

THE BROWN-MERRILL BOLT ACTION RIFLE

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When the Civil War ended the U.S. Government had an incredible number of surplus arms in its inventory. Although most were arms used by the Union army, there were also many thousands of captured and surrendered Confederate arms. The vast majority were muzzle loading rifle-muskets that were now obsolete because breech loading guns and repeating firearms that used self-contained metallic cartridges were the future. After the war the U.S. Government was practically bankrupt and was looking for ways to inexpensively modernize its ordnance. One way was to convert its muzzle loading percussion rifle-muskets to breech loading rifles that used metallic cartridges. At the same time the U.S. government sold many of the obsolete arms that were in storage to arms dealers. Many inventors and companies devised ways to convert muzzle loading firearms into cartridge breechloaders and then sell them for a profit.



*Fig. 1 – Brown-Merrill rifle converted from British Pattern 1853. Right side.
Photograph courtesy of Rock Island Auction Company.*



*Fig. 2 – Brown-Merrill rifle converted from British Pattern 1853. Left side.
Photograph courtesy of Rock Island Auction Company.*

One such company was the Brown Manufacturing Company of Newburyport, MA. The Brown-Merrill, bolt action rifle (commonly called the Brown) most often seen today was converted from British Pattern 1853 (P53) Enfield percussion rifle-muskets. An estimated 900,000 P53s were imported by both the Union and the Confederacy during the Civil War. The P53, in .577 caliber, was the predominant Confederate infantry longarm, and the second most numerous Union infantry weapon after the Springfield Models 1861 and 1863 rifle-muskets. Not only were there more than enough surplus P53's available for conversion to breech loading metallic cartridge guns, but the P53's .577 caliber allowed the use of American .58 caliber ammunition.



Fig. 4 – British Pattern 1853 Rifle-Musket

Smithsonian Photo Public Domain

The Brown Manufacturing Company of Newburyport, Mass.

The Brown Manufacturing Company of Newburyport, Massachusetts produced the Brown-Merrill rifle from 1869 to 1873. The firm started in 1861 as Ball and Williams in Worcester, Massachusetts, which produced Ballard rifles and carbines. In 1865 Williams retired from Ball and Williams and the firm struggled on as R. Ball and Company until Joseph Merwin and Edward P. Bray of Merwin and Bray of New York (the sales agents for Ballards) purchased it in 1866. Merwin and Bray moved the factory to Newburyport, provided new machinery and changed the firm's name to the Merrimack Arms and Manufacturing Company. Merrimack continued to produce Ballard rifles as well as Southern Derringers. John Hamilton Brown of Maine purchased the company in 1869, incorporated it in New York, and changed the name to the Brown Manufacturing Company. The firm continued to manufacture Ballard sporting and target rifles and Southerner derringers. The firm manufactured and tried to market the Brown-Merrill rifle but it faced stiff competition in a market that was flooded with surplus conversions and newly-built arms. It appears that Brown also manufactured rifles for others, specifically the Van Choate rifle, developed by Sylvanus F. Van Choate of Boston. In 1873 a depression and low sales forced the Brown Manufacturing Company into bankruptcy and the machinery was sold to former Colt employee John Marlin, who founded the Marlin Firearms Company, and continued to produce Ballards.

The Brown-Merrill Rifle

Almost all Brown-Merrills seen today are converted from British Pattern 1853's, a single shot, muzzle loading percussion weapon. It is a single shot, bolt action, breech loading rifle that fired a .58 caliber Berdan-primer centerfire cartridge. Some examples were also made in .58 rimfire. (The company claimed that the rifle could be made in any centerfire caliber.) The turn-bolt mechanism is similar to the Prussian Dreyse rifle, French Chassepot rifle, the Van Choate (also manufactured by the Brown Manufacturing Co.), and the Ward Burton. There is a short bolt handle at the back of the bolt and two locking lugs just in front of the handle. When the bolt handle is lifted up and the bolt pulled back it cocks a small external hammer immediately behind it and opens the chamber for loading. The hammer has a half-cock and can also be cocked by hand. The user inserts a cartridge into the breech, closes and turn the bolt to lock the action, and pulls the trigger to fire the gun. The external hammer moves forward, striking the rear of the firing pin which projects from the back of the bolt. The firing pin moves forward and strikes the rear of the cartridge, igniting the powder and firing the bullet. When the bolt is turned and pulled back, an extractor in the bolt pulls the spent shell back and the shell is extracted. There is a small bolt locking / safety latch on the right of the receiver. There is a screw on the left of the receiver which, when removed, allows the bolt to be withdrawn from the rifle for cleaning. The rifle is 54 ¾ inches long and three Enfield style clamping iron barrel bands fasten the 34 inch barrel to the stock. (Note: There are three types of P53 barrel bands. The one most often seen on Brown-Merrill conversions is the Palmer Patent.)



*Fig. 5 - The Brown-Merrill action with bolt closed. Note the hammer behind the bolt, the small bolt locking latch in front of the bolt handle, the Pattern 1853 sight and the distinctive step in the stock by the barrel band. Note where the original lock plate was expertly replaced by wood.
Author's Collection, Photo Bill Chronister*

The action and conversion was covered by George Merrill's U.S. Patents, Numbers 119,939 and 119,940, both dated October 17, 1871. Merrill, of East Orange, NJ, was the Secretary of the Brown Manufacturing Company and had numerous patents registered in his name, including a shoe fastener, a carving machine, a pin cushion and a toy. The Pattern 1853 Enfields were converted to Brown-Merrills by removing the lock, cutting down the original 39 inch .577 caliber blued barrel at the breech to 34 inches and screwing it into a newly machined receiver with a bolt mechanism. The full-length Enfield stocks were altered from their original side lock configuration. The lock plate and screw bases, along with the escutcheons on the left side of the stock were removed. The lock plate inletting and the left stock escutcheon screw holes were neatly filled using walnut wood that precisely matched the wood of the original stock. The barrel retained its original blue finish, but the new action was left in the white. The patina of the action of the specimen in the author's collection is noticeably lighter than the barrel's patina. The bolt is bright. The rifle retains the brass Enfield-style furniture. It has an iron cleaning rod. There are no external serial numbers. The only U.S. markings found on the exterior of the gun are on the bolt and read:

**BROWN MFG. Co. NEWBURYPORT, MASS.
PATENTED OCT. 17, 1871**

Some Brown-Merrill conversions may still have British stamps or cartouches on the stock. These stamps often identify the manufacturer or sales agent, such as the Birmingham Small Arms Trade (see Figure 10).

The rifle is a handsome, well-proportioned, well-built weapon that retained the lines of the Pattern 1853. The Brown-Merrill bolt action was advanced when compared with other conversion actions of that time. The mechanical design is simple as the lock has only three pieces, the hammer, trigger and mainspring. There is only one spring in the rifle. This is the mainspring, which doubles as the both the trigger spring and hammer spring. The bolt in rifles converted from P-53s have two locking lugs in front of the bolt handle.

While the action may have been stronger than necessary for low pressure .58 caliber rimfire and Berdan centerfire cartridges, higher pressure cartridges, such as the .50-70 and .45-70 were in the offing. However, while the action may have been strong, much wood was removed in the receiver area during the conversion in order to fit the new action, weakening the stock in the wrist. The wrist is the weakest area of the rifle and it is not uncommon to find specimens with cracked stocks in the wrist area.



Fig. 6 – A close view of the Brown-Merrill action with bolt closed. Note the hammer behind the bolt, the rear end of the firing pin and the small bolt locking latch in front of the bolt handle. Note where the original lock plate was expertly replaced by wood. Author's Collection, Photo Bill Chronister



Fig. 7 – Brown-Merrill rifle with action open and rear sight leaf raised. Note that the hammer was cocked by the opening of the action. Note the locking lug in front of the bolt handle. Author's Collection, Photo Bill Chronister



Fig. 8 – Top view of open action. Note the two locking lugs on the bolt, the extractor on the top of the bolt and the groove in the chamber that the extractor slides into. Author's Collection, Photo Bill Chronister



Fig. 9 – Brown Manufacturing Company and patent markings on the closed bolt. These are often the only U.S. markings found on the exterior of the rifle. Author’s Collection, Photo Bill Chronister



Fig. 10 – Birmingham Small Arms Trade cartouche found on the stock of a Brown-Merrill converted from a British Pattern 1853. Photograph courtesy of Rock Island Auction Company.

U.S. Army 1872 Terry Board Rifle Trials

In 1872 the Brown-Merrill, probably in .50-70 caliber, was submitted to the U.S. Army Ordnance Department for its trials. The Brown-Merrill was listed under the name of its designer, Merrill, and not under the company name. It was given number 83 tested with 98 other weapons by the 1872 Small Arms Review Board, also known as the Terry Board for its chairman, Brigadier General Alfred Terry. The board rejected the Brown in the first round with its testing incomplete, and did not recommend it for further testing or

troop trials. Instead, the Ordnance Department chose the Erskine Allin design for the Trapdoor Springfield in .45-70 caliber, a breech loading rifle that was based on an earlier Allin conversion of older rifle-muskets.

In its report, the Board described the Brown-Merrill as one of a class of “breech-loading small arms having a fixed chamber closed by a movable breech-block, which slides in the line of the barrel by direct action, i.e., bolt guns.” The Board’s report further described the Brown-Merrill operation:

“MERRILL, No. 83

Four motions: Opened; loaded; closed; fired.”

“Opened. – By raising the handle of the breech-bolt to a vertical position and drawing it back to its full extent. In raising the handle, the firing-pin is retracted by a lug near its head engaging with a spiral cam-recess in the receiver; it is held back by the lug entering a circumferential groove in the bolt. In withdrawing the bolt it passes over the hammer and presses it back to the full cock.”

“Closed. – By reversing the movement of the bolt. At the end of the forward stroke, the point of the extractor engages with a recess in a ring which surrounds the mouth of the chamber, and against which the bolt is pressed, and turns the ring with it; so that the rotation of the bolt in locking will not cause it to grind against the head of the cartridge.”

“Locked. – In turning down the handle the piece is locked by the engaging of a sectional collar on the bolt with a corresponding groove in the receiver. When this is accomplished the lug on the firing-pin is opposite the deepest part of the spiral recess and is free to move forward when the piece is fired.”

“Fired. – By a center-lock moved by a double mainspring.”

“Extraction. – By a spring-hook lying on top of the breech-bolt.”

“Ejection. – In drawing back the bolt, the natural spring of the extractor presses down the rim of the cartridge upon the bottom of the receiver, until it is checked by striking against a notch left there for that purpose, and is thereby thrown upward around the hook of the extractor and clear of the gun.”

Unfortunately, the Brown-Merrill never completed its safety test. The report noted problems with escape of gas. The report also noted a problem with misfires and that as the gun was fired the bolt became increasingly hard to open. The section of the report ended, “The piece was then withdrawn for alteration.” The following is the test results from the Terry Board’s report:

MERRILL, No. 83.

February 28, 1873.

The safety-test was complied with.

I. Nos. 1 and 2. Escape of gas above.

No 3. Slight escape above. The first cartridge tried under the second test missed fire three times, but afterwards went under the prick-punch.

II. Thirteen shots, 9 hits; the gun opening very hard after each shot.

III. Ten shots; the gun opening with greater difficulty than before.

The piece was then withdrawn for alteration.

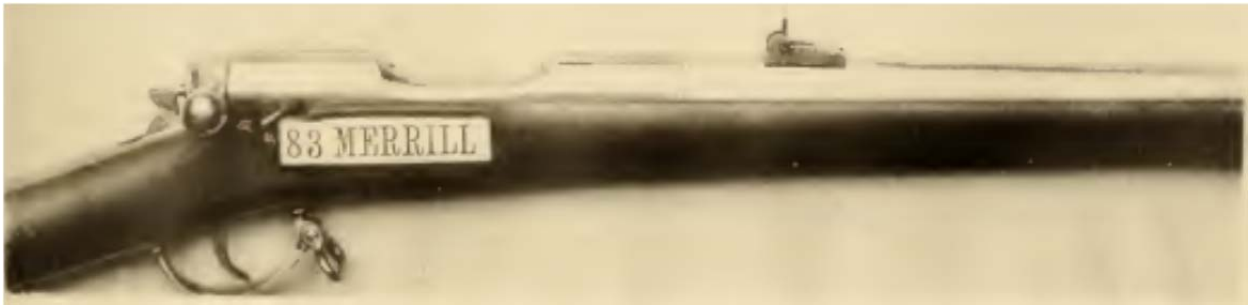


Fig. 11 - Photo of the Brown-Merrill from the Report of the Board for Selecting a Breech-System for the Muskets and Carbines of the Military Service (Terry Board). Note that the rear sight appears to be similar to the rear sight on the U.S. Model 1861 and 1863 rifle-musket rather than the British type sight used on Brown rifles converted from British Pattern 1853 rifle muskets. Also note that the stock is probably a two-barrel band stock and not that of the converted three-barrel band Pattern 1853 stock.
 US Government - Public Domain

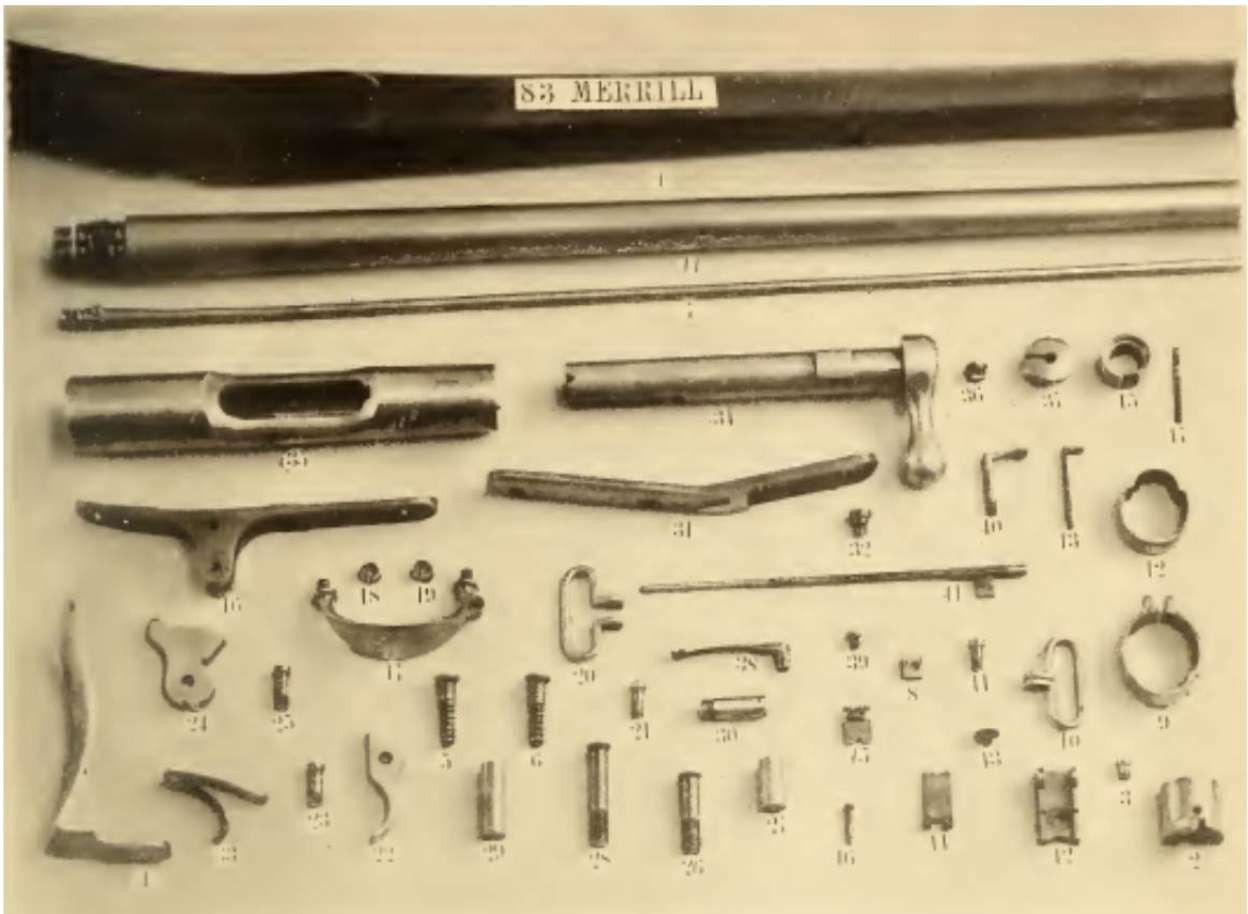


Fig. 12 - Photo of the Brown-Merrill parts from the Report of the Board for Selecting a Breech-System for the Muskets and Carbines of the Military Service (Terry Board). Note that only one locking lug can be seen on the bolt and there are only two barrel bands. Also note that many of the parts – butt plate, trigger guard, barrel bands, and rear sight – are surplus Springfield and not Enfield. The stock is probably new and not converted from a rifle-musket.
 US Government - Public Domain

Despite the Brown-Merrill failing the U.S. Army trials, according to noted author and historian George Layman, there is evidence that New Hampshire issued a small number of Brown-Merrill rifles to one militia unit.

Although the Brown Manufacturing Company never obtained a significant military contract (other than the possible small number sold to New Hampshire), the firm apparently sold the rifles to the civilian market. For instance, there is evidence that

Brown-Merrills were used by the Fenians during an ill-fated 1870 attempt to invade Canada through Vermont. The Bannerman Company in New York sold Brown-Merrill rifles and the 1927 Bannerman Catalogue, page 31, lists a “Fenian Raiders’ Brown B/L Rifle” for sale for \$8.75.

How Many Brown-Merrills?

The exact number of Brown-Merrill rifles that were manufactured is not known. Flayderman states that the quantity is limited. Some sources have postulated that less than 1,000 were produced. Others have conjectured that as many as 2,000 were produced from 1869 to 1873. Whatever the case, the number produced is believed to be very few. According to an 1872 Newburyport newspaper article, Brown had received and completed a contract to convert 2,000 Enfield rifles to breechloaders. However, the customer has not been determined and this article may have been a bit of promotional hyperbole that was part of a publicity campaign to convince state militias or foreign governments to adopt the Brown-Merrill rifle or convert their muzzle loading rifle muskets to the new Brown-Merrill bolt action system.

Three Possible Brown Variations

The mysteries surrounding the Brown-Merrill include not only how many were produced but also when they were produced and how many variations there were. The author believes that that there may be as many as three possible variations. This may seem like a lot of models for a gun that was produced in small numbers but the gun was still in the developmental stage and not really in large scale serial production.

The three possible variations are:

1. Catalogue model - Brown Military Breech-Loader, produced 1869 – 1871
2. Brown-Merrill incorporating improvements in the Merrill patent of 1871 and converted from the British Pattern 1853 rifle-musket, produced 1871 - 1873
3. Brown submitted for the 1872 Army Trials

It appears that Brown was fabricating and marketing the Brown rifle as early as 1869, two years before George Merrill’s patent was issued in 1871. The Brown was advertised in the 1869 Brown Manufacturing Company catalogue, which shows drawings of a rifle called the “Brown Military Breech-Loader” (see Figure 13). The catalogue illustrations decidedly differ from the later Brown-Merrill rifles converted from British Pattern 1853 rifle muskets, which, while rare, are what is most often seen. For instance, catalogue drawings of the bolt of this gun show only one lug, instead of the Brown-Merrill’s observed two lugs. (Note: Drawings of the bolt in the Merrill Patents 119,939 and 119,940 show only one bolt lug.) The rifle in the catalogue lacks the bolt lock/safety latch on the right side of the action. The rifle in the catalogue has a 30 inch barrel instead of the 34 inch barrel of the converted P53s. The stock pictured in the catalogue appears to be more slender than the P53 stock and has two barrel bands instead of the P53’s three. The stock in the catalogue appears to be similar to that of the Brown rifle entered in the Terry Board 1872 Army Trials.

THE "BROWN" MILITARY BREECH-LOADER.

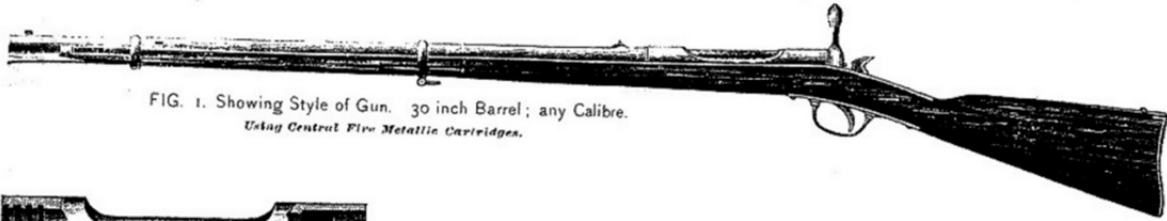


FIG. 1. Showing Style of Gun. 30 inch Barrel; any Calibre.
Using Central Fire Metallic Cartridges.



FIG. 2. Sectional View of Receiver.



FIG. 3. Showing Bolt, Extractor, Lever or Knob, and Firing Pin projecting.

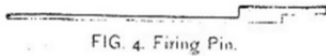


FIG. 4. Firing Pin.



FIG. 5. Showing Lock complete.



FIG. 6. Front View Lever and Hammer, in position to Fire.



FIG. 7. Side View, showing Lever turned at Right Angle and Hammer Cocked.

Fig. 13 – Page from the Brown Manufacturing Company 1869 catalogue showing a rifle identified as the “Brown Military Breech-Loader.” Note the similarities and differences with the Brown-Merrill converted from British Pattern 1853 rifle-muskets. . Public Domain.

Apparently, the Brown pictured in the catalogue was the original configuration of the Brown and that the converted Pattern 1853 Enfields were a second variation that included the improvements in George Merrill’s 1871 patent. The author believes that the rifle submitted to the Army 1872 Board (see Figure 8) was a third variation that had the overall lines of the first variation with the improvements of Merrill’s patent. Unfortunately, the 1869 catalogue was the only Brown catalogue. There were no updated catalogues showing other, later variations, of the Brown-Merrill rifle.



Fig. 14 – Brown-Merrill Rifle converted from P-53. Author’s Collection, Photo Bill Chronister

During the author’s research he found two photographs (see Figures 15 and 16) of a rifle identified as a Brown Trials Rifle that appears almost identical to the “Brown Military Breech-Loader” illustrated in the Brown 1869 catalogue (see Figure 13), rather than a Brown that was converted from a British Pattern 1853. Although much of the accompanying background information was erroneous, the author believes that this is indeed an early Brown-Merrill that was manufactured before the Merrill patent was issued in 1871. The rifle has the bolt and external hammer of the Brown-Merrill, but

also has the slender stock, rear sight, 30 inch barrel, two barrel bands and lack of a bolt lock/safety latch as pictured in the catalogue. Also, the rear sight differs from that illustrated in the Brown catalogue and those found on Brown-Merrills converted from P53's. Like the Brown-Merrill, the only external markings are on the top of the bolt, which read:

**BROWN MFG. Co. NEWBURYPORT, MASS.
PAT. APPLIED FOR**



Fig. 15 – Photo of rifle identified as a Brown. This is probably a pre-1871 Brown. Note the strong similarity to the Brown rifle illustrated in the Brown catalogue of 1869 (Fig. 10) however, the rear sight appears to be the same as that on the rifle in Figure 17. Photo source unknown



Fig. 16 – Brown Manufacturing Company stamp on the bolt of the rifle in Fig. 11. The “PAT. APPLIED FOR” would be consistent with a Brown rifle manufactured before the Merrill patent was issued and the Merrill improvements incorporated into the design. Photo source unknown.

The rifle submitted by the Brown Manufacturing Company to the Army for the 1872 Trials Board (which the Board called the Merrill) is the third possible variation. Judging from the photographs of the Brown in the Board's report (Figures 11 and 12), the rifle has the slender stock and two barrel bands of the first variation but with the Merrill patent improvement, and right side bolt locking/safety latch, found in the Brown-Merrill P-53 conversions.

Some writers have claimed that there was also a Brown carbine. As far as the author is aware, no such example has been observed. Nor have other variations been observed. However, given that the Brown Manufacturing Company would have been trying to promote the action as a mechanism to convert almost any obsolete muzzle loader into a modern breech loading metallic cartridge rifle, it would not be beyond the realm of possibility to see the Brown-Merrill action in a stock other than the Pattern 1853 stock.

One Lug or Two?

A final question is, was the Brown-Merrill designed with one bolt lug or two? Both the Brown 1869 Catalogue drawing of the Brown Military Breech Loader Rifle's bolt and the Merrill 1871 patent drawings (see Figures 19 and 20) show that the bolt had only one lug. Unfortunately, because of its position, the photograph in the 1872 Army Trial

Board's report of the parts of the Brown (Merrill) tested does not indicate whether the bolt had one or two locking lugs. However, observed examples of Brown-Merrills converted from British Pattern 1853 rifle-muskets have two locking lugs on the bolt. Where did the idea come from and why was the change made?

The "why" is self-evident. Two locking lugs make for a stronger, safer action than one lug. As for the genesis of the design, it is probable that the idea came from the Van Choate rifle, which was also manufactured by the Brown Manufacturing Company.

The Van Choate turn-bolt action rifle was designed by Sylvanus Frederick Van Choate, a prolific inventor, who held four US firearms patents (during the time of the Brown Manufacturing Company). Both the Van Choate and Merrill designs were manufactured by the Brown Manufacturing Company at about the same time and there appears to have been some cross-fertilization of designs and ideas. For instance, the first variation Van Choate and the Brown-Merrill's actions and bolt designs were, at first glance, externally similar, with almost identical bolt handles at the rear of the bolt and their turn-bolts also operate in a similar fashion. The first variation Van Choate also has the same lines and dimensions as the Brown Military Breech-Loader illustrated in the Brown 1869 catalogue. There are significant differences in their actions; the Brown-Merrill has a single trigger and external hammer, while the Van Choate has a double trigger and internal hammer/striker.



Fig 17 - Van Choate Rifle. It appears to have the same rear sight as the early Brown in Figure 15. Photograph courtesy of Rock Island Auction Company.

However, the Van Choate U.S. patent drawings (Patent 89,902 dated May 11, 1869, and Patent 94,047 dated August 24, 1869) clearly show two locking lugs (see Figure 21). It is probably that Brown saw the advantage that two locking lugs gave to the Van Choate in handling higher pressure cartridges (including the proprietary Van Choate .45-70 cartridge) and adopted the two-locking lug idea from Van Choate when they started converting the British Pattern 1853's. After all, both rifles were both being made in the same factory by the same workmen.



Fig. 18 – Bolt of Van Choate rifle in Fig. 17. Brown Manufacturing Company stamp indicates that Brown was the manufacturer. Dates below company name are the Van Choate patent dates. Photograph courtesy of Rock Island Auction Company.

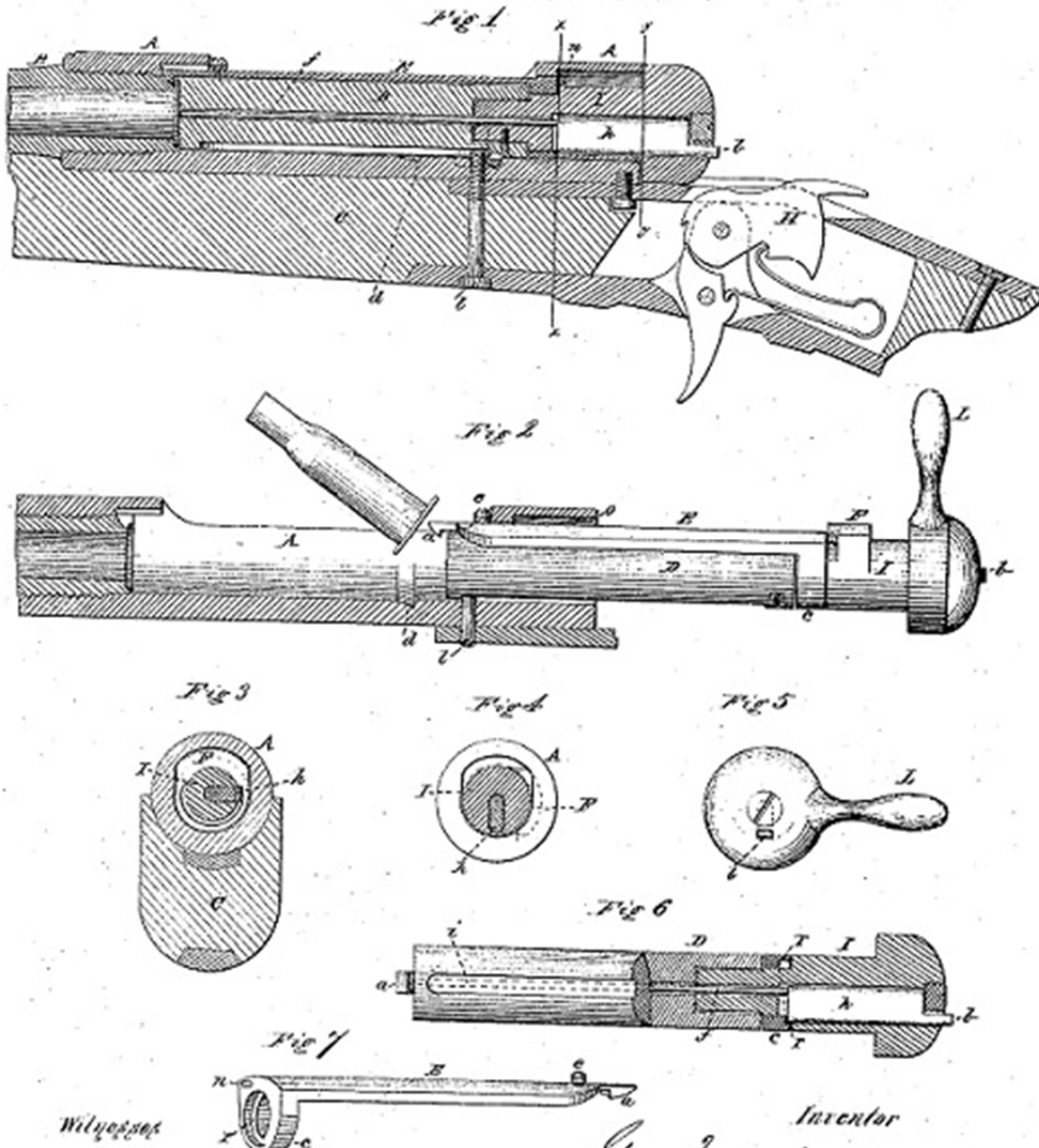
In conclusion, although the Brown-Merrill was a strong bolt action single shot rifle it was never a commercial success. Despite the strengths and advantages of its turn-bolt action it failed to win any major army contracts. This is not surprising given the number of competing designs (including the Remington Rolling Block and the Peabody) and the army's preference for Erskine Allin's cost effective, in-house creation at Springfield Armory. Its poor performance during the Army 1872 Trials probably contributed to its lackluster sales and the eventual failure of the Brown Manufacturing Company.

Today, the Brown, or Brown-Merrill, is a rare, historically significant gun that is highly prized by advanced collectors. It is a prime example of firearms development when firearms design was in a state of flux. It is one of the first American bolt action, single shot rifles firing a metallic cartridge. Its current price reflects its desirability. Recently, an example sold at a Rock Island Auction Company auction for \$1,840.

No. 119,939.

PATENTED OCT. 17, 1871.

G. MERRILL.
BREACH LOADING FIREARM.



Witnesses
Yarrington
Phil S. Dodge.

Inventor
Geo. Merrill
by Dodge & Munroe
Attys.

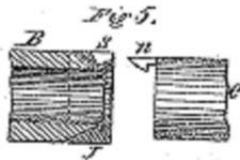
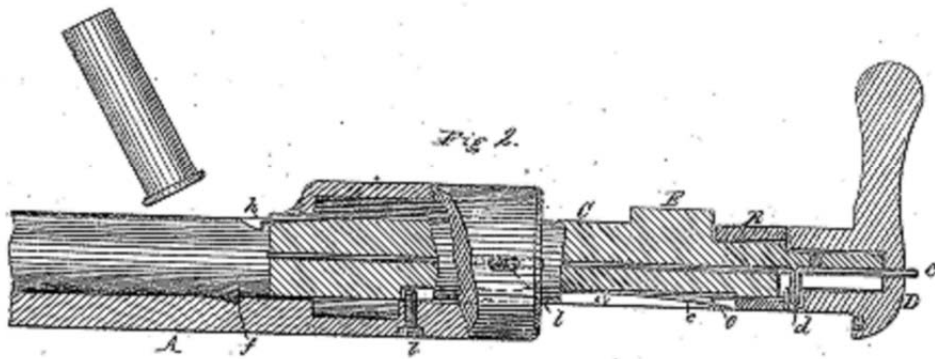
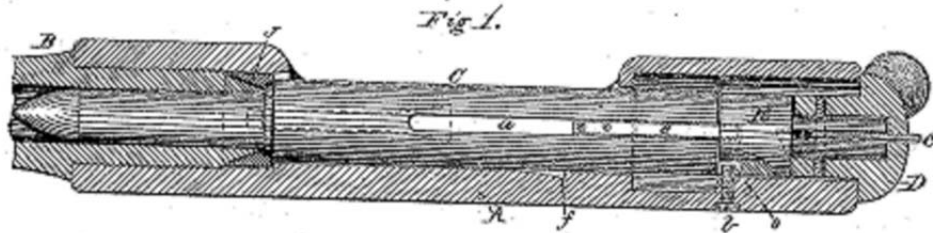
Fig. 19 - George Merrill's Patent 119,939 drawings for his breech loading rifle.
U.S. Patent Office, Public Domain

GEORGE MERRILL.

Improvement in Breech Loading Fire-arms.

No. 119,940.

Patented Oct. 17, 1871.



Witnesses.

Harry King.
Phil S. Dodge,

Fig. 6.



Inventor.

Geo. Merrill.
by Dodge & Munn

Fig. 20 - George Merrill's Patent 119,940 drawings for his breech loading rifle.
U.S. Patent Office, Public Domain

S. F. VAN CHOATE.
Breech-Loading Fire-Arm.

2 Sheets—Sheet 1.

No. 89,902.

Patented May 11, 1869.

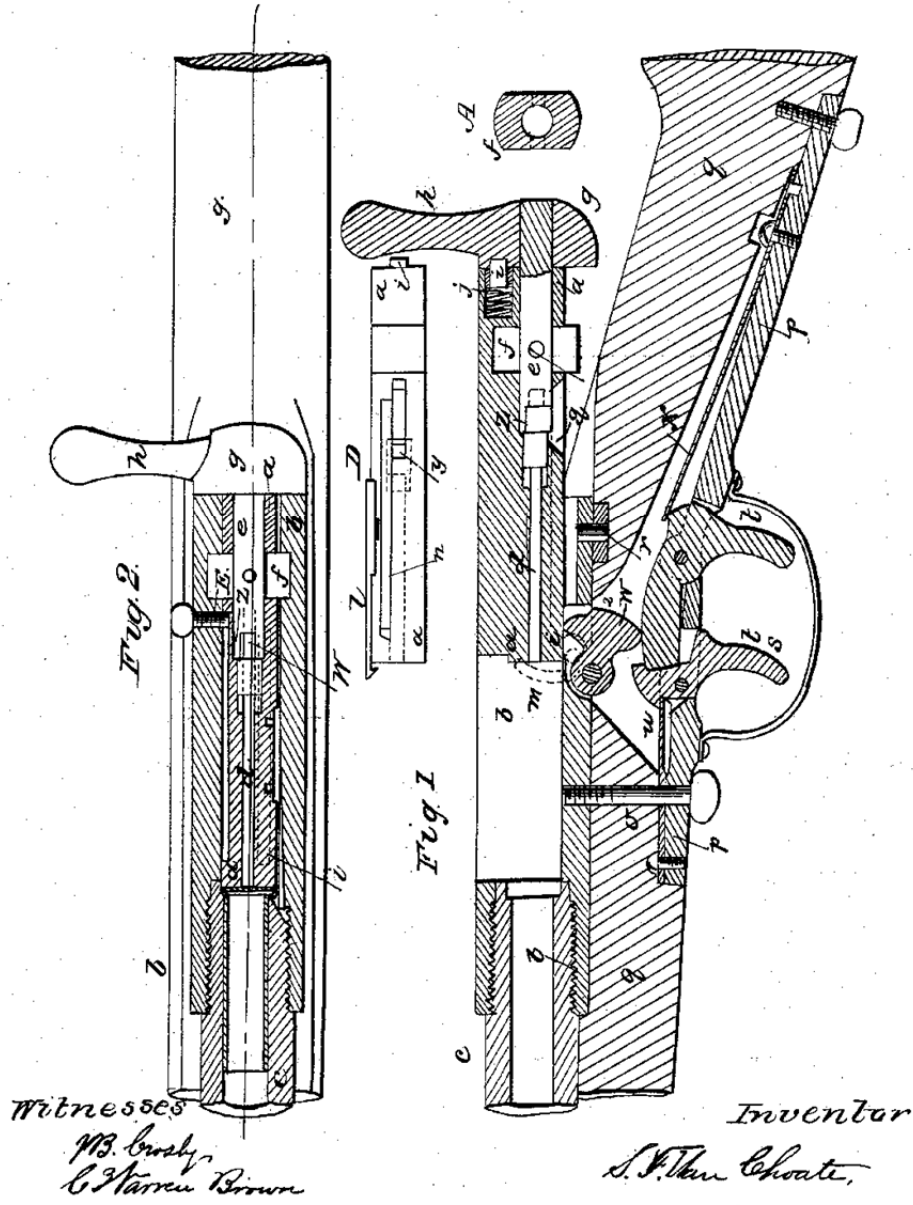


Fig. 21 – Sylvanus Van Choate's Patent 89,902 drawings for his breech loading rifle. Note the two locking lugs in the bolt. U.S. Patent Office, Public Domain