

# A FIRST MODEL SHARPS PISTOL-RIFLE

by Ralph Spears

## Background

An interesting rifle was offered in a recent Rock Island auction. I liked it because it was a cased gun, which always appeals to me and was made by Christian Sharps. Otherwise, I knew nothing about it but as I collected Sharps carbines used during the Civil War and had recently completed extensive research on other Sharps' rifles and carbines made by Sharps and William Hankins,<sup>1</sup> also during the Civil War, I made a bid. To my surprise, my bid was successful. Now I had to do some research and find out about what I had bought. This is what I found.

In 1854 Christian Sharps was already a famous designer and inventor of firearms. The iconic dropping breech percussion carbines that he had designed, which carried his name, had been purchased by both the U.S. Army and Navy and had already seen service. The latest model of those carbines and sporting rifles were then being made by the Sharps Rifle Manufacturing Company (SRMCo) in Hartford, Connecticut. Sharps however, had become unhappy with that company. He had argued with Richard S. Lawrence, a noted inventor and the plant superintendent of the factory in Hartford, over the redesign of the carbine. He was also upset that the Company had refused to manufacture single shot pistols that he had designed. Consequently, he had sold the rights for his patents in 1852, and was no longer associated with that firm. On his own, and soon in partnership with Harvey Hull in Hartford, Christian Sharps failed with a new company to manufacture cartridges and primer pellets. In 1853, after that failure, Sharps moved to Philadelphia and formed a new firearms company in 1854, the C. Sharps & Co. The City Directories for 1855 and 1856 list the address of his retail store at 336 Frankford Road.<sup>2</sup> He began the manufacture of the single-shot pistols that he had failed to manufacture with the SRMCo. He also began designs of new firearms. He would continue to make and sell firearms in Philadelphia for the next sixteen years.

C. Sharps & Co sold firearms from its store at 336 Frankford Road between 1854 and 1856. In 1856 the Company relocated offices and the retail store to a larger property at 486 Green Street.<sup>3</sup> The new address was owned by Sharps' new partner, Ira B. Eddy. Eddy provided needed capital but also owned a large three-story brick building near the western end of the 'Wire Bridge' over the Schuylkill River at 30th Street (Figure 1). Sharps and Eddy began manufacturing firearms in this building. The image of this facility was displayed on the Company's business cards and letterheads and titled as the Fairmount Rifle Works. Note the 'Wire Bridge' in the image, then a famous Philadelphia landmark constructed in 1842, is shown on the right in Figure 1. The Rifle Works housed in the building depicted allowed for the expansion of the factory facilities needed for the manufacture first of the Sharps' single shot pistols, and later, the firearms of his subsequent designs.

Sharps and Eddy organized the layout of the new works to be efficient and functional. The works were powered by steam. Smoke can be seen rising from the stack at the building's rear in Figure 1. The forging of components was done in the basement. Barrels were made on the first floor; tools and smaller parts were made on

the second floor. Assembly and finishing were done on the third floor.

The Company briefly changed its name to Eddy, Sharps & Company in 1857, but later that year, Nathan A. Bolles also joined the business, and the Company's name reverted to C. Sharps & Co.<sup>4</sup> All firearms manufactured by Sharps in Philadelphia are stamped with the name "C. Sharps & Co" until 1862 when William C. Hankins became a partner.<sup>5</sup>

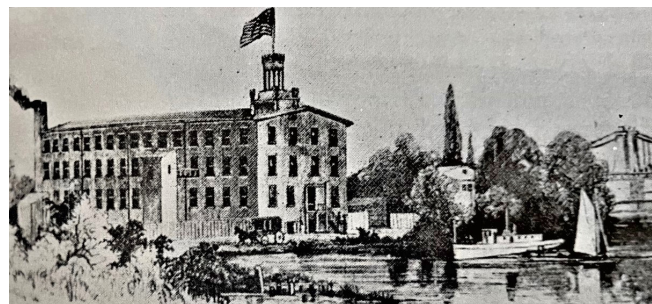
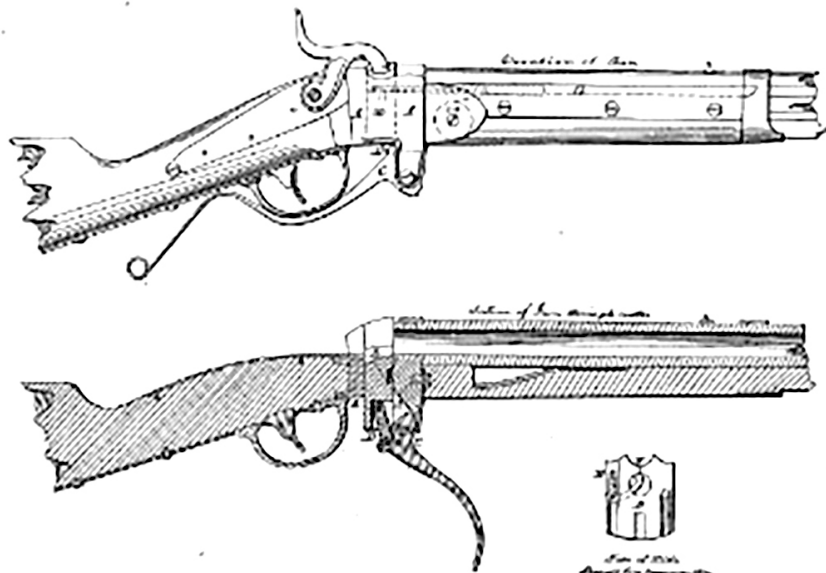


Figure 1. Fairmount Rifle Works at the Wire Bridge in Philadelphia, 1856.

At his new factory in Philadelphia, Christian Sharps first manufactured single shot pistols based on his 1848 patent. This patent, No. 5,763, for a breechloading firearm with a dropping breech, was also the basis of the more famous firearms manufactured by the SRMCo. Figure 2 shows the drawing of the awarded patent. Although, he had sold the rights to the patent to the SRMCo, and the design was a clear infringement on his earlier patent, he was able to manufacture the pistols because (1) the SRMCo had no interest in manufacturing pistols and Sharps believed the refusal of the company to manufacture pistols had been a breach of his contract that had sold the patent rights to the SRMCo, and (2) pistols were not in competition with rifles and carbines made by the SRMCo. Moreover, Sharps had sued the SRMCo, and until the suit was resolved, he was not allowed to manufacture the pistols.<sup>6</sup> The suit was finally settled in January 1859 unfavorable to Sharps, but the C. Sharps & Co had already temporarily suspended manufacture by 8 July 1858. The R.G. Dun & Co Credit Report makes the following statement: [Sharps'] "have suspended operations for the present owing to a law suit with Hartford [Sharps] Rifle Co. as to the right of C. S[harps] & Co. to manufacture the Rifle."<sup>7</sup>

Before manufacturing ended, the C. Sharps & Company made two models of pistols. Both models incorporated the Sharps' dropping breech and, also, the automatic pellet priming system that Sharps had patented on 5 October 1852 (Figure 3), Patent 9,308. Sharps had also sold the rights to that patent to the SRMCo. The pistols also incorporated the added improvements to the pellets carried within a metal tube, Patent 9,820, awarded on 28 June 1853 (Figure 4). The action of the primer is shown in Figure 5. A plunger (A) attached to the hammer (1) skims a pellet primer from the top of the primer magazine (2). The plunger stops (3) but the primer continues to a position over the cone nipple (D).

Figure 2. Sharps' patent 5,763  
Drawing for "dropping breech"

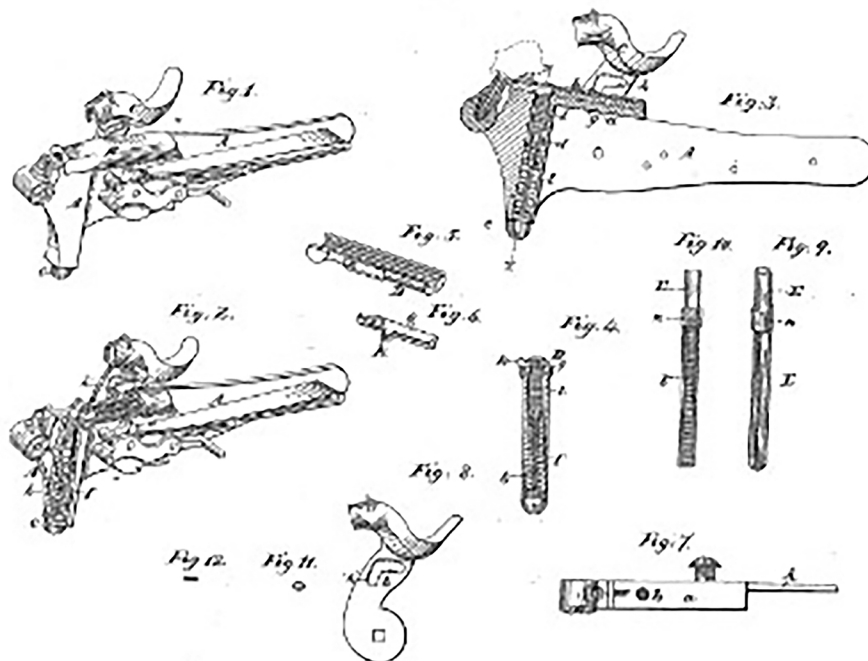


No. 5,763

C. SHARPS  
Breech-Loading Fire-Arm

Patented Sep. 12, 1848.

Figure 3. Sharps' patent 9,308  
Drawing for Sharps Automatic  
Priming system.



No. 9,308

A. SHARPS  
Priming Cycle

Patented Oct. 5, 1852

The earliest of the single shot pistols are called the 'small frame' by collectors. These are all chambered for .31 caliber paper cartridges. The production of these pistols is believed to have begun in mid to late 1854.<sup>8</sup> About 400 of the pistols were eventually manufactured.<sup>9</sup> A 'large frame' model was introduced the next year.<sup>10</sup> The 'large frame' pistol was chambered for .36 caliber. Initially, they were chambered for paper cartridges, but by 1857, Sharps had developed a metal cartridge, and the falling block was modified to accept it. Sharps developed two types of cartridges. The first had a wire extended from the base, an 'extractor arm'. The wire was used to pull spent cartridge cases from the chamber. Later, a 'mule-ear' replaced the wire with an extended base of the cartridge case for the same reason. Sharps's pistols had no extractor. Only the extractor wire or 'mule-ear' allowed for the removal of the spent cartridge from the chamber. Production of the "large frame" pistols numbered less than the "small frame", only about 350 were manufactured.<sup>11</sup>

### Sharps Pistol Rifles

The production numbers show that the pistols were not a large commercial success. Over a period of about 30 months, only about 750 pistols had been manufactured, and fewer actually sold. In 1857, to increase his market, Sharps began making rifles, still using the same action, aimed especially at the sportsman's market. Sharps also hoped to interest the Army. However, no rifles were yet finished by September 1857 in time for the 1857 West Point Trials. On 12 August 1857, in a letter to Colonel H.K. Craig, Chief of Ordnance, the C. Sharps & Company listed the arms that would submit for the West Point Trials to take place the following month. This list included a Model 1841 rifle modified as a breechloader with Sharps's patented bolt action<sup>12</sup> (Patent 16,072 of 11 November 1856) and pellet automatic primer, and one of each type ('small frame' and large frame') of his single shot pistols.<sup>13</sup> None of these firearms were listed in the 18 firearms actually evaluated in the West Point Trials.<sup>14</sup> In the same letter was the statement: "our Model Rifle, containing all of our Mr. C Sharps' improvements +

for which he has obtained patents, is not quite finished.” This rifle he referred to was most likely one of his pistol-rifles. This is fully confirmed by the description in the next sentence of the letter: “The Pistols which we present, however, combine all the improvements and are exactly like the Rifle under construction.”<sup>15</sup> This letter is also important in that it dates the first production of these rifles to after the date of this letter.

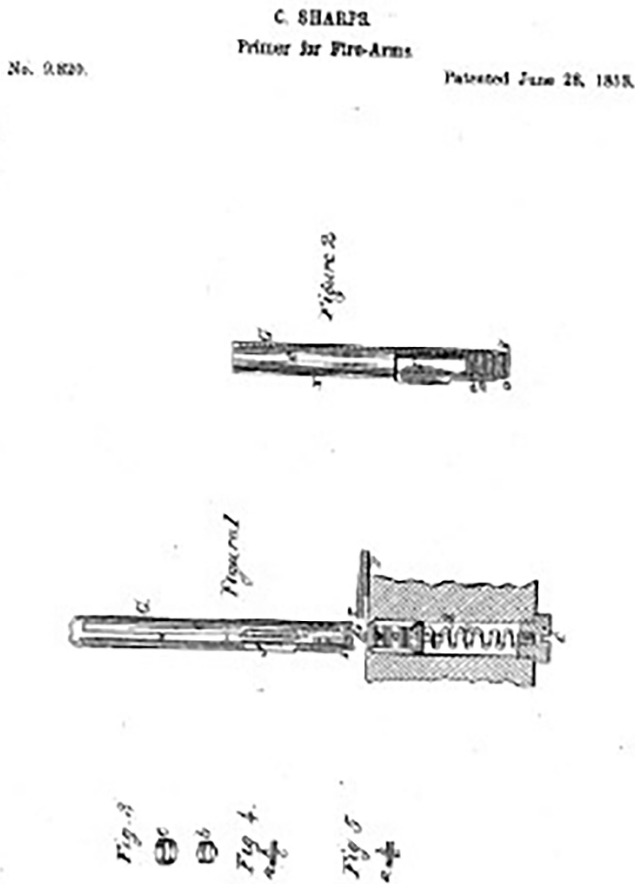


Figure 4. Patent 9,820 Drawing for Improvements to Sharps Automatic Priming System.

There are three variations of pistol rifles made by Sharps. The first of the new Sharps rifles (Figure 6), known to collectors today as a first model - first type, used frames originally manufactured for the ‘small frame’ pistols. These rifles retained the serial numbers originally allocated for pistols with serial numbers for these rifles beginning in the mid-400s.<sup>16</sup> Rifles are mostly found with a 26½ inch octagonal barrel and are chambered for a .31 caliber paper cartridge. Characteristics of this type rifle are the octagon barrel, the wooden cleaning rod held under the barrel, the lack of a patchbox and the screw seen on the wrist of the stock that held the stock to the original pistol’s frame. Most of these rifles have German silver hardware. The rear sights are mostly open “v” notch. Based on serial numbers, the total production number of rifles made of this model and type was no more than 50.

The second variation is similar to the first and is also known as a first model but as a second type (Figure 7). It used unfinished frames originally manufactured for the ‘large frame’ pistols. These rifles are all chambered, like the ‘large frame’ pistols, for .36 caliber cartridges. Unlike the pistol rifles using smaller pistol frames, the frames had not been finished and had not yet been stamped with serial numbers. A new set of serial numbers was introduced

for these rifles, beginning with ‘1’. These rifles typically have 28-inch barrels but the barrels are round. These rifles no longer have a cleaning rod mounted beneath the barrel. All the rifles do have a round iron patch box within a tear-drop blued escutcheon added to the right side of the stock. To make the stocks stronger, the backstrap of the original pistol frame was straightened and used to securely attach the stock to the frame. The screw through the wrist of the stock was discarded. Hardware is usually iron. The most common rear sight found on these rifles is a brass sighting tube. Less than 50 of this type of rifle were manufactured.



Figure 5. Action of the Sharps Patent Automatic Priming System displaying the linked plunger driving a percussion priming pellet from the magazine to a position over the cone nipple as the hammer falls. (Diagram reprinted from The Gun Collectors Letter No 15, 21 August 1947, p 73).

The breechblocks were modified. During the production of the ‘large frame’ pistols, Sharps had developed metal cartridges and the pistols and this model pistol rifle had the dropping block modified to accept either an ‘extractor arm’ or “mule ear” metal cartridge (Figure 8). These cartridges are described below.

The third variation (Figure 9), while the most common, is still rare. Probably only a few hundred were manufactured. These rifles are known as the Second Model. These rifles are very similar



Figure 6. Sharps First Type of the First Model Pistol Rifle (photograph courtesy of Morphy Auctions).



Figure 7. Sharps Second Type of First Model Pistol Rifle (Author's collection).

to the second type of the first model but instead of using unfinished 'large pistol' frames, they all have purpose-built and re-designed receivers. The receivers have a similar but different profile. These rifles still have 28-inch round barrels and the serial numbers seem to be a continuation of the number range begun with the First Model, second type rifles. Many of these rifles have a new type adjustable rear sight designed by Christian Sharps. The sight allows range adjustments to 600 yards. Sharps will eventually patent this sight on 23 July 1861 (Patent 32,899).<sup>17</sup>

### New Cartridges

By the mid-1850s when these rifles were manufactured, it was a period of rapid developments and improvements in cartridges. Before the 1850s, the military used prepared paper cartridges mostly as a way to improve a soldier's rate of fire. Firearms were overwhelmingly muzzle-loading and cartridges for smoothbore muskets and pistols were paper wrapped and combined lead projectiles with a pre-measured quantity of black powder. Cartridges were easily handled and carried. The Sharps Pistol Rifles, as were the earlier single-shot small and large frame pistols were all still designed to use paper cartridges. The cartridges included a conical ball of the correct caliber wrapped in paper with the pre-measured quantity of powder. Metal cartridges had been in development since at least 1812 when Samuel Johannes Pauli of France invented a cartridge with a metal (brass) base. Full metal cased cartridges for breechloading arms were introduced as early as 1832 by Louis Perin, also of France. At this early date, metal cartridges had to be cast and the metal, normally brass, was inflexible and did not expand to provide an effective gas seal. The cost to manufacture a metal cartridge case was uneconomical and uncommon. The patent of Luther White in the United States in 1852 to shape thin metal sheets solved many problems. Luther's patent to make lamp holders and rivets was soon recognized as ideal to make thin and cheap brass cartridges. The thin metal makes the cartridge flexible. When the cartridge is fired, the casing expands and effectively

seals the breech from venting expanding gasses at the breech. In 1856, first Ambrose Burnside in March and then Doctor Edward Maynard in June patented metal cartridges manufactured using White's method. The important characteristic of both of these metal cartridges was that they provided an effective gas seal at the breech when the cartridge was fired in their new patented breech-loading firearms.

By 1857, Christian Sharps had also invented metal cartridges to use in his single shot pistols and pistol rifles. He did not secure patents for his cartridges and there is no record of any legal actions for patent infringements. Maynard, whose patent was filed after Burnside's, claimed his cartridge differed from the Burnside because the Burnside cartridge was for use in firearms with moveable breeches. The Sharps cartridge differed in this same way. Also, unlike Burnside or Maynard, Sharps made no claim that the cartridge provided an effective gas seal at the breech. He did not need to because he had already claimed the gas seal as part of his original 1848 patent for his dropping breech. The Sharps cartridges were not needed to seal the breech. The cartridges were primarily intended to be re-loaded and reused.

Sharps' first design is 'an extractor arm' cartridge, shown in Figure 10 (left). The small and large frame pistols and pistol-rifles have no mechanism to remove the spent cartridge case after firing and this cartridge has a metal wire attached so that the case can be pulled back from the breech after firing. It was not ideal but, presumably, it mostly worked. Sharps soon designed an improved cartridge. The wire of the 'extractor arm' cartridge could break off, making the removal of the expanded casing difficult. The new design was very similar but replaced the wire 'extractor arm' with a cast extension to the cartridge base. This 'mule-ear' design is also shown in Figure 10 (right). The 'mule-ear' is unlikely to break off.

These were the first metal cartridges designed by Christian Sharps. They would soon become obsolete and be replaced, mak-

ing surviving examples of these cartridges very rare to collectors. In 1857, in probably the same year Sharps began to manufacture these cartridges, Smith and Wesson and Ethan Allen began to market small caliber pistols firing a new type primed metal cartridge, the rimfire.<sup>18</sup> By 1859, Sharps incorporated the Smith and Wesson and Ethan Allen improvements, not yet patented, and designed and patented a small caliber four-barrel pistol that fired these same rimfire cartridges.

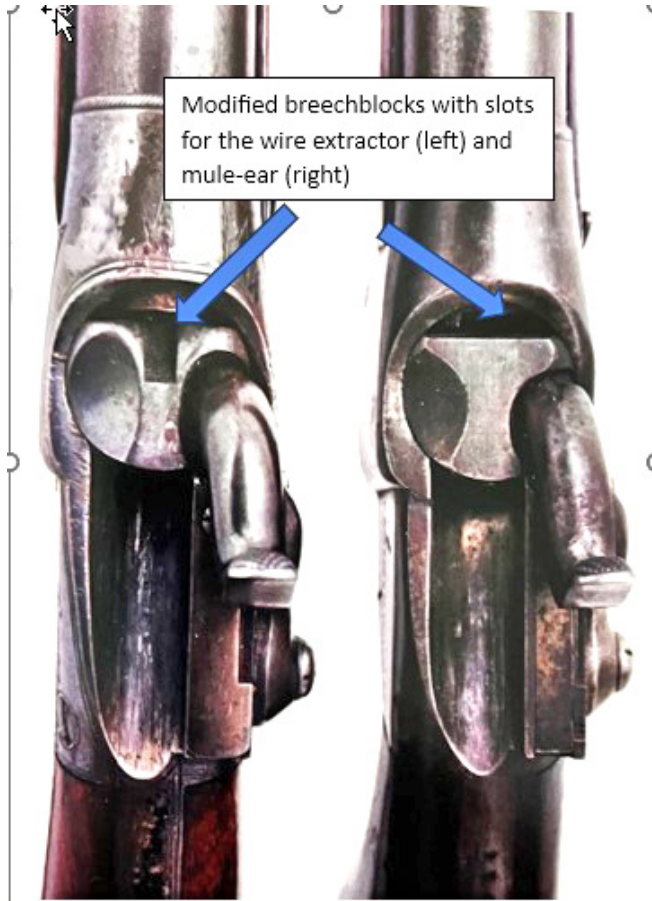


Figure 8. Comparison of modified breechblocks showing slots for extractor.

### My Sharps Pistol-Rifle

My Sharps Pistol-Rifle (Figure 11) is one of the approximately 50 made of the second variation of the first Model. The frame and breech were originally manufactured for a 'large frame' pistol. The frame was unfinished without a serial number when it was used to make this rifle. A new set of serial numbers had been introduced for these rifles and this rifle is serial numbered '11'. On this rifle, the number is stamped on the underside of the operating lever

(Figure 11, bottom left). The receiver is stamped on the right side under the hammer: "C. SHARPS / PATENT /1848-52" in three lines, (Figure 11, middle). The patent dates refer to the original dropping breechblock patent, 5,763, awarded 12 September 1848 and to Sharps' patent for his automatic percussion capping system, 9,308, awarded 5 October 1852.<sup>19</sup> The left side of the receiver is stamped identifying the manufacturer: "C. SHARPS & COS. / RIFLE WORKS / PHILADA PA." also in three lines. The rifle is .36 caliber with a 28-inch round barrel, typical of this variation. The receiver finish is case hardened and the barrel, trigger guard and buttplate are blued. Inlet into the right side of the stock is inserted a circular patch box within a tear-drop blued escutcheon. The rear sight found is a sighting tube (Figure 11, bottom right). The front sight is a brass blade.

The breechblock has been modified to accept the Sharps 'mule-ear' metal cartridge (Figure 12). Cartridges were supplied in pasteboard boxes of twelve cartridges. Interestingly, the boxes were printed in six lines with instructions: "*The balls and Brass / Tubes should be kept well / greased to insure accurate / shooting, and to prevent the / tubes from sticking in the / Gun.*"

The rifle has the Sharps automatic primer system Sharps originally patented in 1852. Primers were pellets that were ejected from the rifle's primer magazine into a position directly over the cone nipple as the hammer fell. The primers were supplied in individual copper tubes originally packed in small tin boxes (Figure 13). The box had a paper label printed "SHARPS / PATENT PELLETS / OR PRIMERS / Patented June 18, 1853". Note the patent date refers to Sharps' patent 9,820. This patent is an improvement of his original patent for his pellet priming system, patent 9,308, awarded 5 October 1852. The new patent provides for the small tube to carry the pellets, simplifying the loading of pellets into the magazine described in Sharps' earlier patent. A tube of pellets is also shown in Figure 13. The small pellets can just be seen in the brass tube.

The cased set was obviously made for an American military officer, probably a militia officer. The set with the pistol -rifle includes:

- Black patent leather military belt with non-regulation two-piece gold plated eagle and shield/wreath buckle,
- A British style black patent leather primer pouch
- A rectangular black patent leather Sharps cartridge box containing a cartridge tin with a wooden block to hold eighteen cartridges and space in the lower portion, below the wooden block, for additional loose cartridges.
- A .36 caliber single shot iron bullet mold stamped with a possible serial number "771".
- A rectangular tin Sharps primer box (empty) with a paper la-



Figure 9. Sharps Second Model Pistol Rifle (photograph courtesy of Collectors Firearms).

bel that reads "SHARPS / PATENT PELLETS / OR PRIMERS / Patented June 28. 1853".

- A small glass container of grease.

The example of a Sharps pistol-rifle in the author's collection is a high condition piece nicely cased with high quality accessories. Most importantly, it is the only known example of a cased set for a Sharps pistol-rifle of any of the types. It is unfortunate that there is no information about for whom the set was made. The military motif of the 'eagle' belt plate clearly indicates the set was made for a military officer.



Figure 10. Sharps 'Extractor Arm' cartridge c 1856 (left) and 'Mule-Ear' cartridge (right) (Lewis Behling collection).

## Conclusions

The pistol-rifles were clearly a transition model. Christian Sharps started his new company in Philadelphia, specifically to manufacture single shot pistols based on patents that he had sold to the Sharps Rifle Manufacturing Company before he dissolved his involvement with that company. The pistols design were direct infringements of the patents he had sold, and he would soon need to develop new designs. These pistols were only marginally commercially successful. Over three years, between 1856 and 1858, the company made less than 1,000 pistols. In 1857, Sharps, needing to expand his market, began to make rifles. These still used the same patents used for the pistols. Indeed, these rifles used the pistol's actions. With lackluster sales of pistols, Sharps at first, could use the receiver frames originally made for pistols, but now surplus, for his rifles. Two versions of rifles were manufactured. The first model had two versions, one based on small frame pistols in .31 caliber and the other based on large frame pistols in .36 caliber. Less than 100 of these first model rifles were made and sold. With exhausted stocks of pistol frames, Sharps continued production during 1858 of a second model of rifle. The design was almost the same but the receiver frame was purpose-built. As many as 400 of these rifles may have been manufactured before production ceased in 1859. By then, Sharps had finally settled his patent suit with the Sharps Rifle Manufacturing Company, and on 10 January 1859, he had agreed to cease manufacturing of the rifles.<sup>20</sup> By then, Sharps had better designs.

Christian Sharps needed new designs. The production of these rifles had proven only marginally successful. His next design of a rifle would prove significantly more so. However, before he had his new designs, Sharps had begun to manufacture percussion re-



Figure 11. Cased First Model, Second Type, Sharps pistol-rifle, c 1857 (top); receiver markings (middle); serial number stamp on operating lever (bottom left) and tube rear sight (Author's collection).



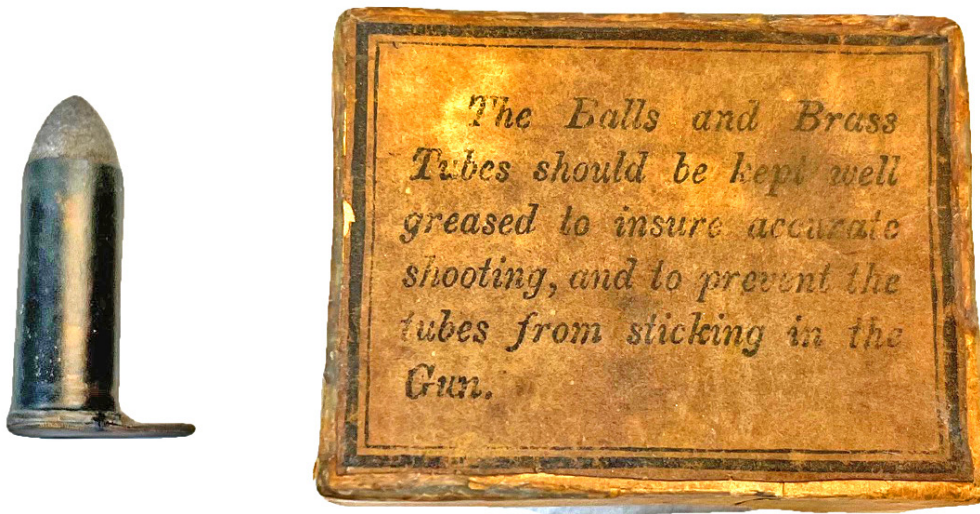


Figure 12. Sharps 'Mule-Ear' metal percussion cartridge and pasteboard carton (Author's collection).



Figure 13. Primer tube for Sharps Automatic Priming System and Tin Box containing Tubes of Primers for the Sharps.

volvers to replace the single shot pistols. The revolvers were not, notably new designs. Although Colt's patent for revolvers had finally expired in 1857, the Sharps revolvers were still probably based on a patent infringement. Sharps has no patents for these revolvers and they appear to be close copies of Smith & Wesson designed revolvers. The production of these was short. More importantly, by 1859, Sharps had fully recognized the advantages of the rimfire cartridge and developed completely new designs for firearms to use them. All of Sharps new designs began based on his patent for a four-barrel pistol with a sliding barrel<sup>21</sup> using a rotating firing pin and firing rimfire cartridges. These pistols were wildly popular and commercially successful. Eventually over 160,000 of the four-barrel pistols would be made and sold.<sup>22</sup> In 1860, Sharps followed the design of these pistols with the design of a new rifle, still based on the same sliding barrel action as patented for his four-barrel pistols.<sup>23</sup>

For use with his new rifle, Sharps also completed the design and development for a large caliber rimfire cartridge, specifically suitable for military use. These cartridges, .52 caliber, were likely the very first large caliber rimfire cartridges manufactured in quantity.<sup>24</sup> In 1860, Sharps decided to enter the market to manufacture rimfire cartridges used for his patented firearms, and he invented the machines he used to manufacture them by the millions during the Civil War. His first patent for machines to make ammunition, Patent 22,753, was issued on 25 January 1859. He was soon awarded several other patents improving the manufacture of cartridges: Patent 29,108 awarded 10 July 1860 for packing cartridges with powder; patent 30,647 was awarded 13 November 1860 for forming cartridge cases; and patent 40,772 was awarded 1 December 1861 for the improved priming of metallic cartridges. Both the rifles (and carbines) and cartridges were purchased in large quantities by the Army and Navy during the Civil War.

## Endnotes

- <sup>1</sup> Marcot, Roy, Paxton, Ron and Marron, Edward W, Jr, *Sharps Firearms, The Percussion Era 1848-1865*, Northwood Heritage Press, Tucson, 2019, Chapter 29.
- <sup>2</sup> *McElroy City Directory of Philadelphia*, 1855 and 1856.
- <sup>3</sup> Sellers, F. *Sharps Firearms* (7th Printing), Alstead, NH, 2001. P. 103.
- <sup>4</sup> *Ibid*, p 106.
- <sup>5</sup> Marcot, Roy, Paxton, Ron and Marron, Edward W, Jr, *Sharps Firearms, Model 1878 "Borchardt Patent" Rifles and Other Sharps Models*, Northwood Heritage Press, Tucson, 2024, p. 412.
- <sup>6</sup> Marcot, Paxton, Marron, 2019, op. cit. p 130.
- <sup>7</sup> *R.G. Dun & Co Credit Report, Pennsylvania Vol 137*, p 507. (Baker Library in Harvard Business School)

- <sup>8</sup> Marcot, Paxton, Marron, 2019, op. cit. p 131
- <sup>9</sup> Ibid, p 134. ‘Small Frame’ pistols with serial numbers to the low 400s have been observed.
- <sup>10</sup> Ibid, p 135. The source suggests that these ‘large frame’ pistols may have been introduced as late as early 1856.
- <sup>11</sup> Ibid, p 142 ‘Large frame’ pistols have observed serial numbers from 473 to 827 Sellers, 2001, p 110). According to Sellers, pistols with higher numbers are known but these appear to be “experimental” and not production.
- <sup>12</sup> Ibid. p 153-154.
- <sup>13</sup> Letter from Byron Leidy to Craig 12 August 1857 (NARA Record Group 156, “Textual Records of the Chief of Ordnance”, Entry 994, Correspondence Relating to Inventions, Special File Inventions, Box 18, Class 6, Nos. 331-450 (1857-1861), Folder: IN6 (331-342). The position of Byron Leidy who signed the letter for the Sharps company has not been determined. It is believed that he was a senior clerk. Philadelphia Directories show his occupation as a bookkeeper.
- <sup>14</sup> Lustyik states there were 23 entries (Lustyik, A. F., “John P. Schenkl – A Versatile Arms Inventor”, *Gun Report* March 1971, p 14). The Sharps carbines made by the SRMCo were included in the 18 tested but none of the firearms submitted by C. Sharps & Co.
- <sup>15</sup> Letter from Byron Leidy to Craig 12 August 1857 (NARA Record Group 156, , Entry 994, Box 18, Class 6, Nos. 331-450 (1857-1861), Folder: IN6 (331-342).
- <sup>16</sup> Marcot, Paxton, Marron, 2019, op. cit. p 145.
- <sup>17</sup> This is the rear sight design used on all the Sharps & Hankins rifles and carbines manufactured during the Civil War. Sharps was awarded patent 32,899 on 23 July 1861 but the sight was in use much earlier. The sights on these pistol-rifles are graduated to 600 yards but the sights used of rifles and carbines manufactured later during the Civil War on Sharps & Hankins firearms are adjustable to 800 yards.
- <sup>18</sup> By the next year, Sharps had invented a large caliber rimfire cartridge that he would use in Sharps & Hankins rifles and carbines during the Civil War.
- <sup>19</sup> Both patents were used for rifles and carbines manufactured by the Sharps Rifle Manufacturing Company of Hartford, Connecticut also. Christian Sharps’ use of these patents is an apparent direct infringement as he had sold the full rights for these patents to the SRMCo in 1852. A judgement against Sharps on a lawsuit dated 10 January 1859 confirmed patent infringements.
- <sup>20</sup> *R.G. Dun & Co Credit Report, Pa Vol 137, p 507*
- <sup>21</sup> Patent 22,753 awarded 25 January 1859.
- <sup>22</sup> Sellers, F. 2001, op. cit. p 125-168.
- <sup>23</sup> Sharps applied for a specific patent for a sliding barrel rifle chambered for rimfire cartridges on 26 September 1860 but it was rejected since the action was deemed to have been the same as awarded in Sharps’ patent for 4-barrel pistols. Sharps re-applied and did receive a new Patent 32,790 awarded 9 February 1861.
- <sup>24</sup> Benjamin Tyler Henry had developed a .44 caliber rimfire cartridge for his lever action magazine rifle by 1860 and these were the basis of his patent 30,446 awarded 16 October 1860. . Christopher Spencer also developed a .52 caliber rimfire cartridge in late 1859 for use in his magazine rifle, patented 6 March 1860 (Patent 27,393) . There are no known Henry or Spencer rifles commercially available using large rimfire cartridges before December 1861 however.

