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DIGITAL ARCHIVE  
EDITION

# PRECISION ARMS WORKSHOP

AND THE AMERICAN GUNSMITH ARCHIVE

A TECHNICAL JOURNAL OF CRAFT, REPAIR & RESTORATION

08

ARCHIVE ISSUE NUMBER

INSIDE THE ARCHIVE

# 1895 NAGANT REVOLVER TRIGGER WORK

NEW FIREARMS GUIDE • MONTGOMERY COMMUNITY COLLEGE • GUNSMITHING BUSINESS TIPS, PART 2 • BRUSH RESEA...

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# AMERICAN GUNSMITH

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## FROM THE ARCHIVE

# New Firearms Guide

BY AMERICAN GUNSMITH EDITORS AUGUST 2021

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**I**mpressum Media Inc. was founded in 2009 in Los Angeles, California.

Their Firearms Guide, recently released as the 12th Edition, is the largest gun guide, pricing reference, schematics, and manuals library available as a firearm, air gun, and ammunition reference for enthusiasts and industry professionals. “The Firearms Guide 12th Edition is the world’s largest searchable guns and ammo reference guide that presents over 80,000 antique and modern firearms, air guns, and ammunition from 1,500 manufacturers from 62 countries.

It covers all types of guns from the oldest black powder muskets to American classic guns to the newest 2021 guns. Users can search the Guide by caliber, type of action or stock, by year of production, country of origin, or any other way and will get all the tech specs, prices, features and up to 12 high-resolution pictures per gun.

The Firearms Guide is used by police forces around the world as a firearms identification tool,” says Chris Mijic, publisher of Firearms Guide. “If you are a gunsmith, having over 18,500 printable high-resolution gun schematics, blueprints, manuals, and antique cata-

logs will help when working on client guns.” Published since 2009 on various media, the 12th Edition is the largest yet.

In addition to the Reference Guide with over 80,000 guns, ammunition made by 1,500 manufacturers from 62 countries, the Gun Value Guide that presents antique and modern guns with gun values online based off of the 100%-30% condition ratings, and the 18,500 printable hi-res gun schematics, the Firearms Guide can be used in two ways: The cloud-based Online Edition at [FirearmsGuide.com](http://FirearmsGuide.com) is updated regularly and searchable with an active Internet connection, and the off-line Flash Drive Edition for Windows which can be used off-line and with 100% privacy. “Many Firearms Guide users love the fact that they can use the Flash Drive Edition offline, completely anonymously, without Google or any search engine or Internet provider tracking and archiving their gun-related searches that they can later sell to any client or deliver to the government,” says Chris Mijic.

“The Flash Drive Edition keeps privacy private.” Firearms Guide Online 12th Edition can be purchased as a subscription or in combination with the Flash Drive 12th Edition.

**BOTH ARE AVAILABLE AT [FIREARMSGUIDE.COM](http://FIREARMSGUIDE.COM)**

## PISTOLS

# 1895 Nagant Revolver Trigger Work

*Over a century old and a marvel of “Old World” design and manufacture, the 1895 Nagant suffers heavy triggers. Here’s how to work on these classic revolvers and improve their triggers.*

BY BRIAN R. SMITH    AUGUST 2021

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Is there any way you can reduce the trigger pull on this thing?” asked the customer, holding an 1895 Nagant revolver. “I can barely squeeze it in single action, almost cannot in double action, and I can’t hit anything with any action because my hand is shaking so much from the strain.” “There’s a lot going on inside a ‘95 Nagant,” I replied. “It’s not so much a revolver as a handheld machine that locates cartridges rotationally and translationally.

Not only does the trigger rotate the cylinder and cock the hammer, but it also moves the cylinder forward to insert the rear end of the forcing cone into the chamber opening in the cylinder. All that takes some force.” The 1895 Nagant revolver is 126 years old and pure “Old World”.

For all its “old world” character, the ‘95 Nagant is quite advanced mechanically, with its internal mechanism that pushes the cylinder forward as the action is cocked. It was advanced for its time in that it featured a unique gas seal to reduce gas leakage at the forcing cone and cylinder. On the other hand, it has a reputa-

tion for a horribly heavy trigger pull. Designed by the Belgian Nagant brothers, Emile and Leon, it has its roots in earlier Nagant cartridge revolvers, notably the 1887 Swedish 7.5mm revolver.

The Nagant firm was heavily involved with the development of the 1891 Mosin-Nagant. This revolver’s unusually light trigger pull provided the clue and inspiration as to the direction the author took with the customer’s revolver. The Nagant rifle, and the Russian Czar’s government wanted to replace the aging S&W No. 3 revolver in 44 Russian with a more up-to-date handgun.

Knowing the Nagants, they tailored the request for quotation on existing Nagant revolvers, with one major exception: They wanted the revolver to have a tight seal between the forcing cone and the chamber openings to reduce or eliminate gas leakage and improve bullet velocity. The Nagant brothers delivered, designing the prototype in 1892 and delivering the first of approximately 20,000 Belgian-made Model 1895 revolvers in that year or early

## 1895 NAGANT REVOLVER TRIGGER WORK CONTINUED

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It is the first step in disassembly of a '95 Nagant revolver. This gains quick access to the mainspring, which can be compressed slightly with thumb and forefinger for removal. No tools necessary! 1896; sources are conflicting. It was chambered in a .30 caliber rimmed cartridge with a recessed bullet and a crimped case mouth that reminds one of a short, wide-mouth funnel.

In operation, as the 1895 Nagant is cocked the cylinder is cammed forward by a sliding wedge and a rotating block that are part of the lockwork, so that the rear of the forcing

cone enters the chamber opening in the cylinder, and the crimped "funnel" case mouth enters the forcing cone just a tad.

The concentric, annular overlapping of the three components does indeed This serves the same purpose as the groove in the backstrap of a Colt double-action revolver with a V-shaped mainspring; locating the mainspring apex to allow the top and bottom leaves to do their thing. The thickness of the bottom leaf is essentially uniform and ends in a notch on one side. serve to "seal" the barrel/cylinder gap and increase bullet velocity by a claimed 200-300 feet per second.

In addition, it has been widely reported that the 1895 Nagant "is the only revolver that can be silenced." Silenced examples are in various museums in the former Soviet Union, the United States, and in other countries. Some US-resident 1895 Nagant owners have modified their revolvers to accept suppressors, with some degree of success. A bit more about the cartridge; it fires a 97 grain .311 caliber bullet at 1070 fps for a muzzle energy of

## 1895 NAGANT REVOLVER TRIGGER WORK CONTINUED

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The Number 2 pencil points to the long firing pin just clearing the frame; this is the position from which the hammer can be removed from its pivot. The trigger can be lifted off its pivot when in this position. 250 foot-pounds of force. That puts it approximately in the same class as some loadings of the 32 H&R Magnum and a bit more powerful than the revolver loading of the 32- 20 Winchester Center Fire.

It has been widely reported elsewhere that one can fire in the 1895 Nagant revolver the 32 ACP, the 32 S&W Short and Long, and the 32 H&R Magnum. However, bulged and To remove, rotate it backwards into the position shown.

Take care to keep the sanding drum moving and to not exert too much force that causes overheating and tempering of the hardness.

cracked cases result due to differences in chamber inside and outside diameter of the various cartridge cases, thus, it is not recommended to do so. “Just because you can, doesn’t mean you should” applies here. Back to the customer, who has been waiting patiently during this review of the background and history of the 1895 Nagant revolver, it was to his fortune that I had an in-

## 1895 NAGANT REVOLVER TRIGGER WORK CONTINUED

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A reduction of about 0.008-0.012" from the original thickness seems to bring the single and double actions pulls to manageable levels. Insert the top leaf tip in its recess in the hammer, then do the same with the bottom leaf tip in its trigger recess. Be sure to place the mainspring apex locating peg in its hole in the right grip frame; a tap with a light hammer ensures that it is seated. Interest in the Nagant personally and own a few examples.

One of them in particular was captured by the Finnish Defence Forces sometime during the Winter or Continuation Wars when the Soviet Union invaded Finland. This 1895

Nagant features a glossy black blueing and a small rectangle surrounding the letters "SA" for "Suomen Armeija" (Finnish Army).

This 1895 Nagant example possesses the lightest single and double action trigger pulls of any other 1895 Nagant that I've either handled or fired, with a single action pull averaging 6.4 pounds and a double action pull of 13 pounds. In comparison, the customer's 1895 Nagant exhibited a single action pull force of 12.3 pounds and a double action pull that maxed out my Lyman electronic gauge.

Exploratory surgery was indicated on both my Finn Capture Nagant and my customer's revolver to compare and contrast apparent differences in the lockwork that could possi-

bly explain the light vs. heavy trigger pulls. What exactly did the Finns do? Disassembly Disassembly of the 1895 Nagant is extremely simple but not obvious to the uninitiated. If you have experience with the takedown of Colt, Smith & Wesson, and other revolvers, you may have some "unlearning" to do.

Lower the loading gate on the right side of the revolver and rotate the cylinder to verify there are no cartridges. Grasp the head of the ejector rod and rotate it 180 degrees counter-clockwise. The ejector rod can be Far, 1 oz., a reduction of 5.8 pounds. Not in the same league as modern double-action revolvers, certainly, but such a reduction made the '95 Nagant shootable with reasonable accuracy.

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1895 Nagant Revolver (Specifications subject to change without notice) 1 Front Sight 2 Barrel 3 Ejector Sleeve 4 Frame 5 Ejector Rod 6 Ejector Rod Spring Stop 7 Ejector Rod Spring Stop Screw 8 Trigger Guard 9 Trigger Guard Screw 10 Trigger pulled forward and out of the cylinder axis pin. The collar surrounding the barrel into which the ejector rod is mounted can be swung to the revolver's right to clear the kidney-shaped flange on the cylinder axis pin. Withdraw the cylinder axis pin forward and out of the revolver.

With the loading gate still open, the cylinder can be removed from its window in the frame to the right. Using an appropriately-fitting screwdriver, loosen and remove the screw that is in the right side plate just above and centered on the top of the right grip plate to free the removable left side plate. Using a urethane hammer, tap the right side of the frame slightly to pop off the left side plate.

Now for a glimpse of the unusual innards of the 1895 Nagant: There's a hammer, trigger, and a hand that all look somewhat normal and familiar. 11 Hand 12 Left Side Plate 13 Left Grip 13a Grip Insert 13b Grip Insert Screw 14 Recoil Plate 15 Hammer Block 16 Mainspring 17 Cylinder Pin 18 Cylinder Sleeve 19 Cylinder Sleeve Spring 20 Cylinder Pin, but there's some other bits behind the hand and in front of the hammer. The hammer has an incredibly long firing pin and the reason for it will become apparent in a minute.

Inside the grip resides the V-shaped mainspring not unlike those of Colt, Webley, or Enfield revolvers. The end of the lower leaf imparts against a shoulder in the rear of the trigger, and acts as the trigger reset spring. The end of the upper leaf of the mainspring is thicker and has a duckbill-shaped tip which engages in the underside of the rear of the hammer, providing the force to drive the cocked hammer forward for the firing pin to strike the cartridge primer.

At the apex of the mainspring where the two leaves join, the right side of the spring features a small diameter cylindrical peg that seats in a hole in the right side of the grip frame.

In this manner: 21 Loading Gate 22 Loading Gate Pivot Screw 23 Loading Gate Spring 24 Loading Gate Spring Screw 25 Side Plate Screw 26 Firing Pin 27 Firing Pin Pivot Pin 28 Double Action Fly Screw 29 Double Action Fly 30 Double Action Fly Spring 31 Hammer 32 Lanyard Ring. The mainspring apex is held fast in the Nagant's grip and the upper and lower mainspring leaves are free to pivot about this locating peg.

Some Interwebz resources instruct to install the grip retaining screw into a threaded blind hole directly under the "tail" of the hammer with the hammer cocked. The hammer can then be released and wiggled up and off its pivot pin. While this method works, my experience is this can be cumbersome with certain examples of '95

Nagant revolvers. One in my collection cannot be disassembled in this manner due to dimensional variation in components.

The central issue is compressing the mainspring slightly in order for it to be removed. I find that the thumb and forefinger are entirely suitable, given the following procedure. To begin internal disassembly, first look to the front of the trigger guard where a flat-headed screw of large head diameter can be found. Loosen the screw to raise the screw head out of its countersink in the trigger guard. Rotate the trigger guard down, pivoting around the stud at its rear, then lift the trigger guard off of the stud.

To prevent loss while handling the frame, the trigger guard screw can be completely removed and stored in a parts bag, box, or magnetic dish. With the trigger guard removed, easy finger access to the mainspring is possible. Grasp the two leaves of the mainspring with thumb and forefinger and squeeze them together slightly to allow the tip of the lower leaf to pop out of the trigger.

You may have to first pry the mainspring locating peg out of its seat in the right grip frame to facilitate the lower leaf removal from the trigger. The mainspring is now unrestrained and you can simply withdraw the end of the upper leaf from its recess in the rear underside of the hammer. Rotate the hammer to the rear just until the tip of that "anteater nose" firing pin clears the frame. Take note of the double and single action sear

## 1895 NAGANT REVOLVER TRIGGER WORK CONTINUED

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engagement surfaces in relation to each other. Grasp the hammer with both fingers or forceps and withdraw it from its pivot stud. Turning attention to the trigger, with a pick or small screwdriver swing the hand to the rear to clear the frame, then wiggle the trigger up and off its stud. You will note that the cylinder stop/bolt is a nub on the top rear surface of the trigger, not a more conventional spring-loaded semi-circular block peeking up out of a slot in the bottom of the cylinder window.

The cylinder stop function is also partially performed by ratcheting teeth on the rear OD of the cylinder which mate with a single tooth in the extension at the top of the loading of the loading gate. This prevents the cylinder from turning backwards. Clever, these Belgians. Remove the vertically-sliding hammer block that's actuated by a prong at the rear of the trigger. Rotate the recoil plate to the rear clearing the frame, and up and off of its axis stud.

This recoil plate looks like a tiny mallet with an oversized head and has a hole through which the long firing pin passes to reach the cartridge primer. In operation, as the trigger is pulled to the rear, the hammer block pushes the recoil plate forward which in turn forces the cylinder forward for the chamber mouth to engage the forcing cone. Trigger Work We've gone a bit farther than necessary. Let's turn attention to the mainspring once again.

To recap, the upper leaf end is larger with a "duckbill" appearance, whereas the lower leaf is continuous in thickness and ends in notch. We will be concerned with the lower leaf. The lower leaf of the mainspring in my Finn Capture Nagant was about 20% thinner than the lower leaf of the customer's revolver mainspring. The customer's mainspring lower leaf was roughly 0.047-0.052" where the lower leaf of the Finn Capture mainspring was 0.039-0.042".

The thickness of the upper leaves of both mainsprings was the same, within a couple thousandths of an inch. This makes sense,

in away. Although both leaves of the mainspring are involved in all of the lockwork forces, the lower mainspring has more of an effect on trigger pull, and it stands to reason that the Finn armorers would thin the lower leaf. Again, both leaves work in balance and have an effect on all forces in the lockwork.

Going too far with thinning or bending one of the leaves can be detrimental to the revolver's action, such as misfires from hammer strikes being too light. It was fortunate that I had a pattern from which to work in the Finn Capture Nagant's mainspring. I had fired several dozen rounds from the SA revolver and it had never failed. Visual examination of the other internals along with measurements of some key dimensions showed little or no difference between those parts in the customer's revolver or my Finn Capture.

The primary detectable difference appeared to be the thickness of the lower mainspring leaf. I chose to do the "other half of the experiment" and install the Finn mainspring in the customer revolver. I cocked the hammer and pulled the trigger a bit too enthusiastically, expecting the heavy pull, and was shocked at how much lighter the pull was. The Lyman gauge showed that the customer's single action pull was now 6 lb., 14 oz.

Out of curiosity, the customer's '95 Nagant mainspring in the Finn Nagant revolver yielded a measured single action pull of 12.9 lb. After gathering the above information, the rest was easy and completed with fundamental metalworking. The customer's mainspring was clamped in a vise with the lower leaf up, and a rotary tool sanding drum was used to grind the leaf thinner starting about 3/8" from the end and stopping 3/8" from the apex.

The grinding was performed lengthwise, not across the leaf, because the leaf is curved and the sanding drum is straight, so the grinding would be extremely irregular and non-uniform if the leaf was ground across instead of lengthwise. I marked the

boundaries of grinding area with an indelible marker and worked those areas between the marks until the middle 2/3 to 3/4 of the lower leaf was about 0.040" thick.

I worked slowly, moving the sanding drum constantly and watching the metal for any indication of discoloration. Frequent stops were made to allow for cooling and for measuring the thickness of the lower leaf. I also re-assembled the revolver at grinding intervals to check the trigger pull. Once finished with grinding, the mainspring was wiped down with Corrosion X to forestall any rusting. The customer's 1895 Nagant was reassembled and the single-action pull tried and measured a final time.

It felt like a S&W revolver in comparison and the pull force was 7 lb. 1 oz. The double action pull was 12.7 lb. Three 7-shot cylinders full of primed resized cases yielded 21 bangs. When the customer came over and dry-fired his Nagant, the look of surprise on his face was priceless, asking, "What did you do?" "Trade secret," I said. After a brief chat with him continuously dry firing at a spot on the far wall the entire time, he took leave.

And I took out the first of my other 1895 Nagant revolvers and starting with that one over the next few nights gave them all the old "Finn treatment." A final note. While this method worked for this particular '95 Nagant and others in my personal collection based on what was apparently done at one point to another '95 Nagant that was once in Finnish Army inventory, this technique may not work for all '95 Nagant revolvers.

Mainsprings are difficult to come by and the usual parts vendors are out of stock most of the time. Proceed with caution. AG

## FROM THE ARCHIVE

# Montgomery Community College

*Overview from the Director of Gunsmithing Program at Montgomery Community College for potential students.*

BY MARK DYE AUGUST 2021

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It has been a full 25 years now since I first walked into Montgomery Community College's Gunsmithing classrooms as a student, determined to make a career out of a love of firearms. By the end of that first day, I was fully convinced that I'd found "my people." I received some valuable training during my time at MCC and went on to work in the gunsmithing trade for a number of years under the tutelage of some very well-known gunsmiths. About a decade ago, I returned to my Alma mater to accept a teaching position.

After the retirement of Wayne Bernauer, who spent 30 years teaching at Montgomery, I took over as the Program Director for the Gunsmithing curriculum. For the benefit of those not familiar with this school, or its Gunsmithing program, I'd like to provide a brief description of what this school has to offer. Situated in the rolling landscape of rural North Carolina, Montgomery Community College's Gunsmithing program is a two-year associate degree program that has been in existence since 1978.

It occupies over 10,000 square feet of space dedicated solely to the education of gunsmiths. The facilities include classrooms complete with ample work and bench space, vises, and tool boxes; two full machine shops fully stocked with lathes, milling machines, surface

grinders, CNC equipment, and other tooling associated with the gunsmithing trade; metal finishing labs with capabilities to apply traditional caustic bluing, Parkerizing, Cerakote-type painted finishes, and even case color hardening.

The school also boasts on-site range facilities for test-firing or training. MCC's arms room contains over 300 firearms that are used as teaching aids. These range from flintlock muzzleloaders to recently released modern handguns. The MCC Gunsmithing program is an overview of the Gunsmithing trade. While many skills and specialties fall under the heading of Gunsmithing, Montgomery's program offers instruction on a wide variety of them. Students spend a substantial amount of time learning machining.

In fact, the first semester consists entirely of machining classes. From there, students move into general repair classes and precision rifle barreling. During the summer term of the first year, students work on synthetic rifle stocks and semi-inlet wood ones. Precision rifle bedding is taught during this term. During the first term of second year classes, students take a handgun repair class as well as an advanced long-gun repair class. In all repair classes, design and function theory is heavily em-

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phasized. Firearms are discussed as systems, so that lessons learned on a particular type of system can be readily applied to other similar firearms. Metal Finishing and custom handguns are the topics of the spring term of second year. Here students learn to properly polish metal and refinish firearms with a variety of finishes common to the industry. A substantial portion of the custom handgun class is devoted to the building of a custom 1911 pistol from a build kit.

During the final term of classes, students take a class devoted to modern sporting firearms. AR platform rifles, AK variants, Ruger 10/22s, and FAL variants are examples

of projects tackled by students during this popular course. Throughout the program, results-based gunsmithing is an instructional goal. In other words, rather than simply doing something because it has been done that way in the past, projects should be tested to measure the real world improvements.

As with any higher education, Gunsmithing training represents a considerable investment for a student. Tuition for the two-year program will total around \$12,000 for North Carolina residents and roughly twice that for out of state residents. The required tools and materials for the program (which includes

much of the tooling that a working gunsmith would need) as well as several project firearms, is currently around \$10,000.

Graduates choose to enter the firearms industry in a variety of ways after completion of training at Montgomery. Many seek to start small businesses of their own. Some will go on to work for small gunsmithing shops or retail locations. Others will fill a variety of roles at larger companies within the firearms industry ranging from warranty repair centers, sales, to instructing armorer's courses. A few choose to work within the law enforcement or military com-

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munity. These opportunities vary from things like armorer positions on military posts to working with the FBI's prestigious Hostage Rescue Team. Not all learning occurs in a classroom. MCC students have opportunities to attend school trips to SHOT Show, factory tours of Ruger and FN, trips to historical colonial gunsmithing shops, and various shooting activities. These activities are benefits of the industry affiliations that the school enjoys.

Relationships with companies like Brownells, Midway USA, Benelli, and many others are critical to positive student outcomes. Gunsmithing students at Montgomery Community College come from all walks of life. While some students are traditional college-age people, many others are former military or are transi-

tioning from other careers. The ages of students range from 18 to 80. What is consistent is a love of firearms and an interest in turning this into a viable career path.

Current student, Pat Weaver, noted that, "In my perspective, the striking advantage of the MCC program is the ready access to the dedicated staff of professional gunsmiths, all having unique backgrounds and specialties in the various facets of the trade." Regardless of the end goal for students interested in Gunsmithing, from hobbyists to those interested in pursuing a serious long-term career, Montgomery Community College offers opportunities for education.

The short-term NRA programs provide short, focused courses on specialty areas within Gunsmithing, while the two-year degree program provides a more comprehensive bigpicture view of the trade. AG

## FROM THE ARCHIVE

# Gunsmithing Business Tips, Part 2

*Insights into the persona of gunsmiths.*

BY MARK R. HOLLENSEN AUGUST 2021

ORIGINAL PP. 12-15

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This is a topic that is often left out of business-related education materials. I mention this because I did touch upon it in *The Business of Gunsmithing; A Practical Strategic Compendium*. I opted not to go too deep into this subject in my book as I know there are many people out there that might say I am encroaching on psychological or human behavior, and that is better covered in medical journals and behavioral science literature.

However, I wanted to elaborate on this topic here because over the years I have encountered gunsmiths that I walk away from wondering how they manage to stay in this business. I'll bet some of you have done the same thing. What is a "Gunsmith Persona"? Well, I wasn't a psych major (a little slack here, please?) but there is a line between personality traits and customer service that I've observed to suit successful gunsmiths.

In my book I brought up the thought process of creating, working on, refining, and making a persona for yourself to succeed. I don't mean to call out people that my posses some of these negative traits, rather, I bring it up as a discussion to help your career. Professional

craftsmen are best served by simply being themselves. Working with customers, wholesalers, dealers, and whomever else you have business dealings with as being yourself typically translates to honesty, integrity, and self-confidence.

But each of us have our own way of communicating with other people and how we interact with Live up to this motto and you'll improve your gunsmith persona. them and that can make the difference between "good word of mouth" or "stay away from that guy". Each of us probably knows if we tend to communicate with others in a more positive or more negative way.

And if you can recognize that you'll have opportunities moving forward to make any needed changes on how you interact with other people in refining communication skills and interactions. The goal is to make your interactions a positive experience. This is so very important when working with your customer base. Outward projection of impatience coupled with negative facial expressions, eye rolling, or routinely correcting customers can project a negative ex-

## GUNSMITHING BUSINESS TIPS, PART 2 CONTINUED

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perience. “So what?” you ask? It’s only a problem if customers stop returning and having negative interactions with customers can doom a business faster than poor gunsmithing work itself. You could actually be a very talented gunsmith and still ruin your prospective future by demonstrating superiority or negative connotations when working with customers. And that type of attitude can even translate over the telephone as well as in emails and text messaging.

I once worked for an individual that assigned his employees work via email and the messages read like someone screaming. After getting to know him I learned it was just his writing style with nothing negative intended, even though first impression of his writing indicated otherwise. I brought this to his attention and began making changes to his messages. Turns out, I wasn’t the first person to mention this and even he was realizing the unintentional distancing.

He began refining his persona, starting by asking me to review his emails before sending for a second opinion. Being the boss, he didn’t have to do this but he felt it was important to improve and took the steps necessary to do so. Not everyone will do that. Creating, building, and everrefining a positive persona is not Developing your business persona is also key. something taught in gunsmith school and you seldom ever hear about this unless you are taking a course on specific psychological or personality traits.

No, I didn’t learn any of this from a book; I learned from day-to-day communication with people, employees, co-workers, and my customers. This also includes people at

other businesses, such as local gun shops, parts distributors, wholesalers, local hardware stores, manufacturers, local licensing authorities, etc. You need a well refined and defined positive persona to effectively carry out your job and move your career forward regardless if you are working as gunsmith in someone else’s shop or your own.

Apart of forming positive relationships and your persona is the ability to talk with customers and not to them. Listen first, then discuss their issues to better understand the best service you can provide. As we get better at our job, we can quickly become “short” with a customer because we have presumably “heard it all” before. But that way of thinking can quickly lead you down the path of exhibiting negative behavior—intentional or not—in the eyes of the customer.

Believe me, there is likely a negative-projecting gun shop employee or gunsmith in your neighborhood right now. Don’t make yourself part of that crowd, especially when it is unnecessary and will only hurt future business. Be the considerate gunsmith that hears complaints (while improving your business) rather than causes them. One area that can help influence your “gunsmith persona” with being positive is to follow the Gunsmith Patch motto, which says, “Gunsmith: Dedicated to Shooters and Their Guns”.

During my career in the U. S. Border Patrol our motto was “Honor First” as a reminder to us to carry out our daily duties with that in mind. Make all decisions based on doing what is right, with honor and you pretty much will make good decisions all day long. A quote I like states,

“Always do what’s right, and do it because it’s right, not because it’s popular or will be noticed. It will be difficult at times, but do it anyway. In Memory of John H.

Nelson.” Following this advice has served me well throughout my working life. More on the Gunsmith Patch motto. You owe it to your customers to be dedicated their shooting and their guns. I have seen some gunsmiths become very selective about what they do, and as time moves along, they begin to see themselves as “having arrived” and therefore, no longer need to worry about that motto. I disagree. I think as long as we are gunsmiths and serving our customers we should be dedicated to those shooters and their guns.

I think we owe it to them to educate them about their guns and the firearm industry, repairing and enhancing their firearms and to simply be there for them when they need something gun related. This doesn’t mean that you shouldn’t specialize in certain tasks as a working gunsmith. Many do. But whatever you specialize in, be the gunsmith with the positive persona that is there for those customers who needed your service.

You want your customer base to have the trust to come to you whenever they need something and, just as important, to refer you to their friends and fellow shooters with confidence. Word of mouth will always be important, especially in our business, and which direction it goes depends on you. Negative word of mouth seems to spread much faster, though. Consider a customer asking for a repair on an old, beaten up shotgun

## GUNSMITHING BUSINESS TIPS, PART 2 CONTINUED

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that you estimate to be worth \$75. The negative persona might reply with something like, "I don't work on junk like that." Think what that customer feels in the moment. How would you feel? Even though we may know that the firearm is low quality or that any work will cost much more than it is worth, don't project negative feelings toward a would-be customer. A positive reply might be something like, "Let me see what you have there. Those were good old guns back in their day.

What are you thinking about doing with it if it is repairable?" This starts the positive interaction you want with the customer. That customer may tell you that the old gun belonged to a relative and they really want to clean it up, shoot it again, and keep it in their family. Or perhaps they just want to clean up an old gun as a family keepsake with no need to return it to normal function. The gun may have a sentimental value to that customer worth more than the estimated value, repair, or refurbishing cost.

This is the case more often than you think. Why would a customer seek your services to repair an obviously old and worn gun if they simply wanted something to take shooting or hunting? After learning what the customer wants without making assumptions, a good follow up would be an offer to look the gun over and provide an estimate to see if they want to move forward. Not too hard to do.

Even if they choose against paying for your services, I guarantee that customer will walk out of your shop pleased that at least somebody cared enough to take a look. And whether the customer decides to move forward and pay what it costs to repair it or gives you the all-stop on it, that customer will more than likely go home, dig out all of their guns and bring them to you for some sort of service, inspection, cleaning, or repair down the road.

This approach is better than being dismissive, only to have them leave and tell everyone they know what ana-hole you are. Believe they will do that! Avid shooters go to ranges, gun shows, on hunting and fishing trips, to competitive shooting events, and are only too happy to lend a story. When a discussion on the subject of a "gunsmith" comes up, the bad gunsmith always comes up first. How is that kind of "Gunsmith Persona" going to serve you and your shop?

Since gunsmithing as a career doesn't always make enough money to allow advertising during the Super Bowl half-time ceremonies, you'll have to use what you can to get the message out about who you are, what kind of work you do, and what kind of a gunsmith you are in the eyes of your customer base. This is so important in becoming a successful gunsmith. You have to remember that people have bills to pay. Things like electricity, fuel, car payments, insurance, food and other must have essentials to live their life.

So when trying to become a successful gunsmith, you are competing for that money; money that they spend while making ends meet. Leave a bad taste in the mouth of a customer and they will reweigh how (and where) they spend their hard-earned dollars. I have found that honesty alone can pave the way for more customers. It's not about low pricing. People will respect you if you are completely honest with them and then charge a fair and honest fee for your services.

Having integrity, projecting a positive image, and being truthful with your customers makes up the base of your gunsmith persona goals. Treat customers as you would like to be treated. You will be tested from time to time but that will define the gunsmith persona you are working so hard to build. I'm not saying you must take crap from belligerent customers. You will know when the time is right to be firm

even if it risks losing that particular customer. But for a truly problematic customer, that isn't a bad thing.

If that happens to you, those customers probably already have a bad reputation so it'll hardly be surprising you were forced to lower the boom due to their irrational behavior. Just make sure you have done everything you possibly can to be the supportive, honest, and positive. Integrity is one thing people can never take from you. Creating your gunsmith persona doesn't stop with your customers bringing in repairs. This needs to be extended outward to all of the people that you are working with within the industry.

Take for example a parts house that mis-filled your order by sending an extra or additional items without charge. Even if though the mistake is theirs, don't pocket the parts. Instead, contact them and ask how to proceed. Even if they wouldn't have caught the error you build rapport as an honest broker and the kind of customer worth extending a favor or preference to in the future. Or, say a customer pays you cash and in recounting later you find there was too much.

You could assume it was a tip, but I'd call to let them know. How do you know that customer didn't do it on purpose just to see what you really are made of? If it really was a tip, they'll appreciate you more for being trustworthy and honest. Being known for honest business among local gun shops will have them sending customers your way. Maintain your reputation with the shop and extend that to your customers.

Remember, other businesses sending customers your way are also putting their reputation on the line with their recommendation. Burn a local shop employee or one of their customers after a referral and they'll learn to stop. Or, they'll only call when desperate with poor jobs that won't that may not make

## GUNSMITHING BUSINESS TIPS, PART 2 CONTINUED

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you much money. Those shops and other businesses are part of your voice in the firearms community. Have the persona that encourages repeat recommendations. When working in services, you have a lot of eyes on you every day that you turn out your work. And those eyes are your word of mouth advertising. Be mindful of that and do your best to project an image that people return to. Working with people in our type of industry can be a challenge at times so take those challenges seriously.

Place yourself in their shoes, keeping in mind that they don't know have your knowledge and experience about firearms, servicing, and repair. Some customers will be very knowledgeable and capable and defining their problems and needs well but many won't. Consider those customers new to the gun world. Don't you think they feel intimidated when they simply walk into your shop and ask for help, not fully understanding what to ask for? A persona of mentoring anew customer may create a customer for life.

Haven't you ever felt that way when walking into a car repair, computer repair, or some other shop you're not fully versed in? You may not understand what is wrong or even how to fully explain the problem. It's part of the reason you're seeking help in the first place! Once there, you quickly realize that you know no one there, and then you may wonder how badly they are going to screw you over, only because that seems to be the norm anymore. I know I have felt that way many times.

Case in point: I took my pickup in for an oil change and tire rotation some years ago to anew service station about three months after I had had all of my brake shoes and rotors replaced. I had driven the truck less than 2,000 miles since that brake job. While in the waiting room, the service manager came in and began telling me that my brakes are completely worn and that all four rotors needed to be replaced as well.

He even gave me a quote on that work while looking at a work order in his hand. "What?," I replied. "I want to see my rotors and brakes since I just had them done a few months ago." Basically, I called him on it. At that point, he tried to back out of it by saying he needed to go see if the truck was still up on the lift. He came back and said, "Sorry about that, I had your car mixed up with another one." Yeah right! Just think if I had not questioned it?

Right then and there I knew I would never return to that place. Keep this in mind when quoting repair estimates and don't take the risk of making up unnecessary repairs as you may get called on it. Be honest and up front and you will never have to worry about this type of scenario happening to you. Be mindful of the customer that comes into your shop for gun work.

They may not have experience with guns and might be taking a risk bringing their firearm(s) in to you so that you can tell them what is wrong and how much it might cost. They may try to describe to you what it is going on using wrong terminology because they don't have the knowledge to describe the issue. Your job is to be the professional and put them at ease about the whole process.

Rather than tell them what you think or assume is wrong with it, you are better served asking them what is happening when they shoot and/or operate it so they can reveal what problems they have in their own terms. This tells the customer that you are interested in them as well as their prized firearms while standing ready to correct it. Simply saying, "Yeah, I know what it is. See it all the time. Just set it down over there." is probably not the best way to let your gunsmith persona shine through.

Your goal is to make the customer feel very comfortable about the whole process and that their prized possession is now in the right hands. Along those lines, some ser-

vice providers or gunsmiths are very good at what they do and can churn out beautiful gun work. But their persona, hard as they might try, just won't translate well during customer interactions. Try as they might, the positive doesn't seem to shine through. There is nothing wrong with that, if you know how to work around it.

Sometimes you need a good communicator as the front person in the business while the gunsmith with the less desirable persona does the great work in back room. It happens in every career type out there, so it can and will happen in the gunsmithing or gun retail shop trade. Just be aware of it and put the positive persona that works well with the customers out in front to be the voice of the business.

Besides, there are some gunsmiths I personally know that say they would rather be left alone in the back to do their work and not have to deal with the public. There is nothing wrong with that at all. Do what you must to project the positive image you need to have. But if you plan on owning your own shop down the road, either take the steps to create a positive persona now or plan on hiring a person that does to be your positive influence in the shop that you build.

Working on your positive Gunsmith Persona can increase your bottom line by increasing clientele. I understand that time is money and that you can't get your work done if customers are calling you all day long for advice. You just need to find away that works best for you in your business to work with your customers daily whether as the shop gunsmith, the owner of the shop, or both. Be the gunsmith that shooters want to call first or ask advice from.

They in turn will be spreading the word to others about how well you treated them. Your business will never suffer from being too honest, too fair, and too positive. Believe me! AG

## FINISHING

# Brush Research Manufacturing

*Abrasive nylon wheel brushes provide deburring for extremely hard metal parts. Here's how JR Precision & Welding used Brush Research wheels for muzzle brake manufacturing.*

BY CARLO CHATMAN AUGUST 2021

ORIGINAL PP. 16-17

When an application calls for surface finishing, cleaning, polishing, deburring, edge blending or removal of paint, rust or other contamination, a wheel brush is often the ideal solution. A type of power brush, wheel brushes are motor-driven and may feature an arbor hole or keyway that supports their use with grinding equipment or CNC machinery. Wheel brushes are circular in shape with uniform distribution of the fill materials extending radially from the center core to the periphery.

When metal wire filaments are used, they are excellent tools for light deburring, edge blending and general surface finishing. The brushing action occurs at the edge or face of the tool on machined parts such as steel shafts, gears, turbine blades, or extrusion cut-offs. However, when harder materials are involved, wire filaments can break off, or deform—even if crimped.

Although knotted wire options are available for more aggressive deburring, for today's hardened steels and alloys even this type of wheel brush is not sufficient. Instead, for the most aggressive deburring or surface finishing the solution is a wheel brush that utilizes abrasive nylon filaments made of silicon carbide. Taking it one step further, diamond grit can be used for the hardest metals and alloys in use today.

The construction of these composite hub radial wheel brushes, as they are called, provides along-lasting wheel with less filament breakage and superior performance. For JR Precision & Welding (JR-PrecisionWelding.com, a machine shop in Houston, Texas, the issue of removing large burrs from machined holes in an extremely hard 4140 steel alloy part used as a muzzle brake for firearms was proving a challenge. Founded in 2017, the machine shop specializes in 3 and 5-axis CNC manufacturing, 3D printing, and welding.

One of their projects involved manufacturing muzzle brakes and compensators for rifles and pistols. The designs consisted of a small length of tubing approximately five-centimeters long requiring a series of slots, vents, holes, baffles, and similar to redirect a portion of propellant gases to counter recoil and unwanted muzzle rise. Where and how these holes are placed in the muzzle brake has a tremendous effect on the influence of the brake in terms of recoil and muzzle movement.

However, when machining these holes, large burrs were forming at the oval-shaped gas ports. The cylinder was made of 4140 steel, a 1% chromium-molybdenum steel alloy that is generally hardened and tempered to a tensile strength of 850-1000 MPa (megapascals).

The company was machining the part on a 5-axis machine in an elliptical path, which increased the size of the burrs created.

"The burrs that were created were razor sharp and thicker than we wanted them to be on each of the four main ports in the part," says James Mawazeb, Director of operations and lead engineer at JR Precision & Welding.

This led him to reach out to a local tooling representative from Bass Tool & Supply, a leading supplier of CNC machine tools, for wheel brush options to remove the burrs in one automated operation. The rep, in turn, suggested he contact Los Angeles-based Brush Research Manufacturing (BrushResearch.com, known for inventing the Flex-Hone, a tool characterized by abrasive globules that are permanently mounted to flexible filaments that are attached to a center shaft.

With its low-pressure, lowtemperature abrading process, the Flex-Hone tool can remove workhardened layers and deburr parts without disturbing the underlying metallurgical structure. Brush Research also manufactures a wide array of wheel, cup, and end brushes in a variety of sizes, filaments, and grits. Still, based on the geometry, location of the burrs and the hardness of the metal alloy, it wasn't immediately clear what the best solution would be.

So, the engineers at Brush Research suggested Mawazeb send in several sample parts for testing in the lab. At its surface finishing laboratory in Los Angeles, Brush Research engineers

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can analyze customer parts that require finishing, then select and test the tools that will provide the best solution according to customer operating parameters. At first, the company attempted to remove the large burrs using Nam Power abrasive disc brushes. Composed of flexible abrasive nylon filaments bonded to a fiber reinforced thermoplastic base, the disc brushes contain a unique combination of both ceramic and silicon carbide abrasive.

The abrasive filaments work like flexible files, conforming to part contours, wiping and filing across part edges and surfaces to deliver maximum burr removal rates.

Although an excellent tool, the abrasive disc brushes were not sufficient removing the burrs. "After testing out disc brushes with different depths and speeds, we decided to try an abrasive nylon wheel brush," says Elysha Cole, Product Support Specialist at Brush Research. "It was able to easily get into the slots, push the burrs out and remove them." The abrasive-filled nylon filaments are set into molded cores, allowing higher filament densities and putting more cutting tips at the point of attack.

In addition, the filaments are extremely durable and self-sharpening, providing excellent performance and wear life. As the brushes come in contact with the work surface, the filament grit wears off, exposing new cutting particles. In that manner the brush continues to be sharp even after repeated use. In addition, unlike the bristles of metal brushes the abrasive nylon fibers are not prone to deforming or breaking off like wire brushes.

The product utilized to prove the concept was a 6" diameter tool with silicon carbide filaments. Because the burrs were a bit heavier and the customer was not concerned about the final surface finish, the machine shop opted for 80 grit. The tool can be automated on CNC equipment or offline as a secondary deburring operation. According to Mawazeb, the abrasive nylon brush met all his requirements, including how well it fit in his 5-axis machine's magazine holder and existing toolholders.

However, the primary concern was how much material the brush would remove. "We didn't want the brush to affect the outer diameter measurements in away that affected the performance of the ports," says Mawazeb. After testing the abrasive nylon brush, Mawazeb says he was impressed.

In addition to removing the large burrs, the brush also provided a soft edge break to the four ports so they were not razor sharp without affecting the surface finish. "The abrasive nylon brush removes just the right amount of material," says Mawazeb. "The surface finish actually matched what the customer wanted as well." After proving the concept in the lab, JR Precision & Welding ultimately decided to purchase a smaller 3" diameter version of the wheel brush.

The shorter trim fill has less give, so delivers an even more aggressive action. Mawazeb says he also tried another brush from another supplier, but was not impressed. The filaments were angled down and the fill was not as compact as the abrasive nylon wheel brush from Brush Research. "I tried another brush, but didn't like how it performed. When it would go over the part, it would be like it was a toothbrush, just rubbing over metal. So, it didn't actually remove anything.

It actually scuffed up the part more and left a horrible finish," explains Mawazeb. According to Mawazeb, the machine shop has installed the abrasive nylon brushes and the equipment is programmed for the next order of muzzle breaks scheduled for production. AG

## HISTORY

# Iver Johnson 1911A1 Carbine

BY ROBERT K. CAMPBELL AUGUST 2021

ORIGINAL PP. 18-21

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I have written a number of books on the 1911 and it is by far my favorite handgun. I know how to use and maintain a 1911 and any problem I run across is like an old friend in anew dress. On the other hand, I sometimes wonder why makers cannot seem to get the 1911 right after over a century! I have a number of proven firearms I bet my life on. There are also quite a few that are just fun guns that do not require a task to fulfill. The Iver Johnson 1911A1 Carbine is one of the latter.

However, coming across a 1911 that wasn't a handgun piqued my interest. There are plenty of precedents in history for shoulder-stocked handguns. The type seemed ideal for mounted troops to dismount and fight with. Sure, it wasn't a rifle but it was better than trying to fight a fast moving battle with along gun on horseback or hoping a stored rifle was still in the scabbard. Stocked revolvers for cavalry later morphed into stocked selfloading pistols.

It's important to point out the problems with legal issues this has posed since the 1934 National Firearms Act was enacted. Due to this, you cannot simply mount a stock on a pistol, although there have been attempts at non-fixed braces. Generally speaking, you cannot legally shoulder stock a pistol. For the most part we

should have a pistol in a holster and a rifle in a sling, but then this Iver Johnson is a fun gun. As for stocks, hinged types and slots and connectors were used.

A shoulder stocked pistol with along barrel, however, becomes a carbine, kind of like the Taurus Circuit Judge. Just the same, the Judge is more permanent being along barrel revolver. For this reason, do not change the configuration of the Iver Johnson 1911A1 Carbine. It comes dismounted with the stock on one side of the shipping box, so that seems all right, but once the carbine was put together in the shop and I filled the papers out I have not dismounted it.

So what we have is a simple wood plank extension with a connector from the stock to the mainspring housing. This is actually a neat trick and one that was outlawed for use with pistols since the 1934 NFA. Suppressors, fully automatic firearms, Short-Barreled Shotguns, and Destructive Devices were also proscribed, at least without a ton of Federal paperwork and a tax. A shoulder stocked pistol is a Short-Barreled Rifle and also demands a tax stamp and paper work.

And it isn't worth the trouble in my estimation if this piece is any example. The Iver Johnson 1911A1 Carbine features a 16.25 inch barrel. So, in There is no difficulty.

## IVER JOHNSON 1911A1 CARBINE CONTINUED

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Just the same, it should not be roughly handled. keeping this assembled you have a carbine, not a Short-Barreled Rifle, and the seller can check the rifle box on your paperwork with no additional BATFE requirements. Iver Johnson Makeup This Iver Johnson firearm is a rebranded SAM. Shooters Arms Manufacturing of the Philippines makes close copies of the GI 1911. The pistols feature a cast frame and forged slides. In general, my impression is that their 1911 firearms are not quite up to the Rock Island Armory brand.

On the other hand, a friend of considerable experience has the opposite opinion and I changed my view of the piece as the testing and work progressed. The firearm component of the carbine is a GI-type 1911A1. This means small sights and controls. The grips, however, are nicely checkered. The sights are not true to the GI type, and this is all to the good. They are at least as tall as the Colt Government Model Series 80 or Springfield Mil Spec. I applaud this decision.

Small sights are true to the GI but should be larger, so no harm there. The trigger action isn't bad and perhaps above average at a 4.9 pound compression on the Lyman registering trigger pull gauge. There was no creep or grit at all in the action. As for the finish, I have to admit it is a bit above the average Rock Island in my gun safe. There are no runs, no buffer marks, no tool marks. Should one of these carbines come into your shop there are several things to know.

The warning on not fitting another barrel is first and foremost. Don't monkey with

## IVER JOHNSON 1911A1 CARBINE CONTINUED

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*Original caption: Bottom: The carbine failed to feed properly, however, after a minimal feed ramp polish the problems were cured, hanging off of the muzzle.*

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it! There are serious penalties. Second, understand the differences between this gun and a GI gun. The 16.25 inch barrel is most noticeable difference and features the standard swinging link that was a design point of the 1911. I cannot imagine the difficulty the engineers had in designing a working pistol that would feed and cycle with the extra weight of a 16.25 inch barrel

The issues in lock time and cycle must have been extraordinary. Just consider the difficulty in convincing an Officers Model to function and the long slide 1911 as well. The magazine spring housing is modified in order to accommodate the shoulder stock and is made of polymer. The shoulder stock... well, I suppose it is more than a plank but most of us could have fabricated a better stock in a high school shop class. The shoulder stock attachment is sheet metal and I'd caution against rough handling.

The curve of the stock is geometrically best as possible for this lash up. The butt of the stock is uneven and stays in the shoulder as a result. Again, the greatest respect for the engineers who designed this and managed to have it sell for a price point a little above a standard GI 1911. The stock has a nineteen-inch length of pull, which is quite a bit longer than most carbines. The pistol weighs a solid four pounds even on my scale when unloaded.

This is a heavy shoulder-stocked pistol, but actually it is a light carbine! It isn't that difficult to swing around quickly. I don't know how you would sling the piece, but it needs one for the field, but not for home defense. As for the sights, using this as a carbine puts your eye closer to the sights than a standard 1911 pistol. Coupled with the tall sights this

results in a good sight picture. I did have to paint the front sight to improve visibility. The grip safety must be addressed properly.

There isn't much room to depress the safety. Lay the thumb across the safety as if racking back the hammer of a single action revolver, keep it planted, and it works well. I am certain that a simple cure well within the boundaries of the legal requirements would solve this problem. By taking a grinding tool across the metal of the stock and relieving the stock to an extent—right side for a right handed shooter and left side for left handed shooter—the grip safety problem would be alleviated.

I think an inch would be ideal. I did not do this as the carbine may be traded at a later date, so making improvements would be okay but not personalized customizations.

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Above center: The work was easily accomplished with a “.45 caliber” Sharpie. The work was not difficult. Test Firing The carbine was well lubricated prior to firing. All magazines were well used and proven in other guns. I used a good mix primarily from Wilson Combat. All magazines locked in place and functioned including Mec-Gar, ACT-MAG, Brownells, Chip McCormick, and Colt. The initial loading was the Black Hills Ammunition 200 grain lead semi-wadcutter. The first shots were uneventful.

Recoil is very light, lighter than most any pistol caliber carbine I have fired, including my Specifications: Importer: Iver Johnson Arms Manufacturer: Shooters Arms Manufacturers (S. A.

M.), Philippines Model: 1911A1 Carbine (IJ01RIFLE) Action: Single-Action Semi-Automatic Caliber: 45 ACP Frame: Carbon Steel Finish: Olive Drab Sights Improved fixed sights, larger than the standard GI Barrel: 16.25" Trigger Pull: 4.9 pounds Overall Length: 35" Height: 5.25" Slide

Width: 0.92" Weight: 4 pounds Capacity: 8+1 rounds, also accepts 7, 10 and 11 round magazines Twist: 1:16" RH, 6 grooves MSRP: \$650 favorite Winchester 1892 in 45 Colt. I fired one hundred twenty rounds fairly quickly and it was great fun.

There were no failures of any type. Accuracy was surprisingly good. At 25 yards groups of 1.5 to 2.4 inches were the norm, but slow-fire groups were the exception. Most of the shots were fired at dirt clods and clays on the berm and rapidly at man-sized targets. Had I left well enough alone that would be the end of the story. But that isn't what I do. The next session I took along several jacketed hollow point loads. None would feed.

The Hornady Critical Duty, Black Hills Ammunition 230 grain JHP, and Speer Gold Dot hung up on the feed ramp The bullet noses were banged up badly in the cartridge case. These loads feed in my old Argentine Modelo 1927 and some, but not all, feed in the SDS/Tisas GI gun. The feed

ramp was free of burrs and tools marks. Not to lose the day, I fired a number of the Black Hills 200 grain loads and the pistol began to short cycle. Nonplussed, I heavily lubricated the pistol and it began to function again.

My friends, GI guns need to be lubricated well and may not feed some hollowpoints, but the SAM carbine took it too far. But then again, this was anew gun with less than four hundred rounds through it. At this point I also fed the carbine with an eleven round Mec-Gar magazine with perfect function. One thing I confirmed—and it would have been a hard nut to crack if the factory had not got it right—the recoil spring combination was correct.

Cycle reliability and function was good with all loads even if feeding sometimes was not. Back to the shop. Polishing I carefully polished the radius of the feed ramp. The process for polishing a feed ramp starts with

## RIFLES

# Reader Forum

BY AMERICAN GUNSMITH EDITORS AUGUST 2021

ORIGINAL PP. 22-24

**C**ustom Marlin Ballard I have a Marlin Ballard rifle in my shop. The barrel is marked "George Schoyen" so I assume he rebarreled it. The serial number is 332XX. I'd like to know about when it was made. It is also missing a ferrule under the barrel along with the ram rod (I assume it was a ram rod, or maybe a shooting stick?) Could it have been blackpowder before rebarreling? The bore measures 0.370, the chamber at the case head measures 0.520, and the chamber the ramp and the barrel throat that must not be changed.

If that angle is changed the piece will not feed. A half round file is often suggested and they are usually the right size. I have discovered that a magic marker or Sharpie is just the right size. Tape a piece of fine grit sand paper over the Sharpie and carefully polish out rough spots and tool marks. This combination polishes up and down at the same time.

A surprisingly small mark or burr will tie the pistol up and this approach addresses it, leaving the feed ramp angle unchanged with only the effort needed for the bullet nose to feed properly. I use dummy cartridges put up on the Lyman press to check for feed and then take the piece to the range for live fire. In this case the work

was accomplished and the carbine chambered and fired normally. I fired several hollowpoint loads with good feeding. just in front of the head measures 0.425.

The chamber seems straight The inexpensive SAM-based 1911 carbine has gone up several notches. The fit and finish are good. The engineering and adapting of the 1911 into a carbine is excellent. The trigger is good. Accuracy is good. The pistol would be suitable for home defense or even as a farm or truck gun once proofed, polished as needed, and paired with a good loading. There are two main concerns. First, I would modify the stock to help with missing the grip safety for some shooters.

I am not certain a beavertail would help in this application and that would likely prove too expensive for such an inexpensive firearm. Second, which seems standard operating procedure with many inexpensive 1911 guns, is a modest feed ramp polish. The Iver Johnson 1911A1 Carbine is a fun gun, a bit odd, but a good conversation piece. AG but I have not done a chamber cast yet. Any idea on what cartridge it should chamber?

Any ideas on where I may find the missing ferrule or what kind of sight was on the front and where I may find one? Kenneth W. Wright From Brian Smith. That rifle is a gem of firearms history! George

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Schoyen was born in Norway in 1845 and eventually settled in Denver doing gunsmithing and bought out his employer. He became famous building breech-loading target rifles on Ballard, Stevens, Maynard, and Winchester 1885 single shot actions for the Schützenfest target shooting activities of the late 1800s and early 1900s. Schoyen rifles were every bit as popular and well-known as rifles built by Harry Pope. Schoyen's customers included Annie Oakley and Buffalo Bill Cody. Schoyen passed away in 1916.

The Schoyen-barreled Ballard has chamber dimensions that are approximately those for the 38-55 cartridge but with perhaps slightly wider tolerances. Back in the day, shooters would reload brass many times, and the pressures generated by blackpowder loads were low compared to the newly-introduced smokeless powders of the late 1800s and early 1900s, so cases would fire-form to fit a specific rifle's chamber.

I'm not saying definitively that the Schoyen Ballard in your shop is chambered in 38-55, however, it seems to be and warrants a chamber cast. It is always best to chamber cast these so that you have actual chamber, throat, and bore dimensions to work from. 38-55 case dimensions are provided above. Reader Forum Survey From Joe Carlos. I am seeking the experience of other gunsmiths regarding first shot fliers following cleaning.

Here are three submitted to me and all of these contributors agreed to having their names published. In the February through

April 2021 issues I ran a series on AR-15 Fliers. I mentioned that following bore cleaning most AR-15s shoot one or two fliers (often called "fouling shots") before they settle down and begin shooting normally. I asked if any reader had a solution for this long-running problem to submit their suggestions to me.

I was pleasantly surprised to get three different suggestions which I will list. Obviously, this would serve the dual purpose of helping to avoid corrosion during storage. Bob Coles from M. O. A. Gunsmithing recommends Lock-Ease also burnished lightly into the pores of the bore following cleaning. He says Lock-Ease contains graphite which may help eliminate fliers.

Michael Centofante, who was in charge of long range sniper training for a large sheriff department SWAT team, recommends using a patch or two of rubbing alcohol at the end of the cleaning cycle right before dry patching. I plan to test all three of these methods myself when time permits. In the meantime, if anyone reading performs any testing I would appreciate hearing from you at Lefever Shotguns I was just given a 1921 Lefever Nitro Special shotgun in 12 gauge.

Based on the serial number of 111,XXX, I was curious as to whether the receiver is nickel coated or just bare polished steel. It has light surface rust on all the exposed metal, particularly the receiver and trigger plate. I don't want to polish it too much as to wear away the waterfowl engraving gracing both sides. My goal is just to clean it

up. Bruce Cooper Mark Hollensen responds. To my knowledge, the Nitro Specials were not offered with nickel plating back then.

My assumption is that it has been polished down to the bare metal. That said, it could have been nickel plated by someone along the way over the past 100 years, however, I wouldn't assume this to be the case. Check the receiver water table and do some light polishing there to see if you can tell if that area was nickel plated or not as the receiver would have been submerged in the nickel plating solution if that was done.

AR-15 Uppers What would you recommend for an all-around AR-15 bolt receiver group and barrel for close quarters shooting? I am interested in building an M16A2 replica similar to what I learned to use while in the Marine Corps. Phil Author Joe Carlos responds. Contact Rock River Arms (Rock River Arms. com, and seek their "Vintage A2 Rifles." Also look for their "Options and Upgrades" which may allow you to substitute more desirable characteristics.

At some point you may need to call RR and speak to one of their smart guys to make sure you are getting what you want. In addition to the barrel, you can purchase all other parts you will need to finish your build from RR or you can simply get them to perform the entire build if you wish.

## READER FORUM CONTINUED

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Genuine A2 barrels are normally 20" long with threads on the front for a flash suppressor. They are skinny under the handguards and have a Delta assembly on the rear, a front sight housing held on with pins, and a triangular handguard end cap just behind the sight housing. I consider the following options to be desirable with regard to the barrel. First, if possible, substitute a Wylde chamber for the sloppy NATO chamber.

Second, depending on what ammo you will be shooting you may want to substitute a 1:9 or 1:8 barrel twist for the standard 1:7 twist. A 1:9 twist will stabilize all military bullets that you will have access to, such as 55 grain FMJ and 62 grain green tip. If you wish to shoot 77 grain magazine-length ammo, however, you will need a faster 1:8 or 1:7 twist. Finally, I recommend you get the barrel in chrome moly steel without a chrome lining.

If you have other questions, feel free to contact me directly by email at Savage 775 and SMLE I have an old humpback-style Savage Model 775 shotgun with a problematic aluminum receiver. A previous owner let the side screw holding the shell elevator work loose and continued shooting without tightening it so now the hole won't hold the shell elevator in line to let the bolt close. I've looked for a replacement receiver without success.

Sarco has old Belgium-made receivers (I presume Brownings) but they responded it's unlikely my action components would fit. Is this true? Second, I have an old #3 SMLE Ire-barreled to 444 Marlin. It is a single shot but I'd like to make it a repeater. Sgt. Bill R. Simpson Mc Clain Co. Sheriffs Office (retired) From author Ray Ordorica. It's possible to have the hole in the aluminum receiver welded, redrilled and tapped. I had that done to the sparkplug hole on my old racing Ducati.

As to making the SMLE feed, I just say good luck. Go at it with a Dumore very slowly. Start the round up and see where it hangs. Grind a bit, do it again. I did this to my Springfield 03- A3 to make it feed 458 Magnum perfectly, upside down, slow, fast, and even with empty cases. This little task took a whole day of slowly grinding. H&R 999 Sportsman Revolver I have an H&R 999 22LR in my shop (serial number BA033xxx) that won't advance the cylinder.

I have tried different cylinder advance hands from Munich, all new manufacture pieces. The spring seems to be extra long and I haven't found any combination of cutting and bending this spring that seems to help the pistol. Any advice or technical help would be appreciated. The real frustration is I have worked on many of these pistols in the past. Kenneth W. Wright From RK Campbell. Without the gun on hand, I'd guess something is perhaps wrong with the reproductions. Do you have the old hand?

Match the new hand to the old one to see if there is a difference. Modify accordingly. You could slip a coil off the spring but that is a bit difficult as it is so small. There is always the old trick of taking the old hand and heating it very little and then beating it with a hammer across a metal block to make it a little longer—often this makes it work. From Dave Manney. Is it possible that the bushing the cylinder spins on is bent and causing the cylinder to bind when advancing the cylinder?

It might be bent to the side and bound on the bolt face when in battery. Check there. M2 Magazine Does anyone have any ideas on how to make a magazine for a M2 Springfield? I rescued a badly treated rifle, although I do not think it is worthy of a 200+ original. Maybe it is a conversion of some kind? I relined the barrel and got most of the pits out so it looks and shoots pretty good. Charlie Davies From Paul Mazan. Triple K makes the only aftermarket magazines for the M2 Springfield I know of.

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