loaded by inserting ammunition through the top of the gun or into a tube that runs parallel to the rifle’s barrel. Other semiautomatic rifles use *detachable* magazines that can be quickly swapped out when empty and replaced with a new, loaded magazine.



A pair of .22 caliber semi-automatic rifles. This is the same gun, in two different configurations. The one in back has a traditional wood stock, the one in front has a modern plastic polymer stock. The black gun also has a rail, onto which a scope can be mounted, and it is a muzzle brake (mounted on the muzzle) which stabilizes barrel vibration, so that the user can stay on target for the second shot.



The major external parts of a semi-automatic rifle.

Some of the most popular models of semi-automatic rifles are chambered in the .22 Long Rifle rimfire cartridge, and are used for recreation, target shooting, training new shooters, and hunting small game. Millions of relatively inexpensive self-loading .22 rifles have been sold.



In this rifle scope, the dial on the left is used to adjust magnification, from 2X up to 15X. The two dials on the right are used to make small vertical and horizontal adjustments, so that the center of the scope points exactly to the barrel's point of aim. The scope can be attached to a rifle by a pair of mounting rings on the top of the rifle (not shown).

Because the use of recoil energy or diversion of gasses in the semi-automatic action significantly reduces felt recoil, semi-automatics can be easier to use by persons who do not have great upper-body strength. For all users, the reduced recoil helps keep the muzzle on target, increasing the accuracy of a second shot. Many hunters trade off the long-range accuracy of a bolt-action for the better second-shot accuracy of a semi-auto, especially at medium or shorter ranges. The reduced recoil and greater accuracy for second or subsequent shots also have obvious self-defense utility.

In addition, firearms with detachable magazines (that is, most semi-automatic rifles and handguns, and some bolt action rifles) can be usually reloaded more quickly than other firearms, particularly by nonexperts. Although most gun fights are over after just a few shots, many police and citizens prefer the ability to quickly reload if necessary.

An increasingly prominent and controversial category of semi-automatic rifle consists of those that look like fully automatic military rifles. For example, to most observers, the semi-automatic AR-15 rifle appears identical to the automatic M-16 rifle, which has been a standard U.S. military rifle. Indeed, many of the components—such as the barrel or stock—are identical. The important place where they differ is the firing mechanism. While the AR-15 can only fire semi-automatically, the M-16 can fire automatically *or* semi-automatically. The choice is controlled by an external selector switch on the receiver. In the twenty-first century, unlimited automatic fire has been eliminated for most U.S. military rifles. Instead, the selector switch is used to choose one-shot semi-automatic fire, or an automatic burst of three rounds.

Lawful AR-15 type semi-automatic rifles are made by many manufacturers, and often are carried in law enforcement patrol cars as backups to the officers' sidearms. Such rifles are also purchased by private citizens for personal defense. They are the primary type of rifle used in organized centerfire rifle-shooting events such as NRA High Power Rifle competition. Today, they are “a mainstay for competition, self-defense and, most recently, many flavors of hunting.” Michael Bane, *AR Rifles in the Hunting Woods*, *Outdoor Life*, Sept. 18, 2007, <http://www.outdoorlife.com/node/21010945>. The AR-15 and similar rifles are “the guns of choice for many hunters, target shooters and would-be home defenders.” Andrew Park, *A Hot-Selling Weapon, an Inviting Target*, *N.Y. Times*, June 3, 2007, at 31. ATF records indicate that more than 400,000 AR-15 type rifles were produced for sale in the United States in 2008.



AR-15-type semi-automatic rifles.

While the AR-15 type rifles are the most common in their category, there are many other popular similar rifles, such as the Ruger Mini-14 and Mini-30, and various models from foreign companies, such as Switzerland’s Sig-Sauer.

The AK-47 (and its descendants, the AK-74 and AKM) is an automatic that is the most common rifle in much of the world. Designed for the Soviet Union and its allies by Mikhail Kalashnikov in 1947, the AK-47 is extremely durable and reliable, even under very adverse conditions, such as being exposed to a sandstorm. Semi-automatic variants of the Kalashnikov design have been popular in the American market.

Semi-automatic rifles that have a military or futuristic appearance are dubbed “assault rifles” by gun-control advocates, or “modern sporting rifles” (MSRs) by the American firearms industry. In the last several years, these types of rifles have been the leading type of rifle sold in the United States. Today, as historically, the overwhelming majority of civilian rifles are derivative of military designs. *See* National Shooting Sports Found., Modern Sporting Rifle Facts, <http://nssf.org/msr/facts.cfm>.

Several states have outlawed “assault rifles.” For example, New Jersey prohibits the possession, by most private citizens, of more than 50 different named semi-automatic firearm models, including the AR-15, and “substantially identical” copies of those firearms. N.J. Rev. Stat. §§2C:39-1w(1), (2), :39-5f. California prohibits the possession of a list of specific named “assault weapons,” and also defines as an “assault weapon”—and thus also prohibits possession of—any rifle with one or more of a list of features such as a pistol grip, a folding or collapsible stock, a flash suppressor attachment to the muzzle, and other features. Cal. Penal Code §12276.1.⁷



Sig-Sauer SIGM 400 semi-automatic rifle.



Sig-Sauer SIGM 400 Hunter semi-automatic rifle. Same gun as above, except with some features (e.g., camouflage, fixed shoulder stock) preferred by many hunters.

7. The legal category of prohibited “assault weapons” is predominantly composed of “assault rifles” but may also include a few models of disfavored handguns or shotguns. Hawaii bans “assault handguns,” but not rifles or shotguns.

From 1994 to 2004, United States federal law contained a similar set of restrictions. The Public Safety and Recreational Firearms Use Protection Act, formerly at [18 U.S.C. §922\(v\)](#) (1994), prohibited the manufacture for sale to private individuals of defined “assault weapons,” including the AR-15. The federal ban also prohibited the manufacture for sale to private individuals of detachable rifle or handgun magazines holding more than ten rounds. *Id.* §922(w). However, the federal assault weapons ban included a sunset clause, which caused the law to expire by its terms on September 13, 2004, ten years after its passage. Today, these rifles are no longer specially regulated by federal law, although they are, like other firearms, regulated by the federal Gun Control Act of 1968 (Chapter 8). Six states specially regulate or prohibit these rifles (California, Connecticut, Maryland, Massachusetts, New Jersey, New York).

3. Lever-Action



Winchester Model 1873 lever-action rifle.

Lever-action rifles, the first repeating rifles, were introduced before the American Civil War. The user can manually eject a spent round and chamber a fresh round by manipulating a lever assembly attached to the rifle’s trigger guard. Lever-action rifles, such as replicas of the famed Winchester 1873 rifle, are still fairly popular today for hunting. They are widely used in the self-consciously nostalgic sport of cowboy action shooting, in which participants wear Western clothing and shoot cowboy-themed target courses using firearms of nineteenth-century design.

4. Single-Shot

Finally, *single-shot rifles* are still produced, and are simple and often economically priced. (This chapter began with a diagram of such a gun.) After firing, the cartridge must be removed or ejected from the breech of the rifle and replaced by hand. They are often highly accurate for hunting and for long-distance target shooting.

The *pump action* is common for shotguns and is discussed below. Pump action rifles exist, but they are not as common as other rifle actions.

5. Characteristics of Rifles

Rifles have greater range and accuracy than either handguns or shotguns. Rifles can be fired more accurately than handguns because they have longer barrels

and are braced against the shoulder for firing. In a handgun, one or two hands hold the grip. There is thus one point of contact for stability. For a long gun, there are two points of contact: the stock against the shoulder and the nontrigger hand holding the fore-end of the gun. A pistol grip placed just behind the trigger guard can provide a third point of stability for a long gun. Many long guns have pistol grips. Rifles are more accurate than shotguns because the rifling in the barrel makes the conical or cylindrical bullet more aerodynamically stable. (Shotguns, discussed below, generally fire multiple spherical pellets, which are not nearly so aerodynamically stable.)

Rifles are also generally more powerful than handguns. Indeed, most types of centerfire rifle ammunition deliver dramatically more kinetic energy than common handgun rounds. Consider the example of an ordinary bolt-action deer-hunting rifle in a popular medium game cartridge, the .270 Winchester, introduced in 1925. At the time of this writing, in most parts of the United States, such a hunting rifle can be bought new for \$500 to \$900 (although custom or heavily modified rifles can cost much more). The .270 Winchester launches a 150-grain⁸ bullet at a velocity of 2,800 feet per second (more than 2.5 times the speed of sound), delivering more than 2,000 foot-pounds of kinetic energy to a target at 100 yards distance from the muzzle. When fired from a stable rest, with a telescopic sight, such a rifle can often place a group of three shots within a one-inch diameter at 100 yards.

Compare this with a handgun firing a bullet of similar weight. Even a fairly powerful handgun cartridge, such as the .40 Smith and Wesson cartridge, widely used by American law enforcement agencies, launches a bullet of similar weight, 155 grains, at a velocity of only 1,200 feet per second (slightly more than the speed of sound), delivering about 330 foot-pounds of kinetic energy at 100 yards distance — less than one-sixth the energy of the rifle. (See Chapter 11, Exercise: Ammunition-Based Controls, for more ballistic information of common ammunition.)

Moreover, even a skilled pistol shooter would have difficulty keeping a group of shots within one inch at 25 yards with a typical police or self-defense handgun; conversely, a rifle shooter can produce such accuracy with relative ease.

The ammunition capacity of rifles varies widely. Bolt-action rifles hold from 4 to 6 cartridges or sometimes more. Lever-action rifles can range from 6 rounds up to a dozen or more. Semi-automatic rifles use magazines that can range from 5 rounds' capacity up to 20 or 30 rounds. (Specialized magazines with very high capacities of up to 75 or 100 rounds are available for some semi-automatic rifles.)

Some of the most common and popular rifles are rimfire rifles, particularly in the .22 Long Rifle chambering. The two most popular semi-automatic .22 rimfire rifles, the Marlin 60 (introduced in 1960) and the Ruger 10/22 (introduced 1964), have together accounted for more than 15 million rifles sold. These rifles are commonly used for target shooting, practice, and small-game hunting.

8. A "grain" is 1/7,000 of a pound, or approximately 0.0648 gram. Grains are used for measurement of bullet weight, and for gunpowder. The term originally referred to the approximate weight of one grain of wheat.

6. Legitimate Uses of Rifles

As noted above, rifles are standard equipment for hunting land animals. They are also increasingly popular for police work and self-defense. Target shooting with rifles takes a wide range of forms, with the apex being the National Matches held every year at Camp Perry, Ohio.

A NSSF [report](#) indicated that about 14 million Americans hunt in a given year, and about 21 million hunted at least once in the last five years. A [Harris Survey](#) for the NSSF reported that 14.8 million Americans “currently participate” in rifle target shooting. According to one NSSF survey, an estimated 10.6 percent of American adults engaged in target shooting with a rifle in 2009.

7. Crime with Rifles

Rifles are the type of firearm that is least commonly used in violent crime. In 1997 interviews of prison inmates, only 1.3 percent of state and federal prisoners reported being armed with a rifle during their offense of conviction. Bureau of Justice Statistics, U.S. Dep’t of Justice, *Firearm Use by Offenders*, NCJ 189369 (Nov. 2001). However, the power of rifles means that rifle wounds are more likely to be fatal than handgun wounds.

Rifles have figured prominently in political assassinations. In the 1960s, President John F. Kennedy and civil rights leader Rev. Martin Luther King, Jr., were both killed by assassins firing rifles from concealment. Today, one challenge of protecting dignitaries from assassination stems from the threat posed by potential assassins armed with rifles.

F. Shotguns

Shotguns are the third major category of common firearms. As of 1993, the ATF estimated that Americans owned 66 million shotguns. The ATF’s Annual Firearms Manufacturing and Export Report for 2012 shows that in 2012, 936,010 shotguns were manufactured in the United States; 42,858 were exported. The ATF’s [Firearms Commerce in the United States 2014](#) Annual Statistical Update shows that 936,235 shotguns were imported into the United States in 2013, with Turkey, China, Italy the leading sources.

Federal law defines a shotgun as a gun that is

intended to be fired from the shoulder . . . [and uses] the energy of the explosive in a fixed shotgun to fire through a smooth bore either a number of projectiles (ball shot) or a single projectile for each pull of the trigger.

[28 U.S.C. §5845](#)(d). Thus, a shotgun is a long gun with a *smooth bore*, a barrel whose interior lacks the spiral rifling grooves found in rifles and handguns.

1. Shotgun Shells

Shotguns use ammunition that differs in several respects from handgun or rifle ammunition. Shotgun ammunition takes the form of cylindrical *shot shells* with plastic cases, instead of the metallic cases characteristic of handgun and rifle cartridges.



Shotgun shells, pictured next to rifle and handgun cartridges for scale.

A typical shot shell is filled with round, metal *shot pellets* that are released when the shell is fired. Payloads of shot range from *birdshot* loads, which fit hundreds of tiny pellets into a single shell, to *buckshot* loads, which use much larger and heavier pellets, sometimes as few as eight or nine pellets per shell.

Shotguns are commonly used for bird hunting. Larger loads with fewer pellets would be used for bigger birds, such as geese, while loads containing tiny pellets would be standard for small birds. The largest pellets (buckshot) are used for hunting deer or for police work and self-defense.

Other than the differences in casing, and the use of round pellets rather than conical bullets, shotgun ammunition works the same as rifle or handgun ammunition.

Traditionally, shot pellets have been made of lead, like most handgun and rifle bullets. However, concern about the effects of ingested lead on animals has led to restrictions on its use in hunting. In 1991, the U.S. government banned the use of lead shot while hunting waterfowl in the United States. [50 C.F.R. §§20.21\(j\)](#), 20.134. Ammunition manufacturers now sell a variety of shotgun shells loaded with nonlead shot composed of other metals, such as bismuth, tin, steel, and tungsten. These nonlead alternatives are widely used for shotgun hunting today, although some argue that they remain inferior to lead shot in performance and/or price.

Not all shotgun shells contain multiple pellets; they can also be loaded with a single, large-bore projectile, a *shotgun slug*. Shooting slugs lets the shotgun function similarly to a powerful rifle at short ranges. The typical use for a shotgun slug would be deer hunting, police work, or self-defense. (Some specialty shotguns for slugs may have rifling inside the barrel, which by federal law makes them “rifles,” although everyone still calls them “shotguns.”)

2. Shotgun Gauges

Different shotguns use shells of differing sizes, corresponding to the width of the shotgun's barrel bore. The size of a shotgun's bore, and thus the size and power of its ammunition, is frequently expressed as its *gauge*, a somewhat archaic form of measurement compared to the usual fractions of an inch (or millimeters) that are used to measure rifle and handgun calibers. A shotgun's *gauge* is the number of lead balls, of the same width as the bore of the shotgun, that are required to equal one pound of weight. Thus, a 12 gauge shotgun has a barrel of the same width as a lead sphere that weighs one-twelfth of a pound. This method of measurement yields the counterintuitive result that the *lower* a shotgun's gauge number, the *larger* and more powerful its ammunition. The most common type of shotgun in the United States is the 12 gauge shotgun, followed by the 20 gauge shotgun. Other shotguns are 16 gauge, 28 gauge, and the smallest standard shotgun is the .410. Ten gauge shotguns exist, but were more popular in the past than today. To make things more confusing, the small is the .410, which is named for the measurement in inches of its barrel's diameter, not a gauge measurement. A 12 gauge shotgun has an 0.73 inch barrel diameter.

3. Types of Shotguns



Pump shotgun.

Like rifles and handguns, shotguns are available as single-shot guns, although they are less popular than repeating shotguns.

The most common repeating shotgun in the United States is the *pump action*. The pump shotgun stores shells in a tubular magazine underneath the barrel. Wrapped around the magazine is a wood or plastic fore-end, which can be manually slid (“pumped”) backward and then forward. To eject a fired shell from the firing chamber and load a fresh one into the chamber from the shotgun’s tubular magazine, the user pumps the fore-end. Pump shotguns typically hold from four to eight shells. They are less expensive to manufacture than semi-automatic or double-barrel shotguns. They are widely used for police work, self-defense, hunting, and rural control of pests and predators.

Semi-automatic shotguns function similarly to other semi-automatic guns. When the shotgun is fired, the recoil energy or gas released by firing causes a reciprocating bolt to eject the spent shell and load a fresh shell into the firing chamber, ready to be fired with another press of the trigger. Unlike semi-automatic pistols and rifles, semi-automatic shotguns rarely use detachable ammunition magazines. As with pump-action shotguns, the ammunition supply of two to eight shells is typically stored in a fixed magazine tube that runs underneath the shotgun’s barrel. The few shotguns that use a detachable box magazine, or a revolving cylinder, for ammunition storage have been subjected to special controls. *See* Chapter 8.

Double-barreled shotguns have no magazine but feature two adjacent barrels that can each be loaded with a shell, allowing a total of two shots before reloading. “Over/under” double-barrel shotguns place one barrel atop the other. “Side by side” shotguns orient the barrels alongside one another. Double-barreled shotguns are popular for skeet, trap, and sporting clays (below). Double-barreled shotguns are offered at a range of price points, but high-quality examples are very expensive, often boasting fine wood and engraving. Such shotguns are used mainly for sporting purposes such as competition and bird hunting. Many countries with very restrictive firearms laws, such as the United Kingdom, impose relatively less regulation on the private possession of double-barreled shotguns. *See* Chapter 14.

4. Legitimate Uses of Shotguns

Shotguns are commonly used for hunting, especially bird hunting; for shooting sports such as trap shooting, skeet shooting, and sporting clays; for self-defense; for police work; and for protection from threatening or pest animals in rural areas. They also play a limited role in military operations; they are useful for security duty and for fighting in buildings or other close quarters. Some states, such as Illinois, Massachusetts, New Jersey, and Ohio, disallow the use of rifles for hunting deer. In these areas, it is common for deer hunters to employ shotguns loaded with buckshot, or, most commonly, with slugs.

Shotgun sports are the most popular organized shooting sports in the United States. In addition to hunting, popular shotgun sports are trap shooting, skeet shooting, and sporting clays. Trap and skeet shooting were both created to simulate bird shooting. In both sports, the shooter tries to hit flying clay disks. Trap and skeet shooting take place on specially constructed target ranges; the differences between trap and skeet are whether the shooter stays in a single spot

or rotates among five different shooting positions along about a quarter of a circle, and whether the clay “birds” are released from one fixed position or two. The shotgun sport of sporting clays, invented in the latter twentieth century, also involves firing at flying clay targets. However, the sporting clays course involves ten different shooting positions in a large outdoor area. Participants shoot clay targets in a variety of natural settings that present differing terrain and obstacles. At each position, the shooter will fire at two different flying clays. While the flight paths of the clays in trap and skeet are relatively fixed, the flying patterns in sporting clays are much more diverse. One sporting clays stand might involve a first shot at a clay bouncing along the ground, and a second shot at a clay flying almost straight up into the air. An estimated 8.4 million Americans participate in the shotgun sport of sporting clays. Comparable numbers participate in the traditional shotgun sports of trap shooting (7.58 million) and skeet shooting (6.98 million). National Shooting Sports Found. Survey, Sport Shooting Participation in the United States 2009. Another survey estimated that 4.9 million Americans participate annually in waterfowl hunting, which employs shotguns. Forest Serv., U.S. Dep’t of Agric., & Univ. of Tenn, 1999-2002 National Survey on Recreation and the Environment.

Shotguns can be used for military purposes, particularly at close range. They were common in World War I as “trench guns,” were used as late as the Vietnam War, and are still used for specialized purposes. However, the bulk and weight of their ammunition make them unsuitable for extended carrying, and at distances beyond a few dozen yards, the much greater accuracy of the rifle makes it the preferred military arm.

Some firearms trainers recommend the use of a shotgun instead of a handgun for home defense. They emphasize that the shotgun is much more powerful than the handgun, while still presenting less risk of overpenetration than most rifles, and that the use of a shoulder stock enables the shotgun to be aimed more accurately under stress than a handgun. However, the weight of a shotgun (typically seven to nine pounds, compared to perhaps two pounds for a handgun) and its heavy recoil can make it difficult for small-statured shooters, or those with limited upper body strength, to use a shotgun effectively for self-defense.

All types of firearms have their own particular advantages and disadvantages for lawful self-defense, and it is impossible to say that one particular type of gun is “best” in general.

5. Crime with Shotguns

Shotguns are the second most commonly used type of firearm in crimes. Their use in crime falls well behind handguns, but ahead of rifles. In 1997 interviews of prison inmates who were armed with a firearm during their offense of conviction, approximately 13 percent of prisoners reported that they were armed with a shotgun. Bureau of Justice Statistics (BJS), U.S. Dep’t of Justice, *Firearm Use by Offenders*, NCJ 189369 (Nov. 2001). In addition, 7.4 percent of police officers fatally shot between 1982 and 1993 (with guns other than their own duty weapons) were killed with a 12 gauge shotgun, the most common type of shotgun. BJS, *Guns Used in Crime*, NCJ 148201 (July 1995).

Often, criminals carrying shotguns will saw off much of the barrel (an act that is illegal under federal law, *see* Chapter 7). The sawed-off shotgun is not very accurate, but (like any shotgun) is devastating at close range.

G. *Specialty Types of Firearms and Accessories*

1. Muzzleloaders

All of the types of modern firearms described above are sometimes called *breech-loading* guns. This is because the user loads the gun's ammunition into the firing chamber from the gun's *breech*, that is, the rear of the barrel.

However, the first firearms were *muzzleloaders*, which do not use cartridges or shells for ammunition. The flintlock muskets and rifles used by infantrymen in the American Revolutionary War are an example of historically significant muzzleloading firearms.

To load a muzzleloading gun, the user pours a charge of black powder down the *front* of the barrel (i.e., the muzzle) and then uses a ramrod to ram a bullet or round ball projectile down the muzzle, covering the powder charge. Introducing a spark into the firing chamber ignites the powder, and fires the gun with an accompanying cloud of smoke.

Early muzzleloaders simply used a small amount of fine gunpowder in a small pan inside the gun to provide the priming spark. However, the early nineteenth century saw the invention of self-contained *percussion caps*, which ignited when struck by a hammer. These were the ancestors of today's centerfire primer caps.

Most muzzleloaders can only fire a single shot. After that, the slow loading process must be repeated. But the first repeating firearms, such as the early revolvers introduced by Samuel Colt in the 1830s, were also muzzleloaders. (In essence, each chamber of the revolver's cylinder was individually loaded like a separate muzzleloading barrel.)

Muzzleloaders are technologically obsolete, but their limitations and their traditional quality give them an appeal to hunters and historical firearms aficionados. Today, many states maintain special "muzzleloading" or "black powder" deer-hunting seasons in addition to the regular firearms hunting seasons. Hunters willing to use single-shot, muzzleloading rifles receive the benefits of a separate season to hunt, usually before the regular hunting season begins. The growing popularity of muzzleloading hunting has fueled a steady improvement in the sophistication of commercial muzzleloading firearms. It is now possible to purchase muzzleloaders that, apart from their one-shot capacity and slow loading procedure, have the features of a high-quality modern hunting rifle. Some are even strong enough in construction that they can use smokeless gunpowder. Most modern muzzleloaders use commercial black powder "substitutes" that have similar burning properties to, but are more stable in storage and easier to clean up than, traditional black powder. In modern muzzleloaders, the gunpowder is not loose, but is a cylindrical pellet.

Muzzleloading firearms also have a distinctive legal status. Under current federal law, muzzleloading firearms, including "cap and ball" revolvers, are

much less closely regulated by federal law than modern, cartridge-using firearms. The Gun Control Act of 1968 classifies black powder rifles, shotguns, and handguns as “antique firearms” that are exempt from federal regulation, as long as the guns cannot use fixed (cartridge) ammunition. See 18 U.S.C. §921(a)(4), (a)(16)(C). Individuals can order many kinds of black powder muzzleloading firearms directly through the mail or Internet.



Model #: NAA-1860-4-CB • NAA 1860 Earl Companion • Caliber: 22 Mag. #11 Percussion • Cylinder Capacity: 5
 Length: 7-3/4" • Height: 3-1/8" • Width: 7/8" • Weight: 8.6 oz. • Barrel Length: 4" • Sight: Stainless Steel Post

This North American Arms revolver is a muzzleloader. To load the gun, one removes the revolving cylinder from the frame of the gun. After that, one rams gunpowder and then a bullet into each of the five cylinder chambers, from the front. Finally, one places percussion caps on the back of each cylinder chamber, and then puts the cylinder back into the gun.

2. Machine Guns

Federal law defines any firearm that can fire more than one shot per press of the trigger as a machine gun—or rather, to use the actual spelling found in the National Firearms Act of 1934, a “machinegun.”

The term “machinegun” means any weapon which shoots, is designed to shoot, or can be readily restored to shoot, automatically more than one shot, without manual reloading, by a single function of the trigger. The term shall also include the frame or receiver of any such weapon, any part designed and intended solely and exclusively, or combination of parts designed and intended, for use in converting a weapon into a machinegun, and any combination of parts from which a machinegun can be assembled if such parts are in the possession or under the control of a person.

26 U.S.C. §5845(b). Thus, the standard infantry weapons of most nations’ armies today are machine guns, including the U.S. military’s M4 and M16 rifles, and the AK-47 and AK-74 rifles of the former Soviet bloc nations. All of these weapons are capable of firing automatically, either “fully automatic” fire (in which the gun keeps firing as long as the trigger is held down, until the ammunition runs out) or multi-shot “burst” fire, in which a single trigger press fires two or three shots automatically.

In the civilian sphere, all automatic firearms are closely regulated by the federal government under the National Firearms Act and the Firearms Owners' Protection Act of 1986. Possession of a machine gun is illegal unless the possessor has completed extensive tax and registration requirements. *See* Chapter 7.

In 1986, federal law was amended to ban the private possession of machine guns manufactured after May 19, 1986. *See* Firearms Owners' Protection Act, 18 U.S.C. §922(o). Only machine guns that were lawfully registered prior to that date may be owned and transferred pursuant to the National Firearms Act. In effect, the 1986 federal ban created a fixed pool of somewhat more than 100,000 legally "transferable" machine guns, to which no new guns can be added. This scarcity, as you might predict, has caused the price of transferable machine guns to climb steadily in the decades since the ban was enacted. Prices currently begin at around \$3,000 for the simplest models and range upward to \$25,000 or more for rare or high-quality weapons.

Federal law uses the term "machinegun" to mean an automatic, but there is a technical distinction. The Gatling Gun, invented during the Civil War, is an example of a machine gun that is not an automatic. The Gatling Gun is powered by a hand crank, rather than energy from the firing of ammunition. Gatling Guns, and other nonautomatic machine guns, are not covered by the National Firearms Act.

3. Silencers or Suppressors

A silencer (also called a "sound suppressor") is a mechanical device that reduces the sound created by firing a gun, much as an automobile muffler reduces the sound created by running the car's motor. It usually takes the form of a can-like cylinder that attaches to the muzzle of the gun.



Suppressor attached to firearm.

Many consider "suppressor" to be a more correct term than "silencer," because the devices reduce noise but do not render a firearm even close to silent. (This is an important difference between real suppressors and ones portrayed in movies.) However, "silencer" is the term used in federal law:

The terms “firearm silencer” and “firearm muffler” mean any device for silencing, muffling, or diminishing the report of a portable firearm, including any combination of parts, designed or redesigned, and intended for use in assembling or fabricating a firearm silencer or firearm muffler, and any part intended only for use in such assembly or fabrication.

18 U.S.C. §921(a)(24).

In the United States, all “silencers” are closely regulated by the federal government under the NFA. Sound suppressors typically reduce a gunshot sound by about 15 to 20 decibels; contrary to many media portrayals, the suppressed sound can still be much louder than a chainsaw. Like the possession of a machine gun, the possession of a silencer is illegal unless the possessor first completes extensive tax and registration requirements. However, there is no ban on the manufacture of new silencers.

Ten states outlaw suppressors/silencers. AmericanSuppressorAssociation.com.

In many European countries, suppressors are not regulated as strictly as in the United States. Instead, suppressors are commonly available and are frequently used to reduce “noise pollution” from hunting and target shooting near inhabited areas.

4. Armor-Piercing Ammunition

Federal law and some states restrict the manufacture, sale, and/or possession of bullets whose composition makes them unusually effective at penetrating modern body armor such as the bullet-resistant vests worn by police officers. Federal law prohibits the manufacture of “armor piercing ammunition” except for sale to government agencies, and prohibits federally licensed dealers from selling armor-piercing ammunition to individuals. 18 U.S.C. §922(a)(7)-(8), (b)(5).

Most prohibitions of “armor piercing” ammunition define that category by focusing on the bullet’s material composition. Ordinary ammunition uses bullets made of lead and copper, while laws regulating armor-piercing ammunition typically restrict the use of very dense metals such as brass, steel, or tungsten.

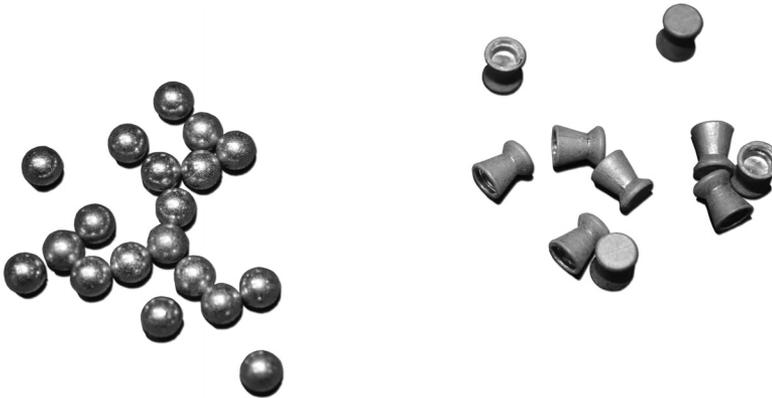
The armor-penetrating ability of ammunition depends heavily upon the velocity of the bullet, not just the bullet’s composition. A bullet fired from a rifle will have much higher velocity than the same bullet fired from a handgun, because the rifle has a much longer barrel. Thus, as a practical matter, virtually all rifle ammunition introduced within the last hundred years that is suitable for hunting deer or larger game will penetrate soft body armor (which is typically made of a flexible fabric called Kevlar), regardless of the composition of its bullets.

Hard body armor comprises rigid ceramic plates that can stop rifle fire, but such armor is much heavier and more cumbersome than soft body armor. Some body armor consists of a synthetic honeycombed material that, because of its shape, is especially good at absorbing the force of projectiles. American soldiers going into combat often wear hard body armor, and police officers on special combat teams do also; for ordinary daily police work, soft body armor is the norm.

5. Air Guns

Air guns are not “firearms.” Instead of being powered by burning of gunpowder, they are powered by compressed air or carbon dioxide. The compressed gas is usually stored in a small cylinder that fits in the gun’s grip or stock. The compressed air may also be created by pumping a slide or lever on the gun. The simplest air guns, such as the famous Daisy Red Ryder, shoot a small (.17 caliber) round ball called a *BB*. Other air guns fire a special *pellet*.

Air guns can be rifles or handguns.



BBs and pellets.

Air gun shooting is an Olympic sport, and within a limited range, the highest-quality air guns can be extremely accurate, more so than even the best firearms.

In most jurisdictions, air guns are subject to no special controls, although some jurisdictions limit unsupervised use by minors. New Jersey regulates air guns the same as firearms (police permission is required for each purchase), and New York City bans them entirely.

6. Paint Guns

Paint guns are used in the sport of *paintball*. Teams with paint guns shoot at each other in a special field that has various obstacles and places to take cover. Informal matches can also be held in the woods or other natural settings. Paint guns (usually smooth-bore long guns with a relatively short barrel) fire a round paintball, whose caliber is typically from .43 to .68 inches. If a player is hit by a paintball, he must leave the field for the remainder of the match, or for a period of time.

The gun (or “marker,” as players call it) is powered by a large cylinder of compressed air or carbon dioxide attached to the gun, and connected to the action via a hose. Markers can be pump action, semi-automatic, or automatic.

Head protection, especially for the eyes, is mandatory, and a paintball hit on bare skin can raise a welt. Military training is sometimes conducted with paint guns, allowing simulation of close-quarters combat without a risk of injury or death. Indeed, the United States Army is a leading sponsor of paintball products

and events, and works assiduously to enlist paintball competitors. Paintball is an intercollegiate sport.

As with air guns, paint guns in most jurisdictions are subject to no special restrictions, but in a few places are regulated as if they were firearms.

H. Nongun Arms

As the title of this book indicates, it is mainly about firearms regulation. However, the right to keep and bear arms, as interpreted by the courts, is not necessarily confined to firearms, and there are certain to be many cases in the future as to what constitute constitutionally protected “arms.”

1. Swords, Knives, and Other Edged Weapons

In the nineteenth century, the sword, particularly the short swords wielded by cavalymen, was often listed as among the core type of militia-suitable arms protected by state constitutional guarantees. *See* Chapters 5 and 6.

To the generation who fought and won the American Revolution, a paradigmatic arm was the bayonet, a knife made to be attached to the tip of a rifle or musket. (As discussed above in Part G.1, a musket is a long gun that shoots a single large ball of lead.) At close quarters, the bayonet was a more effective weapon than the firearm, partly because it did not need to be reloaded. Nineteenth-century decisions generally treated swords and knives as being within the scope of the right to arms, although there were sometimes exceptions for knives thought to be used mainly by ruffians or brawlers — such as the Bowie knife. *See* Chapter 5.

In most states, there are no particular restrictions on purchasing and owning swords or knives, but carrying restrictions may exist, especially on knives, and there may be bans on certain types of knives, especially switchblades and daggers.

Fencing, using sabre, epee, or foil, is a popular sport. History-minded organizations such as the [Academy of European Medieval Martial Arts](#) (based in Toronto, Canada) train people in old-fashioned combat techniques, such as swordsmanship.



Buck Knife, model 482.



Buck Knife, model 730CM X-tract.



Is a hatchet a Second Amendment arm?

For further information on edged weapons and tools, see David B. Kopel, Clayton E. Cramer & Joseph Edward Olson, *Knives and the Second Amendment*, 47 U.Mich. J.L. Reform 167 (2013); American Tool and Knife Institute, <http://www.akti.org/> (industry); Knife Rights, <http://kniferights.org/> (consumers).

2. Bows

Until well into the sixteenth century in England, the paradigmatic militia arm in England was the *longbow*. In Switzerland, it was the *crossbow*.

In the modern United States, bow hunting is still common. Although archery is not as popular as it was in the nineteenth century, many people do participate. Many states have special bow-only hunting seasons. Hunting with a bow is more difficult than hunting with a firearm. In order to make a lethal shot, the bow hunter must get much closer than does a firearm hunter.

Invented in the latter twentieth century, *compound bows*, which use a complex system of pulleys, predominate in modern hunting. The pulleys allow the bowman to store more mechanical energy with the pull of the bow string. Compound bows are more difficult to draw when the bow string is first pulled but are easier to hold in the fully drawn position. They were originally controversial but are now accepted everywhere that bow hunting is allowed.



A huntress with a Hoyt compound bow, wearing camouflage by Prois Hunting Apparel for Women.

Outside Switzerland, crossbows have always been more controversial, being associated with highwaymen and other criminals. However, a growing number of states now allow crossbow hunting, some for all hunters, others only for older or physically challenged hunters. Unlike vertical bows, the string of some crossbows can be drawn by turning a crank. Other crossbows have a metal loop on their fronts that assists weaker shooters in reloading. The shooter places the loop onto the ground, places his foot into the loop to hold the crossbow down, and then pulls the string back with both arms. Once the string is drawn, it is held in position by a lever until it is released by the pressing of a trigger. These features make crossbows easier to employ by bowhunters lacking upper-body strength. The stock and trigger of a crossbow look much like a firearm, and thereby make the crossbow look more controversial.

For further information, including safety instruction, see North American Crossbow Federation, <http://www.northamericancrossbowfederation.net>; North American Bowhunting Coalition, <http://www.nabowhuntingcoalition.com>.

3. Sprays

Chemical defense sprays have been common in the United States since the late 1960s. Most states have few or no restrictions, but Massachusetts does require a permit to possess and carry. For a summary of state laws, See <http://www.misdefenseproducts.com>. Many hunters carry a large and especially powerful canister called *bear spray*, which is sometimes more effective than a gunshot at turning away an aggressive bear.

Like any method of self-defense, sprays have particular advantages and disadvantages. Many people prefer a nonlethal means; and the carrying of sprays is allowed in many places where firearms are not. However, sprays tend to be less effective against aggressors who are under the influence of drugs or alcohol, or who consume a diet with lots of hot peppers.

4. Electric Devices

Stun guns have two exposed electrical prongs. The current between the two prongs can temporarily disable a person. To use a stun gun, one must touch the stun gun to the target's body. A variant of the stun gun commonly used in law enforcement is the *Taser*, which uses darts. The darts are attached to coiled springs, allowing the weapon to be used against an assailant several feet away. Stun guns and Tasers will not work on an attacker wearing a thick coat. The following states ban stun guns and Tasers: Hawaii, Massachusetts, Michigan, New Jersey, New York, Rhode Island, and Wisconsin. Some cities, including the District of Columbia, also have prohibitions.

5. Blunt Weapons

Laws about blunt weapons, such as *billie clubs* (also spelled “billy”), are extremely varied, ranging from no controls to prohibition. Like many of the weapons discussed in this section, they are often prohibited from public carry by general laws against carrying dangerous weapons.

6. Martial Arts Weapons

Most martial arts weapons, such as *nunchakus* or *throwing stars*, were created by the Chinese, Japanese, or Okinawans. They became popular in the United States as part of the surge of interest in all things Chinese, including the martial arts, that followed President Richard Nixon's 1971 opening to China. Most states have no special laws about them, although some states restrict carrying. New York and Massachusetts (and to a lesser degree, California) ban almost all of them.⁹ See *Maloney v. Cuomo*, 554 F.3d 56 (2d Cir. 2009), *vacated sub nom. Maloney v. Rice*, 130 S. Ct. 3541 (2010). The *tonfa* (essentially a billie club with an extra, perpendicular handle) is a popular arm for police use.

9. The oddest such ban is Massachusetts's prohibition of the “zoobow,” Mass. Gen. Laws Ann. ch. 269, §10(b), which appears to be a mistranslation of a fictional weapon from a Japanese fantasy adventure movie.

7. Knuckles

Brass knuckles and similar devices for the fingers (e.g., rings with fighting spikes) are prohibited in many jurisdictions.

For further information, see Eugene Volokh, *Nonlethal Self-Defense, (Almost Entirely) Nonlethal Weapons, and the Rights to Keep and Bear Arms and Defend Life*, 62 Stan. L. Rev. 199 (2009). The online website to this textbook contains a list of ALR annotations on weapons law, and those annotations are a good starting point to survey the diverse state laws on nongun arms. <http://firearmsregulation.org>