The hunting gun made with one, two or more barrels

Paolo Tebaldi July 2018

The invention history from
J. S. Pauly to the present

Chapter I

French guns from J. Pauly to F. Schneider

The twilight of the flint striking ignition.

By the end of the XVIII century the fulminates were discovered. These chemical compounds are shock-sensitive explosives.

The flintlock ignition was thus slowly replaced by the percussion cap system, so the appreciated muzzleloading guns were rejuvenated and they could be used for a few more years.

The intuition that a cartridge, together with the new ignition system, could be inserted by the breech end was much more important, but the breech had to be mobile and striker-equipped.
The flintlock gun structure was changed in a manner that would lead to open it, load the ammunition and then safely close it. In the following decades the gunmakers were committed with three main topics: easy opening, strong closing and safe cartridges.

Percussion cap

Damascus barrels

Among different construction processes the one described below was used for the making of high quality barrels.

Thin strips of iron and steel were forged in a single billet. Three billets were joined ,twisted around a mandrel (Fig. 1) and passed through the rolling mill, from which a strip 7-10 mm wide came out. This strip was heated in the forge, wrapped around a casing pipe and little by little percussion-welded (Fig. 2). Then it was the turn of other craftsmen who drilled and polished the barrels. Finally, after welding ribs and lumps, the barrels were burnished. Thanks to this last process the iron gets darker and the steel lighter.


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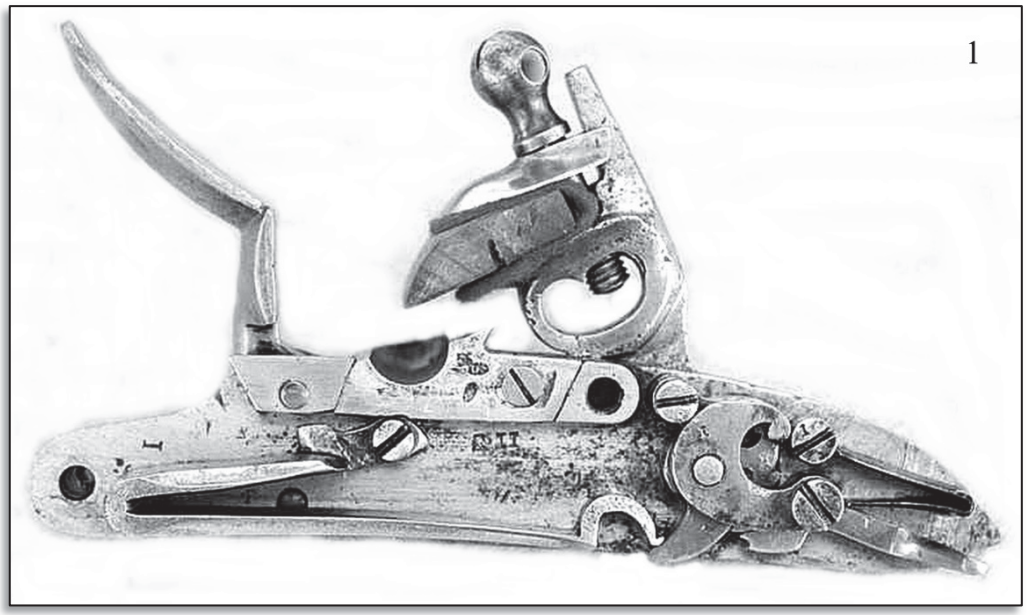
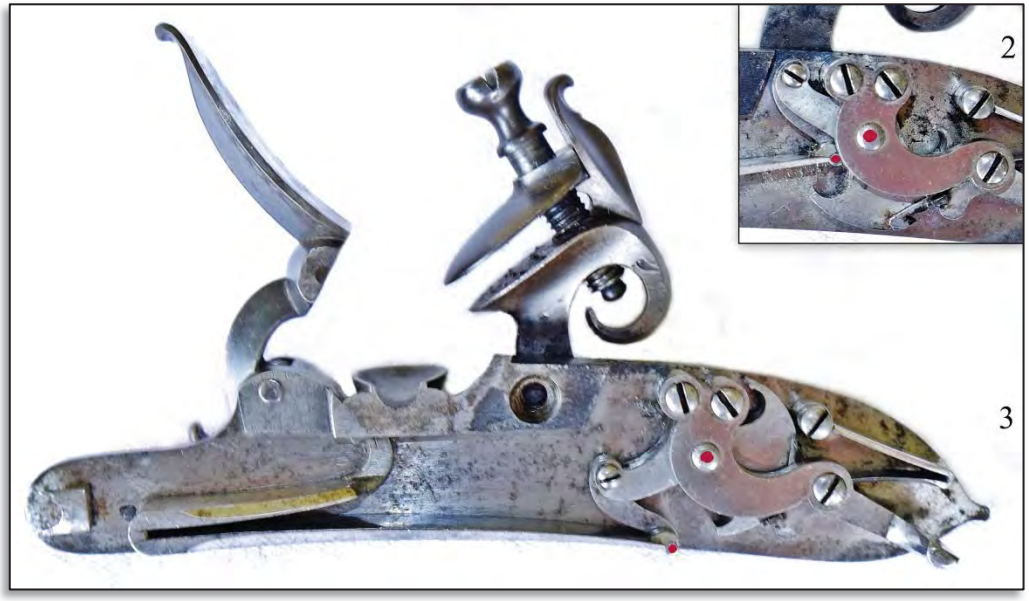




The reform of the lock

The “arcaic” lock, even in its so called modern version (Fig. 1), had a major fault: the mainspring was in direct contact with the tumbler. When the hammer is cocked, the spring, reaching the highest compression, pushes so strongly on the tumbler that the trigger becomes very hard to pull. Once pulled, the rotation of the tumbler open the spring and the hammer moves forward with decreasing force. That force also had to win the frictions between the spring and the tumbler and between the flint and the frizzen. The lower the energy on the hammer, the fewer the sparkles on the priming powder.

Around 1775, probably in France, the lock started to be modified.

Mainspring and tumbler were joined by a small rod, called swivel. In this way the friction between the parts is reduced to the minimum.

But it’s not only this. The rotaion of the tumbler varies the distance between its center and the clan of the mainspring, due to the presence of the swivel. When the hammer is cocked the distance is reduced (Fig. 2), when uncocked it increases (Fig. 3). This variation acts over the spring’ performance, allowing light shooting and vigorous percussion.

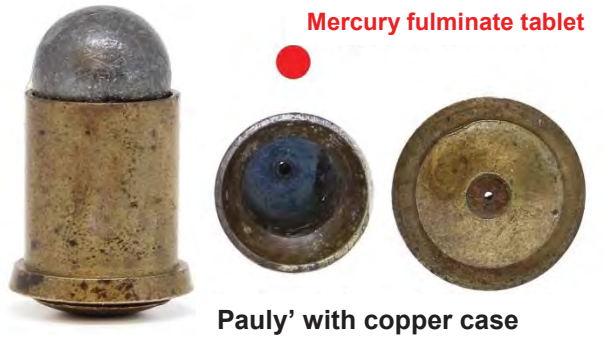
The renewed side by side

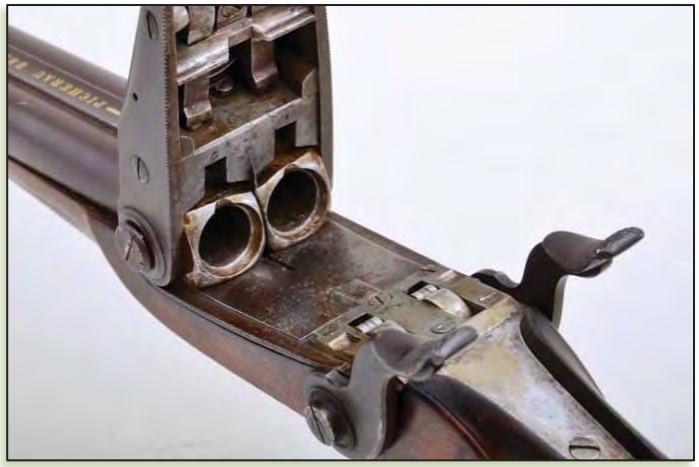
The improvements to barrels and stock reduced the shooting time and facilitated the thrust shooting. By 1810 the stock shapes became more suitable to this new way of shooting. The gun became more balanced.

After 1820, with the percussion cap ignition, the back action sidelock joined the bar action lock, both in the muzzle loading guns and in the breech loading guns.
When it is finely built its geometry controls the long spring so that the “golden” rule is complied with: hammer vigorous on the cap and light at the start.

This lock with pear-shaped sideplate will be widely used, since, being cased in the sock’ neck, it doesn’t need an expensive coupling with the action.
Carefully crafted, it will be used on fine and elegant side by side guns and on the stronger express rifles, which needed a less carved action.
Less fine specimens of this lock will be used on a huge number of cheap guns.

1812. JOHANNES SAMUEL PAULY.





Give me a flintlock gun and two self-contained cartridges and I will give you a breech loading gun. *Johannes Samuel Pauly*

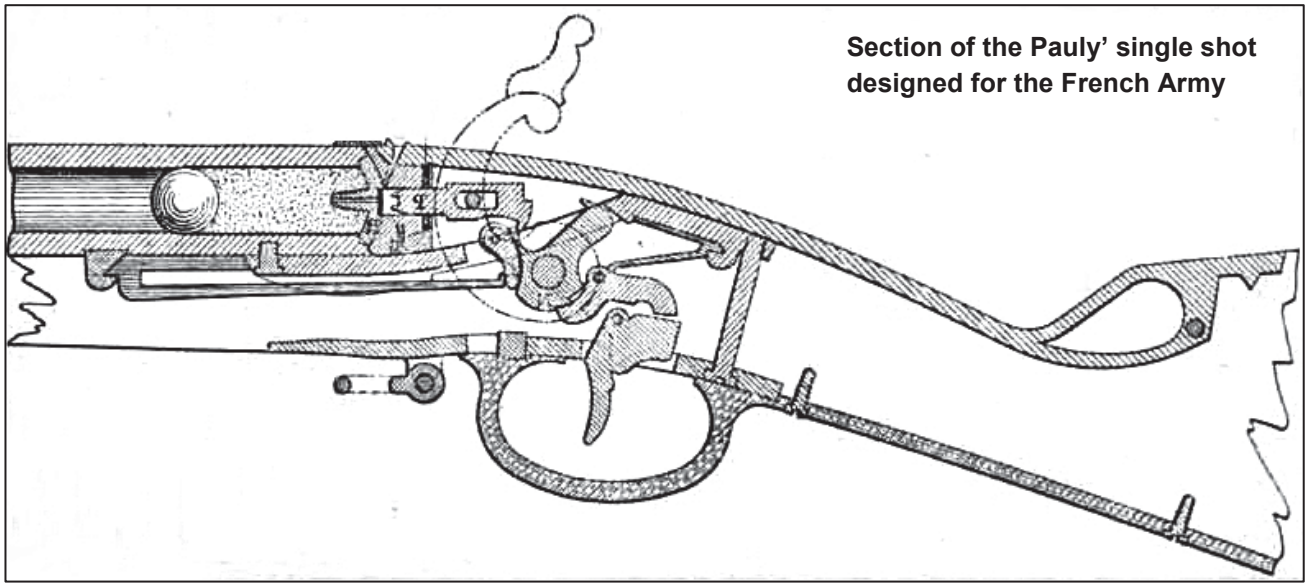
In 1800, in France, L. Leroi started the production of mercury fulminate, a newly discovered chemical explosive.

Some years later Johannes Pauly, a gunsmith working in Paris, had a flash of genius. He invented a cartridge with a fulminate ignition inside (in its substance it is the one still used today) and realized the gun able to shoot it.

The cartridge consisted in a perforated base with a fulminate tablet in its center. A thin paper case cylinder was fixed to the base, this was the powder and lead container. Then the case will be made with brass.

At that time the existing gun was the flintlock one and Pauly started from this structure. He thinned the breech, bored a chamber for his cartridge and welded two cylindircal protuberances on the sides of the barrel. A shutter with a striker could rotate around these two hinges, when it was in the higher position the chamber was accessible, then, when closed, it tightened the cartridge in its seat. The firing mechanism was internal, fitted under the breech. The hammer was cocked by an external lever.

On the side by side there necessarily were two hammers.



Section of the Pauly' single shot designed for the French Army

The Pauly revolution was over the level of the average intelligence of that period and it was not understood.

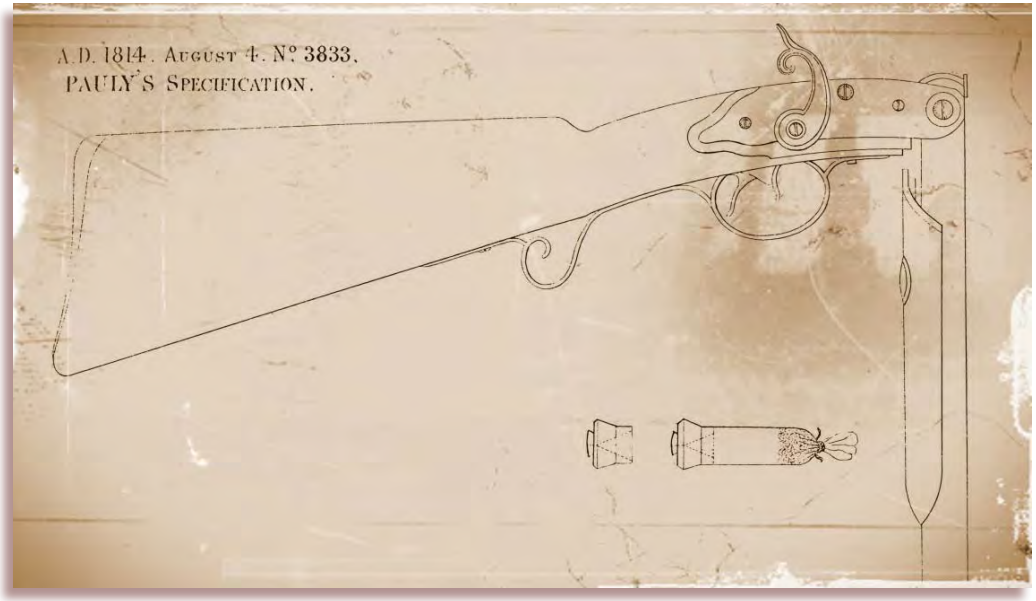
The armies refused the futuristic gun and the too dangerous cartridge (Leroi dead in the explosion of his fulminate factory).

The wealthy hunters, who boasted the magnificent flintlock guns made by Boutet in Versailles as a status symbol, were contemptuous.

Anyway, the obvious path was fixed in 1812 and more clearly in 1814. The doubtfuls will slowly throw away ramrod and flasks.

In 1814 Pauly proposed another model of his gun, even more advanced. This gun, despite its modest aspect and the unsafe cartridge, subverted the world ruled by Boutet and LePage.
Everyone saw only the faults of this disruptive innovation and they were blind to the values. Indeed that gun and that cartridge, refined over time, are still the ones used today.

Pauly's masterpiece, the break action center fire side by side. The Arc de Triomphe that signed the beginning of the new way in 1814.



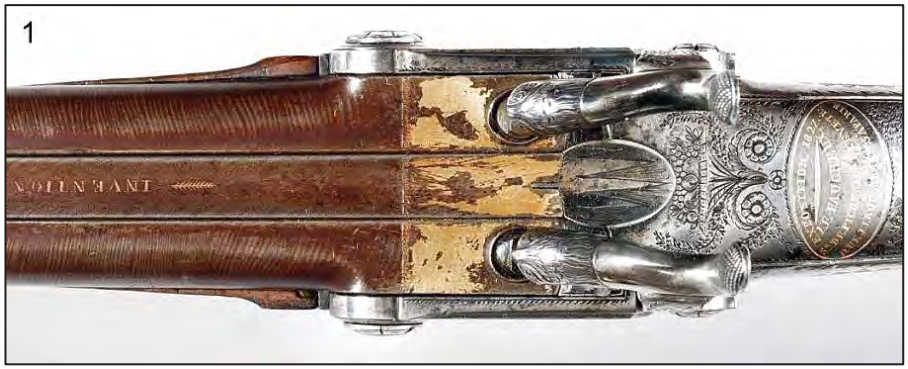

Pauly 1814
single shot version

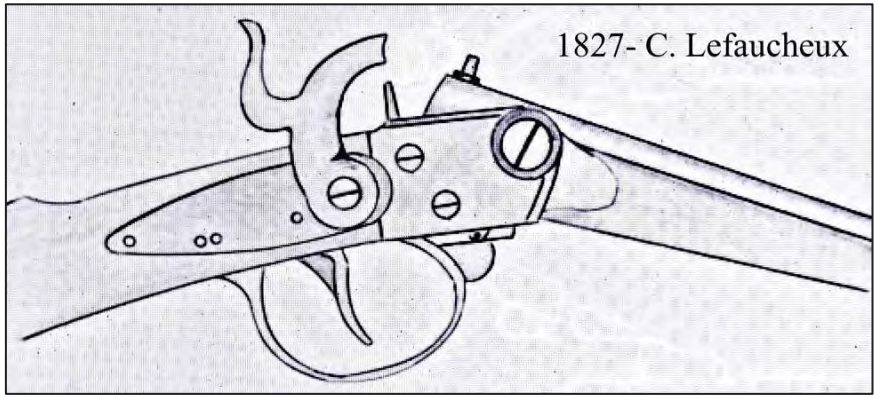
1820 approx

PERCUSSION CAP OVER NIPPLE

Caps and nipples appeared before 1820, they have uncertain paternity and had immediate and great success.
Joe Manton said he was the inventor, Prelat patented it in 1818, in the USA J. Shaw filed his patent in 1821.

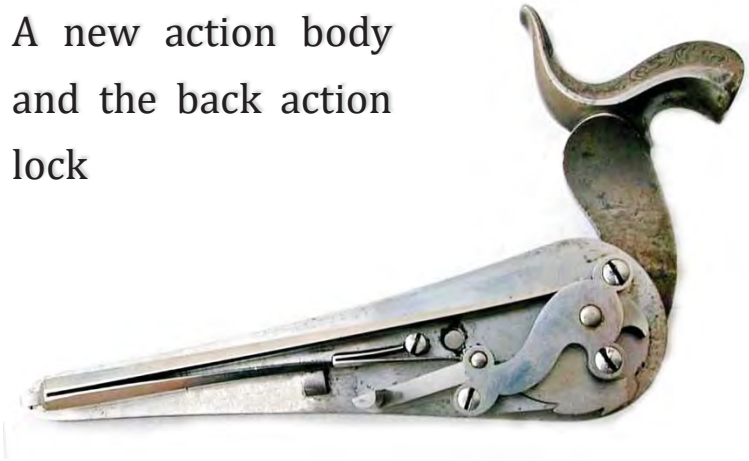
In the 1820s and 1830s Pauly's disciples used the new ignition system on the two guns designed by the master (dead in 1821?). Nipples were screwed to the shutter or to the barrels (Fig. 1 and 2); in 1827 Casimir Lefaucheux patented a break action rifle. The cartridge of these guns was made with a paper case containing powder and lead.





In 1814 Pauly moved to London. In Paris his students Eugène Pichereau first and Casimir Lefaucheux then took his place. And his other workers? The apprentice Nikolas Dreyse returned to Sömmerda and there he became the most famous gunsmith of Prussia. Clement Pottet in 1829 patented the first hammerless breech loading side by side and then, in 1855, he realized the lead cartridge that is still used today. Nicolas Flobert invented a smal cartridge that will become the .22LR.
Honour to the master who was able to train such students.

A new action body and the back action lock



In the 1830s the side by side' action took shape. With the lenghtening of the action flats the barrel's hinge moved forward, thus creating the space for lumps and for the opening – closing mechanism. The back action sidelock, cased in the stock's neck, was introduced.

The cartridge was the limitation of these guns, at the moment of the explosion it couldn't seal the chamber. The combustion gases came out also from the breech towards the shooter. Moreover the explosion in a chamber could ignite the near one. Adopting metallic cases with a nipple and containing the paper cartridge was not very useful.

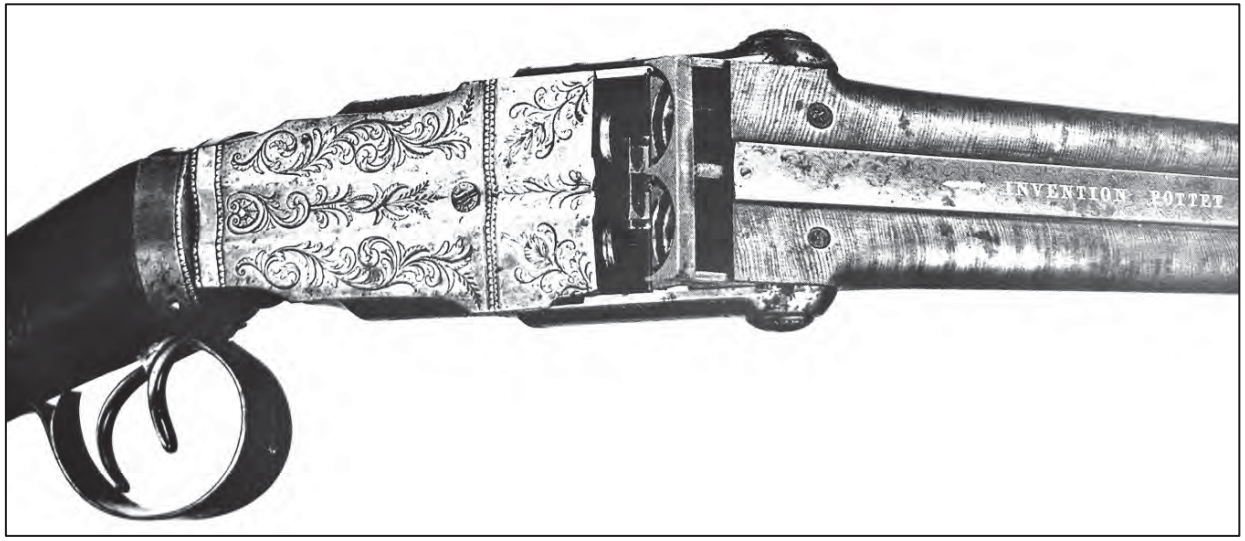
There were two main opening/closing systems in these new break action guns.

One is known as Lefaucheux, a sturdy T-bolt controlled by an under-lever, it strongly retains the barrels (Fig. 1).

In the other system there is a bolt parallel to the barrel axis wich fits into the rear lump. While rotating forward the lever, the bolt draws back and the gun can be opened (Fig. 2). From this germ the modern closing system will rise.

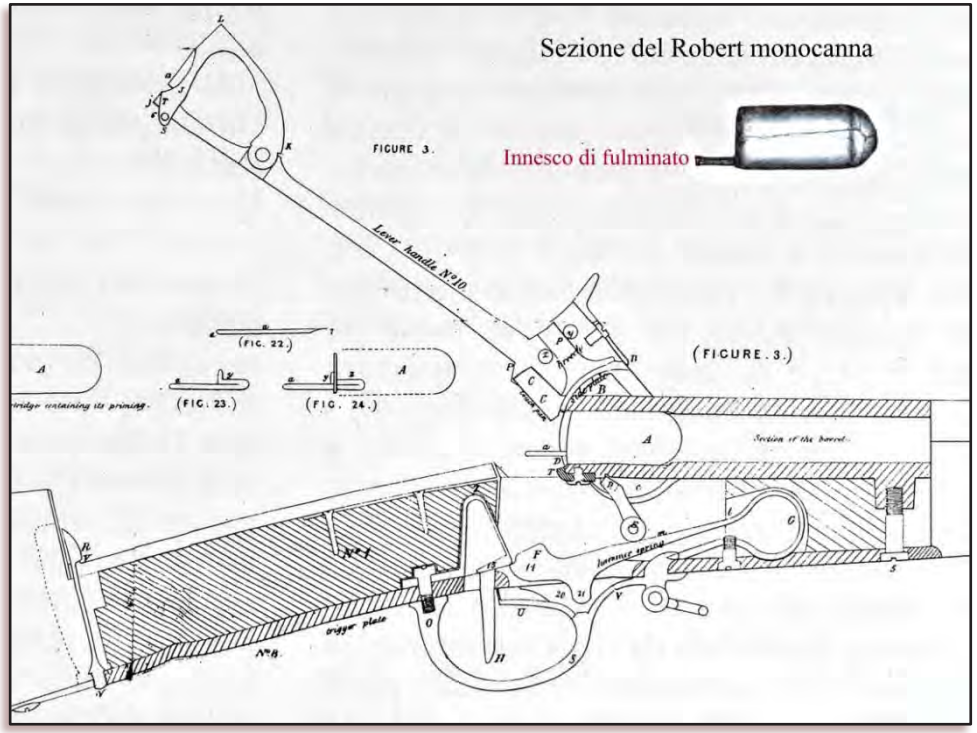

FRANCIS MARQU

1829. CLEMENT POTTET



The gun made by Pottet was the first hammerless side by side. With the rotation of the breech tumblers were automatically cocked (in 1829!) and it was possible to access the chamber.
It was possible to use two different kind of cartridges. One had a nipple into the base where it was possible to put a fulminate cap. The other had an horizontal pin and a source of ignition inside the case.
This gun, that's futuristic in concept and design, is almost impossible to be found.

1831. J.A.ROBERT



This gun was a step forward in the way outlined by Pauly. Source of ignition inside the cartridge and a hammerless gun.

Robert used the tubular ignition patented by Joe Manton in 1818. So he realized a cartridge with the fuminate inside a thin copper tube that protrude from the base.

The aspect and most of all the visionary functionality leave us admired. The opening of the gun cock the tumblers. Closing the gun while pulling the triggers allow the uncocking without the risk of an accidental firing. It has the cocking indicator. When the hammerless will come, after 1870, it will based upon these rational principles.

Talking about prophesies. Is the Darne side by side a Robert-like gun but with a horizontal stroke shutter?


MEDAILLE
D'OR
1835

1834. CASIMIR LEFAUCHEUX

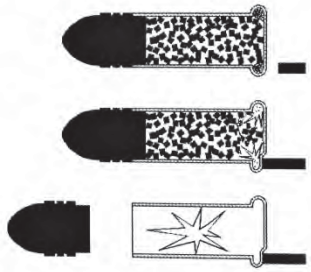
The Lefaucheux cartridge was the solution found to overcome the limitations of a technology still not able to give a safe centerfire ignition.
It came into use around 1836 with some glitches, then around 1846 Houllier introduced some improvements and it (almost) became well-functioning.
The “almost” concerns the pin, a treacherous protrusion wich needed a careful handling.
The pinfire side by side will then be used for decades; it had also been made with double ignition system, pinfire and centerfire together.

The typical gun commonly known as Lefaucheux (fig. 1).
At the beginning the action was weak and it took time and reason to make it stronger without being too heavy.

(fig. 2). An evolution was obtained with the creation of a thinner lump that could firmly fit in its mortise. In this way there was space for a strong flat surface, strong enough to bear bar action locks, if required.

A la mode de Louis XV

J. Brun
12mm Lefaucheux
barrels L. Bernard
goldsmiths Faunière frères
engraver J-C. Tissot



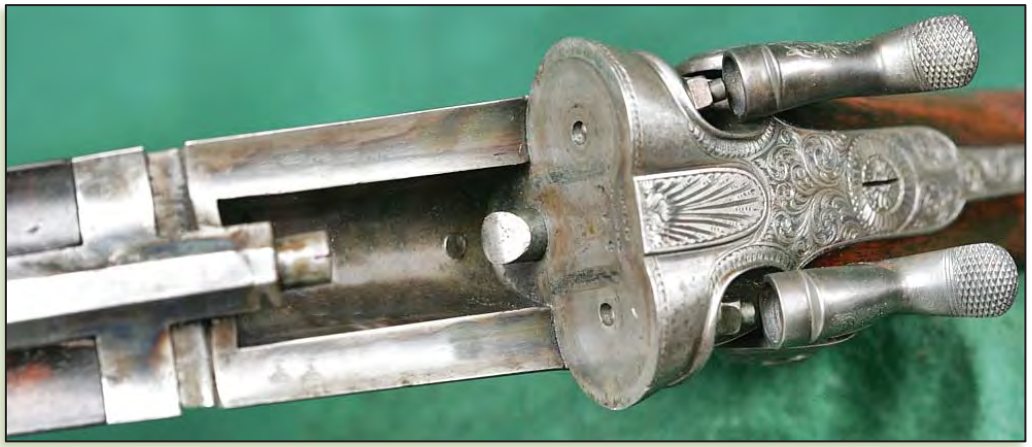
1849. NICOLAS FLOBERT

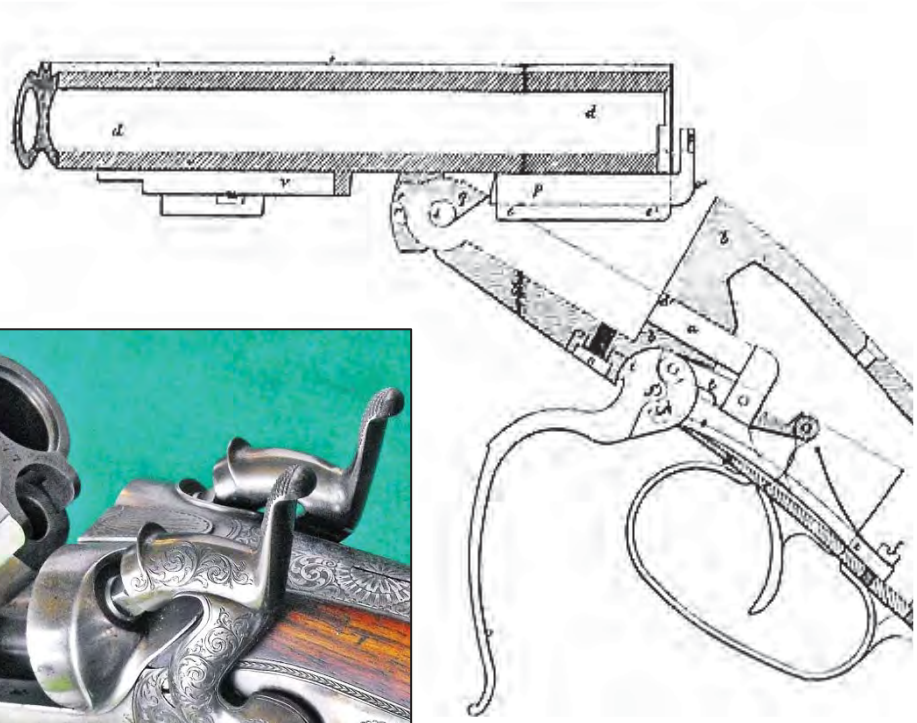
Flobert conceived a rimfire cartridge to be used just for fun with special indoor-guns.

There is also a version in cal. 9mm Flobert with extended case, it fires a lead shot load. It has been used in the hunting hut, but then ignored from the hunters because ot the very modest performances.

The rimfire cartridge invented by Flobert has been used in 1857 on the first S&W revolver. The .44 Henry, also known as .44 rimfire, was the key to success of the lever-action Winchester rifle. Since 1887, transformed in .22 LR, this cartridge is used all over the world, from the smallest ranges to the Olympic ones.

1858. FRANCOISE EUGENE SCHNEIDER



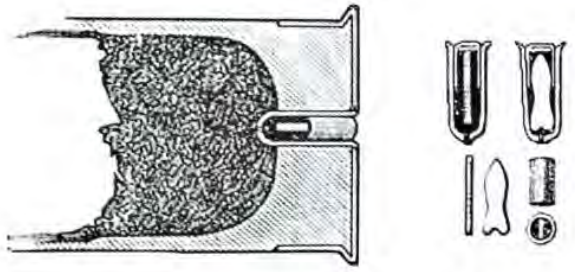


From 1855 to 1860 Pottet and Schneider developed the cartridge that is still used today. The arrow fired by Pauly 50 years earlier hit the target.

So many years are the evidence of the difficulties encountered to reach the goal. Brainwaves, disappointments, setbacks, deadlocks. If we really think about it, even the Lefaucheux' cartridge was a conquest and a step back at the same time.

With this side by side made by Schneider, practical and well working, there was the end of a pioneering and troubled season. The research made by the French gunmakers had a standstill.

In 1851, after the London's Great Exhibition, Lang started to build pinfire guns. Lancaster bought the patent owned by L. Gastinne. Daw patented with his name this Schneider' gun. The baton passed to the English gunmakers.



The Schneider' side by side built by G. Daw, who bought his patent in 1861

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English version by Piero Zanette