AUTOMATIC PRIMING OF FLINT AND PERCUSSION FIREARMS

by HENRY M. STEWART, JR.

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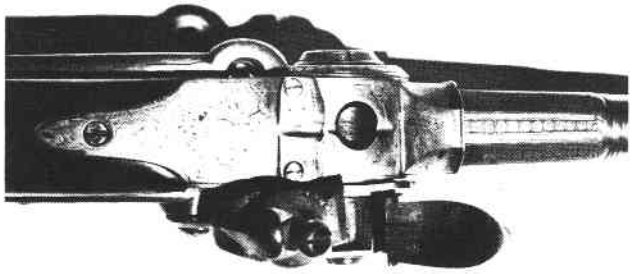
To the modern shooter the number of steps required prior to firing an antique arm seems a sizeable loss of time. The amount of time between shots is even more impressive. The hunter with the flint Kentucky had one shot at a deer and the soldier with his musket didn't have time to fire many times at cavalry in full gallop of a charge. Our forefathers recognizing this time lapse as highly important tried by a variety of methods to speed up the process as firearms evolved. The machine gun and automatic rifle attest their ultimate success.

This brief speech to fellow members of the American Society is at best a definitive base for the study of methods of speeding up one phase of firing. Priming the arm automatically without resort to sticking fingers into a pouch for caps, using a priming horn or flask, and eliminating one step in the loading process will be given a platform here upon which the more complete picture can be built. Multi firing arms in revolver or magazine form will play a prominent part as the premium of speedy priming was emphasized in these, but a full share of single loaders particularly in the military will be noted. The thirty odd types discussed as a starter can be enlarged from the experience and knowledge of the members.

First, chronologically we have the magazine arm for loose powder and ball most easily identified as the Cookson type although actually preceded by Lorenzini. The I Glass pair Circa 1750 (PIC A and PIC B) on exhibit here conform to this type. Movement of the lever on left side in a downward arc towards the muzzle, with barrel directed downward, accomplished the loading. From a separate compartment

Picture A.
I. Glass Pair



Picture B.
I. Glass Top View

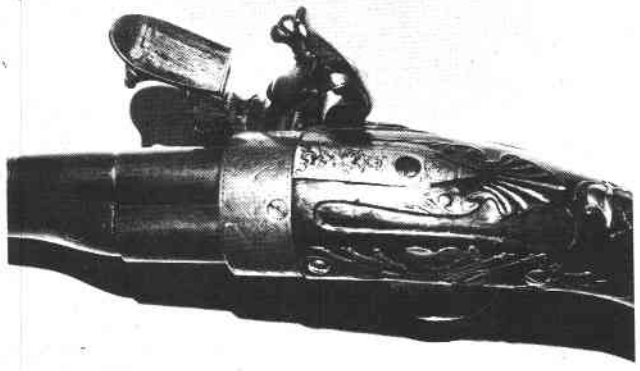
to rear and beneath the pan a revolving chamber performs an arc downward at the same time to put the compartment in position to pick up loose powder from this priming magazine. The same motion closed the frizzen over the pan readying it for restriking when next fired. Return of the loading lever puts the powder filled compartment back as floor of the pan. This first type we can classify as faucet breech priming.

The second type as exemplified by the Wilson flint (PIC C) revolver Circa 1770 is a hand revolved type pre Colt. When the arm was cocked and frizzen closed a ratchet arrangement between lock frame and frizzen body revolved a chamber that picked up powder stored in the compartment on front face of frizzen. Closing the frizzen dropped the powder into the pan ready for flint ignition. This type can be classified as ratchet on frizzen with built on powder magazine.

The Collier, finest of the flint revolvers and Circa 1815 (PIC D), differs from the preceding type in that a fixed arm attached to the top strap of the breech replaces the ratchet arrangement in effecting the pick up of powder and depositing of same in pan. To identify we can call it lever on frizzen magazine type.

The three preceding types developed around multifiring types but this last type for flintlocks was specifically designed for musket single loading use to eliminate the hand priming step. It is identified as Lt. Sloat Self Priming Gun Lock and applied to the Springfield Musket in 1818. Here we have the powder magazine located above the lock separate from the frizzen with a revolving pan compartment. The motion arc of this chamber is actuated by a ratchet engaged by corresponding ratchet fingers on the hammer. Cocking the hammer aligned the pan compartment with the magazine, firing the hammer ratcheted the compartment back as base of the pan ready for flint sparks. We can class this as ratchet on hammer type. See Hicks Plate 25.

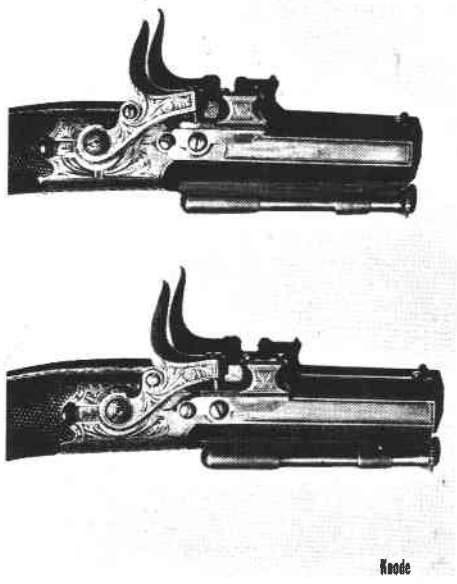
The foregoing describes the flintlock types of which I have specific experience and your knowledge of additional types will be welcomed so that this subject can be more fully covered. There are expectables such as a priming compartment on the sliding pan cover of the miguelet but we should add only known types. For the record but unknown to me James Thomson, British Patent #3784, March 9, 1814. Flint with connecting link between hammer and powder reservoir frizzen. Cock and Prime. Urbanus Sartoris, British Patent #4336, January 23, 1819. I have seen this arm of which both pistols and long guns were made but did not study priming system.



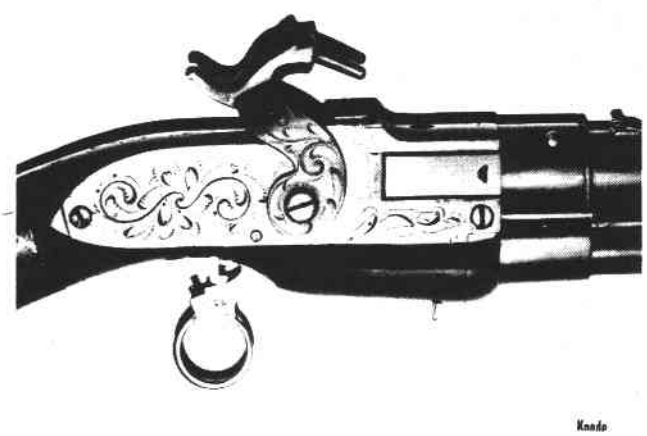
Picture C.
Wilson Flintlock

Picture D.
Collier Flintlock

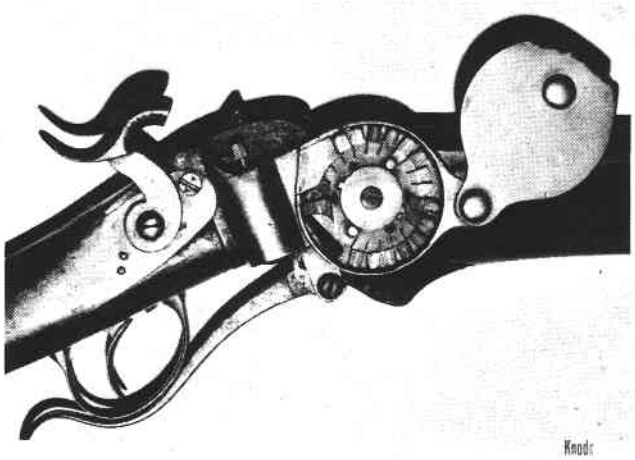
Picture E.
Forsyth Scent Bottle



Picture F.
Forsyth Sliding Pan Type



Picture G.
Jennings Patent #6973



Picture H.
Sharps' 1st Model, Type 1

Moving to the fulminate period we begin with the two types of Forsyth and classification of the (PIC E) hand revolved scent bottle is questionable as automatic priming. However, the sliding pan model (PIC F) is definitely a true type. Linkage between hammer and sliding magazine pulls the magazine back over the flash pan depositing the fulminate. The drop of the hammer on firing moves the magazine forward exposing the fulminate in flash pan for the hammer strike. Both scent bottle and sliding magazine are fully covered by our deceased member Lewis Winant in "Early Percussion Firearms" using the arms displayed here for part of the discussion. From the automatic viewpoint, I will merely note that during this period there were adaptions with variation such as Henry Shrapuel use of fulminate pellets instead of fulminate powder and magazine adaptions of the preceding flint systems such as Green's ratchet on hammer, Lewis and Tomes revolving magazine by same lever system as sliding pan Forsyth, and prolific adaptions of manual priming from magazine such as Westley Richards, Joseph Egg, et al. We should note the first of the hammer with primers which, though manual, forms the base for later automatic types. This is the "Towlson" type with a manually revolved priming magazine in the hammer.

Moving from the early fulminate we can consider automatic priming in the wide variety of systems prior to the final adoption of the self primed cartridge. During this period, roughly between 1830 and 1870, we have four basic classifications (1) percussion cap, (2) percussion tape, (3) fulminate wafers and (4) fulminates as powder, pill and strip. Whereas the predominance of automatic priming lay in the multi shot arms of the flint period, here we find automatic priming predominately removing the priming chore from single loaders with emphasis of loading changing to breech from muzzle. The Colt's patents stifled revolver production from 1836 - 1858 to account for the revolvers and the magazine arm was bogged down with loose powder and ball with few exceptions. There will be many references to Winant's book Early Percussion Firearms as I had the pleasure to assist in its preparation with many of the statistics mentioned and pictures of the very guns on exhibit here. Just as many of the items were first given to Winant, you will find additional ones in this listing further developing the story and shown and disucssed possibly for the first time. I might add that a similar study of magazine arms should be recorded at another time by one of our group as a foundation for that incomplete category. Mr. Maynard, Smithsonian Curator, first exhaustively listed the magazine types.

After Forsyth and his contemporaries we see the development of automatic priming accelerate with the use of fulminates. This percussion era being the most prolific. I have broken it down into the following categories:

(1) Percussion Powder and Pills
(2) Percussion Caps
(3) Percussion Tapes
(4) Percussion Wafers
(5) Percussion Strips and Cylinders

Under category (1) the following are the list of patents:

A - Edwards #1134 April 25, 1839
B - Jennings #6973 December 25, 1849 (PIC G)
C - Percival & Smith #7496 July 9, 1850
D - George Leonard #9922 August 9, 1853
E - Wright #11917 November 7, 1854
F - Boynton #26648 January 3, 1860

During the talk delivered at Philadelphia meeting I did not include the George Leonard patent - this patent has been unknown and unmentioned until I purchased the patent model at the meeting and have since researched and added it to the list. This is the third of the Leonard patents leading up to Robbins & Lawrence. On the others, I recommend Winant "Early Percussion Firearms".

Let us next examine the automatic priming utilizing the percussion cap. The Rousseau, English Patent #9258 of 1842, supplied caps through a tube spring loaded to push out the caps. The nose of this tube lay alongside the hammer and could swing laterally over the nipple whenever the hammer was cocked. This put it in position to deposit another cap with each cocking. The beginning of the famous Christian Sharps breechloaders saw an ingenious automatic capper using caps. The first model Sharps has a large cap box just ahead of the breech. If you will glance at the picture (PIC H) you will see the caps are placed on fingers in a position totally different from that found in normal capping devices. With the breech lowered for loading this automatic capper neatly deposits a fresh cap atop the nipple ready for firing. Sharps Patent #5763 of September 12, 1848 just barely beat out W. M. Cass's Patent #5814 of September 25,

1848 for Amercian honors (PIC I). Cass had a series of nipples that were pre-capped and each cocking of the hammer brought a ready capped nipple in position for firing. Like the Forsyth the seal to prevent lateral ignition had to be good or a Cass user got sprayed with exploding caps. However, the next patent of Porter (#8210 of July 8, 1851) gained its ill repute because it could spray bullets like Cass sprayed caps. The Porter (PIC J) was a revolving turret and the initial design had automatic powder and ball loading as well as priming. This was quickly abandoned but the automatic priming was developed. On the original models the caps were placed on individual nipples around the turret. You will see different shapes on the capping device of the Porter but actually all conform to the regular concept of an auto feeding cap box. I have read that the caps were placed cup outward so the hammer entered the cup and smashed the cap down on the touch-hole in the turret, but my examination shows that the caps were placed cup toward the touch hole. These Porters are often called pill lock where the cap box is present and percussion where the nipples are present around the turret. In my opinion, the first models had percussion nipples, then for a span of roughly 700 pieces the auto capper was used and then manufacture reverted to percussion nipples for the next four hundred specimens. The Joseph Day Patent #11477 of August 8. 1854 followed the Porter and would have represented a problem in use since the caps were put in a tube for breech to butt, cup down and dependent on a ratchet feed to bring them in line with the hammers at each cocking. Alonzo Perry with Patent #12244 of July 8, 1851 (PIC K) adapted the Rousseau British idea by having a removable tube with spring loading to push the caps facing cup forward. As the breech was turned on its trunnions the nipple came in line and was capped. So that we may get on with models that were produced, I am only going to list the next three patents as I didn't have them available at the time Knode so kindly took the pictures.

John Swyney - Patent #13474 August 21, 1855 is spring fed capper into vertical moving breech where nipple lowers into line with capper. Have this in patent model and unmarked rifle.

Frederick Newbury #14774 of April 29, 1856 - Same as above in cap application - have patent model only.

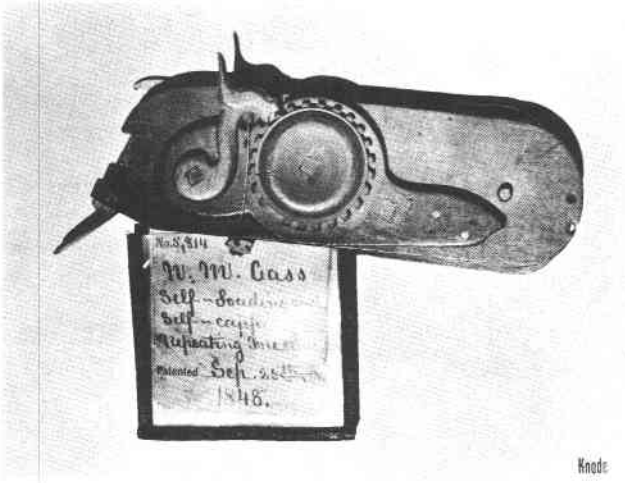
Frederick Curtis #22940 of February 15, 1859 - Same as above in cap application - have patent model only.

The automatic tape primer revolves around the work of one man, Dr. Edward Maynard (1813-1891) who practiced dentistry in Washington, D.C. Firearms and dentistry seem at opposite poles so I found it quite interesting to note that the Register of Cadets at West Point showed Edward Maynard, from New York, as a cadet in 1831. I later learned that he left prior to completing the first semester. This military interest plus the mortar, pestle, and chemicals of his dental trade made the firearms angle much more reasonable. Fulminate in paper tapes protected by collodian, varnish, shellac or other water resistant coating were the Maynard contribution based on his patent #4208 of September 22, 1845. Two Maynard type feeds are known, the finger or pusher type and the wheel or sprocket feed. The spring finger type was on the Type 2 first model Sharp (PIC L) and the box conversion of flint muskets (PIC M). The wheel or sprocket type I find was first covered in patent #26364 of December 6, 1859 although I note mention of the sprocket in 1858. The Maynard tapes were originally made and supplied by Mass. Arms Co., Chicopee Falls, Mass. for Maynard Arms. The tapes each contained 36 primers and failed the water-proof test only because moisture entered from the cuttoff end. The directions advise that use, after an interval of days, begin by cocking through the first three caps without trying to fire them. I have a strong feeling that Maynard sold his rights to the tape feeding method of patent #4208 to United States and had to come back with Patent #26364 method of feed to get back in the automatic primer field. In the meantime we have Ward using Maynard tapes and J.P. Marshall also designing around the Maynard invention.

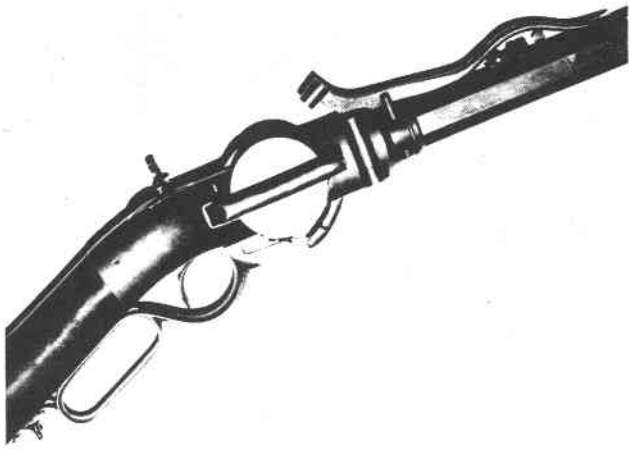
Lieutenant J. N. Ward's Patent #15262 of July 1, 1856 (PIC N) utilizes a tape primer in the hammer. The Ward hammer appears correctly on a completely converted musket, with unique breech and sight on front band. Each hammer is serial numbered and from those observed I would say that less than 100 muskets were converted to Ward. After having seen a modern made Ward hammer I would make note that the complete musket is difficult to duplicate and the Ward hammer should be properly stamped. The J.P. Marshall Patent #25661 of October 4, 1859 also utilized the Maynard tape primer on a Joslyn carbine. (PIC O). The sprocket feed and the knife edge underhammer preceded Maynard by two months.

I will not list all the types that used Maynard but it is quite impressive as use covered muskets, rifles, single shot pistols, revolvers, deringers, etc. but suffice that Maynard was the most diversified in use of all automatic primings.

Percussion wafers. As I examine these mechanisms I can't help but recall that engineering research definitely shows that the design of the bumblebee makes it impossible to fly! The automatic wafer feeders threw wafers into the path of hammers, slamming through an arc towards the nipple anvil. The first of these was Christian Sharps' Patent #9308 of October 5, 1852 (PIC P) where a spring loaded vertical

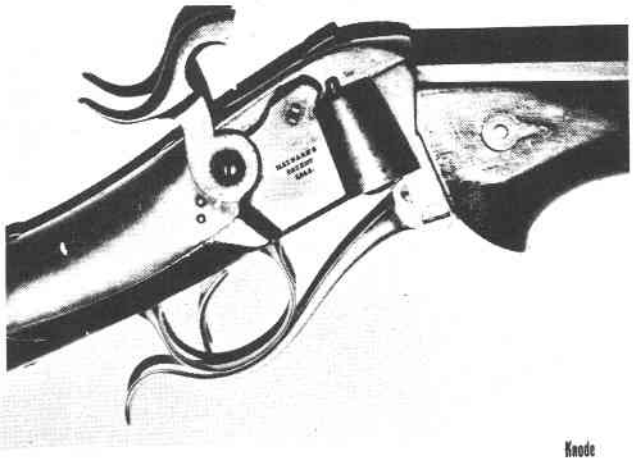


Picture I.
W. M. Cass' Patent #5814

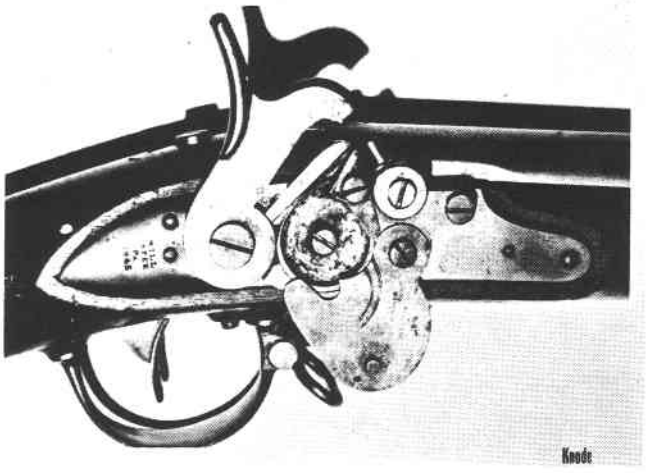


Picture J.
Porter Patent #8210

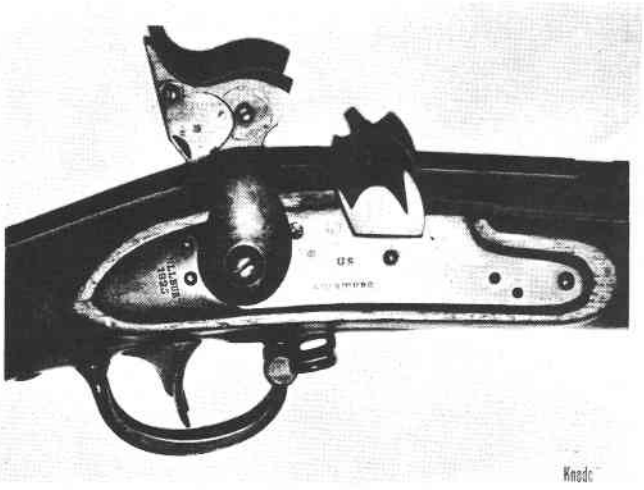
Picture K.
Alonzo Perry Patent #12244



Picture L.
Sharps' Patent Type 2,
Maynard Type Feed



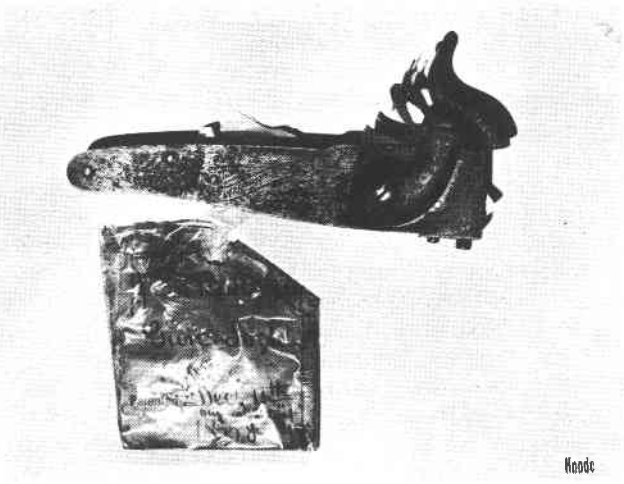
Picture M.
Box Conversion of Flint Muskets



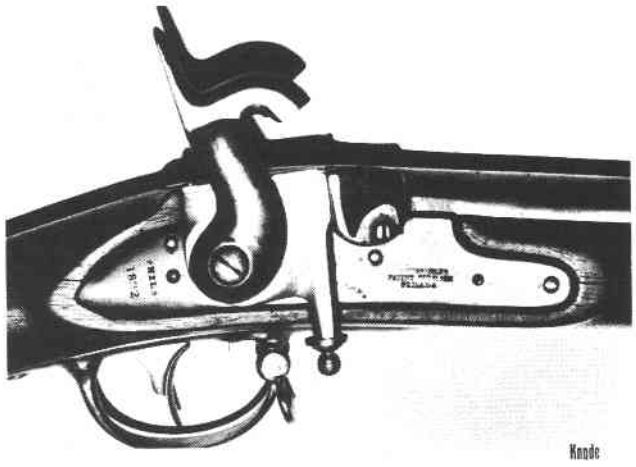
Picture N.
Lt. J. N. Ward's Patent #15262

Picture O.
J. P. Marshall's Patent #25661

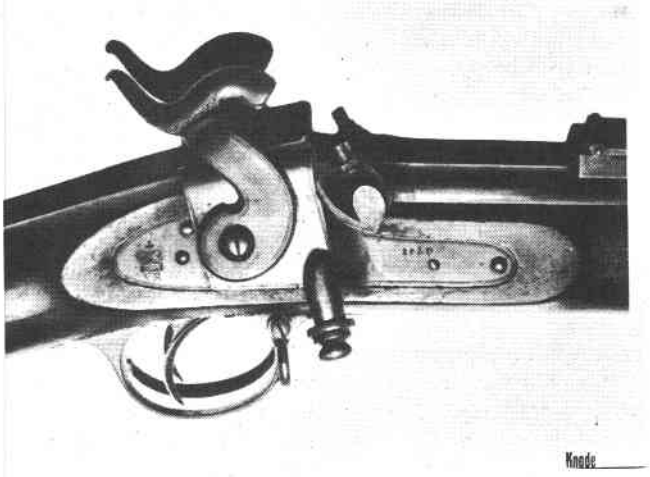
Picture P.
Christian Sharps' Patent #9308



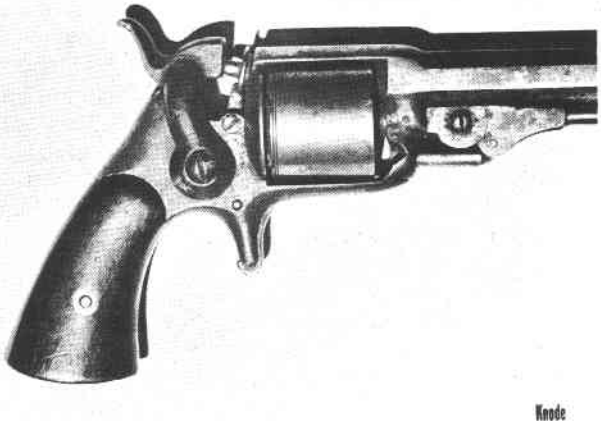
Picture Q.
Butterfield's Improvement #129



Picture R.
Butterfield's External Fixture



Picture S.
Lemuel Chester's British
Patent #2050



Picture T.
Jacob Rupertus' Patent #23711

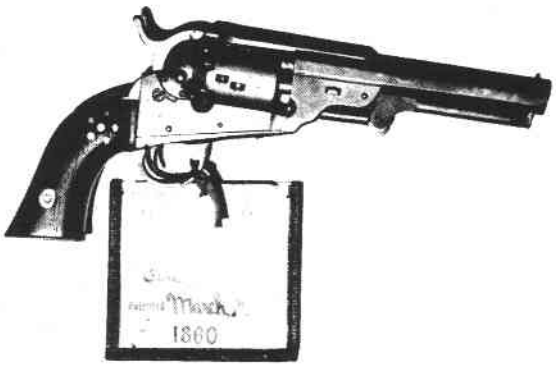
reservoir of wafers had the top one pushed out over the nipple as the hammer fell. A simple mechanism that depended on the wafer arriving just in time to be struck. It worked and except for the refinemnet of the Lawrence cutoff remained unchanged through the remainder of the percussion period. Butterfield's patent under additional improvement, #129 of December 11, 1855, was granted in that the wafer was pushed out in a ring theoretically positioning it more positively (PIC Q). The original patent was self contained in the lock but to secure business in conversion of muskets the Butterfield was also designed as an external fixture (PIC R) bolted to the old lock plate. A later conversion not pictured pierced the old lockplate with the vertical reservoir and mechanized it internally to feed wafers. Judging by the rarity of any Butterfield action the inventor didn't realize too great a monetary award. However, a Lemuel Chester of Philadelphia proceeded to patent the Butterfield idea under his own name in England (British Patent #2050 of 1858) and licensed Enfield to convert to auto priming by an external added unit (PIC S). It would be interesting to know how this occurred. The Butterfield primer enjoyed use on muskets, rifles, revolvers, pistols, and Deringers but not in quantity. So far this phase of automatic priming has been about Philadelphians, and the next two are likewise credited to that city. Jacob Rupertus, prolific in ideas and associated with many prominent Philadelphia arms people. Jake worked or had work preformed by Krider, Siner, Deringer, Wurfflein and others. His patent of interest here is #23711, April 19, 1859. To visualize this look at (PIC T) with hammer resting on a floating nipple. A slot just visible at back of hammer where thumb piece joins body of hammer is the point where the wafer is ejected and slammed through almost 90 degrees to hit the nipple. Before you doubt the 90 degrees please be advised that the wafer ejects directly to the rear in a flat plane and arcs from horizontal to vertical aided by the hammer. The reservoir is vertical from bottom of grip up to the slot. Did it work? Only about three collectors have specimens so I'd guess negative. So Rupertus came back the next month with Patent #23952 of May 10, 1859 (PIC U), a hammer with self contained reservoir, and this on muskets and revolvers appears workable. Wafers are pushed by spring in a vertical stack towards nose of hammer. As hammer falls a lever pushes wafer up into face of hammer over the nipple. W. H. Bell of Washington, D.C. has three patents credited, the first two #22618 and 23545 of 1859 are for a wafer primer container to be inserted in a hammer and a method of feed into the face of the hammer. The 20th century lawyers would have had a ball determining the validity of these in terms of Butterfield, Rupertus, etc. However Bell's Patent #27518 of March 20, 1860 is unique (PIC V). Here the wafer reservoir is built into the cylinder pin. Reference should be made to Winant's "Early Percussion Firearms," page 194, to see the piece disassembled and the primer feed exposed.

Finally, in the percussion period, we have a catch-all category covering fulminate in strips and extrusions. Baron Heurteloop, Patent #2203 of July 29, 1841 is the American patent covering patents and development work in England from about 1832. This is a fulminate extrusion in pewter or lead tube fed either round or flattened into a hammer with knife edge to pinch off a section and fire it against anvil or nipple. The Koptipter underhammer lock is pictured in Winant, Figure 162 and 163. In (PIC W) is a Tower lock that could be the early Heurteloop version as it has a feed and cutoff edge connected to a flint hammer as a seeming conversion. Our English friends may be able to contribute more on this. Still another system, this one utilizing a fulminate extrusion without metallic cover protection is pictured ins PIC X. At least three of this model have appeared, the writers and two on dealers lists. A sleeve around the breech bolster is lever connected to the hammer tumbler so as to revolve through arc back to alignment with feed tube on cocking. Fulminate presses into an opening in the sleeve. As hammer falls sleeve revolves to place the fulminate charge under the hammer over the touchhole. The final type unfortunately not pictured is the Gedney #23241 of March 15, 1859 using the fulminate extrusion. Few models of this, in finished form, are found but the hammers were manufactured and sold by American Priming and Arms Co. of New York with Gedney's patent data stamped on the face. Apparently these were made in quantity as my two models are serial numbered in 300's and 1100's. As hammer fell a portion of fulminate was sheared off and pushed up on face of hammer. The anvil design of the nipple was essential for results.

In closing the talk may I give well deserved credit to our long suffering editor, Harry Knode. His pictures make the dissertation understandable and his horsewhipping persistence made me put this together for publication. My coronary condition was neither brought on or aggravated by Knode, but I hear he broke the leg of another contributor so as to tie him down and get the Henry-Winchester article. Seriously, if these writings appeal to you give Knode a goodly measure of credit even as you recognize he won't know what I wrote about.

Knode

Picture U.
Jacob Rupertus' Patent #23952



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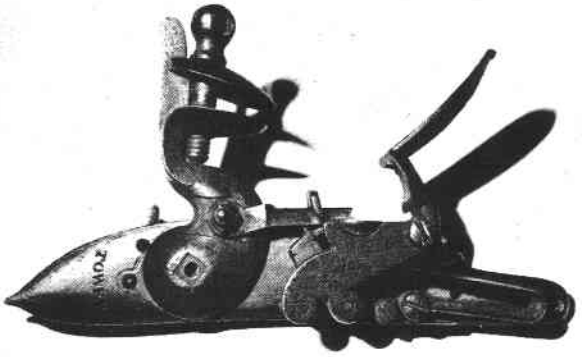
Picture V.
R. Bell's Patent #27518



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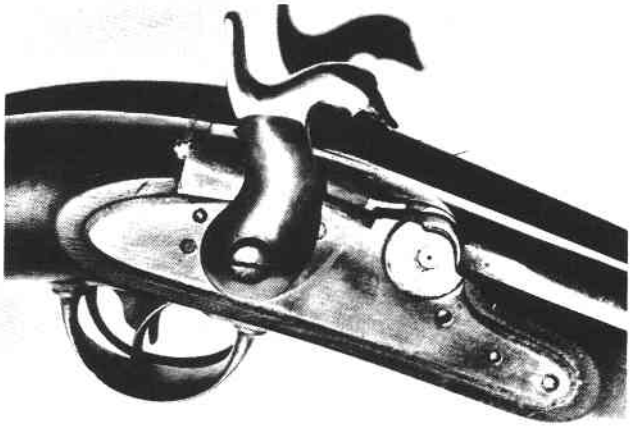
Picture W.
Tower Lock Possibly
Heurteloop Conversion



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Picture X.
Utilizing A Fluminate Extrusion
Without Metallic Cover