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PRECISION ARMS WORKSHOP

AND THE AMERICAN GUNSMITH ARCHIVE

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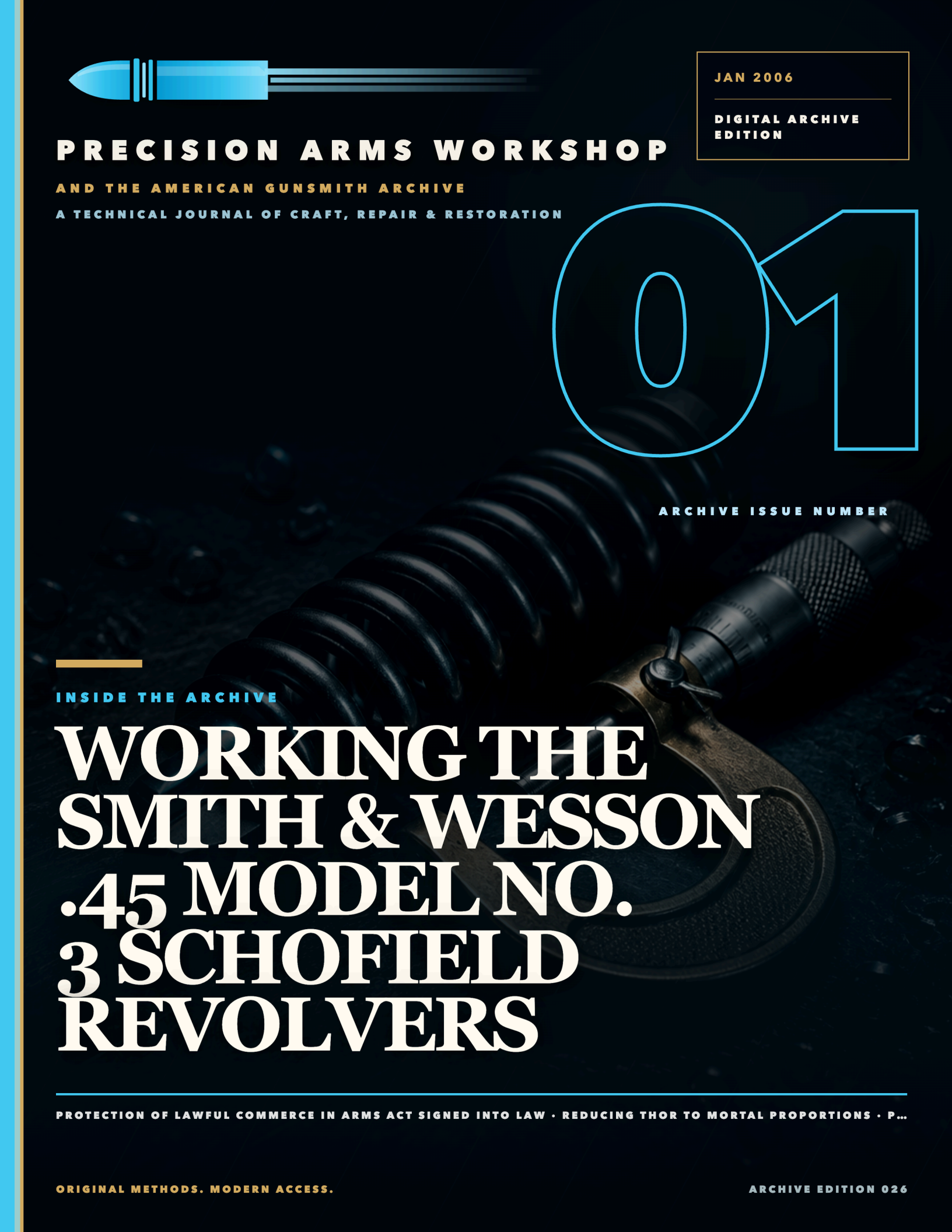

INSIDE THE ARCHIVE

WORKING THE SMITH & WESSON .45 MODEL NO. 3 SCHOFIELD REVOLVERS

PROTECTION OF LAWFUL COMMERCE IN ARMS ACT SIGNED INTO LAW · REDUCING THOR TO MORTAL PROPORTIONS · P...

DIGITAL ARCHIVE EDITION

Preserved for the bench.

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IN THIS ISSUE

Contents

A complete guide to the searchable editorial work preserved from January 2006.

FROM THE ARCHIVE

Protection of Lawful Commerce In Arms Act Signed into Law

BY AMERICAN GUNSMITH EDITORS JANUARY 2006 ORIGINAL PP. 2

On October 20th, as I worked diligently on this issue, two emails arrived in my inbox almost simultaneously. Both concerned the passage in the House of the Protection of Lawful Commerce in Arms Act (S.397), which had recently passed in the Senate. The first of these emails was from NRA Executive Vice President Wayne La Pierre, who said: "This is an historic victory for the NRA. Freedom, truth, and justice prevailed, and today S.397 is one step closer to becoming the law of the land.

No other industry is forced to defend [itself] when a violent criminal they do not know, have never met and cannot control, misuses a legal non-defective product. American firearms manufacturers will now receive the same fair treatment." La Pierre went on to say: "The Protection of Lawful Commerce in Arms Act seeks to end predatory and baseless lawsuits initiated nationwide by the gun-control lobby. These lawsuits sought to bankrupt a lawful, highly regulated industry by holding the manufacturers and retailers responsible for the unforeseeable acts of criminals.... We area safer country today because Congress passed this critical legislation and acted to save American icons like Remington, Ruger, Winchester, and Smith & Wesson from politically motivated lawsuits.

Our men and women in uniform abroad and at home now will not have to rely on France, China, or Germany to supply their firearms." The other email was also a press release, this one from The Coalition to Stop Gun Violence (CSGV).

According to Executive Director Joshua Horowitz: "This bill is based on a series of fabrications and half-truths, and its supporters have twisted the facts in an attempt to defend the indefensible—the idea that gun sellers should be shielded from the legal consequences of their own misconduct." And, speaking of fabrications and half-truths, Horowitz went on to say: "The fact is that, with earlier NRA-backed bills cutting the budget and gutting the legal authority for enforcement of the nation's gun laws, private lawsuits are one of the few tools left to hold corrupt, negligent, and reckless gun sellers accountable for funneling guns to criminals." Thankfully, at the bottom of the CSGV's press release was a link to "unsubscribe" from the Coalition's distribution list, which—I can assure you—I never subscribed to in the first place.

As you no doubt know by now, President Bush subsequently signed S.397 into law a few days later. Now, if Congress and the President could only do something about unsubscribing me from all those other email lists I never subscribed to.... Editor Keith Lawrence Technical

PISTOLS

Reducing Thor to Mortal Proportions

Named after the mythical Norse god, EAA's Thor is capable of bringing down the largest game and shows great promise as a silhouette shooter.

BY CHICK BLOOD JANUARY 2006 ORIGINAL PP. 3-5

Original caption: Right top: European American Armory's Thor is sharply focused on hunters having the skill and experience to go after large game with a single-shot pistol, but it could easily find other targets. Right bottom: The Thor is constructed tightly.

Manufactured by Tanfoglio in Italy and imported by European American Armory Corp., Thor is designed to accompany skilled big-gamers who have little fear of going after lion, rhino, grizzly or Alaskan brown bear with a single-shot pistol. A genuine hand-cannon, the gun is available in at least 11 calibers, the smallest being .223. From there, Thor just becomes more formidable all the way up to .45-70 and .50 SW.

Regardless of chambering, the barrel is 14 inches long with polygonal rifling, overall length is 16 inches, and the empty weight is five pounds. Though it may look somewhat odd at first, look again and I think you'll notice something very familiar about the Thor. That's right, it's built on a M1911 frame.

Except for the magazine release, which serves as a barrel-latch release on the Thor, the receiver can be taken apart, serviced, and reassembled like any other M1911. (The barrel latch assembly [#20] is removed/ reinstalled in the same manner as a M1911 magazine latch.)

The first few times the gun is field stripped, it may be necessary to use an 8-ounce hammer and a nylon drift to separate the carriage from the frame. The other new addition to the frame is located at the back end, and is identified as the hammer-safety cross pin (#8). It prevents the barrel from being closed unless the hammer is in the half-cock position—a position to be remembered at all times.

No attempt to open the action with the hammer fully forward should ever be made; damage to the firing pin could be the result. I'll make you a bet. I'm betting that someday soon the new owner of a Thor will walk into your shop wondering why he can't get the action open. "It's too tight," he'll say. You'll get a firm hold on the frame to depress the grip safety, half-cock

the hammer, press in on the barrel latch with your thumb, and give the top of the barrel a solid rap or two out near the muzzle with a rubber or rawhide mallet. The owner will wince and cast a hostile glare in your direction, but the rear of the action will pivot up on the forward carriage and barrel cross pin (#15). The ejector assembly (#2, 3, 4, and 5) will rise with it. (There's no ejector in the frame.) To remove the barrel, push the forward cross pin left to right.

The pin need not be pushed out completely; allow it to come to Reinstalling it is easier and less hazardous to the pin if it is not totally drifted out. Just move it sufficiently to allow removal of the latch. Ba stop by not forcing it. You now have a complete barrel assembly, a frame with carriage (#16) attached, and the wrap-around grips are off. You can't get into the frame without separating it from the carriage. You're about to find out the carriage is on as tight or tighter than was the barrel.

AFTER PUSHING OUT THE REARMOST CROSS PIN (#15), YOU HAVE TO DRIVE A

1 Barrel Latch 2 Ejector Pin 3 Ejector Pin Stop 4 Plate Pin and Ejector Pin Stop 5 Ejector Spring Guide and Plate Guide 6 Firing Pin 7 Bolt Stop Pin 8 Hammer Safety Cross Pin 9 Firing Pin Spring 10 Bolt Block 11 Bolt Block Plunger Spring (2) 13 Bolt Block Plunger 14 Firing pin Stop Plate 15 Carriage & Barrel Cross Pin (2) 16 Carriage 17 Bolt Block Pins 18 Safety Guide Rod 19 Grip Screw Washer EAA Thor Single-Shot Pistol 20 Latch Button 21 Sear Lever Pin 22 Hammer Pin 23 Safety 24 Grip 25 Grip Screws (2) 27 Main Housing Pin 28 Bottom Plate Guide Stop 29 Plate Guide Stop Spring 30 Bottom Plate Guide 33 Bottom Plate 34 Bottom Plate Screw 35 Mainspring Housing 36 Mainspring Cap Pin 37 Mainspring Housing Pin Retainer 38 Mainspring 39 Mainspring Guide 40 Sear Spring 41 Assembled Trigger 42 Grip Safety 43 Safety Plunger 44 Safety Plunger Spring 45 Front Plunger 46 Frame 49 Latch Stop Pin 50 Latch Spring Plunger 51 Latch Stop 52 Hammer Rod 53 Hammer 54 Hammer Rod Pin 55 Interrupter (Disconnector) 56 Sear Lever 57 Extractor 58 Extractor Plate 59 Extractor Spring 61 Receiver 62 Latch Pin 63 Barrel Pin 64 Barrel 65 Carriage Pin Stop 66 Extractor Edge Pin 67 Extractor Edge 68 Extractor Edge Stop 69 Elastic Ring Pin Stop

FROM THE ARCHIVE

Precision Drilling And Tapping Techniques

With a few simple tips and an accurate setup, you can drill and tap holes for sight mounts or scope bas es better than what's done by most firearm manufacturers.

BY DENNIS A. WOOD JANUARY 2006 ORIGINAL PP. 7-9

One of the most common tasks a gunsmith performs is drilling holes and tapping threads into those holes to keep some item in place on a firearm. This job can be performed in a casual manner or, by using a few simple techniques, it can be done with a degree of precision that will ensure these tapped holes hold with the maximum degree of strength. I'll go over some of the preparatory set-up methods and then cover the whys and wherefores of what makes a strong thread and holding system.

The Setup is Everything The one piece of machinery that gets the most use in my shop is the drill press. Whether I'm working on a firearm or making some little gizmo to help me get a job done more efficiently, the drill press is called upon for many of the tasks involved. The one I have has 12 speeds that turn the chuck from 134 to 5,484 revolutions per minute by means of two belts and a three-pulley system that takes only a few minutes to set to the desired spindle speed.

To make sure that the job turns out in the best possible way, the drill press table needs to be as perfectly perpendicular to the drill chuck as we can possibly get it. This means that the table must be level from front to back and then side to side. This can be done with a level but for the utmost in precision, a dial indicator affixed to a shaft and then mounted in the drill chuck will help you sweep the table surface and then tweak flatness within thousandths of an inch.

When the drill press is used to drill holes to a specific depth, a dial indicator should be used to record the cutting depth of the drill, again, within thousandths of an inch. A decent vise that will hold your work firmly without damaging any finish is a good investment that should be considered. The vise will need to hold your work level if a drilling jig is mounted to the part or so that top-dead-center of the part being drilled can be found with a dial indicator.

Consider using drill bits that have a 135-degree angled cutting end rather than the common 118-degree type. When the job calls for drilling a hole to a specific depth, the 135-degree flatter face is less pointed and will allow at least two more full turns of thread over the 118-degree-type drill when fine threads (40 to 56 TPI) are tapped into place.

Drilling and Spacing Holes If you have access to a milling machine, the dials that move the table back and forth and in and out will help get the cutting tool over topdead-center of the barrel or receiver you need to put holes in. If you have a milling machine you already know how to do that. The tough part when using a drill press is to get the drill chuck over top-dead-center and maintain it when drilling holes with a specific spacing. This is where a jig

or fixture of some sort will help, as the precise hole spacing is built into the jig to match the hole spacing in the base or mount. I've made up several styles of hole-spacing jigs. When the job calls for installing a center bead along the top of a vent rib on a shotgun, it can be difficult to keep a free-spinning drill from "walking" off location because of the machined matte surface on the rib.

A simple little locating jig that I made up has a hole in the center of a 1-1/8-inch-diameter by 5/8-inchthick round stock that was drilled in the lathe to accept a #45 bushing. Knurling was formed on the outside diameter of the 1-1/8 inch stock to provide a secure grip on this diameter when in use. This round jig was then set up in an indexing fixture on the mill so that a 3/16 hole could be drilled 3/8 inch from the center.

The round stock is then indexed 180 degrees and another 3/16 inch hole then drilled across from the first hole. A 3/16-inch by 3/4-inch-long hardened dowel pin is pressed into each 3/16 inch hole, leaving 1/8 inch of the dowel protruding out the bottom face of the jig. A #45 drill bushing is then pressed into the center hole until the drill bushing shoulder meets the top face of the round stock.

In use, the jig is held on top of the vent rib in the location where the center bead is to be installed, and then rotated until each 3/16-inch dowel pin finds each side of the rib. The bushing hole is then centered in place and the #45 hole for the #3-56 tap is drilled to depth. Hole-spacing jigs are available from several different manufacturers in various configurations to help space sight-base holes accurately. These jigs eliminate the tough job of finding top-dead-center with an indicator and edge finder.

I combined several of the ideas used on these drill jigs and added a few of my own to come up with one that would make the outcome accurate using just one setup. The hole-locating jig I made has 1/4-inch reamed holes spaced at .562, .500, 1.000, and .800 inch that accept bushings made from 0-1 oil-hardening steel. The bushings area slip fit into any of the six reamed holes in the jig.

The sequence involves first drilling a starter hole with a #1 center drill which has a 1/8-inch body diameter with a 3/64-inch-diameter cutting tip through a 1/8-inch bushing installed in the jig. This drill will create a spot for the "pre-ream" drill and then slightly chamfer the edge of the holes at the top surface. This chamfering is important when we get to the tapping phase. This bushing is then removed and replaced with a bushing that will accept the pre-ream drill which drills the hole to depth. This bushing is then replaced with a bushing that will accept the finishing reamer that will bring the hole to the tap-drill size. During each drilling step, cutting oil is used to lube the cutting action. After the appropriate holes have been reamed to size, the barrel is taken out of the vise and put in a padded vise on the bench without removing the jig. Tapping Threads When we work with firearms that have been drilled and tapped at the factory, we are not usually dealing with the best threads possible.

A drill is a roughing tool, so if we desire a more precise hole for tapping, the hole will need to be reamed. A reamer is a finishing tool that will remove irregularities caused by the drill and cut a more perfectly round hole with a much smoother surface and a more precise diameter. Reamers are available in the same wire sizes as the appropriate tap-drill diameters. You will find that with these small-diameter reamers there will be a male center on the cutting end used during the manufacture of the reamer.

This little center should be dressed off with a fine-grit sanding belt, taking care to avoid removing the temper of the reamer. Because these reamers will be cutting bottom holes, the cutting lead will only need to be around .030-inch long. When using a reamer, we need to drill the holes we want to tap to a diameter around

ten-thousandths of an inch smaller than the recommended drill diameter. For example: A #6-48 thread calls for a recommended tap-drill of #31 (.120 inch diameter). Instead of using this drill, we would use a #36 drill (.110 inch diameter) to rough out the hole, and then finish the hole to size with a #31-wire-size reamer. The most common size threads we use on firearms are #3-56, #6-48, and #8-40, along with the occasional #6-40 thread used by some sight-base manufacturers.

All of these taps are rather small in diameter and will be found in either a twoor three-flute configuration, meaning they have either two or three cutting edges. Cutting leads can be obtained in the plug style that has a 5-7 thread cutting end used to tap through holes, or the bottoming tap with a 1-1/2 thread-cutting lead used to cut threads very close to the bottom of a blind hole. I find it best to have two of each style on hand for each of the threads I use most often.

The #6-40 thread, being less common, doesn't come across my bench all that often, so I only keep one bottom-cutting style and one plug style in stock. Buy the best taps you can afford. Taps made of high-speed tool steel are best and will out-last carbon steel taps better than four to one, without costing that much more. When they get dull, either have them sharpened by someone offering that service or toss them out. Trouble comes quickly when a dull tap is used in an attempt to cut threads.

Most common high-speed-steel taps are class GH-3 in the extra fine thread pitch we most often use. The "G" means that these taps have ground threads. The "H" means that this is a high-size tap, and the "3" represents the amount that the tap is oversize; in this case, around .001 inch. Some of the scopes we see these days can be quite large and can be a bit heavier than a normal hunting-type scope.

When these scopes are mounted to large caliber, Magnum rifles, usually .33 caliber on up, #6-48 screws may not be the best choice. During recoil, inertia always travels in a repetitive, linear direction. The stress is concentrated at the minor diameter of the screw, where the bottom surfaces of the scope bases meet the top face of the receiver.

Drilling, reaming, and then tapping the provided #6-48 holes to #8-40 will give added shear strength to the mounting system because of the larger minor diameter of the #8-40 screw. You will gain around 15 percent more shear strength per screw with the #8-40 screw diameter. Of course, the bases will then need to be countersunk to accept the larger mounting screws.

For open, screw-attached iron sights, there's no reason why the #6- 48 screws wouldn't be strong enough to overcome any inertia working on these lighter-weight sights. Fastener Choice Mounting screws are another one of those things we have little control over. You get what you get and hope for the best. There are several fastener styles in use on bases, both for scope mounts and iron sights. Most often seen are those with a 90-degree shoulder and those with an 82-degree shoulder.

Depending on which style you prefer, you will need to have an assortment of driver bits to install these screws. For holding bases of any sort in place, I prefer the slotted, 82-degree-angle head type. The 82-degree angled head has around 30-percent more bearing surface that bears against a mating surface of the same angle and will produce a bit more holding strength than the 90-degree-head fastener. My preference for the slottedhead-type screw comes only from my (continued on page 21)

experience and what I've observed with the different styles of fastener. The slotted-head screw can be tightened with reasonable care using a properly sized bit, and along with a dab of thread locker, will give consistent service. A close second would be the Torx-type socket screws. The bits for this type of head fit the sockets they were intended for very well, and there is less chance for cam-out. With the hex-socket-type fasteners, I've had several failures, with the head twisting off during installation.

This was no doubt caused by the hex socket in the screw being broached to maximum depth, leaving a thin wall at the bottom outside diameter of the head. The trouble is, how do we know if a socket has been cut too deep and a torque-overload condition has occurred during the tightening process, which could cause failure somewhere down the road? Conclusions Drilling and tapping holes should not be done in a hurry.

With a couple of extra steps, the holes you drill and tap will be of a better class than are now performed by most production processes. By setting up your equipment to be as accurate and sturdy as humanly possible, and then drilling and tapping through bushings perpendicular to the bore line, you can produce tapped holes as good as those done by any custom metalsmith around. ■

FROM THE ARCHIVE

Dampening Barrel Vibration For Improved Accuracy

Only minor gunsmithing is required—namely, removal of the front sight—to install the Limb Saver Barrel De-Resonator. And a simple test shows that it does work.

BY CHICK BLOOD JANUARY 2006 ORIGINAL PP. 10-13

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The first time I clearly heard an arrow twang off a bow string and audibly whiz to its target was in the film Robin Hood. I figured the sounds had been enhanced for dramatic effect. That may have been the case, but I've always thought bow hunting was the "quiet" way to down game nonetheless. It was at one time, of course, when simple one-strand bows were the weapons of necessity with Indian tribes from Maine to the Pacific Northwest.

Those early hunters would find little similarity between their hunting tools and the exotic present-day compound bows. They might not like the new incarnations, either. Today's bows entail a tremendous amount of energy storage in a hand-held device. Everything from the draw of the string through the hold on the target to the release of the string and the follow-through affects this energy.

The instant the arrow is loosed, the stored energy is released simultaneously to produce recoil, shock, vibration, loss of accuracy, and noise that can spook an animal before the arrow can reach it. Right about now you're getting ready to ask why I'm going on so much about bows and arrows. This is a gunsmithing publication isn't it? Patience, please. A product has been developed by by Chick Blood Sims Vibration Laboratory (301 W.

Business Park Loop, Shelton, WA 98584; www Limb Sav-er.com) to reduce vibration and noise in archery that outperforms butyl, raw silicone rubber, sorboth ane, neoprene, and numerous other viscoelastic materials. Trademarked as NAVCOM, short for Noise and Vibration Control Material, it has been used for recording-studio insulation, computer hard-drive isolation, as well as for applications in the aerospace and automotive industries.

More recently, it is being used to reduce shock and vibration in sporting equipment such as aluminum baseball bats and golf clubs. Here comes the gun stuff. Take a length of clothes line or a fishing pole and snap it with your wrist. The vertical whipping you see happens, to a much lesser degree, with a rifle barrel every time it's fired. This is not its only movement. Subtle barrel harmonics, or vibrations, begin before the bullet starts toward the muzzle.

These vibrations are caused by lesser things like the sear disengaging the firing pin, the firing pin striking the primer, the powder charge igniting, and the bullet initiating its travel forward. Once in contact with the rifling, the bullet establishes a 360-degree vibrational pattern. In other words, while the barrel does move up and down, it also moves in a circular manner. The sum of all this moving around causes the projectile to exit the muzzle at a slightly different point in the 360-degree arc.

It stands to reason that if there is a reduction or dampening of the vibration, circular included, the size of the arc is reduced. The smaller the arc, the tighter the group fired. The problem of barrel vibration and its effect on accuracy should come as no surprise to you.

The fact that barrels vibrate was "discovered" by gun writers of the 1930s. (Paul Mauser conducted experiments with barrel movement in the 1890s.) Reading of barrel vibration, many misguided accuracy buffs tried to defeat vibra The rifle was leveled and bore sighted before testing began. Range was 50 yards.

ARCHIVE IMAGE WITHHELD

Original caption: Right top and bottom: Two targets show the before and after effect on accuracy.

tion by applying upward pressure on their barrels with the forend. This technique, however, created another problem: The pressure placed on the barrel bent the action. A far, far simpler way of harmless ly defeating rotational vibration of a barrel has come on the scene in the form of the Limb Saver Barrel De-Resonator made of NAVCOM. It both dampens vibration and shortens the settling-down time of a barrel as the bullet travels through it.

At least, that's what is claimed on the blister pack in which my de-resonator arrived. These claims were worth checking out before I settled in to write this report. My first problem was that the de-resonator won't slide on a barrel with its iron front sight in place. It presents no similar problem with a scope, as long as the objective lens sits high enough to clear the little device. Having every intention of removing the human factor from my testing, I didn't require a scope.

I'd decided to secure the bolt rifle to be used in a rifle vise, clamp the vise to the firing line, pull the trigger via a string, and use factory ammo only. The rifle eventually chosen was the first rifle my Dad gave me—a single-shot Winchester Model 60A in .22 LR caliber. This rifle is accurate enough to have fired tighter off-the-bench

At the top is a 1-1/4-inch group produced without the Deresonator; below it is one of several 1-inch groups produced with the device on the rifle barrel. groups than an Anschutz Model 1413 I used during a test of 20 different brands of .22 LR ammo I performed a few years ago. I felt the little Winchester would be a tough but fair platform for the de-resonator, in spite of the small caliber.

And, besides, there was no way I was going to remove the front globe sight with inserts and bubble level from my .30-'06 Pre-64 Military Match Model 70 Bull Gun. The only thing that made me queasy about the Model 60A, in fact, was removing its front sight. It had never been off the rifle—let alone moved either right or left to change point of impact.

Gritting my teeth some, I scribed an easily touched-up line on the sight dovetail base and a matching one on the barrel, drifted the revered original sight out left to right, and attached it to a magnetic strip above my bench I use to keep small parts from vanishing. Then I was off to the range. After setting out a rapid-fire pistol target at 50 yards, I clamped the Model 60A in the vise.

Having no sights to work with, I removed the bolt and bore sighted the target dead center, secured the vise to the firing line, and tied a 36-inch-long string to the trigger. The barrel had been thoroughly cleaned previously, so three "fouling shots" were fired, the target was replaced, and the rifle again bore sighted by minor repositioning of the vise. The next three shots resulted in a 1-1/4-inch group. Not too disgraceful for a 70-year-old pea shooter.

I removed the rifle from the vise and applied a few drops of gun oil to the first 4 inches of the barrel. I worked the de-resonator on so it sat about 2-3/4 inches aft of the muzzle, which is one of the manufacturer's recommended positionings. Another target and another bore sighting followed before three more rounds were sent downrange. The group size shrank to 1 inch.

After moving the de-resonator back to about 2 inches in front of the forend, the second recommended position, and after another bore sighting, a third string of three shots showed no change in group size. This time, I moved the vise and bore sighted again at a blank area on the same target. Three more shots followed, again producing a 1-inch group.

I got the feeling that no matter how many shots were fired, until the bore got really fouled, I could get the same groups as long as I cared to remain on the firing line. Having other things to do, I concluded that whatever vibra tional harmonics existed in my oldest rifle they had been defeated, and she was more accurate than ever. Could the groups have been even tighter (perhaps a perfect cloverleaf?) with another brand of ammo? Possibly.

Small-bore firearms are known to perform better with one kind than with another. The same would be true of the positioning of the de-resonator on another rifle's barrel. But the testing was designed to find out if the device worked, and work it did. Sims Vibration Laboratory also offers a nice line-up of NAVCOM recoil pads in slip-on and grind-to-fit configurations, as well as precision fitted units for various specific rifles.

The company also produces an interesting assortment of other vibration-damp ing items for firearms. If you come in contact with anew Remington 700, though, don't bother ordering a NAVCOM recoil pad to put on it. It comes from the factory wearing one. ■

MAINTENANCE & REPAIR

Perform a Trigger Job On the Beretta A391 Xtrema

Reshaping the hammer can solve the trigger-adjustment problems on this popular Beretta shotgun.

BY SERGEY LYALKO JANUARY 2006 ORIGINAL PP. 14-16

Beretta's Xtrema semi-automatic shotgun is now well known to hunters and target shooters. It was introduced by Beretta in 2002, and quickly became recognized by many waterfowl hunters. This 3.5-inch-chambered shotgun has a number of attractive features including an overbored barrel, long forcing cones and chokes, a self-cleaning gas piston, and an adjustable stock.

Although designed for 3.5-inch extreme loads in waterfowl conditions, the Xtrema will also function with mild shells, making it quite desirable for target shooters. I believe, however, that there is one serious problem with this gun—its trigger. On many occasions, I've heard complaints from shooters about the Xtrema's trigger, and most of the gunsmiths I've talked to have been unable or unwilling to deal with this problem.

Some discussion of this matter can be found in the product-review located at http:// waterfowlreview. com/review/ber etta_xtrema.htm. The problem itself sounds very simple—the gun comes from the factory with a trigger pull of around 6 to 8 pounds. In addition, the pull is long and rough. So it's not surprising that owners want the pull made lighter, smoother, and shorter.

Routine polishing of the sear and hammer, which might suffice with other guns, doesn't work on the Xtrema, since even small changes of the sear-hammer engagement can make the hammer slip from the sear at every reloading. In other words, every time the bolt is closed, the hammer, instead of holding in the cocked position, jerks off the sear and makes a shot impossible.

After doing several trigger jobs with results between 4 and 5 pounds and never knowing for sure whether the hammer is reliably cocked or is Figure 1. going to slip down at some future time in the field, I decided to take a serious look at the problem and find an effective remedy. In this article, I'll analyze the mechanical reasons for the problems with the Xtrema's trigger, and suggest away of fixing them. At the time of this writing, the new Xtrema 2 is on the market.

I hear that it does not suffer from these trigger problems, but there are many guns of the previous issue that can benefit from the adjustments outlined here. A Close Look at the Problem The shooters' major complaint is that the trigger pull is heavy, long, and rough. For the gunsmith, this complaint presents a challenge, since trigger-pull adjustment almost invariably leads to an unstable hammer-sear engagement; i.e., the hammer does not stay cocked, but slips from the sear. I call this the "hammer-jerk" problem.

So, my goal was to first find away to reliably engage the hammer and sear. Only then would it be possible to adjust the quality and tension of the trigger pull. Let us look closely at the ham Figure 2.

mer-jerk problem and the related mechanical elements of the action. In so doing, it may become clear what changes in mechanics are necessary to eliminate this problem. Figure 1 shows the action with the original hammer and sear engaged, and all other elements removed.

The trigger-pull qualities such as length and smoothness are defined by the shape of the sear tooth and the sear notch of the hammer, which I call the "hammer notch." To a large extent, the tension of the pull is also a function of this engagement, but has the resistance of the trigger spring as an additional component. Figure 2 shows the trigger with trigger spring. I found that the factory spring alone creates a resistance of more than 2 pounds. This can be measured when the hammer is not cocked.

The spring can be easily replaced, which is the first thing I did. Note that this trigger spring still needs a resistance of about 1 pound for reliable working of the trigger and disconnector. Since my goal was to reduce the trigger pull to 3 pounds, the remaining 2-1/2 to 3 pounds had to be removed by polishing the sear-hammer engagement. At the factory, the sear and hammer are adjusted so that they "catch" each other. This is shown with certain exaggeration in Figure 3-A.

Such adjustment creates a lot of resistance during the trigger pull. In fact, the trigger pull in this situation drags the hammer back against the mainspring tension until it is released by the sear. This very drag is the source of the excessive trigger pull. Usually, trigger pull can be reduced by polishing the hammer notch.

This is easy to do and to check with a trigger-pull gauge, since the Xtrema's trigger group can be dealt with separately from the receiver, meaning that there's no need for assembly and disassembly after each session of polishing. When the trigger pull is adjusted to 3 pounds and tested outside the action, everything still looks good. The problem, however, shows up immediately after replacing the Figure 3. trigger group in the receiver.

Pulling the bolt back and releasing it, which is a normal way of loading the gun, causes hammer-jerk from the sear. If I didn't do this polishing myself, I would suspect that the sear and hammer notch were bitten or worn out. But it must be something else. One difference between manually cocking the hammer (when the trigger group is taken from the receiver) and doing so by cocking the hammer with the bolt, is in the speed with which the hammer lowers on the sear.

The bolt drops the hammer on the sear with significant speed—especially during live shooting. Doing this manually puts the hammer on cock much slower; first, because cocking the hammer manually stops right after hearing the click of the hammer-sear engagement, and second, because the hand cannot release the hammer momentarily. The bolt, in turn, moves the hammer much farther than is needed for engagement, and then quickly releases it at a distance from the engagement point.

This consideration made me assume that a hammer cocked by the bolt slams on the sear and opens it enough for disengagement. This is somewhat similar to what I've seen on pistols and other semi-automatic guns. Such a possibility on the Xtrema is even more feasible, since its sear opens in the same direction when the hammer pushes it. This is easily visible in Figure 1. To prove this assumption, I checked the real travel of the hammer when it is cocked by the bolt.

For this purpose, I first measured the depth of the bolt from the lower edge of the receiver, which is close to 1.18 inches. Figure 1 shows where the bottom of the bolt moves during loading of the gun. Next, I projected this depth on the hammer travel during cocking. Figure 4 shows how much farther the hammer travels back than is required for the normal engagement when the bolt is backed up.

I call this "hammer over-travel." This over-travel (distance "D" in Figure 4) is about 0.3 inch, and allows the hammer to accelerate on its way forward to the extent that, instead of stopping on the sear tooth, it moves the sear forward against its spring, and unlocks itself. This is the major reason for the hammer jerk. The other reason for this problem is the position of the hammer notch relative to the sear.

As shown in Figures 1 and 3-A, originally the sear tooth is engaging the hammer notch (R) close to its edge. So, when the hook portion (F) of the hammer notch is polished away, the sear easily opens and releases the hammer. These were the two reasons for the trigger problem I found on this gun. Fixing the Trigger Problem As soon as these two reasons for the trigger problem on the Xtrema were identified, it became clear how to eliminate them. First, the hammer

Figure 4. Figure 5. over-travel (D) has to be reduced to a minimum. And second, the sear has to engage the hammer notch deeper, as shown in Figure 3-B. One way to achieve both goals at once is to braze a steel insert into the factory hammer and reshape it appropriately.

Figure 5-A shows the hammer after brazing the insert, reshaping, and adjusting the trigger pull to 3 pounds. (Figure 5-B shows the original factory hammer.) This photo shows how the original dimensions were changed to eliminate the hammer-jerk problem. One thing to keep in mind during the reshaping of the hammer is that the tail (T) serves as a secondary disconnector. On its way back, the hammer pushes the trigger link (#3 in Figure 6) down and disengages it from the sear by placing it into the sear recess (#1).

There is a primary disconnector on this gun shown in Figure 6 as #2. It disengages the trigger link and sear on every bolt opening and keeps them disengaged until the bolt is properly closed. So, the function of the disconnector on the Xtrema is duplicated by these two parts. This means that the disconnecting function of the hammer can be abandoned. Nevertheless, it is more reliable to have them both in place. The length of the hammer tail (T) is critical for the independent secondary disconnection.

At least, it should not be longer than required, since that would not allow the trigger link to engage the sear for the next shot. After brazing the steel insert into the factory hammer and shaping it as shown in Figure 3-B, I adjusted the trigger pull to a smooth 3 pounds. Testing with live ammo was successful. The trigger pull Figure 6. Figure 7. was light, smooth, and crisp, with no hammer-jerk problems. Thus, I believe my assumptions about hammer overrun and sear-hammer engagement were proved.

After approximately 100 shots, the insert brazed into the hammer broke off. Fortunately, it had already fulfilled the task of proving the concept. Instead of playing with another insert, I decided to make a completely new hammer from oil-hardened Starrett steel. This seemed to be more reliable; and besides, I wanted to properly heat-treat the new hammer since it's important to have the hammer notch hardened enough to keep the shape and preserve the adjustment of the trigger pull.

After making anew hammer as a complete copy of the prototype with (continued on page 21)

insert, I spot-hardened the hammer notch and once again adjusted the pull to 3 pounds. Note that spot-hardening is the only possible way to harden the hammer notch, since the rest of the hammer should not be brittle. Figure 6 shows this new hammer engaged with the sear. The overrun of the new hammer was adjusted to the very minimum; Figure 7 shows this overrun during the bolt opening. As you can see, this overrun is minimal, since it is just enough to disconnect the trigger link from the sear.

Now it was time for testing again. I had to make sure that three things were holding up reliably; first, that the hammer didn't jerk from the sear; second, that the new hammer didn't crack or break even under hard stresses; and finally, that the trigger maintained smoothness and 3 pounds pull throughout. To create the most comprehensive test, I chose about 100 different shells—everything from 2-3/4-inch mild shells to 3-1/2-inch Magnums. The test went smoothly. There were no misfires or any other problems.

The hammer did not have any jerks, even when the gun became as hot as a stove. The trigger maintained a consistent pull. After this test, I disassembled the action and checked the condition of the sear and hammer notch. There were no signs of any damage. The gun has now been back in service for quite some time. After hundreds of rounds, it holds all my adjustments. Note that the change in the hammer shape now allows adjustment to a shorter and lighter pull.

It can be made even less than 3 pounds, which was not my goal in this case. Conclusions The problem of reducing and smoothing the trigger pull on the Beretta Xtrema shotgun can be solved with the two-step procedure outlined above. First, the hammer has to be reshaped so that it does not have an exceeding overrun beyond the sear-hammer engagement point. The sear has to engage the hammer notch on its entire depth. This step will ensure reliable sear-hammer engagement.

The second step is to do a quality trigger job in order to achieve the desired tension, length, and smoothness of the trigger. ■

METALWORKING

Working the Smith & Wesson .45 Model No. 3 Schofield Revolvers

With modifications patented by Major George W. Schofield, Smith & Wesson's top-break Mod el No. 3 revolver became a well-known and well-respected sidearm for the U. S. Cavalry.

BY DAVID R. CHICOINE JANUARY 2006 ORIGINAL PP. 17-21

ARCHIVE IMAGE WITHHELD

Original caption: Right top and bottom: Smith & Wesson's Model No. 3 Schofield in .45 caliber was purchased by the U. S. Army in contracts starting in 1875. The Schofield served alongside the Colt SAA with units of the 6th, 9th, and 10th Cavalry, among others. This well-used 1st Model .45 U. S. Army Schofield has a serial number in the 2,000 range. Schofield alterations turned the Model No. 3 into a more practical revolver for cavalry use.

ARCHIVE IMAGE WITHHELD

ARCHIVE IMAGE WITHHELD

In 1870, the U. S. Army contracted with Smith & Wesson to deliver 1,000 of their revolutionary new top-break Model No. 3 revolvers in .44 S&W caliber. The delivery to Springfield Armory of the 800 blued and 200 nickel-plated revolvers took place in 1871. After issuing the new revolvers to the cavalry for a period of field trials, the Army came to the conclusion that the S&W was too complicated and delicate for service use, and decided not to purchase additional revolvers.

Largely due to the efforts and inventiveness of a U. S. Army major who enthusiastically supported the top-break service revolver, however, the Army returned to the notion of adopting atop-break revolver in 1875, and eventually purchased over 8,000 S&W Model No. 3 Schofield revolvers in .45 S&W caliber. S&W's Schofield Model 3 used the basic Model No. 3 frame, but with alterations patented by Major George W. Schofield.

THE

This was because the barrel latch of the Schofield version could be operated with the thumb of the shooting hand, instead of having to be lifted up with the off-hand like the regular S&W Model No. 3. This modification made opening the S&W barrel an easy, one-handed operation. Schofield also greatly simplified the S&W extraction system, in the process making it more reliable. Introduced in 1875, the .45-caliber Model No. 3 Schofield is a single-action revolver with a square-butt grip shape.

Upon opening the barrel, this revolver, like all S&W top-breaks, features simultaneous, automatic ejection of the spent cases. The Schofield S&W was chambered for .45 S&W, which was similar to the .45 Colt but with a case .1-inch shorter and a bullet weight of 230 grains compared to the 250-grain slug used in the .45 Colt. Smith & Wesson's .45 cartridge used 28 grains of black powder as propellant, while the original .45

This allows the cylinder catch to pivot up just enough for the cylinder to be pulled off to the rear. Colt powder charge was 40 grains. It wasn't long before the Army reduced this and standardized the 28 grain powder charge with a 230 grain bullet in the S&W length case for all .45-caliber revolver ammunition. In all, 3,000 Schofield revolvers of the "1st Pattern" (or 1st Model were manufactured for the U. S. Army in 1875, with a scant 35 revolvers made for civilian sale.

Serial numbers for the 1st Model started from #1 and ran up to #3,035. Starting in 1876 and built through 1877, an improved Schofield known as the 2nd Model was purchased by the Army. One easily identified feature of the 2nd Model is its barrel catch, which differs from the 1st Model in that it has a flattened, checkered top that was easier to grasp. The barrel catch also used a larger-diameter pivot screw. The 2nd Models used a stronger base pin that was made with longer threads to help prevent breakage.

Also, 1st-Model frames were made of iron and used a removable, hardened steel firing pin bushing, while the 2nd Model frames were made of steel so the firing pin bushing was dispensed with. In all, about 5,285 of the 2nd Models were produced for the U. S. Army, with only 649 manufactured for the commercial market. Serial numbers of the 2nd Model Schofield ranged from #3,036 up though about #8,969.

Military versions were stamped on the frames, barrels, and cylinders with a proof "P" and an inspector's initial, while the U. S. Army grips were marked with an inspector's cartouche and, on later versions, a production date. The Smith & Wesson Schofield was and still is a well-liked revolver; in fact, many shooters and collectors consider it to be the best of all the top-break revolvers made by S&W. Among other notable figures, both Jesse and Frank James used S&W Schofield revolvers.

In more modern times, there have been no less than three replicas of the Smith & Wesson Schofield. Navy Arms was the first of these, offering a replica 2nd Model made by A. Uberti in Italy. This was followed by the Cimarron 1st Model Schofield manufactured by the ill-fated ASM, also of Italy. And in the year 2000, Smith & Wesson itself produced a limited run of a highly modified Schofield. I prefer to call this a "look-alike," since it was far from being an exact replica.

Both of the imported replicas were offered in .45 Colt and other calibers, while the S&W revolver was offered only in the original .45 S&W chambering. S&W Model No. 3 Schofield Disassembly Instructions 1. Pull the hammer (#891) back oneclick, placing it into the half-cocked position. Keeping your finger away from the trigger (#908) at all times, pull the barrel catch (#876) to the rear and tilt the revolver barrel all the way down to open the action. Check carefully to be certain the cylinder is unloaded.

To remove the cylinder (#883), loosen the rear screw in the cylinder catch (#905) about one-half turn. The cylinder catch forms the major portion of the barrel top-strap area and is a separate part from the barrel. Loosen the front screw on the cylinder catch and tilt the cylinder catch up slightly, then pull the cylinder to the rear. The rear cylinder-catch screw (#907) is intended to have an eccentric screw shank that allows the cylinder catch to be tilted up slightly when the screw is loosened about half a turn.

If this feature does not function, the screw might have been changed for a screw with a plain shank. If it has, you will have to remove the rear screw in order to tilt the cylinder catch up so that the cylinder can be removed. The cylinder will now withdraw off the base pin (#879) toward the rear. 2. To remove the barrel, remove the joint-pivot screw (#899) from the

left side of the hinge on the frame (#920), and use an appropriately sized straight punch to drive the joint pivot (#898) out of the frame toward the right side. Be sure to note the witness mark on the joint pivot and its corresponding mark on the frame for reassembly. The barrel (#875) is now loose and can be lifted up out of its joint with the frame. The extractor cam (#886) is located between the ears of the barrel hinge, and it can be pulled down and out of the barrel.

Notice the removable extractor-cam bushing (#886a) at its center. Make note of the position of the extractor cam for reassembly. 3. To remove the grips and sideplate, unscrew and remove the grip screw (#916) and lift off the grips (#914). Unscrew and remove the barrel-catch screw (#877). Be sure the hammer is in the half-cock position, then withdraw the barrel catch (#876) from the top by pulling it up and to the rear. Unscrew and remove the two sideplate screws (#902 and #903).

Turn the frame on its side, holding it by the hinge over a padded bench top with the sideplate facing up. Strike the grip frame a sharp blow or two using a hardwood or plastic mallet. Once the guard is off, the cylinder stop and trigger can be accessed. The revolver shown here is a 1st Model. This will shock the sideplate (#901) and cause it to jump up out of its seat in the frame for removal. Never attempt to pry off the sideplate, as serious damage to the plate and frame may result. 4.

A pair of spreader-type pliers is used to remove the main spring and hammer by compressing the top of the mainspring (#900) so the hammer stirrup (#893) can be rotated forward and out of its seat between the ears at the top of the mainspring. Release the mainspring and loosen the strain screw (#917), which is located in the bottom-front of the front grip strap on the frame. Withdraw the mainspring from the frame side.

Next, carefully rotate the top of the hand (#895) to the rear using a small screwdriver as a lever. While holding the hand to the rear, pull the trigger (#908) and hold it to the rear. The hammer (#891) can be rotated about half-way back and carefully pulled upward, off the hammer stud (#892), and out of the frame. 5. To remove the trigger guard, unscrew and remove the trigger-guard screw (#913) and remove the trigger guard (#912) by pulling down and

875 Barrel 876 Barrel Catch 877 Barrel Catch Screw 878 Barrel Catch Spring 879 Base Pin 880 Cylinder Stop New 881 Cylinder Stop Spring 882 Cylinder Stop Pin 883 Cylinder 884 Extractor 855 Extractor Rod 885a Extractor Stud Smith & Wesson No. 3 Scho ield .45-Caliber Revolver 886 Extractor Cam 886a Extractor Cam Bushing 887 Extractor Spring 888 Extractor Pawl 889 Extractor Pawl Pin 890 Extractor Pawl Spring 891 Hammer 892 Hammer Stud 893 Hammer Stirrup 894 Hammer Stirrup Pin 895 Hand 896 Hand Spring 897 Hand Spring Pin 898 Joint Pivot 899 Joint Pivot Screw 900 Mainspring 901 Sideplate 902 Sideplate Screw, Center 903 Sideplate Screw, Rear 905 Cylinder Catch 906 Cylinder Catch Screw, Front 907 Cylinder Catch Screw, Eccentric, Rear 908 Trigger 909 Trigger Pin 910 Trigger Spring 911 Trigger Spring Pin 912 Trigger Guard 913 Trigger Guard Screw 914 Grips (stocks) 915 Grip Pin 916 Grip Screw 917 Strain Screw 918 Front Sight 919 Sight Pin 920 Frame

forward from the front. The cylinder-stop spring (#881) is fitted into and held captive in the guard by a small dovetail slot inside the trigger guard. The spring will slide to the rear for removal. 6.

Using a cup-tipped pin punch and hammer, drift out the cylinder-stop pin (#882) and push the cylinder stop (#880) out toward the bottom through its window in the frame, located under the area where the cylinder rotates. (The cylinder-stop pin is the center of the three pins that pass through the frame from side to side.) Again using the cup-tipped pin punch and hammer, drift out the trigger pin (#909). The trigger pin is rear-most of the three pins that pass through the frame.

The trigger (#908) can now be pulled out the bottom of the frame. The trigger spring (#910) is mounted inside the front grip strap and is held in place by across-pin running through the grip frame. Drift out the extractor pawl pin (#889), which is the front-most of the three pins that pass through the frame. The extractor pawl (#888) and its spring (#890) can now be removed from the bottom of the frame hinge. 7.

To disassemble the cylinder, insert six fired cartridge cases or dummy cartridges into the chambers for support. Push a punch through the hole in the ejector rod (#885), and rotate the cylinder in a counter-clockwise direction to unscrew the ejector rod from the extractor (#884). 8. To disassemble the hammer, rotate the hand (#895) about 180 degrees and pull it out of the hammer. Drift out the pin in the center-front of the hammer that holds in the handspring (#896).

The handspring will now slide out of its recess in the hammer. The hammer stirrup (#893) can be removed by drifting out its pin at the rear of the hammer. Notice the position of the stirrup for reassembly. Reassemble the revolver in reverse order of the above.

■

READER FORUM

Reader Forum

BY AMERICAN GUNSMITH EDITORS JANUARY 2006 ORIGINAL PP. 22-24

ARCHIVE IMAGE WITHHELD

Mosin-Nagant Conversion? I have a M44 Mosin-Nagant that I would like to rebarrel to .30-30 Win. What are your thoughts on this idea? Will the smaller rim diameter of the .30-30 cause me any problems? If so, how do you recommend I correct for it? I really enjoy the magazine and the great information you provide. Keep up the good work. Don Frost The M44 cartridge (7.62 x 54R) is only slightly less powerful than the .308 and has been employed successfully against dangerous game.

The .30 -30 is far less potent, but there are other considerations. It is shorter and has a smaller base diameter than the 7.62 x 54R. Without modifications to the receiver, for one, merely rebarreling the rifle would result in feeding and extraction problems. Or do you intend to use your M44 as a single shot?

Frankly, we'd recommend against making the change, since a properly functioning conversion would require the services of a gunsmith with a manufacturer's license, meaning that the conversion would likely be quite costly. Stoeger Luger Woes Does anyone out there know anything about a Stoeger Luger .22? I once had one with an aluminum frame that was a very good, accurate pistol. I recently got the chance to buy anew one with a steel frame and jumped on it—not a good thing to do. The magazine doesn't work.

I can fix this, but the toggle won't lock down most of the time. The knee stays up in the line of sight between the front and rear sights. The bolt seems to be completely closed against the breech, but I can't see the front sight. I suspect that the rear toggle spring (#47 in the NRA pistol and revolver book on firearms assembly) is not in correctly, but for the life of me I can't see any other way to put it in. It seems to be just like the position in the book. Any help would be thankfully received.

Max Hoyle The old Stoeger manual we have on file stresses proudly that the frames for their pistols are steel. We were not aware they made an aluminum frame model. Interesting. Nevertheless, check for roughness or damage to the toggle and toggle ways in the frame. If present, polish them out prior to lubrication. To out knowledge, the toggle on the Stoeger is activated by the mainspring, as it is on the 9mm Luger. The spring is identified as #31 in our copy of the NRA guide.

Your mainspring may be weakened or damaged, and that could explain the toggle not fully seating. By the way, we hear a rumor that Beretta USA (the current owner of Stoeger) is considering a reintroduc tion of the .22-caliber Luger. BPS Feeding Problems I need to know the issues of any articles you have done on the Browning BPS shotguns. I had a 10-gauge Browning BPS 3-1/2-inch Magnum brought in with feeding problems.

The initial complaint was that the first rounds fed fired and ejected fine; but after reloading, the shells would not feed or fire. I removed the trigger assembly and looked for any broken parts. None were found. I took the gun out and shot it 17 times with no problems. I now have a 12-gauge Browning BPS 3-inch in my shop with the same complaint. I have not disassembled this one yet, because I thought I may be missing something and thought I would read any AG articles before proceeding.

Any info or education on this subject would be appreciated. Preston We haven't run any articles on the BPS as yet. Considering what seems to be wrong with the 3-inch BPS, the first thing that comes to mind is the selector. It may be in the single-shot position. Next to consider is the magazine follower. Is it stuck in the tube? Another possibility: The carrier may not be lifting the Magnum shells high enough. If so, spring the arms of the carrier closer together or replace it.

Finally, the cartridge stops could be out of adjustment. To adjust, remove both stops from the gun and place them on a true surface. The forward ends of the stops should measure .350 inch up above the surface. If not, make any bend to correct the height 3.5 inches from the rear of the stops. After adjustment, position the forward end of the lefthand stop about 1/16 inch back from the magazine follower. Position the notch at the rear of the right-hand stop to align with the notch in the opposite stop.

Free Drawings from the U. S. Patent Office I just thought I would drop a line to you and other readers who may not know about the patent office. It's not necessary to send for a copy of a patent drawing. The U. S. Patent office has a very fine website that enables a person to view images of patent drawings and text of the patent on-line. It does require a "plug-in" for

your browser, but they provide a link to the download site. It is a special form of a TIFF viewer. After installation, the drawings can be saved, printed, rotated, etc. The website is Hope this helps all the members. Whitney Owens Thank you, Whitney. There's $3 we 'smiths don't have to spend. Remington Stock A customer brought in a cracked stock for a Remington Model 30 in .30-06. I can repair the stock, but the customer would prefer a replacement. I've exhausted stock suppliers I know of.

If no one has stocks for this model, is there another Remington stock I could adapt? Any help would be greatly appreciated. Bob Schmuck Republic, Michigan We spoke with Remington Technical staff members. They tell us there is no Remington-made rifle stock you can retrofit to a Model 30. The people we spoke to all suggested you contact Boyds' Gunstock Industries Info Source for Ruger 96/22 I've been an AGA member since 1999 and have most issues of American Gunsmith since that time.

My question is, has there been an article on gunsmithing the Ruger 96/22 since its debut in 1996? I'm looking for something similar to afield-service manual or assembly/disassembly instructions. If there's been nothing in the magazine, do you know of a source for such info? I'm not a licensed gunsmith, but do work for myself only, and have had no luck with queries to Ruger. Thanks very much. Harvey Langley We've covered several Sturm-Ruger guns but not the 96/22 as yet. We're working on it.

There is no field-service or armorer's manual on this rifle/carbine. However, Ruger does a better than average job and goes way beyond basic field stripping in their owner's manuals. You can download the manual for the 96/22 from the the company's web site (www.ruger-firearms.com). 17-Caliber Cleaner I recently installed a Green Mountain .17 HM2 barrel on my Ruger 77/22. The fit is great and headspacing is flawless. My problem is in trying to find a one-piece cleaning rod and jag for it.

I have seen some rods listed from Kleanbore and Dewey, but some are listed for air rifles only. I emailed Kleanbore about their SAF303 rod kit to see if it was for .17 HMR/HM2 or air rifles. The answer I received from Richard Small was that it would work for both as they are the same caliber. I was under the impression that the .17 HMR/HM2 was a .172-caliber bullet and that the air rifles utilized a .177-caliber pellet. Please help; I don't want to hose my new squirrel gun with a rod that is too large.

Mike Fritz All the bullet-diameter references in our files show the diameter of the .17 to be .172. You do concern us some, however. The .17 HMR is a .22 Magnum case necked down to .17. The .17 MK2, or Mach2, is a .22 LR case necked down to .17, and we can only assume that's what you are referring to as "HM2." You'd probably be all right with a .17-caliber coated rod, as long as you run it in from the muzzle until it extends out the breech, then attach your slotted tip and clean from breech to muzzle.

If you're still nervous about it, check out Otis Technologies' flexible coated-cable system. They make one for the .17, and the flexibility feature makes breech-tobore cleaning much easier.

Forum Feedback In reply to the letter in the February 05 issue, the reader searching for a source for #4 Lee-Enfield bolt heads should try Springfield Sporters. They list them on their #4 parts page on their web site Hope this helps anyone who has a headspace problem with a #4. Lee Rohrer Thanks, Lee. We were under the mistaken impression that Springfield Sporters had gone out of business.

When we checked their web site, we were pleased to find they had not, and remain a fine source for military and other firearm parts. Convert .38 S&W To .38 Special? I've had an S&W .38 Special for several years now. I'm informed that it was a military sidearm issued during or after WWI (possibly a sidearm for the British, later re-imported into the U. S.). I've shot .38 Special rounds in it, but the cases bulge.

This is obviously unsafe, and I'd prefer to get a cylinder to make it a safe and reliable shooter of .38 Special rounds. I enjoy shooting historical military firearms, and am set up to reload .38 Special. I'd prefer to put in a different cylinder to make it an inexpensive shooter, and to keep the original cylinder so that it could be restored to original condition for historical reasons. The firearm is marked with patent dates of Sept. 14, 1909 and Dec. 29, 1914.

Other markings include .38 S&W CTG, proof marks followed by .38 767 and TON 3.5 (hard to read this one). The serial number appears to be V5422xx. The cylinder length is 1.57 inches, and the diameter is 1.45.

(continued from previous page) Is it possible to order a standard .38 cylinder from one of the reputable suppliers that would be a drop in replacement? If not, is there one which could be made to work (say, overly long but correct diameter that I could trim in a lathe)? What issues might I encounter in making this change? Thank you for your time. Kevin C. Hess We don't believe even Old Town Station would have a "drop-in" cylinder for your revolver, and doubt that one was ever made.

A standard .38 Special cylinder would have to be overhauled (shortened) for the .38 S&W, and it's likely that considerable work would have to be performed on the ratchets. A custom pistolsmith, like Ron Power could handle such a conversion. However, it would be easier and more economical to shorten .38 Special brass to 0.775 inch and fire-form it with a moderate load. Keep in mind that the .38 S&W has a .361-inch-diameter bullet, while the .38 Special employs one of .358 inch.

For accuracy's sake, check the bore of your revolver and for more information on its history, contact the NRA Museum (Waples Mill Rd., Fairfax, VA 22030). Part Sources I am looking for parts for the following guns: an Iver Johnson "Sealed 8" .22 LR revolver, a Liberty Arms (Rohm) Model 30 .22 LR revolver, a Rossi Model 92 .44 Magnum, an S&W Model 1-1/2 top-break revolver, and a Stevens 14-1/2 Little Scout. I've already checked with Gun Parts Corp., Bob's Gun Shop, The Traders Den, The Gun Garage, and Jack First.

Any help would be greatly appreciated. M. Belius We're able to offer some additional sources. For Iver Johnson parts, try Firearms International (713/462- 42000; for the Rossi, Braztech The Rohm, Brownells Parts Source List for out-of-production firearms; for the S&W, try Liberty Antique Gunworks and for the Stevens, contact Rudi Prusok rprusok@ nmu.edu). Miroku Parts This is the first time I've been stumped and had to email you.

A customer brought in a Charles Daly field shotgun, serial number S4014MK in 12 gauge, 3 inch. When I first contacted Charles Daly, they sent me the wrong parts and I found they did not fit. I called them back and they said that the gun was not theirs but was made in Japan. I then found out the Japanese company that made these was a company called Miroku. I talked to Wisner's and with Bob's Gunshop, and they were not sure what parts would fit this shotgun.

They stated many other makes and models with parts that might work. If you look at Wisner's or Miroku's web sites, you'll see the parts and drawings. The problem is that all they show are over/unders. This shotgun is a single-barrel semi-auto. The parts that the customer wants are the ejector and the ejector spring. Do you have a drawing for this gun and do you know what parts will fit this shotgun? If you have sources I have not tried, could you please let me know?

Thanks Dave We have no schematic for the Miroku you mention. We do have a source, however, that could be of help in either supplying the parts or linking you with another supplier. Heverling's Guns & Gunsmithing operates out of Palmyra, Pennsylvania, and because of the owner's daytime activities with a major importer, he is not available for phone calls until after 7 p.m. EST on weekdays .17 MK2 Conversion?

In the article in the April 05 issue on the Marlin Model 60, it states that there is no practical way to change it to .17 MK2. Is this because of the tube magazine? I have a 989M2 which uses a clip, and I would like to rebarrel it to .17 MK2. What else would I have to do besides installing a heaver recoil spring? Thanks. Chris Harvard, Illinois As stated in the article, the .22-caliber magazine tube is but one reason. Others include the bolt size, bolt weight, and size of the receiver.

The rifle you're asking about went out of production in 1968. Marlin technicians support our conclusion that it cannot be adapted to the .17 MK2. ■

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