



MAY 2007

DIGITAL ARCHIVE  
EDITION

# PRECISION ARMS WORKSHOP

AND THE AMERICAN GUNSMITH ARCHIVE

A TECHNICAL JOURNAL OF CRAFT, REPAIR & RESTORATION

# 05

ARCHIVE ISSUE NUMBER

INSIDE THE ARCHIVE

# WORKING THE RUGER OLD ARMY PERCUSSION REVOLVER

FIREARM-RELATED ACCIDENTS AT RECORD LOWS • DISASSEMBLY/REASSEMBLY OF THE REMINGTON MODEL 5 RIMFIRE ...

ORIGINAL METHODS. MODERN ACCESS.

ARCHIVE EDITION 042

DIGITAL ARCHIVE EDITION

# Preserved for the bench.

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# AMERICAN GUNSMITH

DIGITAL ARCHIVE EDITION • MAY 2007

## ISSUE RECORD

|               |                             |
|---------------|-----------------------------|
| ORIGINAL DATE | May 2007                    |
| VOLUME        | Archive volume not stated   |
| ISSUE NUMBER  | 05                          |
| SOURCE ID     | ag-5de92366f0db05686494fe41 |

## 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.

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## SAFETY &amp; COMPLIANCE

# Firearm-Related Accidents at Record Lows

BY AMERICAN GUNSMITH EDITORS MAY 2007

ORIGINAL PP. 2

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A new report from the National Safety Council shows that accidental firearm-related fatalities continue to decline significantly, even as firearm ownership rises in the U. S. The declining trends reported by the National Safety Council are also supported by research available from the Centers for Disease Control and Prevention (CDC). According to the CDC, accidental firearm-related fatalities continue to have the largest percentage decrease of all measured types of accidental fatalities.

Statistics provided in the NSC's 2007 "Injury Facts" report show a 40-percent decrease in accidental firearm-related fatalities over a 10-year period ending in 2005. The report also shows firearm-related accidents involving children ages 14 and under declined 69 percent between 1995 and 2003. The council's most recent statistics show 109,277 U. S. residents died in accidents of all types in 2005, with less than 1 percent involving firearms.

The most common deadly accidents involved motor vehicles, poisonings, and falls, together claiming 75 percent of all accidental deaths. "By continuing to heighten

awareness of gun safety and responsible firearms storage, these record low numbers can be driven even lower," said Doug Painter, president of the National Shooting Sports Foundation (NSSF). NSSF directs and funds a number of initiatives focused on firearms safety, including Project Child Safe®, which, in cooperation with the U. S.

Department of Justice, has distributed more than 35 million free gun locks and gun-safety information kits nationwide. NSSF also distributes safety literature and videos that emphasize outreach to schools. Additional support is provided for hunter-safety programs. "Programs and efforts that communicate the importance of firearms safety have undeniably played apart in bringing these numbers to record lows, and continuing that awareness will only help ensure they continue downward," Painter added.

The NSSF estimates that the number of citizen-owned firearms in the U. S. has risen to more than 290 million, while the number of American households with at least one firearm is now about 47.8 million.

## PEOPLE &amp; COMPANIES

# Disassembly/Reassembly of the Remington Model 5 Rimfire Rifle

*This lightweight rimfire is likely to be much more popular than the first Remington to wear the number 5 was over a hundred years ago.*

BY CHICK BLOOD MAY 2007

ORIGINAL PP. 3-6

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The first Remington Number 5 bears no resemblance to the new Remington Model 5. The two rifles differ as much as cats and dogs do. The old Number 5 was a rollingblock sporting and target rifle adapted to use smokeless powder ammunition. It was introduced in 1898, initially chambered for .30-30 Winchester, 7mm Mauser, .30-40 Krag, with .303 British added a few years later. The rifle flopped. Only 198 were sold before it went out of production in 1903.

That was too bad for Remington but a good deal for anyone who owns a Number 5, as it would be a mighty nice collector's piece today. I don't think the new Remington Model 5 will suffer the same fate as the old Number 5. Right now, it's a clip-fed bolt-action available in .22 LR and .22 WMR. I have few doubts that in the future it will be able to handle one or more of the .17-caliber rounds gaining popularity.

While it wears "Remington" on its box and at the rear of the receiver, you'll find "Zastava-Serbia" above and forward of the magazine housing. Zastava is the town; Serbia a former kingdom of the Balkans and presently part of Yugoslavia. Indulge me while I tell you some more about Serbia. It's where World War I got started. In 1914, the Austro-Hungarian Empire's Arch Duke Ferdinand was assassinated in Serbia by an act-alone nationalist fanatic.

Doubting the man was flying solo, the Austro-Hungarian Empire took great umbrage and struck back. The Serbs fought them to a standstill until Bulgaria and the Germans decided to reinforce the Austrians. The Serbians were soon overrun. Much later, during World War II, the Serbs allied themselves with the guerrilla forces of Draza Mihailovic, giving their Nazi occupiers seri-

ous fits until Marshall Tito arrived to unite Serbia, Bosnia, Hercegovina, and Macedonia as the Yugoslav Republic.

Just in case you don't find this kind of history very interesting, I should point out that Serbia and its people are known worldwide for the high quality of the civilian and military weapons they produce. Firearms made in the little republic have been imported for decades to this side of the pond, and fill the inventories of sporting-goods stores from coast to coast. That many of those guns or parts for them are no longer readily available is no fault of their makers.

In seeking to offer an economical It's shown here taken down one step further after removing the trigger guard. Note the wood screw at the rear of the guard.

## DISASSEMBLY/REASSEMBLY OF THE REMINGTON MODEL 5 RIMFIRE RIFLE CONTINUED

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but very high-quality rimfire rifle, then, it seemed to the folks at Remington that utilizing the talents available in Serbia would be the wise thing to do. As I understand it, the components are manufactured in Zastava, Serbia, while the assembly is done in the U. S. This was also a smart decision, since import duties on complete firearms range from high to ridiculous. Those costs would have to be passed along to the ultimate consumer, and the rifle wouldn't have wound up being as reasonably priced as it is.

Now, how about the quality? I found no complaints with the quality of the rifle itself. Unfortunately, there is nothing good that can be said about the quality of the schematic in the owners' manual. Not only is it so fuzzy as to be virtually unreadable, with all the parts numbers seriously obscured, but it contains some significant errors and omissions.

For example, the forward trigger-guard retainer (#38) is identified as a "screw," and there is no sign of (or part number) for the two spacers or washers beneath the trigger screw (#16) or, for that matter, the pin that secures the "spring holder" (#20). To me, the drawing looks like something that might have been drawn up by a junior-high-school kid on a classroom computer. A poor-quality exploded drawing The arrow points to the spring-holder retaining pin (that is missing from the schematic).

The two small set screws are used to adjust the safety (B) and trigger overtravel (C). is not unique to the Remington Model 5s owner's manual; many of the schematics that accompany present-day firearms made by off-shore sources are equally bad. I've seen some totally unreadable ones packed with guns made in Russia, and I've been told this is because the manufacturer believes an exact copy of their product can be worked up from a schematic.

Perhaps, now that this Serbian rifle comes in a box that says "Remington" on it, such an annoying detail will be corrected. On the (somewhat) positive side, I managed to secure another schematic from Remington that while not much better at least made it possible to complete this article. The drawing is still crudely rendered and fuzzy, and there are still parts missing, but at least the part numbers are readable.

**Field Stripping** When it comes to simple field stripping, the Remington Model 5 could arguably lay claim to being the simplest. First, however, make sure the gun is unloaded with the magazine out. Depress the magazine button (#37) and remove the clip (#3). Two things hold the trigger guard (#36) to the stock. The forward one is a machine screw (#38), the rearmost a wood screw. Don't look for them on the schematic. They aren't there.

You only have to back out the machine screw in order to lift out the barreled action. Unless you turn the stock upside down or completely remove the triggerguard, the part identified as the distance bushing (#39) will remain in place. The bolt is removed with the safety in its "fire" or forward position. Raise the bolt handle, hold back the trigger, and pull the bolt from the receiver. The rifle can be cleaned of any accumulation of fouling at this point, and you can give it a close visual inspection for quality.

I believe you will be, as I was, favorably impressed. Detailed Disassembly You'll need a medium hollow-ground and a very small screwdriver, a nylon bench block, as assortment of Starrett drift punches (or an acceptable substitute) and'd ue to the poor schematic'a magnifying glass and considerable patience. When you removed the bolt from the receiver, you uncocked the bolt and relieved the tension on the firingpin spring (#33). Rotate the cover (#21) to align the holes on both sides with a pin (not shown).

Push out the pin with a suitable diameter punch, withdraw the spring holder and firing-pin spring, and move the bolt handle all the way to the rear. Push the firing pin back in its slot until you can tilt up its rear end and remove it from the bolt body (#8). Take note of the lug on the bottom of the firing pin (see photo). This is



## DISASSEMBLY/REASSEMBLY OF THE REMINGTON MODEL 5 RIMFIRE RIFLE CONTINUED

ORIGINAL PAGE 5

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Remington Model 5 Bolt-Action Rimfire Rifle (Specifications subject to change without notice) 1 Magazine Bottom 2 Magazine Bottom Plate 3 Magazine Body 4 Magazine Bottom Lock Piece 5 Follower 7 Receiver 8 Bolt Body 9 Barrel 10 Bolt Handle the only portion of the pin that contacts the trigger (#14). The Model 5 is striker-fired. When the trigger is pulled, it drops away from and releases the pin, which is then under tension from its spring.

The spring expands to push the pin forward and impact with a chambered cartridge. Any work you perform to smooth up the pull would involve stoning and polishing the trigger/firing-pin contact points' without altering their engagement angles.

Additional smoothing, along with a slightly faster lock-time, can be achieved by polishing the trigger/firing-pin contact points' without altering their engagement angles.

Carrier 19 Magazine Holder 20 Spring Holder 21 the inside of the bolt body, the sides of the firing pin, and the sides of the trigger that contact the receiver. The left and right extractors (#11 and 12) are held in the bolt head by two pins, both identified as the extractor axle (#29).

These pins drift from the flat on the underside of the bolt to its top. Take note that among those parts not shown or listed are two extractor springs. There's one for each extractor. Be careful not to lose them when the "axles" are taken out. This brings me back to the receiver and what's attached to it.

When you 21 Cover 22 Ejector Screw 23 Safety Lever 24 Plug 25 Firing Pin 26 Magazine Holder Axle 27 Abutment Screw 28 Regulating Screw 29 Extractor Axle 30 Trigger Spring Screw 31 Magazine Holder Spring 32 Screw, Overtravel Screw, Safety Bar 33 Firing Pin Spring 34 Magazine

Holder Spring 35 Stock 36 Trigger Guard 37 Magazine Holder Button 38 Screw, Front Trigger Guard 39 Distance Bushing 40 Carrier 41 Front Sight Base 42 Screw 43 Front Sight 44 Rear Sight Base 45 Base Screw 46 Rear Sight Carrier 47 Plate Carrier 48 Rear Sight Plate 49 Rear Sight Spring 50 Rear Sight Axle 51 Plate Screw first see the trigger group and magazine carrier (#18), the blobs of red paint on multiple screws will hit you right between the eyes.

Don't be concerned. It isn't red Lok Tite, but a far less severe compound that has been dabbed on the screw slots during final assembly. Any disturbance to the blobs tips off the factory repair people that the mechanism has been acted upon by outside forces and specified settings may have been compromised. In plain English: "Someone's been messing with this gun." It's not shown or identified on the



## DISASSEMBLY/REASSEMBLY OF THE REMINGTON MODEL 5 RIMFIRE RIFLE CONTINUED

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Leave a second drift punch in the trigger after removing the safety lever. "drawing, but there's a screw that secures the front of the magazine carrier to the receiver. Choose a hollowground screwdriver fitting that screw snugly and back it out. A second screw (#31) is hidden beneath the magazine holder (#19) "which most of us would call a magazine release" and its spring (#34). The holder is attached to the carrier by a pin (#26).

It's a very small pin, which requires an equally small-diameter punch to start it out left to right. Once the pin protrudes about 1/8 inch from the right side of the carrier, grab it with smooth-jaw pliers, and pull it out. The holder (release) and spring can then be lifted away to reveal the second screw. To remove it, use the same screwdriver you used on the front carrier screw. The trigger and safety lever can now be pivoted upward for further study.

They are held together by the trigger screw (#16), which is really a .154-inch-diameter pin reduced and threaded to .118 inch at one

end. It's in regard to the safety lever that the two washers/spacers missing from the drawing become a factor. What they do is position the tab of the safety lever to slide into its cutout in the receiver without binding. At the same time, the oblong slot in the tab engages the nipple on the safety (#15) to lock the trigger.

With these last elements in plain sight, I call to your attention to two It was later repaired with screw-slot files and touchup blue. very small set screws (#32) in the trigger body and the abutment screw (#27). The latter retains the safety and can be turned in or backed out to stiffen or ease the movement of the safety. Note: It's possible to freeze the safety solid by over-tightening this screw. Don't. And immediately under the abutment screw is one of the small set screws.

Never turn the abutment screw in any direction without first loosening the set screw. Once you've made an adjustment to ensure smooth travel of the safety and an audible

"click" into engagement with the safety detent ball beneath it (also not shown along with its spring), turn in the set screw to hold your setting. Alternately, you might decide that a modification to the overtravel-adjustment screw (located under the safety in the trigger body) is needed. The rearmost of the set screws must be backed off first.

After the adjustment is made, secure it with the setscrew as you did for the abutment screw. A few words about those baby set screws: Don't back them out all the way. I didn't have a magnetic screwdriver small enough to engage their slots, and getting them started back in the trigger body was one royal pain. Conclusion Reassembly is in reverse order. No problems will be encountered compressing springs; this is, after all, only a .22. Now if we only get the Remington folks to order a total redo of the schematic....

I

## PEOPLE &amp; COMPANIES

# Barrel-Making Goes High-Tech

*The classic Browning M2 has become a straighter shooter thanks to a new high-tech barrel that exceeds specs and enjoys preferred status with American troops.*

BY RAY KEMBLE MAY 2007

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In gunsmithing circles, the name John Moses Browning is spoken with respect that borders on reverence. As well it should be. Even today, over 80 years after his death, Browning's designs continue in production, and the influence of his genius can be seen in virtually all the automatics and semi-automatics that cross our benches. Unless you're in the military or a recently discharged vet, however, it's probably been awhile since you've seen a 50-caliber Browning machine gun.

Known affectionately as "Ma Deuce" and officially as "Browning Machine Gun, Cal. 50, M2, HB, Flexible," this Browning design has been in continuous military service on land, sea, and in the air for nearly 90 years. Although the modifications to Browning's original design have been few and far between and exceedingly minor, recent advances in barrel manufacturing have given the M2 a whole new reputation for straight shooting.

In the March 07 issue, Dennis Wood's article on rebarreling gave a good look at barrel production from the past to the present.

For this article, I toured Sabre Defense Industries' Nashville, Tennessee, plant for a close look at barrel-making of the future. The .50-caliber machinegun barrels made by Sabre are reputed to be the best in the business.

Part of the reason, officials at the Nashville plant believe, is the superior accuracy and easy cleaning that result from the excellent bore geometry and surface finish imparted by a Sunnen HTB tube hone (Sunnen Products Co., St. Louis, MO; [www.sunnen.com](http://www.sunnen.com)). Since installing the hone, test groups from sample barrels have tightened up to roughly half the size the Army's specs require. U.

K-based Sabre acquired the Nashville facility in late 2002. "We've been making military .50-caliber barrels and guns since 1979, as well as commercial rifle barrels for various companies over the years, and the new owner, Guy Savage, planned to reposition our operation to be about 50/50, military and commercial, said Charles

Shearon, general manager of the Nashville plant. "Our operation was to be a launch pad for U.

S. production of Guy's XR15/16 rifles—a premium variant of the AR15/M16" for the civilian and police markets." The start of the Iraq war in early 2003 changed all that. "We received strong military orders for our .50-caliber machine-gun barrels, 7.62mm M60 machine gun barrels, M134 minigun barrels, and various other components. The demand for .50-cal barrels grew in the next few years from about 100 per month to 1,200 per month, and employment at the plant ramped up from 15 to 85.

Sabre makes two variations of the .50-caliber barrel: the heavy barrel for 50 caliber gun start as heat-treated bars of MIL-S-46047, a highvanadium steel alloy. The blanks weigh about 73 pounds, and the finished heavy barrel weighs approximately 25 pounds. Here, the gun-drilled blank is being loaded into the Sunnen HTB-2000 tubehone system.

## BARREL-MAKING GOES HIGH-TECH CONTINUED

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0005 inch and produce a surface finish with a roughness average of approximately 20 micro-inches. Rifling is produced by pushing a carbide button (with the rifling form in high relief on it) through the bore. the M2 Browning gun, and a lighter, shorter version for the M3 aircraft machine gun. Both have a Stellite liner for the chamber throat and first few inches of rifling. The liner and a retainer for attaching the barrel to the receiver are both shrink fitted.

The Stellite liner (75 percent cobalt and 25 percent chrome) withstands the intense heat and gas erosion of the initial discharge better than any ordnance steel. The heavy barrel starts as a 45inch piece of bar stock, 2-5/8 inches in diameter, weighing about 73 pounds. "For the heavy barrel, we use MIL-S-46047, a special alloy with extra vanadium to increase life," Shearon explained. "The aircraft barrel is MIL-S-11595, which we also use in our commercial guns. We have to buy these steels by mill run.

The heavybarrel material is cut by the mill and heat treated before we receive it. We do some preliminary operations to prep it, then gundrill the chamber end with a 0.75inch hole about 11 inches deep. A temporary liner is then installed and the rest of the barrel is gun-drilled with a 0.490inch hole. We ream after drilling, and have a hole-size tolerance of  $\pm 0.001$  inch at that point. The next step is to stress-relieve, and that often changes the bore.

Honing allows us to control the bore's final geometry and hole size to a fraction of the allowable Mil-Spec, which is helpful because of the small variations introduced later with button rifling and chrome plating.

Sabre had been using a manual lapping machine to finish bores, but the increase in military orders resulted in a bottleneck of work at that operation. "Sunnen's senior field engineer in our area, Ron Williams, has always been helpful to us, so we consulted him on

how current technology could improve our processes and output, said Shearon. The result was installation of a Sunnen HTB-2000 tube-hone system in early 2006.

Equipped with Borazon® CBN stones, a traveling steady rest, and whip-guide bushings, the PLC-controlled machine has an output of 10 to 12 barrels an hour, compared to about one an hour with the old process. "The load sensing system on the machine automatically adjusts the stone feed for optimum stock removal without tool crashes, which reduced our labor and helped improve output," explains Garry Hogan, Sabre's plant manager. "More important to us is the automatic gauging system.

The machine gauges the bore after every stroke, allowing us to control hole size, roundness, and straightness to 0.0005 inch without operator intervention. Even after button rifling and plating we are able to stay well

## BARREL-MAKING GOES HIGH-TECH CONTINUED

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50-caliber barrels are waiting to be air-gauged and fitted with a Stellite liner. Each liner is matchground to the individual barrel. Far below the Mil-Spec of  $\pm 0.004$  inch on bore dimensions, which is quite a feat on a bore length of 33 inches. Tool life for the process varies with the amount of stock removal, which typically runs 0.002- 0.004 inch. Hogan says the crosshatch pattern that honing leaves on the bore surface aids in rifling the barrel by maintaining a consistent lubricant film.

To create the rifling, a 0.517-inch carbide button is pushed through the bore, which is 0.503 inch at this stage. The button has the rifling form in high relief on it, and is rotated at the correct twist rate. The lands on the

button S. and our NATO allies. Both versions launch a 750grain slug at over 3,000 fps, delivering up to 10,000 to 13,000 foot-pounds of energy on the target.

For comparison purposes, that's roughly equal to 12 M16 bullets of .223 caliber. engrave the grooves in the bore. "The very round hole we get with the hone helps prevent high and low spots in the rifling, and keeps the grooves concentric with the bore, all of which contribute to accuracy," Hogan adds. "We make our own buttons, too, which gives better control of quality.

The surface finish of the bore coming off the hone has a roughness average (Ra) of approximately 20 microinches (millionths of an

inch) and drops into the low teens after button rifling, significantly exceeding the Mil-spec of 63 micro-inches.

This helps to maximize muzzle velocity and makes it harder for metal and powder fouling to get a toehold, so cleaning is easier. "In the precisionrifle shooting community, the sweet spot for surface finish is considered to be between 10 and 20 micro-inches," explains Hogan. "Though it seems contradictory, a smoother surface actually increases surface contact and friction with the bullet jacket, causing increased copper fouling. (continued on page 21)

After contouring the exterior of the barrel, the bore is chrome plated to a thickness of 0.0013-0.0020 inch. "One of the reasons we run such tight tolerances off the hone is because we lose some tolerance in the plating process," Hogan explains. "The platers are excellent and seldom vary more than 0.0005 inch, but if they do, we already have some margin for error to work with. The Stellite liner starts as a casting, which Sabre gun drills and reams, then sends to a third party for honing.

With the barrel induction heated and an alignment gauge in place, the liner is pressed into the barrel's chamber so that its lands and grooves line up perfectly with those of the barrel. Every barrel is then fired with a high-pressure test round and examined with a Sunnen magnetic-particle inspection system. "We're required to test fire a certain number of barrels from each lot for accuracy," Shearon says. "The Army's spec calls for a 10round burst to hit within an 8-inch circle at 100 feet.

We've always been able to hit 7, but since we started honing we're hitting 4 inches. According to Sunnen's Ron Williams, Sabre's experience is not unusual. "Honing is earning new respect from barrel makers, whether it's pistol, rifle, shotgun, or even paintball," he says. "One leading maker of special-purpose rifle barrels both rough hones and finish hones.

They are perfectionists who hold  $\pm 0.000050$  inch roundness the entire length of the barrel. "We're lucky to be able to interact with users of our products," Shearon says. "At a recent armor-war symposium at Ft. Knox earlier this year, we had tank gunners tell us they knew as soon as they shot a .50 if it was a Sabre barrel or not. If it wasn't, they found one of ours and installed it. We're sure our commercial rifles will earn the same loyalty, too, as we ramp up production and get the word out. I

ORIGINAL SOURCE PAGE

21

## MEASUREMENT &amp; INSPECTION

# Lap Fitting of Rifle-Bolt Locking Lugs

*Symmetry of the bolt locking lug surfaces must not be overlooked when preparing a rifle for the ultimate in accuracy. Both the testing and the correction are simple enough for the do-it-yourselfer.*

BY NORMAN E. JOHNSON MAY 2007

ORIGINAL PP. 10-13

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In blueprinting and accurizing a bolt-action rifle, particular attention is always given to inspecting the receiver, and corrections are routinely made where needed. The locking-lug surface contact must not be overlooked in this process, since the symmetry of the bolt's locking-lug surfaces plays a vital part in the accuracy chain. In accurizing many bolt-action rifles, I've found that careful attention to the locking lugs alone can correct accuracy problems in some cases.

A good number of do-it-yourselfers don't follow the whole blueprinting plan in their quest for better accuracy from a rifle, and failure to pay attention to the locking lugs can compromise an otherwise good accurizing job. The procedure shown here is both simple and effective. Moreover, it can be used by both the do-it-yourselfer and the professional gunsmith with a minimum of cost and time.

**Basic Bolt Inspection** Once a rifle has been fired several times, it's easy to inspect the lockinglug surfaces for contact uniformity.

Metal abrasion usually is manifest as a shiny surface, usually seen more on one side than the other. Where normal firing of the rifle fails to reveal an asymmetry between surfaces, Prussian Blue or a permanent felt-tip marking pen can be used to show points of wear.

I apply a coat on both bolt-lug surfaces and close the bolt on a fired cartridge, which will chamber with some resistance resulting in axial pressure on the lug and receiver mating surfaces. Then carefully inspect each surface for contact differences. Normally, the 6:00 o'clock (lower) locking lug receives the greater wear, which is caused partially by the action of the bolt-cocking mechanism. This depends also on how well the bolt fits the receiver.

Where a fired case is not available, simply perform this step by closing the bolt and pulling firmly rearward on the bolt handle while working it up and down. Where there is no feeling of resistance as the bolt handle is moved up and down, pulling firmly rearward on it will apply some pressure.

Another means of applying rearward axial pressure, both in testing and lapping, can be applied by placing a circular disk of shim stock between the bolt face and the cartridge.

Trying In all cases, however, the symmetry of the locking lugs is an important factor in the accuracy equation. different thicknesses will readily show which one works best. A sheet or two of paper will also work here. **Lapping the Bolt Lug Surface** Lapping the bolt lug surfaces is a very simple operation. Just place an abrasive material on the lug that shows the most contact, and close the bolt fully. This will deposit lapping material against the proper surfaces.

Again, using a fired cartridge works well, but isn't absolutely necessary. With the bolt in place, work the handle up and down a number of times and then remove the bolt. Lightly wipe down all surfaces and reinspect for contact

## LAP FITTING OF RIFLE-BOLT LOCKING LUGS CONTINUED

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Above center: The striations on both lugs shows uniform contact side-to-side, which means excellent bilateral locking-lug contact. Uneven contact here can mean trouble. uniformity. What we're trying to do is to achieve uniform contact bilaterally, and lapping should be stopped as soon as the lugs show even contact. Usually there is little contact difference and the procedure will not take long.

The shim-stock disk can be applied during the lapping procedure, but be sure to avoid getting any lapping material on the shim or the boltface. In fact, a drop or two of oil here is a good idea. As a lapping medium, I use a very fine homogeneous grit like 400 or 600 aluminum oxide or silicon carbide, or even

something as fine as J. B. Bore Paste sold by Brownells. A paste-type medium is usually easier to work with than an abrasive powder mixed into oil or grease, but either will do the job.

As the lapping operation is performed, be conscious of the fact that you're not trying to appreciably alter the head space of the rifle, and it is rare where more than a thousandth or two of contact difference between the two lags will be noted. If it appears to take more than this, I would normally Both the face of the receiver and the locking lugs must have uniform contact. The J-B Bore Cleaning Compound has sufficient abrasion to lap the locking lugs as described in the text.

Extreme care is taken in this procedure while using a micrometer lathe carriage stop. stop the procedure and leave well enough alone. You will quickly note the progress as you work along unless it's a stubborn situation, in which case a more involved means of correction will be required with barrel removal and set back. Conclusion In the never-ending search for accuracy in a rifle, looking to locking-lug contact is a good place to start.

This easy method of attaining more uniform lug contact requires only a basic inspection and simple corrective measures that are easy to perform. I



## FINISHING

# Add the “Midas” Touch

*The gold (or silver) inlay kit from Forster can turn engraving—whether simple or complex—into a striking custom statement.*

BY ROBERT K. CAMPBELL MAY 2007

ORIGINAL PP. 14-15

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When it comes to custom-gun projects, the little embellishments such as case-coloring, engraving, checkering and other custom touches can be an important part of the total package. To that end, Forster cts of Lanak, Illinois [www.forsterprod.com](http://www.forsterprod.com) an inexpensive gold or silver-inlay kit (\$13.40) that will give a touch of distinction to any firearm. The catch is, to use the kit, the piece must sport some kind of engraving, or at least have some pronounced markings on the receiver, slide, or frame.

This is not a problem with most handguns. The lettering on barrels and slides can easily be filled with the gold or silver fill. This touch might not be right for every shooter or every firearm (particularly a collectible), but in the right instances, a highlight of precious metal can really set your metal-work off. The directions supplied with the kit are simple but, of course, must be followed carefully for the best results.

There are three key elements in the kit: the Forster Number 1 Cleaner, Forster Number 3 Liquid Base, and the actual metallic fill. The cleaner, which contains toluene and xylene, should be used only in a well-ventilated area; avoid breathing the vapor or contact with the skin. Some care must also be taken when selecting the area to be filled.

Well worn or corroded areas will not produce good results. Naturally, a deep scratch over the lettering will also be filled, so prepare the section to be filled carefully.

Forster warns against attempting to gold-fill a Parkerized area or any area that has been sandblasted and then blued over. Parkerized surfaces and any rough-finished surface where you don't want the fill to adhere should be masked with tape. Examples of areas where the fill can be used to advantage include the company name and model number on Ruger pistols and the Smith & Wesson logo on revolvers. The sides of the Remington 1100 receiver require some effort, but can be really eye-catching when gold filled.

While the filling can be removed (on most surfaces) if you have a problem, Forster warns that the gold fill cannot be removed from cast engraving. Preparation is much simpler with pistols than with long guns. With rifles, you'll have to mask screw holes and wood-to-metal joints with masking tape to prevent the gold or silver fill from running into these areas. I chose a 1911-type pistol—a Rock Island Armory .45 Compact—for my first effort. This is my daily carry piece and it's a rather plain if purposeful pistol.

The pistol has received several internal upgrades and a set of grips from Wilson Combat, but overall is a pretty plain-Jane carry piece' exactly the intention. I've always thought the historical Rock Island Armory logo on the slide was a nice illustration, and would be even nicer if brought into greater relief or highlighted in some way.

I also thought A gun-patch-type cloth is also included. that, since this pistol is fired every week and drawn from the holster often, it would be a great test piece to see how the gold fill holds up. First, I used the cleaner. The “Number 1” is marked just above the warning label in very small letters, so be sure you have your glasses on—and safety glasses as well. Clean all the lettering and engraving with the Number 1 cleaner. A small cloth is supplied.

These cloths are the same as cleaning patches and are easily replenished when used. Allow the area to dry for a few minutes and then sprinkle a little of the gold powder on a clean piece of paper. Take one of the cloths and dab it in the Number 3 base and then dab it in the gold powder. Carefully work it into the engraving. It will take perhaps a minute to work

## ADD THE "MIDAS" TOUCH CONTINUED

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Then, the excess is cleaned off the surface using the supplied cleaner. the powder in. Then, before the area is completely dry, take a cloth moistened with the Number 1 cleaner and remove the excess. Things did not go as well as I would have liked with the RIA pistol. The application was somewhat inconsistent, even after I worked the area over three or four times.

I decided it takes a little practice to press the gold fill into the engraving with sufficient force and in sufficient volume, and then to avoid wiping it all off when I cleaned up the excess. I decided to try another handgun to add breadth to my test, and the results were much better. This gun was a Glock 19. While the Glock is not something you think of

when you think of "custom touches," I thought I would give it a try. The results were excellent.

The lettering of the words "GLOCK" and "9 x 19" really stood out with the gold fill, and gave me a bit more pride in what is otherwise not a very attractive piece. I moved to my newest polymer Overall, the author was pleased with the results of the Forster inlay kit. frame pistol, a Glock 37. On this pistol, I got excellent results on the first try with a minimum of fuss and bother. Curious, I broke out another favored carry gun, a Springfield Armory with a lightweight frame.

The Springfield emblem on the stainless slide is quite attractive. The Springfield Armory emblem is well struck, deep and well defined.

Again, the results were excellent, although gold on stainless steel is not as eye-catching as gold on blue. The gold fill on each of these pistols was an experiment. As for the Glocks and the Springfield, the lettering was deep and took the gold inlay well. As it turns out, the RIA pistol has very shallow engraving.

Under magnification, the edge of the Rhode Island Armory emblem was a lighter strike on one side than the other. I can only blame myself for not putting the emblem under a strong magnifying glass in the first place, and I hope you'll benefit from my mistake. Still, one fact remained. Despite (continued on page 21)

the good results with the other pistols'confirming Forster's claims for the product't he RIA piece was the one I had originally wanted to embellish with the gold accent. Eventually, with a little more experimentation, I learned how to deal with the shallow and uneven engraving. I'll warn you, however, that it's time-consuming and you'll have to decide if it's worth the effort. This is how I did it. Clean as normal. On my pistol, the word "Armory" was deepest, while "Rock Island" was a bit thinner.

After the first application, "Armory" looked good. I let this word dry and taped it over. Then I moved to applying gold fill to the less well-defined letters in hopes of making the lettering match. I used a lead pencil'not sharp, but dull and round't o fill in the lines of the words "Rock Island." I dipped the cloth in a little base, which adhered well to the lead, and then dipped a bit of powder and applied it to the surface.

Then, looking through the magnifying glass, I carefully used a combination of pencil erasers and Q-tips to clean up the excess gold fill from around the letters. This technique was tedious, but it allowed me to get an even gold coloring in the letters, and the RIA pistol looked great when I was finished. In the final analysis, I concluded that the gold fill makes a striking addition to a blued-steel gun'as would the silver.

On a stainless gun, the gold fill is subtle, but attractive. (The silver, of course, wouldn't show up at all on stainless steel.) The work involved in using the product turned out to be about twice what I thought it would be, but this isn't the first time a seemingly simple job has become more time-consuming. But I can't say that it's more complicated than I thought it would be, as the procedure is really quite simple.

In short, I'd say that a little practice is a big help, and well-struck deep engraving makes the process much easier. I

ORIGINAL SOURCE PAGE

21

## TOOLS &amp; FIXTURES

# Build a Gunsmithing Library

*Minutes spent doing research in your library can often save you hours of frustration at the bench. Here are some suggestions for building that library.*

BY ARTHUR J. HUNT MAY 2007

ORIGINAL PP. 16

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A good gunsmithing library is as important as any tool you own. And a good library takes along time to put together, so if you haven't already started one, start now! A good library (notice that I keep saying "good") is a big help is when you have disassembled some gun you're not too familiar with, and put the loose parts in a box while you wait six weeks to six months or more for apart to come in.

Oftentimes, putting the gun back together is not nearly as easy as it was to take apart. (Ever notice that?) A quick trip to your library could save you lots of time and frustration. If you're just getting started, make a point to write to every firearms company and distributor asking for any parts lists, disassembly instructions, and technical bulletins they have to offer. Be sure to include a copy of your FFL. You'll be surprised at the amount of material you'll receive.

Also check Shotgun News for reprints of old catalogs, as these often contain a wealth of information. I file all catalogs in my file cabinet for easy access. Not only are they helpful, but over the years they've become collectibles as well. Don't overlook the help, however small, that an exploded drawing or disassembly brochure can be to you. If you haven't already, buy the N. R.

A. firearms assembly & disassembly books, the Gun Digest disassembly/ assembly series, and any others you can find that include "how-to" information. If you have a gun in your shop for which there is no information available, photograph it as you disassemble it. You'll become skilled with the camera as time goes on and, properly filed, these photographs can be invaluable. I use standard-size looseleaf notebooks. The larger ones are too hard to leaf through.

If there are a great many models or variations of a gun, I'll put that gun in a separate notebook. Each notebook is labeled on the spine. As I obtain more data, I just keep adding notebooks. Put as many names on each notebook as you can. I even have a contents sheet in the front of each book, and checking this contents sheet will quickly tell you if you have what you need. Several of the larger companies put out technical bulletins for their various models.

Usually the prices are higher than for the "how-to" books, but these are well worth the money. Occasionally, you'll find cut-away drawings or pictures where you least expect to find them. Either copy them, or if the book or magazine is not valuable, cut the page out and place it in the appropriate notebook.

Parts catalogs are another good source of information (particularly those from Gun Parts Corporation and Jack First). There are many other outfits that sell parts that don't publish a catalog. They might just run an ad in a magazine like Shotgun News or Gun List. I cut out these ads and paste them in my parts notebook. This is more efficient than keeping a stack of old magazines and then having to sit down and look through all of them to find a particular ad.

You can set them up alphabetically or by the gun brand or type. Finally, make sure you keep your issues of American Gunsmith. (The AGA sells binders for them.) There's an index in each December issue that lists all that year's articles. You can make a copy of the index and put it in the front (or on the cover) of your binder for that year. And once you build your library, don't forget to use it!

If you forget things as easily as I do, a few minutes spent looking something up and refreshing your memory can often save hours of frustration at the bench. It's time well spent. I

## PEOPLE &amp; COMPANIES

# Working the Ruger Old Army Percussion Revolver

*The name of this Ruger offering and its initial appearance might lead you to conclude it's a replica of a revolver from a bygone era. It isn't.*

BY DAVID R. CHICOINE MAY 2007

ORIGINAL PP. 17-21

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The Ruger Old Army revolver isn't really a true replica of any original blackpowder-era revolver. Nevertheless, today's shooters have found it a very practical alternative to original percussion revolvers and it has become popular with blackpowder shooters. Ruger manufactures this modern percussion revolver using the "Old Model" Blackhawk action as its base, and it's available both with or without Ruger's excellent adjustable target sights. Blued-steel and stainless-steel versions are both produced.

A ruggedly built pistol, the Old Army has proven to be suitable in every way for percussion shooting events. The Old Army comes with the standard Ruger Blackhawk grip shape, so it has the feel of a Colt grip, only just a little wider. The Old Army has a robust, solid top-strap over the cylinder frame, much like the 1858 Remington percussion revolvers.

Ruger also uses a removable base pin that is similar to the Remington, only in this case the head of the base pin also serves as

a pivot for the loading lever—a little like the Civil War-era Rogers & Spencer revolver. Mechanically, as hinted above, the Old Army shares an action with the reliable Ruger Old Model Blackhawk first introduced in the 1950s, so it does not have the ultra-safe transferbar ignition used by the entire line of New Model Ruger Single Actions.

The Old Army's cylinder does sport a set of machined notches at its rear end in between the nipples. These are there so the hammer can be safely rested in one of the notches when the revolver is loaded and capped. Sturm-Ruger has obviously devoted lots of thoughtful attention to making this a practical, user-friendly blackpowder revolver. For instance, to keep the hot and dirty blackpowder gases from fouling the cylinder-base pin, they've added a gas ring to the front of cylinder.

They've also located the rear of the barrel well back into the cylinder opening in the frame. In this way, the barrel-to-cylinder gap is positioned well behind and away

from the front of the gas ring. This is a trick Smith & Wesson learned early in the days of blackpowder cartridge revolvers, and it really helps to keep powder fouling out of the cylinder-base-pin area so the cylinder won't seize up after firing a few shots. Takedown Instructions 1.

As always, we begin by making absolutely certain the revolver is not loaded. Begin by holding it firmly by its grip, as you do this, be careful to keep your fingers away from the trigger (#CB03900). All the while, point and hold the barrel's muzzle in a safe direction. Place the hammer (#CB04000) in the loading position by pulling it to the rear until you hear one audible click.

At this point, you can check to be sure the cylinder (#CB10101) is unloaded before attempting any disassembly or before. Although the rugged blackpowder revolver is built using modern steel and technology, it offers the look and feel of a Civil War-era revolver. Author photos.

## WORKING THE RUGER OLD ARMY PERCUSSION REVOLVER CONTINUED

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In the photo, the base pin is partly withdrawn. The loading-lever and base-pin design is similar to that of the Civil War-era Rogers & Spencer .44 percussion revolver, only much stronger. handling the revolver. Carefully examine the rear of the cylinder at each chamber to be certain that there are no percussion caps on any of the nipples (#KCB07200). If percussion caps are present, you should immediately consider this a loaded firearm: Do not attempt any further disassembly.

Also look at the front of the cylinder to be sure that there are no charges in the cylinder chambers. (An indication that a chamber is loaded would be if bullets or balls or bullet lubricant is showing at the front end of the chamber.) Of course you should never look directly into the barrel or chambers; instead, view the chambers by looking down into them from the side.

A loaded cylinder can be emptied by taking the gun to the bullet trap or Then the hammer is dropped and the pin will hold the mainspring assembly captive, allowing it to

be removed. This is the hand spring. This spring and its plunger can now be removed. a range, and firing it until it is empty. Alternately, the loaded cylinder can be carefully removed in order to render the weapon safe without firing, by carefully following the instructions to remove the cylinder given below in Step 2.

Note: Once the loaded cylinder has been removed from the revolver, set it aside, away from the remainder of the firearm. To transport the loaded gun safely to the range, position the cylinder so



## WORKING THE RUGER OLD ARMY PERCUSSION REVOLVER CONTINUED

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the hammer is in between two nipples. Pull the hammer slightly to the rear and control it with your thumb while you hold the trigger back. Slowly and carefully lower the hammer so that its nose rests in one of the machined notches on the back of the cylinder, in between the nipples. 2. Removing the cylinder begins with the hammer still in the loading position.

Use the screwdriver portion of the combination tool supplied with the revolver to turn the base-pin retaining pin (#CB2800) a quarter of a turn counter-clockwise. Unlatch the loading lever (#CB00800) by pulling now free and can be rolled out through the right side of the cylinder frame (#CB00200). 3. To remove the grips and grip frame, unscrew and remove the grip screw (#KXRO1300) from the center of the grip and then remove the two grips (#XR01000).

Bring the hammer to the fully cocked position and insert a small steel pin or brad through the exposed hole at the bottom of the hammer strut (#XR01500). This will confine the mainspring when the hammer is released from full cock. Next, pull the trigger to release the hammer and gently ease it forward. Unscrew and remove the five screws. They are simply pulled forward for removal. the loading-lever latch (#CB06- 700) to the rear.

The loading lever is then pulled down to assume an angle about 90 degrees to the barrel. Then pull it forward to withdraw the base pin (#CB02- 900) and the bullet rammer (#CB- 00900) from the frame. The cylinder assembly (#CB10101) is that hold the grip frame (#CB00300) to the cylinder frame. The grip frame is now removed by pulling it slightly to the rear and then down, using care to hold the pawl spring (#XR05000) and plunger (#XR05100) captive until the frame is clear.

As the grip frame separates from the frame, make a note of the position of the pawl spring and its plunger. (They're sandwiched between the rear of the frame and the top of the grip frame.) These parts can now be pulled out to the rear. The mainspring and strut assembly can now be removed out through the opening in the side of the grip frame, and the trigger spring (#KCB03700) with its plunger (#CB03800) can be withdrawn out of their hole, located at the inside-rear of the trigger guard. 4.

To disassemble the action, unscrew and remove the hammer screw (#CB01600). This is the rear-most screw in the right side of the frame. The hammer assembly can now be rotated slightly to the rear and pulled down and out of the frame. The pawl (#KCB00700) is connected to the hammer and will come out of the frame with it. Once you have the hammer assembly out, the pawl can be removed by simply lifting it up out of its socket hole on the left side of the hammer. "



## WORKING THE RUGER OLD ARMY PERCUSSION REVOLVER CONTINUED

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CB-6 Barrel Assembly Complete CB02900 Base Pin  
CB02800 Base Pin Retaining Pin Assembly CB00900  
Bullet Rammer CB10101 Cylinder\* CB00200 Cylinder  
Frame (not offered for sale) CB04500 Cylinder Latch  
CB03400 Cylinder Latch Pivot KCB04600 Cylinder  
Latch Spring CB-36 Front Sight, Adjustable CB03610  
Front Sight, Fixed (not illustrated) KMR13601 Front  
Sight Base, Adjustable KE-26 Front Sight Cross Pin,  
Adjustable CB00300 Grip Frame, Standard XR01700  
Grip Frame Screw A, Front XR01800 Grip Frame Screw  
B, Back (2 req'd) XR01900 Grip Frame Screw C,  
Bottom XR01000 Grip Panels KXR01400 Grip Panel  
Dowel XR01200 Grip Panel Ferrule, Left XR01100 Grip  
Panel Ferrule, Right KXR01300 Grip Panel Screw  
CB04000 Hammer CB01600 Hammer Pivot KCB04100  
Hammer Plunger KE-22 Hammer Plunger Pin  
KXR04300 Hammer Plunger Spring XR01500 Hammer  
Strut CB00800 Loading Lever CB06700 Loading Lever  
Latch Next, unscrew and remove the trigger screw  
(#CB03400).

This is the center screw in the right side of the frame.  
The trigger (#CB03900) will fall out the bottom of the  
frame.

Use a small pick or screwdriver blade and CB06800  
Loading Lever Latch Screw KCB06900 Loading Lever  
Latch Spring CB00400 Mainspring XR00500

Mainspring Seat XR05200 Medallion (2 req'd., not il-  
lustrated) KCB07200 Nipple CB07300 Nipple Wrench  
(not illustrated) KCB00700 Pawl XR05100 Pawl  
Plunger XR05000 Pawl Plunger Spring MR15900 Rear  
Sight Assembly, Complete, Adjustable carefully lift the  
fixed arm of the cylinder-latch spring (#KCB04600) to  
free it. This removes its tension from the cylinder latch.  
Unscrew and remove the cylinder-latch screw  
(#CB03400).

This is Ruger Old Army Blackpowder Percussion  
Revolver (Specifications subject to change without no-  
tice) MR05902 Rear Sight Elevation Screw, Adjustable  
MR05901 Rear Sight Blade, Adjustable MR05906 Rear  
Sight Elevation Spring, Adjustable (2 req'd.) MR05600  
Rear Sight Pivot Pin, Adjustable E05903 Rear Sight  
Windage Adjustment Screw, Adjustable MR05907 Rear  
Sight Windage Spring, Adjustable Old Army CB03900  
Trigger Old Army CB03400 Trigger Pivot Screw Old  
Army CB03800 Trigger Plunger Old Army KCB03700  
Trigger Spring Old Army \*Must be factory fitted. the  
forward-most screw in the right side of the frame.

The cylinder latch (#CB04500) with its spring (#CB-  
04600) can be taken out from the bottom of the frame.  
For ease of reassembly later, be sure you make note of

the position of this spring and the cylinder latch before you remove them. If it's necessary to disassemble the hammer, the hammer plunger (#KCB04100) and plunger spring (#KXR04300) can be removed from the hammer by drifting out the hammer-plunger retaining pin (#KE-22). 5. All that's left now to disassemble are the "peripherals." Once the loading lever is off the revolver, you can simply lift it out of its seat with the base pin.

The bullet rammer (#CB00900) is removed from its seat with the loading lever by sliding it off. In order to remove the loading-lever latch (#CB06700) from the loading lever, unscrew and remove the loading-lever latch screw (#CB06800) from the front-center of the loading lever (#CB00800) and slide off the loading lever latch and its spring (#KCB06900). Assuming the cylinder is unloaded, the nipples can be unscrewed by using the combination wrench supplied by Ruger with the gun.

It goes without saying (but I'll say it anyway): Don't attempt to disassemble a loaded cylinder. If the gun is so equipped, the adjustable rear sight is removed by first unscrewing the rear-sight elevation screw (#MR-05902) and then drifting out the rear-sight pivot pin (#MR-05600). Once the sight is free, use caution: two tiny, compressed coils—the rear-sight elevation springs (#MR-05906)—are located directly under the rear sight.

The rear sight blade (#MR-05901) can be removed by unscrewing the rear-sight-leaf windage screw (#EO5903). Then push the sight leaf to one side and tilt it up so it can be pulled out the top. The rear-sight windage spring (#MR-05907) is now removed by pulling it out of the screw hole in the side of the sight. Conclusion Reassembly of the Ruger Old Army revolver is straightforward and can be accomplished by simply reversing the order of the steps above. I

## PISTOLS

## Reader Forum

BY AMERICAN GUNSMITH EDITORS MAY 2007

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**M**odel 422 Disassembly Could you tell me where I can find disassembly and reassembly instructions with an exploded view of the Smith & Wesson Model 422 semiautomatic pistol? Dennis Johnson Coeur d'Alene< Idaho Both your requests are answered by Gun Digest Their book on disassembly/reassembly dedicated to semi-auto pistols includes the S&W Model 622, which is a stainlesssteel version of the 422. Their book of exploded gun drawings includes the 422 along with 974 others.

Doubling Fox I have a Fox Model Bin 20 gauge with double triggers. During this year's dove hunt, the gun started firing both barrels when the back trigger was pulled. I have back issues of AG for a lot of years, but don't remember an article on the Fox. I also need disassembly info and a source of parts if any are needed. Any advice or information you can provide would be appreciated. Doubling in a double gun is usually caused by poor trigger-to-sear engagement.

When one barrel is fired, the second barrel is jarred off at the same time. This is due to wear in most cases. Unless you're skilled in the necessary arts, we'd recommend against welding or silver-soldering up the related parts and reshaping them. It would be better to replace whatever is worn. Takedown instructions and a schematic are

in the NRA Guide to Firearms Assembly (hard cover edition). Parts are probably available from Jack First Bulged .22 Cases I have a 550.1 Remington in the shop for broken firing pin.

I replaced the firing pin and test fired the gun. I got a good solid hit, the gun fired, but did not extract. I tried to push the empty out with rod, but it would not move. I disassembled the gun and found that the case was bulged in the middle. This one has a recoiling chamber, and it appears that the case is bulging in the gap. I went through this three times with the same results. I'm missing something here. Have you ever run into this before? How did you correct it? Thanks'any help will be appreciated.

Our best guess is that a large amount of .22 Short ammo has been fired through the rifle. These pills let loose at the juncture of the floating chamber and the rear of the barrel. Fire cutting'erosion'is the result, along with a generous amount of residue. Then, when a .22 LR is discharged in the enlarged chamber, the case mouth expands to fill the cavity created by the Shorts, and hard or no extraction results. If the erosion isn't too severe, take out the chamber and brush it as clean as possible.

Do the same with the end of the barrel. In cases where the chamber is too eroded and cleaning doesn't help, anew chamber will

be needed. The last we heard, Nu-Line Guns had a few of these still available. Universal/IJ 30 Carbine Can you tell me which issue, if any, has an article about the Universal Arms 30 Carbine or Iver Johnson 30 Carbine? Thank you. JR Weaver Fair Grove, Missouri There was an article on the M1 Carbine in the February 96 issue, which covered repair and refurbishing.

We hope you've been an AGA member since then and have kept your past issues, because a reprint going back that far is no longer available. Both the Universal and Iver Johnson were close clones of the military M1 Carbine, though not as high in quality. Instructions for disassembly and reassembly appear in Gun Digest's book dedicated to centerfire rifles, and would apply to both Universal and Iver Johnson copies.

If you have to get deeper into servicing, we recommend Jerry Kuhnhausen's shop manual on the M1 Carbine (from Brownells). Binding Ruger SP101 I have a Ruger SP101 in .357 Magnum with a 2-1/4-inch barrel. The cylinder rubs against the rear end of the barrel. Where can I obtain (1) complete disassembly instructions and (2) an exploded parts diagram? Any idea what the problem is? Back in November 92, we published an article on smoothing the action of

## READER FORUM CONTINUED

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the SP101. This issue is long ago out of print, but all is not lost. Takedown instructions are published in Gun Digest's book on the subject devoted to revolvers and a schematic is shown in their book of exploded handgun drawings. While they would be helpful, none of the aforementioned books addresses your problem specifically, and without having the revolver in hand we can't make a precise diagnosis. However, close the cylinder and see if there's a lot of movement fore and aft.

This would indicate excessive endshake, and the cylinder could be rebounding forward to contact the barrel. This can be corrected by installing an end-shake washer or washers (Brownells). Now open the cylinder and spin it with two fingers. If there is any wobble in the spinning, it indicates the crane is bent, with the result that the cylinder is not revolving true and is making contact with the barrel. A bent crane can be straightened.

Instructions are somewhat lengthy for publication in this forum, but are included in Jerry Kuhnhausen's Shop Manual for Ruger Double Action Revolvers (also available from Brownells). A third possibility exists. The casing thickness of .357 ammo and all other ammo for that matter can vary from maker to maker. A thick rim could bind the action or, in your case, force the cylinder into contact with the barrel. By the way, the SP 101 is very much alive in Ruger's present lineup and Brownells has parts for it.

Mistimed Double Nine Several months ago, I had a customer bring in a Hi-Standard Double Nine .22 revolver. It was

literally in pieces, with missing and broken parts. I have located replacement parts and reassembled it, but I can't get it to time properly in either single or double action. I have disassembled and reassembled it several times, and I'm sure its put together properly. Any information you can give me or if there is any manuals I could obtain would be greatly appreciated.

Ninety-nine times out of a hundred, a timing problem can be traced to the hand. It's either too short or too long and isn't rotating the cylinder into alignment with the barrel for lockup. In some cases, a short hand can be lightly peened into conformity. An over-length hand can be carefully filed, stoned, and polished to fit. Another less likely possibility are badly worn ratchets. In that case, rather than trying to reform them back into working order, we'd look around for replacements.

Ithaca/Remington Questions I have a couple of questions: 1) Has there been an article on the assembly/ disassembly of the Model 51 Ithaca? And 2) Have you done an article about replacing the extractors on the Remington 721 with rivets using the newer Model 700 extractors? If you have, please let me know which issue they were in. Thank you. The Model 51 went out of production in 1985 and we have not covered it to date.

Anew company, Ithaca Guns USA, LLC, is now manufacturing the Model 37 and is developing anew autoloader. They are, however, now able to provide parts for the M51 and Mag 10. We're working with them to arrange an article on the original M51. So stay tuned.

There are two reasons why no articles have been done on Remington 721 extractors and 700 extractors: 1) The bolt faces aren't compatible; and 2) a 700 bolt would have to be installed in the 721. This would be very tricky to achieve, since Remington bolts are restricted to factory-only service.

Rechamber Arisaka? I have a customer who wants to rechamber an Arisaka 6.5 Jap to a more available ammo type. The 6.5 Jap ammo is costing him an arm and a leg. Any help on this would be appreciated. If this is possible, could you recommend someone who could do this at a reasonable price? Thank you in advance. You didn't mention whether the caliber is 6.5 x 50 or 6.5 x 51 (rimmed). Regardless, your customer may want to consider reloading his own ammo.

Caliber 6.5 x 50 can be formed from .30-06 brass, and 6.5 x 51 from .303 Savage. As for rechambering, go to the S. A. A. M. I. web site ([www.saami.org](http://www.saami.org)) to confirm which caliber or calibers would be most compatible. If the information isn't on their site, you can write to S. A. A. M. I. at Newtown, CT 06470. Franchi Barrel? I hope you can direct me to the correct place to have an extractor replaced on a Franchi barrel (an old Remingtonstyle copy, I believe).

It appears to be welded into the rear of the barrel, and then polished to where it's almost impossible to see that it was attached in this way. Thanks in advance for your assistance. We think you're referring to the ejector, not the extractor. Extractors are located in the bolt. Ejectors are per-

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(continued from previous page) manently mounted in the receiver or barrel extension of most shotguns. Depending on the model, Franchi shotguns are now under the wing of Benelli USA. Your gun may be so old that they won't have a replacement barrel available. That, of course, would mean an extensive search through the aftermarket or for the services of a barrel maker. Balking Bryco I have a Bryco JA-9mm semi-auto pistol that's in need of repair. If I chamber around by hand, it works, and chambers like it should.

But when I fire the gun and it tries to chamber the next round, when the round comes out of the magazine it won't lock up, and the round gets caught in the slide. This pistol has got me stumped. Any information will be helpful. Thanks. Around 1990, Bryco was shattered by a guilty verdict and a huge monetary damage award for an accidental shooting on the West Coast. Today, according to the Blue Book, Bryco is a current manufacturer in California, but their pistols are sold exclusively by F. A.

Jennings, a distributor in Carson City, Nevada. Neither organization was present at the most recent SHOT Show, and neither are listed in the industry directories published by such periodicals as *Shooting Industry* and *Gun Digest*. Compounding that, no 9mm "J" model (a caliber .22) Bryco pistol shows up in the current edition of the *Standard Catalog of Firearms*. None of this directly addresses your prob-

lem, of course; we merely wanted you to be aware of the vacuum within which you're working.

Bryco was not noted for using the highest quality materials in their pistols. As a result, they're subject to wear. We wonder if wear has occurred in the grip-frame area and the magazine isn't locking in fully upward. If so, a partial or complete bolt override can occur producing a failure to chamber. The bolt could also drag somewhat on a hesitant round. Pondering further, the magazine itself may be the root of the problem by releasing around too early or too late. A replacement might cure this.

Lacking a replacement, you might try adjusting the magazine feed lips. Finally, we understand the pistol doesn't function well, if at all, with hollowpoint ammunition. Info on the .308 x 1.5. Do you have any info on the .308 x 1- 1/2? It looks like an interesting cartridge, although I don't see chambering reamers or dies listed anywhere. Thanks. Bob Reno, Nevada. The cartridge, a wildcat, was developed by Frank Barnes in 1961. Its official name is the .308 x 1.5 Barnes.

There is considerable information on it in *Cartridges of The World*. Currently, with the possible exception of T/C single-shot pistols, no firearms we're aware of are chambered for the round. In the past, a Swedish Model 96 and a Remington Rolling Block chambered for the round produced outstanding accuracy. Forming and reload-

ing dies may be available from RCBS on special order. For reamers, check with Clymer Manufacturing. Bound Up Browning Gold I am working on a Browning Gold 12-gauge semi-auto shotgun.

The customer complained about an occasional misfire after approximately 20 rounds. The gun was extremely dirty, so I cleaned the entire gun with special attention to the trigger group. I checked the headspace with go and no-go gauges, then reassembled and test fired with a snap cap. Everything checks out okay. Could a weak hammer/main spring be a culprit here or do you think the excessive crud and gunk could have been the cause?

Also if I need to disassemble the trigger group for replacing parts, I will need a source for a manual. Do you have a manual available in your archives? Thanks for your help. Unfortunately, this gun differs from all other Browning shotguns. We have it on our to-do list of future articles, but that won't address your immediate problem. We did, however, have a chat with a Browning engineer. He believes the problem was due to the fouling you cleaned up.

As for replacing the spring in the trigger group, it's a two-minute job. There's a single pin at the back of the mechanism. Remove it and you'll have access to the spring. There is no field-service manual on the Browning Gold. The folks at Browning apparently never got around to preparing one.

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