VOLITIONAL RIFLES, THE ORIGINS OF THE WINCHESTER LEVER ACTION

by Danny Michael, Curator, Cody Firearms Museum

Today I am going to be talking about the predecessors, the early predecessors to the Winchester lever action rifle. Of course, Winchesters are famous firearms. They are well known among all of you, known among the public. Known from the novice to the advanced collector. But of course, the predecessors to the various Winchesters are less well known. And one of the reasons I wanted to talk about this is that 2023 marks the 150th anniversary of a few important firearms and their introduction. The 1873 Trapdoor, the Colt Single Action, and of course, the Winchester Model 1873, sometimes called, "The gun that won the West."

I have my issues with that expression, but the 1873 was certainly used in the West and of course that firearm is well known to all of you. The closest attributed designer to that particular Winchester would be Nelson King and perhaps Luke Wheelock. Winchester made the 1873 for a 50-year run in the late 1800s and early 1900s and sold over 700,000 during its production lifespan

If you need an excuse for cake in your life, serial number 2 shipped out on September 26th, 1873, ahead of serial number 1. Bake something on that day and celebrate the birthday. In the lead up to this anniversary, I have been getting interested in this topic. And as you know, no firearm design starts in a vacuum. There are always origin stories to these firearms.

The origin of the 1873 dates back to the 1840s, but there are also some predecessors even beyond that. What I would call "proto lever actions", for lack of a better term. Photographed is a Cookson made example of the Lorenzoni system in our museum collection which uses a lever on the proper left-hand side (Figure 1). That lever that rotates the internal mechanism to put powder and a projectile into the breech. The shooter rotates that level every time they want to fire. The Kalthoff was another early repeater in continental Europe and works in a similar fashion.

An additional example in the collection is a rifle signed by a gunsmith named Dorrtlo (Figure 2). We believe the signature belongs to a German gunsmith named Michel Dorrtlo. The firearm itself is inscribed with the year 1683. The rifle works on a similar concept to the Cookson in that there is a lever to rotate the internal components to reload separate powder and projectiles. The main mechanical difference between the Dorrtlo and the Cookson is that lever is the trigger guard on the Dorrtlo rather than mounted to the side as it is on the Cookson. The user still rotates the lever 180 degrees forward and back and the mechanism needs a little bit of help from gravity to function properly. The Dorrtlo contains projectile and powder magazines inside the action and stock of the rifle. As a last early lever action example, I have to at least mention the Colt Ring lever rifles (Figure 3). Of course, they function quite differently, and the shooter uses the ring in front of the trigger to advance the cylinder, but it is yet another pre-Winchester lever action of sorts.

But these early "proto" lever actions bore little influence on the lineage we're discussing today. The various firearms that eventually led to Winchester start with, Walter Hunt, a name you may know. Hunt was an incredible inventor, as many of the folks in the 1800s were. He worked on sewing machines, the firearm being discussed, and probably the most famous thing you could associate with him as an everyday item is the modern safety pin. As far as we know he only worked on a single firearm, but that firearm started the process that led to the Winchester Repeating Arms Co. This rifle is what we have come to call the Hunt Volitional Repeating Rifle. Pictured in Figure 4 is an example for this gun from the late 1840s. As far as

Figure 1. Example of the Lorenzoni system by Cookson, 1680.

Figure 2. Dorrtlo rifle, 1683.

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Figure 3. Colt ring lever rifle, 1837.

Figure 4. Hunt Volitional Repeating Rifle.

I know, the museum's is the only extant gun from his patent. The story about how it came to be in the collection is that while many of the guns came straight from the Winchester factory, this one didn't live all of its life at Winchester. Winchester made a trade for this gun in the mid-1900s, from a gentleman in Virginia. While we have guns that came from Oliver Winchester or some of the company's designers' firearms that stayed at the factory, this rifle was a little too early and was never part of the Winchester Collection until the 20th century. We can see that the Hunt doesn't really look like a Winchester at all. In fact, it doesn't really appear much like any firearm of its day. The key piece of Hunt's invention, that would continue to later firearms, is the tubular magazine, below the barrel. Hunt does one other really important thing, just visible in his patent (Figure 5, appendix 1). He also invented the "Rocket Ball" ammunition (Figure 6). He applied for a patent on this new ammunition type around the same time as his firearm and moved away from those early lever proto-lever action guns that must assemble powder and projectile in the breech into a self-contained cartridge. Rocket balls were still separately primed, and the Hunt rifle has a very small priming reservoir or priming magazine for pill style primers. However, powder and projectile are held together which was an important step forward. While Hunt worked on this rifle, he met George Aerosmith, likely well before Hunt filed for his patents. Aerosmith probably had another inventor working with him named Lewis Jennings.

I believe it is likely because of Arrowsmith, Lewis Jennings and Walter Hunt began working together to develop Hunt's first idea. Both men were in George Arrowsmith's circle in the late 1840s and working on firearms that used Rocket Balls. This Jennings patent is dated 1849 and covers his improvements on a repeating rifle (Figure 7). The Jennings breach loader and the Hunt Volitional are often closely associated and it seems that one led to the other. I'm not the first one to put it forth, but Tom Hall in his writings on the topic and Bruce McDowell in his book on pre Winchester's have shown that the conventional story about these guns is a bit off because Hunt's invention usually gets credited to 1849.

However, by 1847 there was already a British patent for a gun, which was most certainly not a Hunt. The British patent is what we know as the Jennings. This British patent was filed on the same day as Hunt's patent for Rocket Ball ammunition. The British grant Lewis Jennings, or a British agent in the employ of a foreigner, as the patent says, his rifle patent in England in 1847. Hunt filed for a patent for his cartridge on the same day that Jennings filed for his rifle, although Hunt's would be granted much later. Given the way the patent application dates play out it seems that Hunt and Jennings had met by 1847 and began working together. This means that Hunt may have been working on his rifle as early as 1846 or even perhaps earlier. An interesting aside is that as firearms researchers we rely on patent dates for a lot of these things, but ideas are often percolating much earlier than that necessarily would show. In fact, one could make the case to base the invention date on when patents are applied for since that's when the inventor felt the idea was ready. As for the order of these firearms it still seems plausible that Hunt had his idea for gun and ammunition that Jennings expanded upon Hunt's work, since the Jennings utilized Hunt's ammunition.

Although, all that to say that the Jennings rifle was not necessarily a step in the right direction. The Jennings is even less of a lever action than the Hunt. If anything, we could call it a slide action. This is the interior of a Jennings rifle from the museum collection (Figure 8). The bolt is visible within the top of the action. You can also see the rack and pinion system that actuates everything else. The Jennings has a locking block at the rear to keep the bolt in battery. As the user slides the ring forward, it engages the teeth of the rack and pinion, retracts the bolt and drops the locking block out of the way.

The Jennings has a small a priming magazine on top of the receiver and a long-nosed percussion hammer to reach down through the receiver to detonate a tubular primer in the chamber. The original patent for the Jennings showed a magazine feed, however the example shown is a single-shot breechloader. The Jennings breaks down into three models. The first is a repeater shown in the patent. Production quickly shifted to a single shot breech loader, and finally a muzzle loader. The whole thing went backwards from the order that it seems it should normally have. As with any new firearm the Jennings repeater had teething issues and it seems like they made just a handful, perhaps as few as a dozen, maybe less. The only one known to me is currently held in the Smithsonian collection. Even as production shifted to the breechloader there were enough problems with it and using proprietary

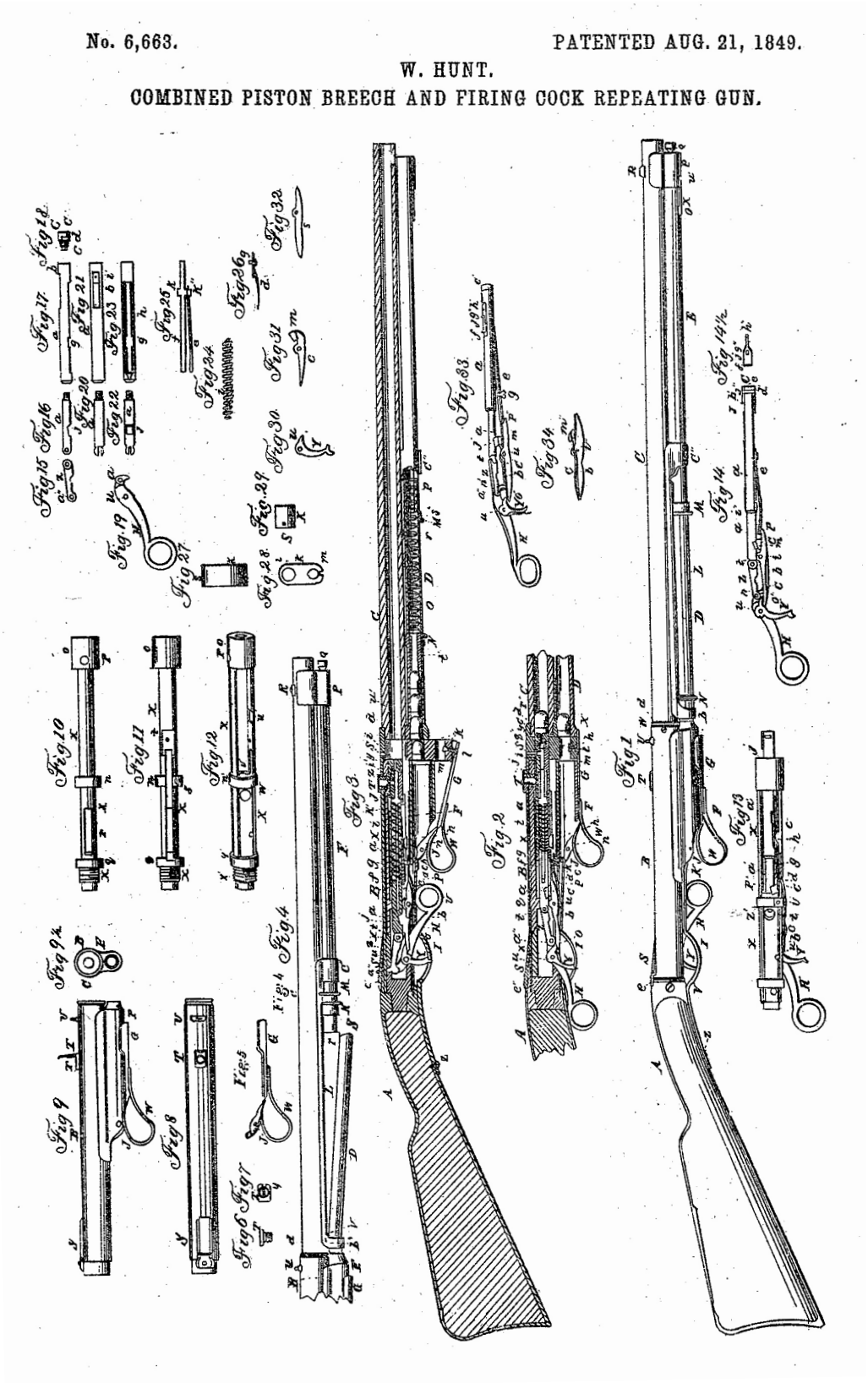

Figure 5. Walter Hunt patent number 6,663 awarded August 21, 1849..

ammunition many of those are now muzzle loaders. Collectors can now find both factory-built muzzle loaders and non-factory period conversions.

So far, we've introduced Hunt, Arrowsmith, and Jennings, but the serialized production of the guns takes place as those three begin to exit the picture. Arrowsmith may have recognized the difficulty in producing the design or divested for some other reason, but he sold the design of the rifle and ammunition to Cortland Palmer. Palmer was an investor and businessman in his own right. Palmer wanted to turn this design he now owned into sales and hired the manufacturing firm Robbins & Lawrence to make the firearms. Palmer took the added step of hiring a foreman to oversee production of his new product, which is where Horace Smith enters the story. As Smith works on these troublesome rifles, he takes on his own initiative to begin improving them which eventually led to the Smith-Jennings series of rifles and begins to move our story back towards a lever action rifle.

Figure 6. Rocket Ball from the Cody Firearms Museum Collection.

On this example of a Smith-Jennings we can see that we've returned to an under-barrel tubular magazine and not a cleaning rod as was substituted in the Jennings breechloader (Figure 9). The Smith-Jennings rifles have a distinct pot belly as ready identification if you're trying to tell them apart from the earlier Jennings rifles. This particular rifle is a second model. Inside the receiver you can see a silver-colored piece, which is the cartridge lifter. In this photo the lifter is sitting in the raised position. The bolt in this photo is to the rear position. The locking block is down, and the lever and ring trigger are forward. As the user pulls this trigger to the rear, it moves the bolt forward, then kicks the cartridge lifter down, and then raises the locking block.

All three variants of the Smith-Jennings have a priming magazine on top of the receiver with a long narrow percussion hammer. These rifles are really the first inklings of what would become the toggle link action that the Winchester became famous for and that is present in the Henry rifle and Volcanic repeaters. Each of them used a development of the action that started with the Smith-Jennings.

One part of this story that is interesting to me is that at several points now this really should not have gone much further. There were a lot of failures to get this far and there will be more along the way. In just a few short years we have eight iterations of the design. Shown here in order (Figure 10) are the Hunt, Jennings Repeater, Breechloader and Muzzleloader (both factory and non-factory) and the Smith-Jennings First, Second, and Third models. These eight firearms represent all of the development from about 1847 until 1851 or 1852 when most of the Jennings and Smith-Jennings production took place. There are a few different estimates of production but from surviving serial numbers 1,000 has been used as

Figure 7. Jennings Breech-Loader, the second iteration of Jennings' rifle design as a single shot breech-loader vs the initial repeater that he patented.

Figure 8. Jennings Breechloader interior – Action view of a Jennings breech-loading rifle, serial № 250. Visible from left to right are: the locking block (note the camming track), ring-trigger, pinion, and bolt (note the arm that rides with the bolt to interface with the priming magazine). The trigger and bolt have integrated racks that engage the pinion to work the action. The trigger is most of the way to the rear and the bolt is completely forward in this photo. Further movement to the rear will lift the locking block, and, as the trigger moves all the way back, the fourth tooth from the left is wider than the first three and will trip a sear in the lock to fire the gun. All loading is done through the rectangular gate, seen here in the open position towards the muzzle.

Figure 9. Smith-Jennings Interior: Action view of a 2nd Model Smith–Jennings rifle, serial № 8. Visible from left to right are: the locking wedge or block, the bolt (note the thin arm that rides with the bolt and interfaces with the priming magazine), the ring lever that acts on the bolt and locking wedge and the cartridge lifter. In this photo, the bolt is pictured partially to the rear. Pulling the ring to the rear will move the bolt into battery and lift the locking wedge into place. The lifter also serves as a guide to keep the bolt aligned with the chamber when in its raised position. The small cylindrical piece on top of the ring acts on a sear (not pictured) that is part of the lock that has been removed to take this photo. The lock work itself would have been familiar to any flintlock or percussion gunsmith. Compared to the Jennings, the Smith–Jennings shows pieces much closer to the later toggle-link lever-action.

Figure 10. These eight firearms represent all of the development from about 1847 until 1851 or 1852 starting with the Hunt (top) Jennings Repeater, Breechloader, and Muzzleloader (both factory and non-factory) and the Smith-Jennings First, Second and Third models (bottom).

Figure 11. Volcanic pistol as made by Smith & Wesson, (top), prototype rifle attributed to Smith & Wesson (middle) and more a more embellished .54 caliber prototype rifle made by Smith & Wesson (bottom).

a benchmark. Even that might be high. None of them really found success and it would have been easy for the lineage to end here. But these rifles did pave the way, because in the course of all this, as the story goes, Smith meets Daniel Wesson and the two of them keep working at Smith's improvements to the Smith-Jennings.

The story on how Smith and Wesson met is also hazy but is usually portrayed as they met while both at Robbins & Lawrence working on different contracts that R&L were manufacturing. After the Smith-Jennings sales fizzled out, Smith worked with Wesson, and they developed the Volcanic. Pictured in Figure 11 are a pistol and two rifle prototypes from our collection. Of these three arms, one is production pistol from the initial Smith & Wesson Company. The embellished rifle is also attributed to them, but rifles based on their design didn't enter regular production. The final pictured rifle is an unmarked prototype attributed to Smith and Wesson.

Figure 12. View of a Winchester 1873 factory cutaway. The toggle-link action is in the locked position.

The two important steps of the design in these guns are the evolution of these firearms to a true toggle-link action (Figure 12) and adding the primer to Hunt's rocket ball to create Volcanic ammunition. As an aside one of my favorite features on the bottom lever action rifle pictured is that the lever has been engraved as a serpent. That style is a bit unusual for firearms but a noteworthy detail.

Smith & Wesson briefly put their new Volcanic pistol into production but soon decided to move on to other things, namely rimfire ammunition and revolvers. They sold their design to the newly formed Volcanic Repeating Arms Company (VRA). It is at this point when Oliver Winchester appears as a shareholder. Winchester, a successful entrepreneur thanks to his shirt manufacturing company, becomes a shareholder for the VRA Co. But in that short span from the end of production at Robbins & Lawrence until the formation of the VRA Co. Smith and Wesson took this from a failed novelty to a nearly workable product, even if the ammunition wasn't the best solution. But the toggle-link at the heart of the Henry, Winchester 1866, 1873 and 1876 was there.

Smith and Wesson made one other important contribution to this story. Since Volcanic ammunition would prove to be underpowered, their invention of rimfire ammunition offered a practical alternative. Volcanic style cartridges are widely considered anemic. There's just not enough room inside that conical bullet to get enough powder behind the projectile. The museum does have a few Volcanic cartridges in our collection, and it appears that there are different variations of them. Unfortunately, there is no great source on just how much powder was behind them and how much energy we're talking about. In one memo Winchester noted that they examined some and they had six and a half grains of black powder and a one-hundred grain bullet. The ones in our collection weigh in at about 118 or 120 grains. We could only prove for sure with destructive analysis and would still have to account for powder and other loss over time.

The Hunt projectiles weigh approximately 330 grains, but we do not know the ratio or even have an old estimate like we do with the Volcanic cartridges.

These predecessors to the more famous Henry and Winchester are interesting to me. They laid the groundwork for their better-known descendants even though none of the predecessors could ever really be called successful. Their development led to the eventual success of the Winchester Repeating Arms Company, which led to our collection and to this museum. Without Hunt, Jennings and Smith in the 1840s and 50s, there is no Henry, King and Winchester in the 1860s and 70s, which is why I find this compelling.

Endnotes

1 This article is the edited transcript of an oral presentation at the American Society of Arms Collectors June 2023 meeting. The talk was adapted from the author's article "Volitional Repeaters & Jennings Breechloaders: Tracing the Origins of the Lever-action Rifle". That article is a more detailed version of this story with full citation and references available. Michael, 2021 "Volitional Repeaters & Jennings Breechloaders: Tracing the Origins of the Lever-action Rifle" in *Armax: The Journal of Contemporary Arms* Vol VII No. 2. Helios House Press, Perth, Australia.

2 Walter Hunt, *Combined Piston Breech and Firing Cock Repeating Gun*, U.S. Patent No. 6,663 granted August 21, 1849.

3 Walter Hunt, *Cartridge*, U.S. Patent No. 5,701, granted August 10, 1848.

4 Hall, 1958 'Forerunners of the First Winchester' in *Gun Digest 1958, 12th Edition*. Gun Digest Company, Chicago, IL.

5 McDowell, R. B. 1985. *Evolution of the Winchester*. Armory Publications, Tacoma, WA.

6 In addition to the above sources, those interested should consult Harold Williamson's book *Winchester: The Gun that Won the West*, AS Barnes & Co., New York, NY. This source touches on the topic but also gives a broader history of Winchester and the legacy these initial firearms had.

UNITED STATES PATENT OFFICE.

GEO. A. ARROWSMITH, OF NEW YORK, N. Y., ASSIGNEE OF WALTER HUNT.

COMBINED PISTON-BREECH AND FIRING-COCK REPEATING-GUN.

Specification forming part of Letters Patent No. **6,663**, dated August 21, 1849; patented in England, December 10, 1847.

To all whom it may concern:

Be it known that I, WALTER HUNT, of the city, county, and State of New York, have invented a new and useful Improvement in the Construction of Fire-Arms, which I denominate "The Volition Repeater;" and that the following is a full and faithful description of the same.

In the annexed drawings, which are on a scale of six inches to the foot, I have given in Figure 1 an external side view of my said improved gun, which, in length, weight, and caliber nearly corresponds to the United States rifle. Fig. 2 exhibits a vertical longitudinal cut section of the action or lock ready for pulling trigger, together with a portion of the ball-magazine and barrel, with a ball inserted at the breech. Fig. 3 exhibits a similar view of the whole gun, showing a correct profile of every part and member, external and internal, of which the same is composed, and arranged in their proper position, which I will now proceed to describe, with similar letters of reference to similar parts throughout all of the figures.

In the following description I have selected Fig. 3 as the most perfect exposé of the internal arrangement of said gun, which is externally composed of the following principal parts, as shown in Fig. 1, viz: the butt A, lock-case B, barrel C, ball-tube or magazine D, spring or rod case E, bolster F, transfer-trigger G, loading-trigger H, guard I, transfer-trigger pin J, spring end of guard K, thimble-strap L, fixed thimbles b'', c'', and P, sliding thimbles M N, fastening-spring O, head of ramrod Q, front sight, R, back sight, S, middle sight, U, priming-magazine T, fastening-back bolt V, set-screw W, discharging-trigger Y, and guard-screw Z′.

The lock-case and butt are screwed together at e'', and the barrel and lock-case at d''.

The internal arrangements of the lock, &c., are as follows. (See Figs. 3, 13, and 14, which latter is a dissected or detached side view of said lock, beginning with the charging-trigger H and the firing-trigger Y, which are suspended upon the pin u.) In Fig. 3 is shown the bottom end of said trigger H thrown forward. The upper end is hooked downward and connected by a rule-joint at a'' to the rear end of the connecting-link Z, the front end of which link is connected by a similar joint to the back end of the breech-piston a at t. Said piston is composed externally of three parts—viz., the tail a, the cylinder or spring-case a', and breech-plug c'—which are screwed together at i'' and j'', (see Fig. 14, five dissected side views, Figs. 16, 17, 18, and 19, with top and bottom views, Figs. 20, 21, 22, and 23.) Upon the surface of a', near the front end, a notch is filed out, making a flattened surface at b', upon which is placed a slider, j, made of sheet-steel, with the front and back ends bent upward the depth of the notch aforesaid, with a spring-tongue, h'', projecting forward. (See Fig. 14½.) The end of the tongue is bent in the shape of a U, which end, as the slider is moved back and forth, falls into the priming-hole i', (see Fig. 2,) and forces the kernels of priming, which might otherwise remain in said hole, into the cavity below. The horizontal motion of said slider is restricted in its vibrations by the bottom of the priming-chamber T, which catches upon the flanges f'' and g''.

The central part of said breech-piston a' contains the helical or coiled mainspring i, wound around the firing-punch f, one end of which spring bears against a collar on said punch at k'. Upon the bottom end of said collar is attached the detent-spring e by means of the flange on the same at k''. The back end of said mainspring bears against the forward end of the tail-pin a. (See Figs. 2 and 3, 24 and 25.) Along on the under side of said main spring-case a' it is cut through to the internal cavity, in which longitudinal slot h' is an enlargement, at g', (see Fig. 23,) through which the firing-punch f is inserted, and through which slot h' the flange k' is allowed to reciprocate, being acted upon by the attaching and detaching of the detent e to and from the detent-pin g, which motions are effected by the back-and-forth action of the trigger H and the breech-piston a', as shown by their contrasted positions in cut sections, Figs. 2 and 3, and by pulling the firing-trigger Y, which, bearing down on the back end of the lever b at o'', lifts the end of said detent at p'' from the detent-pin g, which pin is inserted up through a corresponding hole in the back part of said detent, thereby releasing the firing-punch f, which is impelled forward by the mainspring i through the tube into the rear end of the breech plug

or pin c' at q'', which is the firing-chamber of the priming.

In Fig. 3 a kernel of percussion-powder is shown as having dropped into the priming-hole i from the magazine T, which in Fig. 2 is brought forward past the end of the firing-punch f and deposited in the firing-chamber of the priming at q'', as aforesaid.

Fig. 31, letter c, gives a side view of an intermediate detent in said lock, which I call the "lock-lever," which is shown in the cut-section views, Figs. 2 and 3, and also in the detached view, Fig. 34, and combined view, Fig. 33. Its object is to fasten the breech-pin secure in the end of the barrel at the time of firing, which is effected by the impingement of the hooked upper end of the charging-trigger H upon the end of said lever at n''. It being centrally suspended upon the pin v the forward hook upon the end m'' is forced up into the notch j', cut in the under side of the tail-pin of the piston breech-pin a, (see Fig. 33,) thereby securing the same firmly in its place, as aforesaid.

I would remark that this is the only position in which the priming or gun can be discharged, because the flange m'' on the front end of the lock-lever c prevents the front end of the lever b from raising the detent e from the pin g until the said flange is let up into the notch j', as before described. (See Figs. 2, 3, 14, and 33.)

Figs. 10, 11, and 12 give a top, bottom, and side view of the lock-frame X, which is cast in one piece, and in which is placed the whole action of the lock, as shown in Fig. 13, side view, the whole of which is placed in the lock-case B. (See detached side and top views, Figs. 8 and 9, end view, Fig. 9½, and cut sections 2 and 3.)

Upon the front bottom side of said lock-case B is an enlargement or bolster, which supports the transfer-trigger G upon the pin J, and up through an opening in which, at is front end, is inserted the transfer-tube k, (see top, side, and end views of said tube in Figs. 27, 28, and 29, and vertical side cut sections of the same, Figs. 2 and 3,) where the connection of said trigger G and tube k is shown at l, which connection is made by the T-hook fixed in the front end of said trigger G, and made to swivel through an opening in the bottom of said tube k, by which it is thereby loosely connected by a swivel-joint, as aforesaid.

The office of said trigger and tube is to transfer the cartridges from the ball-magazine D (see cut section, Fig. 3) to a line in front of the breech-pin at c', in order that by pulling the charging-trigger H it may be forced into the breech of the barrel ready for discharging, as shown in cut section, Fig. 2, at r''.

The motion of said tube and trigger is effected by the left hand, which supports the gun at F G, where, by a slight upward pressure of the ball of the hand upon the bow of the trigger, at w, it is placed in the position to receive the cartridge, as in Fig. 3, when, by pressing the palm upward at G, the tube is raised and the ball carried in front of the breech-pin, as before described, and shown in Fig. 2, in which position said trigger ordinarily remains at rest, being partially held by the pressure of the guard-spring upon the heel of said transfer-trigger at K.

I will now proceed to describe the ball tube or magazine D and spring-case E, which are supported in the thimbles b'', c'', and P in the ordinary place of the ramrod. By drawing the thimble N toward the muzzle of the gun till both it and thimble M have passed the joint s' the spring r catches and holds thimble N, and as that is attached through a slot made the length of its play in the side of the tube D next the barrel C to the follower t'', on which the lower end of the spring O bears, said spring is also drawn back and held and the end of the tube D′ released, as shown in Fig. 4. The ball-tube D is then separated from the spring-case E at s'', and thrown outward by the spring v'' ready for filling with cartridges from cases prepared for the purpose containing, say, twelve, more or less. The magazine being filled is returned in a line with the spring and ramrod-tube, where it bears upon the check-spring r and releases the thimble N, attached to the follower t'', which last, being operated upon by the coil-spring o, is forced down upon the cartridges, driving the bottom one into the transferring-tube k whenever it is brought into a straight line, as before described, and shown in Fig. 3. Said ball-tube is held in its position by sliding the thimble M over the joint s'' after the thimble N has been let down, as aforesaid. (See Figs. 1 and 3.)

$O^{\times}$ is a small spring in the upper end of the spring-tube E, designed to fasten the same by means of a hook fitted into a gap in the thimble P at w''.

Fig. 26, letter d, is a spring secured to the under side of the lock-frame by means of the detent screw or pin g, (see Fig. 11, at t',) which spring bears upward upon the lock and lifting levers b and c, keeping them in their positions for the action of the triggers H and Y.

The priming-magazine is a small thimble or cup with a hinged cap, T, having a slot cut through its bottom at y'. (See Figs. 6 and 7, which are side and bottom views in Figs. 2 and 3, cut-section views.) Said magazine is shown as screwed down through the lock case and frame, directly over the priming-hole i' in the breech-pin a', when the same is drawn back ready for charging, as in Fig. 3.

The cartridges designed to be used in this gun are those recently invented by me, for which an application for Letters Patent has been made at the United States Patent Office.

Having given a full description of my said improved gun, I will now proceed to describe its mode of using and the action of its parts when in operation.

The ball or cartridge magazine being charged as before described, and the gun brought to a firing position, the left hand clasping the gun

around the transferring-lever and bolster at F G, the transfer-tube *k* is brought down by the ball of the same hand bearing on the bow at *w*, as before stated, and as shown in Fig. 3. A cartridge having been forced into the transfer-tube by the spring O is thus carried up in a range with the breech-pin *a'*, which is now thrown forward by drawing back the charging-trigger H with the second finger of the right hand, which at the same time clasps the waist of the gun at A, (see Fig. 2,) by which means the cartridge-ball is forced home into the breech of the barrel. At the same time a kernel of priming is carried from the bottom of the primer T and dropped in the cavity in front of the firing-punch *f*. Simultaneously the lock-lever *c* enters the notch *j'*, being forced up by the point of the trigger H, which presses down its back end, as before described, and shown in Fig. 2.

The gun being now loaded, primed, and cocked, is fired by pulling the trigger Y, which forces down the back end of the lifting or detaching lever at *o''*, the front end of which lifts the rear of the detent-spring *e* from the pin *g*, when the firing-punch is suddenly thrown forward by the coil-spring *i*, which explodes the percussion in the chamber aforesaid, the flame from which passes through the central hole, *y*, in the breech-plug *c'*, perforating the tissue in the center of the cartridge, and discharges the gun, when the triggers H and G are again returned to their former position, as in Fig. 3, and the operation is repeated until the magazine is exhausted, when it is replenished, as before described, and shown in Fig. 4.

The priming-magazine may safely contain from fifty to one hundred primings, and the ball-magazine may extend the whole length of the barrel and contain some two dozen cartridges, in which case it would be necessary to force them down by hand or some other arrangement; but by separating and charging the lower half of the spring-case on my plan it is advantageously charged with twelve balls from a case before mentioned, which I consider of sufficient length for convenience or utility.

What I specifically claim as new in the above-described gun, and desire to secure by Letters Patent, is—

1. The construction of a hollow sliding or piston breech-pin, which is operated by a lever in loading and securing the charge in the breech of the gun, which breech-pin, in addition to the above characteristic, contains or has attached to it the mainspring, firing cock or punch, and firing-chamber of the priming.

2. I also claim the plan of transferring the priming from the fixed magazine to the firing-chamber in or by means of the said sliding breech-pin, as above set forth and described.

WALTER HUNT.

Witnesses:

GEO. G. SICKLES,

ELISHA BLOOMER.