



APR 2020

DIGITAL ARCHIVE
EDITION

PRECISION ARMS WORKSHOP

AND THE AMERICAN GUNSMITH ARCHIVE

A TECHNICAL JOURNAL OF CRAFT, REPAIR & RESTORATION

04

ARCHIVE ISSUE NUMBER

INSIDE THE ARCHIVE

ITHACA FLUES SHOTGUN

CMMG RDB 5.7X28MM • IVER JOHNSON HAWK • IMPROVED WILDCAT CARTRIDGES • TECH SIGHTS

ORIGINAL METHODS. MODERN ACCESS.

ARCHIVE EDITION 196

DIGITAL ARCHIVE EDITION

Preserved for the bench.

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AMERICAN GUNSMITH

DIGITAL ARCHIVE EDITION • APRIL 2020

ISSUE RECORD

ORIGINAL DATE	April 2020
VOLUME	Archive volume not stated
ISSUE NUMBER	04
SOURCE ID	ag-272ec01c8335eeab67e5b25a

DIGITAL EDITION

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

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

IN THIS ISSUE

Contents

A complete guide to the searchable editorial work preserved from April 2020.

2 CMMG RDB 5.7x28mm
AMERICAN GUNSMITH EDITORS • ORIGINAL PAGES 2

3 Iver Johnson Hawk
ROBERT K. CAMPBELL • ORIGINAL PAGES 3-5

6 Ithaca Flues Shotgun
MARK R. HOLLENSSEN • ORIGINAL PAGES 6-11

12 Improved Wildcat Cartridges
NORMAN E. JOHNSON • ORIGINAL PAGES 12-14

15 Tech Sights
ROBERT K. CAMPBELL • ORIGINAL PAGES 15-17

18 Armorer Courses
STEPHANIE A. MARTZ • ORIGINAL PAGES 18-20

21 Cartridge Case Rings
NORMAN E. JOHNSON • ORIGINAL PAGES 21-23

24 Reader Forum
AMERICAN GUNSMITH EDITORS • ORIGINAL PAGES 24

FROM THE ARCHIVE

CMMG RDB 5.7x28mm

BY AMERICAN GUNSMITH EDITORS APRIL 2020

ORIGINAL PP. 2

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CMMG Inc. began in central Missouri in 2002 and quickly developed into a full-time business. Known for their Radial Delayed Blowback actions, CMMG is now offering their 5.7 AR Conversion Magazine. Holding 40 rounds of 5.7x28mm, this magazine fits mil-spec AR-15 lower receivers when paired with CMMG's 5.7x28mm Radial Delayed Blowback upper. The appeal of 5.7x28mm is that it is a small caliber with high velocity designed for a handgun and/or personal defense weapon (PDW).

The cartridge was developed in response to NATO's request for a replacement for the 9x19mm cartridge. Any AR-15 can shoot 5.7x28mm using a CMMG 5.7x28mm Radial Delayed Blowback upper and 5.7x28mm AR

Conversion Magazine. CMMG recommends using a standard carbine buffer and action spring to reliably cycle. The 5.7 AR Conversion Magazine also retains last round bolt hold-open functionality. The Radial Delayed Blowback has less felt recoil than direct blowback designs.

CMMG also offers complete firearms designed for 5.7 AR Conversion Magazines built with CMMG's Mk4 lower receiver. The 5.7x28mm uppers are available in five, eight, and sixteen-inch barrel lengths. Or you can build your own. CMMG offers 5.7x28mm bolt and barrel kits with the same barrel options. For more information, visit CMMGInc.com or call

PISTOLS

Iver Johnson Hawk

Commander-type 1911-style handgun.

BY ROBERT K. CAMPBELL APRIL 2020

ORIGINAL PP. 3-5

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After one hundred and ten years you would think we would be able to get a singular handgun design down pat and that examples would always work correctly and function. As long as people desire a less expensive product and companies try to provide it, we will never have a perfect handgun. Then again, there are occasional problems with relatively expensive handguns as well. I was recently able to test and evaluate the Iver Johnson Hawk 1911, a Commander-type pistol.

This handgun lists for about \$600 and may be found for ten to twenty per cent less on average. The pistol tested features a high grade blue finish and a matte blue finish version is available for forty dollars or so less. While offered by the American-based Iver Johnson Arms company, the primary compo-

nents are manufactured in the Philippines. The impression is that the pistol is shipped from S. A. M. (Shooters Arms Manufacturers) in the Philippines and Iver Johnson does the final fit and finish.

The finish is nice throughout, with a dull matte on the stop of the slide and lower parts of the frame. There were no discernible tool marks. The sights are high visibility types dovetailed into the slide and giving a good sight picture. The rear sight features a Phillips head screw that may be loosened for adjustment; rather odd compared to the generally-used Allen head screw. Witness marks for setting the sights are dimpled into the slide.

The beavertail grip safety is well designed and well fitted, releasing its grip on the trigger about half into compression. Combined with the sharp slide lock safety indent, the fit of these parts is credible, even impressive. The grips are easily among the nicest I This harks back to 1980s designs in the author's opinion. have examined. They appear to be cocobolo or the very similar rosewood, are checkered in the double diamond pattern, and feature Iver Johnson's owl symbol.

The long trigger and flat mainspring housing are typical of modern This pistol uses a standard recoil spring and spring guide set-up. The trigger action, however, was far too heavy, breaking at 8.1 pounds. The primary fit and finish leave little to be desired. While the trigger is heavy, a trigger job would fix that. The safety is easily adjusted.

IVER JOHNSON HAWK CONTINUED

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Problems came up when firing tests were taken. The extended slide lock safety lever of the Hawk was crisp and positive and did not present a difficulty. The beavertail worked properly. The extended slide lock lever was another thing. I have been of the opinion, tempered with experience, that extended slide locks are best reserved for competition handguns. During recoil, shooters tend to allow the thumb to drift into an extended slide lock lever and tie the gun up by pressing it into the locking slot in the slide.

This problem was encountered by several shooters firing the Hawk. It was difficult for them to adjust, even though they are long time 1911 shooters. These heavy slide locks tend to build up their own momentum and are far less suited to Com- The slide stop is actually larger than the Wilson Combat replacing this one. mander .45s than the Government Model. You cannot use the thumbsforward grip with this slide lock as that technique sends the thumb into the slide lock during recoil.

During the firing tests with Black Hills 185 grain JHP +P ammo the Hawk tied up when using a tenround Chip McCormick magazine, occurring on the tail end of a string with the ninth cartridge that failed to fire. A typical short cycle, however, when I switched to the supplied ACT MAG magazine there were no short cycles but the pistol failed to feed the all-brass hollow point twice in two magazines. In modern 1911s feed reliability is often taken for granted and the performance exhibited by the Hawk isn't acceptable.

Even if you factor out the problems with the McCormick magazine and the 185 grain TAC bullet in the factory magazines, you still have the problem with the slide lock. Despite the good finish and fit, the poor choice of the extended slide lock and finicky feeding soured the firing experience. It is asking a lot for a magazine spring to feed along column of cartridges into a pistol with a short slide as a Commander-length has greater slide velocity and momentum.

The first chore was to order a Wilson Combat standard slide stop. At just over thirty dollars, this is a fair price for a great product but it did not fit right in. A quick check of Kimber, Taurus, and Desert Eagle handguns on hand showed the Wilson Combat slide stop to be a good fit. A bit of file work and then heavy polishing was needed to convince the slide stop to fit. Test firing with forty rounds of Black Hills Ammunition 230 grain FMJ in the factory magazines went without incident.

Feeling courageous, I also used two Mec-Gar ten-round magazines with the same load with no issues, however, while the pistol fed some hollowpoints it did not like the Barnestype all-copper bullets. While one solution is to just use standard JHP loads, well, fixing handguns is what I do and it seemed that the Iver Johnson Hawk deserved to be all it could be. I carefully examined the feed ramp. The proper 0.032" gap between the two pieces of the feed ramp were properly cut it seemed. This polish is the clas-

IVER JOHNSON HAWK CONTINUED

ORIGINAL PAGE 5

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Far right The slide lock safety exhibited a crisp indent. Fitting was deemed good, perhaps even excellent. Note wear on this new handgun's parts. sic application and minimalism is the proper approach. I never polish a ramp unless the pistol simply will not feed and I am certain the bullet nose is catching on the feed ramp and there are no other problems such as a poor magazine or poor handloads.

The process involves carefully removing tool marks or scratches from the feed ramp without removing metal without changing the an-

gle of the feed ramp. There is a small stop about 0.032 inch between the top of Below center: Never change a feed ramp angle, only polish out the burrs and scratches. the ramp and the barrel throat that must not be changed. If that angle is changed the piece will not feed. A half round file is often suggested and they are usually the right size.

I have discovered, looking over the bench, that a Sharpie pen is just the right size. Tape a piece of fine grit sand paper over the Sharpie and carefully polish out rough spots and tool marks. A surprisingly small mark or burr will

tie the pistol up. The feed ramp angle isn't changed, only the effort needed for the bullet nose to feed properly. I use dummy cartridges put up on a Lyman press to check for feed and then I travel to the range to do alive fire.

In this case, the work was accomplished and the pistol fed chambered and fired normally. AG

MEASUREMENT & INSPECTION

Ithaca Flues Shotgun

How I repaired an Ithaca Flues 16 gauge double shotgun.

BY MARK R. HOLLENSEN APRIL 2020

ORIGINAL PP. 6-11

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So, in comes another old double shotgun with a similar customer request. They want it inspected for use and, in this case, both barrels are going off at the same time with one pull of the trigger. Not good! This time the shotgun is an Ithaca Flues double chambered in 16 gauge. The serial number had a distinct "S" over it, placing this shotgun as a Grade 1 Special and two grades above the field grade. The serial number lists this shotgun as having been produced in 1916.

Since Ithaca reportedly didn't introduce a 2 3/4" chamber in the 16 gauge until 1934, this shotgun undoubtedly has 2 9/16" chambers, unless it has been re-chambered somewhere along the way over the past 103 years. Right now, about the only good news is that the barrels have not been cut down but the overall condition of the shotgun was not very good.

There was lots of surface rusting present on the barrels inside and out, one fairly it had to be the wrong bit type as these are just wood

screws and wouldn't have been that difficult to remove, provided the right screwdrivers had been utilized. Notice the small, sharp, protruding edges of the receiver corners where they meet the stock? They act like little wood splitters when the gun is fired and eventually will break away the wood on top of the buttstock, as this one did.

According to Ithaca records, this shotgun was produced in 1916. deep dent on the right barrel, and both bores were pitted heavily with rusting still going on inside. Measuring the barrels, I found that they are 28" long with the original steel front sight bead still attached, choked full (left) and modified (right.) The front trigger fires the left barrel and the rear trigger fires the right. I decided to do a little research on the Flues shotguns, mostly for the benefit of my customer but also to include here.

History tells us Ithaca made various models of double shotguns between 1883 and 1948. There were the Baker & NIG models, the Crass & NIG models, the Lewis & NIG mod-

els, Minier & NIG models, Flues models, Lefever models, and a few others as well. The earliest models were the Baker & NIG guns, with the Crass & NIG models coming shortly thereafter. The Flues models came from Emil Flues, a gunmaker from that early time period. Based on serial number records found, there were roughly 405,456 made.

Then, Flues serial numbering jumped to nine digits beginning in 1969 and up until 1980. The older model guns became very popular during their time, and most notably, the Flues model became a favorite among shooters and hunters. As popular as these shotguns are, there are some drawbacks to owning them today. First, as previously stated, prior to 1934 the 16 gauge guns were chambered with 2 9/16" chambers.

The 12 gauge guns also had short chambers early on; if you own one of these, it must be checked and that means with a chamber gauge and not alive 2 3/4" shotshell. Why? Because you can chamber a 2 3/4" shotshell in these old

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When looking at a matching numbers gun, you will find the serial number (or the last four digits) on the barrels, forend, receiver, under the trigger guard, and on the forend iron. Look for this when documenting a serial numbers-matching shotgun. short-chambered guns. The problem is that the live shell is not 2 3/4" long when unfired, so it will fit.

But if you fire that shotshell, you are taking great risk to injury or worse because upon firing the crimped hull opens up after firing but cannot fully open up due to hitting against the shorter forcing cone (smaller diameter) in the chambers, creating pressures the gun was never designed to handle when produced. In fact, even if you shot a 2 1/2" shotshell with today's modern smokeless loading data, that pressure alone could open up. Notice the barrel lock retaining spring and button (middle of the receiver).

Remove these now before they become lost as they are not attached to the receiver. Also note how the sear springs are toed inward and that the sear legs are also bent inward. The long, curved front edge of the safety slide presses up against the back of the barrel locking bolt. When opening the shotgun with the top lever, the cocking plunger will push the barrel locking lug

rearward and move the safety button to the SAFE position each time the gun is opened/cocked. the barrels.

Worse yet, as in the case of this shotgun, the deep pitted bores and rusting has reached "an unknown depth" in the barrel steel, so much so that you could potentially blow the barrels with even the shortest, lowest pressured and made-for-black powder-guns ammunition available today. There seems to be a great fascination about hunting with these guns from yesteryear; a nostalgia thing I guess.

But knowing how these guns were made during that time period tells me that they really are not for hunting or shooting anymore. They are for collecting and admiring and should be pulled from the hunting and shooting gun line-up just to be safe. I often ask my customers, "Is it worth the risk of an eye, or a few fingers, or your life to pull the trigger on Old Betsy"? To me, it is not.

And in the case of this shotgun, not only due to the deep rust pitting and dent in the barrel, but my chamber gauges measured these two chambers at 2 1/4" long! How can that be, you say? It could be the chamber reamer was past its full service life before being pulled, or it could be whomever chambered this shotgun didn't make sure it was chambered to at least the going length of the day at 2 9/16".

This is actually the first Flues double gun I have ever had in the shop with that short of a chambering and in both barrels, too. If you get one of these in your shop, remember that "mechanical shooting condition" does not mean "take her out and shoot away!" Explain all the issues associated with pulling the trigger on modern shotshells with your customer so they are fully informed. If they decide to shoot it, they are on their own.

You just don't want them to say, "My gunsmith said it was in great shape and that I can shoot it." With that horse beat to death, let's get back to the shotgun on the bench. There is nothing wrong with making sure an old shotgun works as it is supposed to. In this case, it was dangerous as both barrels were reportedly discharging with one pull of one trigger. Which trigger? I never got an answer on that.

If the gun isn't repairable or if the owner wants the gun to work mechanically while ensuring it can't discharge even with live ammunition loaded, remove the firing pins and store them separately for future use. This will ensure that no one shoots the gun unintentionally and injures themselves or someone

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Relieve tension on the top lever spring before unscrewing the set screw retaining it or risk stripping the threads—or worse—breaking it off. This could also happen when reinstalling it, so be careful here. The hammers will be under heavy spring tension when removing them, so be prepared. else. In the case of this shotgun, I found that one of the sear springs was loose and out of alignment and that was causing the doubling.

Once the sear springs were tightened and aligned properly to the sear legs, it worked just fine. And a deep cleaning made it feel smooth as silk again during use. **Disassembly** To disassemble an Ithaca Flues completely, open the action and look to be sure that there is nothing in the chambers. Once clear, close the action and remove the forend assembly by pulling downward from the front of the forend. It is held in place by spring tension. Once removed, open the action and lift the barrels off of the receiver.

This is typically as far as you will need to go for routine cleaning and lubrication. If replacing the firing pins, disassemble the shotgun further. Since I had this in for repair, I completely disassembled it as it was full of old black powder residue, gunk, and surface rust. To disassemble the forend assembly, remove both wood screws that secure the forend metal to the wood forend. Once those are removed, wiggle and lift the forend metal out of the wood.

Remove the forend latch (flat) spring by removing the forend latch spring screw. Once those are removed, drift the forend latch pin out from right to left to complete the disassembly of the forend unit. To disassemble the barrel assembly further, begin by turning the barrels upside down and remove the large set screw. This screw retains the extractor to the barrels. When removed, withdraw the extractor rearward out from the barrels.

With the barrels still upside down, remove the small set screw to allow removal of the cocking lever and cocking lever coil. The firing pin screws are shown, along with the barrel locking bolt straddle block and barrel locking bolt straddle block screw. Once the screw is out, push the barrel locking bolt rearward to remove it from the receiver. spring assembly. The assembly will be under spring tension, so hang on to the cocking lever so it and the coil spring comes out in your hand.

This completes disassembly of the barrels. Moving on to the receiver and buttstock assembly, begin by moving the top lever a little further to the right while using a punch to depress the round barrel lock trip seen inside the bottom of the receiver. This will allow the top lever to be returned to the closed position, or the top lever will now be in line with the tang. Next, use a block of wood to cover the firing pin holes in the receiver and pull the triggers to release the hammers.

The rear trigger fires the left barrel and the front trigger fires the right barrel. On this particular shotgun, the left barrel was full choked and the right barrel was modified. With the hammers now lowered, begin by easing the top lever over to the right just enough to access the wood screw located underneath and unscrew it a couple of turns but not so much that the top lever catches on the screw when released. Turn the receiver over and remove both trigger guard wood screws.

Unscrew the trigger guard from the trigger plate. You may need to pull the front trigger rearward while unscrewing the trigger guard to have proper clearance so the trigger guard doesn't rub against the front trigger while unscrewing it. Unscrew the smaller-headed machine screw that secures the trigger plate to the receiver tang. Once this screw is out, remove the large-headed screw from the trigger plate ahead of the trigger guard screw hole.

The trigger plate will be under spring pressure from both sear springs and the barrel lock retaining button and coil spring. If the trigger plate doesn't want to come loose, reinstall the trigger guard and use it to wiggle the trigger plate loose from the receiver. As the trigger plate is pulled away, make sure

ITHACA FLUES SHOTGUN CONTINUED

ORIGINAL PAGE 9

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The barrel locking bolt straddle block is in position in the receiver. Once aligned properly, the screw will be installed and tightly secured in place. To pull the barrel lock coil spring out and the barrel lock retaining button that it sits in as they can fall out. Set these aside for now. Turn the receiver back upright and move the top lever to the right enough to remove the wood screw under the top lever. This will allow separating the receiver from the buttstock.

With the trigger plate now fully removed, begin disassembly of that unit by first removing both sear springs. Unscrew the two screws that secure the flat sear springs to the trigger plate. I marked these as left and right. Note how the two springs are seated on the trigger plate. When reinstalling them, make sure the springs are placed directly underneath each sear leg. These two sear springs will be “toed in” a little on the trigger plate and that is why.

Next, remove the triggers by first unscrewing the trigger spring stop screws attached to the side of each trigger. Once those screws are removed, drift out the single pin that retains both triggers to the safety slide bridle. With this pin removed, pull the triggers downward and out of the trigger plate. Remove the safety slide by drifting the safety slide pin out right to left, then pull the safety slide out of the safety slide stud.

With the safety slide out of the way, remove the trigger (wire) spring by removing the screw that secures the safety slide bridle to the trigger plate. Once the bridle is removed, the trigger spring drops out. You can increase tension on the trigger spring legs during reassembly if the triggers feel sloppy in the trigger plate. This completes disassembly of the trigger plate unit. Moving on to the receiver, begin by removing the safety assembly.

Remove the safety slide button spring by unscrewing the safety slide button spring screw. Note where the screw secures the spring to the receiver before removing it as the slot in the spring is longer than necessary and the spring needs to be relocated in the same position when reassembled. With the safety slide button spring loose, drift the small safety slide button cross pin out (right to left). This pin secures the safety slide button to the safety slide. Under that, the top lever cam.

Once the screw is removed, the top lever can be removed from the top of the receiver. button spring. Once the pin is out, lift the safety slide button out from the top of the receiver tang. The safety slide button spring comes off at the same time. If you didn't remove the barrel lock retaining coil spring and barrel lock retaining button, do that now. Again, they are loose in the receiver so they just drop out. First we'll remove the sears. Scribe an “R” for right and “L” for left on each sear leg before removal.

With the receiver upside down (preferably clamped in a padded vise), drift the sear retaining pin out of the receiver from right to left. Each sear will come out as the pin is drifted out. Next, mark both hammers with an “L” for left and “R” for right, and drift the receiver pin out that retains them from right to left. Keep in mind that someone has already been inside of this receiver so the receiver pins may have been installed incorrectly at some point.

Look at the ends of each receiver pin and drift them out accordingly. Typically, the small end of each pin is where you will place the drift punch to remove them. As you drift the pin out, the hammers will be captured by the drift punch. Keep your thumb with pressure over and on each hammer while removing the drift punch so you can capture the hammers and coil springs. Once the hammers are removed, pull the hammer coil spring assemblies out. Each spring will have a hammer spring plunger attached to them.

The hammers have legs on the front that engage with the cocking lever attached to the barrel assembly; you won't find cocking rods in this shotgun. With the hammers and springs out of the way, access the firing pin retaining screws. Unscrew each, being careful not to damage the heads as they are set screws and easily bent or damaged. Lubricate them liberally if they are not easily unscrewed. Once the retaining screws are removed, the firing pins

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drop out of the receiver. You will notice that there are no firing pin return springs. During reassembly of the firing pins, make sure you don't seat the screws too deep as you can pinch the firing pins to the frame if you do. Just seat the set screws so that they capture the rear of the firing pins and allow for free movement of each pin. With the receiver still upside down, remove the large-headed screw in the middle of the receiver bottom.

This screw secures the barrel locking bolt straddle block to the barrel locking bolt. This screw will be very tight, be careful not to damage the screw head slot. Once this shown is a hunting dog scene above the "Ithaca Gun Co. Ithaca, N. Y." stamp.

Also, note the front of the hammer legs in the receiver cutout that engage with the cocking lever in the barrels. screw is removed, use along brass punch to drift the barrel locking bolt out of the receiver rearward by tapping on the punch from the front of the receiver where you can see the front of the barrel locking bolt. Once it is pushed rearward and freed up, pull the barrel locking bolt all the way out from the rear of the receiver.

With the barrel locking bolt removed, the barrel locking bolt straddle block will fall out or can be lifted out of the receiver. You

will see a stud on one corner of this straddle block, and it connects to a hole in the top lever cam. When you reassemble this straddle block, position it in place with the stud pin inserted into the top lever cam hole, then insert the barrel locking bolt from the rear of the receiver until it is aligned properly.

Install the barrel locking bolt straddle block screw, making sure it is tight. You might want to place a drop of red thread locker on this screw as you don't want this screw coming loose during use. With the receiver still upside down in the padded vise, use a small screwdriver or punch to compress the top lever cam coil spring inward enough so that you can unscrew the top lever cam coil spring retaining screw from the receiver.

Take spring pressure off this screw when removing it so you don't strip the threads or bend the screw. With the screw removed, pull the coil spring out of the receiver. Remove the top lever cam screw from inside the middle of the receiver and work the top lever back and forth until you can free the top lever from the top of the receiver. Turn the receiver over and dump out the top lever cam. Make note as to how it was in place before removal. This completes disassembly of the shotgun. Reassemble in reverse.

Reassembly Tips After cleaning and during reassembly, use quality grease to lubricate the moving parts inside. I like Krieghoff brand grease and their spray oil. The grease doesn't set up and harden over time and the spray oil they sell is very light and penetrating, leaving a thin film of protection on whatever you spray it on. Use a small brush to apply the grease to all moving parts in the action and it will feel much smoother when reassembled.

Plus, it will add a layer of rust protection/prevention to the internals as well. When reinstalling the barrel locking bolt assembly, begin by placing the barrel locking bolt straddle block in place, inserting the corner pin on the block into the top lever cam hole. Then, insert the barrel locking bolt from the inside rear of the receiver.

Once it gets through the receiver hole and the barrel locking bolt straddle block, push it forward until you can see the marks where the screw originally held the barrel locking bolt straddle block to the barrel locking bolt and tighten the screw securely. Use thread locker here as you don't want this screw to come loose ever. When reinstalling the trigger plate assembly, align the trigger

ITHACA FLUES SHOTGUN CONTINUED

ORIGINAL PAGE 11

plate to the receiver before mating it to the buttstock. Make sure the sear springs are directly under each sear leg correctly. Align the safety slide leg that fits into the safety slide button U-shaped opening as this will ensure proper seating of the safety. Once everything aligns properly, separate the trigger plate from the receiver and install the receiver into the buttstock by angling the rear of receiver downward to slip it into the front of the buttstock. Fully seat the receiver into the wood.

Move the top lever over to the right a tad and install the wood screw under the top lever—just don't tighten it fully yet. Turn the receiver back over, make sure the barrel lock retaining coil spring and barrel lock retaining button are installed in the bottom of the receiver, then seat the trigger plate over the bottom of the receiver. Make sure that the safety slide arm fits into the safety slide button Ushaped opening on the tang again. It might help to move the safety slide button while seating it into place.

Once that is inserted properly, press downward on the trigger plate and install the trigger plate large headed, albeit short, screw. Snug this screw up and then install the rear trigger plate (machine) screw that screws into the top tang of the receiver. Once everything is in proper place, tighten the two trigger plate screws and then turn the receiver back over and tighten the wood screw under the top lever. Install the trigger guard and both wood screws that secure it to the buttstock.

Perform a function test at this point to make sure the action is working properly. Use a block of wood to protect the firing pins if you decide to dry fire it. Once the shotgun is reassembled, always use quality snap caps when dry firing as the firing pins are fragile and can break easily. Furthermore, when storing these old shotguns, it is best to drop the hammers on snap caps, remove the forend wood and barrels to get the snap caps out, and then put the barrels and forend back on the receiver.

This takes the mainspring tension off of the hammer springs during long-term storage. As mentioned previously, this shotgun was repaired and now works as it should. You should never attempt to take one of these apart without the proper tooling—specifically, hollow ground screwdrivers, long pin punches, clamps, and other tools needed to disassemble it properly—as you risk damaging the soft metal screws, breaking fragile parts, etc.

A check online with Numrich (GunPartsCorp.com) revealed they carry many of the parts needed for this particular model shotgun, but not all. And some of those parts are VERY hard to find, if even possible. So keep this in mind before getting out the tool chest and cracking one open. You could end up with a cigar box full of parts in the end. In closing, I looked high and low for a detailed schematic for this model shotgun, without success.

I did, however, use the same parts naming conventions as those listed on the Numrich website, so when referring to each part in this article, you will find it by name and photograph on their website under Ithaca Flues model shotguns. I had to be the bad guy and tell my customer that he should never fire around from this shotgun again, ever.

I couldn't even tell him that it would be OK to order in some 2 1/2" black powder, low pressure shotshells due to the short chambers in his gun and deep rust pitting in the bores. In this case, I made my point clear and had my customer sign a document stating that the shotgun was unsafe to use, keeping the original with me and giving him a copy. Just a little security for my liability insurance policy. After all, the last document he had (before that) was a receipt for services performed—with my shop name on it!

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FROM THE ARCHIVE

Improved Wildcat Cartridges

Gunsmiths should be prepared to test the rifles we build and offer sound advice on some of the lesser understood aspects involved. Working with Improved or Wildcat cartridges fits right in here.

BY NORMAN E. JOHNSON APRIL 2020

ORIGINAL PP. 12-14

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An Improved cartridge is essentially an enlarged version of an existing cartridge, fireformed or expanded in the forward half of the case body and shoulder over the parent cartridge. These cases are normally headspaced on the same neck and shoulder datum line as it is fire-formed in the new chamber. The end result is a cartridge that holds a greater volume of powder, thereby increasing its velocity and often its overall performance. The process is not always without some cartridge loss due to case cracks or splits.

There are obviously caveats to be observed by the shooter if sound practices are not followed. Typically, the reamer used for an Improved cartridge is headspaced on the neck shoulder or case datum line. As a result, the case is correctly headspaced and ready to be fireformed, resulting in a new version of the cartridge. Attempting makeshift headspacing techniques can lead to real problems and locked up or blown rifles. One such risky procedure is to use a long-seated bullet in an attempt to establish headspace.

That is where a longseated bullet makes firm contact in the leade or throat of the chamber as a means of headspacing. There are always added problems where the Wildcat or Improved cartridges are much shorter than the chamber they are to be formed in, particularly forming rimless cartridges.

Three typical cartridges pictured from left are the .30-06 Improved, fire formed from the .30-06 cartridge; .257 Improved, fire-formed from the .257 Roberts, dating back to 1934; the 5.6x44 SW-NEJ cartridge, a straight wall cartridge designed by author, fire-formed from the .223 Remington cartridge. Standard .223 Remington cases can readily be fired in this Improved chamber for target or hunting.

As a rule it is strongly advised to stay away from any Wildcat or Improved cartridge where the new reamer doesn't allow headspacing off the neck shoulder datum line of the chamber. The Fire-Forming Process Over the past 60 years I have fire-formed a great number of Wildcat and

Improved cartridges, including those existing and a good number of my own design. I have done so without untoward incidents and have always looked forward to each new version, whether my own or for others.

Many have shown noticeable improvement in both accuracy and velocity. The Improved case is usually formed from cartridge cases with headstamps of like designation, i.e. .257 Improved originates from the .257 Roberts; the 6.5/06 is the .30-06 necked down to the 6.5mm bullet. There are scores of interesting possibilities. The question is often asked relative to the powder charge used in fire-forming a cartridge.

In my own experience, powder charges used to fire-form cartridges are about midway in the reloading manual for the parent case. I normally use a medium burn rate of powder and a medium bullet weight for case forming. Sometimes I'll go close to maximum as pressure signs are

IMPROVED WILDCAT CARTRIDGES CONTINUED

ORIGINAL PAGE 13

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Far 6x44 SW-NEJ resulted in a very practical Improved version of the .223 Remington. This was accomplished with a near straight wall reamer and a 60degree shoulder up to the neck-shoulder datum line. There is no .223 Improved case with greater powder volume. Headspaced on the neck-shoulder datum juncture, standard .223 Remington cartridges can safely be fired in rifles chambered for the Improved cartridge with outstanding results.. 223 Remington cases in the 5.6x44 SW-NEJ cartridge.

Load used was 73 grain Berger bullets ahead of 22 grains of Hodgdon Varget powder. The bore break-in was combined with case fire-forming resulting in 50-yard groups under 1/4 inch. The barrel used here was a five groove Pac-Nor match select. Note the difference in the case shoulder and body taper of

the fired and unfired cases. Working with Improved and Wildcat cartridges can be a very fulfilling endeavor both for the gun owner and the gunsmith. carefully observed.

Of course, the newly formed case will later receive a greater charge of powder as it is designed to do. I believe the new case should fully obturate the chamber on the first firing. This will result in fewer split or asymmetrically formed cases. Overall case shape or size seems to have little bearing on the final outcome. 223 Remington (five rows on right) to 5.6x44 SW-NEJ (five rows on left) show the interesting possibilities for both the gunsmith and shooter.

With further regard to the use of different powders in case fireforming or subsequent handloading there is a warning we must

heed. There is overwhelming evidence that reduced charges of slow burning powders can cause detonation resulting in extremely high pressures and blown guns. This would include any of the slow burning powders like 4350, 4831, et al. While this may apply more to larger overbore cases, all cartridges must be included, both in cartridge fireforming and general handloading.

The state of case/shoulder malleability does, however, have a direct bearing on case forming. Cartridge cases are an alloy consisting essentially of copper and zinc in variable proportion capable of being annealed through varying degrees of heating and cooling. Some brands of cases are pre-annealed. If cases aren't age hardened or over worked through repeated shooting and resizing, case loss should be minimal,

IMPROVED WILDCAT CARTRIDGES CONTINUED

ORIGINAL PAGE 14

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Rifling twist rate should also be included as it is important in bullet stabilization. From left, case fired in chamber, round head screw to be tapped into drilled out primer pocket, drill bit and 10-32 tap. if at all, particularly with new brass. I have perhaps annealed less than 15 percent of my Improved or Wildcat cases with very little loss due to case cracking or splitting.

I often use the shoot-and-clean bore break-in with case fire forming and usually see accuracy quite representative of that barrel's potential. I usually break in a bore at 50 yards and like to see those early small groups while using good components. Polishing Chamber Walls Despite our best efforts at reaming a chamber, there will be some minor imperfections remaining as circular striations.

This can easily be removed or decreased by rotating a fully fireformed case into the chamber covered by a coating of J-B Non-

Embedding Bore Cleaning Compound or other polishing medium. As a means of holding the case in an electric drill or lathe, I drilled and tapped the case head for a socket head screw. Just a short session of polishing will do the job... don't over do it. Polishing will also assist our efforts in getting a more uniform, fully-sized case.

As a means of complete fire-forming of the case shoulder area I apply a very thin film of sizing lube to the Such illustrations and warnings as noted in the Hornady 10th Edition Handbook of Cartridge Reloading serve as a warning. "For example: Comparison of the .222 Magnum and .223 Remington show case size near identical in appearance.

However, the .222 Magnum is about one tenth of an inch longer and holds 1/2 to 1 grain more powder. .223 cartridges should not be fired in a .222 Magnum chamber as

the case dimensions are different and the cases are likely to rupture, possibly causing injury." I cite this example not to discourage just below the shoulder and through the case neck. This does wonders in totally forming this area of the case. Some of these little things sure can make our job a lot easier and more effective.

In the final analysis, fire-forming Improved or Wildcat cartridge cases holds little mystery. But the gunsmith and the reloader/shooter of such cartridges should develop a good working knowledge of the fundamentals involved. There's a pretty good chance you may even enjoy doing it while you're at it. AG age but as a reminder to always be alert and exercise reasonable caution in one's selection of cartridges used in Improved or Wildcat cartridges.

RIFLES

Tech Sights

Mounting and using Tech Sights, an ideal aftermarket iron sight.

BY ROBERT K. CAMPBELL APRIL 2020

ORIGINAL PP. 15-17

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I have been testing a number of modern quality .22 caliber rifles recently. Among the numbers tested, some are better than others. While this has a degree of simple personal preference, one defect noted among them all was the poor sights. The old blade rear and post front is useful for general target work in training new shooters and perhaps small game at short range but that is all.

On the other hand, my M1A and AR rifles, although designed long ago, feature excellent quality aperture sights that make for fast and accurate shooting. The same certainly isn't true of the sights still found on popular .22 rifles, including the Ruger 10/22 and Marlin 60. I elected to upgrade the sights on the Hunting Tactical Super Sixty and my choice wasn't difficult.

In the past I have installed Tech Sights (Tech-Sights.com, on customer's rifles and the Below center: Note hole for stabilizing screw and AR-15-like front post sight. result was a great improvement. I checked their website to see if they had anything available for use on my build. While it was no surprise to see the ever-popular Ruger 10/22 have accessories offered, the Marlin 60 is also covered by Tech Sights. That was satisfying as there simply aren't many Marlin 60 accessories.

Factory sights often are not suited for precision work. For those that hunt with a Winchester 94 or Marlin 336 and understand how to use buckhorn-type sights and can make use of the difference between a coarse and a fine bead, they are fine understudy sights. For those using AR-15 and M1A rifles, these sights do not have a commonality for practice.

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Above center: The rear sight offers excellent adjustment range. Tech Sights have many advantages, among them a greatly-improved sight picture, a longer sight radius, and easy installation. The average improvement in sight radius is eight inches with the Ruger 10/22 and Marlin 60, offering greater precision than simple open rear sights. The aperture leads the eye to the center of sight, allowing for centering the front post in the rear sight easily, and offers more practical accuracy and fast shooting ability.

I like this for practice. And there are those who count on a quality .22 as their home or ranch defense firearm. Most of these load the piece with CCI Mini Mag or Stinger cartridges. As .22 LR High Velocity ammunition

goes, this is as good as it gets. I ordered 200-series (TSM200) sights for the Super Sixty. Theselection of the sights bears some discussion. The standard 100 series only offers windage adjustment in the rear sight and elevation in the front, while the 200 offers both windage and elevation adjustment.

I feel that for almost all rimfire use, the 100 series is just fine, however, there is only ten dollars difference in price and I'd rather have the extra adjustment. Just the same, the less complicated sight seems the most popular. If you order the 200 series be certain to also order the sight adjustment tool (TS211) which is a neat design well worth its modest price. The Ruger 10/22 is slightly more difficult

than the Marlin 60 as the Ruger's front sight retaining pin must be pressed out with a brass punch.

While punches and screwdrivers are required with some firearms, the Marlin 60 is perhaps the simplest. None are difficult for a gunsmith but the home hobbyist possibly needs to bring the gun in to ensure that the sights are centered properly. In addition to a gunsmith knowledgeable in keeping the sights centered, the primary problem with home installation is the chance the finish ends up marred by ten-thumbed installation.

A standard level of care common among good gunsmiths along with proper use of thread locker is needed.

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The author elected not to use the recommended Loctite in order to maintain the ability to adjust eye relief. With a shrouded rear sight, a good range of adjustment, and sold attachment to the sight rail, Tech Sights area great addition to the Marlin 60. Far As for improvement in practical and absolute accuracy, the difference in this case was pronounced. The Super Sixty had proven capable of approximately two-inch groups at 50 yards with the CCI Mini Mag, thanks to its excellent trigger.

After fitting the Tech Sights, three shot groups were shrunk in half. Installation I'll be using TSM200 Tech Sights installed on a Marlin 60-type receiver and barrel in the form of the Hunting Tactical Super Six custom rifle. First, clear the rifle. I remove the magazine tube after manually racking the bolt. The Super Sixty is a Marlin clone that features a hold open latch. The front sight is removed by turning out the sight screw.

I then set the original sight aside. 0054" and its 40 clicks yields 0.216" total movement on the 36 TPI threads. The 100-series flip sight changes aperture elevation by 0.036" (5.86 MOA on a Ruger 10/22 with 18 1/2" barrel) and with a 50-yard zero, that's about right for 100 yard zero on the higher aperture. With a 25-

yard zero, impact will be 0.77" low at 100. I mounted the rifle in a fixture in order to stabilize it while centering and installing the front and rear sights.

The front sight tower assembly is lined up and centered on the front of the barrel and the 6-48 screw tightened down. Apply either low or medium strength Loctite to the 6-48 screw used to lock down the Tech Sight front sight. Move to the rear sight, which is installed on the scope mounting rail of Marlin 60 rifles. This requires a steady hand. The rear sight uses a Lock Block Assembly (TS00238) that runs left to right to secure the rear sight. Carefully position the rear sight on the scope mounting rail.

The rear sight should be held in place by hand to properly contact and engage the right side of the scope mounting rail. Insert the Lock Block left to right and screw the attaching nut into place. Slide the rear side forward a bit to obtain proper eye relief, then tighten the Lock Block down. When you have finished, you'll have a nice rarity: A .22 rifle fitted with top-quality aperture sights. The improvement in both practical and absolute accuracy is pronounced and worth the effort. AG

FROM THE ARCHIVE

Armorer Courses

The good, the bad, and the ugly of Armorer Courses.

BY STEPHANIE A. MARTZ APRIL 2020

ORIGINAL PP. 18-20

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If an instructor begins an Armorer Course with something along the lines of “AR-15s are just as easy as putting Legos together,” ask for a refund. If that isn’t possible, tread lightly on any information given out. I wrote this article to show what students should ask for in an Armorer class and bring to light what instructors should be doing for their students in their own classes.

As I’ve stated in my previous articles, I have a heavy baseline of knowledge from being a full time Small Arms Repairman in the Minnesota Army National Guard. I know that these weapons area lifeline and any owner of a firearm should have the same concept within mind. Due to this, I believe that any type of firearm instructor should teach with that same responsibility. I’ve taken many manufacturer courses contracted with the military such as FN America and Knights Armament.

I’ve also taken civilian courses such as GLOCK and the Semper Paratus Armorer Course. Armorer courses are important in equipping students with the knowledge and tools to know how their personal firearm operates first, then giving them the knowledge to assemble, disassemble, and trou-

bleshoot malfunctions. Knowing this, there are many different levels and types of Armorer courses.

Basic Builders Courses In a builder course, either the company putting on the course provides parts that were first bought through them for you to assemble it yourself, or it allows students to bring in their own purchased parts and assemble it in class. These courses are especially important for the instructor to know the differences in companies that are out there.

If it’s a builders course where students are buying the product in shop and all from the same company, that is your moment to provide why that company outstands the rest when it comes to product excellency. If it is a class where students can bring in their own weapon and parts of choice, it is your time to be honest about what they have and vet their parts. The students expect to leave with a fully functional firearm and more knowledge about what is out there that they can improve on.

It is important for you to be honest and have a working knowledge of the civilian manufacturer industry. I say working knowledge due to the fact that the civilian firearm industry is always changing and parts will either be coming out that meet

standard or be way off. Make sure to verify that their parts are indeed able to safely function in their weapon. This can be as simple as them setting them out and you looking them over.

Check for the obvious safety things, such as the correct caliber bolt, and inspect for issues such as loose carrier keys or incorrect takedown pin springs, selector springs, and other parts that look very similar. In my previous article I wrote down a simple step-by-step check on M4style carbines. It takes about two minutes and can be a savior for new students putting together a weapon you haven’t vetted. In simple builder’s courses it is also important that all students stay with the instructor at all times.

If you let students get ahead, they can miss out on pertinent information and other students can be left behind. Something that can be so simple to us can be very difficult for a brand new assembler. Make sure to stay within the knowledge needed and not deviate to too technical of information. Students come there to learn and leave confident in This stake was made with a Mayhew Center Punch and small brass hammer using a Geissele Reaction Block. Note, all pictures in this article were taken by Nate Schultz.

ARMORER COURSES CONTINUED

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their firearm. Try not to overwhelm them or they will lose that base of knowledge. Advanced Courses In advanced courses, technical knowledge is needed. These types of courses should always be at least two days. Advanced courses can involve induced and remedying malfunctions during live fire, gunsmithing, or advanced maintenance. These are the type of courses that the instructor really knows what realm The barrel extension is greased and will be installed using a Geissele Reaction Rod. he/she can teach.

Gunsmiths will be able to teach many different aspects than I would be able to teach as a maintainer and repairman, such as machining. If you are teaching malfunctions, this should be somebody who often operates their weapon. Tool selection is key in these courses as students will want to know reasons to use one brand of tool rather than the other. I recommend having a list of tools and lubricants that are being used to assemble or work on the firearm.

These courses should also teach about the weapon system as a whole. This means magazines, ammo, etc. All of these aspects will change depending on the platform of firearm being taught. For example, bolt actions will have a lot of different teaching points than gas guns will. Don't be afraid to give a test at the end. Many of these students may want to instruct one day and it's important to verify where they are at in their knowledge. You are giving your certificate with a name on it; that holds weight.

The worst advanced course that I have ever taken came from a government entity that I won't name. It was given to Soldiers and Civilians alike that will be repairing that specific weapon system. The weapon system and capabilities as a whole were never talked about. Also, it turned into a basic, "take this part out and put it back in" course. Don't be that instructor. Teach about the weapon, not just disassembly and assembly. Be an operator first and you can never go wrong.

Maintenance Courses Maintenance courses can be completed in a few hours but are just as important as any other course. This type of course involves teaching about different lubricants on the market and how to apply them. It should also teach firearm inspection, what to inspect, how often, etc. These short courses can be the reason between someone's firearm continuing to function or not.

Semper Paratus Arms Semper Paratus Arms created and instructed by the late William Larson is one of the most notable AR-15 Armorer courses in the community. It was the standard. Will worked for various privately contracted companies overseas and attended a vast array of armorer courses. This is where he grew his passion to teach. Some courses that he attended were poorly taught, basically being a

ARMORER COURSES CONTINUED

ORIGINAL PAGE 20

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commercial for the weapon system covered. They were also only available to Military and Law Enforcement entities. Will worked for many manufacturing companies, such as Bravo Company Manufacturing, and he learned the manufacturing processes and differences between them. From this, Will decided to start the first notable civilian armorer course that was based on the Colt Technical Data Package information and his own experiences overseas and in the states.

Students would bring in their own firearm which allowed Will to be brutally honest about what their firearms were capable of. One of the most memorable things he would do during his course is bring a reamer in 5.56 caliber. He would then grab a student's gun that he thought should be checked based on the company that made it. The student would often be in awe while watching metal shavings fall from their improperly-sized bore.

He proved why students need to vet the company they are getting their parts from, why AR-15s shouldn't just be seen as "building Legos," and should always take a class before assembling their own rifle. Will

offered students a lot in his course. He offered two day armorer courses and three day advanced armorer courses which included a Sionics is company that upholds the Technical Data Package standard with their parts. range day teaching malfunctions.

This was his area of expertise as a contractor working on weapons. Each student would have their own tool set to use during the course, giving students a starting point before going out and purchasing their own tools with no experience to make correct choices. As he was going through his instruction, Will would also actually fix student's firearms during the class. Many screws were given out and stakes were made.

During the course he also gave a list of proper gas systems, port sizes, and buffer weights, which are the most common issues with gas guns. He made sure that students would leave with a properly working firearm or at least the knowledge to get it there. Will is the reason that companies are where they are now, such as Sionics, Sons of Liberty Gun Works, and Forward

Controls Design. He had the ability to answer the tough questions that nobody else could answer. Most of all, he instilled passion within us all.

He is the reason that I am not apologetic for asking a multitude of questions within the firearms industry or nit picking a firearm. He's also the reason why I know how to get the auto sear pin past that pesky little spring leg in the lower receiver (hint: put the selector to burst and go from right to left). He was respected. He was loved. Do not be afraid to be that gunsmith or armorer that wants to get it perfect or that comments on someone spreading bad knowledge.

The firearms industry and lives depend on you being that person, and they thank you for it. We thank you Will Larson, for your passion, brutal honesty, and hard work to put the firearm and owner first. Armorer Courses need to take his example. Thank you to Nate Schultz for taking all the pictures in this article. A list of testimonies and memorials for William Larson is online at AmericanGunsmith.info/williamlarson-memorial. AG

TOOLS & FIXTURES

Cartridge Case Rings

Making a ring from a cartridge case can be done, but it may require an arduous session of imagination and machining ability.

BY NORMAN E. JOHNSON APRIL 2020

ORIGINAL PP. 21-23

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My son brought to my attention a picture of a rather crude ring made from a cartridge case, presumably with minimal tools by someone in the military. By the looks of it, a good deal of creative imagination was involved with obvious constraints in the process. My son and I have created many things together, but he didn't ask me if I could make such a ring as he showed me. It obviously didn't look that easy, particularly made with crude tools.

As a short time passed, I couldn't help but wonder just how involved such a task would be. It nagged me enough to make a few sketches and have a closer look at a few cartridge cases and the necessary tools in getting the job under way. Getting Started In the grand scheme of it all, things appeared somewhat less involved. Two laterally opposing strips of linear case side wall are shaped as bands formed to encircle the finger.

These case wall strips originate at the base of the cartridge where the taper in wall thickness thins down right on through the mouth of the case. The width of

each ring band is approximately 0.20" originating at the inner case base. A rounded corner here begins at the inner base at each side of the case. The average case body and case neck metal thickness is approximately 0.018" thick which is later formed to a flat surface that forms two halves of the band.

In preparation for the four linear cuts, straight marks are made on the outer case wall surface from the case mouth opening to the inner floor of the cartridge. Make the marks so the bands will be wider than that of a normal ring to allow for buffing and finishing. In the process of making the linear cuts I used a small circular blade in a Dremel tool for one of the rings and a fine hacksaw blade in the other.

The cut is finished by holding the case head firmly and horizontally in a padded vise, being sure not to crush or disfigure the case head. A lathe tool post saw with a fine blade would do a perfect job as the case head is far

CARTRIDGE CASE RINGS CONTINUED

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held in the lathe chuck and really speed up production, but I didn't want to go through the setup for a ring or two. The segments between the ring bands are cut free, leaving the two rough-cut pieces to be refinished and shaped to size. The best way to shape the sides of the two bands that will form the ring bands is to use a fine emery wheel. Be sure they remain evenly positioned and at uniform width as they are finished to size.

The two bands are then straightened and From this position the ring band will be straightened and formed in a circle to fit a finger. Below center: Following flattening and straightening of the ring bands, the case head is again placed in a shell holder. Around jawed pliers is used to bend the ring bands outward from the base of the cartridge at an angle to later fit a finger.

From this position around dowel or shaft, about the size of a ring finger, is placed across the inner base of the cartridge and

the pliable bands are bent and formed in a circular fashion around it. Cartridge brass is very pliable and firm finger pressure will form these bands. flattened in preparation for the circular shaping. Shaping the circular curves in each band to fit a finger is best accomplished with the case head held in a proper size case shell holder secured in a padded vise.

I used a circular jawed pliers to bend the brass bands to finger size. Cartridge brass is sufficiently malleable to hold and bend the bands at a near right angle to the base of the shaped cartridge head and then circularly to proper size. All this went very smoothly. Final Forming Next was final forming the bands to fit the finger. With the two bands bent outward, place around piece of steel or hard plastic dowel the approximate size of the wearer's finger between them and fold the bands surrounding the dowel.

Finger pressure should be sufficient for shaping the bands which will overlap at the tips. A light brass hammer may be needed to finally form the bands. Not knowing the exact finger size, I just allowed about a quarter-inch overlap at the adjoining band tips. Worthy of note, the band thickness at the base will run about 0.035" to about a uniform 0.020" for the remaining length, including the overlap at the tips. Cartridge brass has very little spring back as it is being bent and shaped.

It is very durable yet ductile, and capable of being fashioned into anew form. Finishing Touches With the ring neatly formed, it became a thing of beauty and very well proportioned. The cartridge headstamp really stands out. I then polished it to a fine luster. That part was easy. I had practiced on a few spent cartridges and found a medium soft wire brush did a very good job, leaving an ideal luster. As I looked at the ring I thought—why not another one for my son whose idea brought it all about.

CARTRIDGE CASE RINGS CONTINUED

ORIGINAL PAGE 23

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Rings are easily fitted to the wearer by conveniently shaping the bands. I took a quick peek on the Internet for any helpful hints and there were none. All the cartridge headstamps were cut from a cartridge and bonded to existing rings. While the end result may look good, I see it as cutting corners. That involves using another ring, while a ring born of a cartridge is the real thing. On seeing the rings evolve, the thought of a diamond or other gemstone at case head center would really set it off.

And so it was, as the primer was pushed out and replaced with a pre-set gemstone on one of the rings. Finding a preset diamond or other gem already set is usually no problem.

Ideally it should occupy the space of the pushed-out primer which is about 0.20" deep on a large rifle cartridge. My wife, who is also a deer hunter, just happened to have a pre-set gemstone that fit a large rifle primer hole to a tee. Such a ring commands a lot of attention. This pre-set gem is the same diameter as the primer pocket.

This is what makes the one-piece ring a clear choice over those using a cut off cartridge head bonded to a ring. Both have their own sentimental attachment. Who would want a such a ring? As my son felt, he couldn't think of a devoted hunter who wouldn't want such a ring made from the very cartridge used on that special hunt. It appears he was right as a

number of hunters and sportsmen who saw my ring creations all expressed a keen interest in having one or more made.

The creative gunsmith may be the best choice as to who can make such rings, being well qualified and aware of the hunter's sentimental attachment. A jeweler may be a possibility but likely more costly. Then too, you could make your own ring from a cartridge as shown in this article. Practice may be the key, so don't be discouraged if perfection doesn't appear in your first attempt. I can almost guarantee as you hold that finished ring in your hand, regardless of who made it, you'll be mighty glad it's there. AG

METALWORKING

Reader Forum

BY AMERICAN GUNSMITH EDITORS APRIL 2020

ORIGINAL PP. 24

SCCU CXP-1 I have a SCCU CXP-1 that came in disassembled. The slide stop pin is not with the pistol and the recoil spring is hanging on something stopping the slide from being removed towards the front. I can look into the gap in the ejection port and see that the recoil spring is bunching up at a point about where I would think the trigger sear is. I have tried to capture the spring with a hook and lift up while pushing forward on the slide without any luck. From RK Campbell. Order a slide stop.

Work it into the proper place in the angled camming surface to convince the pistol to work, then disassemble. Just about any pistol would be difficult to disassemble with the slide stop missing in this manner. 1873 Kings Improvement I am starting a restoration on a Winchester 1873 Kings Improvement Daniel P. Horn Wolsey SD manufactured in 1894. The rifle sat neglected for decades and looks to have been the victim of a previous failed restoration attempt. I am looking for good parts sources.

The rifle is missing the dust cover, forearm and forearm cap, the magazine tube parts, butt plate, etc. I'm also in need of a good, clear schematic and a source for more specific information on how this rifle would have been configured coming out of the factory in 1894. Gregg Swensen I-Beam Gun Repair, LLC From Mark Hollensen. We had articles on the 1873 in the January 2009, October 2000, and March 1992 issues.

Useful books include NRA Guide to Firearms Assembly: Rifles and Shotguns (red cover); NRA Guide to Rifles and Shotguns (white binding, dark blue cover); NRA Guide to Rifles and Shotguns—Firearms Assembly 3 (black cover, blue print); Gun Digest Book of Firearms Assembly/Disassembly Part IV: Centerfire Rifles (2nd Edition); Firearms Assembly 1: NRA Guidebook to Shoulder Arms (green cover with M12); The NRA Guide to Firearms Assembly—Rifles, Pistols, Shotguns, Revolvers (black cover, gold lettering); and The NRA Illustrated Guide to Firearms Assembly Handbook Volume 2 (blue cover, white binding).

Preston Potvin Parts sources, try Eric Strand Mid West Gun Works contact information omitted in this digital edition), Nu-Line Guns Wisner's Inc. parts@wisnersinc.com), Bob's Gun Shop and Goodwin Guns From Brian Smith. Try Homestead Parts home-Poppert's Gun Parts Popperts- Gunparts.com), Petronio Family Firearms and Jim Shaffer

ORIGINAL SOURCE PAGE

24

SEARCHABLE ISSUE RECORD

Archive index

CMMG RDB 5.7x28mm American Gunsmith Editors	2	Tech Sights Robert K. Campbell	15-17
Iver Johnson Hawk Robert K. Campbell	3-5	Armorer Courses Stephanie A. Martz	18-20
Ithaca Flues Shotgun Mark R. Hollensen	6-11	Cartridge Case Rings Norman E. Johnson	21-23
Improved Wildcat Cartridges Norman E. Johnson	12-14	Reader Forum American Gunsmith Editors	24

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