

BALLARD FIREARMS IN THE CIVIL WAR

by Ralph Spears

A single-shot breechloading rifle with a dropping breechblock was invented by Charles H. Ballard of Worcester, Massachusetts on which he received patent 33631 on 5 November 1861. This reliable and accurate firing gun was one of the first designs put into production and service during the Civil War that was designed to use a large caliber rimfire copper cartridge. Firearms using rimfire cartridges were relatively new. The first successful firearm using this type of cartridge, a revolver invented by Horace Smith and Daniel Wesson, had only been introduced in 1857. However, that hat revolver fired a small caliber cartridge, only .22 caliber. Only in 1859 did large-caliber rimfire cartridges, suitable for military use, become available. The Ballard was not the first firearm designed to use the large caliber rim fire cartridge. In that year, Benjamin Tyler Henry and Christopher Spencer had invented prototype magazine-fed repeating firearms and Christian Sharps had invented a single-shot rifle to use the new design large caliber rimfire cartridges. Nevertheless, Charles Ballard's rifle remained popular and its manufacture continued long after production of these other arms had ceased.

Earlier in his career, Charles Ballard had partnered with Richard Ball in the firm of Ball and Ballard. That partnership had nothing to do with firearms. They were makers of wood-working machinery with their factory at 28 School Street in Worcester, Massachusetts. That partnership had dissolved in 1858 when Warren Williams bought out Ballard's interest. Although, he was no longer a partner in the firm, Ballard remained employed as the shop foreman. It was while he worked as the shop foreman that he became interested in firearms, and it was during this period that he designed and made his patent and first pre-production rifles.¹ Interestingly, Richard Ball and Warren Williams are listed as the witnesses on Charles Ballard's patent application for his new firearm. When Ballard designed his rifle, Ball & Williams were still not in the business of firearms. Until 1862, Ball & Williams, as had the earlier partnership of Ball & Ballard, continued to make planing machines for wood working. In 1862, however, after the start of the Civil War Ball & Williams began the quick transformation into a major maker of firearms. Charles Ballard supervised the manufacture of his patent firearms.

The partnership of Merwin & Bray of New York is also an important component in the story of Ballard firearms. Both Joseph H. Merwin and Edward P. Bray were merchants in New York City during the 1850s. City directories during the decade before the Civil War list Bray as a seller of "plateware" and Merwin as an "importer". These two men formed their partnership sometime after May 1860. A city directory dated 1 May 1861 lists the new firm of Merwin & Bray as located at 246 Broadway.² By early 1862, these partners had arranged with Charles Ballard to market his patent firearms. They then became the exclusive agents for them throughout the Civil War period and later. An advertisement in Harper's Weekly of 29 March 1862 clearly declared the new partnership as the agents and described the Ballard firearm: "*This arm is entirely new, and universally acknowledged to be the nearest to perfection of any Breech-Loading Rifle ever made.*" By early 1862, Merwin & Bray arranged for the manufacture of all Ballard arms, marketed them and secured contracts for sales during the Civil War and after until the partnership was dissolved in 1866.

The firm of Ball & Williams in Worcester, Massachusetts made all but less than 120 of the Ballard patent firearms manufactured between 1862 and 1865. As the exclusive agent for Ballard patent arms, Merwin & Bray helped finance the expansion and conversion of the Ball & Williams factory to allow these firearms to be made in large quantities. For the next three and a half years, this firm manufactured almost 17,500 Ballard patent firearms of several types. The firm of Ball & Williams only ended in July 1865, when Warren Williams retired and the company was re-organized. The new firm, R. Ball & Co. continued to manufacture Ballard patent arms and continued to make about 2,400 more carbines and rifles before early 1867 when Edward Bray finally built a new factory and organized a new company, the Merrimac Arms Company. This company continued to make and market Ballard patent arms for the next seven years. Eventually, the Marlin Firearms company would take over manufacturing Ballard firearms and continue pro-

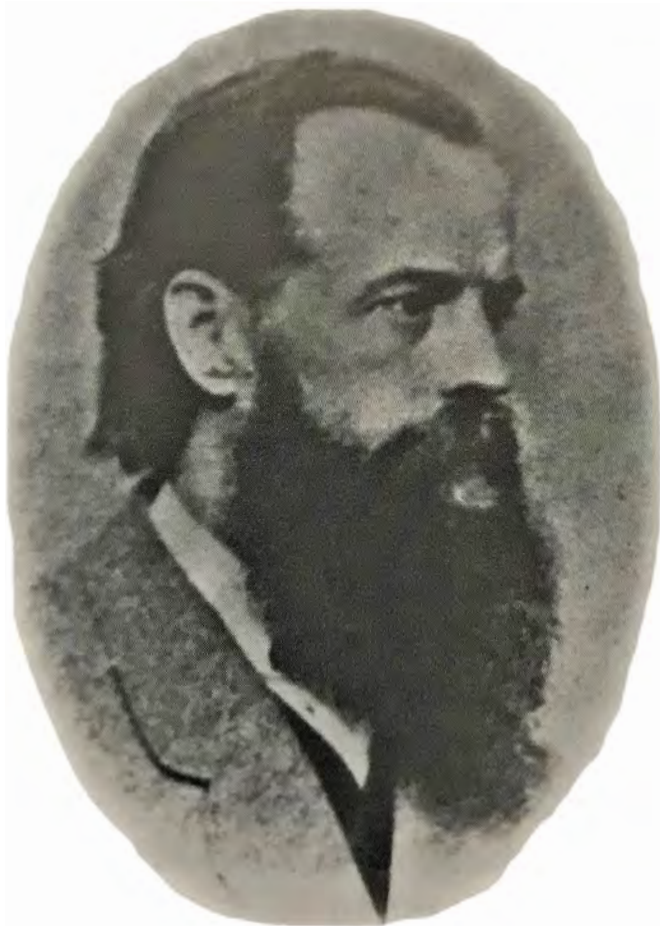


Figure 1. Charles H. Ballard (Photograph courtesy of Milwaukee Public Museum).

duction of these reliable, dependable and accurate firearms from 1874 until 1891. However, the arms of these succeeding companies are not the subject of this paper.

Of the total production of over 17,000 arms made during the Civil War, almost 12,200 of these were sold as military arms. Those arms are the subject of this paper. During the Civil War, Merwin & Bray sold guns with three separate and characteristic designs of the dropping breechblock. The three types of breechblocks are incorporated into several distinct models. Guns with the first type breechblock were only sold commercially, but the other two were sold during the Civil War for military use.

The first type of breechblock made was manufactured only as sporting arms and in several barrel lengths from 22 to 36 inches. The only caliber observed is .38. Barrels were either octagon or half octagon and half round. These are the earliest and have the breechblock actually described in the patent. This model has a characteristic wrought-iron one-piece breechblock with a flat top with beveled flats on each side. Uniquely, this type has an integral internal cartridge extractor. The extractor is as described in the patent, and is the characteristic that differentiates this type from the later types. The extractor, however, proved to be a problem. The patent extractor had a small lip that was designed to engage the edge of the rimfire cartridge when the gun's operating lever was pushed down to lower the breechblock for reloading. In practice, the lip often slipped below the edge of the cartridge and failed to engage it for extraction. Only a few of this type were made, perhaps as many as 100.³ Merwin & Bray only sold a few. All of these were manufactured in late 1861 or early 1862 and none of this type were purchased for military use. Because the extractor is integral with the face of the breechblock, these earliest guns do not have the manual extractor knob that projects from the underside of the forearm that is characteristic of all other Civil War period Ballards.

All the firearms of this early type were manufactured by Ball & Williams and are marked as such. Markings on this type were all the same: "BALLARD'S PATENT / NOV. 5, 1861" on the right flat at the top of the barrel just forward of the rear sight, "BALL & WILLIAMS / Worcester, Mass" on the top flat of the barrel; and "MERWIN & BRAY, AGT'S / NEW YORK" on the left flat of the barrel. See Figure 2.

The second type also uses the same one-piece iron breechblock but the patent's internal extractor that had proved to be unreliable,

was discarded. The internal extractor was replaced with a much more robust and reliable manual extractor that has a small knob installed under the forearm to operate it. This extractor knob is a characteristic of all other Civil War period Ballard arms. The top of these one-piece breechblocks without the extractor are totally flat without the beveled flats on the earlier type. This type with the manual extractor was first manufactured in 1862 and were made for both military and commercial sales. Production ended for this type in late 1863. The markings on this model remain unchanged from the markings on the first model. Markings are on the top of the barrel forward of the rear sight. This model, both military and commercial sporting, is found with serial numbers up to about 9400.

A third type of Ballard arms replaced the one-piece breechblock with one made in two pieces. The two-piece block looks very similar in the overall shape of the earlier one-piece block but is split vertically and the two pieces bolted together. The change to the two-piece block allowed the trigger return spring to be simplified. In the two-piece block the trigger return uses only a u-shaped spring. In the earlier one-piece breechblocks, there had been three small separate pieces required, a coil spring, a plunger to hold the spring in place and a screw to affix the mechanism. These two-piece breechblocks were first made by Ball & Williams beginning in 1863 and continued to be made until the end of the Ball & Williams Company in 1865 and by successor companies after the Civil War.

Ball & Williams made firearms with this type two-piece breechblock with either serial numbers over about 9400, or serial numbers in a new range established for larger caliber carbines and rifles manufactured specifically for military sales. Markings on firearms with the two-piece breechblock differ from the previous types. Patent and manufacturer's markings for this type are no longer on the barrel. Instead, they are now stamped on the receiver. On the right side, the receiver is stamped "BALLARD'S PATENT / NOV. 5, 1861" On the left side, "BALL & WILLIAMS / Worcester, Mass." is stamped in one two-line group above "MERWIN & BRAY, AGT'S / NEW YORK" also in two lines. (Figure 3).

Prior to August 1862, Ball & Williams only manufactured sporting guns made for the commercial market. Even after Ball & William began to manufacture military arms, the manufacture of sporting guns continued and serial numbers on military rifles and carbines are interspersed with sporting arms. Sporting arms continued to be manufactured in significant numbers throughout the Civil War and after. Over 5,000 were made during the Civil War



Figure 2. Markings on barrel flats on Ballard firearms with serial numbers below 9400 (Photographs courtesy of Rock Island Auctions).

Reprinted from the American Society of Arms Collectors Bulletin 127:56-74

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Figure 3. Markings on right side of receiver (left) and markings on left side of receiver (right) for Ball & Williams manufactured carbine with serial number above 9400 (Author's collection).

for the commercial market. They remained a popular sporting arm and commercial sales remained profitable.

Sporting guns were made in a number of calibers and barrel lengths. Almost all were made with full octagon barrels in lengths of 22, 24, 26, 28 or 30 inches. Calibers of sporting guns seen are .32 (rare), .38 and .42. Sporting guns all have half stocks, some with either silver, pewter or brass nose caps. High grade wood stocks are common. Sporting arms were manufactured mostly with iron receivers, operating levers and butt plates but a few were manufactured with brass receivers and hardware. John Dutcher estimates that as many as 200 were manufactured with brass receivers, levers and butt plates.⁴ A few of these guns have engraved receivers.

A few sporting guns were manufactured based on Merwin & Bray's 5 January 1864 patent, 41166, with dual ignition. The dual ignition allowed the gun to be fired either with rimfire ammunition or loaded with ball and powder and fired using a conventional percussion cap. John Dutcher, in his Gun Report article and later book, expressed the opinion that the dual ignition system must have been designed with the military in mind. A few military style carbines, with serial numbers below 5000, have been observed,⁵ but none are known with dual ignition that were actually purchased for military use. Carbines with dual ignition and low serial numbers were probably prototypes and sold commercially. Dual ignition arms with these lower serial numbers have the earlier type one-piece breechblock. They were actually made before the patent was

awarded. Most dual ignition firearms have serial numbers over 15000, so were made after the Civil War. There is no record of a dual ignition arm sold to the U.S. Government or to any state as part of a military contract.

Model 1862 Carbines

The first military guns manufactured were carbines purchased by the State of Kentucky Military Board. In 1861, Kentucky was a state with divided loyalties. Governor Beriah Magoffin strongly supported the Confederacy, but the Legislature was equally supportive of the Union in the sharply divided state. Officially, the state tried to remain neutral and for a time both the Confederate and Federal governments withheld moving troops into the state. The Military Board, however, was an institution established by the pro-Union Legislature in May 1861, organized to prevent the governor from issuing the state's inventory of arms to pro-South companies of the State Guard. Most of the companies of State Guards, the pre-war State Militia, eventually claimed allegiance to the Confederacy. The Legislature organized an entirely new state militia, the pro-Union Home Guards. The Legislature voted funds for the purchase of arms for the Home Guard, but vested control of arms purchases and issues only to this new institution, the Military Board. The Military Board was finally abolished 28 August 1862, but only after Governor Magoffin resigned and Federal forces finally established control over the state. After August 1862, state arms purchases and the control of arms issues was by the state's quartermaster general.

The Kentucky Military Board made their first purchase of Ballard



Figure 4. Ballard patent military carbine manufactured by Ball & Williams, serial number 8784 (Author's collection).

carbines on 15 August 1862.⁶ In the first contract with Merwin & Bray, Kentucky purchased 1,250 carbines and paid \$26 for each. An example of this model is shown in Figure 4. These carbines have a bore that measures .42 inches with a 22½ inch part octagon part round blued iron barrel. The barrel is one of the main differences between military and sporting guns made by Ball & Williams. Military guns characteristically have barrels with the first 9 inches octagon and the remaining length round. Sporting guns generally have full octagon barrels.

The Army would later designate the military carbines they purchased in 1864 as the Model 1864. Since the military carbines of this type differ from both that model and another model designated by the Army as the “Old Model”, military arms of this type can probably be designated, instead, as the Model 1862. Nevertheless, it needs to be recognized that this is not a contemporary designation, but a modern one.

Receivers were made of iron finished blue. The hammer is case-hardened. The carbines were half stocked with the forestock secured with a single blued iron barrel band. Note the small brass knob installed under the forearm that operates the extractor that ejects spent cartridges. The markings on these carbines were on the flats on top of the barrel like the markings shown in Figure 2. Carbines have a blued blade front sight and a L-shaped single leaf rear sight. The leaf has two “V” shaped notches, one in an oval window and the other at the top of the leaf. The notch with the leaf lowered is sighted for 100 yards. The notch in the window is sighted for 250 yards and the notch at the top of the leaf at 500 yards as shown in Figure 5.



Figure 5. Single leaf rear sight mounted on Ballard military firearms (Author's collection).

All military carbines for this order and for all later ones have sling swivels. One is attached under the stock near the butt plate and the other is affixed to the bottom of the barrel band. A leather sling through these swivels allowed the cavalry trooper to carry the carbine across his back or over his shoulder.

Ballard patent carbines differ from most other carbines purchased during the Civil War to arm Federal cavalry. Most carbines of other designs had a sling bar and ring mounted on the left side of the receiver. This sling ring mounting allowed the carbine to be carried on a shoulder belt with hook and the carbine was carried hung with the barrel down on the cavalryman's right side either while he was mounted or on foot. The sling swivels on the Ballard carbines, however, required the carbine to be slung across the cavalryman's back or over his shoulder.

The carbines purchased by Kentucky, although with a .42-inch

bore, were designated as .44 caliber and chambered for the No 44 rimfire cartridge. The conical ball of this cartridge had an actual diameter of .44 inches and weighed 210 grains. The cartridge carried 28 grains of black powder. The No 44 cartridge was developed by Smith and Wesson but was never used in their revolvers. This cartridge had been developed specifically for use in the carbines invented by Daniel Wesson's brother, Frank. Although not patented until 1862, Frank Wesson had designed a carbine to use this cartridge as early as 1861.

The Kentucky Military Board had purchased cartridges with the carbines they purchased from Merwin & Bray in 1862, but no actual contract record has yet been found of Kentucky cartridge purchases. Nevertheless, there is a record that a total of 284,200 cartridges had been received into Kentucky stores by November 1863.

The U.S. Army only began purchasing No 44 cartridges for Ballard carbines in May 1863.⁷ Captain Silas Crispin of the Army Ordnance had made the first Federal purchase of these cartridges in May 1863 and these were delivered in July. The 120,000 cartridges purchased by Crispin were all probably issued to Kentucky. The remaining 164,200 cartridges of the total 284,200 received by Kentucky must have been directly purchased by the Kentucky Military Board. Of the total purchased, 154,500 were reported already issued to troops by November 1863. Cartridges for this first Army purchase were manufactured by C.D. Leet & Company.⁸

The 1,250 carbines of this first Kentucky purchase were delivered between 25 October 1862 when the first 100 were delivered and March 1863 with delivery of the final lot. Serial numbers are stamped in two places, on the top of the barrel immediately forward of the receiver and on top of the receiver. Up to three digits of the serial number are also stamped into the left side of the hammer, also on the left side of the breechblock and, usually, on the main spring. The lowest serial number observed is 628. Carbines of this purchase have serial numbers between 600 and about 2500. The serial number sequence overlaps with sporting guns still being manufactured in some quantity.⁹

Shortly after the final carbine delivery against this contract, the then Kentucky Quartermaster General, James F. Robinson, extended the contract with Merwin & Bray on 10 April 1863 and increased the quantity to 3,000 carbines. Since the Kentucky Military Board had been abolished on 28 August 1862, arms purchases were now the responsibility of the quartermaster general. The price remained the same, \$26 for each carbine. These next carbines were identical to the previous 1,250. Although 1,750 carbines were ordered in this second contract, 58 carbines of this purchase seem to have been replaced with sporting arms in order to complete the contract.¹⁰ Deliveries for this contract began almost immediately and the final delivery was made 24 November 1863.¹¹ Serial numbers for these additional carbines are interspersed with sporting guns that continued to be made. The serial number range for these carbines is probably between 2000 and 6500.

Kentucky purchased one more lot of these Model 1862 carbines on 17 November 1863. A new contract for 5,000 firearms was issued for the purchase from Merwin & Bray on that date, but the purchase included three different models. The purchase included 1,000 of this model carbines, 1,000 half stocked rifles with a bore diameter, also of .42 inches still designed to use the No 44 rimfire cartridge and 3,000 full stocked rifles with a larger bore diameter of

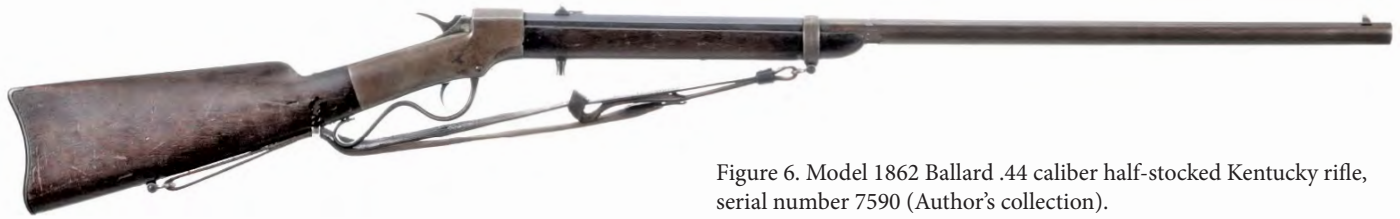


Figure 6. Model 1862 Ballard .44 caliber half-stocked Kentucky rifle, serial number 7590 (Author's collection).

.52 inches to chamber the Spencer 56-56 rimfire cartridge. Rifles will be discussed later. The 1,000 carbines for this contract were identical to those previously purchased and the price remained unchanged. These 1,000 carbines were completed and delivered almost immediately with the final delivery on 18 December 1863. The expected serial number range for this last lot of Model 1862 carbines is between 6500 and 9100. Serial numbers overlap with both the half-stocked rifles purchased at the same time and with sporting arms. The serial numbers might extend to 9400, but all observed carbines with serial numbers above 9100 until the next type of military arms are commercial sales rifles and carbines.

New York also purchased these same model carbines. Adjutant General of New York, Brigadier General John T. Sprague ordered 500 carbines of this type on 6 June 1863.¹³ The National Guard of New York was seeking arms in response to Lee's invasion of Maryland and Pennsylvania in May and June 1863. Merwin & Bray delivered 300 on 20 August 1863, 120 more on 5 September and the final lot of 80 on 14 September. The price paid for the carbines was \$13,123.50 or \$25.00 each plus the cost of 25,000 ammunition cartridges at \$16 per thousand, 100 carbine slings at \$.50 each plus packaging and shipping.¹⁴ Only one of these carbines has been positively identified, a carbine inscribed with the name Major D. Frazar, 13th NYC, (13th New York Cavalry). The serial number of this carbine, 4024, indicates that the probable serial number range for the New York purchased Ballards are probably close to 4000.

In total, almost 4,500 Model 1862 carbines were manufactured and delivered to either Kentucky or New York between October 1862 and December 1863.¹⁵ Only one carbine of this type was purchased by the U.S. Army. They purchased it on 14 September 1863 as a sample for carbines the Army were then considering to purchase.

McAulay identified several Kentucky cavalry regiments issued these Ballard carbines. The 6th, 8th, 11th and 13th Kentucky Volunteer Cavalry Regiments received these carbines during 1863. Even after the War, Captain McConathy's Fayette County Cavalry still carried 60 of these carbines as late as 1870.¹⁶ The only New York regiment identified by McAulay to have been issued Ballard carbines was the 13th New York Heavy Artillery.¹⁷ The carbine carried by Major Frazar indicates these carbines were also issued to the 13th New York Cavalry, or that McAulay misidentified the New York regiment. In 1866, 420 of these carbines were still listed as issued to New York State National Guard Regiments.¹⁸ Also in 1866, Ballard carbines were issued to the 65th and 70th Infantry Regiments and the 1st Cavalry Regiment.

Model 1862 Kentucky Rifles

Kentucky purchased 1,000 rifles on 17 November 1863 at the same time as they purchased the last 1,000 of the Model 1862 carbines. The price for a rifle was a dollar more, \$27. Figure 6 shows an example of a Model 1862 rifle. The rifles were very similar to the carbines still with the one-piece breechblock characteristic of all Model 1862 firearms made by Ball & Williams, but with a

longer, 30-inch barrel. These very attractive half-stocked rifles were chambered for the same No 44 rimfire cartridge as were the carbines. The rifle's blued iron barrel was 30 inches but remained part octagon and part round. The first 9 inches of its length was octagon just the same as had been the carbines. Receivers were made the same as carbines: iron finished blue. The rifles are half-stocked with the forestock secured with a single blued iron barrel band, also the same as military carbines. Note from the photograph that these rifles retained the same sling swivels as mounted on carbines. The rifles, like the carbines, also have the same wide based single leaf rear sight, with adjustments to 500 yards. See Figure 7.

The markings on the rifles also remained the same as on all Model 1862 Ballard carbines and sporting arms. These markings on the top of the barrel are shown in Figure 8. In addition, these rifles were also stamped "KENTUCKY" on the top of the barrel forward of the patent, manufacturer and agent markings.

Figure 7 also shows the serial number stamped in two places, one on the top of the barrel between the receiver and the rear sight and again on the top of the receiver. Serial numbers of these rifles are observed between 7000 and about 8700. The serial number range indicates that these rifles were made in 1863, during the late production of Model 1862 firearms by Ball & Williams.



Figure 7. Rear sight on Model 1862 rifle, serial number 7590 (Author's collection).

Unfortunately, there is no record of issues of these rifles during the Civil War. Although they were identified as rifles when purchased, all records of issues recorded by Kentucky do not differentiate them from carbines. Likely, these rifles were issued to mounted infantry, probably the 30th and 45th Mounted Infantry Regiments. These two infantry regiments were recorded as being issued Ballard arms during 1863.

Old Model Carbines for the Army

At nearly the same time as Kentucky was purchasing their first carbines, the Army also expressed interest. At least as early as 14 May 1862, Merwin & Bray had been soliciting for an Army con-

tract, and in June 1862, the Chief of Ordnance, Brigadier General James W. Ripley directed Captain S.V. Benet, then stationed at West Point, to test and evaluate a Ballard carbine. Captain Benet reported on 13 June that he had completed firing one hundred rounds “without the slightest fouling, the cartridge doing its work perfectly.” He concluded his report: *Altogether, it is the very best breech loading carbine that has been presented to me.*¹⁹ With such a favorable report, General Ripley might have been willing to purchase Ballard carbines, but apparently felt no pressure to do so immediately. However, with the defeat of Union Armies on the peninsula below Richmond, and especially after the Federal defeat at Second Manassas at the end of August 1862, there was a renewed sense of urgency. General Ripley again needed arms. Although correspondence has not been found, Ripley must have contacted Merwin & Bray by early September about purchasing carbines for Federal cavalry. Ripley, however, wanted carbines of .52 caliber. Merwin & Bray responded on 8 September 1862, and offered to sell the Army 5,000 carbines with 22-inch barrels at \$23 each and 5,000 rifles with 30-inch barrels at \$24.75 each.²⁰ Both carbines and rifles would be .52 caliber chambered to use the Spencer No 56-56 cartridge.

*satisfactory trial has been made by them.*²¹

This recommendation seriously restricted the number of these new, untried carbines Ripley could order. The second constraint was price. The commission had not recommended a specific price to pay for patent arms but had stated that prices paid for almost all patent arms contracted during 1861 had been too high. In most contracts the committee investigated they had recommended sharp reductions in the price paid for arms if the contracts were to continue. Ripley, evidently, considered that he had to demand a lower price.

Four days after he received Merwin & Bray’s offer, on 12 September, Ripley, considering these committee recommendations, offered an order for 1,000 carbines and 1,000 rifles but at lower prices of \$20 and \$23 respectively.²² Merwin & Bray did not immediately accept the contract. They had constraints also. During these negotiations, Ball & Williams were fully engaged making carbines for Kentucky as well as the Ballard sporting guns that still were popular. Moreover, the arms requested by the Army were different than the firearms already being made by Ball & Williams and would require re-tooling and additional machinery. The Army wanted arms with a .52 caliber bore and the largest caliber firearm then being made by Ball & Williams had a .42 bore. To secure the Army business, it was very apparent that Merwin & Bray needed additional manufacturing capability, either new machinery and tools for Ball & Williams, or from a new contractor. In hind sight, Merwin & Bray made a poor business decision. Instead of expanding Ball & Williams, Merwin & Bray contracted with a new firm, Dwight, Chapin & Co. of Bridgeport, Connecticut, to make the carbines and rifles for this Army contract. It was only after Dwight, Chapin & Co. accepted the work that Merwin & Bray finally signed a contract with the Army on 31 October 1862.²³ This was over six weeks after the Army’s initial offer.

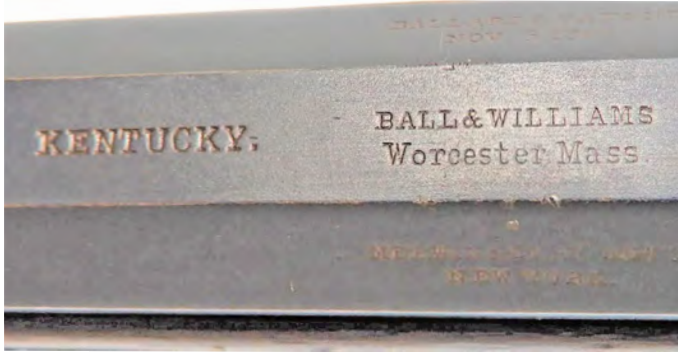


Figure 8. Top of barrel markings for Model 1862 rifle, serial number 7590 (Author’s collection).

Ripley had two serious constraints. First, a commission formed in April 1862 by the War Department to investigate troubled military contracts awarded early in the war had made its final report to the secretary of war on 5 July 1862. The report contained recommendations for

“increased restrictions upon the multiplication of patterns of arms for use in service.

1. That the sample arm shall be tried, by competent officers, in comparison with the best in use; that it shall be proved superior in essential qualities, or in probable cheapness of manufacture, to such

2. That after a sample has been approved, as above, 1,000 be ordered for trial by troops, and that no larger orders until

Before they received this contract, Dwight, Chapin & Co. was a small manufacturer, making only musket appendages such as nipple wrenches, spring vises, worms, cones, etc. The company’s main business was as a subcontractor to William Muir of Windsor Locks, Connecticut who had contracts with the Army for over 30,000 Model 1861 rifled muskets and another contract for 3,000 with New York. In the fall of 1862, Dwight, Chapin & Co. was still a new company, having been in business for less than a year. The Bridgeport City Directory first lists the company in 1861 as “manufacturers of brass, steel and iron” located on East Washington Ave. near Pembroke Street. While the company was new and untried, the owners of the company, George Dwight and Henry A. Chapin had good reputations and were both highly regarded businessmen. George Dwight, particularly, had excellent credentials as an arms maker. Both Dwight and Chapin had been long time residents of Springfield, Massachusetts before moving to Bridgeport in 1861 to start their new partnership. Dwight had previously worked at the Springfield Gas Light Company, had been the chief engineer

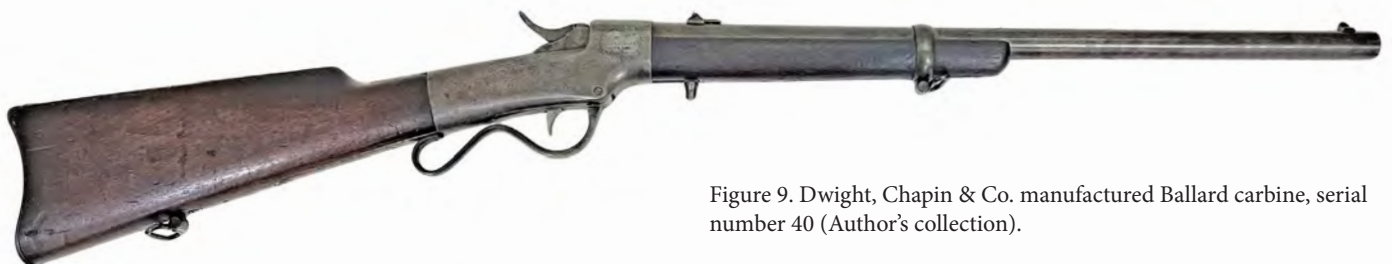


Figure 9. Dwight, Chapin & Co. manufactured Ballard carbine, serial number 40 (Author’s collection).

of the Springfield Fire Department and, most importantly, he had been the last civilian superintendent of the United States Armory at Springfield until civilian leadership of the Armory ended soon after the start of the Civil War. Henry Chapin was also an experienced businessman with a solid reputation. During the 1850s, before he moved to Bridgeport, he had worked with Dwight at the Springfield Gas Light Company.²⁴ After getting the contract from Merwin & Bray to manufacture Ballard arms, the company tried to expand its capability but the company was limited by available capital. The cost of new tools and expansion proved to be too expensive, financial resources too little and the company failed. The company was insolvent within a year of the date of the contract. Its bankruptcy was announced in the *Bridgeport Evening Standard* on 24 September 1863. The announcement also gave notice of a bankruptcy auction. Interestingly, Oliver Winchester purchased the factory and machinery at the sale. The facilities and equipment would be used later to manufacture Model 1866 Winchester rifles and carbines.²⁵

While they were still in business, Dwight, Chapin & Co. completed design and manufactured a sample carbine and rifle that was delivered to the Army on 20 March 1863.²⁶ The Army was disappointed by the quality. The Army rejected both the carbine and the rifle because the breech pieces did not work freely.²⁷ This problem was corrected but the overall quality of workmanship remained an unsurmountable problem. Compared to Ball & Williams manufactured arms, the Dwight, Chapin & Co. arms were crude. John Dutcher wrote, appropriately, that they “look like products of a Russian tractor factory.”²⁸ Dwight, Chapin & Co. could not correct the workmanship problem and struggled to complete the order. Merwin & Bray were forced to request an extension of the contract for late deliveries and in response to the request, on 14 August 1863, Brigadier General Ripley had extended it until 31 October.²⁹ However, Dwight, Chapin & Co. had failed even before the extended contract date. No deliveries were ever accepted. The late deliveries caused the Army to finally cancel the contract with Merwin & Bray.³⁰ The Army never purchased any firearms from this contract.

Except for the one model rifle, Dwight, Chapin & Co. only made carbines and the company only completed about 115 of those before production stopped. An example of the carbine is shown in

Figure 9. The markings of these carbines differ from the markings on the carbines being manufactured at the same time by Ball & Williams. Markings on these were not on the barrel but, instead, are stamped on the receiver. The stamping with the patent information was on the right side of the receiver: “BALLARD’S PATENT / NOV. 5, 1861. The left side of the receiver was stamped in five lines “DWIGHT, CHAPIN & CO. / BRIDGEPORT, CONN / MERWIN & BRAY / AGT’S N.Y.” and then the serial number. (Figure 10).

In addition to markings, these carbines differed in several details from the carbines made at Ball & Williams. All Dwight, Chapin & Co. carbines have the later two-piece breechblock. These were the first Ballard firearm manufactured using this new breechblock design. The breechblocks were cast in two pieces and then bolted together. These breechblocks can be recognized as the top is flat without the beveled sides. This design of breechblock would be adopted also by Ball & Williams for all Ballard firearms manufactured beginning in 1864. The receiver is somewhat larger on these carbines because of the larger caliber. The shape of the receiver is notably more rounded over the top than on the previous arms made by Ball & Williams. The shape of the receiver can be seen in Figure 10. Compare the shape to the earlier Ballard models as shown in Figure 3.

Barrels of Dwight, Chapin & Co. made carbines are still a nominal 22 inches in length but now they are no longer part octagonal and part round. They are round their entire length. The caliber differs. These carbines are all made to chamber the .52 caliber No 56-56 Spencer cartridge. This was a powerful cartridge containing a conical 350-grain bullet with an actual diameter of about .54 inches and 45 grains of black powder. The rear sight remains the same design as on previous carbines. The L-shaped single leaf rear remains unchanged and is the same as shown in Figure 5. It has two “V” notches in the leaf, one in an oval shaped window and one at the top. The notch with the leaf lowered is sighted for 100 yards. The notch in the window is sighted for 250 yards and the notch at the top of the leaf at 500 yards.

These were the first contracted arms supplied to the Army by Merwin & Bray and the Army assigned an inspector to Dwight, Chapin & Co. to inspect these rifles and carbines. The 115 car-



Figure 10. Markings on right side of receiver (left) and left side of receiver (right) for Dwight, Chapin & Co. manufactured carbine (Author’s collection).

bines completed by Dwight, Chapin & Co. are actually the first of the Ballard firearms that were inspected during manufacture by an Army ordnance inspector. Lieutenant Colonel P.V. Hagner, Chief Inspector of Contract Arms, assigned Elias M Dustin to the Dwight, Chapin & Co. factory in Bridgeport in August 1863 to inspect the Ballard carbines being manufactured there. Dustin, however, was only there for a few weeks before the Company failed. All Dwight, Chapin & Co. carbines show his inspection stampings, either “EMD” or usually, just “D” on various parts. None of the carbines have an inspector’s cartouche stamped in the stock but “EMD” is sometimes found stamped on the comb of the stock forward of the butt plate. As mentioned above, despite the Army inspection, none of these carbines were accepted by the Army.

The Army’s cancellation of the contract did not stop production of these carbines and rifles, however. If the Army did not want these guns, Kentucky still did. Merwin & Bray transferred the 115 completed carbines and remaining parts from the Dwight, Chapin & Co. factory in Bridgeport to Ball & Williams before the Bridgeport company failed. Merwin & Bray also transferred the work to complete manufacture of the remaining quantity of contracted carbines and rifles. Merwin & Bray candidly reported to S. G. Sudarth, the Quartermaster General of Kentucky, in a letter dated 12 January 1864:

Owing to a disagreement with our Bridgeport party, we have removed our whole works to Worcester, Massachusetts, where all our arms will now be made under the supervision of Mr. Ballard himself. All our arms at the Bridgeport factory had been refused by the general Gov’t on account of caliber...the work was so rough when we commenced putting together at Bridgeport, that we cannot put any of it into the market until done over. This with other reasons similar, caused us to break off arrangement, which was only temporarily entered into, at the time you were here.

The samples that we shall send you next week will please you much better than the one you saw when you were here, and will be much better made. You will be the gainer in the end by this short delay, as you will now get a regular Gov’t caliber arm.³¹

Ball & Williams, using whatever parts that had already been made by Dwight, Chapin & Co. completed manufacture of the remaining carbines and, perhaps as many as 700 rifles by April 1864. All 1,000 of the carbines and 600 of the rifles were quickly sold to Kentucky. Kentucky purchased almost the total production of carbines and rifles by both Dwight, Chapin & Co. and Ball & Williams on 27 April 1864. Instead of the Army’s contracted price of \$20 for each carbine, however, Kentucky paid \$26 for each carbine.³² Merwin & Bray apparently experienced little financial loss from the cancellation of the Army contract.

The carbines of this model made by Ball & Williams are identical to those made by Dwight, Chapin & Co. Only the markings differ. The right side of the receiver remains stamped with the Ballard patent and date exactly like of the Dwight, Chapin & Co. arms. See Figure 10. The markings on the left side of the receiver, however, are stamped in only three lines as shown in Figure 11: “MERWIN & BRAY / AGT’S, N.Y. / (serial number). Note that the name of the actual manufacturer, Ball & Williams, is not stamped on the receiver. Note also the rounded top of the receiver, characteristic of this model.



Figure 11. Markings on the left side of Ball & Williams .56 caliber Ballard carbine, serial number 680 (Photograph courtesy of Rock Island Auctions).

Although the Army did not actually purchase these carbines, the Army would later, after another contract was awarded, refer to these firearms made by both Dwight, Chapin & Co. and by Ball & Williams as the “Old Model”. These Old Model carbines are serial numbered with a new series beginning with serial number 1. The Dwight, Chapin & Co. carbines have observed serial numbers between 1 and 115. Carbines manufactured by Ball & Williams have serial numbers above 115 to about 1700. The highest serial number observed is 1702. The total number of carbines manufactured and purchased by Kentucky was 1,000. Serial numbers overlap above 900 with the serial numbers for Old Model rifles.

There is no documentation found that indicates what Kentucky units may have been issued these carbines. In 1864, the 16th Kentucky Cavalry and several regiments of mounted infantry did receive issues of Ballard carbines.³³ Some of these were probably of this model. The Annual Report of the Quartermaster General of Kentucky for 1863-64 states that by 30 November 1864 1,640 .52 caliber (referred to in the report as .56 caliber) carbines had been issued to troops and 31 unserviceable carbines remained in stores.³⁴ The total, 1,671, is too high for only carbines. This total must include both carbines and rifles. Undoubtedly, these carbines were issued to more than a single regiment.

The Army did eventually purchase two of these carbines from Henry Chapin after the Dwight, Chapin & Co. failed. On 12 September 1863, the Secretary of War issued Special Orders Number 410 to convene a Board of Officers “to consider and report upon the proper caliber and length of bore of carbines for use of cavalry in the service of the United States.”³⁵ The members of the Board that assembled in Washington were Lieutenant Colonel P.V. Hagner, Major A.B. Dyer, Major T.T.S. Laidley, Captain J.G. Benton, Captain S.V. Benet, Captain S. Crispin and Captain G.T. Balch.

The Board convened on 24 September and on 26 September is-

sued the following recommendation.³⁶

...that in all future orders for carbines of a kind not now used

The diameter of bore of the barrels should be .52 inch.

Length of the barrel should be 22 inches.

Weight of piece not to exceed eight pounds, nor to be less than six pounds.

The weight of powder in the charge should be, in every case, at least one tenth that of the ball.

The board further recommend that the following named carbines be made with bores .52 inch diameter; viz: Sharp's (sic), Gibbs's, Starr's, Spencer's, Joslyn's, Sharp & Hankin's (sic), and Ballard's. The first three will then be able to use the same cartridge as the Sharp's (sic) carbine, which is made of paper or linen; and the last four will be able to use the same cartridge as the Spencer carbine, which is made of copper. There are several other carbines now in service using peculiar cartridges; but as these cartridges cannot be used with any other carbine now in the service, and as the confusion existing by a multiplicity of cartridges would be increased if the calibre of these were changed, the board do not recommend any alteration.

The recommendations were submitted to the Chief of Ordnance, Brigadier General George D. Ramsey. Ramsey was new to the job. He had only just been promoted on 15 September and had replaced General James W. Ripley who had been the Chief of Ordnance since the beginning of the War. Ramsey agreed with the recommendations and forwarded them to the Secretary of War, Edwin W. Stanton on 28 September³⁷ Stanton approved the recommendations on length of barrel and weight but did not accept the recommendations on the correct caliber. The Secretary's assistant, Peter H. Watson, responded to General Ramsey that same day approving the recommendations of the weight of the carbine and the length of the carbine barrel but not the caliber. The response included the following explanation regarding the recommended caliber³⁸:

the only reason given for their conclusion on this point (selection of best caliber for carbines) being that Spencer's, Joslyn's, Sharp & Hankin's (sic), and Ballard's carbines would be able to use the same ammunition as Spencer's. Now, as Spencer's carbine has not yet been made or introduced into the service, it is not seen in what manner the calibre proposed for it should have any influence in determining the proper calibre for this class of arms.

It needs to be noted that when the Secretary of War rejected the recommendation that all the carbines be designed to use the Spencer copper rimfire cartridge, there were no arms then in the service that actually used a .50 caliber cartridge. In September 1863, the only rimfire cartridges then in service were either .44 or .52 caliber.

Several thousands of .52 caliber Spencer rifles were already in service, but no carbines had yet been delivered. The .52 caliber Spencer 56-56 cartridge was an important one and would, within the next year, become the predominate rimfire cartridge in use during the last year of the Civil War, but in September 1863, the Spencer cartridge was not yet so. The superiority of the Spencer over all other Civil War carbines had yet to be demonstrated. In addition to the Spencer rifles, by September 1863, 250 Sharps & Hankins carbines, also .52 caliber but firing a different cartridge

than the Spencer, had been purchased and put into service.³⁹ A thousand Joslyns, to be chambered for .52 caliber cartridges identical to Spencer, had been ordered in June 1863, but these had only been delivered in late August. Several hundred were soon issued to the 19th New York Cavalry but were without ammunition until after 24 September.⁴⁰ There was no record of service with Joslyn carbines using rimfire cartridges when the Secretary of War convened the Board to establish a common caliber for rimfire cartridge ammunition. These, then, were the only .52 caliber arms using rimfire ammunition then in service with Federal cavalry by that date.

Actually, by September 1863, .44 caliber rimfire cartridges were more common. Over 3,000 Ballards⁴¹ and as many as 2,000 Wesson carbines, both firing rimfire cartridges of that caliber, were then in service by Federal and State cavalry regiments.⁴² The only other rimfire cartridge then in service was also .44 caliber. The New Haven Arms Company had manufactured about 2,900 Henry .44 caliber rifles by September 1863, but most had been purchased privately by individuals.⁴³ Colonel Birge's Western Sharpshooters, the 66th Illinois Infantry, had privately purchased several hundred by September.⁴⁴ Kentucky had purchased 120 to arm M Company of the 12th Kentucky Cavalry⁴⁵ and the Army had purchased 240, each with 200 cartridges for the newly organized 1st D.C. Cavalry on 16 June 1863. These were delivered 23 July but ammunition was probably delivered later. Additional cartridges were unavailable before 15 October.⁴⁶

By this date, there were a number of pistols and revolvers made in the United States firing rimfire cartridges: Smith & Wesson, Allen & Wheelock, Christian Sharps, Hosea C. Lombard, Willard Ellis and John White (Plant revolvers), Thomas Bacon, Daniel Moore, E.A. Prescott, Lucius Pond, E. Remington & Sons and the National Arms Company all manufactured and sold pistols or revolvers firing rimfire cartridges, .22, .32, .41 and .44 caliber. The Army, however, had not purchased any revolvers or single shot pistols firing rimfire cartridges of any caliber by this date.⁴⁷

The Secretary of War then sought the opinions from each member of the Board as to the best caliber. Each member of the Board provided their opinion and the responses were split. As a result, Stanton then directed General Ramsey to do trials to determine the best caliber. General Ramsey purchased carbines for the experiments. He issued purchase orders on 24 November, to the manufactures, Sharps & Hankins of Philadelphia, Merwin & Bray of New York (Ballards) and A. P. Bruff of Stonington, Connecticut (Joslyns),

GENTLEMEN : This department, having adopted a general plan for cavalry carbines, has decided that all such carbines as may be ordered in future shall conform to that plan, the principal features of which are : that the barrel shall be twenty - two inches long, with a calibre of half an inch, (.50), and that the weight of the arm shall be not over eight, nor under six, pounds. With a view of making experiments to determine the best charge for these arms, you will be pleased to make for this department, with the least possible delay, six (6) of your Patent Carbines on the foregoing general principles. The chamber of each is to be counterbored to fifty - two hundredths of an inch, (.52 ,) and of the proper length to receive cartridges, as follows:

1 for a 35- grain copper cartridge.

1 for a 40- grain copper cartridge

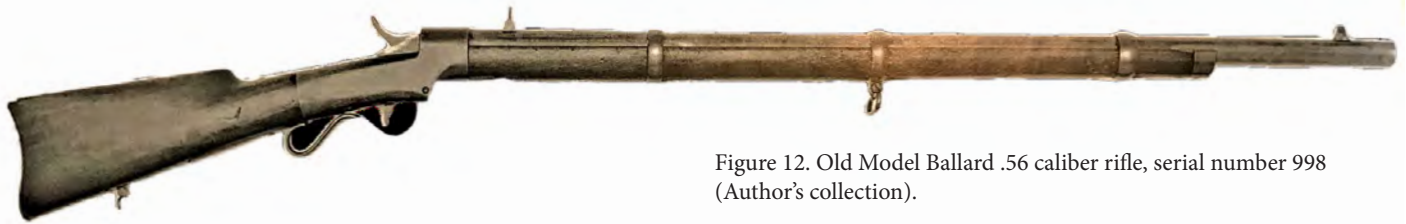


Figure 12. Old Model Ballard .56 caliber rifle, serial number 998 (Author's collection).

*1 for a 45- grain copper cartridge
1 for a 50- grain copper cartridge.
1 for a 55- grain copper cartridge
1 for a 60- grain copper cartridge*

*Be pleased to signify your acceptance or non-acceptance of this order; and, if you accept, please state the time when the six carbines will be finished, and the cost of each.*⁴⁸

Two days later, on 26 November, Ramsey issued a similar purchase order for six more carbines but for carbines chambered for .44 caliber cartridges. Ramsey also ordered Major Alexander B. Dyer, commanding at the Springfield Armory, to supervise the experiments.⁴⁹

Merwin & Bray only delivered six .44 caliber carbines. These will be discussed below. However, in November 1863, Dwight, Chapin & Co., who had been manufacturing .52 caliber carbines were no longer in business, and the machinery for the carbines and rifles were then being transferred to Ball & Williams in Worcester, Massachusetts. Ball & Williams would not be capable of manufacturing the larger caliber carbines for some time. The Dwight, Chapin Co. had recently failed, but Henry Chapin was able to somehow furnish the Army with two carbines with the larger caliber. The Army purchased one rifled on 31 October and the other, a smoothbore, on 5 December 1863. The Army paid Chapin \$20 for the rifled carbine and \$25 for the smoothbore on 17 February 1864.⁵⁰ It is unknown if the chambers of these two carbines were altered for the special .50 caliber cartridges used in the cartridge trials. They probably were not. The Army's cartridge trials formally began 8 March 1864 and the final report of the trials was issued 31 March 1865. These two carbines of this model were the only large bore Ballard carbines purchased and used in the trials by the Army.

Old Model Rifles for the Army

All the Old Model rifles were manufactured by Ball & Williams only after the Dwight, Chapin & Co. failed. The Army originally contracted for 1,000 of these .52 caliber rifles chambered for the Spencer 56-56 rimfire cartridge as part of the 31 October 1862 contract with Merwin & Bray that also included the 1,000 carbines. However, within a year that contract had defaulted and was cancelled. Merwin & Bray transferred the contract to Ball & Williams to complete the original contract. Merwin & Bray was able to sell most of the rifles to Kentucky. That state seemed to always be in the market for Ballard arms.

Figure 12 shows an example of one of these rifles. As is also the case for the Old Model carbine, the rifle's receiver is blued iron with a two-piece breechblock. The receiver top is rounded as is characteristic of these Old Model arms. The rifles, as were the carbines, are designed to chamber the .52 caliber, No 56-56 Spencer cartridge. The barrels on the rifles are still blued, but are now 30 inches in length and the same as the Old Model carbines: round throughout their length. The barrel shape is a characteristic that

differentiates these Old Model arms from most other military firearms made by Ball & Williams: they have part octagon, part round barrels. Another characteristic that differs from all other Ball & Williams firearms manufactured up until this time is the full stock secured with three iron barrel bands.

The front sight remains a blued blade like the carbine but the rear sight on these rifles were a type different from all other Ballard military arms. They are a single leaf folding sight with a sliding "V" notch bar with graduations to 800 yards. This sight is very much like that used on Spencer rifles. See Figure 13.



Figure 13. Old Model Ballard rifle Spencer type rear sight (Author's collection).

The markings on the rifles are identical to the markings on the Ball & Williams-made carbines. The Ballard patent information is stamped on the right side of the receiver, the same as shown in Figure 10. The Merwin & Bray agents markings are stamped into the left side of the receiver in three lines the same as for Ball & Williams-made carbines as shown in Figure 11: "MERWIN & BRAY / AGT'S, N.Y. / (serial number). Note that the name of the actual manufacturer, Ball & Williams, is not stamped on the receiver. None of these rifles show Army inspection markings.

Eventually, almost 700 of the 1,000 rifles originally ordered by the Army were manufactured by Ball & Williams. Merwin & Bray sold some on the commercial market and thirty-five of these were purchased by the Army on 21 December 1863. Colonel James Montgomery, commanding a brigade, then serving in Florida, that in-



Figure 14. Old Model Ballard Rifle for Kentucky, serial number 10940 (Photograph courtesy of Rock Island Auctions).

cluded the 2nd South Carolina (Colored) Infantry purchased them on the open market from James M. Latta of Fernandina, Florida. The 2nd South Carolina was originally raised in May 1863 by Colonel Montgomery with ex-slaves from plantations near Beaufort and Hilton Head. During most of that year, the regiment served mostly on Morris Island, South Carolina. The regiment earned some fame during the Combahee Ferry Raid on 2 June 1863. In that raid, the regiment's baptism of fire, led by Harriet Tubman, the famous abolitionist and one of the organizers of the Underground Railroad that had led thousands of runaway slaves north before the Civil War, the regiment had dispersed Confederate defenders, burned the bridge constructed at the ferry site, along with several plantations, and freed and escorted about 800 slaves to the safety of Union lines.⁵¹ In December, Colonel Montgomery was promoted to command a brigade and the brigade was transferred for service around Jacksonville, Florida. Colonel Montgomery wanted the Ballards to arm his old regiment's sharpshooters. In February 1864, the regiment was re-designated as the 34th Regiment (U.S.C.T.). It served either in Florida or on James Island, South Carolina for the remainder of the war.

The largest sale of these rifles, however, was to Kentucky. Six hundred are known to have been sold to Kentucky by Merwin & Bray on 22 April 1864.⁵² Presumably, that is also the date the rifles were delivered. Kentucky paid \$28 each for these rifles. Contrast this price with the Army original contract price of \$23 for each. Serial numbers on these rifles overlap with the serial numbers of the Old Model carbines. The highest serial number of a rifle observed is 1678 suggesting that as many as 700 of these muskets were made. The lowest serial number observed is 928. This indicates that the numbers overlap with the carbines beginning about 900. The Annual Report of the Quartermaster General of Kentucky for 1863-64 states that by 30 November 1864, 1,640 .56 caliber carbines had been issued to troops. That number of arms, 1,640 is too high for only carbines and this number most likely also includes these rifles. The rifles were probably issued to one or more of the mounted infantry regiments issued Ballard arms during 1864. The 37th, 45th and 52nd Mounted Infantry regiments all received Ballard arms in 1864.

Old Model Rifles for Kentucky

The last military firearm manufactured during the Civil War was a rifle. Originally, the state of Kentucky ordered 3,000 Ballard full-stocked rifles in .52 caliber (contracted to use the No 56-56 Spencer cartridge). The contract for these rifles also included the 1,000 carbines and 1,000 half stocked rifles both chambered to use the No 44 rimfire cartridge that were previously discussed. Both the carbines and half stocked rifles had all the characteristic of the Model 1862, but the rifles included in this contract dated 17 November 1863 differ. These rifles have many of the same characteristics of the rifle made for the U.S. Army, and referred to as the Old Model. Although these rifles have many of the same characteristics of the Army Old Model, they also have differences. Kentucky, in

their reports referred to these rifles as "musketoons". The contract price for these rifles was \$28 each, the same price Kentucky paid for the Old Model rifles originally contracted for by the Army. The completion of the contract with Kentucky for 3,000 of these rifles was more profitable than continuing to manufacture carbines and rifles for the U.S. Army. It will be remembered that the Army would only pay \$23. for each rifle. Moreover, Army purchased rifles were subject to an intensive inspection, more costly to manufacture, presumably, because significant numbers of parts were rejected. Merwin & Bray appear to have not been distressed that the Army contract was forfeit.

An example of a full-stocked Kentucky rifle is shown in Figure 14. These rifles have the same receiver and barrel characteristics of the Old Model rifles for the Army. They also have the same two-piece breechblock introduced for the carbines and rifles and not the one-piece cast block still manufactured for the carbines and half-stocked rifles that had been included in this contract for Kentucky.

As shown in Figure 15, the receivers are like the receivers on the larger caliber Old Model carbines and rifles made for the U.S. Army contract. The top of the blued receiver was rounded. This is very different from both the carbines and half-stocked rifles included in this contract which had flat top receiver with beveled flat edges. The figure also shows that the barrel is fully round and not part octagon and part round. These rifles were made with full stocks for their 30-inch barrels. Forestocks were retained by three blued barrel bands. This is the same as for the Old Model rifles first intended to be manufactured by Dwight, Chapin & Co. but actually made by Ball & Williams.



Figure 15. Top of receiver, serial number 10715 on a Model 1864 Ballard rifle (Photograph courtesy of Rock Island Auctions).

The location of markings differ from the carbines and half-stocked rifles included in this contract. Instead, they are very similar to markings on the Old Model rifles. The markings are stamped on the receiver and not the barrel. The patent markings "BALLARD'S PATENT / NOV 5, 1861" was stamped in two lines on the right side of the receiver as shown in Figure 3. The maker and agent markings "BALL & WILLIAMS / Worcester, Mass." in two lines and "MERWIN & BRAY AGT'S / NEW YORK" also in two lines were stamped on the left side of the receiver as shown in Figure 3. Note that the manufacturer, Ball & Williams is included on the receiver stamping. This is unlike the "Old Model" rifles

originally contracted for the Army but made by Ball & Williams after the Dwight, Chapin & Co. failure. The serial number is not stamped on the receiver as was for the other "Old Model" rifles made after the Dwight, Chapin & Co. failure. On these Kentucky rifles, the serial number is stamped on both the top of the barrel and receiver as also shown in Figure 15; this image also shows that "KENTUCKY" was stamped on the top of the receiver. None of these rifles show inspector marks.

The rear sights on these rifles are not the same Spencer type sight used on the Old Model rifles originally contracted by the U.S. Army. They are, instead, the same as used on all previous Ballard military arms. The L-shaped single leaf rear sight has two "V" notches, one in a oval shaped window. The notch with the leaf lowered is sighted for 100 yards. The notch in the window is sighted for 250 yards and the notch at the top of the leaf at 500 yards as shown in Figure 5.

One of the main differences between this rifle and the Old Model rifles originally purchased by the Army is the caliber. The original contract for these 3,000 rifles specified them to also be .56 caliber, actually meaning to be .52 caliber to use the No 56-56 Spencer cartridge, the same as for the Old Model rifles for the U.S. Army. The caliber for these rifles was changed.

In the explanation included above about the purchase of carbines of the two Old Model carbines from Henry Chapin, for the Army to find the best cartridge for carbines to arm Federal Cavalry, Merwin & Bray had learned that General George D. Ramsey, the Chief of Ordnance, was in favor of .44 caliber. Merwin & Bray had evidently thought the decision would be in favor of .44 caliber. Although their information proved to be incorrect, Merwin & Bray sent a letter to S.G. Suddarth, the Quartermaster General of Kentucky on 12 January 1864 informing him that the Army Ordnance Department was about to standardize all carbines and rifles to .44 caliber and suggested that Kentucky change its order for rifles to chamber that caliber but unlike the previous .44 caliber, to use a new cartridge, the No 46.⁵³ Suddarth accepted the recommendation. Production had not yet begun but when it did, all of these rifles were chambered for the new No 46 cartridge.⁵⁴ The No 46 cartridge, although not as powerful as the .52 caliber Spencer, the Spencer cartridge was still significantly more powerful than the earlier No 44 (.42 caliber) cartridge. The No 46 cartridge has a 300 grains conical bullet measuring about .455 inch in diameter with 40 grains of black powder. The cartridges used in these rifles were first purchased by Kentucky with the rifles. Presumably they were available when the first rifles were delivered in July 1864. The Army Ordnance Department only began purchase of this ammunition in January 1865⁵⁵

The serial number range on these rifles reverts to the serial number range used in previous contracts. None of these rifles are found with serial numbers in the range used for the .52 caliber carbines and rifles originally contracted by the U.S. Army. Serial numbers observed range from 9400 to about 15000. This is the same range as Model 1864 firearms. See below.

All of these military rifles were sold to Kentucky. The first delivery of these full-stocked rifles was 14 July 1864 and the last 17 March 1865. The Annual Report of the Quartermaster General of Kentucky for 1863-64 states that by 30 November 1864, 2,428 of the 3,000 purchased had been received and 655 of these had by then been issued to Kentucky mounted infantry. Eventually most of these rifles would be issued. When Kentucky transferred their

remaining stocks of Ballard arms to the Federal Government in October 1871, they transferred 1,858 of these rifles. At that time, only 688 of the original 3,000 purchased by Kentucky were reported to still be in "new" (unissued) condition.⁵⁶ Unfortunately, the units receiving these rifles have not been specifically identified. However, it is known that the 37th, 45th and 52nd mounted infantry regiments received Ballards in 1864 and 1865.

These rifles remained in service after the Civil War. Two cavalry units, the Forest Rangers of Fayette County and the Foxtown Rangers of Madison County still carried these .44 caliber rifles in 1871. Also in 1871, Hanley's Infantry Company of Nicholasville and the Woodford Guards of Versailles carried these rifles.⁵⁷

Model 1864 Carbines

The autumn of 1863 was a busy time for Merwin & Bray. Even as the production of carbines and rifles at Dwight, Chapin & Co. was failing and the Army contract about to be cancelled, Merwin & Bray was selling many thousands of carbines and rifles to Kentucky. They also offered to sell the Army even more. On 1 September 1863, Merwin & Bray offered to sell 15,000 more of the .52 caliber carbines, but manufactured by Ball & Williams, at \$23.00 each, and 15,000 of a new model of carbine, but chambered for the Number 44 rimfire cartridge also at \$23 each and an unspecified number of .52 caliber rifles at \$25 each. The .52 caliber rifles were probably the same ones then being completed by Ball & Williams after the Dwight, Chapin & Co. contract was about to be cancelled, as these rifles had not yet been sold to the State of Kentucky.

Brigadier General Ripley quickly responded and offered a contract for 15,000 carbines.⁵⁸ The size of this offer indicates that Ripley was no longer constrained by the recommendations of the 1862 Board and could now purchase as many arms as he believed to be needed. The caliber of the carbines for this contract was not specified, but on 14 September, Merwin & Bray sold the Army a sample .42 caliber carbine, chambered the same Number 44 rimfire cartridge as they had been selling to Kentucky, for \$25.⁵⁹ This must have been a Model 1862 carbine as these were the only carbines of that caliber then being manufactured (see above). Merwin & Bray did not anticipate Ripley's quick response. In fact, they were unable to accept a contract. Merwin & Bray's attention was, again, elsewhere., They were still trying to complete the Army's contract for .52 caliber carbines and rifles, even as their contractor, Dwight, Chapin & Co. was failing. At this time, they were very busy transferring the assets and arms from Dwight, Chapin & Co. to Ball & Williams. More importantly, they were in the final stages of negotiations with Kentucky for another 5,000 carbines and rifles. Kentucky paid a higher price and sales to Kentucky were much more profitable and preferred over sales to the Army. The Army wanted to purchase carbines at \$23 each; Kentucky offered to pay \$26 for carbines and even more for rifles. Other than the purchase of the sample carbine, nothing came of this Army offered contract.

The Army, however, would purchase a new model of Ballard carbine. Ball & Williams had completed the design of a new model. When the Army did eventually purchase them, they were designated as the Model 1864. The Army designated these as different from the larger caliber carbines they had contracted for in October 1862 that they referred to as the Old Model. An example of this new model carbine is shown in Figure 16. They are very similar to the earlier, Model 1862 carbines made and sold to Kentucky, but there are several differences.

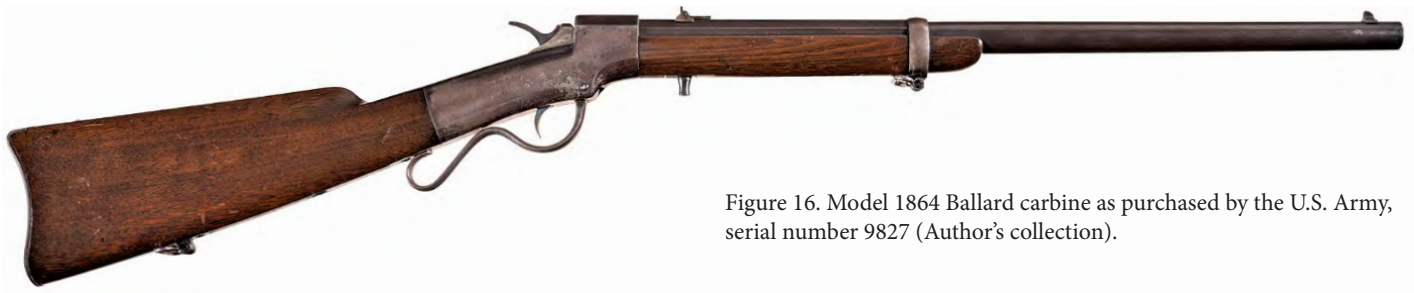


Figure 16. Model 1864 Ballard carbine as purchased by the U.S. Army, serial number 9827 (Author's collection).

1. These new model carbines all have a two-piece cast breechblock. The previous model had a breechblock cast as a single piece. On these new carbines, the halves of the block are bolted together. The top of the block where it lays along-side the breech when the block is ready to be fired is also different. It is rounded without beveled sides like in the earlier model.
2. The markings on these carbines do differ from the earlier carbines. Instead of the markings on the flats atop the barrel just forward of the rear sight mount, the markings were now stamped on the receiver. The patent markings "BALLARD'S PATENT / NOV 5, 1861" was stamped in two lines on the right side of the receiver as shown in Figure 3. The maker and agent markings "BALL & WILLIAMS / Worcester, Mass." in two lines and "MERWIN & BRAY AGT'S / NEW YORK" also in two lines were stamped on the left side of the receiver as shown in Figure 3.

Many characteristics remain unchanged. These carbines (Figure 16) retain the same design of extractor with the brass pull slotted at the bottom of the forearm. They also still have a blued iron receiver with flat top beveled on the sides as the earlier carbines, rather than the rounded receiver of the Old Model rifles and carbines. They continue to have the same design 20-inch blued barrel, part octagon and part round. The L-shaped single leaf rear sight remains the same as used on the previous Model 1862 carbines and rifles and shown in Figure 5. The sight has the two "V" notches in the leaf, one in an oval shaped window and one at the top. The notch with the leaf lowered is sighted for 100 yards. The notch in the window is sighted for 250 yards and the notch at the top of the leaf at 500 yards. All of these carbines also have sling swivels mounted under the barrel band and under the stock near the butt.

Serial numbers are stamped in two places, the same as on the earlier carbines: once on the top of the barrel immediately forward of the receiver and once on top of the receiver. Up to three digits of the serial number is also stamped into the left side of the hammer on the left side of the breechblock and, usually, on the main spring.

All of the U.S. Army accepted carbines and probably some of the carbines purchased by Kentucky that used parts made before the Army contract was terminated, have Army inspection markings. The Army accepted carbines have the cartouche of Miles Moulton, "MM" in script stamped into the left side wrist of the stock (Figure 17). Barrel proof stampings of either Miles Moulton, "M.M." or George Haynes, "G.H." have been observed. Figure 3 shows the "G.H." stamping of George Haynes on the left side of the receiver. Figure 17 shows the "MM" barrel stamping of Miles Moulton. Inspector stamped initials are also found on the top of the stock in front of the buttplate, on the buttplate and on the backside of the barrel band.

The first six carbines of this new model were purchased by the Army for the cartridge trials of 1864. As explained above, the Secretary of War, Edwin Stanton, issued Special Orders Number 410 on 12 September 1863 to convene a Board of Officers "to consider and report upon the proper caliber and length of barrel of carbines for use of cavalry in the service of the United State."⁶⁰

Following the report from the Board and the lack of a clear recommendation regarding the best caliber, Stanton directed that carbines be purchased from Merwin & Bray, from the Joslyn Fire Arms Company of Stonington, Connecticut and from Sharps & Hankins of Philadelphia. to conduct trials. A purchase order for six carbines in .50 caliber was sent to each company on 24 November 1863. Merwin & Bray had no carbines chambered for .50 caliber, and as explained above, Henry Chapin of the failed Dwight, Chapin & Co. eventually sold the Army two of the carbines they had made for the Army contract but had not delivered before the Contract had defaulted in October. Two days later, on 26 September, the Army issued another contract but this time for six carbines of .44 caliber. Merwin & Bray did deliver these six carbines. These carbines were used in the trials that eventually determined that Army carbines would use a .50 caliber rimfire cartridge.

The carbines were requested to chamber cartridges with various powder charges from 35 to 60 grains. None of the six Ballard carbines have been identified and it is unknown how Merwin & Bray actually had the chambers of these carbines modified, if any were actually modified. At least eight of 17 Sharps & Hankins carbines purchased for these cartridge trials survive. They all have markings on the barrel indicating the grains of powder designed for the chamber. The barrel lengths of the carbines supplied by Sharps & Hankins had to be reduced from the normal 24 inches to 22. Presumably, the Ballard carbines purchased for these experiments would be similarly marked, but the barrel lengths of the Ballard were already about 22 inches and did not need modifications. The Army paid \$28 each for these carbines.⁶¹ All six had been delivered and were being tested by January 1864. The Army paid for the carbines on 11 July 1864.

After expanding the facilities at Ball & Williams, Merwin & Bray were again interested in an Army contract. They offered the Army another contract near the end of 1863. A new contract was finalized on 7 January 1864⁶² by General Ramsay for 5,000 carbines, chambered for the .42 caliber, No 44 cartridge, the same cartridge used on carbines previously supplied to Kentucky. The contracted price was \$23 per carbine. The contract also required deliveries of 450 carbines per month beginning that month, January 1864. Merwin and Bray failed to make the January and February deliveries but delivered 1,000 carbines on 18 March. Another 500 carbines were delivered to the Army on 1 August 1864. That was the last delivery. Six hundred more of these carbines were manufactured by Ball & Williams, but were rejected by the Army as the contract had lapsed.



Figure 17. Cartouche of Miles Moulton on the wrist of the stock (top left), barrel inspection stamping (top right), Army inspection markings on butt plate and top of stock (bottom left) and Army inspection markings on barrel band of a Model 1864 carbine, serial number 10203 (Don Dietrich collection).

The 600 carbines rejected by the Army were, as usual, later sold to Kentucky, in September 1864. Merwin & Bray, probably happily, forfeited the remainder of the Army contract. This was no loss, as Merwin & Bray could make more profit and have less hassle with Ball & Williams making arms for Kentucky. The date of purchase of the 600 carbines by Kentucky was not recorded but the Quartermaster General of Kentucky, Samuel G. Suddarth, reported the purchase and the price as \$26 for each carbine.⁶³ That is \$3 more per carbine than the Army paid.

Interestingly, barrels might have been manufactured by E. Remington in Iliion, New York. According to Colonel Thornton, barrel proving was done at Remington.⁶⁴ The inspectors, Miles Moulton and George Haynes might have had to travel between the Remington factory in New York where barrel proving was probably done and Ball & Williams in Worcester, Massachusetts where other components received inspections.

The observed serial number range of Model 1864 carbines with Army inspections is from about 9400 to about 12000. Dutcher, however, notes an inspected carbine with serial number 8919.⁶⁵ That would suggest that at least some of the 1,500 carbines purchased by the Army were the earlier Model 1862. There are several military type carbines observed with nearby serial numbers in the 8900 to 9100 range but they are all the earlier model. Carbines serial numbers fully overlap with serial numbers of the full-stocked rifles purchased by Kentucky. There is also several sporting rifles observed in this serial number range. Model 1864 carbines that do not show Army inspections were probably the 600 carbines sold to Kentucky. These carbines are observed with serial numbers above

11900 to about 13900.

McAulay found records of Army purchased Ballard carbines issued in small quantities to several Federal cavalry units, including the 1st Alabama, 2nd Iowa and 7th Ohio. More substantial quantities, sufficient to arm several troops, were issued to the 12th Ohio and McLaughlin's Squadron of Ohio Cavalry.

The 12th Ohio was mustered into Federal service in November 1863. The regiment fought against Morgan's invasion into Kentucky in June 1864. After Morgan withdrew, the regiment was probably issued their Ballard carbines. The Regiment was assigned to Stoneman's Cavalry Corps and participated in Stoneman's raid into southwestern Virginia and western North Carolina in early 1865.⁶⁶

McLaughlin's Squadron served throughout the Civil War. The unit was raised in 1861 and was sent into Kentucky. It served in east Tennessee and southwest Virginia in 1862 and 1863. In June 1864, probably about the time the Squadron was issued Ballard carbines, it joined Sherman's Army for the campaign to capture Atlanta. It was assigned to Stoneman's Cavalry Corps and participated in the unsuccessful raid to free Federal prisoners at Andersonville. It remained part of Sherman's Army, fighting in Georgia and the Carolinas until the end of the War.⁶⁷

Some publications incorrectly state that 1,200 of these carbines were sent to Vermont following the Confederate raid across the Canadian border on the small town of St. Albans on 19 October 1864.⁶⁸ There is no record of any Ballard carbines sent to Vermont. Immediately following the raid, Vermont organized 31 new com-

panies of provisional infantry, 14 companies of provisional cavalry and two companies of frontier cavalry to supplement existing militia and protect the border with Canada against any reoccurrence. The Army did, in fact, send arms to Vermont following the raid to provide arms for these new organizations. The Army sent rifled muskets for the infantry and 500 Smith carbines and 1,200 Remington carbines, not Ballard carbines, with ammunition and accoutrements. The Smith carbines saw service with these new cavalry companies but the Remington carbines did not because these carbines were not delivered before the final days of the Civil War.

This model carbine continued to be manufactured, primarily for commercial sales, even after Warren Williams retired from the Ball & Williams Company in July 1865. The new company, R. Ball and

Company reportedly manufactured at least 200 of these carbines⁶⁹ among the over 2,000 firearms manufactured between July 1865 and March 1867. R. Ball & Company arms have observed serial numbers from about 16000 to 18000. The earliest observed R Ball & Company marked carbine of this model has serial number 15998 and the highest 17932. It is known that 100 of these Ballard carbines were purchased on 26 March 1866 by the State of New York to arm prison guards.⁷⁰ These carbines are identical to the carbines made for the Army but the markings on the left side of the receiver omit the Ball & Williams markings. The only markings on the left side of the receiver are the Merwin & Bray agent stampings.

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Ballard Military Firearms of the Civil War

	MODEL 1862		OLD MODEL				MODEL 1864
	MILITARY CARBINE	MILITARY RIFLE	DWIGHT, CHAPIN & CO MILITARY CARBINE	BALL & WILLIAMS MILITARY CARBINE	MILITARY RIFLE FOR THE US ARMY	MILITARY RIFLE FOR KENTUCKY	MILITARY CARBINE
NUMBER MANUFACTURED	about 4,500	1,000	about 115	about 900	about 4,500	3,000	about 2,500
CONTACT DATE & PURCHASES	12 Aug 1862 1,250 by KY	17 Nov 1863 1,000 by KY	9 Dec 1863 1 by US	27 Apr 1864 900 by KY	31 Oct 1863 1 by US	17 Nov 1863 3,000 by KY	24 Nov 1863 6 by US (for Cartridge Trials)
	10 Apr 1863 1,750 by KY	-	27 Apr 1864 115 by KY	-	21 Dec 1863 35 by US	-	7 Jan 1864 1,500 by US (unrecorded)
	6 Jul 1863 500 by KY	-	27 Apr 1864 115 by KY	-	22 Apr 1864 600 Plus KY	-	Jan 1864 600 by KY
	14 Sep 1863 1 by US	-	31 Oct 1863 1 by US (for Cartridge Trials)	-	-	-	-
	17 Nov 1863 1,000 by KY	-	5 Dec 1863 1 by US (for Cartridge Trials)	-	-	-	-
BORE CALIBER	.42 (No 44RF)	.42 (No 44RF)	.52 (No 56-56RF)	.52 (No 56-56RF)	.52 (No 56-56RF)	.44 (No 46RF)	.42 (No 44RF)
MANUFACTURER	BALL & WILLIAMS	BALL & WILLIAMS	DWIGHT & CHAPIN & Co	BALL & WILLIAMS	BALL & WILLIAMS	BALL & WILLIAMS	BALL & WILLIAMS
BARREL LENGTH (NOMINAL)	22 inch	30 inch	22 inch	22 inch	30 inch	30 inch	22 inch
	Part Octagon Part Round	Part Octagon Part Round	Round	Round	Round	Round	Part Octagon Part Round
STOCK	Half with 1 barrel band	Half with 1 barrel band	Half with 1 barrel band	Half with 1 barrel band	Full with 3 barrel bands	Full with 3 barrel bands	Half with 1 barrel band
BREECH & RECEIVER							
BREECH BLOCK	1-Piece Cast	1-Piece Cast	2-Piece Bolted	2-Piece Bolted	2-Piece Bolted	2-Piece Bolted	2-Piece Bolted
RECEIVER	Flat Top	Flat Top	Rounded Top	Rounded Top	Rounded Top	Rounded Top	Flat Top
REAR SIGHT	1 Leaf 100, 250 & 500 yds	1 Leaf 100, 250 & 500 yds	1 Leaf 100, 250 & 500 yds	1 Leaf 100, 250 & 500 yds	Spencer Type with 100, 250 & 500 yds	1 Leaf 1100, 250 & 500 yds	1 Leaf 100, 250 & 500 yds
MARKINGS							
BALLARD PATENT	Top of Barrel (Right Flat)	Top of Barrel (Right Flat)	Right Side of Receiver	Right Side of Receiver	Right Side of Receiver	Right Side of Receiver	Right Side of Receiver
MERWIN & BRAY AGENTS	Top of Barrel (Left Flat)	Top of Barrel (Left Flat)	Left Side of Receiver (Bottom)	Left Side of Receiver	Left Side of Receiver (Bottom)	Left Side of Receiver (Bottom)	Left Side of Receiver (Bottom)
MANUFACTURERS	Top of Barrel (Top Flat)	Top of Barrel (Top Flat)	Left Side of Receiver (Top)	None	Left Side of Receiver (Top)	Left Side of Receiver (Top)	Left Side of Receiver (Top)
SERIAL NUMBERS (UP TO 3 DIGITS ALSO ON MAJOR PARTS)	Top of Barrel & Receiver	Top of Barrel & Receiver	Left Side of Receiver	Left Side of Receiver	Left Side of Receiver	Top of Barrel & Receiver	Top of Barrel & Receiver
"KENTUCKY"	None	Top of Barrel (Forward of Rear Sight)	None	None	None	Top of Receiver & Barrel	None
GOVERNMENT INSPECTIONS							
	None	None	Elias M. Dustin ("D" or "EMD") No Cartouches	None	None	None	Miles Moulton ("M.M.") or George Haynes ("G.H."); "MM Martouche" (Cartouches are not on KY purchased)
OBSERVED SERIAL NUMBERS	600 to 9,400	7,100 to 8,700	1 to 115	116 to 1,700	900 to 1,700	9,400 to 15,000	9,400 to 16,000

Endnotes

- ¹ John T. Dutcher, *The Great American Single Shot Rifle*, 2002, p 1.
- ² The partnership of Merwin & Bray remained until it was dissolved in 1866. (Edward Hull, Ballard “Old Model” Firearms Part 1, *Gun Report*, June 1985).
- ³ The highest serial number observed on a gun with this type breechblock is 87. That gun is a rifle of .38 caliber with a 36 inch full octagon barrel. Dutcher only noted guns with this early type breechblock to serial number 54. (John T. Dutcher, “Ball & Williams Ballards: Early 1862 to Mid 1865”, *Gun Report*, August 1999, p 24).
- ⁴ Ibid.
- ⁵ John Dutcher reports a carbine with serial number 4104 (Ibid, p 26). College Hill Arsenal sold one a few years ago with serial number 2547.
- ⁶ Ibid.
- ⁷ Dean S. Thomas, *Round Ball to Rimfire, Part Two*, 2002, p 277.
- ⁸ Ibid.
- ⁹ Dutcher 1999, p 26.
- ¹⁰ Ibid.
- ¹¹ Ibid.
- ¹² Ibid.
- ¹³ Letter from Brigadier General John T. Sprague to Brigadier General James A. Farrell, Commissary General of the State of New York in New York city dated 6 July 1863 reproduced as part of the Annual Report by the Commissary General for 1863 (Sprague 1864, Report 142 p 9).
- ¹⁴ Letter from General Farrell to General Sprague dated 15 August 1863 (Ibid, p 12-13).
- ¹⁵ The second contract of 10 April 1863 for 1,750 carbines, according to John Dutcher, included substitution of 58 sporting rifles. This would make the total of military carbines less than 5,500 contracted. It is also noted that Merwin & Bray offered to supplement the carbines already ordered by Kentucky with 60 sporting rifles with 28-inch barrels and fitted with sling swivels. (Offer was made in a letter from Merwin & Bray to S.G. Suddarth, Quartermaster General of Kentucky dated 2 February 1863, (Dutcher 1999, p 25) but there is no record of purchase.
- ¹⁶ Fayette Hewitt, *Annual Report of the Quartermaster General to the governor of the state of Kentucky for the Year 1871*, 1871, p 34.
- ¹⁷ John D. McAulay, *Carbines of the U.S. Cavalry 1861-1905*, 1996, p 132.
- ¹⁸ George W. Palmer, *Annual Report of the Commissary General of the State of New York to the Assembly of the State of New York, Ninetieth Session, 1867*, Appendix J.
- ¹⁹ NA RG 156-1001.
- ²⁰ Hull, Part 1, 1985, p 17.
- ²¹ Report from J. Holt, Commissioner, to Edwin M, Stanton, Secretary of War dated 26 May 1862 reproduced in Stuart C. Mowbray and Jennifer Heroux, *Civil War Arms Makers and Their Contracts*, 1998, p 8-9.
- ²² Hull, Part 1, 1985, p 17.
- ²³ Ibid, p 18.
- ²⁴ Details of the personal histories of George Dwight and Henry Chapin were compiled by Edward Hull (Hull, 1985). After the collapse of the Dwight, Chapin & Co, George Dwight returned to Springfield and became superintendent of the Gas Light Company. Henry Chapin became the secretary of the New Haven Arms Company, that later in 1866 became the Winchester Arms Company.
- ²⁵ Norm Flayderman, *Flayderman's Guide 9th Edition*, 2007, p 148.
- ²⁶ Hull, Part 1, 1985, p 18.
- ²⁷ Ibid.
- ²⁸ Dutcher 2002, p 31.
- ²⁹ Letter to Merwin & Bray from Brigadier General James W. Ripley dated 8 September 1863 (NA RG 156-81).
- ³⁰ No specific date for the cancellation of the contract is known. No correspondence has been located but Edward Hull reported that he had seen the Ordnance Office ledger of contracts and it noted that the contract was “cancelled” but no date was indicated. (Hull, Ballard “Old Model” Firearms Part 2, July 1985, p 18)
- ³¹ Dutcher 2002, p 32-33.

- ³² S.G. Suddarth, *Annual Report Quartermaster General to the Governor of the State of Kentucky for the Year 1863-64*, 1864, p 10.
- ³³ McAulay, 1996, p 53.
- ³⁴ Suddarth 1864, p 28.
- ³⁵ Adjutant Generals Office, *Proceedings of the Ordnance Board convened by Special Orders No, 410 dated 12 September 1863*, 1864, p 5.
- ³⁶ Ibid, pp 6-10.
- ³⁷ Adjutant Generals Office, 1864, p 10.
- ³⁸ Ibid, pp 10- 11.
- ³⁹ McAulay J. D., *Carbines of the Civil War*, 1981, p 102.
- ⁴⁰ Thomas,D., *Round Ball to Rimfire Part 2*, 2002, p 304.
- ⁴¹ Dutcher,J.T., "Ball & Williams Ballards: Early to Mid 1865", *Gun Report*, August 1999.
- ⁴² Walter, J., *Rifles of the World*, 2006, p 516. The Army, however had only purchased 151 Wesson carbines (McAulay, 1981, p 122).
- ⁴³ Sword,W., *The Historic Henry Rifle*, 2002, pp 71.
- ⁴⁴ Ibid, pp 62-63.
- ⁴⁵ Ibid, pp 16-17.
- ⁴⁶ Thomas, 2002, pp 291-292.
- ⁴⁷ Interestingly, however, the Army had purchased during 1861 and 1862, over 13,000 French revolvers firing primed metal cartridges. These had been in widespread service since late 1861. These included 12,989 Lefauchaux (12 mm) and 550 Perrin pinfire revolvers (11mm). The Army had also purchased 106 Rafael revolvers (11 mm), also manufactured in France, but using an early centerfire cartridge. The disadvantages of pinfire cartridges removed them from consideration from these trials.
- ⁴⁸ Ibid.
- ⁴⁹ Ibid. p 23.
- ⁵⁰ C. A, Dana, *Executive Document 99, House of Representatives, Second Session 40th Congress, "Reply by the Secretary of War to Resolution of the House of 15th March last, asking for information concerning the ordnance department and its transactions"*, 1868, Ibid, p 736.
- ⁵¹ U.S. War Department, *The War of the Rebellion: a Compilation of the Official Records of the Union and Confederate Armies*, Volume 14, 1885, pp 306-308.
- ⁵² Suddarth 1864, p 10.
- ⁵³ Dutcher 2002, p 27.
- ⁵⁴ Suddarth 1864, p 10.
- ⁵⁵ Thomas 2002, p 309.
- ⁵⁶ McAulay, 1996, p 79
- ⁵⁷ Hewitt, 1871, p 33-34
- ⁵⁸ Letter to Merwin & Bray from Brig General J.W. Ripley dated 8 September 1863 (NA RG 81).
- ⁵⁹ Dana, 1868, p 836.
- ⁶⁰ Adjutant Generals Office, 1864, p 5.
- ⁶¹ Ibid.
- ⁶² Ibid. The contract was also listed by John D. McAulay, in *Carbines of the Civil War 1861-1865*, 1981, p 91
- ⁶³ Suddarth 1864, p 10.
- ⁶⁴ NARA RG 156, entry 101.
- ⁶⁵ J. T. Dutcher 2002, p 25.
- ⁶⁶ <https://civilwarindex.com/12th-ohio-cavalry.html>
- ⁶⁷ <https://civilwarindex.com/mclaughlins-cavalry-squadron.html>

⁶⁸ This is an often-repeated myth. Dutcher reported this in his article in the Gun Report and John D. Hamilton also, in his American Society of Arms Collectors article in the 2004 Bulletin. John Hamilton reported correctly that arms transferred from the Ordnance Department to Vermont following the St Albans Raid, voucher 23,378, included 120,000 Ballard cartridges. The arms transferred as indicated on voucher 23,374 was for 1,200 Remington carbines. The date of both vouchers was 13 December 1864. On that date, no Remington carbines had been delivered to the Army and none would be before the end of March 1865. Hamilton assumed that the Ballard cartridges were .44 caliber and concluded that these cartridges could not be used in Remington carbines that needed .46 caliber (No 46) cartridges. Because no Remington carbines were available and Ballard cartridges could not be used with them anyway, Dutcher, Hamilton and others reasoned that there must have been a mistake in the voucher and the 1,200 carbines transferred to Vermont were not Remingtons but Ballards. The vouchers were, in fact, not mistakes. Vermont received only Remington carbines. They did not receive them in December 1864 but they did get them later by May 1865. The Adjutant General of Vermont's Annual Report for the period October 1864 to October 1865 clearly reports 1,200 Remington carbines and 120,000 cartridges in State inventory (page 117-118 of the Report). The Report does not list any Ballard carbines in the State inventory. The confusion about the voucher labeling the cartridges as Ballards was because in December 1864 the only No 46 rimfire cartridges made by that time had been made for the Ballard. 3,000 Ballard rifles using No 46 rimfire cartridges had been purchased on 17 November 1863 by Kentucky and were being issued to that State's troops by mid 1864. These were the only firearms in existence using the No 46 cartridge. The only cartridges yet made and available for transfer to Vermont were cartridges originally made for these Ballard rifles. The Ordnance Department only began purchasing No 46 cartridges for Remington carbines in February 1865. (Thomas 2002, p 309).

⁶⁹ Dutcher 2002, p 39.

⁷⁰ Palmer, 1867, p 4 and Abstract B, p 22.

