



DEC 2012

DIGITAL ARCHIVE
EDITION

PRECISION ARMS WORKSHOP

AND THE AMERICAN GUNSMITH ARCHIVE

A TECHNICAL JOURNAL OF CRAFT, REPAIR & RESTORATION

12

ARCHIVE ISSUE NUMBER

INSIDE THE ARCHIVE

CENTURY ARMS TP-9

THE BEST GUNSMITHS • COUNTERBALANCING THE STOCK • A HUNTER'S FINISH FOR THE WOODEN STOCK • RESTORE, R...

ORIGINAL METHODS. MODERN ACCESS.

ARCHIVE EDITION 108

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 • DECEMBER 2012

ISSUE RECORD

ORIGINAL DATE	December 2012
VOLUME	Archive volume not stated
ISSUE NUMBER	12
SOURCE ID	ag-dc4d0dbffdd4467724d23c41

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 December 2012.

-
- 2** The Best Gunsmiths
AMERICAN GUNSMITH EDITORS • ORIGINAL PAGES 2

-
- 3** Century Arms TP-9
CHICK BLOOD • ORIGINAL PAGES 3-8

-
- 9** Counterbalancing The Stock
NORMAN E. JOHNSON • ORIGINAL PAGES 9-10

-
- 11** A Hunter's Finish For The Wooden Stock
WENDELL DEANER • ORIGINAL PAGES 11-15

-
- 16** Restore, Renovate, Ruin
PAUL MAZAN • ORIGINAL PAGES 16-18

-
- 19** Savage Long-Action Model 112
Retrofit
NORMAN E. JOHNSON • ORIGINAL PAGES 19-21

-
- 23** Reader Forum
AMERICAN GUNSMITH EDITORS • ORIGINAL PAGES 23-24

TOOLS & FIXTURES

The Best Gunsmiths

BY AMERICAN GUNSMITH EDITORS DECEMBER 2012

ORIGINAL PP. 2

When selecting a gunsmith, it's very important to know that very few are skilled at working on all types of firearms. Gunsmithing requires an extensive amount of special tools and equipment. However, it is common for them to farm out some portion of their work to other specialists that can assist when needed. Another important consideration is that just because a gunsmith can do an awesome job of accurizing a .45, it doesn't necessarily mean he's the guy you want building your next benchrest rifle.

It's always a good idea to find a specialist that works on the same type of weapon that you want serviced. You wouldn't go to an eye doctor for a heart operation—no matter how good a doctor he is. Do your homework and check references before selecting a gunsmith. It's a good idea to actually see some of the projects that a perspective gunsmith has done. Then find how long it took to complete them. The best gunsmiths will quickly admit that their expertise doesn't include working on all different types of firearms.

Before I learned how to find the best gunsmith, I was often disappointed at the poor craftsmanship that was performed on my guns. That convinced me (over 30 years ago) to do most of my own gunsmithing. I've found that doing it myself usually provided the very best results. However, the time it takes to get perfect results can be considerable—sometimes even ridiculous. After taking every shop course in high school, I worked in a machine shop for two years.

Since then, I've been lucky to always have access to a machine shop and a wide variety of special tools. This machine shop belongs to one of my shooting buddies. We've worked for decades designing, repairing and building custom guns and unique parts for our guns as well as for local gun shops. Hopefully, we'll be able to produce some of those unique gun parts in the near future and make them available to other shooters.

I now find it easy to respect the work done by skilled gunsmiths, because I understand the amount of time it takes to do quality work. It's hard to imagine producing top quality work and being profitable enough to stay in business. Skilled gunsmiths do exist; and believe me, they really earn their money. Many of them seldom bill you for the full amount of time they actually spend while working on your guns. Specific gunsmithing experience is just as important as knowing how to use a wide range of tools.

You'll find that the best gunsmiths are real craftsmen, and they're proud of their handywork. That's a another important quality to look for when selecting a gunsmith. I've found that it's a common mistake (and sometimes very costly) to select a gunsmith just because he lives nearby. It's far better to select someone that has earned a good reputation doing the specific type of gunsmithing that you're looking to have done. - Commentary by Larry A.

Willis, the owner of Innovative Technologies, a shooting sports design company, and the holder of several patents for reloading equipment. He can be reached at larrywillis.com, Casselberry, FL 32707,

HISTORY

Century Arms TP-9

A not-so-light once over with the new TP-9. If you've done much pistol work there are no real mysteries here, just some red flags.

BY CHICK BLOOD DECEMBER 2012

ORIGINAL PP. 3-8

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-7724D23C41-A1674-P03-F01. Know the rights holder? Please ask them to contact us.
AG-7724D23C41-A1674-P03-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-7724D23C41-A1674-P03-F02. Know the rights holder? Please ask them to contact us.
AG-7724D23C41-A1674-P03-F02

A few months back I reported on another new Turkish import from Century International Arms, Inc. called the Stingray (American Gunsmith June 2012), a design mechanically related to the CZ-75. I relied heavily on the two articles I'd written previously on the CZ pistol in developing detailed disassembly/re-assembly information to pass along to you for there was none available at Century Arms. The pistol was that new to their technical staff. The Stingray is aimed at the CCW market.

As soon as I opened its sturdy plastic case I determined the TP-9 was a different animal. It was wearing a bulky "hood" over its slide and the pistol, sans a loaded magazine, weighs in at nearly 1.50 pounds. What I just called a hood isn't a plastic guard for the slide and I'll tip off what it really is later. For now, a mere mention that it slips easily off to the front by pressing the upper section of its release on its right side is sufficient. Sufficient? Yes, and also very necessary.

While the hood is in place the pistol cannot be field stripped. It seems most curious, then, that no mention of the part, its purpose, how it relates to a couple of plastic pieces stored in the case lid or the need to re-

move it prior to field stripping show up in the owner's manual. First, though, a few more specifics about the TP-9 that do show up. The pistol is chambered for the 9x19mm cartridge.

It comes with two 15 round magazines, has a 4.09 inch barrel with a predicted lifetime of 30,000 rounds, an overall length of 7.1 inches, a height of 5.7, a width of 1.35. How much farther a gunsmith can go is described in the text. Note the Glock-like trigger. 2 sizes of interchangeable grip backs, a rear sight adjustable for windage and a MIL-STD 1913 Picatinny rail for clamping lighting devices or lasers to the frame.

Unless the intent is to house the gun in a backpack, the addition of a flashlight or laser to this pistol makes simple concealment on the person nearly impossible. Hence, I would classify the TP-9 as a home defense weapon. Lord knows it's packing plenty of firepower. Aside from and in addition to that it seems to be well constructed. Outer steel parts are poly coated against corrosion while helping to lubricate the slide and frame. The barrel is black chrome lined and cold forged.

IT FEATURES AN AMBIDEXTROUS DECOCKER

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-7724D23C41-A1674-P04-F01. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1674-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-7724D23C41-A1674-P04-F02. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1674-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-7724D23C41-A1674-P04-F03. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1674-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-7724D23C41-A1674-P04-F04. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1674-P04-F04

Next to the holes is a 1/16" standard drift punch. The two left of the 1/16th punch are ideal for the ultra small pins and pin holes in the TP-9. mounted on top of the slide just forward of the rear sight, a click adjustable three dot sight system and a cocking indicator. OK, no more sales talk. On to the goods. Field Stripping The magazine is out. There's no live ammunition nearby. You're wearing eye protection, the chamber is empty and, equally important, you have pulled the trigger to relax the trigger spring.

There's a take down catch (9) on the left side of the frame. On the other side is a take down catch piece (10). You have to push both 9 and 10 downward to begin removal of the slide. Easy this ain't. To make it tougher, you have to nudge the slide forward with a

thumb while holding down the two parts. Once you have it started the slide slips off the frame quite smoothly. Invert the slide.

Push the recoil spring (53) forward then lift it, the spring A B guide (51), spring guide stop (52) and spring pin (54) out as a unit. Follow with removal of the barrel (50) in a similar manner. This is as far the owner should ever go. As for you, read on. Detailed Disassembly Before charging ahead examine all the pins you'll be facing. If they look like roll pins—you know, no solid center—treat them accordingly by using roll pin punches exclusively. By the way, I've never come up against a tapered roll pin.

They've all drifted in either direction. Nevertheless, the Century Arms techs The opposite end of the catch (B) is on the right side of the frame. Both are simultaneously pushed downward to free the locking block. who regularly work with the pistol replace all pins from left to right in reassembly. The pins can be coped with but as I plodded my way through the TP-9 I became pretty convinced the manufacturer was determined that no one should take it apart.

I'll flag each problem area I had to tangle with by starting every sentence or paragraph it involves with the words Code Red. As you probably discovered in field stripping it, the TP-9 is well put together. Don't let that frighten you. By working with reasonable caution you won't break anything.

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-7724D23C41-A1674-P05-F01. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1674-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-7724D23C41-A1674-P05-F02. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1674-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-7724D23C41-A1674-P05-F03. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1674-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-7724D23C41-A1674-P05-F04. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1674-P05-F04

A B For example, the lug at the upper rear of the firing pin collet (36) locks into a cut-out in the top of the slide end cap (43). If you press inward on the collet lug with a blunt tool while pushing down of the end cap, the cap will leave the collet behind as it travels down and out of the slide. Once again, invert the slide. The lug of the firing pin/striker (38) will require your attention. So will the firing pin block (31). Don't ignore them.

Push the lug to the rear, lift up on it slightly and depress the block. The firing pin assembly should free up to be withdrawn to the rear. Chances are pretty fair it will pop backwards on its own. Righting the slide, allow the block and its spring (30) to be rapped out on your bench. If they don't show up do not push them inward. They could become in-

volved with each other in the firing pin tunnel and plug it up. Pick them out with tweezers. Our first Code Red.

As you can see now the firing pin assembly has A B Compare it to the holes in the top of the slide. The wood chip is in position to protect the frame and the smallest cup punch placed to drift the catch/catch piece retaining pin downward. a number of components. Yes, it can be further disassembled for replacing damaged or lost parts. The most frequent amongst the latter are the retainers (40). In addition, when the assembly has been removed, two things happen.

The decocker can be lifted off the slide and the decocker springs (41) are likely to hurl themselves out of the slide. Make sure they land on a "no bounce" surface. I trapped the

little devils in a shallow pan of water, wiped them dry, air blew them with a dryer, lightly lubed both and placed them in a They are very easily lost. It is built up on its pivot pins and reassembled in a manner similar to other pistols with rear-mounted firing systems. magnetic parts tray to immobilize them until needed.

One Code Red is followed almost immediately by another in the extractor (35). A single numeric mention of it doesn't do removing this particular gremlin justice. I can't blame the entire problem on the extractor itself, however. It's the extractor pin spring (32) and pin (33). Actually, it's primarily the pin and pin holes. Look at the bottom of the slide. The pin mikes to 0.140 in diameter. Now flip the slide over and get take a gander at the two upper

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-7724D23C41-A1674-P06-F01. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1674-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-7724D23C41-A1674-P06-F02. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1674-P06-F02

holes. They're both out-of-round, smaller than a 1/16 inch punch and the rearmost of them aligns with number 33. Did I have to pick out apiece of drill rod small enough to enter the upper hole, cut off apiece, cup its end, harden it, then solder it into a short piece of cold rolled to fabricate a punch, spending time I didn't have doing it? No. Over in a tool drawer in the corner was the solution. It's a set of cup punches I purchased from Brownells about ten years ago and still offered in their latest catalog.

They are made specifically to start out round headed pins without marring the heads. I'd discovered they worked well on moving roll pins if the punch diameter mates exactly with the OD edges of the pin. There were six punches in the set with diameters measuring from 0.050" to 0.072". Into the small hole perfectly went a punch, I could feel it ripple past the inside of the extractor spring. A couple of mild taps later the pin began to exit its hole. A few more taps and it was out, bringing the spring along with it.

Of course I had to retain the extractor with a free finger. The extractor spring (34) would push it free of the slide and itself escape to hiding places. Removal and rein-

stallation of the front and rear sights present A The "hood" slips off when the upper end of the release lever (A) is depressed. The three screws bolt to the mounting piece of your choice and can be set for a number of rake and cant options. no major problems.

Just be careful not to lose track of the front sight retaining screw (49), the rear sight detent spring (44), pin (45) sight adjustment screw (47) and the sights themselves. It's time to tackle the Code Red situations lurking in the frame. In preparation for the challenges, I recommend you cram some on Glock pistols. The back end firing system of the TP-9 appears to have been mechanically approached with a Glock mentality. There are already sources of information available on the Glock system.

One is the Gun Digest Book of Automatic Pistols Assembly/Disassembly. There are also owner's manuals containing schematics to be downloaded from the web. The best source is the book *Glock: The New Wave In Combat Handguns* by Peter Kasler and originally published by Paladin Press. I happened to get my copy from Glock. Contents range from the pistol's genesis,

through the media frenzy about "plastic pistols," function, maintenance, features and even includes a resource list.

Just as I had to refer to previous knowledge of the CZ-75 when working up the past article on the Stingray, I suggest you dig into the Glock in preparation for the TP-9. To begin with, the housing for the TP-9 firing system is identified in the parts list as the ejector (17). Drift out the ejector pin (25). Lift the housing from the frame.

Coming along for the ride will be the trigger lever (22), firing pin activator (19), its activator pin (21), trigger lever spring (23), trigger lever bar (24), trigger bar guide (18) and firing pin activator spring (20). Make no attempt to further dismantle the firing system until you've made notes and sketches of how each part relates to another and in what order they're installed. Pay special attention to how the springs are fit to the components they influence.

You'll begin to recognize signs of the Glock mentality and initiate planning the later rebuild the TP-9 firing system using slave pins. Starting from the left side, you spear each part on the slave in place as it was when originally assembled at the factory.

CENTURY ARMS TP-9 CONTINUED

ORIGINAL PAGE 7

Let's move forward from the firing system to the locking block (6). First glance tells you it's secured to the frame by its pin (12). Partly true but Code Red: The block is also held in tightly by the takedown catch. Under magnification the schematic will show a small hole near the right end of the catch. You see, the right end of the catch fits into the takedown catch plate (10). The catch plate pin (11) holds the catch and the plate together.

The pin hole in the upper side of the catch plate is even smaller than the extractor pin holes in the top of the slide. I mention that because it gives you some idea of how small the pin is that lives in the catch plate hole. To make things nastier, the pin inside the hole has to be drifted enough to allow the catch to be withdrawn from the catch plate. It gets worse.

There's no way to get at the pin hole from the bottom and pushing the pin too far down via the top of the catch plate could result in impact with and damage to the frame. Reach for the set of cup punches again as one of them will fit inside the pin hole. Before you start any movement of the catch plate pin, protect that portion of the frame beneath it by doubling up a small piece of duct tape or temporarily attaching a strip of shim stock.

Even a little chunk of wooden coffee stirring stick between the catch plate and frame would do. With your first line of defense in place, tap downward slightly on the pin. See if the catch can be withdrawn from the frame. Try removing the catch plate from the catch. No luck? You only have to move that pin enough to clear the hole and release the catch so try a couple of more taps. Still no luck? You might be able to gain a bit more room between the bottom of the catch plate and frame by pressing down on the catch.

Alternately, and with extreme care, you can add another layer to your frame protector to push the catch plate itself upward, then press down on the catch. With patience and caution you will have moved the pin enough. When you have, remove the catch to the left, the catch plate to the right, place both aside, discard the protective material and lift out the locking block. Ready, set, go after the trigger (14). Drift out the trigger pin (13). Reach into the frame. Lift out the trigger and trigger bar (26) as a unit.

If you want to separate them later drift out the trigger bar pin (28). If you've done much pistol work at all there's nothing left in the frame that should need step-by-step instructions. That's the good news. The bad news comes in the form of the magazine catch (4) and spring (5). Consider the catch an innocent bystander. The spring, on the other hand, is an underscored Code Red. Looking at it, I've never seen a spring in a firearm as weird as this one.

It's no big deal to grab on to with a pair of long nose pliers and pull it off the catch, which meekly slides out of the frame in either direction, however, I didn't touch this spring. I'd been warned by guys who work with the TP-9 every day that there is no tool made this side of the pond, so far, making it possible to reinstall this odd ball among all springs. It is certainly no Turkish Delight. Leave it alone. About The "Hood" The truth is it's a quick release holster. Honest.

In addition to the holster, the two pieces of unidentified plastic arriving with the TP-9 offer a choice for packing the pistol. They both securely attach to the holster with its integrated screws and allow a variety of cant and rake options. The horseshoe-shape object slips over the uppermost rim of the pants as a paddle holster and the square piece serves as a belt supported mount adjustable to the width of your belt. This unit is very similar to the Blackhawk SERPA line. It is a nice addition to a solid pistol.

1 Frame 2 Back Strap 3 Back Strap Pin 4 Magazine Catch 5 Magazine Catch Spring 6 Locking Block 7 Locking Lever 8 Locking Lever Spring 9 Take Down Catch 10 Take Down Catch Piece (Plate) 11 Take Down Catch Pin 12 Locking Lever Pin 25 Ejector Pin 26 Trigger Bar 27 Trigger Bar Spring 28 Trigger Bar Pin 29 Slide 30 Firing Pin Block Spring 31 Firing Pin Block 32 Extractor Pin Spring 33 Extractor Pin 34 Extractor Spring 35 Extractor 36 Firing Pin Collet 13 Trigger Pin 14 Trigger 15 Slide Stop Lever 16 Slide Stop Spring 17 Ejector 18 Trigger Bar Guide 19 Firing Pin Activator 20 Firing Pin Activator Spring 21 Firing Pin Activator Pin 22 Trigger Lever 23 Trigger Lever Spring 24 Trigger Lever Bar 37 Firing Pin Return Spring 38 Firing Pin (Striker) 39 Firing Pin Spring 40 Firing Pin Retainer 41 Decocker Spring 42 Decocker Lever 43 Slide End Cap 44 Sight Detent Spring 45 Sight Detent Pin 46 Rear Sight 47 Sight Adjustment Screw 48 Front Sight Century Arms TP-9 (Specifications subject to change without notice) 49 Front Sight Retaining Screw 50 Barrel 51 Recoil Spring Guide 52 Recoil Spring Stop 53 Recoil Spring 54 Recoil Spring Pin 55 Magazine Case 56 Magazine Follower 57 Magazine Spring 58 Magazine Lock 59 Magazine Lock Pin 60 Magazine Plug

RIFLES

Counterbalancing The Stock

In the accuracy arena, where 1/8th of a minute-of-angle increments can make a significant difference, overall rifle balance can play a huge part. Among the more useful aids in achieving stock/rifle balance will be the addition of weight to the buttstock.

BY NORMAN E. JOHNSON DECEMBER 2012

ORIGINAL PP. 9-10

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-7724D23C41-A1675-P09-F01. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1675-P09-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-7724D23C41-A1675-P09-F02. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1675-P09-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-7724D23C41-A1675-P09-F03. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1675-P09-F03

The counterpoised riflestock has particular application in the benchrest rifle where the rifle rests on special supports, usually consisting of sand filled bags as an interface. The front support is positioned along the forend of the rifle and the rear sandbag support immediately forward of the buttplate. As a heavier barrel is installed on the rifle there is an increased uplifting of the buttstock with some loss of rifle stability and control. Adding some form of weight here does the trick.

Some use clay as a filler in those composite stocks which are hollow. Wood stocks allow a different choice in counterpoised weight con-

trol. In this case, more dense weight like lead or tungsten area good choice. Here is how I did it with an excellent outcome. Lead Shot As Stock Weight The rifle I worked on was a Savage Model 112 single-shot with a walnut stock. I had gone over the bedding and, as it was a switch barrel, I had chambered calibers .25-06, .257 Improved and .243 Winchester with a 1:8 twist.

While still testing the .243 1:8 twist Douglas barrel (douglasbarrels.net), which was still in the break-in stage, I was experiencing 50-yard quarter-inch, five shot groups. This is exemplary accuracy in any circle, but it would get even better. As the rifle was still in the

breakin period, I had it in a padded vise with the buttplate looking right at me. I decided to remove the buttplate and drill a pair of deep, 9/16th inch holes for installation of lead shot as counterbalance weight.

I would install a half-pound of lead shot into Two drilled holes hold the shot. A small funnel is used to pour the lead shot into the gunstock holes.

COUNTERBALANCING THE STOCK CONTINUED

ORIGINAL PAGE 10

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-7724D23C41-A1675-P10-F01. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1675-P10-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-7724D23C41-A1675-P10-F02. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1675-P10-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-7724D23C41-A1675-P10-F03. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1675-P10-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-7724D23C41-A1675-P10-F04. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1675-P10-F04

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-7724D23C41-A1675-P10-F05. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1675-P10-F05

Thin tape will hold the shot in place until the butt plate is replaced. Using lead shot is much less complicated and does the same job. two holes under the buttplate. I calculated the required half-inch hole depth to be five inches, which is a quarter pound per hole. A full 35mm film container holds a half pound of lead shot, which was divided out between the two holes. The simple formula for volume ($V = \pi (r)^2 \times \text{depth}$) showed that the volume of the film canister to be equal to two 9/16th inch holes.

I used a sharp wood bit with a lead hole to make the holes. A small funnel was used to pour the lead shot into the holes and thin tape used to hold the shot in place. The

screw-on buttplate was put on and the rifle was ready to shoot. While shooting, a noticeably improved balance was felt as a heavier. The balance point of this Model 112 Savage target rifle with 26.5 inch heavy barrel has been moved back to two inches forward of the receiver with the added half-pound of lead shot.

With the rifle balanced with lead shot in the buttstock, accuracy of this .243 Winchester rifle is little short of perfection. buttstock in the rear sandbag. It really doesn't take much to help. I always lift and tap the stock gently into the rear-bag from shot-to-shot, which helps prevent vertical grouping errors. Added weight in the buttstock helps here too.

The new balance point on the Savage Model 112 rifle with medium length action, 26.5-inch, number 7 Douglas barrel was now two inches forward of the receiver ring with a 6-24X Bausch & Lomb 4000 Elite scope and Talley Scope (talleymanufacturing.com) mounting system. Conclusions In shooting for extreme accuracy, sometimes the least obvious things can make the difference. Proper gun balance should always be considered with any changes we make in the stock, barrel or scope mounting system.

Cost is low to get the job done and it can work wonders in your shooting. AG

FINISHING

A Hunter's Finish For The Wooden Stock

times more ways to finish a wooden stock. That is a good thing. Like snowflakes, no two stock blanks are exactly alike. How could there be only one way to do this job?

BY WENDELL DEANER DECEMBER 2012

ORIGINAL PP. 11-15

I can imagine as soon as firearms were invented that the first hunter to carry one concocted some way of dressing up the stock to make it more to his liking. There are tales of boiling berries, crushed walnut hulls, whale oil, and “more things in heaven and earth, Horatio, than are dreamed of in your philosophy.” (Hamlet: Act 1, Scene 5. My apologies to The Bard.) Indians, early trappers, and mountain men adorned their firearms with brass tacks, feathers and deer skin.

This business of “my rifle is the nicest one in camp” has been going on along time and continues to this day. All of us appreciate a finely finished firearm but what that depends on who is doing the appreciating. I have seen a stock finished by having crushed eggshells glued onto it. To my eyes, it was a horror and blasphemy but the owner was very proud of it. So be it. Let us begin.

I freely admit to having copied the techniques and methods of the finishers who came before me, some masters of the craft, others unknown and unheralded. I continue to try and learn from any and all that I admire. From these parts I have created a whole process that works for me. That is what I will present in this article hoping to add one more idea to your own personal repertoire. Unfortunately, high-grade wooden stocks are not as available as they used to be.

That being said, it doesn't mean we can't produce a functional and aesthetic silk purse from the proverbial sow's ear if the right techniques are applied and care and patience are practiced. I get a charge out of reading the old books such as Monty Kennedy's Checkering & Carving of Gunstocks and hearing him bemoan having to shell out ten dollars for an exhibition-grade blank that we might have to pay a thousand dollars for today. There is still good wood out there but you will pay through the nose for it.

I was reading in one of the gun tomes the other day about how Dakota Arms has been scouring the world for the best wood for their firearms. They are not alone, and there is real competition for the premium stuff. I recently inspected a wall full of Dakota rifles at a local high-end gun store and the wood was simply amazing. When every rifle you sell goes out the door for ten thousand dollars, it is what it is. For the rest of us there are preinletted sticks of wood in the hundreds-of-dollar range.

My guns don't sell for the tab Dakota puts on theirs but I have bought a few inexpensive stocks that I have been quite pleased with, especially when comparing them to some of the factory options available. At least when I'm done with them anyone can tell they have been hand-finished with care. As an example, I recently was trying to find a semi-inletted stock for a 96 Mauser.

I wanted a full-length Mannlicher but couldn't find the exact contour I desired without having the stock custom cut, thereby increasing the price considerably. Perusing Brownells catalog one evening I spied a suitable stock (not Mannlicher) at an advertised price of sixty dollars! The stock was petite, perfect for the small-action Mauser which sported a 21-inch barrel. Also, it wasn't bogged down with the usual cheek piece and shadow line that seems so impossible to escape on a classic stock now days.

My idea was to try to emulate the oldtime Mausers that were carried by the hunters that roamed Africa and India in the golden era who could appreciate a short, quick-handling hunting tool. The price made it seem almost like a throw away, but my interest was piqued. When the stock arrived I was surprised to see some nice grain in the buttstock on the off side and a little on the near. The grain ran through the grip and seemed to have been cut properly to bolster the strength in that critical area.

It weighed around two pounds and seemed to be just what I wanted. Inletting the stock to the action and barrel was a standard job requiring patience as well as a modicum of skill. I went through the requisite amount of Jerrow's Inletting Black (kokopelliproductions.com). Trying to stop this stuff from getting on what I don't want it to, especially my hands, is an exercise in futility but it works

A HUNTER'S FINISH FOR THE WOODEN STOCK CONTINUED

ORIGINAL PAGE 12

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-7724D23C41-A1676-P12-F01. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1676-P12-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-7724D23C41-A1676-P12-F02. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1676-P12-F02

It weighs two pounds. Notice how blonde the walnut looks without finish. The stock will darken considerably during the process described in this article and, to my way of thinking, doesn't need to be stained. Better than anything else I've tried. I guess I could wear latex gloves but it seems like overkill. I can't say I like this job but I'm always happy when the final product is finished.

It never fails to feel like you've actually done something when you start with a piece of metal and wood that can't possibly be joined and end up with two pieces that mate like hand in glove. I guess that's one of the reasons I work in this profession. As usual, I inletted the bottom piece and magazine box of the Mauser before I started on the action itself.

I then glass bedded the bottom metal and rear stock screw in its original ferrule, effectively pillar bedding the rifle (the front has its own built-in pillar on the bottom of the recoil lug). Mauser had it right in 1896. Pillar bedding is nothing new and it stops the unwanted compression of wood stocks when the screws are tightened. Personally, despite all the hype, I don't think it does anything else. I got a shock when I finished bedding the action and barrel.

The stock itself was too thin to hold the tang of the action and the bottom rear of the box magazine in the position it was de-

signed for. It was a good half inch too thin. I have tried to include suitable pictures to explain the situation. I must say, in my limited experience, that I have never run into this problem before. Somebody at the factory can't measure worth a damn!

The bottom metal on a 96 Mauser is kind of thick and rides up like a boat's prow, sticking up from the back of the stock in an unmistakable eyesore. Oh well, that's what I get for buying a cheapo stock. I sure as the devil couldn't add stock material to cover it up but what in the heck was I going to do? I thought about my options for along time. Fortunately, the thickness of the Mauser bottom metal worked for me.

It has plenty of steel to function, and I simply ground it down to fit the stock's contour and forgot about it. Sometimes the easiest option comes to you last. It's not a perfect fit, however, not many will be put off by it and I was able to keep the stock and the project moving forward. Before starting the finishing process, I installed a Pachmayr recoil pad and used a scribe to outline the bottom of the buttstock.

After removing the pad, it was placed in a recoilpad jig from B-Square and ground down with my circular sander using an 80 grit abrasive wheel as close as I could go to the scribe lines. On aside note, in putting this article together I could not find the ex-

act same jig listed on either Brownells or B-Square's web sites. It may be discontinued. Whatever jig used, this task is best done outside if you do not have a high-class dust disposal system attached to your sander.

The amount of debris that comes off the pad is astounding. I would recommend a respirator mask, too. I replaced the pad on the stock and finished shaping it, starting with 120-grit abrasive paper and stopping at 180-grit to make the pad a nearperfect fit to the wood. So many factory stocks these days are left with the pad so proud it just seems like laziness on their part. Take the pad off and set it aside so it will not be affected by the finish running over it.

The use of sanding blocks to back your paper is essential. You veterans already know this, but if you are just starting out don't imagine that you can hold a piece of sandpaper sans backing without making dips and other unwanted blemishes in your stock. I use blocks of wood cut to fit, corks, erasers, pieces of automotive hoses and just about anything that fits the area I'm working on. There may be a spot that can't be reached without using your hands only but the vast majority of the time you need a backer.

Trust me on this one. The best way to start your initial sanding of these kinds of stocks is with the barrel, action and bottom

A HUNTER'S FINISH FOR THE WOODEN STOCK CONTINUED

ORIGINAL PAGE 13

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-7724D23C41-A1676-P13-F01. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1676-P13-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-7724D23C41-A1676-P13-F02. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1676-P13-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-7724D23C41-A1676-P13-F03. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1676-P13-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-7724D23C41-A1676-P13-F04. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1676-P13-F04

Moisture will sneak in here, warping the stock if unattended. metal already inletted but unfinished so you can sand right up to the contour of the metal without ruining its finish. Remove the metal from the stock when you are satisfied. I have received blocks of wood resembling chopped up 2 X 4s that manufactures called "semi-inletted." So far, they all pulled down satisfactorily. This one wasn't too bad and I was able to shape it to my specs with 180-grit paper and then smoothed out with 220.

That is where I stop and whisker. Most of you are aware of what that means, but indulge me if I explain for those ignorant of the process. Whiskering a wooden stock simply means wetting and then drying it. This allows fine fibers of wood to rise off the stock

looking like little whiskers, hence the term. These are sanded off using 220-grit and the process repeated as necessary, usually four or five times. Don't skip this step as these fibers have a tendency to rise after the stock is finished.

If not removed now this will ruin the finest job. There are several ways of doing the whiskering. I was talking to a friend the other day who related a tale of an old gunsmith in the early 60s who simply dunked the whole stock in a barrel of water, hung it up and walked away until it dried. It seemed to work for him. Others advocate drying the stock as fast as possible by using a propane torch or other heating device.

The torch works well but you have to be ex- An old cloth diaper (I knew I should saved more of these) is underneath the stock. You won't find a softer cloth. An old brush is used to soak the stock. At least three coats are needed. tremely careful not to burn the wood. I've finally settled on a good electric hair dryer to dry the stock out. You can actually watch the water drying out and the little fellows standing up like peach fuzz on a teenager's chin without the possibility of damaging the wood.

Sand the whiskers off about four or five times, less if none come up. Some recommend leaving the last whiskers standing and continuing the finishing process. I've tried it both ways and haven't been able to determine any difference, so now I

A HUNTER'S FINISH FOR THE WOODEN STOCK CONTINUED

ORIGINAL PAGE 14

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-7724D23C41-A1676-P14-F01. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1676-P14-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-7724D23C41-A1676-P14-F02. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1676-P14-F02

The extra metal is not needed here for strength and is easily reconfigured. just sand them all off until I'm satisfied no more will rise. Some recommend wiping the stock at this point with a solvent such as tolulene. I don't. I think these types of materials take too long to dry (even those of high molecular weight) and will interfere with the sealer going deep into the wood. I use a regular, fresh tack cloth to take away all dust and debris.

They don't leave any residue behind and set the wood to receive the finish. If you are using a stain, now is the time to add it. Personally, I like to leave a walnut stock alone unless the customer wants it stained. Each piece of walnut is its own portrait, and will usually turn out darker and look like walnut without any artificial help. But, it's your project so feel free to experiment.

If the stock I'm working on is not too heavy, I try to hang it by putting a clothes hanger through the front action screw hole without touching the outside of the wood. A cardboard box or other container can catch any drip off. Start adding the sealer to the wood with a throw-away brush. Really load it up until you think the wood can't absorb any more and the sealer runs off the

bottom. Some think the sealer should be allowed to penetrate for 15 minutes or so and then the excess wiped off.

I leave it on, and I usually add a little more after a sufficient time to make sure it is really soaked. I think it takes more time than 15 minutes to penetrate the wood and will cover more completely if allowed to stand as is. Let the stock dry overnight and repeat this process at least two more times. Sometimes you may have to add more but I've found that most stocks will have taken all the sealer they can by the third pass. I then leave the stock dry for at least 48 hours.

Remember, I didn't say this was a quick process. I really think the sealer needs this long to harden and adjust itself to the wood. I guess by now you're wondering what kind of sealer I'm using. Permalyn Sealer and, its companion product, Permalyn Gun Stock Finish are two of the finest products I have found so far for this application. They are manufactured by Laurel Mountain Forge (laurelmountainforge.com, Crown Point, IN 46308. Some sealers need to be thinned with mineral spirits or whatever.

I have found these products can be used as is and still penetrate the wood satisfactorily. Mineral spirits can be used for cleanup but I don't like adding it to my gunstock finish. Here, I would like to say that I've used many products for finishing a stock. I started when I was a little boy on my personal .410 shotgun. Even then I just couldn't leave well enough alone, I guess. I tried Linseed and Lin-speed oil, tung oil, Tru-Oil, spar varnish and God knows how many others.

All the usual suspects but, so far, the Permalyn products have served me well and, until something better comes along, they are what I use. I don't know exactly what's in them. The label states they contain petroleum distillate but the exact composition is proprietary and anybody's guess. It doesn't matter, I suppose. The finish will stand up to weather and resist nicks and scratches which is what I want it to do, as well as my hunting clients. You need some way to hold your stock for sanding.

As you can see from my photos I took a scrap piece of wood and fit it to where the bottom metal goes and screwed it into a dowel in the action area that approximates the diameter of the

A HUNTER'S FINISH FOR THE WOODEN STOCK CONTINUED

ORIGINAL PAGE 15

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-7724D23C41-A1676-P15-F01. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1676-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-7724D23C41-A1676-P15-F02. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1676-P15-F02

The metal is in the white and the recoil pad is attached. Notice that the rear of the trigger guard matches the contour of the stock and doesn't protrude from the stock in an unsightly manner. This rifle is far from finished. Sans scope and rings it weighs exactly seven pounds; not too heavy, not too light. It should hold steady in the hunting fields. barrel channel. I also built a small stand equal to the height of where the vise holds the dowel to stabilize the buttstock.

You can hold the piece in your hands if you want but I believe it's easier this way, especially when you are trying to determine if you've sanded an area enough. By this I mean all the shiny spots need to be wet, sanded down to the wood and turning the stock this way and that to let you see the results if you stand back to check. For the initial wet sanding I use the same 220-grit paper I used for the final sanding before adding the sealer.

At this point the original sealer should be used for the wet-sanding process. The finish is yet to come. 320 grit paper with the sealer can be used after the down to the wood but if you try to use the 320 first it will take forever. The smoother grit paper comes later when the final finish is applied. Most of the directions I've seen in print recommend using a dry, lint-free cloth to wipe off the excess wet-sanding medium. I use paper towels to wipe the stock.

I don't have many lint-free cloths lying around the shop and a roll of Bounty will do you. I have a holder for paper towels directly above my work bench and use them all the time. Wipe the stock against the grain and remove all shiny areas. Before long you will begin to see the difference and rubbing your hand over the sanded areas will reveal wood that is smooth as glass. Where it isn't, use a little more elbow grease but don't allow your paper to get too dry and drag.

Don't get me wrong, the wood will still feel like wood, not plastic, and very smooth with filled pores. For all sanding use wet-or-dry paper that is used for automotive finishing. Usually it will have aluminum oxide or silicon carbide as the abrasive. These kinds of papers do not clog up as fast as regular sandpaper and produce a smoother finish. 3M, Gator and others make these kinds of papers and they can be found by the sheet in automotive stores or ordered on line.

When you have finished pulling down the sealer to the wood you can start to add the final finish. Hang your stock and load it up with the Permalyn Finish using the same technique with the throw-away brush. Really soak it. Let it dry (I usually have a fan running) for at least 24 hours, then do it again. Two coats should be enough, depending on what wood you have. When

you are satisfied the wood will not soak up any more finish, begin wet-sanding with 320-grit paper.

Now you are seeing what the stock will look like when done. Take all shiny spots off and stand back to look at a good job. After patting yourself on the back finish up by wet-sanding with 400-grit paper. Here's where I usually stop but 600 and even 1200-grit paper is available. I did that one time—never again. Unless you are working with an unusually exquisite specimen of exhibition-grade French walnut that will never see the hunting fields I can't recommend pushing it that far.

Hang the stock and forget about it for a week or even two, then you will be ready to begin checkering. When the checkering process is complete either use a good Carnauba wax on your stock or let it go as is. Also, if you want to have a shiny, reflective stock it's possible to take a little finish and rub it on like the hand-rubbed oil stock crowd is fond of doing.

To my way of thinking, all those options are OK but, as I said when I started this article, I am trying to get a finish on a wooden stock that will stand up to the rigors of hunting in the real world. That means a hard, durable, non-reflective (non-game spooking) finish that can be depended on for many years. In that vein I'm not embarrassed to turn over a stock finished this way to even the most critical customers.

AG

RESTORATION

Restore, Renovate, Ruin

Sometimes, the hardest part of a job is dealing with your conscience. What do you do when a customer wants a valuable antique refinished?

BY PAUL MAZAN DECEMBER 2012

ORIGINAL PP. 16-18

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-7724D23C41-A1677-P16-F01. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1677-P16-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-7724D23C41-A1677-P16-F02. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1677-P16-F02

One of the most difficult decisions faced by gunsmiths is the question of firearms refinishing. It is usually not a problem as most of your customers will bring in a battered modern gun and want it refinished and/or reblued to erase several years of hard use. The situation changes dramatically when the customer presents you with along out of production, very collectable firearm and asks for the same service.

What do you do when your customer wants his grandpa's first generation Colt, original Henry, or some other collectable firearm refinished? Normally I will try to talk them out of devaluing a collectable piece of history by explaining that the gun is worth far more in its rough, worn condition than it will be if it is refinished. Sometimes I'll pull out the Blue Book and show them what refinishing will do to the value.

In other words, I make every effort to dissuade them from doing anything other than the minimum necessary to preserve the piece. The problem comes when the customer just doesn't care. I faced this very is-

sue recently and, because I work with a lot of old guns, I face it quite often. A customer presented me with an early 1894 Stevens Favorite with the rare fourscrew sideplate chambered in .25 Stevens, a rim-fire cartridge. The gun had been left in a barn and was totally trashed.

The stock had pieces of steel inletted into the cracked wrist to hold it together. Someone had drilled and tapped those steel plates and used round-headed machine screws. Looking down the bore was like inspecting the sewers of Paris and there was so much pitting and rust on the outside you couldn't even read the company name marked on the barrel. The customer wanted it restocked, buffed, blued and converted to .22LR.

I tried to get him to agree to a general cleanup and to simply leave it as is but he simply would not hear of it. None of my explanations regarding the cost of the work being more than the gun would be worth or the rarity of the gun made an impression. The tang screws are matching replacements, a nice touch. I'd hate for the screws

to be mismatched! At this point, I had a moral dilemma. If I refused to do the work he made it clear that he was perfectly willing to take it to someone else to have the work done.

That put me in a no-win situation as I would simply lose the customer and the gun would be devalued anyway. If I did the work I risked a reputation of ruining valuable collectable firearms. No matter what decision is made, I can promise you someone will criticize it. I know that from experience. Personally, I have come down on the side of serving my customer. My reasoning is simple.

It is his gun and as long as I have taken pains to explain the options and my reasoning, the final decision is his to make and not mine. You may not agree and that is fine with me. In fact, my best friend and mentor disagrees with me completely on the issue and, while I agree with his view that objects of historical interest should not be altered, the guns he refuses to "ruin" get "ruined" anyway. Although he

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-7724D23C41-A1677-P17-F01. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1677-P17-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-7724D23C41-A1677-P17-F02. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1677-P17-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-7724D23C41-A1677-P17-F03. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1677-P17-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-7724D23C41-A1677-P17-F04. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1677-P17-F04

25 Stevens bore was not salvageable. This gun cries out for a barrel liner. feels good about his decision, he hasn't saved the gun. The upside of the desecration of a collectable is that a firearm that was not in shootable condition and chambered for around no longer commonly available is put back in use. From the collector's point of view, I have taken a valuable collectable and turned it into a \$100 rifle. From the owner's viewpoint, I have taken his grandfather's rifle and brought it back to life.

From my point of view, I have taken a wall-hanger, stopped its deterioration and put it back to work teaching kids to shoot. Who's right? All of us! Each statement is true. Enough philosophy, let's look at how the job was done. The first step, after being certain the gun is not loaded, is to completely disassemble it. That is rarely as easy as it sounds.

Screws that have been rusted in place for a hundred years or so are stubborn and refuse to be removed without a lot of effort.

The secret to removal without ruining them starts with patience. A good penetrating oil like Kroil applied to every place there is a gap and allowed to work overnight might not help every time but it will certainly do no harm. I then go through my Brownells Magna-Tip screwdriver set and find a bit that fits the screw slots as snugly as possible.

I chuck the screwdriver bit into my drillpress, lower the bit into the screw slot and, with the gun clamped firmly in place, I bear down on the drill press handle while turning the chuck by hand. This method keeps the screwdriver bit firmly in the screw slot at a 90-degree angle and does not allow it to cam out. This trick was taught to me by the same

friend I mentioned earlier and it will remove all but the most stubborn screws without bugging up the slots.

In fact, it will occasionally See the October 2011 of American Gunsmith to see how it was done in my home shop. twist the head right off the screw if you're not careful With this project, the disassembly went smoothly until I got to the barrel. Sometime in the past the barrel must have shot loose as both the takedown screw and the barrel shank had been semi-permanently locked in place with a heavy-duty thread locker. No amount of grunting, groaning or my choicest curse words made any impression on them.

In the end I had to resort to a propane torch to heat them to the failure point of the Loctite before it would give up its grip on the barrel. I hate to use heat and I had tried everything else I could think of before resorting to the torch. Not knowing up front if

RESTORE, RENOVATE, RUIN CONTINUED

ORIGINAL PAGE 18

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-7724D23C41-A1677-P18-F01. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1677-P18-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-7724D23C41-A1677-P18-F02. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1677-P18-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-7724D23C41-A1677-P18-F03. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1677-P18-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-7724D23C41-A1677-P18-F04. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1677-P18-F04

The rear sight was installed off center at the factory. It was left that way on the refinished gun at the owner's request. the barrel had been sweat soldered in place or was simply rusted solid made the torch was my last resort. The process of converting the gun from .25 Stevens rimfire to .22 Long Rifle rimfire was relatively simple. A .22 barrel liner drill and .22 barrel liner was purchased from Brownells.

These liners are really terrific and the drill has a pilot on the tip to guide it so that the job can be done with a hand drill if you don't have a lathe. The fly in the ointment was that the .22 pilot was very loose in the mostly rusted out .25 bore. I carefully measured the diameter of both the pilot and the bore and made a simple sleeve to fit over the pilot to keep the drill centered in the bore.

Once this had been taken care of it was simply a matter of securing the barrel in a padded vise and drilling a really deep hole. The liner can be either soldered or epoxied in place. I used Brownells Acraglas Gel because it is quick, easy and gives along working time without all the heat required to keep solder melted in the barrel while the liner is inserted. Once the Acraglas sets up, the liner is cut flush with the muzzle and chamber end of the barrel.

The muzzle is squared off and crowned, and the chamber is cut with a .22 LR reamer. The reblue was done after all parts were draw filed to remove the pitting, then hand polished and degreased. I used Dicropan IM and the method described in "Small Shop Bluing With Brownells Dicropan IM" (American Gunsmith, October 2011.) An heirloom to be

handed down to his children and on. Sometimes you have to stop short of perfection to maintain the integrity of the part.

The most difficult part of many projects involving old, out-of-production guns is finding parts and this project was no exception. Fortunately, the Internet provides a number of sources and I was able to locate a stock and fit it to the gun. With his now devalued rifle, and a lighter wallet, this gun's owner is happily using the rifle his grandfather taught him to shoot with to teach his own son to shoot.

Despite all the differences of opinion on whether I restored, refinished or ruined this old single shot, that ain't a bad result. AG

RIFLES

Savage Long-Action Model 112 Retrofit

Revising a long-action Savage Model 112 bolt to an older, mediumaction Model 112 “J” series rifle ranks among the difficult but well within the realm of accomplishment.

BY NORMAN E. JOHNSON DECEMBER 2012

ORIGINAL PP. 19-21

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-7724D23C41-A1678-P19-F01. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1678-P19-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-7724D23C41-A1678-P19-F02. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1678-P19-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-7724D23C41-A1678-P19-F03. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1678-P19-F03

It all began while making up an earlier Savage Model 112 single shot rifle for switch barrel use. The rifle would have two bolts, including .223 and .308 size bolt faces. Two barrels for each bolt were planned. There was, however, a major intervening problem in finding a standard size bolt face to serve two of the barrels. I searched diligently, to no avail. Numrich Gun Parts Corporation (gunpartscorp.com) hadn't had a bolt for the old Model 112 Series “J” in some time.

Parts were no longer made, as communication with Savage Arms alerted me. Other sources painted the same bleak picture. A close comparison of the more current long-action Savage Model 112 bolt showed a striking resemblance between the two. These quite complex bolt assemblies are made up of 22 parts. Then it occurred to me to shorten the long action bolt body as a means of set-

ting back the removable bolt head. The bolt bodies are essentially the same, aside for a 0.544" difference in length.

Cutting off from the front would just remove the laterally opposing holes for the bolt head retaining pin. This would leave a clear section of bolt body to work with in drilling anew pair of bolt head retaining pin holes. Of course, the firing pin and mainspring would also need to be shortened the same amount (0.544") which I will cover later in this text.

Repositioning The Bolt Head The long action bolt body, stripped down with the bolt head, bolt handle and rear bolt assembly screw removed is 0.544" longer than the bolt needed for the Savage “J” series action. Cutting this down leaves a clean section of bolt body to work with, just clearing the bolt head retaining pin holes. Bolt disassembly and reassembly, even with its 22 From left, Model 12 short-action, Model 112 Series “F” in .223 bolt face size and long-action Model 112 bolt.

The bolt to be duplicated in standard bolt size was done by shortening the long-action Model 112 bolt on the right. Below center: Face of the added bolt (on left) that was shortened for the switch barrel project. parts, is not complicated. Removal of the bolt assembly screw allows removal of the entire inner working parts, including the firing pin and mainspring assembly which comes out as a unit. Removal of the bolt head retaining pin, which is held in place with the firing pin, frees the bolt head assembly.

It is important to keep track of all the parts of the bolt. I put the parts of each bolt in separate shallow boxes so they wouldn't get mixed up. I decided to make a special drill jig that would serve as a perfect drilling guide in making the two ¼ inch bolt head retaining pin holes. These two holes must be positioned the exact correct distance from the front of the bolt body (0.275") and at precise bolt body center. The 0.695" diameter Savage 112 series bolt bodies are

SAVAGE LONG-ACTION MODEL 112 RETROIT CONTINUED

ORIGINAL PAGE 20

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-7724D23C41-A1678-P20-F01. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1678-P20-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-7724D23C41-A1678-P20-F02. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1678-P20-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-7724D23C41-A1678-P20-F03. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1678-P20-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-7724D23C41-A1678-P20-F04. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1678-P20-F04

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-7724D23C41-A1678-P20-F05. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1678-P20-F05

On left are the original Savage Model 112 Series "J" and parts, on right area long action Model 112 Savage bolt in the process of shortening. The bolt body is cut to length and firing pin disassembled. case hardened and will require high grade carbide drills and facing tools to do a proper job. The other option would be to anneal the end of the bolt body for easier cutting, facing and drilling. This would be a wise choice to consider.

I used a drill chuck in my milling machine to drill the two bolt head retaining pin holes, making certain the drill jig was securely attached and perfectly square in the vise. You only get one chance at this or the bolt body is trash. I faced the end of the bolt body to the

exact length in a lathe. Actually drilling and machining of the bolt body went very well and the parts were cleaned of burrs and the bolt body polished.

Firing Pin And Mainspring The firing pin cocking piece head unscrews from the firing pin, which is under considerable spring pressure, with a cocking piece link washer between the spring and cocking piece. I held the firing pin stop nut in a padded vise for disassembly and put a punch into the cocking piece pin hole to form a controllable T-handle during separation.

The cocking piece link washer is free floating, so don't lose this as the cocking piece separates from Precise hole drilling would have

been very difficult without the drilling jig. Below center: The assembled firing pin shows the amount of mainspring removed in the bolt shortening process. A 1/4 -28 NF die was conveniently used. the threaded firing pin. It is well to wear eye protection while working on this and to place flexible, transparent tape around the spring and cocking piece link washer.

On separation of the cocking piece, I was pleased to see a 1/4-28 threaded shaft to work with in shortening the firing pin. I added 0.60" of new threads and reduced its length by the amount I shortened the bolt. At this point the firing pin protrusion should be checked and adjusted as required, protrud-

SAVAGE LONG-ACTION MODEL 112 RETROIT CONTINUED

ORIGINAL PAGE 21

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-7724D23C41-A1678-P21-F01. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1678-P21-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-7724D23C41-A1678-P21-F02. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1678-P21-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-7724D23C41-A1678-P21-F03. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1678-P21-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-7724D23C41-A1678-P21-F04. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1678-P21-F04

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-7724D23C41-A1678-P21-F05. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1678-P21-F05

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-7724D23C41-A1678-P21-F06. Know the rights holder? Please ask them to contact us.

AG-7724D23C41-A1678-P21-F06

The amount cut from the firing pin matches the bolt cut-off length. Above center: Before and after likeness of the shortened Model 112 Savage bolt. Top view shows the shortened bolt where the bottom bolt shows a Savage Model 112 bolt before shortening. Top bolt shows the original bolt with .223 size bolt face and the modified bolt in the Savage Model 112 Series "J" action. ing about 0.060". If adjustment is required, turn the firing pin stop nut as needed.

It will lock in place by the notched firing pin stop nut washer. The firing pin can then be reassembled. The firing pin is again placed firmly in a padded vise and the mainspring slipped onto the partially threaded shaft. The spring is then compressed sufficiently to place the cocking piece link washer on top of it and turned on the threaded cocking piece. A proper spring compression clamp is useful here unless you have very strong fingers.

With the firing pin re-assembled, check it for length by dropping it into the bolt with the cocking piece sleeve in place. The cocking piece pin hole should align squarely or just a few thousandths short of the forward aspect of the bolt cocking pin slot. This permits full and free cocking of the firing pin. With the cocking piece pin in position, the rear baffle and bolt handle can also be installed. The bolt assembly screw is then turned firmly into position, ready for use.

This screw starts much easier if the cocking piece pin is fully forward in the fired position. With any complex gunsmithing project there may be a bit of trepidation as the new work is tried and this bolt was no exception. The feeling quickly dispelled as the bolt slid smoothly into position as the locking lugs engaged, sear cocked and the trigger functioned smoothly. I lost no time in fitting and headspacing a .220 Swift varmint-weight barrel and trying it out.

Accuracy was most excellent with a good number of half-minute groups. Below center: Two bolt handles used in the Model 112 Savage Series "J" rifle conversion. Note the difference in bolt assembly screw heads. The older, original bolt has a slotted head compared with the new Allen head screw. Top bolt is the original bolt for the Model 112 Savage Series "J" action. Bottom bolt is the shortened bolt, as described in text, with standard .308 size bolt face.

The two bolts set the stage for a most versatile switch-barrel rifle. Conclusion The Savage 112 series rifles have an excellent reputation for accuracy and this rifle was no exception. With no available bolts for this rifle, the switch barrel project hinged on the prospects of successfully altering a longer bolt. In shortening a bolt in this way there is precious little room for error but the results were good. A good measure of satisfaction goes along with the successful completion of the work. AG

MAINTENANCE & REPAIR

Reader Forum

BY AMERICAN GUNSMITH EDITORS DECEMBER 2012

ORIGINAL PP. 23-24

Simple Pro-gun Marketing Here's a thought I'd like to share with American Gunsmith readers. I found that instead of giving old copies of the firearms magazines I read to friends when I'm through with them, I now leave them in various waiting rooms, such as doctor's offices, auto repair shops, bus stations and the like. People who are stuck waiting for service might be tired of outdated issues of Time, Newsweek and others of that ilk.

I have noted interest in these types of publications whenever I return to those waiting rooms where I left them. Dominick Pisano domscustomrifles.com Great idea, Mr. Pisano! Stevens Model 258A I have a J. Stevens Model 258A 20 gauge bolt action shotgun that a customer brought to me for cleaning. It has been sitting in his basement for about 25 years. It had a little surface rust but it seems to work.

I am trying to disassemble the bolt and there is one pin that holds the striker bushing and I can't figure out how to remove it. It appears to be in a blind hole. I looked up the part in the Numrich catalog and it appears to be a step pin. I've tried looking for a phone number to call Stevens but haven't had any luck. We don't believe a call to Savage present manufacturer of Stevens firearms, will be much help. The shotgun is quite old and there's probably no old-timer at Savage old enough to clue you in about it.

The outfit we previously relied upon for info and parts on elder Steven guns is no longer in business. So far, he hasn't been replaced. New Haven Model 600AT I have a customer's shotgun back in my shop again. It was brought in earlier last year to be cleaned and checked for misfiring. After work was completed and the gun test fired everything seemed fine until deer season came along and it misfired again.

Thinking the problem might be defective ammo, the owner tried firing the same rounds again with same misfire effect. Examining the primer showed sufficient indentation by the firing pin. I even loaded the same rounds into another gun and fired with no problem. After disassembling the firearm again I noticed the firing pin had burrs on both sides hitting the locking block. I removed the burrs and reassembled, firing it with two different types of ammo, including what the customer uses. No problems.

Am I right thinking the problem was with the burrs on the firing pin or is there a chance the problem is possibly somewhere else? The ammo the client is using is Remington Core-Lokt Ultra Bonded Sabot Slugs. While doing follow up on the possible problems I had read something to the effect that Remington used a harder primer than other manufacturers used. Is this fact or fiction? Also, is the New Haven 600AT compatible with the Mossberg 500? New Haven Firearms didn't make shotguns.

They sold shotguns made for them by Mossberg. The 600AT you mention was identical to the Mossberg 500. Bill Reinhart Bill's Gunsmith The burrs you removed from the firing pin area strong indication the gun has been dry fired all too often. Check for similar burrs around the mouth of the chamber, especially in the area of the extractor cut. Since the locking block is located aft of the bolt face it's a bit of a mystery to some of us how it managed to raise burrs on the firing pin.

If the pin indents were deep enough to touch off the primer when you fired the gun, but not the deep enough in other hands it could be the operator isn't bringing the weapon to bear and holding it firmly enough against his shoulder. This is

truer when the shotgun is a semi auto and not often true with a pump model unless the action bar isn't being fully racked through its cycle. The pump malfunction happens more often than not under near panic conditions when a quick second shot is desired.

With a semi auto, the trigger is not allowed to return to its forward position for the same reason. That, when combined with the too loose shoulder contact further results in more recoil being felt by the shooter. And more pain. As for the hard primer supposition, try other brands of sabot hunting loads to see if the misfires continue. If they do, install a fresh firing pin spring but check with Mossberg first to assure a 500 spring will still interchange in your customer's gun.

The 600AT isn't exactly what we'd consider a modern production shotgun. Ruger 10/22 I have a Ruger 10/22 that was brought to me because the bolt will not release after it has been locked open. Everything is assembled correctly but it still will not release when the bolt is pulled back and released like it should. To release it, you have to pull back on the bolt handle and then push the locking lever. Mark Wiggins George W. Wright Owner's Manuals are often critiqued because they provide too little information.

In this case, we believe your customer created his own problem by totally ignoring the manual content for the 10/22. The basic design of the rifle has not changed and includes the built-in bolt lock to prevent the bolt from releasing forward if the rifle is dropped. The lock has an upper and a lower section. Both extend downward from the receiver and are visible within the trigger guard. Here's what the Ruger 10/22 manual tells the owner to do with very

READER FORUM CONTINUED

ORIGINAL PAGE 24

clear illustrations, including large arrows that indicate directional travel to be applied to the lock. To lock the bolt open, retract it all the way to the rear, hold it there and press the lower section of the lock back. When the bolt is released it will not move forward into battery. To release a locked-open bolt, apply rearward pressure to the bolt, maintain it, push up on the upper section of the lock, release the bolt and it will move into battery.

An afterthought prompts us to wonder whether or not the owner tinkered with the rifle in a misguided attempt at a fix-it-myself solution and lost a small, but vital, component in the process. Perhaps a seemingly insignificant spring without which the bolt lock is rendered useless? Ruger doesn't allow guns to leave the factory unless all safety systems are in perfect working order. Neither does any other manufacturer. Bottom line, personally check out the lock function.

If the system fails the test, re-examine the lock and each of its related components to determine for sure whether or not all are present and in good working condition. Model 12 And Coltsman I recently purchased a Winchester Model 12 in 16 gauge. It functions properly but I have been unable to disengage the magazine tube threads to disassemble the firearm for cleaning. I removed the lock pin and in-

serted a punch that is four inches long for greater leverage. The magazine tube still didn't budge.

I stopped at that, not wanting to deform the hole in the tube. I have been spraying the area with penetrating oil. Any ideas? Also I have a Colt Coltsman in .243 on the Sako L57 action that is very accurate with a number of different loads. It has a hideous looking cast aluminum banded front sight ramp. I would like to change it to either a NECG or a Williams ramp. Could changing the front sight ramp affect the accuracy of the rifle?

The Model 12 is covered admirably in the pages of the NRA Guide to Firearms Assembly, hard cover edition. As you will see, there is considerably more to removing the mag tube from its combination barrel/magazine hookup to the receiver. Also note the mag tube, like the barrel, has interrupted threads that must be disengaged before either can be withdrawn from their shared block.

On the second part of your query, as long as the new ramp is no higher or lower than the exiting "hideous" barrel appendage and mounted true center bore your accuracy should suffer no ill effects. Steyr AUG And MSAR 5.56 What is the real difference in these two firearms? Roger E Mitchell The Steyr AUG was originally designed to satisfy military demands, not

those of the US civilian market. Therefore, the patents did not apply in regard to exporting for civilian use.

When they expired, Microtec Small Arms Research acquired rights to manufacture a clone and had its designers reverseengineer the rifle with the intent of adding features they believed would appeal to US shooters. As a result, MSAR STG 5.56 bolts are available for both right and left handed operators, a left side bolt atop release button and forward assist button mounted on the receiver are available on request with an STG order.

Perhaps the most interesting MSAR addition is an optional caliber conversion kit upgrading the rifle from the 5.56 NATO to the more potent 6.8mm Remington. Not so incidentally, while cruising the world-guns.ru/civil/usa web site for even more information on the MSAR and Steyr comparison you request, we came across a do-it-yourself modification that claims to silence forevermore complaints about heavy and/or sluggish trigger pulls with both rifles.

It's called the Trigger Tamer, comes with explicit instructions, transforms a nine pound or heavier pull to a smooth six and costs a few coins under \$60.00, plus shipping. If you're working at gunsmithing, you can purchase a ten pack for considerably less than sixty bucks per. Just thought you other readers would be interested. AG Thomas Kirby

SEARCHABLE ISSUE RECORD

Archive index

The Best Gunsmiths American Gunsmith Editors	2	Restore, Renovate, Ruin Paul Mazan	16-18
Century Arms TP-9 Chick Blood	3-8	Savage Long-Action Model 112 Retrofit Norman E. Johnson	19-21
Counterbalancing The Stock Norman E. Johnson	9-10	Reader Forum American Gunsmith Editors	23-24
A Hunter's Finish For The Wooden Stock Wendell Deaner	11-15		

Rights and corrections. Images without confirmed permission remain reserved in place. Authors, photographers, and rights holders may contact editor@gunsmithmag.com. Corrections to searchable text are tracked against the source-page record.



American Gunsmith

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

GUNSMITHMAG.COM • EDITOR@GUNSMITHMAG.COM