

THE ERN ROLLER SIDELOCK

CLAIR KOFOED

BUILDING A BETTER MOUSETRAP

A gun is much like a mousetrap. The bird (mouse) flies, the eyes see it, the brain directs the trigger pull, the sear releases the main-spring, the gun fires—hopefully catching the “mouse.” The devil is in the details. For a double gun or rifle, it’s crucial that only one cartridge fires each and every time a trigger is pulled.

As the saying goes about a mousetrap (build a better one and the world will beat a path to your door), the world has found its way to gun and rifle mechanisms that perform reliably. Configurations like the triggerplate, Anson & Deeley boxlock and Holland & Holland sidelock have been prominent for more than 100 years. The question is: Will a new, significantly improved sidelock mechanism gain interest?

A gunmaker in Schlebusch, Germany, isn’t too con-

cerned. Max Ern (pronounced “Airn”) designed his revolutionary Roller Sidelock mechanism not for the purpose of gaining fame and patent royalties but simply to improve the functionality and aesthetics of a *Kipplauf* (break-open, single-shot) rifle.

He needed a back-action, low-profile lock for a rifle as nimble and quick as its intended quarry: chamois in the Alps.

The roots of this story go back to the 2006 Safari Club International Convention, where the *Shooting Sportsman* staff took notice of the fine Rigby rising-bite shotguns and rifles that Ern; his son Max Jr.; and his wife, Evelyn, a talented engraver, had on display. It was surprising that

this relatively intricate English top-fastener had appeared “out of the blue” from a relatively unknown German gunmaker. Max Ern Gunmaker and Engravers had not exhibited outside of Europe, and SCI was the company’s first US



Max Ern Sr. (left) met his wife, Evelyn, when they were at school studying gunmaking and engraving. Max Jr. (right) apprenticed in the family shop under his father. The innovative Ern Roller Sidelock (opposite) uses unique internal geometry in a marriage of German engineering and British style.





Working from chopper-lump barrel forgings, the guns of Jagdwaffen Ern are made entirely in the family's shop by a mix of traditional craft methods and modern, computer-controlled machinery. Evelyn's engraving (below) is "much inspired by nature."

showing. It also was surprising to learn that the trio did most of the work literally in-Haus. Starting with outsourced chopper-lump barrel forgings, the Ern's did the rest: boring, rifling, barreling, actioning, stocking, finishing and engraving. Max Sr. also did the case coloring. A video showed them working in a shop on their historic 18th Century farm. After the convention, I arranged to visit Germany to see how an English bite had "arisen" from a country famous for its own gunmaking traditions.

On a warm May evening, Max and Evelyn Ern graciously met me at Cologne Bonn Airport, from which we made the short drive to their home in Schlebusch. The next morning daylight illuminated the pin-neat town with green farm fields and pastures visible in the distance. The historic Ern farm is flanked by newer buildings near the town's center. A classic slate-sided house with street frontage holds the shop and showroom. Just across the street is the 1784-built master house, surrounded by paddocks, a barn, outbuildings and a brick tower dovecote.



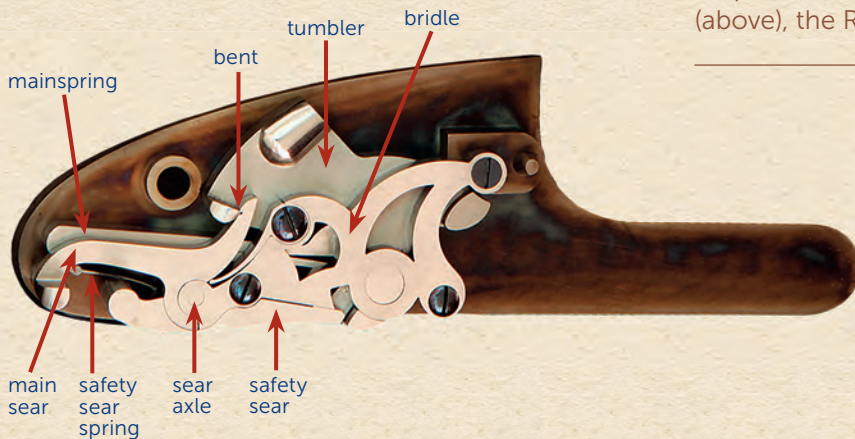
In Germany the Ern name goes back centuries to the bladesmiths of Solingen. Max showed me a family anvil dated 1687 with a slot for forging swords. Schlebusch itself was known for a hammer forge, which is preserved as a museum today. Max's and Evelyn's grandfathers were both skilled craftsmen and worked on the iconic Cologne Gothic cathedral. From a very young age, Max Sr. was smitten by *Jagdwaffen* (hunting guns). The son of

a local beef producer, he took a different path when, at the age of 15, he entered a six-year gunmaking apprenticeship at the Eduard Kettner firm, in Cologne. Afterward he spent a year at the noted gunmaking school in Ferlach, Austria. There he met Evelyn, who was attending the adjoining engraving school, and before long the two became married in work and life. In 1986 the pair opened Jagdwaffen Ern in Schlebusch, and they have been hard at it ever since. (At the airport I couldn't help but notice Max's improved English. At SCI he had spoken little. He explained that he had taught himself: "Nights reading Greener, Burard, Dallas and *Shooting Sportsman*." Doing so, he also had taken to heart the 1879 *Field* test where the Rigby top bite was the only gun that did not "gape" under fire. He also had taught himself CAD programming and CNC operation with the assistance of his other son, Bernhard, who has a master's degree in computer science.

After a German breakfast of cheese, bread, cold meats and fruit, we started the tour at the heart of the operation: the shop. It is always fascinating to see how different makers produce the same result. Often it turns out that they use their own methods, and Ern's methods were, indeed, individualistic. Besides a vise on a lift, he had a drawer filled with new, old-stock, paper-wrapped files made in Ferlach just for barrel striking. Attached to an offset handle, they allow level, flat filing without finger interference. One of Ern's other tools was a pneumatic wood chisel used for roughing-out stocks.



Developed for this break-action, single-shot *Kipplauf* (above), the Roller Sidelock is fast and robust.



When cocked, the mainspring roller of the Roller Sidelock rests in a detent in the back of the tumbler (obscured here by the bridle but visible in the drawings on p. 122). When released, the roller acts directly on the back of the tumbler, whipping it forward.

When we entered the showroom, the row of shining, case-colored arms made a great impression. It was, indeed, one of the rare places a person could have the singular experience of being fit by and ordering a gun from the man actually making it. Somewhat dizzily, I asked about a diminutive double hanging on an overhead beam. Smiling, Max Jr. reached up and took down what turned out to be a metric .405 Winchester-equivalent double rifle—his *Meisterwerke* under his father's apprenticeship. The fine

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lines and finish left no doubt that the young man would be someone to watch. Then Max Sr. retrieved his own masterpiece, the *Kipplauf* mentioned earlier. While I was admiring the Boss-style fences, he mentioned that he had made a new lock for the rifle, but I was so smitten by Evelyn's engraving that it didn't register. The bold scroll had tendrils tying the elements together exceptionally well, and the roses and bouquets were especially lovely. "I am much inspired by nature," Evelyn said, "and I believe '*Pulchra sunt quae visa placent*' ("That is beautiful which gives pleasure to the eye')."

Just before lunch, Max's mention of the "new *Kipplauf* lock" hit home, and I asked to see it. In hand it was familiar yet different—the parts an amalgamation of arcs. One sinuous sear had its spring beautifully inlet into the bridle. Below it, the nose of what turned out to be the safety sear was Holland-like but heavier, with a curved tail. The snaky sear turned out to be the main sear and "overhanging;" it held the tumbler (hammer) cocked near the top, at best mechanical advantage. I asked if Max would remove the bridle, and when he did so, he uncovered a back-action mainspring with a roller on its end. Roller-ended springs are nothing new. Most sidelocks, however, utilize a holdover from hammergeuns called the "link." Often called the stirrup, or swivel, the link is a small "S"-shaped bit of metal with crosswise pins on either end. The pins on one end "hang" from hooks filed in the end of the mainspring; the pins on the other engage holes in the bottom of the tumbler. In this way the great power of the spring is "linked" to the tumbler. Sometimes stress causes the link to break. (The mainspring hooks can break as well.) There is also an inordinate amount of handwork involved in filing the hooks, making the link and fitting the link to the tumbler. By contrast, a roller is simple, robust and functional. When a roller lock fires, the roller pushes on a tumbler lobe, propelling it forward like

a sling on ball bearings.

But the Ern tumbler had no lobe. Then Max modestly demonstrated his brilliant design. On firing, the roller/spring bears up *on the back of the tumbler itself*, whipping it forward. Showing the reverse, Max actually pushed down the tumbler with his *bare* thumb, compressing the spring and cocking it. He could do this because the long tumbler back offers great leverage to push on the spring. Then Max released the main sear and easily used just one finger to hold down the

tumbler to keep it from firing. I was completely baffled. Max explained that, in cocking, the roller rides down the back of the tumbler and passes over a cam and into a detent. The detent "pocket" acts as a dynamic sear, restraining most of the force exerted by the mainspring. This "second sear" allows the "bent" (the actual sear engagement notch) to be deep and secure, yet the trigger pulls are still light and crisp. And contrary to what you'd expect with a spring restrained by two "sears," the Ern Roller Sidelock

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is very fast: approximately 3 microseconds, or 3 millionths of one second.

Because this is a back action, with the mainspring not in the action bar (most double rifles are back-actions), less metal is removed from this high-stress area. Following “form/function,” Ern’s architecture is arranged such that the tumbler pivot point is very low on the sideplate. This allows a slimmer action that is very good for smallbores and rounding. But lock function still is not compromised, as often occurs with scaled-down sidelock geometry using smaller, stiffer springs and sharply angled firing pins. The low profile also produces less force on the bolting and Rigby top fastener. And in Ern’s words: “It’s also beautiful!”

The elegant and simple, low-stress Ern Roller Sidelock has the potential for great reliability and longevity. Perhaps its only flaw is common to all V-spring actions: Springs break. In the past spring-making was more art than science, and replacements were difficult to get and expensive. Today EDM machines cut spring profiles easily. Ern’s back-action springs are cut long and have well-tapered arms for minimal flex stress.

The last Ern Roller Sidelock improvement can enhance human longevity: The safety sear is “force-neutral.” This means that any external force (e.g., a drop) acting upon one arm of the sear acts equally upon the other. It could be likened to dropping bags of shot simultaneously on the ends of a horizontally balanced teeter-totter: The teeter-totter won’t move. It is improbable but possible for a Holland-style lock to fire if a gun is dropped very hard and flat on its belly or back.

Over lunch I asked Ern why he had spent so much time on this lock. “I’d rather not duplicate what others do or copy a copy,” he said. “Also, we always strive to improve design and materials. This lock greatly reduces stress, is low and allows more rounding. Form should always follow function.” A natural question followed: Why not build a “best” shotgun with the “best” Roller Sidelock? Ern explained that it would be difficult without a client. Design, execution and engraving would have to be

squeezed into what were often 12-hour days . . .

After lunch we continued touring the historic grounds. Behind the house where the Ern’s live were stables and a large, half-timbered barn. The barn housed the machine shop, where I had expected to find a Bridgeport mill, lathe and perhaps a band saw. Instead we entered a room containing CAD-driven EDM and CNC machinery. Ern explained that in order to be competitive, he had acquired this older but still highly functional used equipment.

Another door led into the large bay of the barn, where a huge, antediluvian rifling bench occupied an entire wall. The mechanical wizardry of the Suhl-made, self-indexing Schilling und Craemer bench gave the Ern’s a tool un-

equaled today. It had been acquired from Franz Sodja Werke, in Ferlach, and allowed for the making of “cut” single or double rifle barrels in almost any configuration. A large Suhl-made barrel-honing machine was also in the room.

Fast-forward six years, and the Ern’s arrived at the SCI Convention with a finished Roller Sidelock. With some trepidation, I picked up and shouldered the “world’s first.” It had the feel and balance of a best gun. The triggers broke like porcelain, and the fit and finish were immaculate. The trigger-guard screw stud and ducktail curl—details oft overlooked—were filed perfectly. The smoothly struck barrels showed a luster of 10 coats of blue. The wood figure matched the overall tone, and the inletting and checkering could not have been better. Evelyn’s engraving was very nice, indeed, and *SSM* Senior Editor Vic

Venters’ assessment when he had seen the gun at the IWA show came to mind: “British style, German engineering—unbeatable.” The fact that a beaming Max Jr. had done all of the fitting and finishing confirmed that he had arrived.

I was so taken by the *Gestalt* of the gun that the lovely rising bite was almost overlooked.

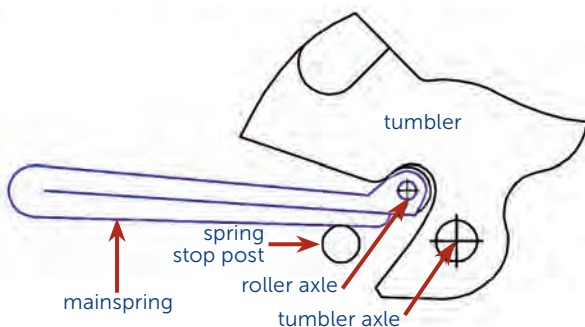
The mousetrap had been improved.



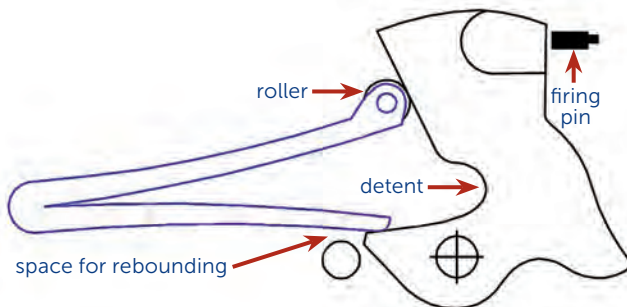
Author’s Note: For more information, contact Max Ern Gunmaker and Engravers, visit www.max-ern.com.

Clair Kofoed is an Editor at Large for Shooting Sportsman.

ERN ROLLER LOCK COCKED (NOT TO SCALE)



ERN ROLLER LOCK FIRED (NOT TO SCALE)



In Ern’s re-engineered sidelock the mainspring’s roller engages a detent “pocket,” which acts as a dynamic sear, restraining most of the force exerted by the mainspring.