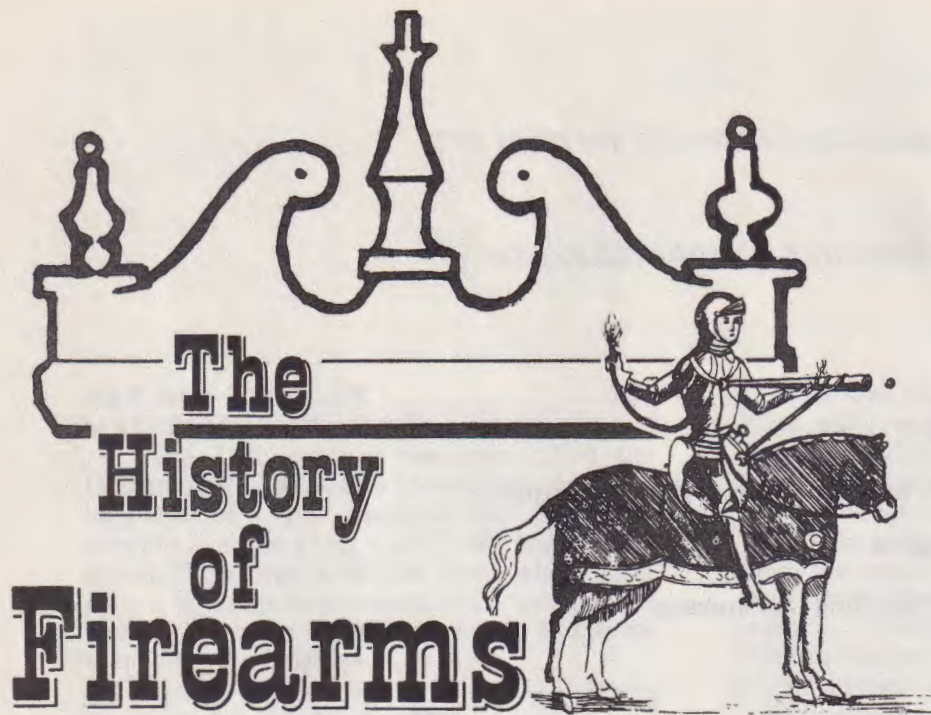


# The History of Firearms



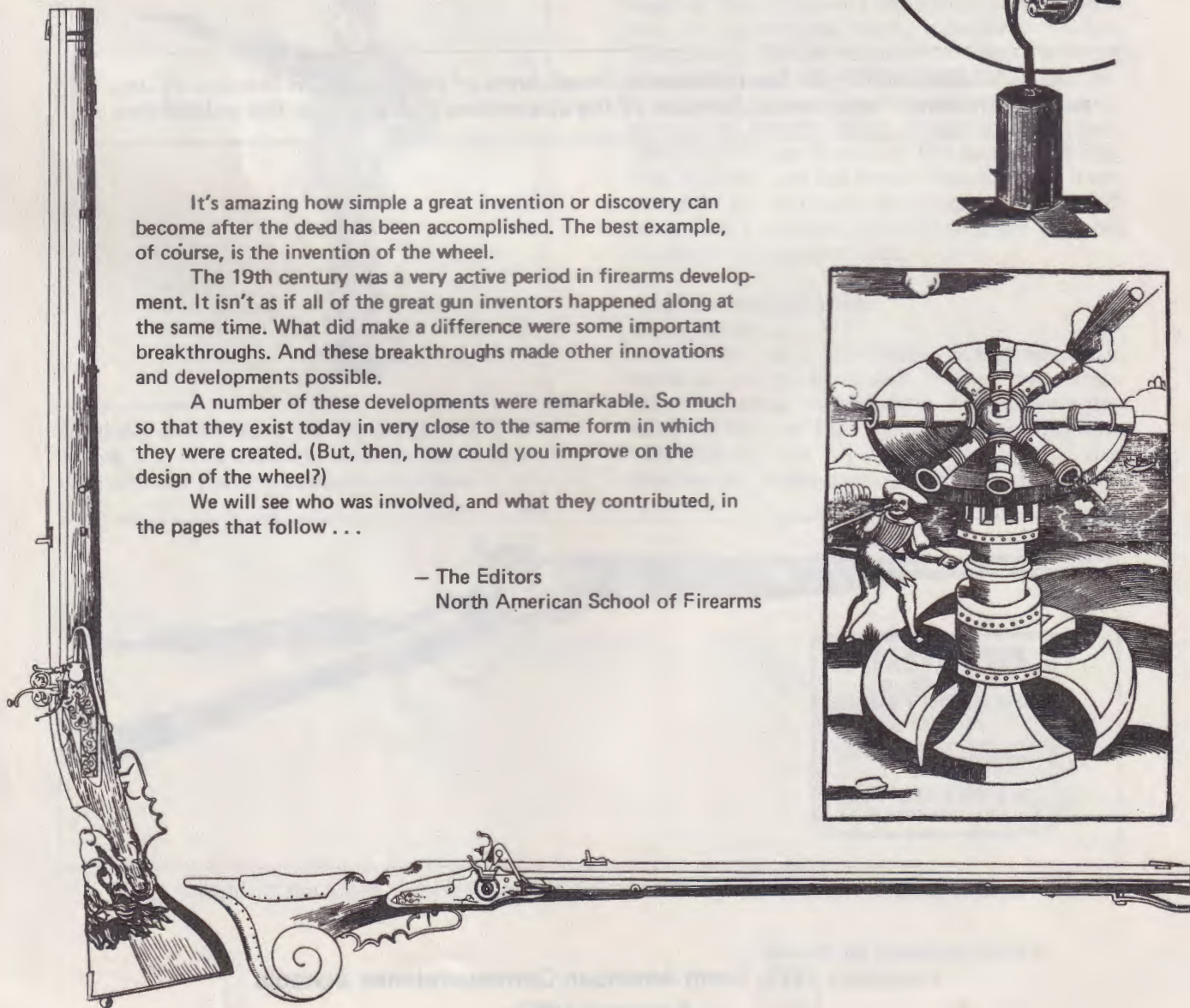
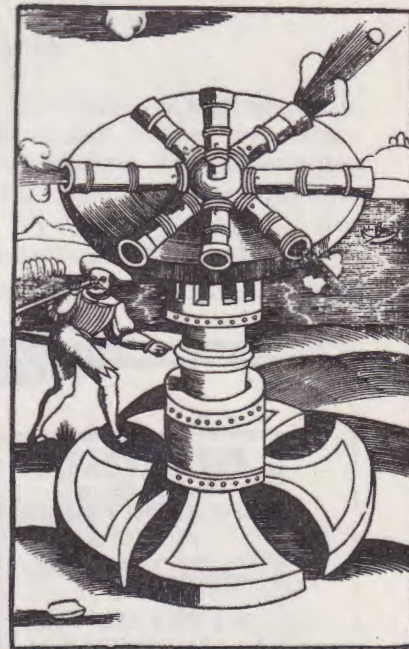
It's amazing how simple a great invention or discovery can become after the deed has been accomplished. The best example, of course, is the invention of the wheel.

The 19th century was a very active period in firearms development. It isn't as if all of the great gun inventors happened along at the same time. What did make a difference were some important breakthroughs. And these breakthroughs made other innovations and developments possible.

A number of these developments were remarkable. So much so that they exist today in very close to the same form in which they were created. (But, then, how could you improve on the design of the wheel?)

We will see who was involved, and what they contributed, in the pages that follow . . .

— The Editors  
North American School of Firearms



## THE HISTORY OF FIREARMS – PART 2

### THE GOLDEN AGE OF FIREARMS

#### NEW MEN WITH NEW MATERIALS TRY AGAIN

The 19th century has been called the Golden Age of Firearms Development. It was in the 1800's that advances men had been stewing over for years were finally made functional. This was also the time when great names in firearms emerged, some names that were to become household words and some that few will recognize.



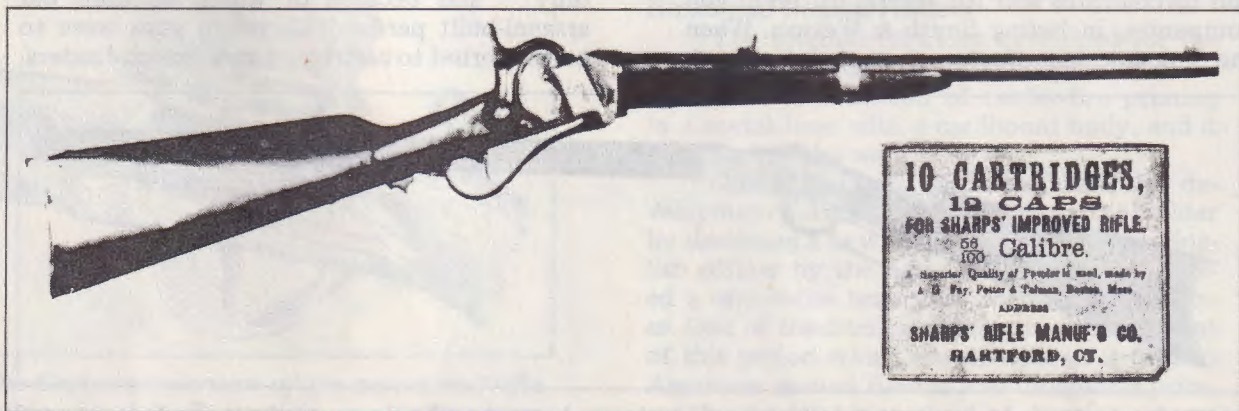
*Guns are well-known for "winning the West" during the 19th century, but they were also a very popular pastime sport in the cities.*

It was the time of the invention of the first really capable breech-loader, and also the metallic cartridge. When these two ideas became realities, and were combined, firearms as we know them today came into being.

One of the first successful breech-loaders, and the name of the arm that contained it, has come down to us as a measure of greatness in firearms. This was the Sharps rifle. The cartridge version of the Sharps was to become known as "Old Reliable." It was originally designed as a percussion-ignited, breech-loading rifle. It used a dropping block system and, in its original form, a paper cartridge. The Sharps design employed a finger lever at the bottom of the receiver action. When this lever was lowered, or moved forward and down, the breech block dropped in mortises and exposed the chamber. The paper cartridge was inserted and the breech-block/finger-lever raised in the mortises, shearing off the end of the paper cartridge and exposing the powder to the fire percussion cap.

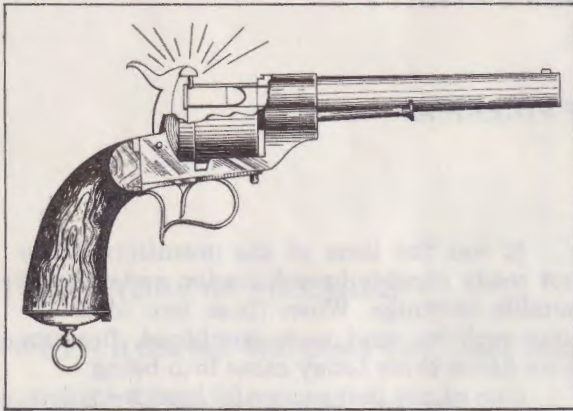
#### And Meanwhile, Across the Atlantic . . .

While we in the United States were still working on crude breech-loading, paper-cartridge firearms, inventors in France were developing two of the most important firearm innovations. The BB cap by Flobert and the pin-fire by Lefauchaux permitted the inven-



*"Old Reliable," the 1842 Sharps. Inset shows old cartridge box for the popular Sharps rifle.*

tion of the hinged frame which is seen today in most double-barrel shotguns. A man named Houiller later developed the real pin-fire cartridge.



*Lefauchaux's pin-fire principle.*

#### And Back Home, Enter Smith and Wesson

One of the more successful repeating systems of American derivation was the Volcanic rifle. This was the development of two gentlemen in Connecticut named Smith and Wesson. The Volcanic cartridge consisted of a hollow-based bullet with a charge of black-powder in the hollow base. This was held in with a paper disc which also contained the primer. Since the powder charge was small, due to the limited capacity of the hollow-based bullet, the Volcanic was a very low-powered arm. It had very poor obturation, and consequently did not last long. It was made both as a rifle and as a pistol. While it had a very short life, it was the immediate ancestor of the modern-day Winchester rifle.

#### Henry Tackles the Volcanic

One of the great firearms inventors and mechanics of the time was a man named Tyler Henry. Henry had worked on many different gun mechanisms and for several different gun companies, including Smith & Wesson. When the Volcanic manufacturers went out of busi-

ness, the business was purchased by one of its stockholders, Oliver F. Winchester. Winchester was smart enough to retain Henry as the head mechanic in his new plant, known as the New Haven Arms Company. Henry immediately set out to redesign the Volcanic and make it a much more dependable and powerful firearm. He used the double toggle lock joint, which had been patented by Smith & Wesson, and around that he designed a new rifle, using a rim-fire cartridge that was also a patent of Smith & Wesson. He thus created the Henry rifle.

Tyler Henry's contributions to firearms development in the middle 19th century, and to the firearms corporation owned by Oliver Winchester (which was later to bear his name), were so important that every round of Winchester rim-fire ammunition manufactured today has an "H" stamped on the head. The cartridge used in the Henry rifle was .44-caliber rim-fire.

#### Cartridge Development

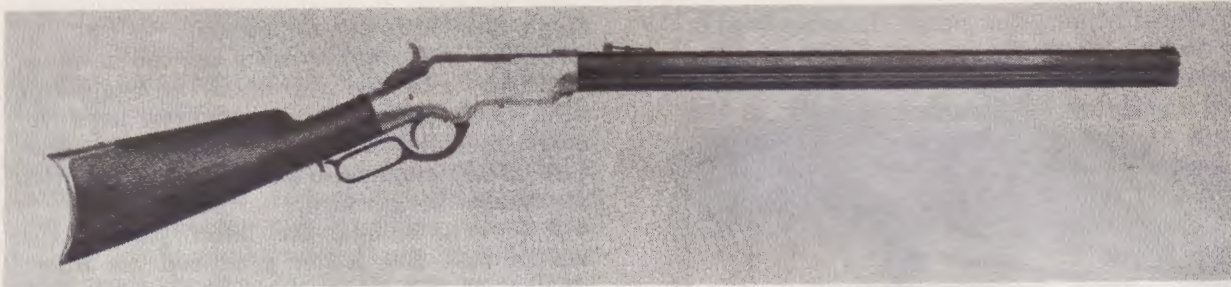
While we discuss the rifles, we must emphasize the cartridge. The development of the rim-fire cartridge opened the way for the development of the repeating rifle that much sooner. This in turn called for a more powerful cartridge than could be developed in the rim-fire configuration. This demand led to the repeating rifle and to the development of the center-fire cartridge, a combination which is with us even today.

The first patent grant on a center-fire cartridge was granted in France in 1857. This particular development was almost a dead ringer for the shotgun cartridges which we use today.

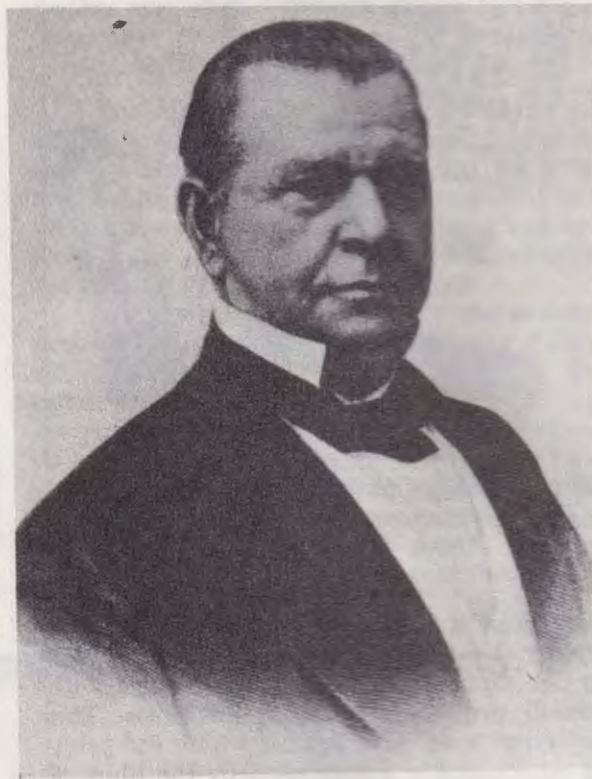
A further development of the center-fire cartridge was the Snider conversion of British military percussion rifles. This Snider conversion was adopted by the British for much the same reasons as was the cam-lock action accepted by the United States military — economy — and because of which all their old arsenal-built percussion system guns were to be converted to cartridge-firing breech-loaders.



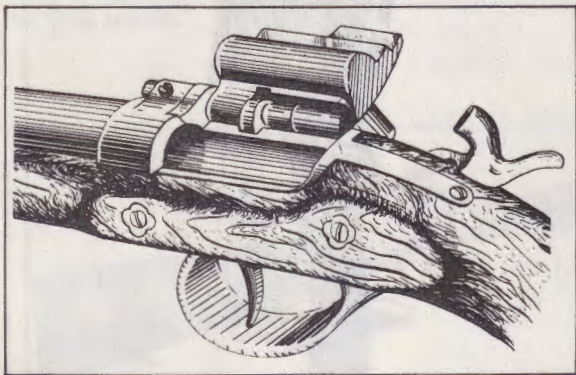
*The original Volcanic repeating rifle from Winchester's arms collection was short-lived, but paved the way for the modern-day Winchester.*



*The original Henry repeating rifle, from the Winchester collection, was the result of Tyler Henry's redesign of the Volcanic.*



*At left, B. Tyler Henry, one of America's great arms and ammunition developers. The letter "H" appearing on the head of every Winchester rim-fire cartridge case is in honor of his work on its development. At right, Oliver P. Winchester, founder of the great Winchester Repeating Arms Company, now a division of Olin-Mathieson Chemical Corporation.*



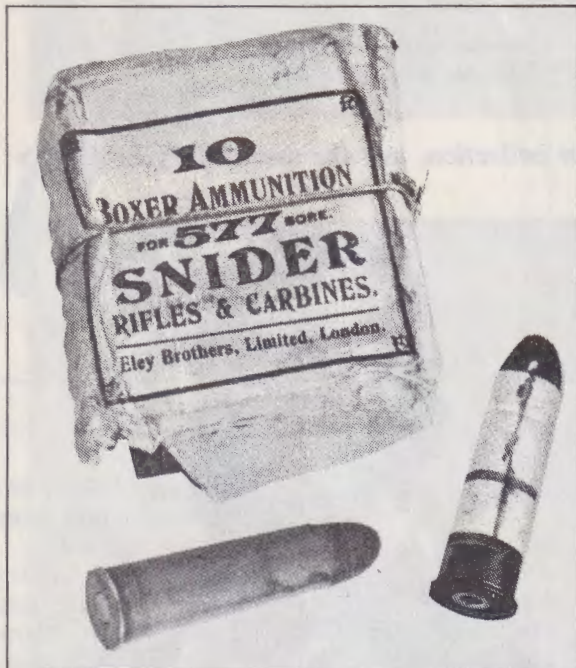
*The Snider conversion of the percussion rifle, shown in this illustration, precipitated improvements in center-fire cartridges.*

#### **Boxer and Berdan Primers**

The original cartridge developed for the Snider was almost like our modern-day shotgun shell. It consisted of center-fire priming in a metal base with a cardboard body, and it didn't work too well.

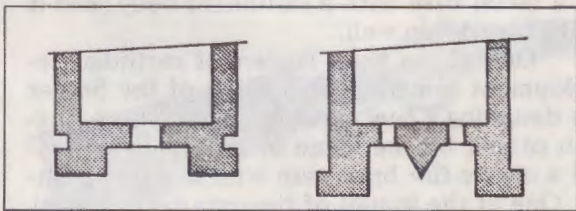
One of the great leaders of cartridge development remedied the faults of the Snider by designing a new cartridge. This was an English officer by the name of Boxer. He designed a center-fire brass case with a Boxer primer. One of the ironies of firearms development of this period which is still with us is that an American named Berdan also designed a primer, along with his method of drawing a brass cartridge case. The irony is that the European-

developed primer, the Boxer, is today used in the United States almost exclusively, and the Berdan primer, developed by an American, is used in almost every other country in the world except the United States and Canada.



*Snider cartridges, an improvement on the center-fire, underwent many variations or "marks." Above is the paper-covered brass version with iron bases.*

There is a difference between the two primers and the two cases. The Berdan case has two, and sometimes three, flashholes, with a small projection between the holes. This projection is an anvil against which the priming compound is compressed by the blow of the firing pin. The Boxer primer has one center flashhole and a self-contained anvil. The one centrally located flashhole provides an extremely efficient and easy way to decap the fired case. Berdan-primed cases, on the other hand, are extremely difficult to decap, and are decapped by either prying with a pointed tool or by trying to force them out by means of hydraulic pressure.



*The Boxer primer (left) was developed with one center flashhole and a self-contained anvil. The Berdan (right) included two or three flashholes and enclosed the anvil in the case.*

### Single-Shot Rifle Developments

The 19th century also saw the development, to its highest degree, of the single-shot rifle. In fact, there were very few improvements, modifications, or even, for that matter, very little demand for single-shot rifles after the turn of the century.

It wasn't until the latter part of the 1960's that Bill Ruger produced his Ruger single-shot, which was very closely followed in time by the Bo Clerke improvement of the Winchester high-wall action. Clerke's design duplicates, almost line for line, the Winchester action which has been famous for so many years. The difference is that the Clerke design has coil springs instead of flat springs, uses modern steel in its manufacture, and has an investment-cast receiver. Using the same method of manufacture for the receiver and coil springs throughout, Ruger's design of the single-shot also has a Farquharson-type level lock to hold the operating lever to the trigger guard. This makes a nice, clean design.

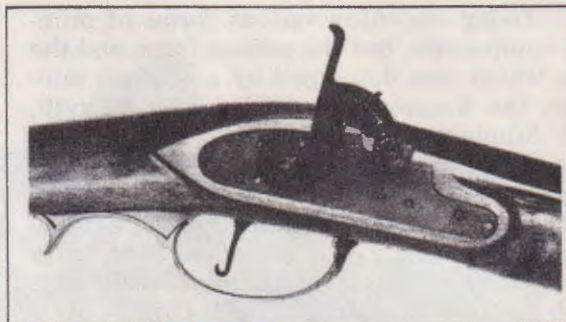


*Civil War Sharps held by a member of Captain Hiram Berdan's Sharps Shooters.*

One of the earliest and most successful of the breech-loading designs was Christian Sharps' dropping block (or falling block) system. While originally designed as a paper cartridge-fed breech-loader, it required a small modification to integrate it with the metallic cartridge. In fact, various modifications of this same dropping block locking system are still in use in some forms of artillery. Sharps rifles were known for their accuracy. The term "sharpshooter" is evolved from this particular rifle. During the Civil War, Sharps rifles were used by the troops under Hiram Berdan and these troops were known as Berdan's Sharps Shooters.

#### A Giant Step

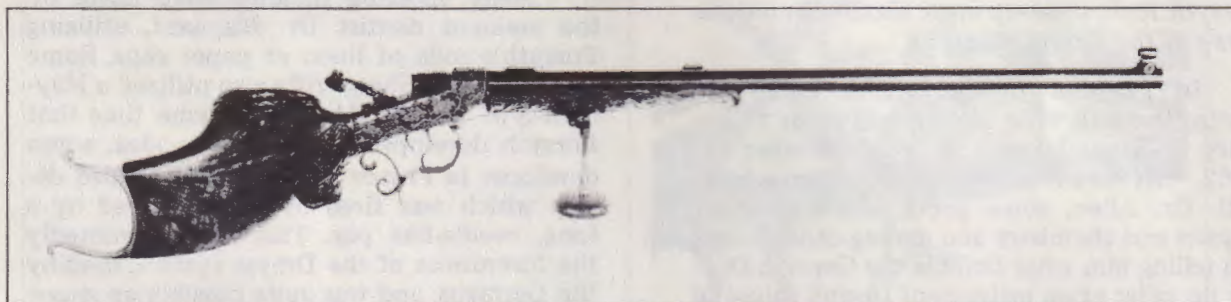
All of the various systems which we have discussed — the cannon lock, matchlock, snaphaunce, flintlock, and all the derivations and variations of these systems — were merely steps in the development of firearms as we know them today. What is probably the "giant step" in firearm ignition system development, and the one which contributed the most to firearms as we know them today, was the percussion lock. One of the greatest advantages, particularly in this more advanced form, was that the percussion system needed no flashpan full of powder, no priming, and was therefore more weather resistant and consequently more reliable.



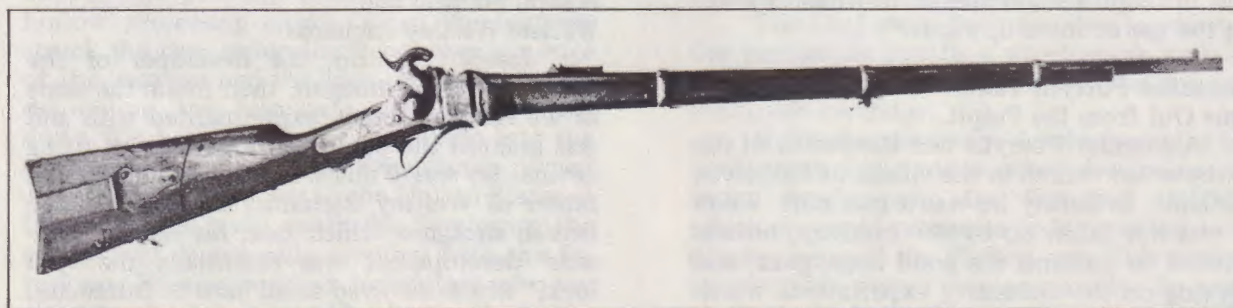
*The development of the percussion locking system was one of the giant steps in the development of firearms. Pictured is the style used about 1840.*

The earlier forms of the percussion lock were merely a means of detonating a small amount of fulminate and then using the resultant explosion and fire to ignite a priming pan full of powder. In this respect, the percussion lock in its earliest forms merely supplanted the cock and frizzen of the flintlock.

Most gunpowders are fairly stable compounds in that they burn and do not detonate. They usually have to be ignited by the use of fire or an explosive of some type. There are gunpowder types used in various devices such as grenades which can be detonated by a sharp blow and therefore do not need fire; however, these gunpowders do not fall within the province of arms.

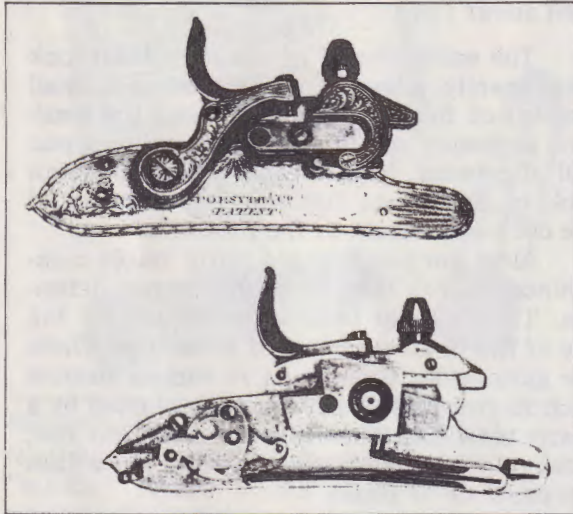


*Early single-shot target rifle, the Ballard Schuetzen, fitted with an Arthur Hubalek barrel and hammerless action.*



*The Sharps falling (dropping) block design used during the Civil War.*

Today we enjoy various forms of priming compounds, but the earliest form, and the one which was developed by a Scottish minister, the Reverend Alexander John Forsyth, was fulminate of mercury. Forsyth did not discover fulminate of mercury. It had been known up to a century before. He is credited with its application to the principle of detonation; that is, the use of fulminate of mercury in the ignition system of a firearm. While Forsyth is credited with this discovery, it is known that he applied this principle to firearms at the same time many others were making the same discovery.



*Forsyth lock, close-up view, shows the unique shape of the sliding magazine.*

In *Firearms of the World* by W. B. Smith, the following reference is made to the diary of Samuel Pepys, dated November 11, 1662, "At noon to the coffee house, where, with Dr. Allen, some good discourse about physics and chemistry and among other things I'm telling him what Dribble the German Doctor do offer of an instrument to sink ships; he tells me that which is more strange, that something made of gold, which they call in chemistry 'Aurum Fulminans' — a grain, I think he said — of this put into a silver spoon and fired will give a blow like a musquette, and strike a hole through a silver spoon, downward without the use of force upwards."

#### **Alexander Forsyth Takes Time Out from the Pulpit**

Alexander Forsyth was the pastor of the Presbyterian church in the village of Belhelvie, Scotland. Evidently he was a gun buff. When he was not taken up by the ministry, he was devoted to hunting, his good dogs, guns, and working on the chemistry experiments which led to his developing the first percussion gun lock.

The first one of record was developed by Forsyth in 1805. With the permission of notables of the British government, he had access to the Tower of London, which in those days was much given to the experimental development of arms and ammunition and was not the tourist attraction it is today. There he further developed his gun lock, utilizing the percussion or detonation system. As an interesting sidelight, while he was working in the Tower he developed these locks together with James Watts, who is given credit for the development of the steam engine.

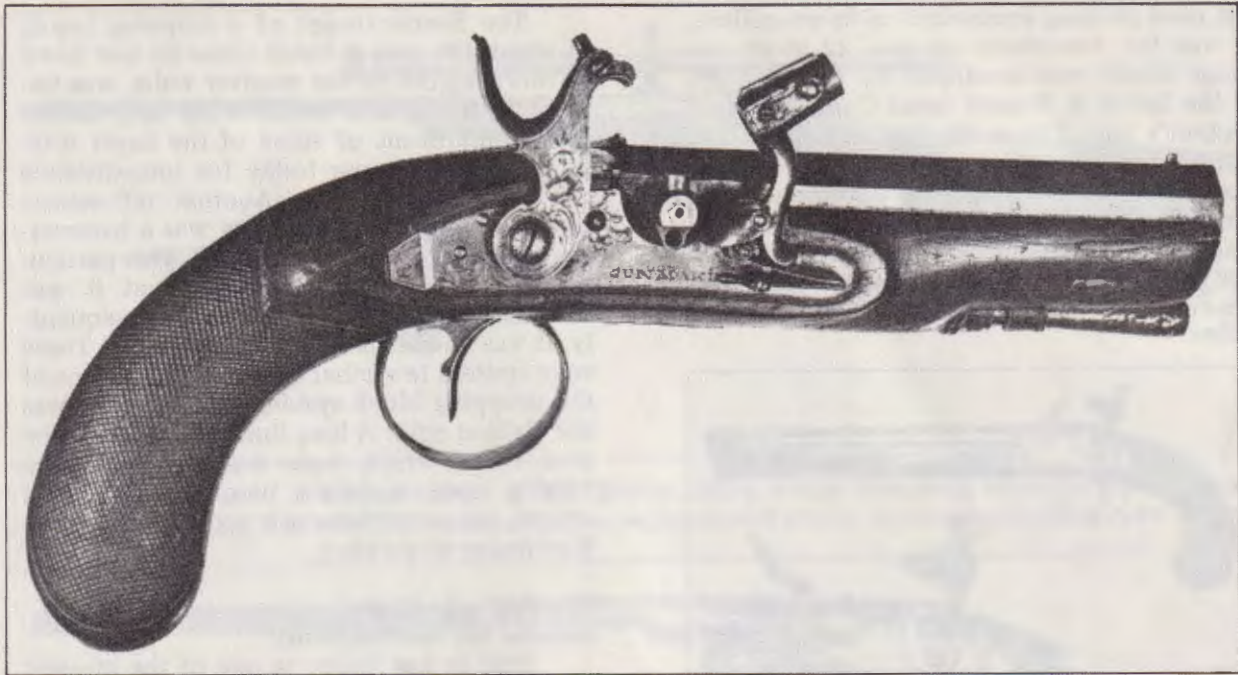
Forsyth's original development was placing fulminate powder in the flashpan, probably of a converted flintlock. Since a loose powder of fulminate of mercury is, at best, an unhealthy thing to be playing with, he soon found a means to contain the fulminate by placing a pinch of powder between two pieces of paper. This "cap" was soon followed by a strip of paper holding many pinches of fulminate, and having another strip of paper glued over the top of that. This was essentially a "roll of caps," much as our children use today in cap pistols. And thus it has come about that the commonplace of today was the wonder of the scientific world only a little over a century and a half ago. Forsyth's paper cap and rolled paper cap idea was retained up through the Civil War and was used by Union forces.

Many sporting firearms were made by the eminent dentist Dr. Maynard, utilizing Forsyth's rolls of linen or paper caps. Some models of the Sharps rifle also utilized a Maynard-type primer. About the same time that Forsyth developed his paper cap idea, a gun developer in France used a similar-shaped device which was fired by being pierced by a long, needle-like pin. This was undoubtedly the forerunner of the Dreyse system, used by the Germans, and was quite possibly an ancestor to the Volcanic system. The Volcanic system provided the mechanical means of operating the firearm which is still with us today in several lever-action repeating rifles.

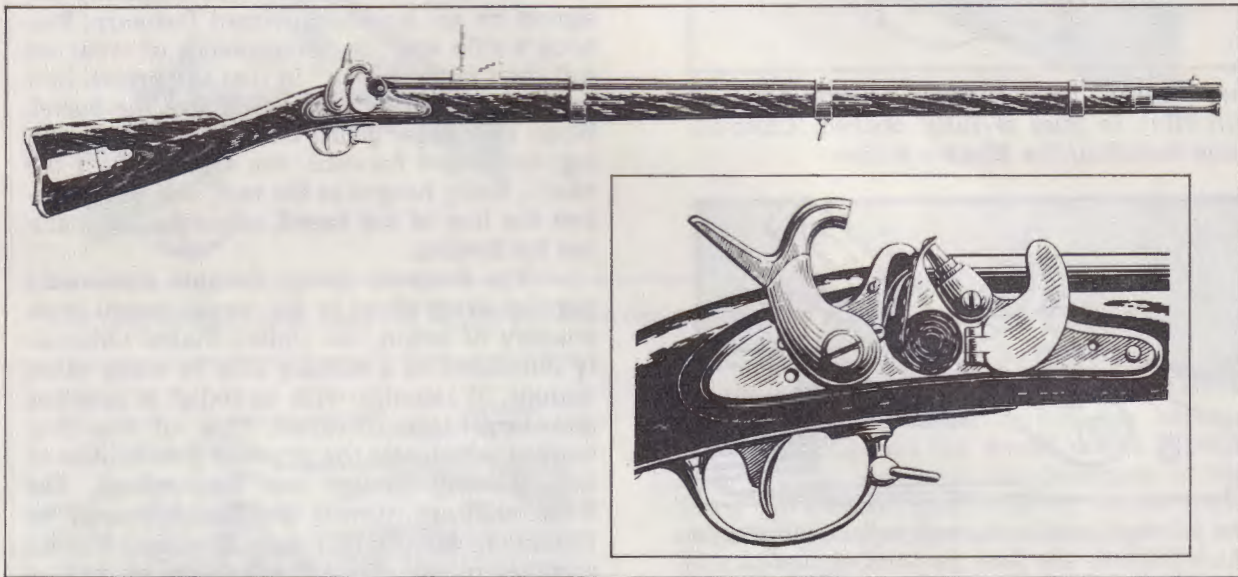
#### **Joseph Manton and William Westley Richards**

Joseph Manton, the developer of the double-barreled shotgun, then much the same as we know it today, experimented with and was granted the patent on a percussion firing device. So was William Westley Richards, the father of Westley Richards, developer of the British shotguns which bear his name. Richards' development was essentially the "pill lock," which involved small balls of fulminate.

It was a very short step to take this small rolled ball of fulminate and enclose it in a soft



*Pistol with Forsyth lock, made in the late 19th century.*



*The Army paid Dr. Maynard \$75,000 for military rights to his tape lock, used on the U.S. Army rifle Model 1855. Inset shows close-up of the Maynard tape priming system.*

copper cap. This cap could then be slid over a hollow projecting nipple. When the hammer struck the cap, squeezing it between the edge of the hammer and the edge of the nipple and detonating the fulminate, fire would flash down the hollow stem of the nipple into the charge and ignite it. An Englishman named Joshua Shaw, who was in the United States at the time he is given credit for developing the copper cap, is generally credited with this invention. There are other individuals who lay claim to the honor, but Shaw seems to be the accepted inventor.

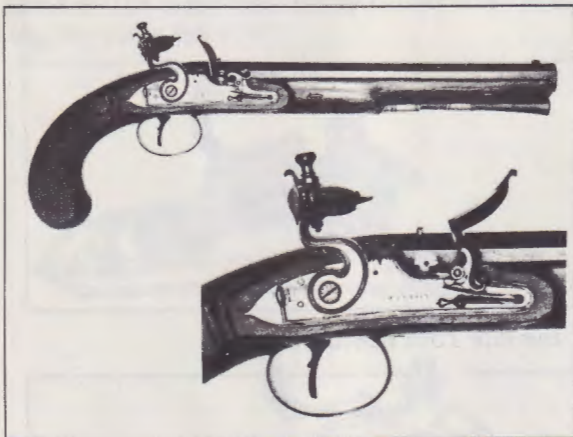
#### **Finally, the Self-Contained Cartridge**

The next step, from the development of the percussion cap to a much more suitable method of ignition for firearms, was the self-contained cartridge.

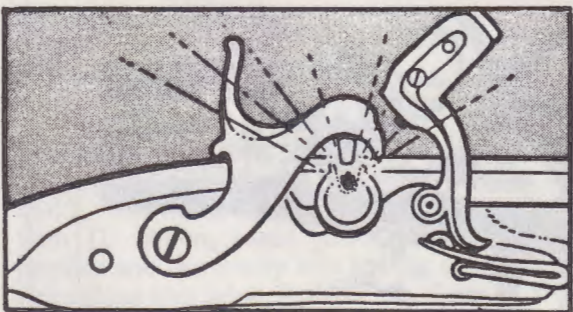
If we disregard such developments as the needle gun and various other designs in cartridge development, the first real cartridge which we could recognize today was the 1835 development of the Flobert cap. This particular cartridge design was practically the same as that which we know today as the "BB" cap. The Flobert cap did not contain powder,



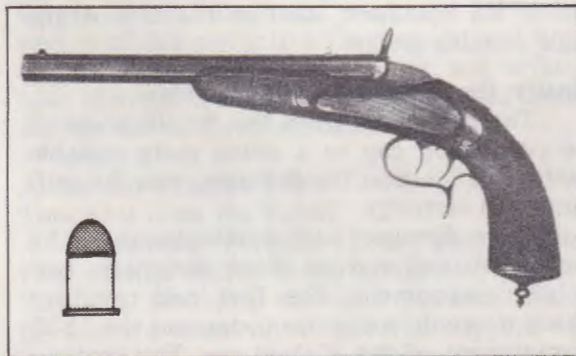
but used priming compound as its propellant. It was the forerunner of the .22 short cartridge which was developed by the founders of the Smith & Wesson Arms Company from Flobert's cap. Other rim-fire cartridges that followed were in use up to the middle 1950's. Today we have continuing development in rim-fire ignition systems, including the .22 magnum cartridge and the one brought out in 1967 by Remington, which was a bottle-neck rim-fire case which ignited a .22-caliber cartridge.



*This Manton pistol is ready to fire; hammer with flint in jaws is fully cocked. Close-up shows details of the Manton action.*



*The pill lock involved small balls of fulminate which fell into the flash pan and exploded.*



*Once Flobert invented the self-enclosed cartridge in 1835, development of cartridge cases was rapid.*

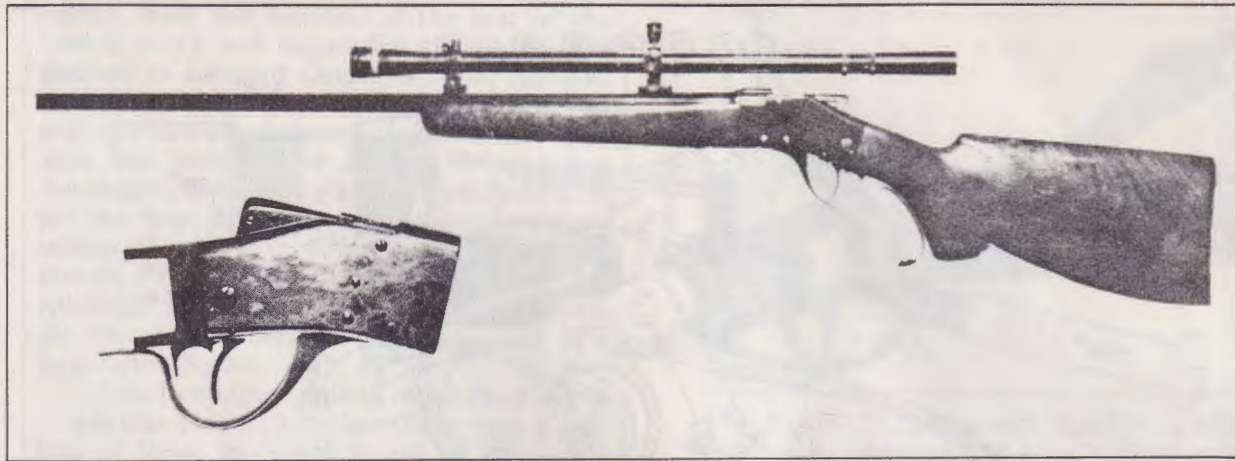
The Sharps design of a dropping block, in which the breech block slides up and down in mortises cut in the receiver walls, was immensely strong and was used for large-caliber rifles reminiscent of some of the larger magnums which we use today for long-distance and big-game shooting. Another refinement of the dropping block system was a hammerless design of the original Sharps. This particular rifle really had a hammer, but it was shrouded so it would be hidden. Consequently, it was known as the hammerless gun. There were quite a few other American variations of the dropping block system, one of which was the Ballard rifle. A long line of Stevens single-shot rifles, which were made up until the 1930's, used a falling block variation. Of course, the most famous is probably the great Winchester single-shot.

#### **The Peabody-Martini Became the Martini-Henry**

Still in use today is one of the greatest single-shot systems of the 19th century. This is the Martini rifle, which was originally designed by an American named Peabody. Peabody's rifle was the development of what we call the "falling block" in that the breech bolt was hinged at the rear and above the barrel. When the trigger guard was unlocked by pushing down and forward, the front end of the block, being hinged at the rear, was drawn below the line of the barrel, exposing the chamber for loading.

The Peabody design became immensely popular everywhere in the world except in its country of origin, the United States. Originally purchased as a military rifle by many other nations, it remains with us today in sporting and target-type firearms. One of the first nations which saw the inherent possibilities of the Peabody design was Switzerland. The Swiss military turned the Peabody over to Frederick Martini for modification. Martini completely redesigned the Peabody by making it a self-cocking gun, and then did away with the huge exterior hammer which was a carry-over from flintlock to percussion to large-hammer-striking-firing-pin days. In fact, Martini deserves great credit for his firing pin design mechanism, and he ended up with a combination of the Peabody breech lock and a Martini firing mechanism.

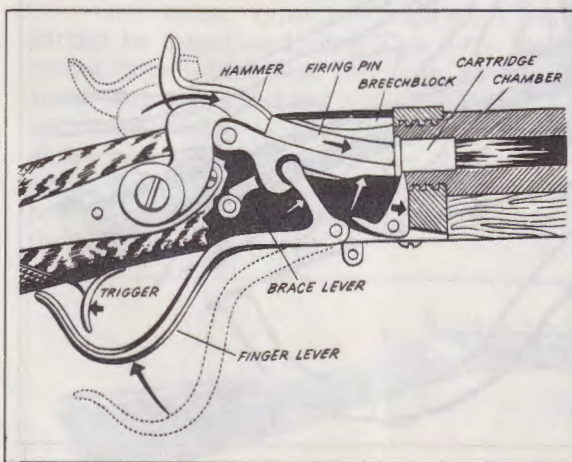
In 1871 this rifle was adopted by the British in .45-caliber, using one of Colonel Boxer's rolled brass cartridges. It was fitted with a barrel made with polygonal rifling in which lands are formed at the angles. This design is credited to Mr. Henry. This was how it came about that the Peabody name was dropped, even though Peabody was the original



*The Sharps-Borchardt is representative of the Sharps falling block (dropping block) action, which was popular during the mid-19th century. Sharps-Borchardt above is equipped with a tube sight.*



*The first Stevens rifle used the tip-up action, a variation of the falling (dropping) block system.*



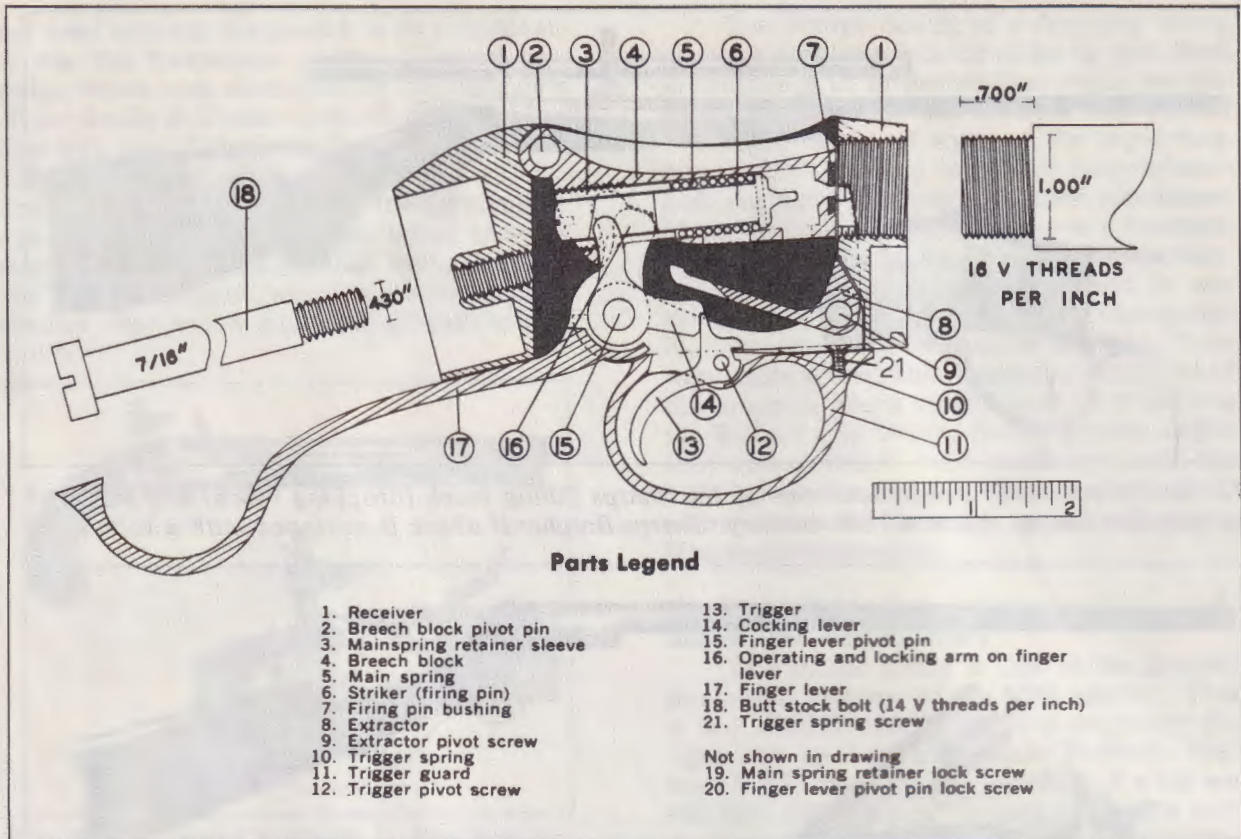
*The Peabody breech-loading action was another variation of the falling block.*

inventor of the locking system, and the rifle became known as the Martini-Henry.

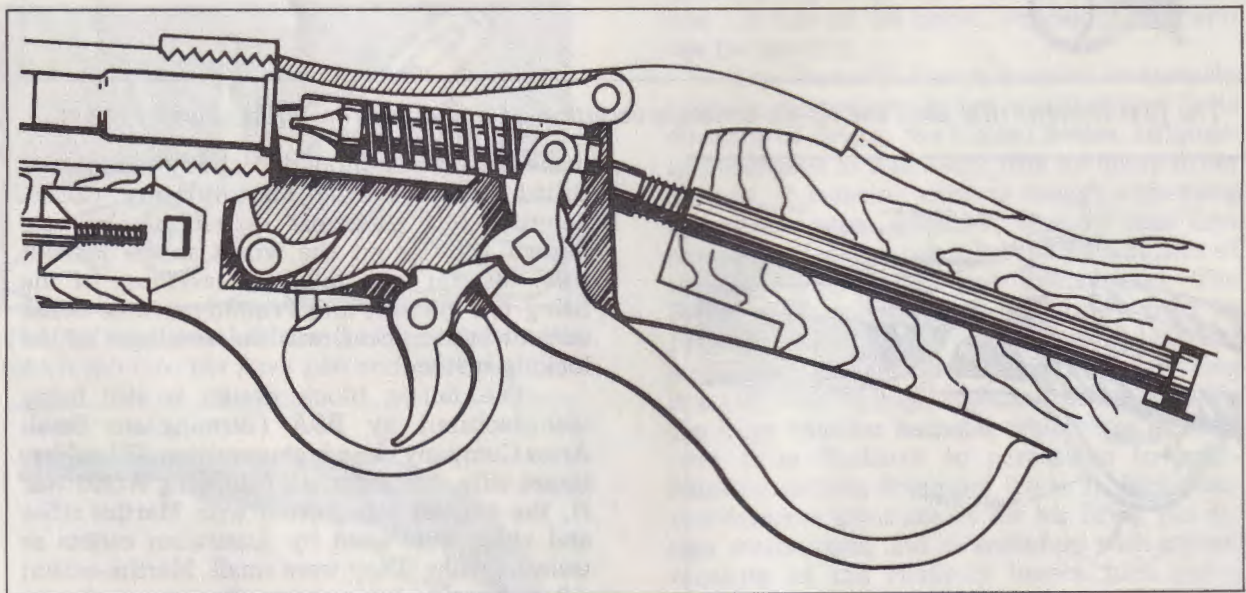
Although many rifles were made by the Providence Tool Company under the correct

name of the Martini and Peabody patent, the British used the name Martini-Henry. Consequently, this particular system has become known throughout the world as the Martini rifle. Martini was only the developer of the firing pin system, and Peabody, whose name doesn't even appear, was the developer of the locking system.

The falling block design is still being manufactured by BSA (Birmingham Small Arms Company) as a high-precision .22-caliber target rifle. Immediately following World War II, the market was glutted with Martini rifles and they were used by Australian cadets as training rifles. They were small, Martini-action rifles. Most had an extraordinarily good trigger pull, and they became very popular as actions for small, single-shot varmint rifles. Today they are hard to find, and one in excellent condition demands a premium. The same system, known today as the Peabody-Martini system, but still a variation of Peabody's hinged lock, is used all through Europe in any number of custom-built single-shot rifles. Pea-



*Martini redesigned the Peabody into a self-cocking gun and did away with the large hammer.*



*After Martini had modified the Peabody, and that modification was changed by Henry, the action was quite different, and so was the name; Peabody was dropped and it became the Martini-Henry.*

body's locking system was also used in the Spencer shotgun, which was one of the earliest American repeating shotguns, and lived a very short life. Many European free pistols also use this system.

#### The Remington-Ryder

Another ironic misnomer in firearms design of a popularly used and accepted system is the story of the development of the old rolling block. The patent for the rolling block

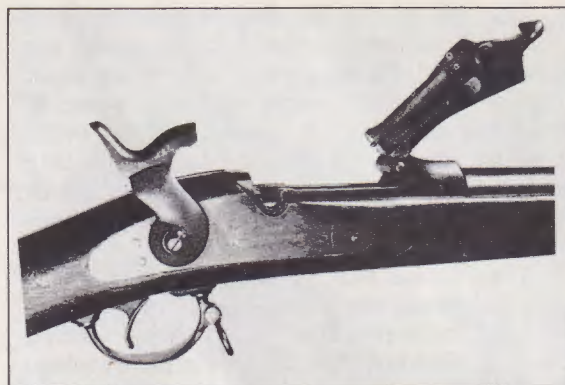
design, with the hammer at the rear of the breech block and supporting the block, was granted to Leonard Geiger in 1863. Another patent of a later date of a rolling block, but with the hammer forward of the breech block axis, was patented by Joseph Ryder. When Remington bought Ryder's patent, they also got the man. Remington also bought Geiger's patent design (U.S. 37501), which was improved by Ryder by the split-breech design. Although Remington used the Geiger patent, the system has been known ever since as a Remington-Ryder.

The Remington rolling block system was so popular that all together there were a million of these particular design of rifles sold for military purposes. Another item of interest concerning this particular design is the pistols which were made for both the Navy and the Army, and which today command great prices as collector's items.

There were many other types of single-shot rifles in use throughout the 19th century. Included was the trapdoor Springfield, which was originally .50-caliber and was later reduced to a .45-caliber. Credit for design and selection of this rifle is usually given to E. S. Allin, the master armorer at Springfield Armory, even though in 1895 the widow of Hiram Berdan was awarded a judgment of his claim that he had developed this particular type of single-breech lock. Other British designs included the Farquharson, Westley Richards, and Swinburn, which was a modified Peabody.

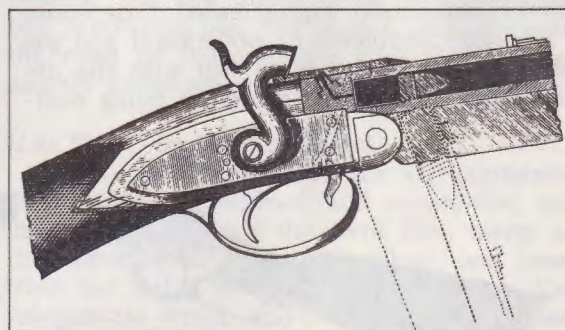
#### Emergence of the Winchester Repeater

One other type of single-shot action should be mentioned here. This is the hinged-frame type which was probably designed in Italy, but was patented by Lefauchaux. This particular design is prevalent today in shot-guns, although Savage at one time made a single-shot, high-powered rifle, and there have been several types of target pistols made with the hinged-frame system.

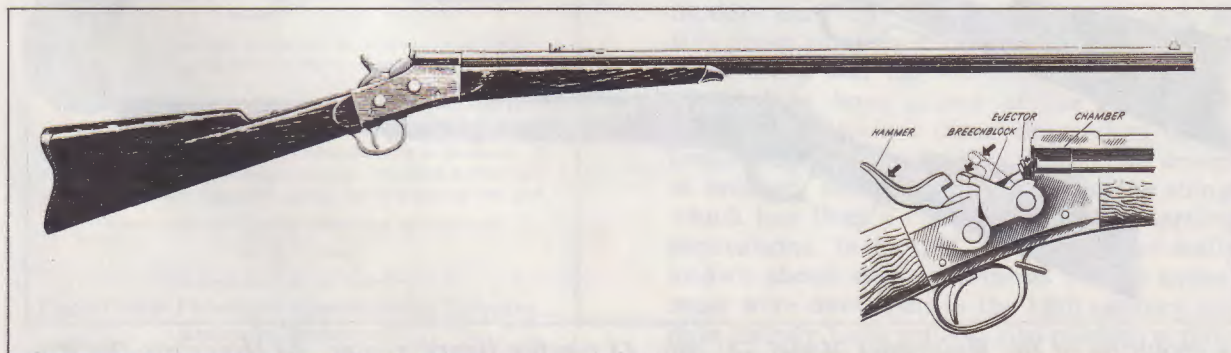


*The Model 73 Springfield trapdoor with action open, showing the breech block swung entirely open for loading.*

The high point of military use of the single-shot, breech-loading cartridge rifle was during the battle of Plevna, in the Turkish war of 1877. It was here that the single-shot Martini-type rifle, in the hands of the Turks, slaughtered advancing Russian troops at long range. It was in this same battle that another American-designed gun, the Winchester repeating rifle, finished the job at shorter range than did the Peabody design at long range. This particular rifle was the 1866 version of the military Winchester, which was merely the Henry rifle with the King-patented side loading gate, in .44-caliber rim-fire.



*Action of Gilbert Smith's American percussion carbine with hinged frame.*



*The Remington rolling block was a favorite among buffalo hunters, and more than a million rifles were sold.*

The use of the Winchester repeater, and its obvious success in two battles, sealed the doom of the single-shot rifles with which most of the armies of the world were equipped. It turned the thinking of the military in every nation to the design and/or use of repeating firearms. Turkey, which had started with 30,000 Winchester repeaters, immediately ordered another 140,000.

Thus it was that the basic ignition ideas, or cartridges as we know them today, were developed between 1800 and 1900, referred to as the Golden Age of Firearms Development. During this period also, rapid advancement was made in firearms design.

In the beginning of the 19th century, we found the flintlock in almost universal usage. It was used by all the military of the day in various forms, both rifled and smooth-bore. The flintlock attained its highest development, as far as our country is concerned, in the design of the so-called Kentucky rifles, which were actually made in Pennsylvania. Breech-loading firearms such as the Hall and Jennings rifles had been introduced and were successful, even though they did leave a lot to be desired in the way of a finished firearms product.

About one-third of the way through the century, the idea of percussion ignition had found its way into firearms development and firearms became, within the scope of their ignition, much more sophisticated. True, some of the same problems of obturation and gas sealing at the breech were still with the designer, but these were gradually being over-

come as design after design flooded the arms markets from the fertile minds of many inventors, many of whom came up with the same idea at the same time, although sometimes separated by thousands of miles, large oceans, or continents.

The two major objectives which were being approached by most of the inventors of the day were the capabilities of the breech-loading and repeating firearms.

#### Samuel Colt

Strange as it may seem, as we look at the situation now, the self-contained cartridge and the breech-loader did in fact follow successful repeating developments. Samuel Colt's revolver, while not the first revolver, utilized a muzzle-loading system of loading the cylinder and was ignited by a cap fired upon a hollow nipple through which a spark found its way into the powder charge. In fact, it wasn't until about 1872 that Colt first marketed a breech-loading revolver. Not, of course, that it was not within the scope of the Colt Firearms Company to develop such a gun; but they were bound by the Roland White patents, held by Smith & Wesson, which precluded anyone other than Smith & Wesson from marketing a revolver using a cylinder through which holes were bored completely.

#### The Civil War — A Cap and Ball Affair

The percussion system died hard — in fact, it is not yet dead. There are many black-powder and replica shooters in the country



*The evolution of the Winchester Model 73: top, .44 rim-fire Henry; center, .44 Henry rim-fire Winchester, Model 1866; bottom, .44 WCS Winchester, Model 73 carbine. Pictures from the Winchester Museum.*

today who use these guns as a source of enjoyment in pursuing their hobby of guns. The percussion system (percussion cap) was utilized all through the 19th century. In fact, one of our bloodiest wars, the War Between the States, was mainly fought with cap-and-ball percussion firearms.



*Samuel Colt, founder of one of the largest firearms dynasties in the United States.*



*The Civil War was fought with percussion arms.*

Some of the first self-contained cartridges, in which there is a metallic cartridge case containing a priming compound, propellant, and projectile, were developed during and immediately following the years of the Civil War. Most of these cartridges were rim-fire of extremely low power and were limited in their development by their ignition system. The percussion cap, however, led to what we now term the center-fire type of cartridge. This is the brass cartridge containing the bullet, propellant, and the direct lineal descendent of the percussion cap, the primer, included into the head of the cartridge case. It functions exactly as did the percussion cap of yesterday.

**If at First You Don't Succeed . . .**

With the advent of the self-contained cartridge, both rimmed and center-fire, immediately following the Civil War, many of the firearms developments which had been tried but failed were given another look. Developments which had been tried unsuccessfully as far back as the matchlock era were tried again with success. These new attempts brought changes in ignition systems until the modern cartridge was developed. In fact, all that most of these old ideas needed to make them work was the self-contained brass cartridge. The lever action of the well-known Winchester rifle is a direct descendent of the low-powered Volcanic rifle. Today we accept as ordinary and take for granted many things which less than a century ago were startling innovations. In fact, if the truth were really known about such systems as we use today, most were developed in the 19th century and have merely been refined into modern sophisticated systems.

Take, for example, the familiar bolt system, or turning bolt system. Its forerunner

**COLT'S**  
New, Double Action, Self Cocking, Central Fire,  
SIX SHOT REVOLVER.

The Hammer is Self-Cock.

.38 cal. long or short.

Price, with Rosewood Stock and Case-hardened Frame, \$18.00  
They will also be finished with Hard Rubber Stock and  
Nickel-plated.

THE FIRST SAMPLES HAVE JUST BEEN ISSUED.

This pistol has the double-hand or pawl, which makes the revolution more free, and adds to the endurance of the arm. It is the only self-cocking pistol which has this advantage. It exceeds in accuracy and penetration any pistol of its class. The material and workmanship cannot be surpassed, and its manipulation is easier than that of any other self-cocking pistol.

*The pistol should be carried with the hammer resting in the safety-notch.*

TERMS CASH.

ALL COMMUNICATIONS MUST BE ADDRESSED TO  
Colt's Patent Fire-Arms Manufacturing Company,  
HARTFORD, CONNECTICUT.

JANUARY, 1877.

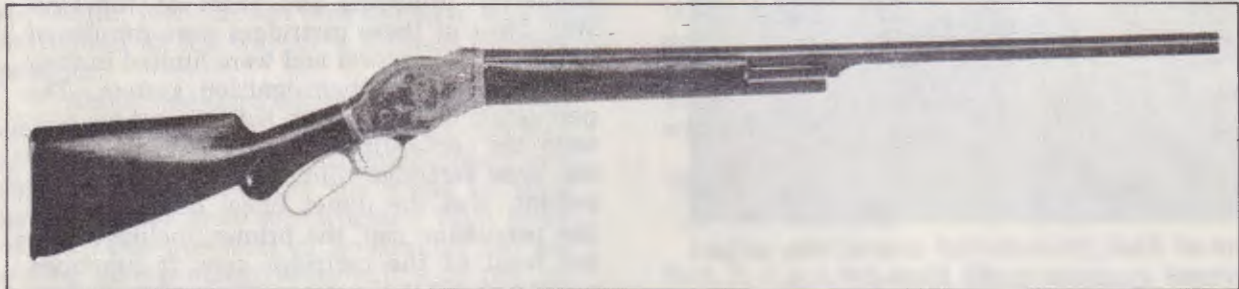
*Advertisement, dated January 1877, for Colt's new double-action six-shot revolver.*

was the Dreyse needle gun, named after its developer. Not that this gun fired needles, but it was fired by a long firing pin similar to a needle. This particular gun used a paper cartridge. Attached to the back or base of the bullet was a fulminate cap or primer device, and behind it and attached to the bullet was a bag of powder. The long firing pin or needle (which in construction and configuration was similar to the striker of modern-day bolt-type firearms) penetrated the bag of powder and struck the primer attached to the base of the bullet. This particular system of ignition and firearm development was unique, to say the least. For one thing, it was the forerunner of the front ignition (systems of ignition powder still in use today not only in experimental rifle cartridges, but very popular for self-contained artillery ammunition in which a tube transmits the primer flash to the front end of the propellant in an effort to obtain better and more complete combustion) and the turning bolt, similar to the bolt latch which is used to lock doors.

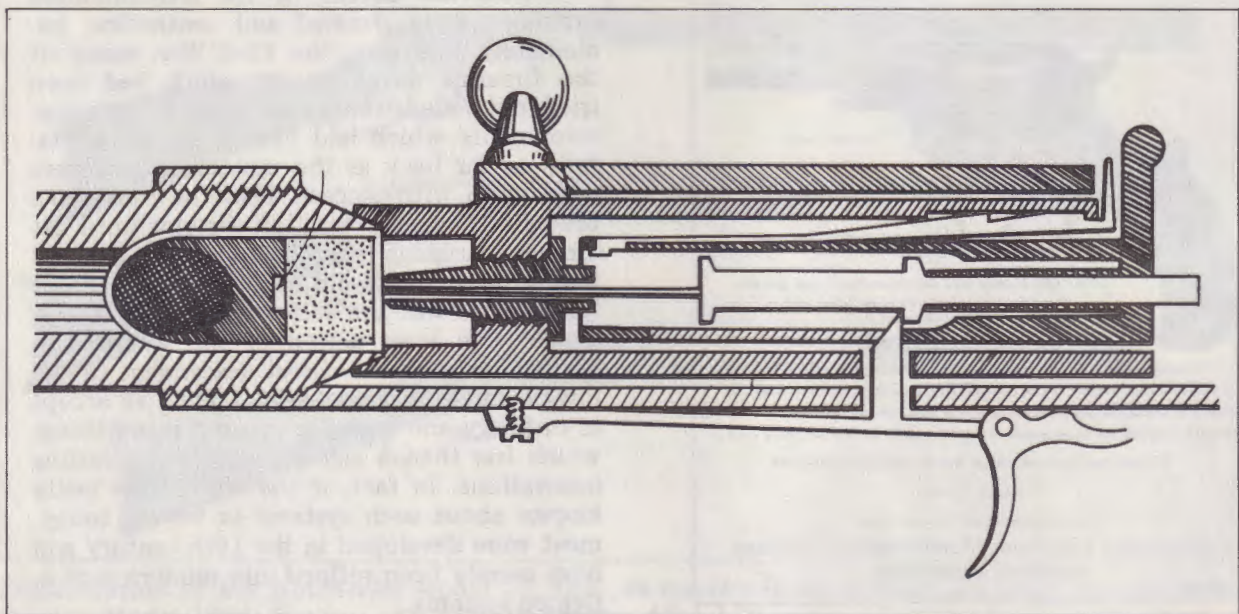
### The Dreyse Had Its Drawbacks, But the Idea Lingers On

The Dreyse system was developed in the late 1830's and was put into use by the Prussian army in 1842. As is often the case with many brilliant military minds, most observers from nations other than Prussia found much to be faulted in the Dreyse system. The obturation obtained with the paper cartridges was very poor. The needle, being in contact with the burning powder and exploding fulminate, corroded very rapidly and broke very easily. Consequently, the Dreyse did not live up to early hopes. It was, however, important. It was, as far as we know today, the first practical application of the turning bolt system.

Another development at the time was the Samuel Colt revolver. This system really never became popular in rifles, either in the cap-and-ball configuration or in the self-contained cartridge configuration. It was, of course, extremely popular and still is for handgun design. This probably stems from the fact that, in some of the earlier percussion



*The Winchester Model 1877 lever-action is a direct descendent of the Volcanic rifle.*



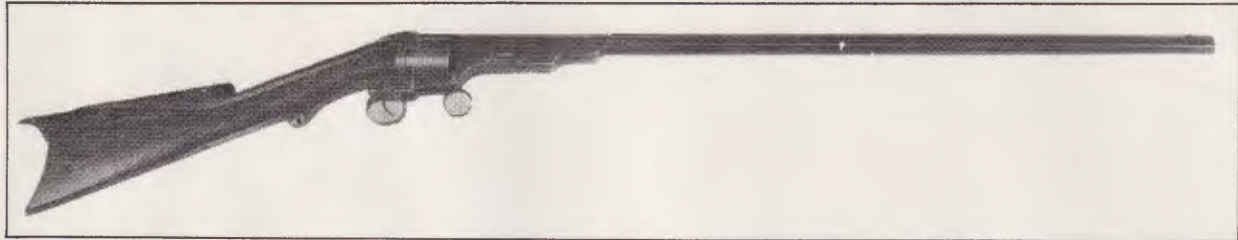
*Dreyse needle gun mechanism and cartridge.*

firearms, fire from one chamber would run around and ignite other chambers. Having one's hand in front of a revolving cylinder, of which one or more chambers might discharge while not in line with the barrel, was a pretty good way to lose a hand. This serious deficiency impaired the popularity of Mr. Colt's invention in long guns, but had no effect on its use as a one-hand gun.

And finally again, to show that few things are new under the sun, a firearms system design known as the Terry was introduced in 1852 in which the bolt-action arm had locking lugs at the rear of the bolt. This system is

much the same as the Schultz and Larson, and the 780 series Remington models in use today.

When you look at the firearms you own, you will see the inventions and innovations of many men, from all over the world, incorporated into their design. We will continue to follow the development of firearms in Part 3 of this history, "War-Born Offspring and Sporting Descendants." As the name implies, many of the fine sporting arms that we enjoy today have come from arms developed for quite another purpose: that of man dominating other men.



The Samuel Colt long gun, a revolving rifle, was not as popular as was his handgun model.

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