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PRECISION ARMS WORKSHOP

AND THE AMERICAN GUNSMITH ARCHIVE

A TECHNICAL JOURNAL OF CRAFT, REPAIR & RESTORATION

11

ARCHIVE ISSUE NUMBER

INSIDE THE ARCHIVE

LEVER ACTION IRON SIGHTS

GUNSMITHING SERIES • CZ 75 KADET ADAPTER • CHASSIS OR STOCKS FOR COMPETITION SHOOTERS • COLD BLUE

ORIGINAL METHODS. MODERN ACCESS.

ARCHIVE EDITION 203

DIGITAL ARCHIVE EDITION

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IN THIS ISSUE

Contents

A complete guide to the searchable editorial work preserved from November 2020.

2**Gunsmithing Series**

AMERICAN GUNSMITH EDITORS • ORIGINAL PAGES 2

3**CZ 75 Kadet Adapter**

ROBERT K. CAMPBELL • ORIGINAL PAGES 3-6

7**Chassis or Stocks for Competition Shooters**

STEPHANIE A. MARTZ • ORIGINAL PAGES 7-8

9**Cold Blue**

ROBERT K. CAMPBELL • ORIGINAL PAGES 9-11

12**Gunsmith Profiles**

ROBERT KOLESAR • ORIGINAL PAGES 12-14

15**Ruger Custom Pistol**

ROBERT KOLESAR • ORIGINAL PAGES 15-18

19**Lever Action Iron Sights**

ROBERT K. CAMPBELL • ORIGINAL PAGES 19-22

23**Reader Forum**

AMERICAN GUNSMITH EDITORS • ORIGINAL PAGES 23-24

RIFLES

Gunsmithing Series

BY AMERICAN GUNSMITH EDITORS NOVEMBER 2020

ORIGINAL PP. 2

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The Gunsmithing Student Handbook Series from Fred Zeglin, et al. is a collection of four primers filled with modern information about gunsmithing and tools. Learning how these are designed and made will make you more efficient and profitable as a gunsmith. Chambering for Ackley Cartridges, Understanding Headspace, and Chambering Rifles for Accuracy were the first three.

Gunsmith Tools, Cutters & Gauges—A Primer is the newest release of the series, containing over 100 years of knowledge about how and why gunsmithing tools are designed and manufactured as they are. Fred Zeglin, gunsmith, teacher, and writer, has worked with the makers of gunsmithing tools, reamers, headspace gauges, and more to create this series. Each book provides a highly detailed and technical explanation of the subject at hand in away that any gun lover will be able to understand.

The series dovetails nicely with each other as the subjects are all connected. Zeglin compiled knowledge from Clymer Precision Inc., Dave Manson Precision Reamers, JGS Precision Tool Manufacturing, Pacific Tool and Gauge, and SAAMI together, collating all these

sources into cohesive works that represents a century of best practices. Zeglin has been building custom hunting rifles for over thirty years.

His teaching experience includes conducting classes for the NRA Short Term Gunsmithing program at three separate colleges and as the Coordinator/Instructor for the Firearms Technology program at FVCC. Prior to the Gunsmithing Student Handbook Series, Zeglin published Hawk Cartridges Manual, Wildcat Cartridges, Reloader's Handbook of Wildcat Cartridge Design, and P. O. Ackley, America's Gunsmith.

Zeglin also created two digital video courses for the American Gunsmithing Institute: Taming Wildcats and Reloading A to Z. "People who have decades of experience with a job and its tools have a 'curse of knowledge.' In short, they have no idea how much of what they know needs to be explained to people with less experience," said Zeglin. "Even the terminology that we use requires defining.

I think these books area huge step toward breaking that curse." All of Zeglin's books are available in paperback or e Book format on Amazon. His books as well as services can be purchased directly from FredZeglin.com or by contacting or

FROM THE ARCHIVE

CZ 75 Kadet Adapter

How to fit the CZ 75 Kadet Adapter II, a .22 Long Rifle conversion unit for CZ 75/85-series pistols.

BY ROBERT K. CAMPBELL NOVEMBER 2020

ORIGINAL PP. 3-6

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I hear interesting things at the ranges, shops, and gun shows I frequent. It isn't all about work. Sometimes it is idle curiosity and meeting with like minded people. When I walked into a shop recently one of the first things I heard was, "I would have ran him out!" The story was evidently a good one. Many things are humorous when they don't happen to you. The story was that a gentlemen had came into the shop looking over a number of CZ 9mm pistols, including the CZ 75 Omega, a CZ 75B, a P-01, and the CZ 75D.

He told the clerk he was determined to purchase one of them and the slight difference in price was not a problem. But, he continued, they had to fit his CZ Kadet conversion unit. That was the deal as he had found the unit for a song at a pawn shop and wanted to acquire a CZ 75 9mm to go along with it. The shopkeep did the proper research and it turned out the Kadet should fit any of the steel frame 9mm pistols on hand but not the polymer CZs.

As it turned out it did not fit the CZ 75 Omega, seemed too snug on the P-01, but fit the CZ 75B well if very tight. The cus-

tomers went away happy and the clerk re-assembled the handguns. An interesting story and I suppose the fellow behind the .22 caliber pistol. The Kadet conversion works well. counter went above and beyond. The other worker, however, stated that he would not have taken new guns apart (they were really just field stripped) just to try jamming the customer's conversion unit.

That is a decision for another time. Fast forward a few days. The fellow had been firing the CZ Kadet conversion on his new CZ pistol and was quite happy, at least until he decided to fire the pistol with 9mm. He could not convince the Kadet conversion to slide off of the frame. He did not want to force it and he was familiar with CZ operation as he had owned a number of CZs and close clones. I had the call in the morning and picked the pistol up that evening.

This led to a great deal of research on the Kadet and CZ pistols. I have modified and written on the subject of Colt conversions but I admit no experience with the Kadet. This experience turned out to be interesting. I learned the CZ 75 Kadet is best fitted

to the frame it is mounted on. I managed to get the conversion unit off without mishap. Unfortunately, the solution requires having three hands.

The Kadet is not similar to most of the aluminum lightweight slides that are popular and relatively inexpensive, such as the Jonathan Arthur Ciener types. The Kadet is all steel and it isn't really a slide although it fits onto the CZ 75 frame like one. The actual bolt is enclosed in this "slide" and reciprocates as the Kadet is fired. This is a good solution and far superior, longevity wise, to an aluminum slide conversion. Lets look deeper into CZ's description and their specifications for the Kadet.

The CZ 75 Kadet Adapter II is a separate accessory for the CZ 75/85 pistol series allowing the firing of Far The P- 01, right, will work with the proper slide stop but the Kadet .22 magazine will protrude from the magazine well.

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22 Long Rifle rimfire. When properly fitted, this conversion is the perfect training or plinking pistol with the slide weighted and balanced just like the CZ 75. The Kadet features all-steel construction and an adjustable rear sight. Included are two ten-round magazines that fit flush with grips of the full size CZ 75 and SP-01 models.

The Kadet conversion kit will work on the CZ 75 full-size and compact models including the 75, 85, SP-01, 75 Compact, P-01, P-06, and PCR, but note that the fullsize magazines will extend out of the bottom of the shorter grips on these models. The Kadet conversion will not work on the 97, 75 TS, 2075 RAMI, SP-01 Phantom, P-07, or P-09 models. Pre-B model 75s may or may not function with the Kadet due to differing magwell dimensions.

When used on an aluminumframed compact model (PCR, P-01, and P-06) as well as the steelframed Compact 40, a specific slide-stop is required for proper last round hold open. This is part Below center: The forward area of the “slide” that may need to be filed for a proper fit on a centerfire frame. They are shown with 9mm magazines for comparison. number and is available at no charge through CZ’s parts department. On 85 models, the 85 slide stop must be used but will not enable last round hold open.

When used in competition-oriented or modified 75 series pistols like the Shadow, a factory-weight CZ 75 mainspring may be required to provide proper primer ignition. Specifications for the Kadet is a unit weight of 1.05 pounds and a cold hammer forged barrel 4.72 inches long. As for removing the conversion unit, I held the bolt back to the spot where the witness marks line up with the frame. The slide stop was very tight and it was difficult to press it out.

I found a cleaning rod tip of the exact dimension to lock the bolt in the position to line up the witness marks on the bolt and the frame. While holding the slide lock down a bit, I gently tapped it out with a Real Avid padded mallet. The slide was pretty darned tight coming off. After further research and discussion I was able to fit the slide. According to CZ it is necessary to fit the Kadet adapter with “minimal clearances” in the guide rail.

According to CZ’s instructions, although it isn’t explicitly stated, the Kadet must be manufactured oversize. The owner hit it lucky by finding a frame the Kadet simply fit, more or less, although it was tight. It would not easily fit another frame of a very similar handgun he tested. Begin fitting the Kadet by removing the recoil spring. Compress the spring, tilt it, then remove it by pulling it to the rear. The Kadet is filed and polished slightly to produce a snug fit in the rails.

The clearance between the barrel and the frame is maintained as minimal. The initial surface to be filed is the locking lug portion of the barrel with the locking lugs surface filed first. As the Kadet is tried on the frame, additional work may be needed by filing the forward section of the unit behind the muzzle where it meets the guide rails. The slide stop is going to be tight no matter what we work with.

With the pistol illustrated the slide stop was tight in 9mm—after all, CZ is a high end maker—but tighter with the Kadet. Included with this Kadet under the foam padding of the case was a Kadet-specific slide stop. There was also a sight adjustment tool. Perhaps our CZ enthusiast should have dug a little further in his case.

I am glad he had the forethought to bring the padded case and instructions with him, even if he didn’t read them, although even with the instructions I still needed more research to solve the problem. After a relatively small amount of file work the adapter was much easier to mount and dismount from the frame. Even after fitting, the Kadet remains tight, a bit tighter than the 9mm slide. A final piece of fitting that may resolve hair pulling issues.

About 0.7 inch going forward from the rear of the slide is a small notch, just behind the cut out for the safety lever. The area between this notch and the safety notch, on

CZ 75 KADET ADAPTER CONTINUED

ORIGINAL PAGE 5

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the lower face toward the rear of the slide, may need to be filed. The test is to place the Kadet on the frame. If the safety will not properly engage and indent, this small area needs to be polished slightly. Disassembling the Kadet is relatively simple. Move the recoil spring forward by pressing and compressing it toward the muzzle. Bring the rear of the recoil spring out of the lower assembly. The barrel is fixed, pinned into the "slide". The lower half of the unit is removed by pressing it back and slightly up.

Reassemble the unit by angling it properly to allow the ejector to clean the lower half of the unit. CZ cautions to take care not to damage the ejector. I could certainly see this happening. The ejector is a strong and robust unit, but it is thinner than the slide and could be damaged if the slide came to bear against it in lateral movement. The Kadet is robust and has proven reliable. The magazines have a stop at the bottom and this limits capacity to ten rounds. The sights are European LPA types.

An adjustment tool is included. As a nice touch, the sight adjustment tool is magnetized. These marks must be lined up to disassemble the CZ 75 pistol. My research indicates there are two types of firing pins, an

early and a late model, with the late model being an improvement over the original and able to fit all Kadets. It is easily changed and similar to the 1911 and full-size CZs. Press the firing pin in against the firing pin spring pressure. The firing pin stop is then pressed downward.

Be certain to cover the firing pin and spring with a thumb to prevent the firing pin and spring taking flight across the hall. Replace the firing pin with a new type firing pin. Luckily the LPA sight adjustment tool was perfect for depressing the firing pin. I found the proper part at CZcustom.com for \$20. They also have a firing pin spring for \$3 and a good number of mainsprings. This brings us to another possible problem with the CZ 75B and Kadet.

As many of you have learned when dealing with a factory-new set up, there is far less mystery involved. We hope the piece arrives with factory standard springs and Far Left/center: The CZ 75 Kadet breaks down into its basic components easily enough. 22 conversion units. The bolt, shown to the rear, recoils as the pistol is fired. that it is in specification. Used guns are another matter.

Rimfire Malfunctions The problems with malfunctions and rimfire pistols are common to all types and to all of the conversion units. The CZ 75 is not an exception. I dredged up the memory of a 22 Long Rifle conversion I worked with a decade ago and I simply used experience from the Colt Ace conversion to fix it. The Kadet doesn't have a floating chamber but it has certain other similarities. The Kadet fired sometimes but not all of the time, and interestingly enough did not want to fire in double action.

We assume the double action whack is heavier than single action. A common problem is a too-weak mainspring. CZ mainsprings are available as light as eleven pounds though seventeen pounds is more common, which is the weight I would have in a defense handgun or any CZ 75 I wished capable of digesting every type of ammunition. The rimfire cartridges aren't as reliable as centerfires and demand a strong strike on the priming compound. A standard mainspring must be used with the Kadet and is a simple fix if needed.

I suppose a shooter with a tuned CZ 75 may be disappointed but there is no getting around this baseline requirement. A second approach may be useful. The occasional failure to

CZ 75 KADET ADAPTER CONTINUED

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Original caption: Top: The Kadet 22 Long Rifle slide stop, left, differs from the 9mm slide stop. that will compliment the high quality CZ 75 pistol. It simply must be properly fitted to the handgun. AG A tool for sight adjustment is included in the unit's hard case. Bottom: It is necessary to remove the firing pin and firing pin spring in order to clean the firing pin channel.

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fire may be because of firing pin energy. The first step is to thoroughly clean the firing pin channel as rimfire ammunition is much more dirty than centerfire ammunition and we tend to fire a lot of it at a range outing. Powder ash, lubricant residue, and even lead shavings are common. Some ammunition is cleaner than others, such as copper washed, but there is still powder residue. If the pistol is failing to fire there should still be at least a light strike.

Clean the firing pin channel and the chamber of the barrel. Another simple fix for a failure to fire is to clip a coil from the firing pin spring. Since the Kadet doesn't use the 9mm firing pin and spring and will not be used for critical duty, this is an acceptable fix. When the firing pin spring is clipped it doesn't take as much force to send the firing pin forward. One coil is good, usually does the business, and the firing pin will still reset.

We do need to impress upon the owner a greater need to clean the Kadet more often, at least every five hundred rounds. Depending on the ammunition, function with any rimfire will become sluggish after too much fouling. I was able to fire more than three hundred rounds in the latest Kadet I worked with. Function was flawless.

While it is the usual recommendation to use only CCI Mini Mag ammunition, noted for flawless function in otherwise problematical firearms, this conversion performed well with a number of proprietary bulk loads. It also performed well with the CCI Subsonic. Accuracy is excellent. I fired several 2" 25-yard groups and a few even smaller. One exceptional group went in 0.9 inch for three rounds with the next two widening the group to 1.9"—still outstanding.

THE CZ KADET IS A ROBUST, SOLID, AND WELL ENGINEERED PIECE OF GEAR

The LPA sight adjustment tool is useful for pressing the firing pin inward to remove the firing pin stop.

FROM THE ARCHIVE

Chassis or Stocks for Competition Shooters

Determining if chassis or stocks work best for competition shooting, especially in the Precision Rifle community.

BY STEPHANIE A. MARTZ NOVEMBER 2020

ORIGINAL PP. 7-8

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Oftentimes in any type of gun discipline we are pushed into the use of certain equipment because we see others do it or it's the "next best thing". Well, there will always be a next best thing and someone will always try to tell you what the best piece of equipment is. The important thing is to understand what you are using and why. In the Precision Rifle community there are an especially large amount of gun buffs that know what is "right".

Truth is, unless they know your story and knowledge base, they may not know what is right for you. Stocks and chassis are an example of the "use what is right for you" concept. Your decision between using a stock or chassis and what brand and customizations will depend on environment, type of employment, genuine needs for customizations and adjustability, your wallet, and, most importantly, your experience with past and present types of chassis and stocks.

Stocks A stock is what most envision when thinking of a standard hunting rifle. While wood was most common, they are increasingly made out of composite ma-

terials. For example, Manners Composite Stocks (MannersStocks.com, is a popular stock company and they make theirs out of 100% carbon fiber material. Foundation Stocks (FoundationStocks.com, is another company on top for performance of stocks and they make theirs out of a material called Micarta.

Micarta is often used for making knife handles and is a combination of paper, canvas, linen, and sealed with resin. Mc Millan (McMillanUSA.com, makes fiberglass stocks. The company says that these stocks are "filled with solid fiberglass in the receiver area and epoxy and glass beads in the forend. Our EDGE ultralight stocks are made with 100% graphite cloth in the shell instead of fiberglass, for less weight and greater strength." When choosing a stock, those materials matter. Do they absorb sweat? Do they fade?

Are they heavy or light? Do I want my stock to be molded or cut? All of these questions come to fruition when choosing your stock.

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Myth or fact: Stocks have less adjustability and customization than a chassis. Turns out, this is a myth. It is often thought that stocks have less adjustability due to the lesser amount of moving pieces. However, a stock's length of pull can be adjusted with some minor cutting and removal of material or by removing the butt plate spacers depending on the stock. Once that is cut or set you won't need to adjust it again. The cheek comb can be adjusted on stocks often by a knob that is already installed.

Either way, ensure that you know the tools needed to do these adjustments. Another aspect of customization is adding weight. Recoil management is huge when it comes to shooting Precision Rifle events and spotting impacts for follow up shots. Many stock companies offer weight customization for minimal extra charge. At least one company on the market is now producing a stock that allows for a removable weight system.

Finally, to allow easy mounting of bipods or other accessories, stocks can be outfitted with rails on the forend, com, and other equipment. Chassis Chassis are most accepted by those who have run standard AR-15s and want a large amount of modularity,

adjustability, and customization. A chassis can feel most comfortable to those who like a boxy kind of feel. They also offer durability in all types of weather due to the materials they are made out of.

Modular Driven Technologies (MDTtac.com), is a popular chassis company. They use CNC machines to build their ACC chassis system out of 6061 Aluminum. Accuracy International Chassis Systems (Accuracy International.us), has been in the game the longest and makes their chassis out of polymer and alloys. They also have delivered and sustained many military contracts with their chassis. Chassis often offer numerous types of adjustability on the stock.

For example, Magpul (Magpul.com), makes the 700 Pro Chassis which offers adjustability in length of pull, butt pad height, Far cheek comb height, and cheek comb fore/aft. Some chassis offer a folding stock option for storage and pack purposes. Many chassis offer a rail system that allows you to mount many accessories such as thumb rests, plates, and bipods. Be sure to look at what type of mounting system it offers such as ARCA, M-LOK, Keymod, or 1913.

It has been said that chassis offer a bit of a difference with recoil mitigation; some shooters state that it's positive while others say it's negative. It all depends on personal preference. This also depends on the ammo and if you're running a suppressor or brake, which is an entire concept that can be dove into on a later date. An important thing to think about before getting your heart set on a system is to ensure that you can also build a 223 Remington equivalent.

Having the exact same build but in a lighter cartridge will save you money and wear on the match gun. As always try before you buy and do your research. I may have stated that the Precision Rifle game is full of buffs, but there are those who were in the same boat and wasted money on equipment that they decided didn't work for them. Join a Precision Facebook group in your state and ask around if you can try different set ups. Growing the sport and supporting multiple companies is huge for these shooters.

They won't be hesitant to allow you to give different set ups a try and find what works for you. AG

FINISHING

Cold Blue

Cold bluing is a quick and easy, if not great, finish. Here's how I restored an inexpensive pocket pistol on the cheap.

BY ROBERT K. CAMPBELL NOVEMBER 2020

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There is nothing like a beautiful deep blue finish. Even matte blue, which needs less attention in polishing, is durable and reasonably attractive. But many times we need to apply a finish to small parts, the muzzle, or just the slide after performing work. The fine art of cold bluing works well for some of this work. With some care, it may even be applied to complete firearms. The hardest part of getting a good finish is polishing the surface. It is best to strip the blue first.

Home concoctions sometimes work but a solution that always works well is Rust and Blue Remover from Brownells. If there is a

good bit of bluing left, along with rust, you want to use this solution and allow the parts (or entire handgun) to soak. Of course the handgun must be stripped into basic components most of the time—but not always as I learned in during a quick fix for a shop. I generally find that several applications of the blue remover are needed.

Stripping away the rust and blue finish will allow a close inspection of the underlying metal and you will see what type of Far Top This old Colt is in good shape for its age. Bottom rust, pitting or damage you are facing. Next comes the part of the chore that demands a bit of finesse. Patience is needed in

polishing. Take a look at the rust and pits in the handgun. If the pitting is severe perhaps a simple matte finish would be best.

A handgun with a nice high blue finish but having pits is more gaudy than attractive. If a high quality finish is needed then go all of the way in polish. I begin polishing with the roughest grit of sandpaper first. This allows the finish to be worked with the sandpaper and rust and burrs removed. Sandpaper from 180 to 400 grit should be cut to 1-2 inch wide strips. I think that if the piece has only a light coat of surface cor-

COLD BLUE CONTINUED

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This is normal when using cold blue. Far I moved to a darker finish in the final product. rosion then 320 grit is a good starting point. I mount the sandpaper on apiece of wood, a straight up square block. Using just the sandpaper, push it against surfaces that are tight and more difficult to get to. Once the ground work is done with 320, polish to 400 grit. I may use finer grit sandpaper if needed. Gasoline or kerosene is used sparingly to wet paper at the 600 grit line, which I like to use on the final finish.

This is time consuming but in the end it works well. When the metal parts are polished they must also be degreased. This is a spot of work that must not be ignored. A lot of grease accumulates in a lifetime of use. Acetone works fine for degreasing. There are commercial mixes from Brownells that have been proven in years of use. I use an old chamber pot—which was never used for the intended purpose in the past fifty years—as it seems just the right size.

This is a neat antique and the finish of the pot was intended to take abuse. It is also mobile and may be taken to the workshop, under an awning, or moved to the laundry room. After a good drubbing with acetone, let the parts set until fully dry. If the acetone isn't dried completely and the slide or parts not thoroughly degreased you'll have problems. I let the parts set overnight. This easy enough for me as I always have It hasn't worn as well as a hot blue finish would but offers reasonable service.

The cylinder and muzzle are well worn.

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Among the tell tale traits of such a flubbed project is the smell—the salts were still evident! several projects going and don't get in a hurry. I most often use acetone and then a commercial mix from Brownells. Lauer Custom Weaponry degreaser (\$10.99 at Brownells. com) also works. Finally, I spray the parts with WD-40, which displaces any water and dries quickly. A big advantage of cold blue is that no heat is needed and it works well for some uses.

As an example, I was recently called to a shop to examine a rather decent looking Colt 1908 25 ACP self-loading pistol. The pistol seemed in good operating order. There was a drawback to sales—the pistol had no finish. There were some advantages, though. Despite having no finish, the pistol had no pitting or rust, the metal was very clean and well preserved. If someone polished this pistol they would have a job with me.

The markings were clear and sharp and there were no tell tale whirls from a poorly done polish job. The pistol looked fine other than not having any finish. Despite being in good shape, bare metal isn't very durable and

doesn't resist rust. I told the gentleman that I could deliver a dark finish that looked OK. The finish wouldn't resist holster wear but would result in a more attractive pistol.

All that was needed was to carefully put a bit of sandpaper on a pencil and trough out the sight channel as it held the only semblance of the pistol's old finish. I used the typical acetone/Brownells solution to degrease the gun and then let it set overnight. After drying, I used a clean bathroom rag that had never been used soaked in oil. I have several of these and I don't mix up the ones that I apply oil with the ones used to apply cold blue.

I soaked the rag and began to move across the long surfaces, getting a nice even polish and then repeating. I paid special attention to the muzzle and the flats of the slide, also watching the safety and grip safety to be certain the application was clean and even. In this case I did not disassemble the piece, first as an economy measure as the customer was on a tight budget and as a learning experience to see how blue applied in this manner to such a small handgun would work.

I was careful to keep the blue even and wiped it back and forth evenly. The darkness of the finish depends on how much you apply to the metal. I kept going until the finish was quite dark and then allowed it to dry overnight. The next morning the finish didn't look that great after drying, but I applied gun oil next. After running the pistol down at intervals during the day the finish looked nice, dark and even.

The result is a finish that added a considerable amount of resale value to a bare bones pistol with no finish. We would never fool anyone with this as a high-end finish and that certainly wasn't the intent. But this pistol was not a collector's item, it is a simple, useful, and reliable small bore pocket gun that someone picked up on the cheap. I lubricated and test fired the pistol with a half box of decades-old Remington UMC ammunition. It cracked off every round, never failing to feed, chamber, fire or eject.

THE PROJECT TURNED OUT WELL. AG

PISTOLS

Gunsmith Profiles

shooting team armorers. Here are their stories.

BY ROBERT KOLESAR NOVEMBER 2020

ORIGINAL PP. 12-14

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In my time on the National Guard and Army Reserve Service Pistol Teams I've been fortunate to meet some of the finest marksmen and armorers on this planet. Most of these fine fellows are now retired, but a few are still around, pulling triggers or building worldclass target guns. Let me tell you about two of the best. Daniel Norwood One of the greats still working in the military marksmanship program is Daniel Norwood.

A native Arkansas, Dan works on Army weapons as a civilian technician (gunsmith) employed by the Arkansas National Guard. Before that he was a full-time National Guardsman, working the same job (building and repairing military weapons) at Camp Robinson, outside of North Little Rock. He also runs his own custom shop: X-Caliber Gun Works, LLC A member of the Guard for 40 years, Daniel has worked as a Soldier-gunsmith for the last 31.

Just recently retired, he has seamlessly transitioned from SMSgt (Senior Master Sergeant) Norwood, All-Guard Armorer, to Mr. Norwood, senior technician/gunsmith,

Arkansas National Guard. And all done without having to move his work bench. The Guard is lucky to have him as decades of experience like Norwood's is impossible to replace. Another reason military armorers at the national level are so good is that they're also competitive shooters.

Daniel Norwood is Distinguished with both service rifle and pistol, has earned the President's Hundred tab numerous times, and possesses the National Rifle Association Distinguished Revolver Badge. Being an experienced marksman makes it easier to tune a match gun to the shooter's wishes when he knows exactly what that competitor needs and wants. Daniel has "been there and done that" and earned the respect of world-class shooters, both military and civilian, nation-wide.

Like most military armorers, Daniel Norwood likes working on the 1911 pistol. He has rebuilt, accurized, tuned, and repaired literally thousands of GI and civilian 1911s, both combat and target, over the years. His guns have won numerous Norwood bending a civilian shooter's 1911

sear spring while checking a trigger for weight. If there's a problem, the military armorers will fix it for free. A cold soft drink is appreciated, though!

The Guard (along with the other national military teams) sends their best armorers to the Nationals to fix weapons for the military shooters. All the military vans will also do trigger jobs, diagnose, and repair civilian shooter weapons for free, in between fixing GI guns. national and international matches in the hands of the Guard's best shooters. 1911s aren't the only guns Daniel works on. He's tuned and repaired High Standards, Smith & Wesson 41s, and all the exotic .22s that are issued to the All-Guard squad.

That includes the European pistols that the International competitors shoot. His M41 S&W conversion, set up for optics, was an issue item for Guard team members when the 41 was popular for NRA Precision Pistol a few years back. Some members still shoot their 41s. I have one; it's phenomenally accurate with Eley Tenex and 100% reliable since Daniel

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22 phase of NRA Precision Pistol matches. A 7 3/8" S&W barrel has been cut to 5.5", sleeved, and a rail attached for optics. Barrel is fitted to the slide and receiver, extractor fitted and tuned, and new springs added. A nice 2.1 pound roll trigger completes the project. Scotch tape added by the shooter around the front of the optical sight keeps the haze filter from rotating during Timed and Rapid fire.

This modified S&W 41 was favored for many years by many of the best shooters on the NGMTU (National Guard Marksmanship Training Unit). It'll easily group into 1" at 50 yards from a machine rest with Eley Tenex. built it for me over 20 years ago. The Guard armorers are now building and repairing the Beretta M9, accurized and set up for Civilian Marksmanship Program Service Pistol events. Last time I stopped by the All Guard trailer at Camp Perry, Mr.

Norwood was repairing a Smith & Wesson revolver that the owner was going to use in the NRA revolver matches. Every year at the National Matches the National Guard, Marine Corps, and U. S. Army Marksmanship Unit weigh triggers, repair, and rebuild civilian-owned rifles and pis-

tols, free of charge, for competitors. If the armorers have the parts (and they usually do), they'll fix it. Having a master gunsmith trouble shoot and repair your match gun is a nice bonus when attending the National Matches.

When not working on match guns or shooting, Daniel teaches military armorer courses several times a year. He also travels with the All Guard squad to all the big matches that might need gunsmith support for the team's weapons. The National Guard team has a tractor-trailer rig that has the machinery and tools inside that would be needed to repair just about anything that could occur with a competitor's firearm. You'll see it parked behind the ranges at Camp Perry if you attend the National Matches.

Daniel is a busy armorer but still finds the time to work on and build match guns when off duty. He's also a military firearms historian and collector. His knowledge about U. S. military weaponry is unmatched due to his having worked on most any small arms a Soldier would have used in the last century. If you stop by the Guard trailer at Camp Perry next year Daniel

Norwood will be there, happily discussing firearms or the Camp Perry weather while weighing triggers or fixing shooters' guns.

With no plans to retire any time soon, the precision shooting crowd will have Daniel Norwood around for many more years working his gunsmithing magic on Bullseye pistols. Justin Mc Millan Finding a good gunsmith is a beautiful thing—especially if he lives close by. I'm lucky in that respect, because Justin Mc Millan lives just down the road from me. I first heard about Justin almost 20 years ago when he was anew Army Marksmanship Unit armorer at Fort Benning. I was pulling triggers for the U. S.

Army Reserve Service Pistol team at the time and went to Benning often for matches and training. I didn't realize it then but Justin worked on my M41 .22 S&W when I had a trigger issue. Nice work. Fast-forward more than a decade when I bumped into Justin in Texas where he was employed as a gunsmith building custom rifles. We hooked up and became good friends due to our Army backgrounds and love of hunting. Because he is also a master 'smith on precision match guns (he's probably the only guy

GUNSMITH PROFILES CONTINUED

ORIGINAL PAGE 14

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who can work on Hämmerli Free Pistols in central Texas), it's been a good deal for me. Justin Mc Millan is a native Texan who graduated from Murray State College in Oklahoma with a degree in Gunsmithing. After graduation, he did a hitch in the U. S. Army, working as an armorer assigned to the AMU. His daily routine was testing, adjusting, building, and repairing Soldier- 22 Mc Millan-built conversion used for bullseye. These can be tricky when being set up for reliable feeding and function.

Trigger is set for a three pound pull with a nice roll-off. It's not just a looker, though—this one shot a 1.2" group at 50 yards from a Ransom Rest. Justin built this while working as the manager of Hill Country Handguns, a division of Hill Country Rifles. Far It groups superbly and functions flawlessly. It's purpose-built to win matches and is all-business. It is the finest .45 match pistol that Bob has used or owned.

Tape on the trigger guard certifies that the pistol is "legal" (it'll pick up a fourpound weight) for a match. 45 for function. com-

petitor weapons, including 1911s, M9 Berettas, U. S.-made .22s, and foreign match pistols. After a tour with the AMU, an armorer will have built and/or repaired more pistols than an average civilian gunsmith will work on in 20 years. It's that busy. After his military service, Justin went on to manage 1911 production at STI in Texas as their lead gunsmith.

Justin Mc Millan can do it all. He's blueprint-ed, tuned, and bedded hundreds of Remington 700s, Mausers, and Winchester 70s. Rebarreling and chamber work was a daily task when he was gunsmithing for Hill Country Rifles (Hill- CountryRifles.com, in New Braunfels, Texas. His revolver actions are flawless—timed correctly, with correct barrel/cylinder gap and no endshake. Unlike many gunsmiths, Justin doesn't make his actions too light. His revolvers are smooth, yet totally reliable... the mark of a master revolversmith.

His forte though, is 1911s... mostly because that's what he loves working on. His pistols are gorgeous. He can build a stunner, but it'll

shoot superbly at 50 yards or it won't leave the shop. And every pistol Justin works on goes bang every time. My latest match pistol, a Colt Government model that Justin accurized, has won several big matches and hasn't malfunctioned after over 1,500 rounds. It'll group into less than 1.5" at 50 yards from a Ransom Rest with Federal factory 185 grain jacketed match.

It's a purpose-driven shooting machine. I also shoot a .22 Marvel conversion, built on a Caspian frame that was assembled by Mr. Mc Millan. It's as reliable as my .45 Government Model. Justin is currently employed as the head gunsmith for Jesse James Firearms Unlimited (JJFU.com, in Dripping Springs, Texas, building and tuning custom 1911s. If you call the shop, you can talk with the people there. If you're so inclined, have a one-of-a-kind 1911 masterpiece crafted for you. It'll shoot like a National Match pistol.

AG

PEOPLE & COMPANIES

Ruger Custom Pistol

How a champion Precision Pistol shooter sets up a Ruger.

BY ROBERT KOLESAR NOVEMBER 2020

ORIGINAL PP. 15-18

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Getting anew pistol is always a pleasure... especially when one comes along that you've been craving. Years ago I had a Ruger Standard Model pistol that the late Don Nygord turned into a pretty neat Bullseye gun. Unfortunately, it went away in along-ago trade; another one I should have kept. I'd been toying with the idea of having another built; Clark Custom Guns in Louisiana used to be the "go-to" people for .22 Rugers and I went to them first, but no luck.

Clark doesn't work on or customize .22 Ruger pistols anymore. I've been shooting lots of .22 ammo recently, concentrating on the CMP .22 matches and ISSF 25m Standard Pistol. I wanted something built specifically for the matches I was shooting, with the sights I liked. Another Smith & Wesson 41 or a High Standard wouldn't work without extensive modifications. Pardinis and Hämmerlis were very expensive.

So I put the idea of an- Pistol wears Ruger lefthanded thumbrest stocks, purchased on e Bay. other .22 pistol out of my mind. Fast forward a couple of years. I was cruising the Internet, reading the Bullseye-L Forum classified section. A minty Ruger .22 in stainless, with some added features, was for sale and the price was right. Not only that, but the gentleman selling it is a pretty good gunsmith, specializing in target guns. I was definitely interested.

The pistol being sold was a minty Mark II bull barrel model. Roddy Toyota was the gunsmith selling it and had stippled the front and back straps, checkered the magazine release, and added a Clark steel trigger with an overtravel stop. A 2.2 pound trigger job completed the Far Roddy has more of these Kensights in stock and it will need to be installed by a good gunsmith/machinist familiar with a Ruger. 2 pounds. NRA rules mandate two-pound minimum.

RUGER CUSTOM PISTOL CONTINUED

ORIGINAL PAGE 16

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package (NRA rules mandate a 2.0 pound trigger, minimum). Roddy set up the trigger with a slight roll-off break, which most Bullseye shooters (including me) prefer. I had envisioned adding a custom heavy barrel, but this pistol, with a factory heavy barrel, could possibly work without installing anew one. I was concerned about the accuracy of the factory tube, but Roddy told me that Ruger barrels shoot quite well at 50 yards; he would shoot the pistol from a Ransom Rest to see what it would do.

I thought we might want to do a muzzle recrown, but Roddy assured me the muzzle looked fine as-is. He also mentioned that Rugers don't have tight (match) chambers like many target .22s and will work reliably with most .22 Long Rifle ammo. Testing went well; the Ruger easily shot within the X-ring at 50 yards with plinkergrade Aguila standard velocity and CCI-SV (standard velocity). That's great news as I wouldn't have to buy Eley or Lapua .22 match ammo for my pistola.

X-ring accuracy at 50 yards with cheap ammo is a beautiful thing. Another advantage is that the Ruger is a very strong pistol; it's almost impossible to damage the gun with any ammo on the market. That's not necessarily true with most .22 target pistols. Shoot a lot of high-velocity or hyper-velocity ammo through a High

Standard and you'll eventually crack the frame. S&W 41s don't tolerate .22 high speed stuff much better.

They weren't designed to; target guns are purpose-built to win matches with very accurate (and expensive) standard velocity rounds. Putting cheap high-volume manufactured discount ammo through an expensive .22 match pistol wouldn't be a great idea. A Ruger, though, won't flinch with any load available. Shooting a National Match Course or plinking in the desert is all good with a Ruger. My new pistol did need some additional attention and I discussed the work with Roddy.

My major concern was replacing the factory Ruger adjustable sights. I like Bo Mars, but those sights have been discontinued for several years. Looking at all the Kensights available, I found a Kensight rear for the Ruger MK II that looked After cutting down and reshaping, Roddy hot-blued the sight. Very nice work. Far A nice, useful upgrade. The Kensight sits 1/2" further to the rear and needs to be fitted properly; not a drop-in installation. Roddy has these sights in stock. a lot like the old Bo Mar.

Roddy put one on, and it's indistinguishable from a Bo Mar. It has a deep square notch and good, repeatable 1/4" click adjustments. He had to do some machine work to make it fit properly, but it was

worth the effort. Metal was relieved underneath the rear sight blade to give more downward movement to the rear sight. A hole was also drilled directly under the elevation screw so that the screw wouldn't need to be shortened.

This has to be done carefully; Roddy mentioned that rear sight elevation screws come in different lengths and the drilling depth would have to be done to match the individual screw length. Because the rear sight sat 1/2" further to the rear, the take-down lever leg needed to be machined flat in order to clear the sight bottom. A little bit of work, but not a big deal if you know what you're doing. Lastly, the top of the receiver was drilled and tapped in case I wanted to mount optics in the future.

Roddy did a few other things that in his experience make the Ruger a more reliable, accurate, and shootable pistol. The bottom of the chamber mouth at the breech face was lightly chamfered to facilitate better feeding and less deformation of the bullet as it transitions from the magazine into the chamber. This keeps the bullet from possibly smashing into the breechface or top of the chamber, either causing a feeding malfunction or deforming the bullet.

Twenty-two caliber bullets are soft lead and deform easily; bullet deformation will open up your group size. Both magazines

RUGER CUSTOM PISTOL CONTINUED

ORIGINAL PAGE 17

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were fitted to the pistol; Roddy checked the bullet angles when loaded and adjusted the magazine lips for optimal feeding. Both front and rear grip straps were stippled. Not too sharp but Above and Nice work and very functional. enough to make a difference when grasping the pistol on hot days with sweaty hands. The magazine catch on the bottom of the grip frame was checkered, making it easier to release the magazine without slipping off the thumb.

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Roddy also included a really neat device that he makes for Ruger pistols. The The elevation screw hole (directly behind the rear sight dovetail) should be drilled with the screw in-hand to achieve proper depth. Relief cut for the rear sight blade and take down lever leg, which has been machined flush with the receiver, are also shown. Roddy lightly chamfered the bottom of the chamber mouth, which helps feeding and prevents bullet deformation.

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Recrowning wasn't needed. It makes a Ruger .22 pistol easier to disassemble without leaving tell-tale scratches or pry marks. main criticism of the older Rugers (including the MK II) is taking the pistol apart for cleaning. The takedown lever is the main culprit; putting the Ruger back together is even worse. Roddy told me that he got tired of looking at scratched and chewed-up backstraps that were damaged by people prying loose the locking lever with a knife blade or screwdriver.

The solution was a tool he makes from a paper clip that takes out the lever without leaving any tell-tale pry marks. Roddy includes one of these handy gadgets with each Ruger he works on. For someone like me who cares Left target is garden-variety Aguila standard velocity. Right target is CCI-SV. Both targets were 20-shot groups, 50 yards. Barrel is unaltered factory with factory crown.

Pistol is a superb shooter with a great trigger and excellent ergonomics. about how his guns look, this is a thoughtful added touch. Several trips to the range have

shown that my new Ruger is ready to compete on an equal basis with most any .22 pistol. First range trip I zeroed at 25 yards with CCI-SV ammo, which had earlier shot well in testing. The Kensight needed 22 clicks from the bottom to give me a good centerhold zero. That's perfect; plenty of adjustment but not riding too high.

Roddy cut, shaped, and fitted anew front sight, taking into account I liked using a center hold. His calculations were spot on, resulting in front and rear sights set up and adjusted for my hold. After the front sight was done, it was hot-blued (not touched up with cold blue) to match the rear sight. It's got to look good as well as shoot tiny groups; Mr. Toyota is a perfectionist. Regular practice has shown that CCI ammo is perfect for this pistol.

With several hundred rounds downrange, the ammo preferences of my Ruger are becoming better known. Aguila ammo is accurate, but there have been several failures to feed and extract. I was also having a few feeding failures with Eley Tenex. This is probably caused by the factory recoil

spring. Lighter recoil spring kits are made by Volquartsen and available from Brownells. Both Aguila and Eley ammo are loaded to lower velocities and have less of a recoil impulse.

A softer recoil spring will ensure proper feeding and extraction with most standard velocity target ammo. Since the CCI .22s shoot great and function the pistol reliably, I'll be sticking with CCI for matches. Some Army-issued Remington "white box" .22 match I had on hand also shot very well, with the occasional misfire Remington ammo is famous for. Eventually I'd like to try Wolf and Federal match for accuracy and reliability. Both have a good reputation with the bullseye crowd.

With the extra work adding the sights and testing, I'm into this pistol for just over \$700. A set of lefthanded thumbrest stocks I found on e Bay completed the project. For the money invested I got a superb, custom-tuned match pistol that will win matches or plink in the outback. It's stainless, easy to maintain, and indestructible, like all Rugers. I'll be keeping it. AG

PEOPLE & COMPANIES

Lever Action Iron Sights

Iron sight options for lever action rifles.

BY ROBERT K. CAMPBELL NOVEMBER 2020

ORIGINAL PP. 19-22

I have used lever action rifles for most of my life. While I enjoy these rifles I also understand their limitations. The power of the 30-30 Winchester isn't as much a limiting factor as the sights commonly found on the rifles. Shot placement is everything and barleycorn sights are not the best bet for accurate shooting. I've tried tang sights and while they are interesting, they simply do not suit my personal style. In the field they had to be pressed into position to be used and were not snag free.

I never experienced the problem of eye injury from hard kicking rifles with tang sights but it certainly exists. The factory buckhorn sight isn't well understood for accurate use and can be more precise than most realize. Keeping the front sight in the bottom of the rear notch works well for most shooters. Just the same, I have looked for something more useful and with greater accuracy potential. I am pleased that I began shooting with iron sights.

I use quality optics on some rifles and appreciate the improvement in long range accuracy potential. Just the same, for close range hunting and use against potentially dangerous animals I prefer iron sights. Among the best combinations I have ran across in some time is the new Skinner Sights Ladder Sight. It is patterned after the famous Buffington sight used on the Springfield Trapdoor 45-70 Government service rifle.

The Buffington sight earned an excellent reputation for accuracy potential in trained hands and in many ways was ahead of its time. The sight from Skinner is designed for use with lever action rifles in the 30-30 WCF class. The first impression of Skinner Sights is of quality and made of good material. The graduations are While the graduations are unmarked, they are precise. marked in bars but not numbers. I have dealt with iron sights marked in foreign measurements and in yards.

Most were highly optimistic and regulated in order to give a soldier a chance of striking out at massed troop formations at 1,000 yards or more. For hunting use they are not practical. Skinner Sight markings provide a repeatable setting with the exact elevation depending on a particular load. For example, light or heavy bullet handloads yield different point of impact with a given setting regardless of what a sight's number might claim.

I keep data in a notebook with sight settings for different ranges based on the specific load used. This is especially useful as I have more than one rifle. Sighting in rifles with optics to strike two inches high at one hundred yards isn't difficult but different cartridges (such as 223 Remington and 308 Winchester) diverge considerably after that. The same applies here. The Skinner Ladder Sight makes adjustment easy.

If you have used factory buckhorn-type sights on Winchester, Marlin, Mossberg, Savage, and other original lever action ri-

fles, the Skinner is a big step up in quality of manufacture, sight visibility, and adjustment. Regarding shooting, if you are used to using the original buckhorn, the Skinner is no mystery; the rear sight notch when folded is simply more well defined. The ladder component used when raised, often called the secondary sight in military parlance, is also a well defined.

I am not making an ex cathedra for a return to halcyon days when we beat the bush with an iron sighted 30-30 WCF, but if I choose to do so no amount of verbal calisthenics will convince me otherwise. I like iron sights and use them well. I also understand the limitations of iron sights. I realize their main value is in the brush and in stalking dangerous game at short range. A limiting factor is that iron sights are designed for use with a standard bullet weight.

As an example, the 30-30 Winchester is offered with a standard 150 grain load. The Winchester Power Point is a faster load than most but still uses a 150 grain bullet and isn't difficult to properly sight in. The 30-30 WCF is also offered with a 170 grain bullet. Then there is the new Hornady Lever Revolution load that jolts a 160 grain bullet to a full 2400 feet per second. Iron sights area compromise in the use of a non-standard bullet weights.

By keeping the adjustment notch in the lowest setting you are able to properly sight the 30-30 WCF

LEVER ACTION IRON SIGHTS CONTINUED

ORIGINAL PAGE 20

It needed polishing/dressing before installing the new sight. for fifty yards. All iron sights don't offer the *théodicée* (perfect world) but then neither do optical sights. It was not long ago a friend made the mistake of taking a scope-mounted rifle on a boar hunt in wooded territory. When the time to take the shot came, all he could see was bristle in the reticle. The same fellow took a black bear at a modest 35 yards using a scope.

He told me he would have performed better and had more satisfaction had he used iron sights on both hunts. Military rifle sights are more difficult to properly sight in as those who enjoy the Mauser and Mosin- Nagant will attest. These rifles were designed for firing at massed troops at very long range. Some of the Russian rifles are encrypted in graduations as indecipherable as Hawaiian Creole, while the much maligned Carcano is more akin to Pitman or Gregg shorthand.

In any case, these rifles may not be sighted for dead center much less than two hundred yards; they fire high at 100 to 200 yards. This is the reason sporterized military rifles were given high front sights. Some of these sights were home made but they worked just fine. Craftsmanship on such sights was between Walter Mitty and a Yanturni shoe but they usually worked. The Springfield 1903A3 was a bit better than the Mauser and the Garand much, much better than anything before.

There are not a lot of sporterized Garand rifles as those iron sights are the best of the best. What all this means is that as good and rugged and precise as iron sights are perhaps they are most useful only within a narrow field of standard bullet weights. This means about 150 grains for the .30 caliber rifles and heavier weights for the .35 and the .45 calibers. This isn't as difficult as it sounds.

As an example, the Winchester Model 94 is often criticized by adherents of the 30-06 Springfield and the various .30 caliber Magnums. Now, I appreciate the 30-06, but let's put it perspective. I didn't progress from black powder to 30-30 Winchester and you probably didn't either, but shooters in 1895 did. The 30-30 shoots long, flat, and hard compared to the 44- 40 Winchester. Shooters who were used to heavy black powder bullets clearly had little problem adjusting to the flat shooting new rifle.

Put in that perspective, the 30-30 is darned impressive, however, today most of us begin with the 30-30 and become upwardly mobile. The problem with an iron sighted rifle is that the sights are not good enough for even the Model 94 if you wish to experiment with different bullet weights. A hard cast 150 grain bullet at 1500 fps is a great practice load if you are able to get it sighted properly and you usu-

ally can at 50 yards. A 125 grain JSP at 2500 fps might be the cat's meow for use against predators.

I am pretty certain we could permanently adjust the rifle for a non-standard weight but we reach a point of diminishing returns if we have to change sight settings. The problem is that lighter, higher velocity bullets likely shoot higher so a taller front sight works. Heavy bullets shoot lower. Handling windage is okay as far as it goes, as long as you are able to drift the sights in their dovetail.

The problem with just holding off (Kentucky windage) is most people can't accurately hold the front sight over and off target consistently and connecting at longer ranges demands a more exact aim. A shooter may get lucky by holding the front sight up and placing the target at the top of the front sight but consistency demands holding the front sight over and obscuring the target while holding the perfect sliver of the front sight up.

It isn't easy and that is why long range accuracy with iron sights is something of an art. My personal 30-30 is sighted for 100 yards when the rear sight is set on the second notch when shooting Winchester 150 grain Power Point. The rifle is accurate enough for 200 yards but 150 is a more realistic limit. The sight is moved up two notches in

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this case. By moving the sight to the third notch I am pretty much on the money at 200 yards, a realistic limit for the rifle under perfect conditions. Learning to use the sight without a bit of study is like opening up anew digital camera and neglecting to study the manual. I cannot tell you exactly what is needed with each rifle but sight alignment must always be consistent. The exact point of impact with diverse bullet weights differs with each rifle.

As a rule it is a smart move to sight the average rifle to strike one to two inches high at 100 yards shooting from a solid rest. This should be dead on at 150 yards with most military rifle cartridges and gives all around utility. The adjustment screw turns easy and locks up tight. Vintage Sights When we state that iron sights are best kept to 200 yards and in, perhaps those firing rifles before the common use of optical sights would take exception.

The Buffington sight fitted to the Springfield Model 1884 was intended to solve many of the problems with the earlier sights. While they appear complex—and they are compared to other sights of the era

—they allowed a trained marksman to connect the low velocity 45-70 Government well past 500 yards. Early experiments were carried out at many hundreds of yards with the Springfield rifle against old ship hulls and the accuracy and long range penetration of the 45-70 was highly respected.

Using a reproduction of the 1860 Henry chambered in 44-40 Winchester demonstrated high accuracy with the Black Hills cowboy load and good results to at least 300 yards with its ladder sight, which is necessary due to the drop of black powder loads. Remember, we are not talking about hitting a deer in the eightinch kill zone at several hundred yards, rather we're firing at massed troops or an artillery position at long range.

The aperture and ladder sights of the original Pattern 1914 Enfield rifle area pleasure to use. I once owned a rather nice P14 that someone had nickel plated. I never learned why, but the rifle was an excellent shooter with Winchester's 180 grain 303 British load. This rifle featured a set of sights that area true rarity today. The P14 was fitted with grenade sights, quite an asset in war-

fare. I have no way of knowing how accurate these sights were but chances are they were darned useful.

There are not many places you can fire old military rifles for accuracy at volley range and fewer shooters today know how to use these sights. But in the day they were terrible harrows on the battlefield. Today I use iron sights for enjoyment, for the heritage, and for a sense of history. But I also use iron sights to take game and so should you. Using Skinner Sights Skinner Sights are installed by tapping into the original Winchester sight notch.

The Skinner may be a little oversize to account for sight notch variations. The dovetail notch may be a bit burred up from long use, as it was in the 1973 rifle I used. I used a small file to dress up the damaged dovetail. With plenty of lubricant applied, I tapped the Skinner sight in from left to right as neatly and straight as possible. This means placing the rifle in a heavily-padded vise and cranking it down tight so there is no movement.

LEVER ACTION IRON SIGHTS CONTINUED

ORIGINAL PAGE 22

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Original caption: Bottom: Mosin-Nagant ladder sight. The markings are often confusing. Unmarked lines work well for most shooters. tucky windage, just account for range when the elevation is set. The sight ears, front sight, and edge of the target will be in a straight line. Of course, keep the focus on the front sight at all times.

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A word on original Winchester ladder sights. I have examined these on 44-40, 30-30, and 38-55 rifles and all appeared identical. This means they cannot be calibrated for loads and calibers as these were diverse cartridges, although they were pretty similar in adjustment to 200 yards and easily adjusted with a lot of shooting. Effective use will depend on how good the shooter is at estimating range and corrections. Skinner Sights are at least equal and likely superior.

With the rear sight set you may use the riser in the original sight for adjustments. The relationship of the front sight and the target should not change and you should not have use Ken-

After some evaluation I find the Skinner Ladder Sight for the Winchester 1894 an excellent investment. It isn't for everyone but it is a high quality sight. Installation is simple enough, noting that the dovetail may need to

be cleaned up, the sight itself may need to be filed slightly as it is machined oversize, and care taken to install straight. Done right, you'll end up with a snug fit. Skinner Sights area class act well worth your time and effort to explore. AG

READER FORUM

Reader Forum

BY AMERICAN GUNSMITH EDITORS NOVEMBER 2020

ORIGINAL PP. 23-24

Cozad Manufacturing I spent six years serving with Staff Sgt. Andy Cozad as a teammate and Platoon Sergeant. He is one of the most honorable and knowledgeable persons I've had the honor of serving with. I am a distributor of his products and I stand by them 100%. MSG Andres G. Sepulveda (ret.) SBtacticalSolutions.org We're consistently getting this kind of feedback about SSG Cozad and his company. Thanks for sharing.

Erma Werke EP-25 I have a German-made .25 caliber EP-25 semi-automatic pistol manufactured by Erma Werke, serial number 135XX. What is a good resource for assembly/disassembly and maintenance for this model? Irwin Perlman Boynton Beach, FL This pistol is listed in a few references with the Standard Catalog of Firearms being a good place to start. Erfurter Maschinenfabrik made these prior to WWII primarily for export. Suggested values range from \$200 for Excellent condition to \$75 for Poor.

Bob's Gun Shop and Numrich have schematics available. Safety Police Memorabilia From Brian Smith. The Safety Police in Part 4 (October 2020) in my article series on Hopkins & Allen revolvers was from the late Bob Buchanan collection at Pioneer Gun Sales, Altoona Pennsylvania, courtesy of Lorrie Buchanan Stirling. Bob had an extensive personal collection of firearms, a fraction of which decorated the walls and hung from overhead.

That store was to many patrons as much a museum as a gun shop and Bob cultivated that ambiance. I obtained the revolver

from Bob's daughter, Lorrie, who took over and remodeled and modernized the store. It's no longer the cluttered "museum" but it still has much of the feel of the old place, but with the attraction of being brought into the 21st Century. I purchased that Safety Police as the subject of the last part of the H&A revolver series and plan to gift it back in honor of her father's memory.

Lorrie has a keen interest in preserving some of her father's heritage. SIG Sauer Mosquito I am in need of a magazine and magazine release for a SIG Sauer Mosquito 22 LR pistol that has come into my shop. I tried American Tactical, SIG, Numrich, e Bay, and Gunbroker, so far with no luck. I can find the magazine in numerous places but the mag latch is out of stock everywhere. SIG says they haven't had parts in several years. Kenneth W. From Mark Hollensen. Hog Island Gun Parts has the mag release.

Try them for the other parts as well. HogIslandGunParts.com/Sig-Sauer-Sigarms-s/644.htm FN FAL Dual Springs Are FN FAL recoil spring sets (the inner and outer springs) really necessary? If so, why? There are many semi-automatic rifles in the world with a single spring and I don't understand why FALs need two. This design is more than 50 years old and is not perfect. Was it because, at that point in time, there were no stronger springs and the designer concluded they needed two?

Do current FAL copies continue to put two springs without knowing why they simply copy the original? From Mark Hollensen. While I don't have specific, historical rea-

sons for this, usually two springs are used for proper load up. In other words, one single heavy spring may not perform as reliably (spring load up during firing) as two smaller diameter and lighter springs working in conjunction with one another.

My assumption is that, through actual live testing, the engineers found that the two spring combination worked best and produced the most reliable functioning of the firearm. You could speculate that a variable rate coil spring could be used in place of the two but without trials and testing that would just be a guess. From Brian Smith. Good question. In theory, any given firearm can't tell the difference if its recoil counterforce is supplied by a single spring or two counter-wound springs.

The answer lies in spring design. In addition to the FAL and other rifles, two recoil springs are more commonly seen in handguns, both blowback and locked breech. Firearm designers specify these dual spring setups because the use of two counter-wound springs is an easy and reliable way to get along-lasting, consistent, progressive rate spring without resorting to stronger single springs which may have shorter service lives between failures.

Springs fail by repeated cyclic loading and unloading, not by sitting compressed or partially compressed on the shelf or in the suspension of the vehicle in your garage. Two springs provide the ability to tweak the force necessary for firearm function and yet provide longer spring functional lifetimes, thus fewer firearm failures.

An example of along-lived handgun design switching from a single recoil spring to dual springs is the Glock Gen 4. Previous generations used a single spring, but Glock introduced a twin spring recoil setup with the Gen 4 and carried it forward with the recent Gen 5. Another example is the Colt 1911. It's well known that the 1911 Government Model has a single recoil spring, but the three-inch "Ultra Compact" versions of the 1911 platform usually have two recoil springs.

Colt also makes the M45 1911 for the USMC using a twin spring setup. In short, it's a design load and longevity thing, based primarily on spring design and fatigue characteristics, not necessarily the firearm itself. From RK Campbell. Thanks for reading! I consulted one of the FN FAL experts I know who is up on history and keeping them running. He reports more problems with improper gas setting than the dual springs. The dual springs are unusual.

A few years before the Walther P38 was given dual recoil springs, one on each side of the receiver, and it worked very well. Later, when or post a letter to Falls Church, VA 22041. For subscription questions or mailing problems contact American Gunsmith

ORIGINAL SOURCE PAGE

24

SEARCHABLE ISSUE RECORD

Archive index

Gunsmithing Series American Gunsmith Editors	2	Gunsmith Profiles Robert Kolesar	12-14
CZ 75 Kadet Adapter Robert K. Campbell	3-6	Ruger Custom Pistol Robert Kolesar	15-18
Chassis or Stocks for Competition Shooters Stephanie A. Martz	7-8	Lever Action Iron Sights Robert K. Campbell	19-22
Cold Blue Robert K. Campbell	9-11	Reader Forum American Gunsmith Editors	23-24

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