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AND THE AMERICAN GUNSMITH ARCHIVE

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INSIDE THE ARCHIVE

CONVERTING REVOLVER CYLINDERS

NOREEN 80% RECEIVERS • HI-POWER VERSIONS • HI-POINT CARBINE • ACCURACY TOOLS

ORIGINAL METHODS. MODERN ACCESS.

ARCHIVE EDITION 194

DIGITAL ARCHIVE EDITION

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IN THIS ISSUE

Contents

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

2 Noreen 80% Receivers
AMERICAN GUNSMITH EDITORS • ORIGINAL PAGES 2

3 Hi-Power Versions
CHARLIE BRIGGS • ORIGINAL PAGES 3-6

7 Hi-Point Carbine
PAUL MAZAN • ORIGINAL PAGES 7-9

10 Accuracy Tools
GLEN CALVERT • ORIGINAL PAGES 10-13

14 Drop The Hammer
ROBERT K. CAMPBELL • ORIGINAL PAGES 14-16

17 Converting Revolver Cylinders
ROBERT K. CAMPBELL • ORIGINAL PAGES 17-21

22 Business Records
BILL SMITH • ORIGINAL PAGES 22-23

24 Reader Forum
AMERICAN GUNSMITH EDITORS • ORIGINAL PAGES 24

PEOPLE & COMPANIES

Noreen 80% Receivers

BY AMERICAN GUNSMITH EDITORS FEBRUARY 2020

ORIGINAL PP. 2

During the Clinton Administration a military contract clause exercised claim to intellectual property rights on items produced for the government and placed the design into the public domain. The idea was to foster competition among makers and lower costs to the government.

This opened the doors for companies other than Colt to pursue contracts on the M16/M4 when the lawsuits settled with Colt losing their exclusivity to the patent transferred from a previous and then-dormant Fairchild Engine and Airplane Corporation subsidiary called Arma Lite. Some companies that benefited found they could not compete against companies like Bushmaster and never got into business. Had they done so, we might have had Stoner-pattern rifles being built in Arkansas by an outfit called POM.

Other companies, such as Eagle Arms, prospered from this. Managed by Lt. Col. (ret.) Mark Westrom, USAR, it paved the way to acquiring and rebuilding Arma Lite. This is one reason why it seems everyone with a bench vise and armorer's block is making AR-15s. Few of these companies are "chip makers" in that they assemble components made elsewhere. Another trend is the so-called "80% receiver" where makers produce components that the BATF has ruled as unfinished machined parts but can be made into a lower receiver.

Noreen Firearms is a Montanabased company known for in-house manufacture of precision self loaders and offers a range of parts. Their line of 80% Lower Receivers can be had for AR-15 and AR-10 rifles as forged or CNC-machined from billet components with various levels of finish and processing, to include none. To further aid with building a rifle project, Noreen offers component parts kits and completed upper receivers. These parts can also be had unprocessed and finished by the building gunsmith.

The company also offers a Jig Set with a left and right fixture along with three plates to ease the drilling and completion of a receiver. Other tools gunsmiths need include a Drill Press, X- Y Axis Vice, Stop Collar, 6" Dial Caliper, and #23, 5/16", and 3/8" drill bits and end mill. Also needed are metal files, cutting fluid, and something to tidy up the cut chips. This provides the means of precision manufacture without needing a milling machine. Additional details are at OnlyLongRange.com or

ORIGINAL SOURCE PAGE

2

FINISHING

Hi-Power Versions

Tips on disassembly and reassembly of different variations of the Browning Hi-Power.

BY CHARLIE BRIGGS FEBRUARY 2020

ORIGINAL PP. 3-6

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I probably shouldn't say this, but sometimes I think John Browning never finished the Hi-Power, his final pistol design, because maybe he had second thoughts about the way it was coming together. The design was finished by Belgian small arms designer Dieudonné Joseph Saive at Fabrique Nationale nearly nine years after Browning's death.

Many have complained about the trigger and magazine disconnect arrangements, but to be fair, Browning could not borrow much from his former, and in my opinion, superior, 1911 design as the patents had already been sold to Colt. Anyway, my job here is to make it easier for you to work on the many versions of the Hi-Power, in use worldwide for over 80 years. It is my hope that I can correct errors I have found in publications dealing with this design, or at least clarify instructions therein.

Disassembly To begin disassembly, extract the magazine. It won't drop free on its own, unless someone has worked on or removed the magazine disconnect. More about this later. Examine the chamber to be sure there's no live round present. Next, **Far Don't** lose it. Now you can remove that firing pin retainer, pin, and spring. pull the

slide all the way to the rear and lock it there using the safety lever. Push the slide stop (55) up.

Pushing on its opposite end, peeking out of a hole on the right side of the slide, remove it to the left. Holding the slide against the tension of the recoil spring, release the safety lever and allow the slide to move forward off the frame. Flipping the slide over, find the recoil spring (23) wrapped around the recoil spring rod or guide (22).

Grab the "knuckle" end of the guide with a hole through it (where the slide stop went through) and pull on it, compressing the spring and allowing removal of the pair from the slide. In some versions the knuckle may have a spring/plunger arrangement inside designed to keep the slide stop in place. I suggest leaving these parts alone unless you're sure there's a problem there. Lifting the barrel upwards and out means the gun is now field stripped. For further disassembly go to the firing pin and spring.

In some versions of the Hi-Power you can remove this by simply depressing the back end of the pin (8) with a small punch or the end of a small screwdriver. Slide out the firing pin retainer (6) as on a 1911 pistol.

On other versions, however, you must, at the same time, either keep the front end of the sear lever (30) depressed or remove it. And if you're going to remove the extractor (30) later, you will also need to remove the sear lever first. I say go ahead and remove it now.

To remove the sear lever, drive out its retaining pin located just under the extractor. Driving from right to left, remove the sear lever, exposing the little spring under it. Don't lose it. Remove that firing pin retainer, pin, and spring. Introduce a small roll pin punch to extract the extractor pin. With this pin out, lift out the extractor (3) and the small coil spring (5) under it. I've found two odd-ball "tools" that make Hi-Power work much easier.

The first is an ordinary two-inch binder clip from an office supply store and the second is a "double hook" tool improvised from coat hanger wire with the upper hook leg about 0.6" long and the other leg about 0.25" long with the bends about 2.5" apart. These tools are helpful for removing the sear (28), sear spring (32), and safety mechanism (24) and a big improvement over the wooden clothespins commonly recommended. The

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With this pin out, lift out the extractor (3) and the small coil spring (5) under it. Far We will depend on these while removing and reinstalling the sear and thumb safety components. On top, an ordinary 2" binder clip from Office Depot. On bottom, a "double hook" made of coat hanger wire. The upper leg of the hook is about 0.6" long and the lower leg about 0.25". The bends are about 2.5" apart. double hook also helps when reinstalling the sear spring.

As aside note, large binder clips like this have also been an excellent source of flat spring material for unavailable gun parts. A magazine retainer spring for a Hungarian pistol and an extractor for a Scandinavian rifle come to mind. Cut and shape the flat material with Dremel cutoff wheels. Poke the short leg of the double hook tool into a grip screw hole.

While holding the frame in one hand, use the other hand to cock the hammer back far enough to insert the longer leg of the double hook into the top of the hammer, holding it in place even after the sear is removed. Note, if your Hi- Power has a spur hammer without the hole, make your double hook's top leg differently to accommodate. The binder clip clamps the sear spring toward the back of the mag well. To remove the sear (28), lock the hammer back with the double hook.

Use a small punch to push the sear pin out, allowing the sear to drop out and partially free up the ejector. Swing the ejector's nose down. Doing this assists when removing the thumb safety components (2). Removal of the binder clip releases the sear spring (32) and it will either fall out or can be removed into the mag well and upward, out of the frame. While restraining the hammer, remove the double hook, gently allowing the hammer to come forward and relaxing the spring in the hammer strut assembly (13).

Remove the thumb safety components (24) by pulling and wiggling the left side safety lever out. Note, if it seems difficult to remove, do not succumb to the temptation to drive or pry it out as doing so can do serious damage. In some versions this lever contains a springloaded plunger which will try to fly out and be difficult to find later so be careful. Other, more gunsmithfriendly versions feature a small vertical pin holding the spring and plunger in place.

If your Hi- Power has ambidextrous safety levers, one of the levers (usually the right side) will be held onto its shaft by a tiny vertical pin through the top of the lever. This must be driven out with a very slim punch. My beloved punch was obtained from Brownells (080-513-639) and is available singly or in a terrific kit of three sizes with available replacement pins. Then, if applicable, the other safety lever and its shaft should be pulled/wiggled out.

Either way, removing the thumb safety components will also have freed up the ejector and the hammer strut assembly. They can now be removed as well. Reassembly We'll start with if you need to use a different hammer spring. You may want a lighter spring to improve trigger pull, though, in the case of the kits from Cylinder & Slide (Cylinder-Slide.com, this can be achieved by using better sear and hammer engagement and machining.

To begin, insert the hammer assembly into a drill press or milling vise upside down with the hammer on the bottom. Using pliers, turn the little nut clockwise one turn or so to compress the spring enough to allow removal of the tiny locking pin above the nut. Carefully fit the small nut into the chuck of the drill press or mill and tighten the chuck. Manually turn the chuck counter-clockwise and unscrew the nut. You can then swap springs and reverse the above steps.

When doing so, be sure to tighten the nut enough to leave room for the tiny lock pin at the end of the strut and replace it. Using pliers again, unscrew the nut enough to hold the locking pin in place. To swap hammers, drift out the cross pin holding the hammer and strut together. Note that many of these cross pins have one end larger than the other which should tell you which way to drift. Before attaching the new hammer, also note the curve in the strut as it relates to

HI-POWER VERSIONS CONTINUED

ORIGINAL PAGE 5

Both: Demonstration of the helpful odd-ball tools to remove the sear (28), sear spring (32), and later, the safety mechanism, (24). In my experience, these improvised “tools” area big improvement over the wooden clothespins sometimes suggested by others. The double hook will also come in handy later when reinstalling the sear spring. As aside note, large binder clips like this have over the years been an excellent source of flat spring material for unavailable gun parts.

A magazine retainer spring for a Hungarian pistol and an extractor for a Scandinavian rifle come to mind. Cut and shape the flat material with Dremel cut-off wheels. While holding the frame in one hand, use the other hand to cock the hammer back far enough to insert the longer leg of the double hook into the top of the hammer, holding it in place even after the sear is removed.

Note, if your Hi-Power has a spur hammer without the hole, your double hook’s top leg will need to be shaped differently, but the concept is the same. Arrow indicates the location of the sear pivot or sear pin (31). To remove the sear (28), lock the hammer back with the double hook as described. Using a small punch, push the sear pin out. This will allow the sear to drop out and will partially free up the ejector. the hammer, as shown in the parts diagram.

The curve is back, toward the rear of the pistol, and slightly visible in the parts diagram. To install the sear, hold the sear

spring back far enough to be behind the sear. I use the binder clip here. During this time, the hammer must be held far enough back to allow the sear to block it. To do this, I use the double hook tool. Then, with the shaft of the safety lever holding the hammer and ejector in position, partially insert the sear pin from the left, just far enough to keep the top of the ejector horizontal.

Here comes the dexterity challenge: With a punch positioned through the frame on the right, work the punch through the sear, then through the ejector and the frame to temporarily push out the sear pin. Now rest a minute. Then work the sear pin back toward the ejector and sear, gently pushing the punch out. Voila! For disassembly and reassembly of the trigger and its components, first note their relationships. The small pin at the rear of the trigger retains the magazine disconnect (21) and its spring (20).

Many of your customers will want these removed as this will lighten the trigger pull and allow the magazine to drop free. However, this raises the subject of liability. It’s your call as to whether you want to “tamper” with safety components. Before drifting out the larger trigger pin (58) above the trigger, consider how much you want or need to remove the trigger assembly.

It comes out rather easily but getting it back in together with the trigger lever (57) in its proper position is, in my opinion, the toughest part of working a Hi-Power.

Assuming you do want to remove the assembly, drift out that larger, middle pin, left to right. Once it is driven out, the trigger assembly can be rotated down into the trigger guard and removed. This pin runs through a coil of the trigger spring (59).

The front of this spring has a pronounced kink at the front and its longer, straight tail presses down in a groove of the trigger lever (57). The spring is installed so that the tip of the kink points down into a recess in the frame in front of the assembly and the straight rear section of the spring presses downward in the groove in the middle of the trigger pin to retain it.

To replace the trigger assembly, leave off the trigger lever for now and put the assembly back into the trigger guard with the nose end up through the frame. Holding the trigger in that position, take the trigger lever in your other hand and carefully fit the “knuckle” end into its void at the extreme rear of the assembly. Check to see if the long end of the trigger spring is in the aforementioned groove. Most of the time it will be.

If so, wiggle a punch through the frame and the trigger pin hole to locate the assembly within the frame. You’re almost home! Now insert the pin, and while holding the punch in place, tap the pin in and the punch out. Reassembly of the rest of the pistol is essentially the reverse of

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Removal of the binder clip will release the sear spring (32) and it will either fall out or can be removed into the mag well and upward out of the frame. While restraining the hammer, remove the double hook, gently allowing the hammer to come forward, relaxing the spring in the hammer strut assembly (13). the installation instructions. However, I have a couple tips that may help.

When reinstalling the firing pin and spring, particularly a strong spring, a handy tool is a piece of brass or steel tubing with its inside diameter (ID) just barely larger than the rear end of the firing pin, but with its outside diameter (OD) smaller than the maximum OD of the firing pin. I use a piece of old radio antenna but hardware stores often carry many sizes of thin-wall brass tubing which also comes in handy in other mechanical pursuits certain to cross your bench.

The tubing will allow you to depress the firing pin without slipping off, compressing its spring until the firing pin retainer can be introduced far enough to prevent the pin from flying across the room. Remove the

tubing and using a small screwdriver, press the firing pin far enough forward to completely insert the retainer. When reinstalling the recoil spring guide assembly, note the "knuckle" on the recoil rod is offset slightly. Install it so the portion with the hole is closer to the barrel.

In the past, while working on certain versions of this pistol I Browning Hi-Power (Specifications subject to change without notice) 1 Barrel Assembly 2 Ejector 3 Extractor 4 Extractor Pin 5 Extractor Spring 6 Firing-Pin Retaining Plate 7 Firing-Pin Spring 8 Firing Pin (All Models) 9 Grip, Left (Standard) 10 Grip, Left (Matte Finish) Grip, Right (Standard) Grip, Right (Matte Finish) 11 Grip Screw 12 Hammer 13 Hammer-Strut Assembly 14 Hammer-Strut Pin 15 Magazine 16 Magazine-Latch Spring Guide 17 Magazine-Latch Guide 18 Magazine Latch 19 Magazine-Safety Pin & Trigger Spring Pin (2) 20 Magazine~Safety Spring 21 Magazine Safety 22 Recoil-Spring Guide Assembly 23 Recoil Spring 24 Safety Assembly 25 Safety-Lever Assembly (left) 26 Safety-Lever Retaining Pin 27 Safety Lever (Right) 28 Sear 29 Sear-lever Pin 30

Sear Lever 31 Sear Pin 32 Sear Spring w/button 33 Sight, Rear (Adjustable), Type "A" 34 Sight Base, Rear (Adjustable) 35 Sight Aperture, Rear (Adjustable) 36 Sight-Aperture Housing, Rear Adj.

37 Sight-Aperture Housing Pin 38 Sight-Elevation Screw, Rear Adj. 39 Sight Elevation Screw Spring was occasionally stumped when I encountered differences not described in whatever handbooks I was researching.

I hope this article will help you avoid these delays.

If not, email me your questions at AG 40 Sight-Elevation Spring, Rear Adj. 41 Sight-Windage Screw (2) Rear 42 Sight, Rear (Complete) Type "B" 43 Sight Blade, Rear 44 Sight Base, Rear (Adjustable) 45 Sight Leaf, Rear 46 Sight-Elevation Screw, Rear 47 Sight-Elevation Spring, Rear 43 Sight Leaf Friction Pin, Rear 49 Sight-Detent Pin, Rear 50 Sight-Windage Screw (2), Rear 51 Sight, Fixed Rear 52 Sight, Front 53 Sight, Front (Adjustable) 54 Slide w/Front Sight, Fixed 55 Slide Stop 56 Trigger 57 Trigger Lever 58 Trigger Pin 59 Trigger Spring

RIFLES

Hi-Point Carbine

Taking on the Hi-Point Carbine, here's my take on setting up this inexpensive 9mm long gun.

BY PAUL MAZAN FEBRUARY 2020

ORIGINAL PP. 7-9

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You bought a what?" A Hi-Point Carbine in 9mm. "You're kidding." No, I'm serious. "But, why?" That was pretty much how the conversation went with several of my friends. My answer, "Because I've heard so many conflicting reports on the gun, I decided to find out for myself" never seemed to make sense to them. The gun had been labeled apiece of junk by the gun gurus on the Internet, so it must be true. Most of them didn't own one and many had never shot one but they knew how bad these were.

Like so many things we see on the Internet, they are often wrong but never in doubt. I started my adventure into the PC carbine world at a "zombie shoot" in Colfax, Iowa where event director Matt Pierce uses his vivid imagination to put on some of the most fun shoots I've ever attended. One of the classes allows the use of pistol caliber carbines and those folks were having so much fun with them I started to pay attention. As I asked around, I found most of the major entries in the category represented.

Beretta Storms, AR variants in 9mm, the Kel-Tec Sub2000, Well used, no sights, and what I call the "Planet of the Apes" stock. and my grandson with his first gun purchased in his name shortly after his 21st birthday, a lowly Hi-Point Carbine. In the last shoot we started seeing the first of the Ruger PC Carbines show up. The object of the game is to shoot about 20 zombie targets per stage as quickly as possible.

There are four stages so 80 rounds minimum as fast as you can shoot and hit the targets soon separates the reliable guns from the others pretty quickly. Naturally, every magazine change is a liability and a stoppage pretty much puts you out of the competition for first place but you still get to play for the rest of the day. As you might imagine it doesn't take long to weed out the problem guns. Be careful not to change any angles. Understand this work voids the factory warranty.

As you might expect, the guns all held up pretty well with most stoppages due to failure of reloaded ammunition rather than the

gun. At the end of the day, my grandson shooting his first competition finished in the top five with his Hi-Point and won his class at his second shoot beating his father with his Kel-Tec Sub2000. Don't you just hate kids with their speed and coordination? Most importantly, his Hi-Point never misfired, misfired, or jammed.

With the 20-round Redball Sports (Redball-Sports.net, magazines, there was never a hiccup. Since then he has added just about every accessory on the market and if anew one comes out tomorrow, I'm sure he will add that as well. I documented the whole story on video at my You Tube channel, .45 Alpha Charlie Papa Channel. Search for the video titled "Custom \$700 Hi-Point 995TS." Yes, it's true, he has over \$700 in the gun buying an accessory or two every payday.

That has brought us to one of the most surprising things to me. Here is yet another gun following in the footsteps of the 1911, Ruger 10/22, and AR-15 that has people

HI-POINT CARBINE CONTINUED

ORIGINAL PAGE 8

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doubling or even tripling the price of the gun accessorizing it. A quick run-through at Gunbroker and several other sources gave me the following list. The cost of a Hi-Point Carbine runs from \$236 to \$425. Down Range Products (DownRangeProductsCo.com, items include a barrel shroud at \$50, muzzle break \$40, extended charging handle around \$30 or less, and Picatinny rail at \$60. Cheaper Than Dirt (Cheaper Than Dirt, lists Redball's twenty rounders at \$25, a magazine coupler at \$22, and laser and mount at \$150.

M*Carbo (Mcarbo.com, sells a Hi-Point trigger spring kit for \$13. Hi-Point Firearms has a red dot sight for \$26, forward grip for \$25, custom shroud for \$45, flashlight with mount at \$26, and a replacement tactical stock for \$41. Other stock options include a bullpup stock from High Tower Ar- The stock set includes a new forend and Picatinny rails for sights, lights, and lasers. for \$250 and an ATI stock (ATIoutdoors.com, for \$80.

That gives you some idea of the accessories currently available as well as how quickly you can have \$700 or more in your "bargain" carbine. Naturally, you probably won't buy all or even most of these after-

market products but they are available to those that want them. Diverse aftermarket accessory options is indicative of a firearm's popularity. Having been duly impressed with the reliability and accuracy of this bargain-basement carbine I just had to have one and see what I might accomplish with it.

I went on Gunbroker and bought a well-used original old Model 995 for just under \$200 and got just what I paid for. A previous owner had cut down the front sight tower, removed the rear sight, put a Picatinny rail on it, and sold it to me without the red dot and just one factory ten-round magazine.

My first move was to or- I ordered a new style stock set, two Redball Sports 20 round magazines, and a flash hider. mory (HighTowerArmory.com, der a flash hider, two Redball 20round magazines, and the magazine loader to help get those last couple of rounds in the mags. The first trip to the range was an eye opener. Despite being well broken in the gun had the secondworst trigger I have ever experienced.

The worst was on a French Gras rifle that literally took two fingers in the guard to pull; I honestly couldn't pull it with just the

index finger. The trigger on the Hi-Point was not quite that bad but it was long, creepy, heavy, and extremely unpleasant. It was impossible to ascertain accuracy because long before the trigger broke, I had lost concentration on the red dot and was thinking about the trigger and whether it was ever going to go off.

It was more like the double-action pull on a cheap revolver than a rifle. I took it home, watched a couple of videos on disassembly and one from M*Carbo on You Tube showing how to install their trigger spring and was ready to go. The takedown procedure for such a simple rifle is not difficult but does have several steps. First, remove the flash hider if so equipped and then the front sight base. Both require an Allen wrench.

Remove the heat shield by sliding it forward and up, and then the charging handle with a 7/16 wrench. Next, take off the receiver shroud by removing the two through pins. This requires a screwdriver to push the retaining clip on the newer model and a wrench on the older model. Unscrew and remove the front sling

HI-POINT CARBINE CONTINUED

ORIGINAL PAGE 9

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swivel and then the retaining clip on the bottom of the stock with a screwdriver. Remove the action from the stock by lifting the barrel up and forward and pull the roll pin from the rear of the receiver. Push the recoil shield back and up. Caution, the recoil spring is quite strong and you must keep control of the recoil shield as it is removed. Slide the firing pin retainer to the rear if you plan to clean or replace the firing pin. Remove the trigger pin (requires a pin punch) and then the trigger assembly.

Polish all contact points and remove all burrs. The Hi Point uses stamped parts and I found them very rough. A fine Arkansas stone removed the burrs quickly. Polish the sear while being careful not to change the angle or shape. The coil trigger spring is under the sear and appears to have once been used on a city bus. I rummaged around the shop and found a lighter spring with the same outside diameter but made with thinner wire. After cutting it to length, I installed it.

That's OK if you're the adventurous type and don't mind disassembling and reassembling the gun over and over for thorough testing to be sure it will work safely.

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The smart move would be to order the replacement spring from M*Carbo for \$13. You will find them online with a dandy video that takes you through all these steps. In the end, I was able to reduce the trigger pull from 12 pounds to 4-5 pounds with no problems in function so far.

The reduction was a combination of factors including the deburring of the trigger transfer bars as well as a reduced power sear spring. It is a job any reasonably experienced gunsmith should be able to accomplish. However, be aware that by doing this you will void the factory warranty. Of course, as with many manufacturers, you can void the warranty by shooting reloads or, in this case, using aftermarket magazines or stocks.

Overall, I was impressed with the little gun for what it is: a fun gun to shoot and basically a plinker. It is accurate enough out to 50 yards or so for small game if you insist and with a light would be a fine home defense gun in 9mm or .45 ACP. I found it reliable, rugged, and reasonably accurate. What more can you ask for in a gun that I was able to find advertised for under \$300 new? AG

RIFLES

Accuracy Tools

Here are the tools and techniques I use to improve accuracy with mounting optics and making ammunition.

BY GLEN CALVERT FEBRUARY 2020

ORIGINAL PP. 10-13

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Properly mounting a scope and careful handloading ammunition can improve the accuracy of your firearm. Here are some of the tools and how I use them. Mounting Optics Before I got interested in precision shooting, I did not give much thought to the best means of installing a scope on my rifles. I bought the scope and rings, installed them as is on the firearm, and leveled the scope by looking through the reticle until it appeared lined up with the world.

I tightened the screws until they felt “about right.” If the screws loosened, I added thread locker. I used this method for many years and it seemed to work OK. Over time, I realized

there is a more precise method to do this and precision and consistency are the keys to improved accuracy. The tools I now use include an inch-pound torque wrench, bubble levels, and scope ring alignment and lapping bars. I start with the The small level has a magnet in the base.

This set is small enough to fit in a range bag. rifle held in a suitable vise. The smaller bubble level is placed on the receiver on a horizontal flat surface such as the top of the receiver or the scope ring base, as was the case with the rifle used for this article. If there isn’t a flat surface on the receiver, the horizontal surface of the scope ring can be used. I

have found that scope rings are usually machined accurately enough to not cause a misalignment issue.

The smaller bubble level has a magnet in its base so it will stick to a steel receiver or scope base/ring which helps keep it in place for the next step. After the rifle position in the vise is adjusted to get the bubble in the center of the level, the other level is installed on the barrel. It has two screws to clamp the level to the barrel (the clamps are padded so as not to mar the finish) and another screw with which to center its bubble in agreement with the other level. The level on the barrel is now the main

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This level is used as the reference when leveling the scope. reference for the rest of the process and cannot be moved without having to start over. The bottom half of the rings are installed on the receiver and their screws are torqued to the proper specification. The alignment bars are installed along with the top half of the ring and their screws. The points of the alignment bars should be lined up squarely if the rings are aligned properly.

If not, the ring-to-receiver screws are loosened and the rings moved until the points are lined up. Torque the screws again and confirm the alignment is correct. If the points do not quite line up, the lapping procedure will fine tune the alignment. If the rings are grossly out of alignment, there may be an issue with the rings, the bases, or the receiver. I have not had any issues with the major brands of rings or bases.

A small amount of lapping compound is applied to the lapping bar and it is installed along with the upper ring sections. The screws are snugged down to the point where the lapping bar will just move with a slight effort. The bar is slid and rotated back and forth until there is little or no drag on the bar. The ring screws are snugged up again and the process is repeated several more times.

The goal is to have at least 75% of the ring inner surfaces showing contact with the lapping bar so it will require a few inspections and repeated lapping to get there. Once the lapping is complete, thoroughly clean the rings of the lapping compound with a solvent. The scope is installed in the rings and the top ring sections installed with the screws snugged up so the scope can be moved axially to set eye relief and rotated for leveling.

Once the fore-aft location has been determined, set the small level on top of the scope elevation turret and rotate the scope until the bubbles in the levels agree. Torque the ring screws to the proper spec. Aligning and lapping the scope rings ensures the scope is mounted accurately and securely to the firearm, will not shift over time, and the scope tube isn't unevenly compressed. The torque wrench ensures that all the screws are tightened to the proper spec and not under (typically) or over torqued.

Having the scope precisely leveled prevents loss of accuracy due to the scope being inadvertently canted. Handloading Loading your own ammunition primarily saves money. Factory match grade 6.5 Creedmoor ammo runs \$1.25 to \$1.50 per round. I can load the same match grade bullets into my previously-fired cases with powder and primer for \$0.45 to \$ 0. 5 0 per round. Cases can be reloaded ten or more times typically with a bolt gun. While autoloading firearms can be tougher on

ACCURACY TOOLS CONTINUED

ORIGINAL PAGE 12

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brass, I reload the brass fired in my M1A four times and then set them aside as I have had a few case head separations. You don't need to spend a lot of money on loading equipment. Start with the basics tools and get some experience, then buy more stuff. I use an old RCBS single stage press that I bought from a friend for \$20. Another advantage of handloading is that it allows you to try different bullets, powders, amounts of powder, cases, and primers in the search for the most accurate combination.

This requires patience but is very rewarding. I enjoy handloading; I find it relaxing. I never get in a hurry when I load, I take my time and pay close attention to all the steps, particularly when charging the cases with powder. I fill 10 cases at a time using a digital scale and then shine a light into the mouth of the cases to check the height of the powder.

My rifle cases are filled to the shoulder so it's easy to see and check the height of the powder.

Handgun rounds use a much smaller charge, such as my .45 ACP loads with 4-5 grains of powder which just covers the bottom of the case. It is much harder to detect an overcharge there so diligence is required. Rifle case length needs to be measured and usually require trimming, especially after being full length sized. The brass stretches and the case length can eventually exceed the max allowable after enough firings.

In a bolt gun, the brass doesn't get stretched as much as in an autoloader and I usually size the case neck only when using the brass in the same bolt action rifle. This reduces the amount of stretch and the cases don't need to be trimmed as often. Straight wall handgun cases typically do not need to be trimmed. I

used to clean the primer hole and deburr the case neck with hand tools but got tired of that and purchased a powered case prep machine which makes these tasks easier and quicker.

The case prep machine has a primer hole cleaner and sizer for small and larger primers, deburring tools for the inside and outside of the neck, and case neck brushes for various calibers. When seating the bullet to the proper depth in the case, I use a bullet comparator to measure the desired cartridge length. This is a more accurate dimension then measuring to the tip of the bullet. It helps me set the amount of "jump" the bullet travels before engaging the rifling.

The amount of jump can have a significant effect on group sizes. I have also started checking the runout of the bullet to the case with

ACCURACY TOOLS CONTINUED

ORIGINAL PAGE 13

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The screw opposite the indicator is used to “true up” the bullet and reduce the runout. a concentricity gage, a tool which measures the amount of runout at the bullet relative to the case. Acceptable runout is typically less than 0.002". The concentricity gauge also has a screw that can be tightened against the bullet to “true up” the bullet and reduce the amount of runout. I have found that the runout in my handloads generally does not exceed 0.0025".

Without a concentricity gauge, you can assume (or hope) that the runout is OK and it may be without bothering to check. However, without such checking, if you have fliers in a group, is it due to runout or something else? The case prep machine and concentricity tool are two examples of tools that can be pur-

chased after you have got some experience handloading. They are not needed to get started.

Chronometer I use a chrono to measure the bullet velocity and don't depend on handloading book data for a given bullet and powder charge. The velocity is another parameter that tells you what the firearm and cartridge are doing and allows you to calculate the energy for a given bullet weight. Higher velocities do not necessarily mean better accuracy. Bore Scope I purchased a digital borescope from Lyman to check the condition of my barrels after so many rounds and to see how effective my cleaning efforts were.

You don't know how well you're removing copper fouling if you can't see in the bore. Lyman's borescope is much less expensive than the optical versions, it is easy to use, and the image on the screen is very clear. Images can be stored on a SD card and uploaded to a computer. The screen is 3.5" diagonally and more than one person can see the bore images at a time. It will inspect a .20 caliber and larger bore. The only drawbacks are that it requires 120V AC and the camera tube is only 20" long.

A craftsman can never have too many tools and having the right tools to do the job makes it much more rewarding. AG This model has lights in the sunshades to improve sensitivity and for indoor use. Far I wish all my barrels looked this good!

PISTOLS

Drop The Hammer

It is all in the trigger. Here are some new procedures I recently picked up working on 1911 pistols.

BY ROBERT K. CAMPBELL FEBRUARY 2020

ORIGINAL PP. 14-16

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I have often stated the 1911 pistol is the Mr. Potato Head of firearms. Changing the hammer, trigger, stocks, and sights isn't that difficult and may lead to big dividends. The trigger is one of the most important parts of the handgun as far as control and marksmanship are concerned. Some shooters see the latest adjustable match trigger in the popular press and feel that they need that trigger for their carry gun, yet their skills have not advanced to the point where a match trigger would be of any aid to them.

Others do not realize that a lightweight trigger action may be contraindicated on a carry gun. But other shooters are skilled at what they do and have reached the point that a good trigger that matches their hand size and trigger finger might be a big improvement. The trigger should be comfortable. If not, it is like a floppy holster or a poor belt. A good

fit means a lot. The trigger must move smoothly directly to the rear dur- The standard 1911 type trigger action is high lighted. ing trigger compression.

The 1911 handgun is often lauded for its straightrearward trigger compression but not all 1911 handguns are as smooth as others. A catch or loose motion is a detriment to accuracy. If the trigger is too short for the shooter the push that is ideal for a rearward press becomes an arc. The too-long trigger stretches the hand.

A very good shot may be able to control a trigger that doesn't fit their hand perfectly when firing from the benchrest but when firing off hand and in competition the difference results in missed shots. It is all about accuracy in competition. Personal defense shooters also want to be able to put the bul-

lets in the target where it will do the most good. I find some shooters attempt to match the rifle trigger to the pistol and like the interface with the shooter to be as similar as possible between the two.

At present with available components this isn't completely possible but I am able to get the two synced in pretty well. The trigger finger should lie on the face of the trigger dead square in the middle of the first pad on the trigger finger. That is simple enough. If working long distance with a gun shipped to the shop without the benefit of the shooter's hand to demonstrate, an etching on paper or a good photograph helps.

Wilson Combat (Wilson Comb at. com, 870 / 545 - 3618) offers a number of good choices in 1911 triggers. While there are worthy competitors, the Wilson Combat

DROP THE HAMMER CONTINUED

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Wilson Combat options are many. trigger always works out well and is affordable for its first class quality. Wilson Combat triggers differ primarily in the trigger face. There are choices in length as well. A little thought goes along way toward being satisfied with the trigger chosen. The Wilson Combat trigger is designed for light weight primarily and light weight aluminum construction prevents backlash.

Backlash is momentum from the trigger release or trigger jump that may result in the trigger bumping the sear when it isn't intended. The trigger pad is designed for the greatest comfort with good adhesion but not too much. There is an adjustable over travel screw that is used in final fitting. The trigger pad is skeletonized and the trigger bow itself is high grade stainless steel. The trigger bow sometimes fits right in without any type of fitting but at other times may require fitting.

In my experience, having fitted many GI guns and having worked with Rock Island 1911s and the like, the trigger bow slips in.

Handguns with tighter specifications, beginning with the Springfield Mil-Spec and continuing to the various Colt pistols, require some fitting. This is a general observation that has held true for many years. When you look at the price of match grade triggers you can only figure that the competition for such parts has resulted in very good buys on the market.

An aluminum trigger pad with striations for control, a stainless steel trigger bow, and adjustable trigger screw are the marks of a modern match grade trigger. Fitting such a trigger isn't difficult but takes a little time and patience. After the gunsmith and the shooter decide which trigger to order and it arrives, the work begins. The trigger is fitted by removing material. Most are just enough oversize for a good fit.

I do this work with a file, realizing that sometimes the way to do things correctly takes awhile. As an example, my son took a day to fit up what became my personal carry gun. A simple flat faced file is all that is needed for this. Vertical looseness and slop

are the enemy of a true trigger action. Drag on the trigger bow is a sure impediment to a proper action. Carefully file and polish these areas. If the trigger does not fit properly in the beginning, a common reason is the trigger is too tall vertically.

A good trick is to purposely insert the trigger in the raceway upside down to learn what it feels like when the trigger doesn't fit properly. When you have a trigger that doesn't fit the raceway on the first shot it does require fitting work but that is actually a desirable thing as the trigger, being oversized, has material to be dressed down. You will now be able to fit and file the trigger by making even cuts top and bottom. The file is begun on the top of the trigger pad and I make every cut going away from me.

While it isn't difficult to cut aluminum with a file, the trigger must be square when you are done. A steady hand

DROP THE HAMMER CONTINUED

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The author has enjoyed excellent results with these parts, and perhaps a trigger held in a vise will do the business. Some will be able to work by hand without the vise. The novice will often cut the wrong place. The upper and lower parts of the trigger pad are the areas most likely to need adjustment. If you mark the trigger and are seeing drag marks along the trigger body, there is some need for further adjustment.

The secret to fitting a trigger properly is attention to detail and to learn to observe and feel drag and to make friction in these areas less. The key is to mark the trigger with a felt tip marker and then be certain that your observations are correct and that you are polishing and moving the friction away. The raceway itself sometimes may need to be cleaned up; a small jeweler's file works well for this. Be certain to be careful setting the set screw.

The trigger pad is the area in which drag is most likely; the trigger bow itself isn't as likely to need filing. An overlooked area is the sides and corners of the trigger bow toward the rear. I usually stop at a spot when the trigger is practically fitted. The trigger

should be fitted until it is tight but not perfectly smooth. I try to mark and test the trigger again. With this information noted the trigger may be addressed against to achieve a fit that has no binding, giving the desired tight fit.

There should be minimal up and down or sideways movement. The rule is to achieve a friction-free fit while remaining fairly snug. The next step is to polish the very back of the trigger bow. I also work the inside edge. Use magnification to find any burrs. Marking the magazines to be used with the handgun is a also good step. I lock in an unloaded magazine to be certain that there is no friction against the trigger bow. In some cases the magazines may be tuned to the trigger.

While this is a good option, as a rule Wilson Combat magazines clear the trigger bow, at least they have in every instance I have tried. Over Travel Adjustment The set screws should be adjusted. It is good to back the screw off a half turn from the discovery of any drag. The screw is adjusted until the hammer will not fall, then back it

off a quarter turn at a time until the hammer will function. At that point, back it out one full turn.

Once the adjustment is set properly and the pistol is test fired, the screw is given a dose of Loctite and the excess carefully cleaned. The final adjustment of the set screw allows the hammer to travel past the sear with little to no drag at all on the half cock hammer notch. Often enough the screw is set but the hammer, while falling, also allows the half cock notch to draw against the sear on the nose. This will eventually result in the sear nose being eventually worn.

Be certain there is enough travel to completely clear the sear of the hammer when completely back. A final step that is pretty nice but not always necessary sets the job apart. If the trigger face is carefully broken up at the outer edges of each serrated area, the result is a good feel for the pad with the trigger finger. This little bit of extra trouble, done on each side of the trigger face, makes for a nice feel and allows seamless adjustment of the trigger finger. AG

MAINTENANCE & REPAIR

Converting Revolver Cylinders

How to work on dual-caliber cylinders and conversion cylinders to improve revolvers and increase the chamberings used.

BY ROBERT K. CAMPBELL FEBRUARY 2020

ORIGINAL PP. 17-21

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Among the most interesting and useful revolvers are those that are chambered for more than one cartridge by use of a replacement or conversion cylinder. Among the most common combinations are .38-40/10mm, .32-20/.32 H&R Magnum, and .45 ACP/.45 Colt. The most common by far are the .22 Magnum/.22 Long Rifle designs. Due to the ease of changing cylinders by simply removing a cylinder base pin, single action revolvers are the most common revolvers with dual cylinders.

There have been occasional attempts at dual cylinder double action revolvers from the factory but they are more rare. And then there are revolvers such as the Smith & Wesson 1917 handgun which use a single cylinder designed to accept two cartridge types: .45 Automatic Colt Pistol and the .45 Auto Rim. Conversion cylinders are not particularly difficult to deal with.

Over time I have experienced problems with both single action and double action revolvers and repaired them without any

difficulty related to the cylinders. The difference between the types, however, must be understood. I would recommend anyone interested in a dual cylinder revolver purchase a factory version. This is much less trouble than obtaining an aftermarket cylinder and fitting it. However, some folks are what I call “real shooters”—and I guess I am one of them.

It isn't all about economy but an important point when working with different chamberings, about a pleasant, even immensely interesting, shooting experience. Expense is a secondary consideration. If someone has a .45 Colt single action revolver and wishes to own a .45 ACP cylinder then they will find away to get it done. The .45 ACP offers real economy and ease of handloading compared to the .45 Colt while offering enough power for most uses. The most useful combination overall is the .22 LR/.22 Magnum.

Some of the others are simply interesting. If you own a revolver that originally had both cylinders and one is lost, it is possible

to fit a spare cylinder to the revolver. If the revolver never was supplied with a spare cylinder in a different caliber, then you may have a bit more difficulty in fitting the cylinder. Let's look at the problems and fixes I have encountered. Single Action .45 ACP Cylinder We'll start with fitting a .45 ACP cylinder to a .45 Colt caliber Single Action Army-type revolver.

I have never fitted a .45 ACP cylinder to a Colt, however, I have fitted several Uberti types. I would imagine the Colt would be reasonably close in dimensions, but the two Uberti revolvers I encountered were not each exactly the same. This is to be expected. After all, Uberti may manufacture a run of brass frame revolvers for one importer designed for a low price point, while the Cimarron revolvers imported from Uberti will be beautiful specimens.

I am certain that a certain deviation in exact measurements in a quality revolver demanding hand fitting is inevitable. Occasionally, aftermarket cylinders in .45 ACP show up for the SAA .45

CONVERTING REVOLVER CYLINDERS CONTINUED

ORIGINAL PAGE 18

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.45 ACP and .45 Colt single action revolver cylinders must have different ratchets. The factory product usually works well. Taking your time in fitting cylinders to other revolvers is important. .45 ACP (left) headspaces on the case mouth. The .45 Colt headspaces on the cartridge case rim. Colt revolver. As recently as June 2019, Midway USA listed .45 ACP Uberti cylinders in stock on their website. The Ruger Blackhawk is fairly common with a .45 Colt/.45 ACP cylinder combination, the .357/9mm less so.

The SAA “Cowboy” types are far less common. Many users never change the cylinders out and fire .45 Colt exclusively while some make extensive use of the .45 ACP cylinder. Perhaps the makers made over runs and the cylinder is available. The Uberti type in particular is very uncommon. As it was, I found a .45 Colt Dakota revolver on my desk along with a .45 ACP cylinder. When the .45 ACP Uberti cylinder arrived, I degreased it. I wanted it clean but dry.

Next, I carefully removed the .45 Colt cylinder from the customer’s Uberti. This is accomplished by opening the loading gate, removing the base pin, and placing the revolver on half cock. The cylinder more or less push-

es out. I then carefully attempted to fit the cylinder into the frame window. It did not fit the revolver. It wasn’t even close. The problem in general is that .45 ACP cylinders are slightly longer than .45 Colt cylinders—at least this one was.

When you take a look at the .45 Colt and .45 ACP case rims under magnification, you’ll see that while .45 Colt doesn’t have a heavy cartridge case rim like the .44 Special, it does have a standard revolver cartridge case rim. There isn’t much need for a heavy rim in a button or rod ejecting revolver versus a star-type ejecting revolver. The .45 ACP is rimless. The .45 ACP and .45 Colt is a good example. and has an extractor groove for extraction from the automatic pistol.

The button ejecting single action revolver works just fine with this set up. The .45 ACP headspaces on the cartridge case mouth, revolver cartridges headspace on the cartridge case rim. The cylinder must set a bit closer to the firing pin with the .45 ACP and need not be relieved as much for the .45 Colt. When I began attempting to fit the .45 ACP cylinder into the Dakota it seemed to be bumping into a raised area on the left rear of the frame.

I studied this for some time and determined that filing the ridge would not affect function with the .45 Colt cylinder. It was carefully filed, cleaned, and trial attempted to place the cylinder into the revolver before repeating again. This was all that was needed for the cylinder to set into the frame window. The diameter of the .45 ACP cylinder was the same as the .45 Colt, however, the ratchet was a bit larger in diameter. The .45 ACP cylinder ratchet measured 0.590 versus 0.550 for the .45 Colt cylinder.

Just the same, the cylinder now locked in and worked fine. Occasionally, a conversion like this will demand end shake bushings to move the cylinder to the rear which are fitted over the cylinder bushing. Brownells offers these. It is a good idea to use Loctite to secure these end shake bushings so they do not fall from the cylinder when the cylinder is changed out. As for the customer’s satisfaction, he has not used the .45 Colt cylinder since obtaining the .45 ACP.

My slight file work did not affect the fit of the .45 Colt revolver cylinder. A note on accuracy standards. It isn’t unusual for older revolv-

CONVERTING REVOLVER CYLINDERS CONTINUED

ORIGINAL PAGE 19

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.45 ACP cylinder. .45 Colt is a grand old cartridge. For most of us, the .45 ACP is more economical and readily available. ers—and we are talking about one hundred years ago—to have a bore diameter of 0.452 to 0.454 in .45 Colt. Both .45 ACP revolvers and self-loading handguns generally run 0.451. Modern revolvers, with few exceptions, have a 0.451" bore in both .45 ACP and .45 Colt. So, 0.451" jacketed bullets and 0.452" lead bullets will work just fine.

If you fit a .45 ACP cylinder to an old Colt with the more generous bore dimensions I am certain that cast lead bullets need to be a larger diameter for good accuracy. Anyone asking for this type of conversion is apt to be a knowledgeable shooter, but just the same, a good discussion is in order before beginning. Smith & Wesson 1917 The story of the Smith & Wesson 1917 is a thrice told tale I will repeat again.

Before the United States entered World War I, Britain was hard-pressed for handguns and purchased thousands of Colt and Smith &

Wesson revolvers in .455 Webley. When America entered the war, we had perhaps 30,000 1911 handguns. We needed to arm every troop for what was shaping up as a pistol war and a million man army. Colt simply could not fill the need for 1911 handguns and neither could Remington UMC or other contractors.

Smith & Wesson had production capacity geared up and simply re-chambered their big frame revolvers for the .45 ACP cartridge. Since the .45 automatic cartridge does not have a cartridgecase rim, the rounds simply fell into the cylinder. After early testing, a properly chambering cylinder design was implemented, although the ejector star would not eject a rimless cartridge. Smith & Wesson developed the half-moon clip which held three cartridges.

Those clips neatly solved the problem of using a self-loader's cartridge in the revolver by providing headspace with the 0.050-inch thick clips. .45 ACP cartridges were issued in half-moon clips to avoid having two handgun

calibers in the supply chain. While some moon clips may not be suitable for long, hard use, Ranch Products (RanchProducts.com), and Wilson Combat (WilsonCombat.com), offer famously reliable moon clips. Some shooters firing these revolvers have complaints with accuracy.

The 200 grain SWC is more accurate than the 230 grain RNL bullet in handloads. It seems the shorter RNL bullet may tip in the long jump from the cartridge mouth to the forcing case. The 255 grain SWC is more accurate than the 200 grain bullet. Just the same, this is a service gun not a target gun. The .45 ACP for some reason seems more accurate and reliable when fired in moon clips. There is the occasional misfire of the .45 ACP that results in low powder ignition and a bullet stuck in the barrel.

KEEPING AN EYE ON END SHAKE AND USING MOON CLIPS MAY HELP WITH THIS UN-

CONVERTING REVOLVER CYLINDERS CONTINUED

ORIGINAL PAGE 20

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22 Long Rifle/.22 Magnum. This is the Heritage Rough Rider. common but documented problem. As an aside, a young friend that is a serious competition shooter has experienced similar problems with 9mm revolvers, including bullets jumping the cartridge case in recoil. After all, these cartridges weren't meant for revolvers but not all such ammunition is subject to this problem. I recently examined a Smith & Wesson Model 1937, a later variation of the 1917 manufactured for the Brazilian military.

The revolver had unusual burrs in the bolt stop cut in the cylinder. They could be polished out but the real question was, what caused it? I cocked the hammer and found the bolt stop seemed to operate normally. The It isn't possible to do a touch up properly. It wasn't difficult to fit. trigger and hammer seemed in time and the bolt stop window was OK by eye. The hand seemed normal. Finally, I asked how fast the man was shooting?

I am not saying he rivals Jerry Miculek, but he is very fast, shoots a lot of IDPA, and loves his 1917 revolver. The cylinder is

moving pretty quickly when the bolt stop drops into the notch. I have timed splits (time between shots) among competitors as fast as 0.35 second. My range is more often 0.6 second. The famous exhibition and competition shooter Miculek runs around 0.125. The late Elmer Keith practiced a great deal of practical double action shooting.

He noted that if the action were too light he could "tie up" a DA revolver. So, the shooter in this case was advised to slow down. The revolver's burrs and nicks were polished and cold blued. They did not reoccur. The old, smooth, long action Smith & Wesson were nice examples of hand fitting but the modern short action is the better choice for fast shooting. Another choice for these revolvers is the .45 Auto Rim cartridge. After World War I many 1917 revolvers were sold as surplus.

Since most shooters did not wish to fiddle with moon clips, Remington Peters developed the .45 Auto Rim, which is simply a .45 ACP case with a thick revolver rim. This is a strong cartridge case that allows handloaders to put together loads suitable

for thin skinned game. Buffalo Bore Ammunition (Buffalo Bore. com, offers quality factory ammunition. The .45 Auto Rim will not chamber in single action revolver .45 ACP cylinders due to headspace and it will not work in the Taurus .45 ACP Tracker.

This information will help shooters avoid unnecessary purchases of ammunition that will not function in their revolver, though I'm certain .45 ACP in a revolver in general isn't for the slightly interested shooter. .22 Caliber Cylinders In my experience, Ruger cylinders are fitted to each handgun and not interchangeable. The same goes for the Heritage line, a well made and reliable but affordable revolver.

Quite often, a gun shows up in the gun store without the spare cylinder, with someone using one cylinder and losing the other. After all, how many used guns still have the box or original papers? I have fitted a few of these cylinders, perhaps three in thirty years. To check availability and the practical sense of such an operation, I looked for a conversion cylinder for sale

CONVERTING REVOLVER CYLINDERS CONTINUED

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45 ACP Model 1917/37 revolver. They are generally among the most robust of revolvers. and found a .22 Magnum cylinder for the Heritage revolver for sale on e Bay for \$40. A quick check at South Carolina Gun Company (SCgun Co. com, confirmed that a standard Heritage .22 Long Rifle revolver new in the box is \$129 retail while the revolver with a spare cylinder is \$152. Used revolvers are twenty per cent less. For \$23 more dollars the factory version is the much better buy.

Still, if someone has a .22 LR revolver they like, I suppose it is OK to fit a .22 Magnum cylinder. The .22 LR GO headspace gauge is 0.043 while the rim thickness of most .22 LR measures 0.037 to 0.042. Barrel and cylinder gap is often 0.010 on these revolvers. Some are tighter. Headspace is adjusted by polishing the rear of the cylinder to be fitted. This applies to anew cylinder. If it has been in use in another revolver, it may not be long enough to be fitted to another revolver.

If the barrel cylinder gap is tight, you may then slightly file the rear of the barrel. If too loose, the standard procedure to correct gap is to set the barrel back a thread and re cut the forcing cone. This is far too expensive to attempt with such an inexpensive

revolver. I would be very leery of turning the barrel in the frame of the zinc/alloy Heritage, Chiappa, or Ruger Wrangler revolvers. Having a revolver that offers the use of more than one cartridge is desirable for many of us.

Firing inexpensive .22 LR in a revolver and then using the powerful .22 Magnum for hunting is useful. The .45 Colt is more difficult to successfully handload than the .45 ACP as it was originally designed for black powder loads. Blow-by and a full powder burn are considerations. The .45 In most situations there is no cause for concern. ACP is more economical and easier to handload and powerful enough for most uses. The .45 ACP 1917 type isn't a dual cylinder revolver but certainly a dual caliber revolver.

These are interesting handguns and respond well to gunsmithing. A New Trick I wish I could provide exact dimensions for this new trick but I am just investigating the procedure and do not have the guns on hand. However, it is possible; viable, but likely too expensive for many shooters. Some time ago, .455 Webley ammunition was impossible to find. Hornady offers an excellent quality reproduction load as does

Fiocchi Ammunition. Availability varies but if you look hard enough you will find the loads.

The .455 Webley revolver was commonly faced off at the rear of the cylinder to accept .45 ACP moon clips. Since the .455 throws a 265 grain bullet at 655 fps this may be a questionable conversion unless the shooter keeps his .45 ACP loads quite modest. I am certain the strong double action Smith & Wesson revolvers are fine with loads a bit stronger than the .455, but perhaps not the Webley break top revolvers. Sight regulation may also be a problem.

Today, very few original .455 Webley revolvers exist as most were converted. The Smith & Wesson and Colt revolvers issued to the Brits also were converted although the Webley seems more common. A neat machining project is to machine a disk that allows the chambering of the .455 Webley. This disk fits on the back of the cylinder. It replaces the moon clips once used and allows firing the .455 Webley again.

Author John Taffin tells us that two moon clips were too thick and that both he and the gunsmith involved agreed the work was too expensive. For those of you with time and skill, this just may be a good project. AG

FROM THE ARCHIVE

Business Records

No job is over until the paperwork is done. Here's how to keep your shop records clean.

BY BILL SMITH FEBRUARY 2020

ORIGINAL PP. 22-23

You are probably the world's best gunsmith but likely to be the worst record keeper in that same world. Should you ever be audited (heaven forbid) you are going to be hard put to prove your position. Most of the gunsmith types that will be reading this will fall into the category of small business. The Annual Survey of Entrepreneurs (ASE) by the U. S. Census Bureau puts the median U. S. small business having receipts of about \$390,000 a year. I'm guessing most of you gross less than that.

You all should keep records for two reasons. One, obviously, is to pull the teeth of any IRS auditor. The other, and actually the most important to you, is that good records tell you whether or not it is steak or hamburger at the end of each month. History sustains the fact that most artists, technical people, inventors, and gunsmiths think first of their work and last of record keeping. A month of \$10,000 worth of business tells them (you) that they are making money. Sure about that?

If so, I hope you are, but you don't know just how much and you certainly don't want to scratch around with the tax man or your spouse trying to figure out just how much money you made. With all that you have on your mind you cannot accurately recall all your income and expenditures if you don't keep proper records. The average gunsmith does not need an accountant other than setting up an amortization schedule for capital investments, lathes, mills, bluing tanks, etc.

Once this is done your tax preparer or tax software can use it without costing you additional money. It should be of primary in-

terest to know what our take home or net income is. To know exactly what this is each week or month is a relatively simple matter for the smaller shop, especially a one man shop. Let's stay with this one man shop for awhile. What I found to be the easiest way to keep books and know where I was going was to do the following.

First, add up the monthly costs, listing them out as rent, utilities, phone, etc. Multiply by 12 for an annual estimate or just keep it monthly. This can include range fees and shooting when you are promoting your business. Take your year's cost for memberships, insurance, licenses, etc. or any other item that you pay for a year. Add all this up and divide by 12 and add that to your monthly overhead for a true monthly cost. With that handled, keep track on your repair cards of labor, parts, and sales tax.

This is of course the income you receive. If you have gun or retail sales, add these to the pile. Keep all your tickets by the month. Be sure to keep every cash receipt for items that you buy during the month. I create a tab in a spreadsheet (Excel, Open Office Calc, Google Sheets, or similar all work fine) for each month, entering all purchases, adding in my monthly fixed costs including any sales tax, and sum it to find my total purchases plus expenses or general cost of doing business.

I then enter all my labor, parts, gun sales and tax collected. Simple subtraction of your costs from income shows your gross profit picture. For a simple example, let's use \$5,000 monthly income which includes all of the above and comes to \$1,500. You have obviously grossed

\$3,500. I say grossed because there is always something else that comes up and it is a cost to you. If the \$3,500 were a true net income, 12 months of that earns \$42,000 a year. You at least know where you are and if you can better it, go ahead.

If you left a job at \$35,000 per year you'd be losing money! Why? Well, for one thing you have lost any employer-provided benefits and retirement program. You probably are not paying yourself any withholding and file as self-employed which costs you. Plus, your retirement savings such as a Roth and SEP-IRA (you are putting money into a tax-advantaged interest-bearing retirement account, right?) is straight out of pocket with no matching provided.

There are no guarantees in this business except to guarantee you that you are your own boss. Rich you won't get. I am for being my own boss for richer or poorer and besides, I don't fit into the "corporate structure" nor am I a first class "team player" so I like it my way regardless. After you have made out your P&L (Profit and Loss) for the month, file all this information, receipts, tickets, etc. into a folder or large envelope, mark the date on it and file it.

Your records are good, accurate, and above all, easy to find should the need arise. Hiring Help Let's talk a minute about your growing business that makes you think you need to hire a helper. Now the fun begins. Hiring a person to help is fraught with many pitfalls. Please note, I'm using masculine pronouns

BUSINESS RECORDS CONTINUED

ORIGINAL PAGE 23

here only for convenience. Obviously, women can be great gunsmiths as well. First is the possibility of having to carry workman's compensation insurance by law. Your state may not require it but an injured helper can sue you and if you have no protective insurance, you are in the soup. The second, and the most important thing is, can an employee make you money? If you pay him a salary you have to file and collect withholding, more bookkeeping and costs to you. If hourly, you have to keep track of his hours.

So, you think, easy way out, I'll hire him as an independent contractor... who do you think you are kidding? I'll tell you, no one! What to do? Here's what. You have your attorney (more cost to you) draw up an agreement between you that either qualifies him as an apprentice or a contract labor supplier that acknowledges that he will pay his own social security, holds you harmless as to accidents, and is to receive remuneration for his services on the following basis.

In the agreement it should state that should he void the agreement (leave) within a given number of months for any reason, that any and all claims against you are null and void and that he is prohibited from discussing any business policies or methods of yours forever. Failure to comply which necessitates litigation by you against him requires that he pay all legal and court costs. Now you will think this is severe. Not so! This is C. Y.

A. and you better realize that old Billy Bob is in your shop for only the following reasons, pick any you like: 1. Likes guns. 2. Likes you? 3. Likes to work? 4. Wants to stay with you forever. 5. Wants to learn the business so he can build his own. 6. Is honest (won't make it as a gunsmith). 7. Is trustworthy, so you can leave the shop for 2-3 weeks on a hunting trip (ha!) 8. Likes your dog. 9. Doesn't chew tobacco. 10.

Really, only wants to help you. If you picked one out of the ten above, you are probably wrong.

Anyone you get into your shop and train over a period of time will go into business for himself sooner or later. That is the American way— just count on it. Remember, gunsmiths aren't born, you make them! So get a contract drawn. Pay your assistant gunsmith half of all billed labor. Give him jobs that he can do but only pay him for what he does. Sure, if he is really going to help you, then you have to teach him. While this may payoff for you later on it will slow down your output and cost you in the beginning.

Now, let's look at what this man can do for you (I keep saying "man" but applies equally to all women gunsmiths as well). If you are grossing \$5,000 a month and he adds \$2,000 to it and you reach \$7,000, you are ahead. So the rule is that he has to be able to produce more than you alone could do. If not, the deal is no good and you will have to do something about it. One of the more difficult problems with an arrangement of this type is when do you start giving him work?

You know you can turn out the \$5,000 worth but let's assume that you start the first of the month. You give him work to do and you do yours. The month ends and you total up your work as well as his. You find that your work brought in \$4,000 and he did \$2,000. You actually increased your business by \$1,000 as you normally would do \$5,000. So you gained but it could go the other way. Business could falloff which would affect the amount you give him. This of course could lead to dissension and problems.

It's tricky hiring or getting another person in the shop. I am only trying to point out some of the problems before they happen so that you are better prepared to handle them. So, let's review things. We realize we should keep enough records so that we

know if we are making a profit. We have to consider the fact that by going into our own business we lose all the health, paid vacations, and retirement programs that the old job gave us. Thus the question arises, can we make enough money to equal these advantages?

Can we afford replacements for these benefits by buying insurance and IRAs to equal or better what we had? Can we afford to equally insure our new help? Can I stay well and not get sick for a prolonged period because once we stop or become incapacitated the income stops. Whatever you decide, please play the "what if" game and, like the Boy Scouts, be prepared! Your Most Valuable Tools You have two of them. You can't buy them and they are not guaranteed. You use them for every job you do.

Without either one you would be out of business. They are the most expensive in the world and are one of a kind. No one has a set like them. You can't replace them. They wear out and when they are gone, you'll have to close up shop. They break but sometimes they can be repaired. They have feelings, they get sore and tired but with a little care and rest they are ready to go again. They get damaged from use. They have a memory and a lot of know how, though, at times, they need a little coaxing.

Coffee helps lubricate them; no oil is necessary. Money makes them work even better. Wipe them down with \$100.00 bills. You ask, naturally, what are they? Your hands and brains—a gunsmith's hands and brains. Either or both tell you what to do and how to do it. They are partners, one would not work without the other. These are your most valuable tools and assets. Use them well and often. They will reward you and, like a good dog, they don't talk back. Your success (if any) depends on them.

Keep them in check, keep good records, and you'll tip the odds in your favor. AG

SAFETY & COMPLIANCE

Reader Forum

BY AMERICAN GUNSMITH EDITORS FEBRUARY 2020

ORIGINAL PP. 24

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If I was looking for parts for the Lefever I'd see what was available in the way of Flues models—as long as I could return the mismatches! The sears and hammers look the same but the cocking mechanism is distinctly different. The safety lever atop the gun looks the same, but again inside very different. Another distinctly different aspect is the wooden stock attached to the receiver with four screws, two which double to hold the trigger guard as well.

A couple screws needed replacement and I lucked out finding them at Numrich. They weren't labeled as Flues replacements but they worked. Something else I tried at Numrich was purchasing a half-pound bag of bolts and screws—I actually found one I could use! I also judiciously epoxied the inside of the receiver wood to assist

in getting a really snug fit and to strengthen the century-old wood. I've had success glass bedding rifles, so I had a pretty good idea what I wanted to do.

Anyplace that had too much epoxy got Dremeled. For safety sake I decided to handload shotshells using the least amount of powder possible while still being able to knock down some clay birds. I ended up loading 12.5 grains of Titewad and still got 1100 feet per second. An extra 100-150 FPS might make a difference in the pro ranks but for me it works. Mark Bozek Author Mark Hollensen replies. I'm glad to learn that my article assisted you with your Flues shotgun.

Looks like you have done quite a bit to get it back to shooting condition again! Thanks for sharing your photos and information. AG

SEARCHABLE ISSUE RECORD

Archive index

Noreen 80% Receivers American Gunsmith Editors	2	Drop The Hammer Robert K. Campbell	14-16
Hi-Power Versions Charlie Briggs	3-6	Converting Revolver Cylinders Robert K. Campbell	17-21
Hi-Point Carbine Paul Mazan	7-9	Business Records Bill Smith	22-23
Accuracy Tools Glen Calvert	10-13	Reader Forum American Gunsmith Editors	24

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