Marc Gorelick & Jim Burgess
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PERCUSSION MUZZLE LOADER & BREECHLOADER CONVERSIONS TO METALLIC CARTRIDGE BREECHLOADERS

INTRODUCTION & HISTORICAL BACKGROUND

- This presentation will cover an exciting time in arms development – when percussion muzzle loaders were giving way to breech loading metallic cartridge weapons. In particular it will cover efforts to convert military percussion muzzleloaders and breechloaders to metallic cartridge breechloaders.

- There were many experimental designs, systems and inventions, both in the United States and overseas. Quite a few were ingenious and technologically and mechanically fascinating. Unfortunately, we don't have the time, or examples, to talk about them all and give them their due. This would include discussion of the various cartridge conversions of percussion revolvers. They really merit a separate program of their own. So we will concentrate primarily on the military long arms that we do have examples of and just mention some of the others.

- After Civil War Union had over a million serviceable percussion muzzle loading and breech loading rifles and carbines in inventory. The experiences of the Civil War demonstrated that muzzle loaders and percussion weapons were hopelessly obsolete.

- Rapid technological and industrial advances in breech-loading arms and metallic cartridges had helped speed the end of muzzle-loading weapons. Metallic cartridge breechloaders, including repeating weapons such as the Henry and Spencer, had proved successful in combat. Europe was rearming with metallic breechloaders.

- This was known to the War Department. Before the war ended General A.B. Dyer, Chief of Ordnance, wrote to Edwin M. Stanton, the Secretary of War on December 4, 1865, "The experience of the war has shown that breech loading arms are greatly superior to muzzle loaders for infantry as well as cavalry, and that measures should immediately be taken to substitute a suitable breech loading musket in place of the rifle musket which is now manufactured at the National Armory and by private contractors for this Department …."

- Unfortunately, few of the existing breech loading systems were entirely suitable to be primary infantry weapons. For instance, the Sharps was expensive to manufacture. The Spencer and Henry gave good service during the war but their cartridges were underpowered when compared with the 60 grain charge used in the standard .58 caliber rifle-musket. And weapons such as the Lindner, Merrill, Jenks, Smith and Burnside were not mechanically suitable or economical to be converted to metallic cartridge arms.

- The Union cavalry was better off than the infantry because more than 19 different types of carbines were issued to them in adequate quantities for troop trials under combat conditions. But cavalry carbines were relatively short range weapons and their light weight and construction made them unsuitable for use with heavily charged cartridges – most metallic carbine cartridges were low ballistic efficiency.

- In adopting a metallic cartridge breech loader as a primary weapon the victorious Federal government had another problem. It was broke. The Civil War had emptied the coffers so economics would be a primary factor in choosing a breech loading system.

- The Ordnance Department, probably not wanting to be left out of the breech loading race for fear of having to pay royalties on a patent needed for manufacture, or having to buy finished actions or weapons from a commercial manufacture ordered Erskine S. Allin, Master Armorer at Springfield, to develop a breech loading system.

- However, there is evidence that indicates that Allin had actually begun working on a breech loading system in early 1864. There is correspondence from December 1864 about experimental ammunition and he had first filed a patent application in late 1864. The patent office rejected this first application in January 1865.

- In the meantime the War Department ordered the creation of a board of officers, afterwards known as the LAIDLEY BOARD after its chair, Maj. Theodore Laidley, for the purpose of "examining, testing and recommending for adoption, a suitable breech loader for muskets and carbines, and a repeater or magazine carbine."

- The Laidley Board convened on January 4, 1865 and after tests and examinations of over 40 breech loading rifles, carbines and systems for altering the Springfield musket. The board selected the Peabody system for further study. **(Note: Example of Massachusetts Contract Peabody Rifle in .43 Spanish Caliber displayed.)**

- However, because of the Government's fiscal situation, the cost of re-arming the army with new patent arms was not possible and a simpler breech loader mechanism had to be considered. In June 1865 General Dyer of the Ordnance Department directed Springfield to start manufacturing the Allin breech loading alteration of the Springfield musket.

- On June 10, 1865 Erskine Allin for the second time applied for a patent for his system and letters of patent were granted on September 19, 1865. Two years later, for the sum of $1.00, Allin granted the rights to manufacture his system to the United States.

- The converted arms that we will describe in depth are the:
  - 1st, 2nd, and 3rd Model Allins
  - Sharps Carbine and Rifle Conversions
  - Miller Conversion
  - Roberts Conversion
  - Remington Rolling Block Conversions
  - Needham Conversion
  - Snider Enfield Conversion

- As mentioned, there were many more military percussion long arms, both muzzle-loader and breech-loader that were converted to metallic cartridge breechloaders than Jim or I have examples of. Some of these rifles and carbines conversions are:

  - **Mont Storm** – this was a trapdoor type conversion patented in 1856 and about 400 converted at Harpers Ferry in 1860-61 from (it is believed) Model 1841 "Mississippi" Rifles.

  - **Morse Centerfire Alteration** – these were originally Model 1816 Flintlock Muskets that had already been altered to percussion and converted to metallic cartridge in 1860-61. .69 caliber centerfire cartridge. Historically important as the first U.S. breech loading cartridge longarm.

  - **Joslyn Breech loading Rifle** made by Springfield Armory. About 3,007 were made in 1865. Similar type action as the Joslyn percussion breechloader carbine but documentary evidence proves it was an all new action and manufacture and not a conversion. Historically the first true breech loading metallic cartridge weapon to be made in substantial numbers by the armory.

- **Whitney Phoenix Breechloader** – These were based on a patent issued to Whitney in 1874. According to Flayderman's they have been observed as breech loading conversions in .58 caliber of Model 1861 Rifle-Muskets. Made in various models. About 15,000 military rifles and 1,000 carbines in .43, .45 and .50 caliber centerfire made mostly for Central and South American countries with small numbers for State Militias.

- **Remington Rolling Block Conversions** of Model 1861 and 1863 Rifled Muskets – These were done both by Remington and Springfield Armory. Calibers were .58 Rimfire, .58 Centerfire and .50-70. Except for the Transformed Rifle (discussed later) documentation is scarce about them.

- **Starr Rimfire Carbines** converted from the earlier model percussion breech loader. In 1865 the War Department took delivery of 5,000 Starr carbine conversions, chambered for the .52 caliber Spencer round. The carbine differed form the earlier percussion model in having a smaller, straight hammer and being equipped with a cartridge ejector system. The 2nd U.S. Cavalry was issued Starr carbines in the fall of 1865 and by early 1867 had replaced them with Spencers.

1ST MODEL ALLIN - MODEL OF 1865

- I am going to talk about the 1st, 2nd and 3rd Allins, or Models 1865, 1866 and 1868. I consider these to be conversions. Even so, you will note that as they progressed, fewer parts from muzzle-loaders were used until when you reach the Model 1868 you are right on the border line between a conversion and a new manufactured weapon.

- Springfield made 5,005 Model 1865 rifles from Model 1861 rifle-muskets in 1866. The War Department chose the Model 1861 to be the parent arm for the experimental Model 1865 because it wanted to hold the newer Model 1864 rifle-musket in reserve while the Model 1865 breech loaders were being made.

- Thus, the 1st Model Allin can be identified at a glance, in part, because it has the Model 1861's distinctive flat barrel bands and tulip headed ramrod.

- Erskine Allin's upward lifting breech block design is also remarkably similar in principle to that used on the Mont Storm rifles and carbines, which had been first patented by William Mont Storm in July 1856.

- The 1st Model Allin or Model 1865 is simple in principle but extremely complex with many small, delicate parts.

  - The breech section is milled out of an original .58 caliber Springfield Model 1861 musket barrel by cutting away the rear upper end of the barrel, just ahead of the breech screw, and a breechblock is inserted into this opening and pinned at its upper end so that it swings upward and forward when opened.

  - The breechblock and hinge are supported at their forward end by a strap which is mounted to the top of the barrel.

  - There is a cam at the rear of the breech block which fits into a crevice in the breech screw thus locking it in place. The face of the breech plug was modified to provide a locking surface for the locking cam.

  - The thumb latch fits neatly into the recess in the lockplate where the drum and nipple of the percussion rifle-musket had been.

  - A long firing pin slants downward and inward through the breech block to hit the top center rim of the cartridge.

- The cartridge was a short copper cased rimfire cartridge which had a 480-grain conical lead bullet and a 60-grain charge of black powder.

- Although the stock, barrel, furniture and other parts of the Model 1861 rifle musket were retained, the Model 1865 still had 38 new parts and 5 of the musket parts had to be altered. Springfield had to retool an number of machines and purchase or build others.

- The first rifles were sent to the 12th US Infantry for troop trials in June 1866, and after that to the 18th and 21st Infantry Regiments. Reports from the field were mostly negative – the weapon was long, heavy, cumbersome, and had extractor problems. The space between the lock and stock allowed rain, dirt and sand to get into the mechanism. And the ammunition was unreliable.

- Many were issued to the Union Pacific Railroad and the Western Union Telegraph Company for the protection of work crews in the west.

- **2nd MODEL ALLIN - MODEL of 1866**

- In March 1866 an Ordnance Board headed by Major General Winfield Scott Hancock was assembled to adopt a standard cartridge and caliber for the US Army. The Board recommended that the .45 caliber be adopted because of its accuracy, penetrating power and range. Although U.S. Grant, General of the Army, agreed with the boards' findings, he believed that it was advisable to adopt the .50 caliber as the standard since there were already a large number of .50 caliber weapons on hand and Frankford Arsenal had developed a new .50 caliber cartridge. Therefore the .50-70-450 became the standard for the army and the first rifle adopted for it was the Model 1866 or 2nd Model Allin.

- On July 28, 1866, Springfield Armory started converting the first 25,000 Model 1864 rifle-musket muzzleloaders to Model 1866 breechloaders. By the end of production in 1869, the armory had made about 52,300 Model 1866 rifles.

- The changes included:

  - A reduction in caliber from .58 to .50. The barrel was reamed out to .64 caliber and a .50 caliber liner was inserted into it.

  - An improved U-shaped spring extractor replaced the complex and delicate rack-type extractor of the 1st Allin Model 1865.

  - Three oval barrel bands with band springs instead of the earlier flat barrel bands.

  - The cam latch, breech block, and hinge strap were altered

  - New style M1866 ramrod with slotted tip for cleaning and a threaded tip for keeping it in place.

- The Model 1866 was first issued to the troops of the 5th Infantry in the spring of 1867. By the end if June, over 4,600 were listed in field service.

- The Model 1866's baptism of fire took place in July and August 1867 in the famous "Wagon Box Fight" and "Hay Field Fight" in Wyoming Territory. In the "Wagon Box Fight" a party of soldiers from the 27th Infantry and civilian employees on a wood detail from Ft. Phil Kearny, Wyoming Territory were attacked by a about 1,000 Oglala Sioux led by Chief Red Cloud. The 27 soldiers and 4 civilians (armed with Spencers and Henrys) turned the wagon boxes of their wagons into an impromptu field fortification. The Indians who were expecting to face slow reloading muzzleloaders were unpleasantly surprised at the volume of fire and withdrew with heavy losses when reinforcements arrived from the fort.

- In what became known as the "Hayfield Fight," about 600-800 Sioux braves attacked a party of 21 soldiers and 9 civilian employees from Ft. C.F. Smith who were mowing hay. The soldiers took cover and repulsed repeated Indian charges until a relief column arrived from the fort. The Indians, who were used to facing and taking advantage of slow volley fire, were again unpleasantly surprised at facing the relatively heavy fire of breechloaders.

- The Model 1866 remained the standard rifle of infantry and artillery regiments until early 1871.

- The Model 1866 also saw service in Europe with France during the Franco-Prussian War of 1870. Large numbers were sold to France by the U.S. Government, which saw an opportunity to sell off obsolete weapons, including the Model 1866 which was being replaced by the Model 1868.

3rd MODEL ALLIN - MODEL of 1868

- In February 1868, after studying field reports, the Hancock Ordnance Board concluded that the Model 1866 rifle's weight should be reduced to 9 1/2 pounds by reducing the length of the barrel from 40 to 36 inches. Other changes were also made:

  - The old Civil War .58 caliber barrels would continue to be used by reaming them out to .64 caliber and inserting a .50 caliber liner, although new manufactured .50 caliber barrels were soon introduced.

  - The rear of the barrel was cut off at the breech, threaded, and a new complete action screwed on.

  - There was an adjustable rear sight with a sliding leaf.

  - There were only two barrel bands.

  - A new cartridge extractor was introduced.

  - The breech block is dated 1869 or 1870.

- The first of the new rifles were ready for shipment to the field in the fall of 1869 and by the time production ceased in the spring of 1871, Springfield Armory had produced about 52,145 Model 1868 rifles. It remained in infantry service until 1875.

- The major action that the Model 1868 rifles saw during the early 1870's were in the Arizona Territory against the Apaches and at the California/Oregon Border.

- Colonel George Crook's Tonto Basin campaign against the Apaches was one of the most successful waged during the Indian Wars. Crook's methods called for using Indian scouts against the hostile Apaches. These Indian scouts included Apaches, and many were armed with Model 1868 rifles.

- In one of the last engagements of the campaign, on March 26, 1873, Captain George Randall of the 23rd Infantry Regiment surprised a large group of Apaches on Turret Peak, south of Camp Verde. The soldiers, armed with M1868 rifles, climbed to the summit of the Peak at night and at daybreak fired a volley and charged the surprised Indians. In the fight that followed, 23 Apaches were killed and 25 captured.

- The Model 1868 saw extensive service during the Modoc Campaign along the California/Oregon border against Captain Jack and his followers. Both infantry and some cavalry units used the Model 1868 during the siege of the Modoc stronghold in the lava beds of Northern California.

- It was also issued Indian scouts, Indian Police and State Militias. Florida and Wyoming still had Model 1868 rifles in storage for their militias as late as the Spanish-American War in 1898.

The Springfield Model of 1870 Rifle and Carbine, although still considered in the Allin series, were more new weapons than conversions (as were the subsequent M1873 Rifles & Carbines in .45-70.).

MILLER CONVERSION OF U.S. MODEL 1861 RIFLE-MUSKET

- This was a conversion of the .58 caliber Model 1861 Rifle-Musket to a breech loader firing a .58 caliber rimfire cartridge. It was submitted to the Army but rejected.

- It was patented by William H. and George W. Miller of Connecticut and altered by the Meriden Manufacturing Company of Meriden, CT from 1865 to 1867.

- The rifle was altered to breechloader by cutting the back of the barrel and attaching a new breechblock unit to the top of the barrel.

- Lifting upward on a lug type latch released the breechblock allowing it to swing upward for loading.

- The firing pin angled through the breechblock.

- Mountings, finishes and other details remain the same as for the standard Model 1861.

- The lockplate markings most often encountered are: Parker-Snow & Co., Meriden, Conn.

- About 2,000 rifles were converted. Records indicate that they were used in small numbers by the Maryland and New York militias.

ROBERTS MODEL 1861/1863 RIFLE-MUSKET CONVERSION

- This conversion system was patented by Brig. General B.S. Roberts in 1867. About 5,000 were manufactured in 1869-1870 by the Providence Tool Co., Providence, RI for the Roberts Breechloading Arms Company of New York.

- It used the .58 Roberts centerfire cartridge instead of the .50-70 cartridge that the Army had adopted. This was one factor in its not being adopted by the U.S. Army, especially when the army was by 1870 considering going to a .45 caliber cartridge.

- The alteration was made by cutting off the breech of the .58 caliber percussion rifle-musket and inserting the Roberts breech in its place. To operate, a short lever at the tang was raised which dropped the breech downward exposing the chamber and allowing a round to be inserted. The breech was closed by cocking the hammer.

- Mountings, finish and other details are the same as the standard Model 1861 and 1863 arms. The conversion has also been encountered on the Model 1855 Rifle-Musket.

- I have personally seen two English Enfield percussion muzzle-loaders that were converted to breechloaders using the Roberts system. One was at a Forks of the Delaware show a few years ago.

- The Roberts was selected by the New York Trial Board in 1867 and New York signed a contract with Roberts to convert 10,000 Model 1861/1863 rifle-muskets then in state militia armories. The Providence Tool Co had already made 2,000 conversions when the New York legislature refused to appropriate funds for the contract.

- Roberts then contracted with South Carolina, which purchased 5,000 conversions in 1870 to arm all of its 13 National Guard regiments. The rifles suffered heavy loss and breakage and were phased out of service between 1879 and 1890.

- **SHARPS CARBINE and RIFLE CONVERSIONS**

- After the Civil War the U.S. Government decided to convert as many of their percussion arms to metallic cartridge breechloaders as possible. The Sharps was one of the arms selected for conversion and a contract was signed with the Sharps Rifle Manufacturing Company in November 1867 to alter weapons of their manufacture at a price of $4.50 each.

- The War Department considered the Sharps conversion to be a temporary expedient because what it really wanted was an arm using the same breech system throughout the service. So while the converted Sharps were being issued to troops in the field the Ordnance Department made the decision to field test a number of other small arms. However, the converted Sharps allowed the issue of the same .50-70 ammunition to practically the entire army.

- The New Models 1859, 1863, and 1865 Rifles and Carbines were chosen as best for conversion and 31,098 carbines and 1,086 rifles were converted.

- Conversion carbines were of two major types:
  - Original 6-groove bores; and
  - Relined barrels with 3-groove rifling.

- The government allowed all bores less than .5225 to remain unlined. All bores over that size were re-lined to .50 caliber.

- The converted actions were also of three major types:
  - "Model 1867" type .52-70 conversion using a spring-loaded firing pin and 6-groove original barrels. Although the bore was .52 caliber it was intended to chamber the 50-70 center-fire cartridge. About 1,900 were made and most converted from the Model 1863.
  - "Model 1868" type .52-70 conversion with a cam type firing pin and the original 6-groove rifling. It also chambered the .50-70 centerfire round.
  - "Model 1868" type .50-70 centerfire with cam type firing pin and 3-groove lined barrel. About 27,000 were made.

- All the converted rifles were altered to .50-70 centerfire and received the 3-groove relined barrels.

- Some conversions that retained the original stock had the original patchbox. Conversions were refinished by the factory and when the original stock had to be replaced it was replaced by a new stock with no patchbox, whether the original model had one or not.

- The first of the newly converted carbines were shipped to Leavenworth Arsenal in October 1868.

- The converted Sharps carbines saw extensive service on the Western Frontier in the Indian Wars. At one time they armed most cavalry regiments, and were on regimental inventories even after the Springfield Trapdoor .45-70 became the standard cavalry carbine in 1873. As late as 1882 the Secretary of War reported to Congress that 250 Sharps carbines were still on the regimental rolls of the regular cavalry. They were also used by Indian Scouts, civilian employees and were issued to State Militias. New Mexico still armed one of its militia cavalry troops with Sharps carbines as late as the Spanish American War.

- The troops liked the Sharps. They were used to its action from the Civil War where it was one of the most popular cavalry carbines on either side. During the 8-month long Modoc War the cavalrymen found that the centerfire Sharps never misfired but occasionally did have a cartridge stick in the chamber. In one engagement in the lava beds, 1st Cavalry troops armed with Spencers were issued a bad lot of rimfire cartridges that misfired. They would have been overrun except that the troopers next to them, who were armed with Sharps carbines, kept up a steady fire and broke the Modoc attack.

- The Sharps Company converted 1,086 Model 1859, 1863 and 1865 percussion rifles to fire .50-70 cartridges under a contract for the U.S. government.

- This is an outstanding example of a factory conversion of a 3-band Model 1863 to .50-70. It still has the original 6-groove barrel and stock as can be seen by the patchbox.

- I haven't found any cartouches, especially the "DFC" in a banner cartouche indicating that it was either not sent to, or accepted by, the War Department. Perhaps it was a factory overrun.

- You can differentiate the converted Sharps rifles from the Springfield manufactured Model 1870 Sharps rifles at a quick glance because the conversions have 3 barrel bands and no ramrod while the new weapons have two barrel bands and Model 1868 ramrod.

SWEDISH REMINGTON ROLLING BLOCK MODEL 1860/67 and 1860/68

- I briefly mentioned United States conversions of rifle-muskets to Remington-Rider Rolling Block breechloaders. The most famous in the US is the conversion of the Model 1864 Rifle-Musket to the Model 1868 Springfield-Remington Transformed Rifle in .50-70 caliber.
- In 1867 General Dyer, Chief of Ordnance, ordered Springfield Armory to convert 504 Model 1864 Rifle-Muskets to breechloaders using the Remington Number 1 actions.
- The work was accomplished by cutting the Model 1864 in two and splicing-in the Rolling Block action. Remington reworked the rifle-musket barrels and attached them to the action. The weapons were then shipped to Springfield where the work was completed.
- These rifles were issued for field trials and reports from the field were mostly negative. The Remington loaded at full cock, which officers thought was unsafe with inexperienced troops, and it had trouble ejecting spent cartridges due to weak main springs. When the Army issued the Ward-Burton for field trials, it recalled the Springfield-Remingtons, which were eventually sold off.
- The U.S. was not the only country trying to use Remington Rolling Block actions to convert muzzle loaders to metallic cartridge breechloaders.
- In the early and mid-1860's the standard Swedish infantry weapon was the Infantry Rifle Model 1860 percussion muzzle loader.
- In May 1867, Sweden adopted the Infantry Model 1867 in the Remington Rolling Block action. The Army used the 12.17x42R rimfire and the Home Guard used the 12.7x44R centerfire cartridge.
- There was an initial order of 10,000 complete rifles from Remington. In addition, 20,000 rolling block actions were ordered from Remington to convert existing supplies of the Swedish Infantry Rifle Model 1860 percussion muzzle loader to the new metallic cartridge breechloader.
- The Swedish rifles were taken apart, the one-piece stocks cut into two pieces to accommodate the rolling block action and the Remington actions installed using the now two-piece stocks and Model 1860 barrels, creating the Model 1860/67. This was done at Carl Gustafs.
- The Swedish Model 1860/68 is a shorter version (by 4") of the Model 1860/67 rifle. These rifles were also converted from Model 1860 muzzle loaders.

NEEDHAM CONVERSION RIFLE-MUSKETS ("FINIAN RIFLES")

- This design by Joseph & George Henry Needham of London, England, featuring a new receiver with a "trapdoor" breechblock that opens laterally to the right side, was first patented in Britain on October 10, 1865 and later issued a U.S. patent on May 21, 1867. These firearms have a colorful history associated with the Finian Brotherhood, a secret society of Irish ex-patriots determined to win Ireland's independence from Great Britain. Their plan (perhaps hatched over one too many pints of Guinness) was to invade Canada and hold it hostage for Irish independence.

- After the Civil War the Finians, many having formerly served in the Union army, raised funds and purchased 4,220 surplus, muzzle-loading M1861 rifle-muskets from Alfred Jenks & Sons' Bridesburg Armory in Philadelphia. These rifles all had Bridesburg marked lockplates.

- With these muzzle-loading rifle-muskets, 800 Finians crossed the Niagara River from New York into Canada on June 1, 1866. They were successful in capturing Fort Erie but, in the Battle of Ridgeway on June 2, they were forced to retreat as Canadian reinforcements closed in.

- Upon returning to U.S. soil the Finians were disarmed by the U.S. Army. However, the Irish-American vote was strongly coveted by certain U.S. politicians and they managed to get the weapons returned to the Finians who had presumably learned their lesson. Not quite.

- Evidently the Finians felt their only mistake was not having enough firepower. They decided to have their muzzleloaders converted to breechloaders using the Needham system (ironically a British design). In 1867, after finding Colt's price tag too high, they approached and were rejected by Springfield Armory (then engaged making 2nd Allin conversions). The work was reportedly done in a secret machine shop in Trenton, N.J. By late 1869 a total of 5,020 rifle-muskets (to include an additional purchase of M1863 & M1864 Springfields) had been converted.

- The barrels had to be cut off at the breech for installation of the new unmarked receiver ("shoe"). The lockplate also had to be reduced to allow room for the receiver. The nose of the hammer locked the breechblock in place as it fell and delivered a glancing blow to the spring-loaded firing pin. This was not a strong design and found little favor elsewhere. These conversions fired the Berdan .58 caliber center-fire musket cartridge.

- On May 25, 1870, the Finians launched a second invasion into Canada, this time crossing the border from Vermont with 200 men. They were intercepted and soundly defeated by the forewarned Canadian militia (now armed with Snider conversions). All the weapons of the invaders were again confiscated by the U.S. Army and nearly 800 more Finian arms were found and seized to include partially assembled Needhams at Trenton.

- The army auctioned off a total of 984 captured Needham conversions on January 25, 1871. The winning bidder was surplus dealer Schuyler, Hartley & Graham.

- To confuse the collector market, Schuyler, Hartley & Graham acquired additional muskets and parts and assembled nearly 800 more Needham conversions in 1871. Many of these arms were later sold through Francis Bannerman and other military surplus dealers.

- Some Needhams will be found with the stock cut under the middle barrel band so that they could be transported surreptitiously. These are unquestionably Finian rifles that saw some use. However, it is not clear that all Finian weapons were so modified.

- The example shown has a Bridesburg lock but does not exhibit the cut under the middle band.

SNIDER ENFIELD CONVERSIONS

- Action invented by Jacob Snider (1811-1866), an American, in the early 1860s.

- Britain's observations of our Civil War, and the Danish-Prussian War (1864), compelled the formation of an Ordnance Select Committee (similar to Laidley Board) on July 11, 1864 to find a breechloading replacement for its standard infantry arm, the P1853 Enfield rifle-musket.

- The development of the Prussian needle gun (1848) and French Chassepot rifle (1866) made the need to modernize more urgent.

- After reviewing over 50 different designs, the Committee recommended that the Snider action, the only center-fire design submitted, be used to convert Britain's large inventory of muzzle-loading rifle-muskets to breechloaders as an interim measure.

- Production of Snider Enfields began in 1866 and continued until the adoption of the Martini-Henry Rifle in 1871 caused production to be phased out.

- The Snider action was fitted to the rear of the cut barrel with minimal modifications to the lock and stock. The breechblock was hinged on the right side and contained a spring-loaded firing pin. To extract a fired .577 Snider case, the hammer had to be half-cocked, the breechblock opened, and then pulled to the rear.

- Canada received its first shipment of 30,000 Snider Enfields in late 1867.

- There were a total of 5 modifications designated by "Marks" stamped on top of the receiver ring:

    - Mk I: The original series designed for the Pottet cartridge case (brass head with cardboard body much like a shotgun shell). The breech had a rounded rebate for the case rim.

    - Mk I*: (1867) Altered Mk I to use the brass cartridge case ammunition perfected by Col. Edward M. Boxer which greatly improved accuracy. The breech rebate was squared.

- Mk II*: Same configuration as Mk I* but manufactured that way originally without alteration. (Example shown.)

- Mk II**: A Mk II* with strengthened breechblock.

- Mk III: (1869) Entirely new made rifle with steel barrel, flat nosed hammer and improved locking breechblock. (Not a conversion.)

- The Snider action became very popular and was copied by other counties. Even though more modern designs were soon adopted, the Snider Enfields in rifle and carbine form continued in use for many years afterward. Some Canadian militia units used them into the 20th century.

- The example I have is a Canadian Snider Enfield as evidenced by the "DC" cartouche on the left side of the butt stock. It was converted from a London Armory P1853 rifle-musket originally made in 1861 as can be seen from the lockplate markings. The breechblock is marked "B.S.A.Co." and the receiver ring shows it is a Mark II* so it evidently was converted in Birmingham around 1868.

CLOSING REMARKS

The mid 19th century was a period of great advancements in firearms technology. Consider that our military forces went from single shot, muzzle-loading, smoothbore muskets with flintlock ignition to repeating, rifled breechloaders using internally primed metallic cartridges all in a span of only 25 years. Compare/contrast that to the last 40 years and the relatively minor improvements we have seen applied to the M16 rifle. Necessity is often the mother of invention. The American Civil War clearly demonstrated the superior firepower of breechloaders using self contained metallic cartridges and inspired many other important firearms designs and developments.

Cartridge conversions represent a transitional phase between the percussion muzzle-loaders of the Civil War period and the modern cartridge firearms we know today. Their active usage was relatively short lived but they are none-the-less a significant link in the history of firearms development and that is what makes them so fascinating for collectors like Marc and myself.