MAY 2012

DIGITAL ARCHIVE EDITION

PRECISION ARMS WORKSHOP

AND THE AMERICAN GUNSMITH ARCHIVE

A TECHNICAL JOURNAL OF CRAFT, REPAIR & RESTORATION

05

ARCHIVE ISSUE NUMBER

INSIDE THE ARCHIVE

GUNSMITHS DO MAKE MISTAKES SOMETIMES

USAR SHOOTERS TRAIN 82ND AIRBORNE DIVISION · A TALE OF TWO 96S · FAVORITE BRANDS SHOULDN'T VANISH AFT…

DIGITAL ARCHIVE EDITION

Preserved for the bench.

This edition presents the original American Gunsmith editorial work in a modern, searchable layout while preserving its issue, author, and source-page history.

ABOUT THIS EDITION

The article text comes from the original issue and has been reflowed for legibility. Obsolete subscription, ordering, association-service, and house-advertising pages are not reproduced.

Original article images appear only where permission has been confirmed. All other image positions remain visibly reserved so approved art can be restored without rebuilding the issue.

Report corrections or rights information to **editor@gunsmithmag.com**.

AMERICAN GUNSMITH

DIGITAL ARCHIVE EDITION · MAY 2012

ISSUE RECORD

ORIGINAL DATE	May 2012
VOLUME	Archive volume not stated
ISSUE NUMBER	05
SOURCE ID	ag-9b8da4ee59748165afed3378

DIGITAL EDITION

PUBLICATION	American Gunsmith
EDITION	Digital Archive Edition
ARCHIVE STEWARD	Innovation Network LLC
CONTACT	editor@gunsmithmag.com

Editorial fidelity. Article titles, author attribution, issue relationships, source-page references, and article text remain bound to the archive corpus. Layout, covers, navigation, and conversion notes are newly produced for this edition. Historical statements remain part of the original editorial record.

IN THIS ISSUE

Contents

A complete guide to the searchable editorial work preserved from May 2012.

RIFLES

USAR Shooters Train 82nd Airborne Division

BY AMERICAN GUNSMITH EDITORS MAY 2012 ORIGINAL PP. 2

Soldiers with 2nd Battalion, 504th Parachute Infantry Regiment, 82nd Airborne Division gathered on the bleachers on Range 79 at Fort Bragg for Designated Marksman training. What made the class unique was that it was conducted by select members the Army Reserve Shooting Team. Teaching "huddles" were an on-going part of the Enhanced Battle Rifle training—an individual weapon system that will be used by the unit's squad designated marksmen during their deployment to Afghanistan.

MSG Norman Anderson, a four-time Mountain Man Trophy winner at Camp Perry, led a class on calling the wind and reading mirage for long range shooting. The USAR Shooting Team was contacted by 2nd/504th PIR leadership to conduct squad designated marksmanship training on the EBR, according to MSG Richard R.

Kalina II, who was in charge of the training event. "Any time we have a chance to enhance the skill of the warfighter directly … that's a privilege," Kalina said. "You can't place a value on that type of experience." Kalina said that many of the trainers have been with the USAR Shooting Team for many years and have valuable experience to share. "Being able to impart the knowledge that we have to our next generation, that is going to firmly implant on their minds," he said. "In turn, when they make the option to either stay with the Army or go to the Army Reserve or National Guard, they're going to think back to the training they have received right now and they're going to do the same for the next generation." The EBR itself is not completely new but a modification of the M14 service rifle, said SSG John Arcularius, a former USMC Rifle Team member, current NCOIC of the Army Reserve Service Pistol Team and gunsmith for the FBI.

"The best thing we can give them is confidence in their weapon's ability to hit at those extended ranges we expect it to hit," he said.

Arcularius said the training is broken down into five phases to include: position evaluation; dry fire; range estimation; elevation, windage and hold off-hold on; and field fire qualification. "In the beginning of it, we are training them. As we progress, we are actually teaching them how to train themselves and how to sustain their training so when we go away they can still keep confidence and competence to keep a sustained force," he said. Staff Sgt.

Joshua Tyree, a squad leader in 2nd Platoon, Alpha Company, 2nd/504th PIR, said the training was challenging but enjoyable.

The shooting team instructors provided "very, very good teaching points," Tyree said. "They really relate the training to how we are going to use it when we get down range." Tyree, who deployed to Iraq twice, said the training was definitely a confidence builder for him and his fellow airborne soldiers. "Hands down, this is some of the best training I've had in the last couple of years," he said.

HISTORY

A Tale of Two 96s

Most 96 Mausers have matching numbers on all parts. Despite increasing collector interest, this action still ideal for customization.

BY WENDELL DEANER MAY 2012 ORIGINAL PP. 3-7

It was the best of times, it was the worst of times. With apologies to Mr. Dickens, please pardon my plagiarism, but it might really have been one of the best of times for firearms development in history. Arthur Savage introduced his model 99. Oliver Winchester gave the world his many lever-action models. Peter Paul Mauser took his 93, 94 and 95s and improved upon them to build the 96 Mauser, also known as the Swedish Mauser as it is long associated with that country.

This was the last action, and the last cock-on-closing Mauser, to be introduced before the renowned Model 98 came upon the scene. Smokeless powder was coming into its own as well as developments such as the Model 1905 Automatic Colt Pistol (ACP) and its ammunition which would become the model 1911. Many other inventors were at work although most of their firearms have become obsolete and fallen by the wayside after but brief success.

We could also make a case that this was the worst of times since world war was barely over the horizon. Luckily for collectors and builders like me, Sweden decided to remain neutral during the two world wars. The only 96s I know of that actually saw combat use were a number of samples that were transferred to Finland to fight the Nazis. The Swedes did not have to make wartime production shortcuts and the quality of these rifles found today reflects that fact.

Some years ago I was able to procure two good complete actions sans barrel and stock. They are marked “CARL GUSTAFS STADS, GE- VARSFAKTORI”, meaning literally, Rifle Factory of Carl Gustaf’s Town, indicating they were produced at the state armory in a small town in From left to right, a syntheticstocked version, the as-issued military model and a wood-stocked rifle. 35 Remington. Sweden. Gustav V, of course, was the king of Sweden at that time.

The dates stamped on top of the receivers of these my two rifles are 1915 and 1922. Barring a few dings and bumps the actions are in very good condition considering their age. Rather than delve into a history that all of us are familiar with let me say that most 96 Mausers available today have matching numbers on all parts. They have increased drastically in price from just a few years ago. Collectors are discovering them and care should be taken accordingly before any chop and cut conversions.

So, what was I to do with these actions? I decided to build one with a wood stock and the other with a synthetic handle to give myself a comparison of which I would like most. I could always fit an extra wood or synthetic stock if I wished to have even more flexibility. If finished

A TALE OF TWO 96S CONTINUED ORIGINAL PAGE 4

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact **editor@gunsmithmag.com** and reference AG-65AFED3378-A1625-P04-F01. Know the rights holder? Please ask them to contact us.

AG-65AFED3378-A1625-P04-F01

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact **editor@gunsmithmag.com** and reference AG-65AFED3378-A1625-P04-F02. Know the rights holder? Please ask them to contact us.

AG-65AFED3378-A1625-P04-F02

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact **editor@gunsmithmag.com** and reference AG-65AFED3378-A1625-P04-F03. Know the rights holder? Please ask them to contact us.

AG-65AFED3378-A1625-P04-F03

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact **editor@gunsmithmag.com** and reference AG-65AFED3378-A1625-P04-F04. Know the rights holder? Please ask them to contact us.

AG-65AFED3378-A1625-P04-F04

properly even a plain walnut stock looks better than most of today's factory jobs. With hand checkering prices what they are I figured that if I was able to put a couple of reasonably professional scratches on it the value would increase proportionately. A plain, yet functional, point pattern will dress up any hunting rifle. The synthetic stock might be more practical for the hunting field since they aren't prone to warping and any dings and dents are not as disastrous as on a traditional wood stock.

Weight of these rifles would also be an issue. I wanted to see which of the stocks would be the best match for a hunting rifle. These two almost identical rifles would make for an interesting test. As it turned out, the wood-stocked rifle ended up at nine pounds with scope and the synthetic was slightly lighter at eight and three quarter pounds. I realize other gunsmiths have used these actions for.the .308 class of cartridges. Just don't load 'em too hot, they say. I can't condone that practice.

The .308 Winchester is offered by the various factories with pressures upwards of 50,000 Copper Units of Pressure, while the original 6.5x55mm Swedish round designed for this action rarely tops out at 45,000 CUP. Some of these high-pressure loads are bound to find their way into our conversions. If you want higher pressures use a Mauser 98 or one of the many commercial actions available and don't fool around with a marginal piece.

That being said, I have converted several of these rifles to .35 Remington and, being a fan of the .35s, I decided to take that route. This Notice the depth is about file width. You must make your own decision about this shape for whatever pleases you. cartridge operates in a pressure range that the 96s will accommodate easily. Actually, you can go a little hotter than factory and still be in a comfort zone with these boltaction rifles compared to a lever action.

Remember I said "a little." The relatively weak structure of the .35 Remington case doesn't lend itself to being turned into a magnum. I can usually get around 100 to 150 feet per second more than standard loads in my 96s and still feel safe. Another factor is the modifications that have to be made at the bolt face to get these rifles to feed and eject properly. The case head diameter on a 6.5x55 is a unique 0.480 inches. On

A TALE OF TWO 96S CONTINUED ORIGINAL PAGE 5

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact **editor@gunsmithmag.com** and reference AG-65AFED3378-A1625-P05-F01. Know the rights holder? Please ask them to contact us.

AG-65AFED3378-A1625-P05-F01

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact **editor@gunsmithmag.com** and reference AG-65AFED3378-A1625-P05-F02. Know the rights holder? Please ask them to contact us.

AG-65AFED3378-A1625-P05-F02

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact **editor@gunsmithmag.com** and reference AG-65AFED3378-A1625-P05-F03. Know the rights holder? Please ask them to contact us.

AG-65AFED3378-A1625-P05-F03

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact **editor@gunsmithmag.com** and reference AG-65AFED3378-A1625-P05-F04. Know the rights holder? Please ask them to contact us.

AG-65AFED3378-A1625-P05-F04

Do not make a knife edge out of this part. Taken together they change the military persona of this rifle to one that should be taken afield. a .35 Remington it is 0.460 inch leaving 0.020 of slop. I solved this problem by obtaining a universal extractor from Brownells and shaping it to fit. This seems to work well but one of the problems I encountered had to do with the almost hundred-year-old magazine springs. I suggest replacing them with new ones.

A full load of five .35 Remington cases loaded with powder and 200 grain bullets stress these ancient but critical parts. If the springs are not replaced I recommend using only three rounds, one in the chamber and two in the magazine, to ensure good feeding. This will be plenty of firepower in almost any deer hunting situation. Having made these decisions my course was set and I looked forward to seeing the finished products. How close would they be to each other? I didn't want clones.

Each should have its own personality but still be twins. To keep the rifles different I polished one of the actions to 600 grit and left it in the white. These actions are made of a cupronickel alloy, which is a mixture of copper and nickel. This helps protect the action from rust but still requires proper maintenance. The bolt body, shroud, cocking piece were left as is. The Timney safety came blued from the factory but I left the handle unblued and I haven't done anything to the extractor beyond fitting.

I blued the rest of the gun and I think gives an interesting appearance to the rifle. The other action was polished to 320 and blued with the rest of the parts. The actions on these rifles aren't the only parts that need attention. I decided to reshape the military trigger guards to something a little less "clunky" and thoroughly polish the bottom metal. As can be seen in the illustrations, I "pinched" or A high polish is needed here because of the way it stands out on the completed rifle.

The numbers and crown stamp are legible and not dished out by polishing. The front of the Redfield scope mount matches the contours of the receiver. indented the guard on top to have a more pleasing flow and rounded the bottom to match. I also enlisted my grandson's help in this process. First, because this job is tedious and not much fun, and second, I wanted him to understand the process and also appreciate how much work this actually takes to get the bottom metal in order.

One of the floor plates had various dings in it that needed to be worked out. Putting it on a block and tapping the underside with a heavy punch can iron out many of the more egregious dents. When looking at the bottom of the rifle this little piece really stands out as well as the trigger

A TALE OF TWO 96S CONTINUED ORIGINAL PAGE 6

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact **editor@gunsmithmag.com** and reference AG-65AFED3378-A1625-P06-F01. Know the rights holder? Please ask them to contact us.

AG-65AFED3378-A1625-P06-F01

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact **editor@gunsmithmag.com** and reference AG-65AFED3378-A1625-P06-F02. Know the rights holder? Please ask them to contact us.

AG-65AFED3378-A1625-P06-F02

Because of its prominent position on the rifle care should be taken to polish it accordingly. The synthetic-stocked gun came standard with a hard-rubber pad and swivels. The difference in recoil is subjective. Take your pick. guard, so it must be finely polished. I decided to use three grits of paper to polish: 180, 220, and 320. I wanted sanding lines to be lengthwise in the final finish, so I started with 180 grit in line with the bottom metal then going to 220 across and finally 320 back in line.

Using several shapes of sanding blocks I took a lot of care to keep the original lines straight and the corners sharp. Also, this piece is numbered and has a small Swedish Crown stamped on it, so care was taken not to dish these markings out. Something is needed to hold the bottom metal while working it. It should be sturdy, especially when using the file, however, these pieces can be easily bent and disfigured if clamped in a vise. I solved this problem by making my own holding fixture from apiece of angle iron.

I did much the same thing for holding the action and a treatise on the subject can be found in the May 2010 issue of this magazine. This is a relatively simple fixture to make and I have included several pictures of it in use. For indenting the tops of the trigger guards I started with a half-round bastard mill file and removed about the width of the file where the guards begin to be covered by the stock and then smoothed out the ends of the cut.

You will have to make your own decisions as to what you are satisfied with. I continued with a second cut and smooth file before finally using abrasive paper for the final finish. The bottom of the trigger guard was again started by using the half-round bastard file and working across the guard in a rounding fashion until I got the shape I wanted and then finishing with smoother files and abrasive paper as described. One thing, do not overdo the rounding of the guard and end up with a knife edge.

What you want is to take the 90-degree angle off the military feature and leave a pleasing shape. If too sharp it will hinder good gun handling. Make sure this edge is polished correctly and will not cut a trigger finger. I like peep or receiver sights. With the possible exception of an intermediate eye relief scoped Scout rifle, I don't think there is along gun that is easier to handle in the field than a peep-sighted carbine. That being said, my aging eyes preclude their use.

Peeps are fun and OK for the range but when hunting respect for the game animal demands more precise sighting equipment. That's why I decided to drill and tap these guns for scope mounting. Grinding off the top of the rear of the receiver is required to use Weaver-type mounts, however, only three holes need to be drilled for the Redfield JR one-piece bases so I decided to try these for a change. The weight is only a few ounces more than Weaver bases, plus they look good and are very strong.

The wood-stocked rifle was fitted with a Leupold six power which I feel is ideal for a short-range (150 yards) cartridge such as the .35 Remington. The synthetic-stocked gun has a Leupold 3x9 mounted. I think both scopes look good on these rifles. The cocking piece on a model 96 Mauser is a strange affair which I am told was mandated by the Swedish Military. It is an L-shaped part with serrations on top apparently so the rifle could be cocked by hand.

The Swedes must've had really strong fingers because I have a lot of trouble pulling one of these things back. I don't know if it was the real or imagined misfires with period ammunition that the high command was trying to fail safe or not, but I can't think of any other reason for this part's existence. Like our appendix, it is unnecessary. I ground it off both guns. I believe it gives the back of the receiver a better appearance and it has no place in the function of the rifle.

Be careful not to go too fast and compromise the heat treating of the part. Polish it up and no one will ever miss it.

I am a fan of Timney triggers and safeties. These parts are relatively inexpensive and they work. What more can you ask? The triggers are held in place with one pin and are easily installed. Adjustments are simple and seem to hold the settings well. The "wing" safeties require a small notch to be cut in the cocking piece for proper fitting. This is best accomplished by using a small cutting wheel on an end mill such as the Dremel. On the synthetic-stocked rifle I decided to use the military trigger.

I ended up with a very crisp five and one-half pound pull without creep while the Timney is a two and one-half pound dream. Still, the military two-stage trigger is well suited for hunting where a too-light trigger can present safety concerns. An aftermarket trigger may require a minor milling operation on the guard to provide clearance. Both bolt handles were cut off and new ones from Brownells welded on. I am not happy with the result, but it is what it is.

I used a bolt-welding jig supplied by B-Square and plenty of protective heat paste for this project. While I can't say I've used dozens of different knobs on these kinds of rifles, I felt that the clearance left something to be desired. A lot of grinding and polishing was needed to get these bolt handles where they could be worked under a scope properly. I think it may take more than one welding session to get all the little pits removed that are supposed to be minimized by the TIG process.

Of course, welding skill and experience come into play here. The barrel for the wood-stocked rifle was obtained from Brownells and is a short-chambered Shilen. The other rifle is served with an Adams & Bennett tube from Midway USA. Both barrels were cut to 22 inches and tipped with a recessed crown to protect the muzzle. As most of you are aware, there is a huge discrepancy in the price of these barrels and I was very curious to compare how well the guns would shoot. Both were hand-chambered using a finish reamer supplied by Dave Manson Reamers (mansonreamers. com, The leading edges of the chambers were beveled slightly with a stone to ensure proper feeding. The Fajan synthetic stock came from Midway USA. It sports a hardrubber recoil pad and pre-installed sling swivels. Installation was a straight forward drop in.

The only problem with these types of stocks is that most bedding materials such as Acraglas won't adhere to them, so the bedding is pretty much limited to what you get without modification. Surprisingly, at least to me, this rifle shoots more than adequately. I obtained two blank extractors from Brownells and went to work with the Dremel tool equipped with a tiny sanding drum to shape them. I also used my one-inch belt sander to good effect. This job is not necessarily the task for an amateur.

I suggest on your first attempt to study the curves and angles of the original extractor. Don't go too fast because you can burn this part enough to make it unusable with the power tools. Use the belt sander to thin the chamber end so that the bolt can close over it and to thin the entire extractor as needed. Use the Dremel to make the small concave cut and curves needed to fit the .35 Remington case.

The case should feed and be held under the extractor with a firm fit and be able to pop up under spring pressure from the magazine. As far as I know these extractors are not available pre-cut for the 96s so if any of you have an easier way to do this job I would really like to hear from you The wood stock as received resembled the shape of a hacked-out 2x4. At least I thought it was very rough. The suppliers have to produce them so the gun maker has enough excess wood to shape it to his or her liking.

If you've never fitted apiece of wood like this to a gun you're in for a real treat. I started on the bottom metal since this must mate with the receiver perfectly. After many hours and the use of copious inletting black the top of the gun was mated with the bottom of the gun. The action was glass-bedded leaving the barrel free-floated. I then took it to the range to see if it would blow up when fired. Just kidding, of course.

I had checked the headspace and just wanted to go ahead and shoot these guns after working on them for so long. I didn't try either for accuracy, only to see if they went bang safely. Besides, I didn't have anything else more important to do that day. Back in the shop I mounted a Pachmayr Decelerator recoil pad and started shaping the wood stock. Underneath that rough exterior I was surprised to find a pretty nice looking piece of wood.

I finished it using my usual method, which is too involved to go into here and I'll save it for another article. The stock was not that expensive but turned out to have a very pleasing look with good grain and some figure in the walnut. I checkered the grip with a simple point pattern at eighteen lines to the inch. This was not an exquisite handle of hard exhibition-grade French Walnut and I didn't think it could hold any finer checkering, but I like it.

Accuracy with these two guns was respectable with consistent three-shot inch groups at fifty yards with the barrels not yet broken in. I wish I could get some of my newer factory rifles to shoot this well. I cannot note any difference in the accuracy level of the more expensive barrel to the Adams & Bennett tube. Time and a lot more shooting may prove me wrong on that observation.

The 96 Mausers make an interesting project for conversion but they are becoming scarce and expensive and the collector value has risen proportionately. If you have a 96 action gathering dust in your shop I recommend turning it into a hunting rifle you can be proud of. AG

FROM THE ARCHIVE

Favorite Brands Shouldn't Vanish After They Get Acquired

Once a product has made a name for itself it's better business to keep a good name alive and build on it.

BY CHICK BLOOD MAY 2012 ORIGINAL PP. 8-9

There's an undeniable truth in serving gunsmithing clients. They are hugely loyal to the name on a firearm or firearm accessory. The loyalty remains strong unless and until there's a drop-off in quality or performance, or until the item has gone out of production. As an example, I've always favored a preference for Millett scope rings and bases on rifles. When properly installed they refuse to lose zero even after thousands of rounds have been put through the gun.

Of course, I omit any lost zeros due to dropping the rifle on a rock or trying to wrap it around a tree when a deer got away due to lousy marksmanship. I remember a time when it required a no risk guarantee from yours truly to convince a dyed-in-the-wool Brand Xlover to try the Milletts. They didn't let me down. From then on it was Millett rings and bases installed on, or replace what was already installed on, every rifle and handgun the former Brand Xfan ever owned.

At a time not long ago Millett occupied SHOT floor space near or equal to room rented by the major firearm manufacturers. I always enjoyed spending some of my time in the Millett exhibit. I liked the products. I liked the people promoting the products. I trusted them, too. After Tom Millett, the company founder and guiding light, passed on the floor space shrunk. Eventually, it shrunk to zero. Though Brownells continue to offer the product line I still wondered what had become of the company and those people.

This year, the answer hit me right between the eyes when I turned a certain corner on the vast SHOT Show floor. The "booth" looked more like a general store. Huge letters over its entrance spelled out BUSHNELL. The light dawned. Millett is now an acquisition of Bushnell Outdoor Products. This, as I later discovered, was the result of a chain reaction begun by Mid Ocean Partners, a private equity firm, that acquired Bushnell in 1999 from another private equity firm, Wind Point Partners.

Mid Ocean wisely kept the chain reaction going and in 2008 Bushnell acquired the assets of Simmons Outdoor. This practice of acquiring companies whose products mesh profitably with and expand ones own line reflects the history of Bushnell. The company still bearing that name dates back to 1776 and built the first submarine used to wage war called the Turtle because it looked like one when in the water.

Its inventor and builder was David Bushnell, who also proved gunpowder would explode under water while still a student at Yale. In developing his submarine, Bushnell applied the use of water to submerge and raise it, a practice that remains the same today. A full size model of the Turtle is on display at the US Navy Submarine Force Museum in Groton, Connecticut. In amazing contrast to the model and permanently anchored in the river outside the museum is the world's first nuclear powered submarine, the Nautilus.

A final connection between the Turtle came in 1948. In that year, an American entrepreneur, David P. Bushnell, a first cousin on the sub's inventor, entered the optical business by importing and selling high quality binoculars most US citizens could afford. The binoculars sold well. Soon, Bushnell became a familiar name on rifle scopes, spotting scopes and telescopes and became Bushnell Corporation.

After extending its line to GPS devices, night vision equipment, laser rangefinders, holographic sights, game cameras and Weather FX, a personal forecaster for hikers and hunters, the brand name was expanded to include the present, more all-encompassing Bushnell Outdoor Products. All the acquisitions and resulting growth have followed the origi-

FAVORITE BRANDS SHOULDN'T VANISH AFTER THEY GET ACQUIRED CONTINUED ORIGINAL PAGE 9

Above and Focus for both is done simultaneously, images can be viewed on the flip-out color LCD and saved on a SD card. nal Bushnell mission statement: To develop and market superior optical products that enhance the experience of outdoor and sports enthusiasts. Admirable and ambitious but followed up by what? More of the same. In my opinion, there isn't a lemon or stranger on the Bushnell Outdoor Products tree. Sure beats acquiring a company or product just to milk it and dump it. Don't you agree?

RIFLES

All About Rifle Floor Plates

BY ROBERT K. CAMPBELL MAY 2012 ORIGINAL PP. 10-13

It is funny that something as simple as a trap door can give you so much trouble. Talking about rifle floor plates, I have seen them dented, varnished shut by an owner that did not remove the stock during a refinish job—or botch up—and other manner of problems. The floor plate itself is not always a problem. The floor plate latch or lock is the part that gives us the most problem.

Designed to give easy access to the rifle magazine for cleaning and spring replacement or to dump the cartridges if need be, many shooters do not know how to open the floor plate. Pry marks bear mute witness to this deficit in knowledge. They did not go through the military training the original user of the rifle did or, in the case of commercial actions, they did not study the owner's manual. There are a number of different types of floor plates and there is much crossover between military and commercial types.

As an example, I am never surprised at comments made by folks in the shop when spotting a rifle with no floor plate. They automatically assume the rifle is a single shot. Sure, some bolt guns are single shots but some repeaters have blind magazines. I think the main reason for single shot rifles these days are for target shooters tired of misfeeds and nose down malfunctions, but that is a different story. So, we need to be able to educate both the consumer and ourselves.

As abroad impression we may note that the military-type floor plate is most often detachable and the sporting variety is hinged. What about the Mosin–Nagant? Take each one at its own merits. The military floor plate is often detachable as it was intended to give soldiers a means of removing sand or other matter from the magazine in an inhospitable environment. The Mauser type floor plate does a good job.

Beyond a doubt, a floor plate such as the Mosin-Nagant that is easily opened with only finger pressure and easily cleaned was a generation ahead of the others. Of course, a removable part means it may become lost. In conventional floor plate designs the floor plate usually features a pair of cuts in the one piece trigger guard housing, with the trigger guard housing and magazine box usually machined in one piece. The floor plate cuts allow small protrusions on the magazine box to fit into these cuts.

The engagement is tight and solid and backed up by a plunger that is in turn loaded by a spring. The spring loaded plunger usually works well enough with the spring supplying energy to the latch keeping the floor plate closed and secure. Popular wisdom indicates the floor plates were designed to be opened by the pointed nose of a military full metal jacketed bullet, but I have seen all manner of tools used to open the floor plate. A pointed screwdriver is one. Knives always mar the floor plate. Fit is important.

There is always a type of cover around the spring loaded plunger that opens the floor plate. The receptacle that shields the spring loaded plunger is about a quarter inch in diameter. A screwdriver head larger than a quarter inch will not fit in this hole but

that has not prevented generations of shooters from attempting to open the rifle floor plate in this manner. Others have attempted to pry the floor plate up without activating the plunger. The best tool is still a rifle bullet nose as this is the tool the designers intended to be used. Otherwise, a small brass punch may be used. The plunger is pressed, then the plate is released to be pressed to the rear to open.

To replace the floor plate press the plate forward until the tabs catch and close the plate over the plunger. Some plungers are more aggravating than others and each must be learned. Remember if the plunger is disassembled small parts are easily lost. On a number of military rifles the plunger is situated above the floor plate by about 0.25 inches. When you wish to dump the contents of the magazine it is easy enough to activate the plunger and open the floor plate.

This is preferable to running the cartridges through the action and chambering them. Some floor plate problems are the result of rough handling but most floor plates problems area result of accumulated oil or wood finish and the thorough cleaning of the parts is the simple cure. There are a number of small parts in the plunger assembly. These small parts, including the plunger and the springs, must be carefully cleaned to solve most problems.

Occasionally you will have a rifle come in the shop with a frozen floor plate. The rifle's floor plate will not unlock and or budge for anything. The procedure for addressing this issue is easy. Remove the floor plate/ magazine and trigger guard assembly from the stock. Liberally soak the retaining plunger area with penetrating oil, allowing the rifle to set

War time cuts to the Springfield design included eliminating the plunger tube opening device once fitted to the floor plate. overnight. Once you have allowed the penetrating oil to take effect then attempt to actuate the floor plate release again. Occasionally the plunger still will not release after this liberal soaking. A failure to unlock at this point is not that rare and the answer is fairly simple.

When you remove the trigger guard and magazine housing you will see the floor plate is a two piece affair with a retaining pin that holds the pieces together. Drive the floor plate retaining pin out and you will be able to separate the floor plate, the magazine housing and trigger housing. The next step is to carefully clean the parts or replace the spring and plunger if need be. When the parts are cleaned properly and freed of rust they usually begin to function properly.

Sporting guns work a little different, often using sliding and pivoting floor plates. The spring-driven plunger for commercial guns is often mounted in the trigger guard and operated by pressing the floor plate release. In the case of the Mauser Mark Xaction, the actuating lever is inside of the trigger guard. With the Ruger Model 77 the release is on the outside forward edge of the trigger guard. These type of plungers offer a different problem.

The spring-driven plunger mounted in the trigger guard is subject to inadvertent operation and the spring may set. Rusted springs are not uncommon. Binding is another problem. Sometimes, something as simple as backing out the trigger guard screws works when the floor plate release does not release properly, indicating the floor plate may have been over tightened. This backing out of the screws requires just a small amount of movement but if works often.

A problem that is more aggravating is the floor plate releasing and dumping the cartridges when the rifle is fired. This problem is a result of the shifting of parts or wear caused by years of hard use. The parts become peened or lengthened. Magnum rifles sometimes exhibit this issue. The fix didn't require replacing the parts but by working the existing parts. The rifle floor plate and floor plate release were disassembled and the release arm was shortened by the cut-and-try method.

Each incremental cut was very small and checked each time until the problem was fixed. The time involved with these fixes isn't extensive but the expenditure of ammunition and range time can be. Some fixes require no range time at all as you know when the problem is fixed but a magazine floor plate that swings open in recoil is another matter. The nose of the release arm must be shortened enough to prevent the problem but the arm must remain long enough for good function.

I would think that a release arm that had stopped functioning could be peened to instigate function but I have never ran into that exact problem. Some shooters prefer blind magazines and feel that the blind magazine gives superior stock fit. They feel that the floor plate harkens to military heritage. This much is true, but just the same, the floor plate does not prevent good fit, good bedding or proper accuracy. Others feel that a magazine rifle will sometimes rattle.

This is true of some designs but others such as the FN Patrol Rifle with a Mc Millan stock seem never to rattle. When there is an accuracy problem with the rifle and the floor plate laps over the wood, the wooden stock must be relieved in order to allow the proper clearance. This is straightforward work and usually is needed when the stock has absorbed moisture or become warped. The floor plate is an often overlooked part of the rifle's function.

These parts are handy and functional, but occasionally need our attention. AG

MAINTENANCE & REPAIR

Gunsmiths Do Make Mistakes Sometimes

A tale of drilling and tapping a blind hole in a barrel and how a bad mistake in the shop turned out for the best.

BY KEITH FELDHAHN MAY 2012 ORIGINAL PP. 14-20

There have been many articles written in both trade and hobby gunsmith literature about drilling blind holes, tapping, extracting broken taps and the like. All readers who aspire to any skill at all with routine tasks in the gun shop are encouraged to read and soak up all there is on this important subject as it is very important stuff. This article begins with the correct way to perform this work in the shop.

Following that is a story of what actually happens when things went awry for a well-intentioned gunsmith being just a little too casual in his work methods and managed to mess up such a hole. For those not familiar with this work, there are many ways to accomplish a threaded blind hole in a barrel. This is this is how one gunsmith approaches it with a few variations included for those of you who like variety in gunsmithing.

The work properly includes first making sure the barreled action has witness marks where the barrel joins the action so the front sights can be more easily maintained at their correct twelve o'clock position if the barrel is ever removed and replaced. This doesn't have to be done until the time of removal when the barrel and action are stamped together. The mark is usually placed where it will be covered by the stock where it won't show, typically at six o'clock where the barrel joins the action.

Although the above is good practice, you may wish to ask the customer before you actually pound a permanent mark into his barreled action as some might consider it defacing their gun. After marking, the unit is ready for the real work. Now to the drilling and threading. There are the two basic procedures. The first involves using a Forster Universal Sight Mounting Fixture and the second uses a regular drill press vise.

If using the Forster fixture, the barreled action is carefully leveled fore and aft in the jig and clamped into place using the provided clamps in preparation for drilling and tapping. Side to side leveling is automatic when clamping a barreled action in place. Next, the hole's location fore and aft is determined and the jig properly adjusted so a hole guide is located where desired. Now the hole guide part locking screw is tightened.

One does need to use the drill press depth stop when using the jig, however, the only way to mess up using the jig is to use a too large drill guide bushing, resulting in drilling the hole in the wrong place, or neglect to adjust the drill press depth stop correctly and drill too far. Using the drill press depth stop properly adjusted and a suitable drill tap bushing in the jig yields a hole is drilled to the correct depth perfectly centered at twelve o'clock in a single operation. Easy, wasn't it?

All this was done more or less automatically by the jig. The jig is recommended because of the ease of use but a drill press vise using the following technique will do just a good a job. There are flat locations on the bottom of rifle actions such as the Enfield, Mauser and Springfield which make leveling easy. Using a good quality machinist's level such as a Starrett, Brown & Sharpe or Lufkin, level the barreled action both side to side and fore and aft and then securely clamp it in the drill press vise.

Next, place the ramp on the barrel in its desired location fore and aft and level side to side. In the below example, Mr. Customer was very specific about how far back from the barrel's crown the ramp was to be installed. Exact front sight ramp location fore and aft was specified as critical because of the choice of stock.

This arm was to be full stocked, fitted with a steel fore end cap and the front sight had to be in a location which would give the appearance of a classically-stocked Mannlicher-Schoenauer sporting carbine. The customer is always right, remember? The ramp is carefully leveled. For this task I prefer a Starrett No. 130 level (starrett.com). The ramp is then securely clamped in place while still level, checking the mounting hole isn't blocked by the clamps.

I like to scribe the outline of the future hole in the barrel with a sharp scriber through the mounting screw hole in the ramp while it's clamped in place, a technique I learned from Clyde Baker in his book Modern Gunsmithing. We'll need a good drill press with a proper functioning depth stop. James Virgil Howe in The Modern Gunsmith describes his recommended approach to sight installation in the chapter, "Fitting of Sighting Equipment." To paraphrase, the

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact **editor@gunsmithmag.com** and reference AG-65AFED3378-A1628-P15-F01. Know the rights holder? Please ask them to contact us.

AG-65AFED3378-A1628-P15-F01

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact **editor@gunsmithmag.com** and reference AG-65AFED3378-A1628-P15-F02. Know the rights holder? Please ask them to contact us.

AG-65AFED3378-A1628-P15-F02

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact **editor@gunsmithmag.com** and reference AG-65AFED3378-A1628-P15-F03. Know the rights holder? Please ask them to contact us.

AG-65AFED3378-A1628-P15-F03

ARCHIVE IMAGE WITHHELD

The original image is not displayed while permission is being confirmed. If you are the author, photographer, or rights holder, contact **editor@gunsmithmag.com** and reference AG-65AFED3378-A1628-P15-F04. Know the rights holder? Please ask them to contact us.

AG-65AFED3378-A1628-P15-F04

The barrel will be blued later. Hardened steel and easily sharpened. barrel or barreled action is leveled and securely held on the drill press table and the screw-on ramp base is securely clamped in place to guide the drill. He states that it is best to use a body drill of such size that it will just pass through the sight base hole and "spot" or just dimple the barrel in the correct hole location. Note that this spotting drill is much too large for anything more than just starting the hole.

Because the drill just fits the hole it can't wander, so the hole has to start in the correct location. The dimple serves as a substitute for a center punch mark to prevent wandering when drilling into a curved surface. Mr. Howe discourages removing the ramp and instead instructs to leave it in place in order to use it as a guide for the remaining work.

He does state very clearly and correctly to next remove the oversize "spotting" drill and change to a correct size tap drill, a # 31 gauge drill for 6-48 threads typically. This drill is smaller than the hole but won't wander if the dimple was deep enough to be of the full tap drill diameter. W.

F Vickery, regarded as another old master of the art, notes in his classic work Advanced Gunsmithing, "A drill that just fits the screw holes through the sight base is used to spot these holes, just drilling [to] the full depth of the drill point…" This depth can be limited using the drill press depth stop or simply estimated by eye. Some practice on scrap may be in order here if needed. The idea is to start the hole in the exact location desired and drill it true. Most front sight ramps these days come with a Mr.

Howe was not describing a front sight ramp installation but instead the installation of a Lyman 48 receiver sight on a US Model 1903 receiver bridge, his installation being on the right side of the receiver bridge. Receiver peep sights reigned supreme in his day, which was before scopes came into their own, however, the same rules of sight installation apply. The next part is very important. Before actually drilling the hole with the tap drill, set the drill press depth stop.

Too deep is all the way into the bore itself. Double check this. After assuring the stop is correctly set to not drill too deep, go ahead and drill the hole to full depth. Next, we'll

GUNSMITHS DO MAKE MISTAKES SOMETIMES CONTINUED ORIGINAL PAGE 16

130. switch to a bottoming drill, still of the tap drill size, which cuts a flat bottom hole instead of the usual 135 degree cone pointed drill which would have drilled a hole closer to the rifling at the center than at the perimeter. Drill with the bottoming drill just enough to get a flat bottom hole. If properly constructed, the bottoming drill won't drill beyond this, unless it is sharpened like an end mill.

A simple bottoming drill can be made by grinding a regular twist drill in the correct size perfectly flat on the end. The barrel now has a flat bottomed hole ready for threading. You didn't break through did you? Incidentally, there were no Forster Sight Mounting Fixtures in production when Mr. Baker, Howe, and Vickery were authoring their fine works on gunsmithing, but regardless of method, there is nowa blind hole in the barrel of correct size, depth, and location.

Before moving on, let's look at a somewhat different method. Call it the center punch method if you like, this doesn't require a Forster jig either. The above method is followed to the point when the circle is scribed on the barrel. Now, remove the ramp base before drilling. Recall previously the very carefully-determined exact hole location on the barrel was scribed through the mounting hole in the ramp. Use layout fluid or a magic marker first to make it easier to see the scribed circle for what comes next.

Very carefully centerpunch the holes location in the exact center of the scribed circle. The use of magnifying eyewear is recommended. If it is perfectly centered in the scribed circle, start drilling the hole, using a bit smaller than the tap drill size. For example, a #45 gauge size for a #6 thread is good. Of course, all drill press depth stop setting cautions apply. Stop after drilling to the depth of the cone and carefully inspect the work.

If the hole appears perfectly centered by eye when observed with magnification as before, proceed to drill to full blind hole depth. If the center punched hole isn't perfect, "walk" the center punch by angling The hole sizes are for common tap body diameters.

it slightly to the barrel's surface and deepen the punch mark by successive light blows until it is perfectly centered again. Working slowly and carefully is called for here. Sort of a trial and error and correct error procedure. At an average gunsmith's charge of $25 to $50 a hole for drilling and tapping, depending on complexity, there is really no reason to hurry. The best cure for a heavy hand with a hammer is a smaller hammer. Use of really small ones are in order.

A four ounce ball peen or cross peen hammer is a good choice. Drill again but stop as soon as the drill has found its way. Repeat the inspecting procedure as above and if the hole is advancing and is centered, only then proceed to full finished depth using the smaller drill. If for some reason after all the above method is used but the hole is still not centered the following procedure comes into play.

Use a Dremel Moto-Tool hand held with a fine steel cutting point and grind the #45 drill hole slightly oversize, bringing it back to being perfectly centered by eye in the scribed circle. Then drill to tap drill size and clean the hole in preparation to cut the threads. It's nowa perfectly centered correct tap drill size hole in the scribed circle and it's drilled to the correct depth.

It is generally considered good practice among gunsmiths to allow one thread diameter minimum between the bottom of the hole and the lands. A #6 thread has a major diameter of 0.137 inch and a minor diameter slightly less. Whether major or minor diameter is intended can be debated, but not here. Attaining this minimum can be difficult with a thin barrel at the muzzle. Next, the hole is to be threaded.

This is done using a series of taps, taper, plug, and bottoming if it is a deep enough hole, just plug and bottoming only if it is a less deep hole and maybe just the bottoming tap only if it is very shallow hole such as our blind hole. In the incident described below, the tapping process

GUNSMITHS DO MAKE MISTAKES SOMETIMES CONTINUED ORIGINAL PAGE 18

This was done before repair to "see" the dimple in reverse and after repair to confirm it was removed. Gunsmiths are into recycling, too. is where the problem arose, not the drilling. More about that later. If we were careful while drilling a very good job was the result. Now it's back to using the jig or alternately using a substitute method for threading. First with the jig.

After drilling and cleaning the hole with compressed air, pipe cleaners or other suitable means, the drill bushing in the jig is exchanged for a larger tap major diameter size bushing which is just a little larger than the major diameter of the tap. With this bushing in place and a clean, well-lubricated, sharp tap in a Tee handle tap wrench, begin to tap the hole. Advance the tap a half turn, back up a quarter turn and repeat until the hole is threaded as far as the taper or plug tap can advance.

Don't forget to remove and clean the tap with compressed air and/or a tooth brush as needed so the tap doesn't become clogged with metal chips. When the tap has bottomed and can advance no further, back it all the way out, clean the hole until completely clean. Exchange for next shape tap in the progression, plug or bottoming, and repeat the procedure as necessary. When the hole is threaded all the way to the bottom the job of threading is done. The hard part is done. Hurrah!

Now, if not using a jig to guide the tap the threading is done using a handy tool called a tapping guide. It is simply an inexpensive V-block with suitable size holes for the tap shank sizes drilled thru the apex near the ends. It was convenient to locate the holes near the ends of the block. Two were made from blocks with two different size holes in each and have served me well for many years. One End of story.

One of the clamps is a home made replacement. of these blocks, when placed on around barrel serves to guide the tap so it is at a right angle to the center of the barrel. Starrett and other makers, including the "Made In China" brand, make inexpensive Vblocks and these are entirely adequate for making into tapping guides. Blocks that are not hardened and tempered are easier to drill.

Using this method, a suitable new, sharp, and clean, tap held in its holder is lubed with good cutting oil and inserted into the tapping block hole that fits it most closely. The block can be either hand held onto or clamped in place onto to the barrel. While hand held works very well, if

using the clamp, before tightening it, line up the tap's point with the hole just drilled so the tap can be hand turned and backed up easily. Proceed to cut the threads in the usual manner. Note the tapping guide if held in place does just that. It guides the tap. That is it keeps the tap at a right angle to the barrel and aligns the tap with the center of the barrel. This is what is needed. So much for the tapping guide method. Don't want to use a tapping guide? Don't have one and haven't made one?

Another way to insure the tap goes straight into the hole is to retain the barrel in the vise after drilling. Don't unclamp anything. Exchange the drill in the drill press chuck for the first tap to be used and, using the drill press feed, gently advance the quill and turn the tap by hand, backing up as needed. This method also will start the tap into the hole perfectly straight. After a turn or two of this the tap is firmly enough held in alignment so it will continue to thread straight.

The chuck is then loosened, the quill withdrawn, the assembly taken out with the tap still in place. The tap can then be secured in a tap holder and the threading completed by hand. If no intentional side play is put on the tap while hand turning it will thread true to how it was started in the drill press. Complete the threading process and clean the hole. There is nowa properly threaded hole. So from this somewhat lengthy narrative, choose the tools and techniques that work best.

The use of special hardened drills, tapping lubricants, procedures for spot annealing, drilling near bolt lug recesses and the like are interesting, related subjects but best left for another time. What Went Wrong The second part of this discourse concerns an error made in threading a blind hole at the muzzle of a thin barrel. It was part of a routine installation of a currently-available front sight ramp.

This happened after many years of drilling and tapping barrels and receivers for all variety of sights and scope mounts, which just goes to show one can't be too careful in this business. The barrel was quite thin at the muzzle necessitating very careful work in drilling and tapping a shallow blind hole for a screw-on ramp front sight so as not to break through into the rifling or cause any other damage.

Any damage to the all-important last little bit of rifling near the muzzle will affect the ability of the barrel to guide that little bullet straight and true to its intended target. At the risk of too much repetition, careful use of a good functioning depth stop on the drill press is called for so as not to drill too far and cause serious damage. Other cautions apply as will be seen. Everything started out fine.

Awhile back a customer brought into the shop four small ring, 1895 Chillenomarked Mauser barreled actions in 7x57mm intended to be handed down to various family members in the almost forgotten family tradition of handing down cherished items. Each rifle was to be individually made up to an individual family member's taste. A nice gesture I wish I would have thought of myself. The barrels were to be drilled and tapped for identical screw-on ramp front sight installation.

Having done this kind of work many times no problems were anticipated. An acceptable price was agreed upon and the job was taken. These were thin barrels at the muzzle and screws allowing a minimum of four threads to hold the ramps were selected. It is considered good practice to get a full thread diameter of thread length because that is the generally accepted amount needed for full holding power. A thread diameter length of threads for a #6 thread is 0.137", which comes out to 6.5 threads.

This barrel wall thickness allowed for only four threads when leaving enough metal at the bottom of the hole for strength. A similar rule of thumb for the adequate amount of metal under a blind hole near the muzzle of a high powered rifle is not so easy to come up with but the old one thread diameter of metal between a blind hole and the bore is a good starting point.

This also was not possible due to the thin barrel wall as it wouldn't allow a full #6 thread diameter of threads between the bottom of the hole and the rifling while getting enough threads for adequate hold, so only a thin layer of barrel thickness would be left under the blind hole to the bore. Still, I felt confident the thin layer would suffice as my customer was only going to use standard pressure loads.

As an aside and to support this, elsewhere in Howe's book he states pressure in the barrel at the muzzle is only about a tenth that at the chamber, based on testing by him while he was heading up small arms development for the US military and verified by others Frankford Arsenal. So, a thin web of metal is enough at the muzzle. The alternative ramp attachment method is to soft solder—not usually recommended—or hard solder, which has the risk of descaling the bore due to dull red heat needed.

Three of the four units were completed with very satisfactory results. The installed sight ramps checked out straight and level on each barrel with nothing showing in the bores. When it came time to do the fourth sight installation the same procedure as above was used … so I thought. A quick check of hole depth before tapping the last barrel revealed all four barrels were drilled to the same depth. Nothing showed in the bore.

I say this because I checked all the holes as drilled with a Brown and Sharpe depth gauge with the cone point accessory rod so the four hole's depths were uniform as would be expected on identical barrels using identical clamping, same drill and retaining the drill press depth stop setting.

The holes were all drilled with a regular pointed twist drill. A bottoming drill, which was considered good practice by Mr. Howe, was not used to finish the holes. So we have a hole with a 135 degree cone point on its bottom as with the others not breaking through in a light contour barrel. There is adequate barrel thickness here for about 1/8" total of hole and thread length to the point of the cone point drilled hole, no more. Now to tapping, which you are all experts on from reading the above.

A bottoming tap was used which hadn't had its blunt cone point ground off to a flat end. This tap was used to both cut and bottom out the threads on the hole in the last barrel. Apparently, it was turned enough at the end against resistance, as felt at the hole's bottom, to very slightly dimple the bore on the last barrel. This is not a good thing! Not noticing the dimple at this time, all the barreled actions were returned to Mr.

Customer who soon brought back the one with the dimple in the bore with a repair request because the dimple was "noticeable." I ruminated for awhile and really wasn't quite sure how to proceed. My mentor is now long gone and couldn't couldn't ask him, but time can be a friend in these situations. The customer indicated he wanted satisfaction but not a hurried solution.

After awhile, I reasoned I could remove the dimple, pound out the dent and then verify there was no damage done by asking the customer if he would test fire the repaired barrel to compare with the others. This comparison would be the litmus test to see if I had pulled this off. The alternative would be to make it right with a replacement barrel. If the repaired barrel shot as well as the others I could feel such a repair as this was a success. The customer agreed. Now I was faced with actually removing the dimple.

I first assessed the depth of the dimple. The barrel is in 7mm caliber and measures as groove diameter 0.284", lands 0.277", rifling depth 0.0035", six groove rifling, groove width about 0.050" and outside diameter 0.553". The maximum mandrel diameter passed at the dimple was 0.272" as received for repair, so the dimple was 0.005" into the land diameter. My customer certainly had a reason for concern.

To remove the dimple, I used successive mandrels with gentle tapers on their ends to cold upset the bore back to land diameter. The mandrels are hardened and highly polished. Using a little high pressure lube on them, mandrels were inserted from the muzzle in 0.001" diameter increments to bring the bore back to 0.277" at the dimple. Now that the dimple was a flat top and at land diameter. Did I mention the dimple was almost completely located in a groove? How to remove it from the groove is the next challenge.

The ramp is a Williams Gun Sight Company unit installed very close to the muzzle, making the threaded hole and dimple very close to the muzzle, too. If I were to reach the dimple with an upsetting tool (broach) from the muzzle it would have to extend into the barrel just under one inch. I fabricated a steel broach slightly less wide than the 0.050" groove width with a thickness of about 0.042" for strength.

Having a broken Browning A-5 flat spring already heat treated to spring temper, I carefully ground it to size and shaped with an anvil or ironing part only at the extreme end, reducing the dimensions elsewhere so as to not alter the rifling grooves on the way in. This is hard enough to survive the abuse of being used to remove a dent in the rifling of a modern chrome-moly barrel, which is likely not harder than 30-35 Rockwell "C" scale hardness.

The broach was used with successively larger undersized mandrels and pushed in the dimpled groove until the dimple is upset back to groove diameter. Soft lead slugs driven through the bore before and after the repair and inspected with magnification verified the effectiveness of the repair. I trusted the sharpness of the adjacent rifling lands to suitably guide the broach the one inch distance to the dimple with care taken not to not round off the two adjacent rifling lands as the broach travels in.

No account was taken of the rifling twist in this exercise, but given the short distance traveled the rifling twist effect is small. A light touch is definitely called for. The broach was driven with a small hammer as barrel steel is being upset and moved a full 0.0035" of dimple height in the groove. This was done using successively larger mandrels to back up the broach and push it incrementally into to dimple until it was fully reduced to zero height in its groove.

This is easily determined by feel as the broach had the raised ironing part only at its end. The dimple only showed as a small mark of no height in the groove after. Carefully measured soft lead slugs driven through the bore after the work measured the same 0.284" diameter for each of the three pairs of rifling grooves, verifying the dimple was reduced to zero. I measured this with a thin-jawed dial caliper.

Note reduced to zero dimension is not really the same as "gone" as it was still possible under magnification to see which groove had the dimple and observing the rifling groove scratch marks on the lead slug showed differences. A lead lap could have further smoothed this out if desired but my goal was that the dimple no longer could affect accuracy.

In test firing, the repaired barreled action was assembled as a complete rifle together with one of the others, both as identical as could be made using the 100+ year old actions and shot for comparison. Five shot strings for record indicated each barrel shot substantially the same. My customer appears satisfied with these results, as am I. AG

RIFLES

Mauser Mag Madness

Gunsmithing is working through problems. Here's a problem and solution I had when modifying a magazine for a customer's Mauser rifle.

BY A.L. CAVANAUGH MAY 2012 ORIGINAL PP. 21-22

This problem actually started about 15 years ago when a customer gave me a nice M98 Deutsche-Waffen Munitions 1908 Mauser receiver that he had tried to open up the feed rails to chamber the rifle in a cartridge with a larger case. Honest, it wasn't me! I finally came up with and answer to this problem after a few years and after many more years I finally completed it. You see, I have to admit that I am a procrastinator. It took me six months to get around to finally writing this article. OK, you get the idea.

Now back to business. The answer ended up being a Remington M788 detachable magazine that lent itself to mount quite nicely into the existing magazine well of the M98 trigger guard. While it only holds three rounds, this magazine doesn't overly protrude out the bottom. This action was going to be chambered in 7mm-08. Numrich Gun Parts Corporation (gunpartscorp.com,) has Magazine Track Schematic (Design by the author) Missing is the small piece that goes in front of the mag well.

M788 magazines available in this caliber. Note that .308 and 7mm-08 magazines are same-same. The hardest part of this whole project was to fabricate the "track" that the M788 magazine rides on and this required considerable welding work. The welding on this was done with a heliarc welder by my best friend of many years Robert Age, who has at least 50 years of experience with all types of welding. The pictures are self-explanatory.

Of course, the magazine track requires the most time and milling work to finish it out. I have included a schematic of it. The other three pieces of metal for the magazine well were cut from 1/2-inch by 1/8-inch stock to fit the sides of the well. Also notice that I beveled the edges to allow a better weld. The third piece goes to the front of the magazine well. Note that these pieces also were spot welded on the inside of the magazine well.

The original magazine release button hole was plugged, welded and milled out. I drilled and tapped a small hole in the magazine track and a corresponding hole in the back of magazine well where track resides. This will enable you to line up the track, making sure the magazine will be in the right position before welding.

After welding, dress it off, run a 1/4-inch end mill long enough to clear the 1/2-inch pieces and bring the mill to the back of magazine well almost close enough to the track to touch off on the side of well. As you go to the front it will cut more metal off because of the taper and you're opening up for the straight magazine. After these cuts were made for the magazine a bevel on top of the track for bolt clearance was done with a sanding drum on my Foredom.

With this finished, I barreled the action with a sporter-weight tube originally chambered in .280 Remington that I took off a Ruger M77, rethreaded for the Mauser and rechambered for 7mm-08. I'll leave the details of that for another article. I'd like to thank one of my mentors, Reid Coffield, who in the past helped me out of many a problem. Happy trails and keep on gunsmithing! AG

MAINTENANCE & REPAIR

Reader Forum

BY AMERICAN GUNSMITH EDITORS MAY 2012 ORIGINAL PP. 23-24

Browning A Bolt A customer brought in a Browning A-Bolt Medallion in .280 Remington that is missing the complete lower floor plate assembly, including the action screws. I ordered all the replacement parts from Browning and found that the assembly is 1.400 inches too long for this stock. I called the service department and they said these were the correct parts that just require some minor fitting.

This is a 1990 production rifle and I'm guessing there has been changes made to the design since but I haven't been able to verify that. From looking at the stock it looks like it may have been a one piece floor plate since there is no hole in the stock for a forward trigger guard screw. I suspect that there was a change in the length of the hinge plate.

Skip Ritchie Skip's Gun Repair No info on a possible engineering change but we think the fitting is better done by removing wood from the front or rear of the magazine well rather than removing metal from the floor plate assembly. Winchester 62 Where can I find a parts breakdown along with detailed disassembly and reassembly instructions of the Model 62 Winchester .22 pump rifle? The Gun Digest Book of Firearms Assembly/Disassembly Part III: Rimfire Rifles seems to cover all but the 62.

The newest Gun Digest book on rimfire rifles covers the Winchester Model 90. What appears there also applies to the Rossi copies of the Winchester 62 and 62A. Armi 9mm and Remington 67 I recently came across a Armi Fratelli Tanfoglio SPA model BTA-90 9mm pistol and am looking for an assembly/disassembly schematic. Also, I am looking for a front receiver screw for a Remington Model 67 .22 rifle and do not have the ability to make one. Would you where I can obtain one?

European American Armory and Tanfoglio-design pistols were once a major item. Call EAA regarding the schematics For the Remington, call Brownells and ask for a complimentary copy of the parts source list for out-of-production firearms. On it you'll find some that specialize in Remington. Remington 1100 Safety I have Remington 1100 LT-20 that is a right hand gun but has a left hand safety. Can I change it to right hand safety without changing the whole trigger assembly?

The hole where the safety detent ball and spring resides is off set to the left a little so I guess it is left hand trigger assembly. Can you get a safety that would work right handed? We published an article on switching the Model 870 safety back in January 1999. In reviewing it prior to providing this response we became a little concerned about the complexity of the technique despite the fact that it works and is described in the Remington Armorer's School manual for the 870 and 1100.

The article also referred our readers to Jerry Kuhnhausen's shop manual on the two shotguns, available from Brownells. This manual goes so far as to include drill sizes and relocation of the detent ball and spring hole when performing the conversion. George Butler While we've done this work and know of many others who've done so successfully, our cautious nature inhibits our forging ahead regardless of the safety systems of any firearm.

We don't believe Remington offers a separate safety but a complete trigger assembly might still be available that you can install in the gun and remove any possible liability on your part. Contact Remington Service Brad Pope Obviously, changing the position of the safety button will not change the direction in which the shotgun ejects. A right-handed shooter firing a gun made for left handers will still be bothered by the spent hulls flying across his or her face. Baby Hammerless I have been given a Henry M.

Kolb Baby Hammerless .22 caliber revolver. It needs quite a bit of work. Internally almost everything needs to be restored. The only schematic I've been able to find is for the model 1916. This particular piece is marked "PATS. APRIL 5.10/BABY HAMMERLESS/MODEL 1910" and the serial number (59) is located under the left side grip plate. I understand there is a slight difference between the 1916 and 1910 but do not know what it might be. Is there a schematic available for the 1910 and what are any differences?

RJ Litch Paulo de Mesquita St. Petersburg, Florida This pistol has been out of production since 1938 and had a folding trigger. In the condition you describe it can't be worth more than $100, probably less. You can send a photo of the gun to the NRA National Firearms Museum, Fairfax, VA 22030 nramuseum. org) to see if they have any more data on the revolver.

We don't but the fact that you have at least a date and year to provide might secure you a copy of the patent from the United States Patent and Trademark Office in Washington, DC (uspto.gov). Hanover Arms Shotgun I have a Hanover Arms side-by-side double barrel 12 gauge shotgun. I do not believe this gun has very much value but it was my grandfathers and

I would like to fix it up. The stock is in bad need of some repair. The gun has 2-1/2 inch chambers that I intend to ream out to 2-3/4 inch. When restored the gun will probably not be shot very much but I thought it would be safer to ream the chambers since the smaller shotshells aren't readily available. Besides, this will make a good practice project.

The rib between the barrels is stamped "Belgium Fine Damascus." I know that damascus is good in the knife world but am wondering if this is as good in a shotgun barrel or something to be concerned about? Seems like I had heard something about them maybe shattering like a grenade when fired. Perhaps these barrels should not be fired at all? I would also like to reblue the gun but I know that it can't be hot blued because of the soft soldered barrels. What would be the best method of rebluing it?

I have heard of slow rust and nitre bluing but I don't know much about these methods. Would either of these methods be good for this application or would using a cold blue like Formula 44/40 be best? Several alarm bells are ringing. First, "Belgium Fine Damascus." Such barrels were made by hammering strips of steel around a mandrel. Place a modern shell in the chamber, close the action, pull the trigger and the barrel trying to digest that shell can unwind violently.

Second, this was probably a black powder gun and, if fired, would require ammunition charged with equivalent smokeless powder loads regardless of chamber length. The Hanover guns were made by Crescent Arms which dates back to 1892 and gained some fame, or infamy, for manufacturing shotguns on order stamped with the name of local hardware stores. We understand and sympathize with your attachment to shooting your grandfather's gun.

We wouldn't, unless you contact Briley Manufacturing (briley.com, and inquire about fitting it up with full length barrel inserts. This would mean reducing the gauge but would make the gun safe for modern loads. These inserts aren't exactly cheap but they're far more economical than a stay in the hospital. If your eventual decision is to transform the shotgun into an honored wall hanger we suggest you treat the object gently. We can't determine stock S.

Jones condition unseen but its restoration will very likely require some filling, light sanding, restaining and drying. This could be followed by multiple applications of warm, boiled linseed oil, with at least 24 hours between applications, until a desired degree of gloss is obtained. The metal, if not badly pitted, can be cleaned of rust with 0000 synthetic steel wool and lightweight motor oil.

It should then be completely degreased, polished with a mild abrasive paste, degreased again and allowed to dry before applying the cold blue of your choice. After bluing, apply a film of water dispersing oil and you should end up with a quite handsome tribute to the memory of the old shotgun's original owner. 1943 P38 9mm I took my P38 out to shoot. Upon firing the first round the extractor flew into my shirt pocket!

I was lucky as the ground was covered with leaves so I was able to retrieve the part, however, I'm at a loss as to what holds the extractor in. I don't see anything in schematics I've reviewed. Rex J. Raine Retention is via the sear pivot pin and pressure on the extractor is applied by its spring. Remington 51 I am attempting to replace the extractor on a Remington Model 51 .380 ACP pistol.

In attempting to slide the end of the extractor in place and pry the extractor hook away enough to allow the round projection to drop into the hole in the bolt, the extractor cracked in the center. Is there a secret to getting the extractor end to slide in while getting the round projection in place? Trey Emmanuel Sounds like you got a bit too rough and broke the little fellow. The secret is to find a replacement or weld up and finish off the broken one in combination with patience. Don't force things. AG

SEARCHABLE ISSUE RECORD

Archive index

American Gunsmith

The complete searchable archive of a technical journal devoted to craft, repair, maintenance, machining, and restoration.

GUNSMITHMAG.COM · EDITOR@GUNSMITHMAG.COM