



OCT 2011

DIGITAL ARCHIVE
EDITION

PRECISION ARMS WORKSHOP

AND THE AMERICAN GUNSMITH ARCHIVE

A TECHNICAL JOURNAL OF CRAFT, REPAIR & RESTORATION

10

ARCHIVE ISSUE NUMBER

INSIDE THE ARCHIVE

SR-22: A BELATED, IN-DEPTH EXAM OF THE 10/22

ANOTHER MIXED BAG • SMALL SHOP BLUING WITH BROWNELLS DICROPAN IM • BREATHING NEW LIFE INTO A SHATTER...

ORIGINAL METHODS. MODERN ACCESS.

ARCHIVE EDITION 094

DIGITAL ARCHIVE EDITION

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AMERICAN GUNSMITH

DIGITAL ARCHIVE EDITION • OCTOBER 2011

ISSUE RECORD

ORIGINAL DATE	October 2011
VOLUME	Archive volume not stated
ISSUE NUMBER	10
SOURCE ID	ag-309f59fd94f8f8346d490af1

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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FROM THE ARCHIVE

Another Mixed Bag

BY AMERICAN GUNSMITH EDITORS OCTOBER 2011

ORIGINAL PP. 2

In the August 2011 issue we ran “Trigger Work: How Good Is Yours, Really?” by Gerry Ritacco. The article referenced a chart that didn’t make it into print due to space limitations but is available as a PDF for free download at our blog (americangunsmith.wordpress.com). Reader Forum Letters A note from our Technical Editor, Chick Blood. We make it a practice to answer all technical questions sent in to the Reader Forum and to send a response directly to the asking member.

Due to the size of our membership it makes sense to publish these questions and answers as it is likely that someone else will have a similar concern or is interested in the subject addressed. Due to the lead time in publishing it may be several issues later before the question appears in print. Lately, I’ve been receiving dozens of bounced email notices regarding my response, indicating my answer didn’t go through due to a bad email, full inbox or some other issue on the receiving end.

Checking back into my files of sent emails reveals no errors in the address as it appeared on the original message sent to me. I ask all members to check that they are receiving email without problem and that the address they submit for response is correct when sending in questions to the Reader Forum. Gunsmith Career Fair Brownells has announced that the 6th Annual Gunsmith Career Fair will be held April 27 and 28, 2012 at the Des Moines Marriott Downtown in Des Moines, Iowa.

The industry-exclusive event is expected to draw more than 175 attendees and 35 employers. “The Gunsmith Career Fair is the place to network for gunsmiths and the companies who employ them. It really is a must-attend event. Many pros from the Guilds are there and they’re not afraid to share their secrets,” said Pete Brownell, President of Brownells.

Seminars designed to assist new and experienced gunsmiths with their career and business development are an integral part of the event with many chances for hands-on discussions with guild members and other industry professionals. Top companies in the firearm industry and government agencies will once again be on hand to interview attendees for positions at their businesses. The schedule is set up to make it possible for attendees to network with potential employers, fellow gunsmiths and exhibitors.

Recent graduates, working gunsmiths, soon-to-graduate gunsmithing students, gun shop owners and other firearm-related businesses are all invited to attend, as well as anyone interested in beginning a career in the gunsmithing profession. Those interested can sign up at gunsmithcareerfair.com. Attendees and exhibitors are urged to register and book rooms early. Those arriving early will have a chance to tour the Brownells facility in Montezuma, Iowa on Thursday, April 26, 2012.

PEOPLE & COMPANIES

SR-22: A Belated, In-Depth Exam Of The 10/22

After all these years we finally address America's most popular rimfire rifle, now available from the factory in a new, dressed-up form.

BY CHICK BLOOD OCTOBER 2011

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I know exactly what you're thinking. Chick Blood has lost it. That's no Ruger 10/22 in the main photo. That's not the rimfire carbine that hit the gun business like a force fi ve Kansas twister and has seen six million like it vanish from dealer shelves since 1964. No way, no how. Not so fast, my friends. Disarm those sniper pens and pencils. Abandon all thought of emails to the editor accusing your obedient technical editor of going soft in the head.

Deny any temptation to forward expressions of extreme pique at his insulting your intelligence by daring to start off this admittedly belated article concerning a .22 caliber carbine intended purely for sporting use with a picture of what is obviously a tactical weapon. Now hear this, ye potential detractors. It is not a tactical weapon. It isn't even a tactical trainer. As you will soon discover, it is indeed a Ruger 10/22.

It has merely been adorned with a tactical tuxedo and you are to be enlightened with actual, factory methods of its disassembly and reassembly. A unique approach consistently followed since day one by this publication and the accused mental case, I will

add. Onward to fundamental take down procedures. In the interest of full disclosure and a better understanding I'm using more than a single schematic in covering the SR-22.

One covers the complete assembly, a second the trigger group and the third covers the bolt assembly. All are provided with their part lists and appear in the SR-22 owner's manual. I've done the same for similar reasons with other guns in previous issues. As before, I will indicate the schematic in which the identified part being referred to in the text appears until I feel you've become sufficiently accustomed to make further prompting unnecessary.

The magazine is out, the chamber has been checked, the safety is on and so is your eye protection. Allow the bolt to close from the empty chamber check-out. With the 10/22 you'd flip down the rear sight leaf. The SR-22 has none. With both models, make certain the hammer is cocked and follow along until otherwise prompted with the overall schematic. There are two screws (14) se-

curing the forearm adapter (5). Remove both then pull the hand guard assembly (4) to the front and off the barrel (2).

Back out the take down screw (13). Until less than a year ago, the next step would be to remove the scope mount screws (15) so the base (18) could be removed. Otherwise, it could become difficult if not impossible to separate the barreled action from the stock when lifting it upward by the muzzle end. This difficulty, it turned out, was due to the sharply squared corners of the riser to which the scope base is attached. Those corners kept getting in the way of the receiver when the latter was being pivoted up.

As you can see from the schematic, the mount screws run through the mount, the riser and seat in the receiver. Suppose there were rings and a bore-aligned, zeroed scope married to the mount. What would happen if the entire assembly were removed to get at the barreled action for cleaning purposes then subsequently replaced? There would be a loss of zero accompanied by customer dissatisfaction. All go severely against the grain at Ruger.

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A The resolution didn't require rocket science. All risers were to have their sharp corners slightly beveled. As a result, initial fabrication of the riser component was altered from sharp to beveled and every SR-22 produced since late 2010 has left the factory with a "beveled edge riser." No more field stripping troubles. No more lost accuracy due to loss of scope zero. I bring the riser situation to your attention for a specific reason. It's possible you may get in an SR-22 wearing a riser with sharp corners.

It was made prior to the production changeover and retains the potential of difficult disassembly and lost zero. What to do? Take in hand a 0 cut file and carefully radius the corners. It won't need a lot filing to get the job done. It might only require a couple of passes. The next most important consideration in field stripping is the safety button (#12, trigger drawing). The button must be positioned so an equal amount protrudes from both sides of the guard housing (#1, same drawing).

Overlook this equality when the action is later lifted from the stock and the stock or safety button or both will be damaged. At the risk of there being an engineering change before you read this, you may not find any roll pins in the SR-22 and none of the solid pins are so tightly mated to their holes as to give you any trouble when drifting them out in either direction.

Wear may B The Excelite multi-hex driver (B) included in the photo is one in a set and eases removal of lengthy socket head retaining screws. cause the receiver and bolt block pins to have loosened sufficiently. In fact, when you pull out the trigger guard assembly all three pins may drop free after the barreled action is lifted out. If there is a roll pin present it's probably retaining the firing pin in the bolt. My standard advice for roll pins is not to drift them entirely out.

Instead, move them only enough to free up the part. This will make reinstallation far easier down the pike and lessen the possibility of inflicting damage to the pin. Except for its adjustable stock, the rifle is field stripped. Detailed Disassembly Assuming all pins still remain with the barreled action note what are you now holding in your hands. Looks pretty familiar, huh? I told you up front this article was about a 10/22.

Apologies for negative thoughts of resulting hostile actions to be taken regarding the failing state of my neurons hereby gracefully accepted. To proceed, drift out the fore and aft receiver pins. Separate the guard assembly downward from the receiver. Switch the safety off. Place your thumb over the hammer, pull the trigger and ease the hammer to its fired position. Invert the

rifle and B Atake a good look at the bolt assembly and its immediate surroundings in the receiver.

It depends on how much fouling you see but if a cleanup is needed, drift out the bolt stop pin. Fail to do so and the bolt (#1, bolt assembly drawing) stays in the gun because the pin keeps you from moving it far enough back to clear the receiver guide rails. Use the cocking handle assembly (#8, same drawing) to retract the bolt. This action compresses the integral recoil spring. Give the cocking handle a good pinch. Ease the handle assembly forward until the spring is fully relaxed.

Lift the front end of the bolt up. Remove it from the receiver. Withdraw the cocking handle assembly through the ejection port. The assembly should remain as is. A damaged one calls for a complete, factory fresh replacement. If a roll pin is present in the bolt it's the firing pin stop pin (#7) which is also related to the firing pin rebound spring (#6). Once the pin is no longer in their way the firing pin (#5) and spring are slid to the rear and out of the bolt.

The extractor (#4), its plunger (#3) and spring (#2) still remain. Insert a jeweler's bladed screwdriver ahead of the plunger. Depress it along with its spring. Hold both to the rear, lift the extractor from its bolt recess and

SR-22: A BELATED, IN-DEPTH EXAM OF THE 10/22 CONTINUED

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Akeep any spring pressure under control while removing the plunger. Both components are very easily lost and very hard to find. By releasing the hammer to a red position you eased pressure applied by the hammer spring (#21, guard assembly drawing). Press on the hammer to move it forward a little further. Grasp the end of the hammer strut (#22), raise it from the hammer recess

and remove it. Spearhead on the strut is the hammer spring. Holding the spring on the strut is the hammer spring washer (#20).

If for any reason the washer must be separated from the strut, the spring has to be compressed before it can happen. Ditto when the A The troublesome sharp corners still showing up on older production SR22 rifles may require equal or less beveling. washer is reinstalled. Now push out the hammer pin (#23)

just far enough to allow removal of the hammer. Stop for awhile. Give yourself plenty of time to examine the internals of the guard assembly under magnification and a good light source.

Refer often to the guard schematic and parts list. This delay will prove extremely useful at reassembly time. After the examination, and ideally some photos to jog your memory B A

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Ruger SR-22 Main Schematic (Specifications subject to change without notice) 1 Receiver 2 Barrel 3 Barrel Support 4 Hand Guard 5 Forearm Adaptor 6 Main Body 7 Adjustable Stock Assembly about what you've been looking at, drift out the ejector pin (#25) to free the ejector (#24) and bolt lock spring (#18). Drift out the hammer pivot pin the rest of the way. Move on to the magazine latch (#14), bolt lock (#13), latch plunger (#17), latch spring (#16) and latch pivot (#15).

Shine a high intensity light into the front end of the guard assembly. Depress the latch plunger a few times to observe how all the components just mentioned relate and in what order. When you're confident you can duplicate what you have been watching, start slowly pushing out the pivot pin. Simultaneously, depress and release the plunger. When the pin has been pushed far enough and the drift punch removed, the latch parts and bolt stop will fall from the guard.

Make a slave of the latch pin to use in pre-assembly of the components just 8 Scope Mount Base 9 Barrel Nut 10 Flash

Suppressor 11 End Plate 12 Castle Nut 13 Take Down Screw 14 Hand Guard Adaptor Screw 15 Scope Mount Screw 16 Pistol Grip 17 Pistol Grip Screw 18 Sling Swivel Screw 19 Flash Suppressor Washer 20 Locking Ring 21 Trigger Guard Filler freed from the guard. Tweeze out the plunger and spring. You also might be able to simply jar them loose by tapping the lower front end of the guard on your bench.

The trigger (#6) of a 10/22 has ears at its upper end. Unlike some humans, there's plenty going on between them, specifically, the disconnecter (#5), disconnecter spring (#7), disconnecter pivot pin (#4), sear (#9) and trigger pivot pin (#8). There's plenty going on behind the lower trigger as well. A small hole in the rear of the guard is home to the even smaller trigger plunger spring (#2) and trigger plunger (#3). There's no secrecy about their presence.

The plunger is quite obvious just aft of the trigger in a fully assembled rifle. I bring this up to deter those tempted to forge ahead, drift out the trigger pin then remove the trigger/disconnector/sear assembly upward and 22 Crush Washer 23 Sling Swivel

Screw Washer 24 #10-32 Insert 25 Magazine, 10-shot 26 Receiver Cross Pin (2) 27 Bolt Stop Pin out of the guard. This is the correct route to removal but to do so without first capturing the plunger and spring will result in much time spent searching dark corners.

To avoid this unpleasant prospect cut a half-inch wide strip of duct tape about five inches long and insert it between the rear of the trigger and the end of the plunger. Depress the plunger, wrap both ends of the tape tightly around the back of the guard overlapping them and holding the plunger to the rear. This frees you up to tackle the complete removal of the trigger assembly. A caution.

Once the #8 pin has been pushed from the guard be very careful you lose neither the disconnecter spring or sear as the assembly is moved upward. I suggest clamping it together with a spring-loaded clothes pin as soon as possible before it clears the guard. The clothes pin

SR-22: A BELATED, IN-DEPTH EXAM OF THE 10/22 CONTINUED

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1 Trigger Guard 2 Trigger Plunger Spring 3 Trigger Plunger 4 Disconnecter Pivot Pin 5 Disconnecter 6 Trigger and duct tape bit may not look very professional but I never do anything to a gun with the owner around and they both work like champs for me with a 10/22. Pardon, I mean SR-22. I've been informed by at least one reliable source that the safety of an SR-22 or 10/22 can't be reversed from right to left hand operation as it can be with, say, an 870 shotgun.

I'm further informed that Ruger customer service workers have yet to have a 10/22 or SR-22 come in with the safety removed. Well, I have. I mean totally gone, including the safety detent plunger (#11), spring (#10) and button (#12). The same could happen 7 Disconnecter Spring 8 Trigger Pivot Pin 9 Sear 10 Safety Detent Plunger Spring 11 Safety Detent Plunger 12 Safety Button to you. If it does, here's how I went about setting a stupid act already done to rights. Call Ruger and order in the missing parts.

Have a jar of Vaseline and a dental pick or very small diameter starter punch or the smallest jeweler's blade screwdriver. Put a dab of Vaseline on the end of it and insert the spring into its hole in the guard. This is just to hold it in until adding on the plunger. The button

has a cut on one side. Rotate the button until the cut is facing downwards. With whatever tool chosen, press inward on the end of the plunger.

You'll have to do this as close to its edge as possible. 1 Bolt 2 Extractor Spring 3 Extractor Plunger 4 Extractor Ruger SR-22 Bolt Schematic (Specifications subject to change without notice) Ruger SR-22 Guard Assembly Schematic (Specifications subject to change without notice) 13 Bolt Lock 14 Magazine Latch 15 Magazine Latch Pivot 16 Magazine Latch Plunger Spring 17 Magazine Latch Plunger 18 Bolt Lock Spring 5 Firing Pin 6 Firing Pin Rebound Spring 7 Firing Pin Stop Pin 8 Cocking Handle 19 Hammer 20 Hammer Strut Washer 21 Hammer Spring 22 Hammer Strut 23 Hammer Pivot Pin 24 Ejector sible.

Maintain the pressure as you slowly insert the button in—cut-out side down remember—far enough to capture the plunger. Remove the tool. Simultaneously push and rotate the button the rest of the way through the guard so the spring pops the plunger through the cutout. Check for free movement of the button. Would inserting a piece of tape work as it does with the trigger plunger and spring? Nope. There's almost zero room between the safety button and the trigger guard itself.

As soon as I discovered the missing safety assembly I began to worry about the magazine. Had taking of

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the stupid pill affected it too? Up to a point, the 10/22 magazine isn't an intimidating proposition and the .22 round being quite dirty for its size can generate fouling quicker than many larger calibers. Basic takedown of the magazine, though not recommended, is simple. The front screw requires an Allen wrench. After the screw has been removed, so can the back plate followed by the internal parts (see schematic). Now, go no further. Do not mess with the rotor or spring.

If residue has piled up, blast it off with a spray cleaner, do the same to the interior of the mag and put it back together so it looks just like it did inside before you took the Allen wrench to it. Please leave the spring alone as it is pure misery on the 10-round magazine. The good news, on the other hand, is the new BX 25-round magazines for the 10/22 series present no problems in take down or reassembly. As long as permission is first given to use the dishwasher, they are also dishwasher safe.

A bit of preventive maintenance is in order. When you take the bolt out examine its front end. See the angle there? Now look at the fully assembled magazine. The magazine throat has an angle too. To avoid feeding problems these two angles have to be the same in relationship to each other. Dummy rounds fed into the mag and several manual cycles of the action after reassembly will confirm, or deny, whether or not they are. I'll add this fact.

The best policy to follow with a 10-round magazine acting up because an owner has dismantled it is to add the cost of a new one to your bill for services rendered. They are remarkably inexpensive. Not your services necessarily, the magazines. The stock, almost as noticeable a difference between the SR-22 and the 10/22 as the tactical tuxedo, provides a six position adjustment for length of pull. There are locking holes on the underside of the extension tube and a spring loaded pin inside the butt.

Squeeze the rear part of the lever on the underside up against the stock and slide the assembly in toward or away from the receiver. Release the lever. Move the assembly in or out until the pin snaps audibly into one of the holes in the extension tube. Try the fit and readjust if necessary. Reassembly Tips Invert the gun when reassembling the bolt into the receiver, the pointed end of the recoil spring rod is fitted into its recess in the rear right of the receiver.

The recoil spring should be positioned flat against the side and bottom of the receiver. Maintain the guide rod in its position by keeping pressure on the bolt handle between your thumb and forefinger. You have to maintain this pressure and equal it while you simultaneously use the side of a screwdriver blade to compress the recoil spring against the leading end of the bolt handle.

Keep the spring fully compressed and examine the top of the bolt. There's a recessed section at its top and a like section of the bolt handle that mates with it. Position the two components to ensure the marriage and press down on the bolt until you hear them click together. Allow the bolt handle with bolt attached to move forward slowly. Cycle the handle a few times to check for correct assembly. Install bolt stop pin.

All the aids previously used in disassembly, such as clothes pins, Vaseline and duct tape, will be applied again in rebuilding the guard assembly. You will also need a slave pin to reassemble the trigger elements prior to sliding them back down into the guard. The slave is pushed out with the trigger pin. The bolt lock spring lays on the right side of the hammer as viewed from above. The hammer strut assembly is dropped into place and the safety button on "fire" with its notch facing upwards.

The bolt lock spring is fitted into the bolt stop should be trapped under the ejector pin when the pin is installed. If you took the trouble to list each component as it was removed and remember how they were originally assembled there should be no serious problems to resolve when reversing your steps. But you do that all the time, don't you? AG

FINISHING

Small Shop Bluing With Brownells Dicropan IM

You can do professional bluing in your shop without hot caustic salts! Brownells Dicropan IM requires minimal equipment and set up but can yield professional results.

BY PAUL MAZAN OCTOBER 2011

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In recent years the problem of refinishing a gun in a small shop or by a hobbyist has been somewhat resolved with the introduction of a plethora of alternative finishes. These range from air cured epoxies, like Brownells Aluma Hyde II, to a number of spray on and bake enamels with Teflon or ceramic additives. I was involved in the development of many of these products when I worked for Brownells, and later at Battenfeld Technologies and can attest to their ease of application and abrasion resistance.

They are an excellent choice for alloys and other items that cannot be blued. Their biggest drawback, however, the relatively thick coating they leave and the fact that many gun owners still think of them as "paint." In the case of alloy frames and parts there is little choice but many customers with steel guns still want their guns blued. A hot salts bluing system is simply out of the question for many of us.

Not only is it expensive to run gas lines, buy tanks, stands, and salts it also requires a dedicated building or very well ventilated room to operate in due to the quantity of steam generated and the caustic nature of the salts. Anything and everything in a hot salts bluing room that is iron or steel must be painted or it will turn into a pile of rust.

I have been searching for a bluing method that would allow the small shop or hobbyist to provide a professional bluing service to their customers I use an old camp stove without having to farm the project out. I've tested any number of cold blues and asked several chemical supply companies about a quick and easy solution to the problem and have come to the conclusion that the magic elixir just isn't out there.

Rust bluing is always an option and is an excellent choice for custom projects where time is not a factor. One day while browsing the latest Brownells catalog I stumbled

on their Dicropan IM and remembered a research and development project I was involved in with that product back in the 1980's. The IM originally stood for Immersion but the product was difficult to use and even harder to get a really professional finish with.

It was languishing in the catalog and would probably have been dropped if anew and better process could not be found. The result of that session was anew method of applying the solution that produced some truly impressive results. Brownells has been selling the product and offering detailed instructions on its use ever since. The instructions are available online from the Brownells web site (brownells.com) and they describe what is basically an accelerated rust bluing process.

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Slowly it dawned on me that perhaps the product I had been searching for was right there all the time. I called Brownells and placed an order for a quart of Dicropan IM along with two carding wheels to make the process of removing the loose oxidation from the steel easier than hand rubbing it with degreased steel wool. For my test piece I chose a Colt 1903 Automatic that I purchased as a “gun in a bag.” Someone had planned to refinish the gun and had disassembled, stripped, and tried to remove all the pitting.

At some point they realized that the pitting was deeper than the lettering and stopped just before all the lettering had been removed. At that point they evidently lost interest in the project so I was able to buy the gun at a very reasonable price. Following the direction that I downloaded from the Brownells site all the parts were thoroughly stripped, wire wheeled and degreased. From this point on you will be handling hot metal parts so a pair of insulated rubber gloves are required.

The parts will be suspended in boiling water so it is necessary to make up some wooden bore plugs and wire hangers. Suspend the parts in boiling water for five minutes, remove and allow to air dry. Shake off excess water and the part should be dry in short order. Once dry, card the parts – that is, remove the surface Materials List Materials I Bought Brownells Stock Number Approximate price 1. Dicropan IM (Pint) 082-008-016AD \$40.00 2. Two Row Carding Wheel 360-164-581AD \$15.00 3.

TCE Cleaner/Degreaser 083-060-024AD \$25.00 Other Items you will need but may already have on hand 1. Cotton balls used to apply Dicropan IM 2. 0000 Steel Wool, to card parts in lieu of a carding wheel 3. Gun Scrubber or other degreaser in lieu of TCE Cleaner/Degreaser 4. Wire to hang parts in hot water tank 5. Large pot big enough to immerse parts 6. Insulated rubber gloves, to hold hot parts while carding rust with degreased steel wool or a wire wheel.

Once all the surface rust is removed and with the part still hot, swab on the Dicropan IM. When the part is thoroughly

covered with the IM suspend the parts back in the boiling water for 15 minutes. Once again remove the parts, shake and allow to completely dry. At this point the parts will be covered in a brown coating. Don't panic, just card the brown off and apply another coat of IM. Then it is back in the boiling water for five minutes, remove, dry, card and reapply another coat.

These steps are repeated until a deep rich blue is achieved. Most gun steels will require five or six applications but some may take more. Don't despair, just keep repeating until you have the depth of color you want. When you are satisfied with the color, the parts should be coated liberally with a water soluble oil like Ballistol and allowed to cure overnight.

The next day wipe the excess oil from the parts with a clean soft rag, reassemble the gun, call your customer and tell him his gun is ready to be picked up. With the instruction available on the Brownells site you can download and print them, giving plenty of time

SMALL SHOP BLUING WITH BROWNELLS DICROPAN IM CONTINUED

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to study them and decide what you will need before you order. The first time I did it on my own I was concerned if I was doing it right as the Colt didn't seem to be getting any darker until the sixth coat. After ten coats the color was simply beautiful and tough as nails. Remember, you are carding each coat with steel wool or a wire wheel.

As one of the techs said at the time of that long ago R&D session, "Unless you can rub the finish hard enough to raise sparks, it's not going to scratch." An alternate and faster method involves heating the parts with a propane torch, applying the IM, allowing it to work, carding the surface, reheating the met-

al and applying the IM. There are no instructions for this method but it is something I have experimented with and it has worked well for me on the few guns I have tried it on.

The difficult thing to control is the heat applied to the part. It must be hot enough to allow the IM to dry without running but still be cool enough to handle so the part can be carded. The hot water method is virtually foolproof as the parts never get hotter than the 212 degrees of the boiling water and is safe to do with soft soldered doubles. The propane torch method is faster but you do run the danger of overheating parts.

You must keep the flame moving and understand that heavier areas require more heat and cool slower than thinner areas that should be heated last because they will cool faster. Both methods can be used to blue a gun in your shop in a few hours time with excellent results. The finish is dark, tough, and superior to any of the cold blue solutions I have used. For large volume work there is still no substitute for hot salts bluing but for occasionally bluing one gun the solution is Brownells Dicropan IM. AG

MAINTENANCE & REPAIR

Breathing New Life Into A Shattered Old Gunstock

Sometimes restoration of an old gunstock isn't even in the realm of possibility, but this old gun was different.

BY NORMAN E. JOHNSON OCTOBER 2011

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A customer approached me with a really old 10-gauge Burkhard double shotgun with a badly broken buttstock. He wondered if the old stock could be restored. The stock was hanging loosely to the action, held by four splint-like brass braces. The braces were mortised deeply in place and retained by four dozen small brass screws. My first impression was to turn this job down.

The damage incurred to this old gunstock appeared irreparable, however, as I learned more about the history surrounding this old gun, it would be like breathing new life into an old fallen general. The owners were well apprised on the background of this 130 year old 10-gauge shotgun. The gun was made by Wm. R. Burkhard, a gunmaker from St. Paul, Minnesota between 1855 and 1880, hence the gun's name. The gun had been owned by James J. Hill, famed railroad builder, also from St. Paul, Minnesota, during the same era.

Burkhard shotgun as received for evaluation and possible reconstruction of the stock. ing the same era. Mr. Hill later gave the shotgun to Mike Loso, the great

grandfather of the wife of the couple now owning it. With such an interesting history following this old shotgun I decided to take on the job. Getting On With The Job The complicated order of repair would involve a well organized sequence, some parts of which would be a first time experience for me.

I really didn't know what was in store before disassembly of the stock. I couldn't risk removal of the part of the stock forward of the point of the comb. There was a comminuted transverse break from mid stock immediately forward of the comb. This involved multiple splintering of the wood with a large, loose piece extending from mid stock to the point of the comb. As I slowly removed the many brass screws from each of the four brass repair inlays, the stock separated in my hands.

Still, I couldn't help but marvel at the courageous work by some old gunsmith who meticulously fitted the brass repair

BREATHING NEW LIFE INTO A SHATTERED OLD GUNSTOCK CONTINUED

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inlays, held in place by at least four dozen screws. This must have been accomplished before the advent of epoxies available today, involving much time and patience. Examination of the internal exposed wood appeared quite clean and sound for a gun 130 years old. There appeared to be no major oil-soaked areas within the break that would have rendered epoxy repair a marginal situation at best. At this point I assembled the pieces and held them in place as the finished stock would be.

They actually fit together quite well, which offered a ray of hope. I then bonded the major back portion of the stock together with dyed epoxy mixture to match the anticipated dark color of the original parts. I made sure all the cracks were drawn tightly together just as they were separated. I used Brownells Steel-Bed for the initial stock repair work col-

ored with the dark brown dye provided in the kit. I thought about J-B Cold Weld here, but this material is quite thin and runs easily.

I really couldn't risk that. I had to be sure epoxy wouldn't ooze into the projected splinters and interfere with the second stage as the two major stock pieces would later be united together. The stock was left over night to set. With the major stock pieces bonded solidly together, I held my breath as I fitted the two parts into one another. There were multiple spiculelike splinters that had to fit together.

It appeared at this stage irreparable damage had been done to the stock but the customer wanted the old gun repaired if at all possible. Luckily, they did. So the next order of business would be attaching these two parts together. Bringing Things Together As the two major stock parts were coated with Steel-Bed

epoxy I carefully aligned the two parts and pushed them quite forcefully together. They were secured this way until set solidly. Thus far I was pleased with the way things were going.

It actually began to look like a gunstock, but I had much more work to do. The repaired crack nearly matches the looks of natural wood grain. During the next phase I filled in the four gaping mortises formerly used for the brass repair braces. I had thought of making walnut wood inlays to fill the slots but matching the color and grain would be difficult and time consuming. I decided on using dyed epoxy material. The remaining stock was very dark—almost black in color—so tinting the epoxy material was in order.

Trial and error yielded a satisfactory color and I filled the open inlay slots a bit over-full to allow for final shaping and finishing.

BREATHING NEW LIFE INTO A SHATTERED OLD GUNSTOCK CONTINUED

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The inner surfaces of the broken stock were deeply etched with a tool bit to help promote epoxy bonding. The longer replacement screw, extending through the tail-band of metal, extends from trigger guard to pistol grip cap. The trigger guard later serves to help support the stock. Applying The Final Stock Finish In the repair process there was a piece of the plastic buttplate missing that I

had also repaired and couldn't finish the stock until this was done. I'll cover this repair in another article later.

By now I had learned more about mixing dye into the Steel-Bed epoxy and was about to try some of the Brownells epoxy dye in Birchwood Casey Tru-Oil. I tried a small batch on some wood to see how it covered to be sure the dye didn't interfere with the dry-

ing process. Things were fine there. What I really needed was a darker stock finish to match the color of the forend and the undisturbed front portion of the buttstock. Following some experimentation, I finally arrived at a color blend that worked.

About 10 drops of Brownells black This was the first positive indication that the repair would really work.

BREATHING NEW LIFE INTO A SHATTERED OLD GUNSTOCK CONTINUED

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Here a special blend of dyed Birchwood Casey True-Oil is used to match the color of the forend and part of the stock attached to receiver. dye in an ounce of Tru-Oil made a stock finish that very closely matched the old stock. As I applied it, I had to use a dab and wipe technique to blend things just right. I really didn't want a sheen finish, so things would match the color and texture of the old antique gunstock. After much wiping and blending, I set the gun aside to dry.

A glance at the old gun showed a transformation that suited me just fine. I had shown pictures of the broken gun to my wife as it was torn down and again later after finishing it. She was quite amazed. In the early stage of repair I had also called the owners to view the many broken parts of the old gun. Given the condition of the stock, a successful repair did not appear a sure thing. As the owners viewed the finished work, they were pleased to see the old gun closely restored to its original condition.

They had a special place all picked out for it. R. Burkhard shotgun shows a result beyond expectations. The color blend was a near perfect match with the forend. The before-and-after left the owners in awe. Conclusions As gunsmiths, we are often offered uncertain jobs but this doesn't always mean we shouldn't try, especially if there is hope of helping a customer. A seemingly impossible repair may have a reasonable fix. This can lead to a great deal of satisfaction for all. AG

MAINTENANCE & REPAIR

Dealing With A Stuck Chambered Round

handle a live round stuck in a chamber.

BY ROBERT COLES OCTOBER 2011

ORIGINAL PP. 16-17

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As hunting season begins here in Michigan I can count on receiving several calls dealing with dirty, jamming, mistreated guns from the previous season that should have been repaired right after last season. One particular call that was a bit touchy as it dealt with a stuck live round in the chamber! After a conversation with the customer on the condition of the rifle I now had it on the work bench and started to examine methods of safe extraction.

This article will cover a method I found to be very effective and safe to use by chemically removing the live round. The customer's rifle in question was a Browning BAR .30-06 semiautomatic. After firing around of factory ammo he tried to chamber a hand load of unknown specs. The rifle would not fully chamber the cartridge and after repeated slamming of the bolt to try and force the round he brought it to me to extract.

The bolt would close enough for the extractor to grab the case rim, however, force applied to the charging handle to extract the round would just pop the extractor back over the case rim leaving a stuck cartridge. I was able to lock the bolt open and inspect the case head through the action. Phone calls to several long-serving local gunsmiths proved to be unsuccessful on finding a shop that had any helpful advice. A call to Browning's service techs also turned out to be of no help.

Obviously, I couldn't ship a loaded gun to them and the company would not sell any manual on detail strip. The author found that a combination of Kroil Penetrating Oil and Hoppe's No. 9 made the job much safer to complete without incident. ping or factory specs—such as barrel removal, what parts are pressed fit, pinned, threaded, etc.—since I am not an authorized Browning repair shop.

Advice for my dilemma from fellow gunsmiths suggested killing the primer and powder in a K-1 Kerosene bath, however, that still would leave me with an uneasy feeling when I tried to push out the live round. The thought of placing a drive rod down the bore and setting the bullet deep into the mostly-chambered cartridge gave me grave thoughts of what might happen if the round went off. Yes, we all have seen photos of banana peeled barrels from accidentally plugged bores.

After talking to a Federal Cartridge Company tech about primers and gunpowder reacting to friction from trying to drive out the round I learned they do not test primers for reverse pressure on them as would result from pushing the bullet into the case. The Federal tech went the extra mile and researched possible reactions of tapping on the bullet with a fully charged case of gunpowder and alive primer. These Federal employees are great guys to offer such extensive help in my touchy situation and I am greatly ap-

DEALING WITH A STUCK CHAMBERED ROUND CONTINUED

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Just enough of the brass was removed by Hoppe's and loosened with Kroil to pop out. preciative of all the help and advice on primers and powder sensitive issues they gave me. Despite the help, no one ever said that it's safe to pound on the bullet to drive out around from the chamber. This type of action is not encouraged by any means and should be avoided if at all possible. I decided to look into a chemical solution to dissolve brass or slightly reduce the outside diameter of the case.

My first thought was to use ferric chloride, however, it leaves sediment during the etching process, which needs flushing, and I didn't know what the reaction would be if any seeped into the case mixing with the powder and primer. Also, this might slightly etch the bore. Not a good choice so I needed to think of a commonly available brass etchant chemical that is barrel-steel friendly. Then I remembered what has been said about Hoppe's eating your brass brush and jags after cleaning out the bore.

To prepare for this method I first filled the bore half full with Kroil Penetrating Oil in an attempt to loosen things up. After a good soak, I emptied the bore of Kroil and filled the barrel half full with Hoppe's No. 9, leaving the bolt locked open and placing a rag at the base of the cartridge in the action to soak up any seeping liquid. One day after the Hoppe's flooding I inspected the rifle. The bolt still would not lock up.

With the rag still loosely in the action I wacked the buttstock on the floor and the round just popped out of the chamber! It had been eaten just enough by the Hoppe's to release the grip of being stuck. I felt much safer in removing the stuck round this way. After a thorough inspection for safe firing and good cleaning of the bore this touchy job was over. Conclusion/Recommendations I cannot say that I am eager to receive another stuck live round job any time to soon.

With the lack of information and tooling to break down the rifle and attempt alternate methods of extraction, this use of Hoppe's

No. 9 and Kroil worked wonders for me. All precautions were taken to prevent the bolt from slamming shut on the stuck live round during the above mentioned work. As brought to my attention by several gunsmiths of the trade, while working with this type of job I kept the customer informed in advance of the potential steep cost prior to the job.

If the chemical process had not worked I would have been faced with the option of tooling up to remove the barrel for extracting the cartridge. Obtaining an action wrench would have been the trick here since I couldn't find a supplier for them and an overly-expensive tool to have lying about as I don't often receive Browning BAR rifles that need rebarreling. As with any job, closely examine the risks at hand and process necessary to remedy the problem.

If you're not up to the job the wise choice is to refer the customer to a shop that is able to deal with it. No dollar amount is worth taking life or limb risks! Think smart and work safe.

FINISHING

A Look At Handgun Grips

Tasteful fitting, finishing and/or replacement of grips on a newly refinished handgun can enhance performance and improve the looks.

BY ROBERT K. CAMPBELL OCTOBER 2011

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Often enough when working with a handgun the refinishing job is tedious but the end product is worth the time invested. There are times when extra details are involved. A ding on the muzzle means a recrown job in order for the refinish project to be perfect. Scratches may need to be polished out. When it comes to handgun grip panels or stocks, a poorly fitted or bad looking set of grips may adversely affect the looks of the handgun.

The owner may not have noticed how badly the grip panels fit or how rough they looked before, but now that the pistol has a bright new finish the grips just no longer suit the pistol. The grips are dinged, worn, and perhaps even missing the enamel from the

medallions. While some shooters will go for the gold and upgrade to Smith and Alexander 1911 grips or something from Hogue's wooden line, many shooters like the original looks of a set of Double Diamond grips.

On revolvers, Smith and Wesson target grips are still popular although Aherend's combat style grips are breathtakingly done. I cannot imagine my Colt Official Police with anything but a set of original grips with the Colt Pony, but some in the author's storage bins are actually hand made. Some are show pieces, others are utilitarian. I have to admit the Pachmayr absorbs recoil much better. To each his or her own and this keeps us in business. Often there are compromises and we go with what we are able to obtain.

If we cannot obtain good original grips we can look to reproductions. Other times, we will refinish the grips and need to be able to. Of course the grips are removed from the handgun to be reworked. Gun Parts Corporation is a source for these grips. make them a simile of the original appearance. However, it isn't always straight refinishing. In this day of mass produced products—and a few one-at-a-time custom grips—sometimes a set of grips is delivered that doesn't quite fit.

While sending them back to the maker is always an option I don't think a few file strokes is as

A LOOK AT HANDGUN GRIPS CONTINUED

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Shame on the maker! Luckily, you can fix this pretty easily. much trouble as double postage there and back and the time that may be involved. Just be certain you know what you are doing because a wrong stroke means you have bought the grips no matter if they were not perfect to begin with. While completing a recent refinish job I worked with a stock set that had a few problems.

It is an aggravation when the maker provides a pair of grips that don't quite fit but as long as we have only a difference I say go for it and use the file to get the job done. The

work I am going to describe is not complete fabrication or a heavy duty refinish and recut of checkering by any means. It is a relatively quick fix that will provide the customer with a more suitable handgun that will afford greater pride of ownership and appreciation of your work. First, lets look at fit issues.

If the grips were on the handgun before you refinished it you already knew about the fit. If the owner included a set of grips to be fitted you may discover a bad fit after the refinish. On one occasion I was Notice the frontstrap, which may be cut and removed if desired, has

begun to fray and needs to be trimmed. com. So far, I've had excellent luck with this company. attempting to fit a set of grips to a 1911 when I noticed there was overlap on the grip frame.

In two other instances 1911 grips were supplied that did not allow clearance of the magazine release. One of these were remedied with a few file strokes. On the other the work would have resulted in a wider cut and odd look the owner

A LOOK AT HANDGUN GRIPS CONTINUED

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I have inserted a Wilson Combat foil wrap. They are OK, not as nice as some earlier grips but this is what they look like when new. would not care for. These grips were dispatched back to the factory. On other occasions owners have ordered 1911 type grips that did not accommodate a newly-fit ambidextrous safety or magazine guide. When it comes to the 1911 we have to be certain that the grip panels support the plunger tube.

I have seen cheap stock panels, including some that came from the factory that did not support the plunger tube. This is not acceptable. On another occasion when refinishing a Browning High Power, the owner supplied a rather nice set of Esmeralda O'S heehan Cocobolo stocks. The problem was this High

Power was an original military version featuring a lanyard ring that required a stock cut out.

The new and expensive grips would not fit and would have required a deep cut and the refinish may not have matched the rest of the stock that was cut. Some of you may think that rubber grips and stock panels do not need to be trimmed but this is not completely true. I have seen several sets during the past few months that had extrusions requiring trimming.

The fit was OK but the front grip strap suffered from several rather ugly protrusions from the mold that gave me pause to wonder if quality control had slipped at the maker. Thankfully these were the exception and

trimmed easily with an X-Acto knife. Linseed oil, finish or similar has been sopped on the roundel. Worse still, this was done to a very nice original Model 27. These checkered grips are found on a Kimber Gold Combat. Another note for those who often work on collector's items.

I recently worked through several Webley revolvers. One old .455 had a rather nice set of original grips with a bad chip in the bottom. I was certain that the grips would crack if the pistol was fired often. Luckily, I found a set of replacement grips at Gun Parts Corporation. The good folks at Gun Parts were careful to point out that these are reproduction grips and while they are painstakingly similar they are not

A LOOK AT HANDGUN GRIPS CONTINUED

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AG-346D490AF1-A1580-P21-F04

If the pistol is refinished these grips will do nothing for the pistol! Be certain to make the customer aware of such drawbacks. From Hilton Yam, 10-8. originals. In this case the shooter used the Numrich Arms grips for shooting and has preserved the originals in case the pistol is sold at a later date, an ideal solution for his turn of the century Webley revolver. Let's address actual refinishing. As I have mentioned, often when the handgun is refinished the old worn grips do not match the new finish.

The first thing to do is to remove the grips carefully. It sounds elementary but sometimes grips are varnished to the pistol and must be carefully worked off. This is especially true of grips that have been refinished in the past. Next, take a look toward protecting the roundels or grip medallion. Nothing marks a grip refinish as an amateur effort

more so than having linseed oil in the medallion area. I use masking tape in several thin layers, cut to fit and taped down, to cover these medallions.

You will find that these little roundels are easily damaged and should be protected. By the way, Colt, Smith and Wesson and Ruger are usually well secured but some competing grips may exhibit loose medallions. Now is a good time to glue them in place. Begin the refinish job by taking off the old finish, which is not the same as sanding the wood. You need a rather sharp chisel-shaped instrument.

I have used the CRKT Razel knife in some operations largely because it is on hand but it is easy enough to use the belt grinder to grind any fl at surface sharp enough. The finish is easily scraped off in a few minutes. Next, you will use pro- The grips on the right

are found on a Colt 1911 manufactured in 1918. They are worn thin and actually have pieces missing on the edge. If the pistol is refinished, Kimber cocobolo grips would be a good addition. These grips are from JMB Distributing.

They were exactly correct in dimension straight from the maker. gressively fi ner sand paper to sand the wooden grips down. Always be careful to preserve the rounded edges and grip contours. After you have the grips pretty smooth you need to wet them down liberally allowing about an hour or so for them to dry. Resand again. You will find a few protrusions known as whiskers. Be certain to take care of these at this point in the process. After the grips are allowed to dry overnight examine the wood for appearance.

I SELDOM HAVE TO SAND MORE THAN THE AFOREMENTIONED TWO INITIAL

treatments. Next I carefully apply spray lacquer. No special formula is needed and lacquer from any department or hardware store works just fine. A smooth, even movement will prevent the dreaded fish eye or orange peel look. Go slow and smooth, keeping the nozzle about six inches away from the grip panels. Allow the grip panels at least 30 minutes to dry between coats. A nice, clear finish is achieved with three or four good thin coats, depending upon personal preference.

Remember, the finish is the finish and not the natural tone of the wood. The finish covers and protects the wood. Complete the finish with steel wool, taking care to address any runs or thick spots. At this point I should mention that some grips may need repair. I undertook an unusual repair a few months ago. A customer attempted to hand fit a set of Karl Nill grips to the Heckler and Koch P 7. They are a bit complicated to fit and while there is only one way they go on, Complete your American Gunsmith collection.

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PISTOLS

Reader Forum

BY AMERICAN GUNSMITH EDITORS OCTOBER 2011

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Baby Eagle My collection of magazines and books does not include a detailed procedure for disassembly of the UZI Baby Eagle 9x19mm pistol. Have you done an article on it? And can I get a copy? Stu Grell Grell's Gunsmithing We ran an article on the IWI Jerico 941 in the January 2010 issue. That pistol and the Baby Eagle are sufficient kin to enable you to refer to the Jerico in taking down your Baby Eagle. Back issue info is available at american-gunsmith.wordpress.com/back-issues.

Leade Lapping Abrasive Paper The article "Leade-Lapping A Bore For More Efficient Barrel Break-in" published in the August 2011 issue refers to a 3M abrasive sheet material or lapping paper coated with micrograded mineral patches on a high strength polyester backing. Could you provide more information about this product? I have tried to find information on the 3M web site without success. Any additional information, such as actual product name or other would be appreciated.

Do you know of any retail outlet where this can be purchased for use by an individual simply wanting to do some work at my small volume gun shop? James K. Ramsey Author Norman Johnson responds: Another company now handles the lapping paper that I use: PSI Int. (psidragon.com). I would suggest using the following numbers for leade lapping.

Micron US Product Color Grade Mesh Number 30 400 3M481Q Green 15 600 3M481Q Gray 9 1200 3M281Q Blue Stevens Mod 67 Series E I'm working on a Stevens Mod 67 Series E 12 ga. pump shotgun. The shell lifter will not operate and I don't really understand how the mechanism raises the lifter. I've heard that this gun has a reputation for lifter prob-

lems. Is lifter assembly replacement the answer or is there something else to look for? This one has seen quite a bit of use but the owner doesn't want to retire it.

Your comment about the extended use of the gun makes us suspect the springs in the carrier (lifter) mechanism. In most pumps the shell feeding back from the magazine strikes the carrier dog causing it to let go of the carrier (lifter) and allow the latter to raise the shell to the chamber mouth. When the pump handle is brought forward, the shell is moved off the carrier by the bolt and fed into the chamber.

When the bolt has gone fully into battery and locked, pulling the trigger releases the cocked hammer and the gun discharges. Before going crazy searching the aftermarket for out-of-production springs and/or parts, give the trigger mechanism a thorough cleaning and lightly lubricate it. Though action springs in old shotguns can and do weaken, at times they can and do become so fouled they lose much of their ability to act like springs.

P38 Pistol In a previous issue of American Gunsmith you have a letter inquiring about the safety of a WWII-era P38. The safety is supposed to block the firing pin and drop the hammer but P38 pistols made then have a safety with an extremely thin section that can break. This renders the safety useless as it no longer blocks the firing pin when the hammer drops and the pistol will then fire whenever the safety is applied.

It is impossible to tell when the safety may break making each application of the safety an "adventure." Supposedly the firing pin was redesigned after WWII making more recent P38s safe. I consider WWII-

era P38s as very dangerous firearms and I don't know why this information is not better known. H. S. Mc Cann Wye River Arsenal Thanks. Arsenal workers usually know more about these subjects than all but the most fanatical collectors of a given firearm. We hope our readers will take your input seriously as we do.

Don Frost Trapdoor Spring eld Advice The original 405 grain loads for the Trapdoor Springfield eld that Winchester and Remington have produced for longer than I've been alive (I'm 55) were designed to be fired in most early rifles chambered in that cartridge. Velocity runs about 1300 FPS and pressures are in the 25,000 PSI range, which is near black powder levels. I would advise against any of the modern smokeless loads marketed for modern rifles, such as the Ruger Number 1, Marlin 1895, and others.

There are specialty producers of black powder cast bullet loads that closely duplicate the original loads and these are quite easy to find. Do a quick search of online suppliers, such as Buffalo Arms, Midway USA, or Graf & Sons. As for the load differences between carbines and rifles, the carbine models could safely digest any load produced for the rifle, such as the .45/70/500, but it just kicked the snot out of the shooter. Shootability was the issue, not pressure levels or safety.

Some cavalry units during the time period purposely drew infantry loads as they believed the heavier bullet "carried" or "ranged" better than the lighter carbine load and considered it a decent trade off yielding more recoil but more range. Charles Moriarty San Antonio, TX What you state about the cavalry carbine may be true but the one we were

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approached for reloading advice—a subject we do not make recommendations upon—involved an original trapdoor Springfield. Do to the distinct possibility of metal fatigue in a gun that old we felt the safest course was mention of the 55 grain cavalry load. That information, by the way, was provided to us by a manufacturer of black powder equivalent smokeless powder loads as part of a warning not to use modern .45/70 factory ammo in the carbine.

Sig Sauer P226 I just reassembled a Sig Sauer P226 after refinishing with Dura-Coat. The finish is not the problem, rather, the problem arises from the fact that the slide will no longer go on the frame! It seems that the feed ramp on the barrel is hitting against the front of the locking block instead of going over the top of the locking block. The frame and slide appear to be assembled correctly and all of the parts are where they are supposed to be. Can you give me any insight as to what the cause may be?

Au contraire and begging your pardon, the finish could be the problem if it has been applied too thickly. Clean the coating from the slide and frame rails, lightly lubricate both and retry function. Hopefully, a coating was not applied to the pistol's internal parts, thereby throwing off Sig's well-known talent for close tolerances.

1911 Sight Dovetails A few months ago I inquired about dimensions for different sights for the 1911 platform.

I received a lot of email saying that I must be crazy and that I would have to purchase and measure the various sights.

After exhaustive research, this is what I uncovered: Kimber: Adjustable rear .3605" x .164" x 60 degrees; Fixed rear .322" x .070" x 65 degrees; Front .3414" x

.0745" x 60 degrees GI: Rear .344" x 60 degrees (some sources list this as .290" x 60 degrees) Novak: Rear .495" x .125" x 65 degrees (requires additional machining beyond dovetail cut); Front .330" x .075" x 65 degrees Robin Miller Bo-Mar: Rear .359" x 60 degrees (requires additional machining beyond the dovetail cut.) Heinie: Front .305" x .062" x 60 degrees Caspian: Front .300" x .060" x 60 degrees STI: Front .300" x .060" x 60 degrees Para-Ordnance: Rear .375" x 20 degrees; Front .250" x 30 degrees Anyone else wanting to add to this information is free to email or phone me.

Robin Miller Winchester 670 I have a Winchester 670 I'm restoring. After a thorough cleaning, disassembly, strip and rebluing and repairing of cracks in the wood and refinish I have it back together again. The rifle had been used for a crutch in the brush and as a lever to pull from. In short, it was abused and rough. The front sight was taped on with a few good wraps of standard electrical tape, put away wet and allowed to rust and dust. Now, thanks to my efforts, it looks like a respectable lady.

I was starting to check function and have one last issue that I can't seem to find a fix for. It may seem trivial but the bolt safety is a bugger to flip. I must have disassembled the firing pin assembly a dozen times and reset the thing. In order to set the safety from the fire position to any mode of safe I have to simultaneously close the bolt and push forward on the bolt to get the firing pin rearward enough so the safety can cam over into place. What might some potential fixes be?

Dane Frazier We are referring all queries on old, old Winchesters to Nu Line Guns, a former factory authorized service center, who may also be able to provide any required parts. Call and ask for Jerry Stevens at extension five. AG

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