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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

MAKING ODD ONES SHOOT

DEFCON 4SD • THE "UNTOUCHED" MARTINI- HENRY, PART TWO • FINDING INFORMATION • HANDGUN GRIP RECONSTR...

ORIGINAL METHODS. MODERN ACCESS.

ARCHIVE EDITION 172

DIGITAL ARCHIVE EDITION

Preserved for the bench.

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IN THIS ISSUE

Contents

A complete guide to the searchable editorial work preserved from April 2018.

2 **DEFCON 4SD**
AMERICAN GUNSMITH EDITORS · ORIGINAL PAGES 2

3 **The “Untouched” Martini- Henry, Part Two**
PAUL MAZAN · ORIGINAL PAGES 3–5

6 **Making Odd Ones Shoot**
RAY ORDORICA · ORIGINAL PAGES 6–10

11 **Finding Information**
ED NUTTER · ORIGINAL PAGES 11–13

14 **Handgun Grip Reconstruction**
NORMAN E. JOHNSON · ORIGINAL PAGES 14–15

16 **The Mauser C96**
JOHN M. BUOL JR. · ORIGINAL PAGES 16–20

21 **New For 2018**
AMERICAN GUNSMITH STAFF · ORIGINAL PAGES 21–23

24 **Reader Forum**
AMERICAN GUNSMITH EDITORS · ORIGINAL PAGES 24

MAINTENANCE & REPAIR

DEFCON 4SD

BY AMERICAN GUNSMITH EDITORS APRIL 2018

ORIGINAL PP. 2

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Operating gunsmiths interested in maintaining profitable shops are wise to keep an eye on emerging trends. Conversations with several gunsmiths recently revealed that some of the most profitable, ongoing work for them includes AR-15 builds (no surprise there), 9mm carbines of various makes (influenced from Pistol Caliber Carbine competition), and suppressors. All three of these are nicely put together in this offering from Desert Design & Development.

D3LLC is a design and manufacturing company making integrallysuppressed weapon systems for civilian and law enforcement markets. The company's founders have over 30 years of combined firearm design, manufacturing, and sales experience. The DEFCON 4SD from D3LLC is an integrally-suppressed barrel system based on the Heckler & Koch MP5-SD designed for 9mm carbines and pistols based on the AR-15 platform.

Using a 6.75" match-grade barrel and ports that are designed to support the host suppressor, the 12" suppressor features a large expansion chamber and unique barrel support and baffle

system. Combined, it's 13.75" from chamber to muzzle. Colt released the first 9mm AR platform, which is the closest thing to a "standard" for this.

Similarly, the DEFCON 4SD is as close as a standardized "drop-in" option for 9mm AR-15s. "We have created a 9mm AR barrel that resembles the MP5-SD barrel and made it more efficient and accurate," said James Seto for D3LLC. "The mated high-volume suppressor works in tune with the ported barrel and produces amazing suppression quality, even for a blowback carbine.

The ports allow some of the gasses from the 9mm projectile to be bled off into the expansion chamber and reduce the muzzle velocity down to subsonic levels. Off the shelf ammunition from 115 to 158 grains produces a sound level from around 123d B to 110d B, respectively.

Our DEFCON 4SD is a proven system and is the same suppressor system we use on our 9SD Complete Integral 9mm AR Upper Assemblies, as well as our D3-9SD, The Ultimate Urban Carbine." For further information, contact D3LLC Sales & Operations (D3LLC.com).

MAINTENANCE & REPAIR

The “Untouched” Martini- Henry, Part Two

A cautionary tale of restoring a classic single-shot battle rifle. Here’s how I restored the metalwork.

BY PAUL MAZAN APRIL 2018

ORIGINAL PP. 3–5

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Original caption: Top: As received the left side of the receiver is covered in a century of dirt and corrosion from careless storage.

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In Part One we worked on the stock of an “Untouched” Martini-Henry and gave you some techniques to help you match the new wood that was added to replace where wood had rotted during storage of the rifle. This time let’s look at some ideas on how to restore the metal parts. The size of the metal working project in front of you is going to depend on what you are starting with and what you want when you’re done.

If you want a pristine example that looks like it just left the factory, you need to spend the money for a higher-grade gun. If you want a shooter that looks like a 150-yearold military rifle that was issued and used, you have a lot of work to do on an “Untouched” grade Martini. I mentioned previously this isn’t a job for a beginner. That is mainly because restoring a firearm in this condition takes skill in gunsmithing, metalwork, and woodwork, as well as a lot of patience.

In the case of this gun, my partner and I concluded that it was really not a candidate for restoration to anything but a shooter. There was simply too much deep pitting on the outside. We were left with restoring it to asho o table old war horse that looks like it has seen more than its share of action. We will not be rebluing it or draw Here is the rear sight as it was when the rifle arrived.

Some of the dirt and corrosion has been removed to identify the rifle as an Enfield-manufactured piece rather than one made in Nepal.

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Here is proof it was a good choice on our part. Otherwise, the internal parts looked far better than the exterior of the gun. filing out the pits in the metal as that is simply impractical. Instead, we'll leave as much of the patina it has spent 100 years building and concentrate on repairing the metal hardware. We used simple nuts and bolts from the hardware store to lend that support.

The nuts were simply run down the bolt, the assembly was placed in the receiver, and the nuts were then unscrewed and tightened against the receiver walls with open-end wrenches. As each metal piece was removed from the stock, we evaluated if it could be saved. In most cases, a wire wheel on a buffer was able to remove the

rust. Many of the screws were rusted in place and called for We pulled the barrel to clean up the threads and wire brushed the barrel and receiver.

The Martini has a very thin-walled receiver and it is important to support the receiver walls before you put a wrench to it to unscrew the barrel. It would be very easy to bend it and ruin the gun. We used simple hardware store nuts and bolts to reinforce it by cutting the bolts to just short of the internal width of the stripped receiver, screwing the nuts on to the bolts and then unscrewing them until the head of the bolt and the nut were firmly against the inner receiver walls.

Although the metal work was tough, there are no secrets to removing rust from metal. Wire brushing and plenty of time and elbow grease with steel wool and oil took these parts as far as we wanted to take them. Once again, it is up to you if you want to leave any patina on apart or to polish and reblue instead. That may be dictated by how deeply pitted it is. We found many screws rusted in place. In order to remove one of soaking in penetrating oil.

Some simply had to be drilled out and replaced. the barrel bands it was necessary to cut the screw. After removal from the stock, it was drilled out and replaced. The rear sight ladder was bent and had to be s tra ig ht-

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Adding wood to the top of the forend allowed us to eliminate the broken-out places as well as hide the pitting. A hundred years of neglect had taken its toll on both the metal and the wood. ended. A fairly easy project for anyone with a vise and a hammer. The thin metal parts, such as the edges of the barrel bands in some cases, were rusted to the point that the edges were ragged.

In such cases, the only options may be to either find a replacement or to grind the edges until the thicker metal is reached to leave a smooth edge. All of this will make collectors cringe but keep in mind, we are taking a gun in poor condition no collector would want and returning it to a shootable condition. Probably the most difficult part of a restoration project like this is the need to think your way through each step, identifying the problem, and then deciding how you want to fix it and to what degree.

When I first looked at this Martini when it was delivered I wondered if it would ever shoot again but looks can be deceiving. Although the outside surface was discouraging, the bore and internal parts were in very good shape. The dirt and rust can be cleaned off. The stock can be reworked with the techniques we discussed in Part One or anew replacement stock can be purchased. However, once you pay for a replacement stock set, you could have simply bought a higher-grade gun in the first place.

As I have mentioned, these types of issues will The head had completely rusted away and there was no way to turn the screw. crop up and be different forever y such project and really isn't a suitable task for a first timer. If you are reasonably competent and really want a challenge to see how well you can restore a really rough piece, this may be the deal for you. A word of caution regarding

shooting the Martini-Henry. The .577/450 Martini-Henry case is cavernous and it is strictly a black powder round.

The barrel walls are thick enough to support black powder pressures even when the exterior is deeply pitted but if you have any doubt, err on the side of caution. The military load was 85 grains of Curtis & Harvey No.6 Coarse black powder under a 485 grain soft lead bullet. The gun was renowned for its recoil.

Unless you are actually going to hunt big game with it or just love guns that beat the heck out of you, smaller charges of 1F or 2F powder and lighter bullets can make them a much more comfortable gun to shoot. That's likely ideal for shooting a restoration project that you've put a fair amount of time into making shootable again. AG

PISTOLS

Making Odd Ones Shoot

The best gunsmithing effort won't return a completed project to shooting status until ammunition is arranged. Here's an approach to loading unusual or unavailable cartridges.

BY RAY ORDORICA APRIL 2018

ORIGINAL PP. 6–10

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I well recall the drive that made me become a reloader. I had a .45 Webley Mk VI, a fine revolver that had cost me all of \$13 and was modified to accept .45 ACP rounds in clips. The gun was fun to shoot but ammo was costly. Reloading was the obvious answer, so that's where I began my reloading career. Reloading for that old beast was simple. I bought a Lee Loader for .45 ACP and used it to reload for the Webley and for one or two other of my early .45s.

One day it was time to upgrade, so I bought a Lyman Spar-T, a turret press, that served me well enough until I got my RCBS Rock Chucker. By then I had branched out into many other reloading needs, and the 'Chucker reloaded almost every round I've put together since the day I got it, back in about 1974. I say almost because some rounds just can't be loaded on a normal press. This is where pure gunsmithing comes into play.

Today you can buy almost any size brass or bullet you might need for reloading, and also loaded rounds engineered and assembled by major makers for many of the really odd old calibers. Today's shoot- It weighs nearly 12 pounds and even so, its recoil is not for the faint of heart. Loaded with a 900-grain custom bullet, the questions are how do you get the

brass sized and determine the correct bullet, and how do you get that bullet made? ers have it mighty easy compared to 40 years ago.

Here's a tip: I don't think this golden age of reloading components and oddball factory ammo will be around forever. I hope I'm wrong, but if I had a rifle needing, say, .400 Jeffery ammo, currently made by Hornady in this country, I'd buy a lot of it. Ditto brass and bullets, and the high-end "dangerous game" Hornady bullets are some of the finest in the world. Some years back, reloading for unusual cartridges was not easy.

Because components used to be hard or impossible to get, reloaders back then had to figure out how to make their strange rifles shoot by using what was available. A sizing die for a .30-06 might be able to compress the walls of a strange cartridge enough to get it to fit in the chamber of a rifle when no other option existed other than to make a chamber cast and spend through the nose for custom dies. That trick is still often useful today.

Forty years ago Ross Seyfried and I wrote apiece for American Rifleman about making odd-bore double rifles shoot when components could not be found ("Paper Patching Makes Biggest Bores Work" in the June 1978 issue.) We paper-

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Author made a sizing die, pictured, out of a steel bar bored to the exact size. The brass cases are pushed in using a vise and then a lathe, and removed from the sizing die with the wood rod shown, which also acts as a deprimer. The cases were first annealed, patched bullets to fit. By the way, that was his first appearance in a major firearms publication, though not mine.

Back then it was impossible to get 0.475-inch diameter bullets for my .470, or 0.411s for Ross's. This was not at all critical and easy to make on the lathe. Determining how heavy was the tough part. Figuring out the correct weight was done by experimentation with a variety of custom-made heavy bullets combined with lots of past experience with big double rifles. .40-cal double rifle. Cases were also unavailable for most of the oddballs.

Some desperate shooters resorted to turning brass cases on a lathe for the big old rifles. Some of us acquired a few Berdan-primed rounds and put up with decapping them until the cases wore out. Happily, at about that time, Jim Bell came up with his "basic brass" which could be formed into cases for our strange, generally British, rifles. And so we managed, back then, but even today some items just can't be found.

I recently sold my Alexander Henry double twelve-bore rifle, which required brass cases and a 900-grain bullet. Nope, I couldn't load those on the Rock Chucker, nor could I buy those huge, heavy bullets over the counter. I'm told the old Hollywood Senior press might have worked to size the cases, but I never found one along the way. However, I was able to load three-inch .500

Express cases on my Rock Chucker, and I made plenty of rounds for my old Churchill .470 double rifle on the 'Chucker by being clever.

My .470 handloads served me well in Africa. Loading those big British rounds was easy once we had brass and bullets readily available, but not so with the big brass cases for the 12-bore double-barrel Henry. How did I get the Henry to shoot? I had about a dozen brass cases that would not quite fit into the twin chambers of the old rifle. I needed to bring down their outside diameter by a few thousandths, not a huge amount, so I made a loading die.

This was in the form of a ring of steel about an inch long bored to the correct size for the rifle's chambers (chamber casting told the story). The steel ring was stout enough to take the sizing forces. I eased the hole in

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He carefully bored out the mould to the author's precise dimensions. The result was perfection, which meant the author had to shoot the darned things. Masterful work. my new sizing die at one end to get the brass case started. I shoved each case into the steel ring with my vise as far as I could and then finished the job on my lathe, holding the ring with the chuck and driving the lubricated case all the way in with the lathe's tailstock before driving them out with a dowel.

I had to anneal It weighs 900 grains and needs to be paper patched. Author's friend Ned Christiansen made the mould from an existing NEI mould to the author's exact dimensions. They are rubbed with Alox or beeswax or something slippery to ease their passage down the bore. the

cases before sizing them, and of course everyone knows how to do that. Firing pressure was low so I had to size the cases only once.

Seating primers, either the shotgun type or common rifle primers (I had both types of 12-bore brass) was a matter of starting the primer and pushing it all the way home in a big vise, with the mouth of the case against a block of wood to avoid damage. I had to make a tool to slightly open the mouths of the sized cases to permit the insertion of the paper-patched bullets without tearing the patch. I cut a taper on the end of a steel rod and shoved the cases onto it just enough to turn back the case mouth.

I also made a simple loading block to ease the handling of these big cases. The proper size Forstner bit in my drill press and a block of 2x6 solved that one. Then came the task, in the case of the Henry, of finding out what powder charge to use. With a double rifle like the Henry, the most pressing task actually was to determine the proper bullet weight. With my Henry that was not easy. Because I am the British Cartridge editor for Cartridges of the World, my literature on the subject is comprehensive.

Despite this, my bunch of books told me nothing. There was nothing I could find, anywhere, that told me what the bullet weight was supposed to be. However, there were some clues within the rifle itself. One of these was the weight of the rifle, which was stout. Nearly 12

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pounds. That meant the rifle was built to deliver serious horsepower. The fast twist rate also indicated a heavy bullet. Despite all this information to the contrary, I first tried round-ball loads with varying degrees of luck, mostly bad. Those tests indicated a stout powder charge was indeed needed and definitely a heavier bullet. But how heavy? To manufacture heavy bullets I drilled holes in a 2x4 and filled them with molten lead.

I then turned the resulting plugs Recoil with the 900-grain bullets was considerably more, to the right size on my lathe, making the diameter correct for paper patching. I rounded the plug noses to look like bullets. I fired several different weights of these. That gave me more clues. After many months of experimental testing I finally determined the rifle needed a bullet of 900 grains. The next step was to design a mould.

Several sheets of paper filled with straightforward math calculations based on the mass of lead per cubic inch gave me the size of the mould. I designed it with a semi-circular nose, so half the volume of a sphere gave me easy numbers for the expected mass of the nose, and then of the completed prospective bullet. I

ended up with around-nosed cylindrical bullet with a step where the rounded nose met the side of the bullet, kind of around-nose Keith design.

My friend Ned Christiansen, the incredible Michigan gunsmith (Michiguns, Ltd., m-guns.com), made the mould from an old NEI mould I sent him. The first pouring with a lead alloy slightly harder than pure lead gave me exactly what I wanted, just under 900 grains. With pure lead it would have been right on the money as designed. I phoned Ned and told him I had some bad news. "What?" he said. "Is the mold wrong?" "No," I told him. "It's perfect. It makes gorgeous bullets of just the right size and weight.

The bad news is that now I have to shoot them." As you might imagine it's not a lot of fun shooting heavy loads of powder behind 900-grain bullets. The rifle shot them quite well, enough to tell me all I needed to know about the Henry. Let me tell you, that was a real rifle. I have a 9x56 Mannlicher Schönauer rifle for which I've made cases using some oddball techniques you might find handy one day. I have a set of 9x56 M-S loading dies that are completely useless.

They don't compress the brass enough to get it into the chamber, and also are for the wrong bullet size. Thing is, there were three "standard" bullet sizes for this caliber. My very early, threedigit-serial-number rifle needs a slightly smaller case than standard, and also requires the smallest of the three bullet sizes, which is 0.353" diameter. (For reference, the other two sizes found in 9x56 rifles are 0.355" and 0.358".) I made cases for this fine old rifle using a complex, multi-juggling process.

I began with .30-06 brass. First, I annealed the necks, then sized the cases full length in my .400/350 Nitro Rigby die to squeeze the lower brass enough to fit the chambers. Then, I necked the cases down in a .358 Winchester sizing die with the neck-expander/primer punch removed. I cut the cases to length, deburred them, and fire-formed them in the rifle with data suggested by Ken Howell in his magnificent *Designing and Forming Custom Cartridges* book.

I used Bullseye powder, pistol primers, tissue paper, and commeal. The resultant cases were usable without further outside-neck turning, though that might have been a necessary step depending on the rifle in question. Bullets were relatively easy for the 9x56. I loaded the

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30-06, .350 Rigby, .358 Winchester, and 9x57 loading dies to get the brass made, sized, cut, fireformed, and finally loaded into suitable ammo for the fine old rifle. Then it's time to make new stuff, any way you can. cases with some custom Hawk 250grain bullets of 0.353" diameter, using the .358 seating die. I arrived at the correct powder charge by reference to the .358 Winchester loading data and carefully experimenting.

Instead of all this juggling I could have popped for a custom-made RCBS die made to my chamber cast, along with a trim die to cut the cases to the right length. However, that's expensive. Also, as noted above, I had on hand a set of dies for a .350 Rigby that were just the right size to squeeze down the lower part of the case just enough to allow the brass to fit the rifle.

This was all just ducky until one recent day after some years of not shooting the 9x56 Mannlicher I wanted to reload my cases and also make some new ones. However, in the interim years since last shooting this rifle I sold my .350 Rigby double rifle together with its loading dies. Uh-oh! Now I'm stumped until I find another sizing die that can squeeze the bases of the new brass enough to fit into the rifle. Ah, the joys of owning oddball rifles.

One more thing: I had been buying special-order bullets from Hawk to fit the M-S. Now I want to be able to shoot easily obtainable and lower-cost standard bullets. I have on hand all kinds of 0.358 diameter bullets of good construction and it's easy to get more at the local gun store but they need to be made a little bit smaller. The solution seems to be to make a simple swaging die to reduce their diameter. I have a design for this but have not yet made the tool.

I suspect an unused sizing die can be bored out to do the job, using my old Rock Chucker. Let's hope it works, when I get around to it. Another double rifle I had, made by Erskine in the 1800s, took short 12-bore paper cases and around ball. It was relatively easy to get that rifle shooting. I used a common 12gauge shot-shell loader to size and prime the cases but I had to shorten them significantly.

As I did for a 10-gauge shotgun on hand which also needed shorter cases, I used a proper-size dowel in the lathe, put the case onto the dowel so that friction on the case would grab and spin it, and then shoved an X-Acto blade clamped in the tool post straight in against the spinning case. This easily cut them to the right length.

With a supply of shortened rifle cases I loaded the proper powder charge and the proper-size ball purchased online from the Log Cabin Shop in Lodi, Ohio (Log- Cabin Shop. com), on top of

several Wonder Wads (RMCoxYoke.com or TrackofTheWolf.com) and secured it all in place with a roll-crimper running on my drill press. One trick to increase bullet size is to paper patch them, and I don't mean just lead bullets. As Ross Seyfried and I proved long ago, paper patching works very well with jacketed bullets too.

We did that with my double .470, wrapping common .458 bullets to fit. I later used that trick with my 6.5 x 54 Mannlicher- Schönauer up in Alaska. I wanted to try light jacketed bullets in the little rifle so patched 'em up to fit. Worked like a charm. Without the great expense and delay of procuring custom reloading dies, clever reloaders can assemble rounds for nearly any rifle or handgun of any age.

All it takes is a bit of serious thought and sometimes some work with a lathe or mill, and you can usually come up with usable bullets and cases, or even a swaging or sizing die, and get the odd bundook working. With some modern cartridges of relatively high pressure the hardest trick might be determining the correct powder and charge. Carefully cross referencing as many loading books as you can get your hands on and looking at similar cartridges ought to give you a place to start.

PROCEED WITH CAUTION AND BEST LUCK TO YOU. AG

FROM THE ARCHIVE

Finding Information

Though it doesn't have everything, the Internet has a vast amount of information, ready to read. Here are resources ideal for gunsmiths.

BY ED NUTTER APRIL 2018

ORIGINAL PP. 11–13



Though it has been said that you can find whatever you are looking for on the Internet, that isn't a completely accurate statement. Some things aren't available yet because they haven't been digitized. Other things are available but require a subscription to the site. However, through careful searching, you can find a vast amount of information. Printed books can play a crucial role in the search for information online. If you are collecting information on Beretta pistols, for instance, you could look in J. B.

Wood's books on the subject as well as yearly released gun books to get a more complete model listing. I have been collecting table of contents and indexes from various guides and books to Some of these have duplicate models listed, but some have a few older models that aren't listed in new books. If you have a digital copy of a manual that isn't listed, I encourage you to send it to them. help me collect information.

Once you have this information, you can use those model names to search using a search engine such as Google, Bing, or many others to find more information. I find including the words "owners manual" and/or "PDF" helps narrow the search down. Adding "exploded view" to the search query sometimes will find the picture online. Once you have

exhausted one search engine, it may help to try another to see if there are any new results. Many factory pages have current model owner's manuals available for download.

A few have manuals for older, obsolete models. Occasionally, you will stumble upon a gem containing a large number of files, like the New Manuals And Diagrams section and Manual Chart of Steve's Pages (StevesPages.com/page7b.htm) organized by the late Steve Ricciardelli. Steve's Pages contain one of the most complete lists of owner's manuals I have seen. One page has owner's manuals, one has military manuals, and another has exploded views.

They are taking donations to keep the site online and ask that to save bandwidth, only needed information is downloaded. Sometimes, factory manuals can be supplemented by military field manuals and other documents, the AR-15 being one example. These can be found on Archive.org by searching for "military field manuals". Other pages may have information that could be transferred to a word processing program and saved as Acrobat (PDF) files, which are more universal and can be opened on multiple operating systems.

If you have access to a public or educational library, it may offer access to online databases. These databases, such as General Onefile,

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org is basically a back up of most of the publicly-available Internet pages. may have access to recent magazine or newspaper articles related to the firearm you are researching. Some of the databases, however, may have limited titles or date ranges available. Depending on the database, there may be an option to set email notifications, so that if an article appears that matches your search terms, you will receive an email. In academic research, Wikipedia. org isn't usually counted as a scholarly source.

While it may not count in a research paper, I find it helpful to read the article to get abroad overview of a topic, which can give Most of these require a username and password to access. Check with your local library to see what is available. you keywords for further searching or new sources the original authors used. For instance, Wikipedia's list of firearms may be missing a few but is a good place to start for general information.

In the same way, people are often critical of Youtube because of the people making videos that are unsafe. On the other hand, some companies and/or individuals, like Brownells, produce quality content. Once you visit a few pages like Brownells and Midway, Youtube will start recommending similar pages. It is important to remember that, while the Internet has made it possible for anyone, anywhere to produce content online, not everyone should take advantage of the opportunity.

Safety violations should not be glossed over, but could be used as a teaching tool. That is why it is important to do off-line reading, to have a knowledgeable person with whom you can discuss ideas, and to have multiple sources for information. When you find helpful pages, you should save them as a favorite in your browser, so you can find them again.

If you work on multiple computers, you can install a browser such as Firefox on a USB drive (sometimes called a flash or thumb drive) using Portable Apps, so you can take your bookmarks with you. PortableApps.com is very convenient to use. You can choose from 300 different applications, from web browsing to games to office-type programs. Naturally, the more apps you install, the larger the USB drive you will need. I usually use Mozilla Firefox as the portable browser, but Opera is also available.

Apache Open Office and Libre Office are available for creating documents and spreadsheets. They may not have every feature of Microsoft Office but they are quite usable. GIMP Portable is available for image editing. I have not used them but you can choose from a few different PDF tools, too. With a large enough



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you can save your documents in a folder on the drive and carry them with you. In the age of electronics, I still like to have books. Books don't need to be charged and don't run out of power and shut off in the middle of a project. I am gradually building a small collection of books as I find them. However, I am also a collector of electronic documents. Books are usually large and bulky; to store 200 books would take serious shelf space. Transporting these books is an ordeal.

On the other hand, you can fit thousands of elec- Portable Apps also have other software that runs directly on a portable USB drive. Keep in mind, some public Internet access locations block the use of USB drives. Don't forget to make a backup. tronic documents on a card about the size of a stamp. This card can be read on a computer, tablet, or some phones.

You could take the entire collection to the range, if needed. If you choose an SD card, you will need to keep the maximum readable size for your device in mind.

I have an older tablet that will read up to a 32GB SD card, which seems like a large amount of space, until you almost have it filled up.. To have a print copy of everything would be an economical and possibly ecological disaster. Once you have found your information, be sure to make a backup copy, in case of loss or theft, or if the device fails. Always have a backup of every important document or file on a second device. Since not every book has been digitized, print material still has a place.

This material can be enhance by digital materials available online – just don't forget to make a backup copy. Though not everything is available, there is a wealth of information on the Internet ready to be found. As a gunsmith, you'd be wise to investigate. AG Alexandria VA 22310

PISTOLS

Handgun Grip Reconstruction

When shooting some heavy recoiling handguns, grip changes can make shooting more tolerable, effective, and with less felt kick.

BY NORMAN E. JOHNSON APRIL 2018

ORIGINAL PP. 14–15

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The reconstruction performed on this rather unusual handgun grip involved considerable work and thinking in doing it just right. The original grip had been formed from a totally reshaped synthetic stock as used on a single-shot rifle. The first revision left the pistol grip too perpendicular and quite small for the shooter's hand. This interfered with proper recoil absorption of the centerfire rifle cartridges used in this handgun as well as making it more difficult to hold and aim while shooting.

The work involved replacement of the existing grip cap along with a buildup of new material at the lower rear of the grip. Refinishing of the entire grip was also performed. This required making a

form to hold the Brownells Steel-Bed that I chose to use as a means of building up the grip. Getting The Job Done Making and fitting anew bottom grip cap was the first step. This was made up of laminated pieces of 1/4 and 1/8-inch thick plastic material bonded together with J-B Weld.

The piece was reshaped to the exact configuration of the former grip cap at the front, extending 11/16" farther back to allow for grip buildup. After reworking the grip cap, it was solidly attached by using the existing countersunk 8-32 screws. With the new grip cap shaped to size and attached, I made up a form using several layers of special tape to retain and mold a mixture of Brownells

Steel-Bed. Release agent was applied to the bottom surface of the new grip cap to prevent adhesion of the Steel-Bed.

It is sometimes necessary to be able to remove the new grip cap from the main grip. Mixing and applying the Steel-Bed was quite easy. I've worked with this Two pre-fitted screws will hold it solidly in position. fine product for along time and, in its place, it has no equal. Mixing is easy with a working time of at least a half hour, depending on the temperature of the mixture. At room temperature it has the consistency of soft peanut butter. It will not run but still conforms to small cracks and spaces.

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Steel-Bed forms nicely without running. The grip form is held at a level position as it is filled with sufficient Steel-Bed to form the approximate shape of the finished grip. In this buildup process the added material within the form is carefully worked to the desired shape of the new grip. In the final setting stage I could easily work and shape the material within the form. The surface of the setting material got as smooth as glass and hard as steel.

After about five hours I removed the forms, revealing a good looking grip. I removed the bottom grip cap just to be sure it would come off

and gave it a final polish. The shaped Steel-Bed had a nice finish to it and only re- Left and Sometimes seemingly minor things can make a huge difference. Conclusion Recoil was much easier to tolerate as a result of reshaping the grip, particularly with a two-hand hold and when shooting over sandbags.

It also makes it easier to use as a hunting handgun guided with minimal support. As we approach some of our gunsmithing tasks, an imaginative and creative effort becomes an important ingredient. We must be ready to combine and shape widely-differing components as we take an

idea and make it happen. AG quired minor sanding. If you haven't worked with Steel-Bed, you'll like the hard, steel-like finish. It could even be checkered using the right equipment.

As a finishing touch, I applied a dark brown dye made by Birchwood Casey to match the other part of the grip. Over this I applied a coat of Birchwood Casey Tru-Oil.

HISTORY

The Mauser C96

The “Mauser Military Pistol” is a triumph of the Industrial Revolution and set the stage for modern handguns.

BY JOHN M. BUOL JR. APRIL 2018

ORIGINAL PP. 16–20



Below: Technician Fifth Grade Melvin Bollig and his Mauser C96 trophy in handmade display box with VFW garrison cap.

ORIGINAL ARCHIVE IMAGE · PERMISSION CONFIRMED



Below: Technician Fifth Grade Melvin Bollig and his Mauser C96 trophy in handmade display box with VFW garrison cap.

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The old pistol mounted in the orange felt-lined wooden box overhanging my Grandfather's basement bar always fascinated me. When I was barely big enough to acknowledge it, I first recognized it as Han Solo's blaster in *Star Wars*. As I grew old enough to comprehend connections between lessons in History classes and my Grandfather's service in World War II, I realized it was a war trophy. And when I developed an interest in guns and shooting I learned it was a Mauser C96.

Melvin Bollig was not a historical figure, being one of many million enlisted men sent into war to do his bit and try to stay alive for a trip home. His stories of the war were sparse and tended to focus on typical enlisted man shenanigans, what he liked about range sessions, how much training he endured in the United States and England, and that time he and his platoon leader both “misplaced” their Garands after a notably drunken escapade somewhere in Europe.

There were a few stories about traveling by ship back home, which included being forced to discard various trophies that ended up at the bottom of the Atlantic. Being limited to one item to bring back, he opted to keep the Mauser pistol but had to discard its wooden stock. Specifics of duty after Normandy weren't talked about, though Grandma said he suffered nightmares years after returning. As a child old enough to construct questions but not really ponder, I asked Grandpa how he got that pistol.

His only explanation was, “There were times men had me in their sights and I had them in mine. I'm still here.” After enlisting I had a better insight of that life. I also better appreciated why he like many troops who saw terrible things on the battlefield didn't like to talk about them. The true quiet professionals usually are quiet about such matters.

Other than his Veterans of Foreign Wars garrison cap, displayed proudly with his many antique John Deere replicas and the two restored full-size Band Gmodels he drove in parades and at antique tractor pulls, Grandpa didn't display

military memorabilia. His only other hint of combat experience was that pistol. A casual visitor might not ever know he had any military background at all, although he was a life member of VFW Post 8447 and American Legion Post 534.

His advice upon learning my decision to enlist was to “go supply” (Quartermaster.) Though he didn't go into details, he wanted my high school-aged self to avoid seeing and doing the things he had to when he was my age on the European front. Of course, the nature of warfare has changed since then (just ask Jessica Lynch) but it was his best way of being protective given I went and signed a DD Form 4.

He left military life in the 1940s, spent some time running a dairy farm (hence his love of old tractors) and then worked for decades handling big cats and other animals at the Henry Vilas Zoo in Madison. Having grown up on and then owning his own dairy farm before moving to the city, handling animals was a welldeveloped skill and sufficient to land him the job he would work for decades.

THE MAUSER C96 CONTINUED

ORIGINAL PAGE 17



Left: While a number of variations and chamberings exist, the classic C96 is chambered in 7.63x25mm Mauser (.30 Mauser) with a fixed tenround magazine.

ORIGINAL ARCHIVE IMAGE · PERMISSION CONFIRMED



Below: Despite not being a great commercial success, the Mauser was one of the first reliable selfloading handguns and saw widespread use in both world wars.

ORIGINAL ARCHIVE IMAGE · PERMISSION CONFIRMED

History The Mauser C96 (Konstruktion 96) is a semi-loading, short recoil pistol originally manufactured by Mauser from 1896 to 1937 with copies made in Spain and China. The design originated with the brothers Fidel, Friedrich, and Josef Feederle. Fidel was a Mauser employee, working as the Superintendent of the Experimental Work Shop for the company. He and his brothers began designing and prototyping the P-7.63 Feederle Pistol on their own as a side project.

When the company decided to manufacture the pistol for commercial sale in 1896, Paul Mauser dubbed the C96 the “Mauser Military Pistol” to attract military buyers. English cavalry officer and future British Prime Minister Winston Churchill was fond of the C96 and used one in 1898 at the Battle of Omdurman and again during the Second Boer War. Thomas Edward Lawrence (of Arabia) packed a C96 during the Sinai and Palestine Campaign and the Arab Revolt.

Those that liked it generally did for its (for the time) high capacity and high velocity. The C96 has a distinctive look due to its long barrel, integral magazine in front of the trigger, rounded handle-like grip, and wooden holster/carrying case that also doubles as a shoulder

stock. In English-speaking countries the gun was nicknamed “broom handle” for its unique grip.

The Chinese dubbed it “box cannon” because of its square-shaped magazine. The C96 was originally chambered in 7.63x25mm Mauser, a cartridge based on the togglelocking C93 Borchardt’s 7.65x25mm round designed in 1893 chambered for the first mass-produced self-automatic pistol.

Mauser’s cartridge was essentially the same dimensionally but charged with 20% more propellant, hurling an 88 grain bullet at a muzzle velocity of around 1400 feet per second. Given the C96’s long barrel and this higher velocity cartridge, the pistol had superior range and penetration than other pistols of the day and remained the fastest commercially-available round until the .357 Magnum was released in 1935. A year into production Mauser strengthened the action and added an extra locking lug to the bolt.

The design was reworked again to motivate cavalry sales by way of a positive safety that fully blocked the cocked hammer while allowing loading. Various hammer, safety, and

internal tweaks were done over the next decade but sales were stagnant until the Central Powers of the German, Austro-Hungarian, and Ottoman Empires had a sudden demand for arms in 1914. The German Army had previously been more interested in 9mm Parabellum pistols but wartime demand ramped up procurement and production of all arms.

Mauser abided with German Army-ordered C96 pistols chambered in the cartridge and produced an initial run of 150,000 copies. These were dimensionally-similar with the most prominent change in appearance being a large “9” engraved in the grip handles. Following the Great War, with the Austro-Hungarian and Ottoman Empires dismantled, Germany was stuck with most of the blame and severe limitations on military production by the Treaty of Versailles. Mauser managed some sales, including continuing the C96 line.

The so-called Bolo model was sold to Bolshevik Russia in 1921 and this variant comprised over a third of the C96s made. To be compliant with the Versailles Treaty, Mauser produced the C96 with shorter 3.9” barrels and smaller grips, which had the unintended consequence of making them easier to conceal. This variant’s popularity with the

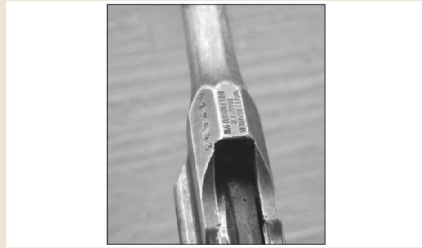
THE MAUSER C96 CONTINUED

ORIGINAL PAGE 18



Above left: Mauser produced over a million C96 pistols in their Oberndorf factory. Above right: Wartime Commercial production C96 pistols were made throughout World War I and was one of the biggest lots of the gun made.

ORIGINAL ARCHIVE IMAGE · PERMISSION CONFIRMED



Above left: Mauser produced over a million C96 pistols in their Oberndorf factory. Above right: Wartime Commercial production C96 pistols were made throughout World War I and was one of the biggest lots of the gun made.

ORIGINAL ARCHIVE IMAGE · PERMISSION CONFIRMED



Below: Neue Sicherung (New Safety) identified with "NS" monogrammed on the back of the hammer were the third of four safety variations and found on Wartime Commercial, Prussian Contract, Postwar Bolo models.

ORIGINAL ARCHIVE IMAGE · PERMISSION CONFIRMED

Bolsheviks is said to be the reason for the "Bolo" moniker. In addition to the pre-war, fixed ten round 7.63mm configuration, larger capacities of twenty and more rounds and machine pistol variants were offered based on patents by Josef Nickl. The "Pistol M30 Schnellfeuer System Nickl" M712 was a select-fire, full-automatic C96 with detachable magazines.

Mauser then continued production of their longrunning pistol line into the 1930s but was losing market ground to other self-loading handguns and to copies from Spain and China. While never officially adopted by any country as their primary sidearm, limited numbers were purchased by military and police forces in Germany, China, Indonesia, Italy, Norway, Persia, Turkey, as well as unofficial use by troops in a large number of other countries. By 1939 Mauser had produced over one million C96 pistols.

Given copies made in Spain and China, total production is higher. Impressions Historical and serial number research tells me my Grandfather's

C96 was manufactured sometime during World War I.

The serial number places it among a batch of about 150,000 Wartime Commercial pistols made for Germany between 1914- 1918 with this particular one made toward the tail. Having "liberated" it from Germany and choosing not to cast it into the Atlantic, the pistol remained buried in a steamer trunk after getting stateside and was purposely forgotten for many years. After moving off the farm and into the city, Grandpa liked to keep busy with various hobby and restoration projects.

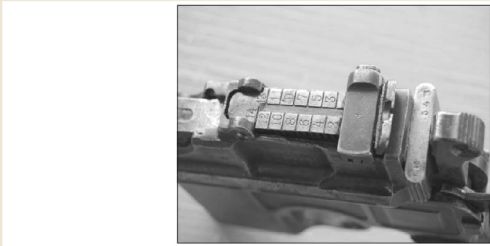
He eventually built a display box to add his trophy to the ever-expanding collection of curios in his basement bar where it remained until his passing. Knowing I'd appreciate it most, Grandma bequeathed it to me. Seeing it displayed above my fire place and coming upon a fair deal on .30 Mauser ammunition, my friend and mentor Bob Kolesar convinced me to resurrect the old warhorse.

By the time I stripped the pistol to inspect and prepare it for our range session, this C96 was rapidly nearing 100 years since coming off Mauser's Oberndorf factory floor with other World War I arms production. All things considered, the pistol is still in surprisingly good shape. Slipping cartridges into the magazine at the range was the first ammo the gun had seen since the Roosevelt administration. All shooting was done standing, unsupported, and one handed—the way most pistoleros would have shot back then.

Recoil was sharp but not unpleasant. Despite the gun's size, the near-magnum velocity gave a bit end of that lot. It very well could have been issued and in service before the armistice. By the time it was re-issued to the German soldier whose fate was met on the European Theater by Technician Fifth Grade Melvin Bollig, this pistol had already been in service at least a quarter century and was likely older than either man at the time.

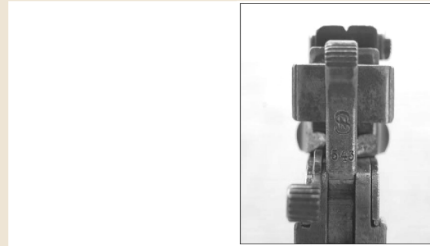
THE MAUSER C96 CONTINUED

ORIGINAL PAGE 19



Left: The C96 rear sight adjusts for elevation much like Mauser rifle sights. Elevation is marked in 100-meter increments for beyondoptimistic distances.

ORIGINAL ARCHIVE IMAGE · PERMISSION CONFIRMED



Above: Like their rifles, Mauser C96 sights were overly small and not a particularly good aid for good, consistent sight alignment.

ORIGINAL ARCHIVE IMAGE · PERMISSION CONFIRMED

of flip but was quite controllable. The biggest obstacle to good shooting were the tiny sights. Like their rifles, Mauser's sights are overly fine and consist of a leaf rear sight "V"-notch marked for elevation in hundred meter increments out to an optimistic 1400(!) and paired with a Mauser trademark pyramid front sight. Even in bright mid-daylight conditions the sights were dainty.

No one will confuse a C96 for a tuned NMC ball gun and the bore on this specimen is in rough shape but holding under eight-inch groups at 25 yards off our feet proved doable. Despite the less-than-pristine barrel, the gun fed and functioned without any problems. The C96 is a study in 19th Century engineering and craftsmanship. Every part is machined steel, the interlocking parts of the action are somewhat complex but completely functional and reliable, and the fit is first rate.

Upon attempting initial disassembly and learning the first step was removing the magazine base plate from the cleared pistol, I was concerned this one was different as it appeared the magazine was one solid piece. Closer inspection revealed the base did remove, it was simply fitted so well that no seam between the parts was evident. In a modern world of massproduced polymer, stampings, and

CNC machines, the C96 is a triumph of the Industrial Revolution and a great historical artifact.

War Trophy Policy During World War II the United States War Department had a much more open policy on troops returning with trophies.

Back then, pertinent war trophy firearm documents were in two record groups: Record Group 407 (Army-Adjutant General Decimal File 386.3: Captured Property) and Record Group 165 (Records of the War Department General and Special Staffs, Office of the Chief of Staff Decimal File 332.2: War Trophies, Box 208 and 307.) Records consist of discussions limiting war trophy firearms to one per soldier and provisions of Circular 155 published May 28, 1945 strictly forbid full automatic weapons.

This policy was extended through the 1950s. Records in Box 208 also limited War Trophy firearms to one per soldier. Normally, Customs would pass firearms not restricted by the National Firearms Act and would collect a duty for notably valuable firearms. If allowed, importing an NFA-regulated Elevation is marked in 100-meter increments for beyondoptimistic distances. firearm required a formal application before Customs would clear it.

Generally, all military and merchant marines were held to Department of War policies then, though some individual services, such as the Army and Navy, had established separate procedures for war trophies. Soldiers were authorized to bring or send machine guns back to the United States until the practice was prohibited by Section VI of Circular 155, effective May 28, 1945. Preceding policy (Circular 353, Section III) authorized bringing or sending back almost anything.

Concerns were subsequently expressed by authorities about NFA firearms. The only valid form for enemy captured items from the European Theater was the AG USFET Form N 33 (Authorization to Bear and Retain Captured Enemy Equipment) and usually applied to pistols. Our current Department of Defense has a different policy on war trophies than the War Department did during World War II. Army Gen. John Abizaid, the commander of U. S. Central Command, put out the policy.

Basically, under no circumstances can individuals take as a souvenir an object that was formerly in the possession of the enemy. It is strictly forbidden to bring back any war trophies at all. U. S. Central Command officials have been very clear that service members cannot bring home weapons, ammunition,

THE MAUSER C96 CONTINUED

ORIGINAL PAGE 20



Above left: The near-magnum velocity of the .30 Mauser yields sharp but controllable recoil. Above right: The C96 was never a target gun and this ancient piece has a bore in rough shape. Despite being shot by a 2650 Club pistol marksman, this target was typical for 25-yard groups.

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Above left: The near-magnum velocity of the .30 Mauser yields sharp but controllable recoil. Above right: The C96 was never a target gun and this ancient piece has a bore in rough shape. Despite being shot by a 2650 Club pistol marksman, this target was typical for 25-yard groups.

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30 Mauser yields sharp but controllable recoil. Despite being shot by a 2650 Club pistol marksman, this target was typical for 25-yard groups. or other prohibited items. A few soldiers trying to smuggle weapons back from Iraq and Afghanistan have gone through courts martial and others received Article 15 administrative punishments. Maj.

Robert Resnick, an Army lawyer at Fort Stewart, GA noted, "There is a whole spectrum of punishments, depending on the severity of the offense." Mauser Collector Notes I was able to collect some manufacturing data on my Grandfather's captured Mauser. Mauser C96 Serial number 413543, Waffenfabrik Mauser, Oberndorf am Neckar, Neue Sicherung. This was a Wartime Commercial build made between 1914-1918 with serial numbers 270000- 430000.

Start of war time production began with serial number 273339 and standard war commercial production ended in 1918. By serial number 280000 Neue Sicherung (New Safety) was introduced. Identified with "NS" monogrammed on the back of the hammer, New Safety models

were the third of four safety variations and were found on Wartime Commercial, Prussian Contract, Postwar Bolo models. The safety is on when pushed up and the hammer must be manually held reward to engage it.

This locks the hammer back much like the Mauser 98 bolt action's three-position safety. Current and would-be Mauser C96 collectors are at a disadvantage due to all Mauser company and manufacturing records being destroyed at the conclusion of World War II by order of the U. S. Army. This can make referencing specific details of when a given serial-numbered firearm was made, or even the quantity of a specific model, quite difficult. The C96 was not a commercial success initially.

It is believed Mauser may have purposely skipped blocks of serial numbers intentionally to give the appearance of greater sales volume, though some of these numbers by have been back filled later. Adding to this mess, some C96 pistols were made under contract and such lots were serial numbered as their own series beginning with number "1." This can mean that some samples with



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sequentially lower serial numbers were actually made later than higher-numbered firearms and vice versa.

All firearms, especially those made and issued during times of war, experience design evolutions. Changes are made to improve performance, address discovered flaws, to reduce production cost, or other reasons. The C96 experienced a multitude of changes over its four decades of production, including parts modifications—notably the hammer, rear sight, and extractor—and four variants of the safety. In addition to sketchy serial numbers, C96 pistols are best identified by appearances and mechanical characteristics.

It's worthy to note Mauser would sometimes implement a design change for a given contract or for general production only to return to using older parts or milling procedures on later models. If there was an explanation for this, it was lost when that U. S. Army officer in charge of the captured Mauser plant in Oberndorf am Neckar ordered the records destroyed. AG

TOOLS & FIXTURES

New For 2018

A selection of new tools and parts for gunsmiths.

BY AMERICAN GUNSMITH STAFF APRIL 2018

ORIGINAL PP. 21–23

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Birchwood Casey has made products for gunsmiths for years. Their new Weekender Kit is a consolidated gunsmith kit to help keep firearms running in top form. The Kit comes with professional gunsmith-selected tools, including specialty bits for specific firearms, and a durable hard case to keep things organized. The 27-piece kit includes a nylon and brass-faced hammer, precision Phillips and flat screw drivers, brass, steel, synthetic, and roll pin punches, and flat, Phillips, hex, and torx driver bits. MSRP \$36.

BirchwoodCasey.com, Real Avid Started in 2009, Real Avid makes tools for gunsmiths and firearm enthusiasts. The Spot Light Precision Cleaning Kit is a multi-tool with built-in light. Three LED lights are built into the handle to illuminate the

tool and work. The handle can hold a selection of included tools, such quick-change cleaning tips and swab holder that accommodates most common cotton swabs and patches, brass pick, nylon and brass scrapers, and nylon and bronze brushes. MSRP \$29.99.

The Armorer's Master Wrench is an ergonomic update that delivers serious torque. Designed to be the most comfortable and accurate wrench on the market for torquing barrel nuts and castle nuts, this tool also features muzzle brake and fixed stock receiver wrenches. Included in the handle are three interchangeable nylon, brass, and rubber hammerheads. MSRP \$59.99. The Lug-Lock Vise Block uses the strength of the barrel lugs to safely secure an AR-15 upper during work.

Rather than clamping the upper receiver into a vise, the Lug-Lok secures any upper receiver by fitting into the barrel extension with a non-marring, machined aluminum block. Additional pins hold the working angle steady and a Lock Knob keeps the upper where wanted. MSRP \$69.99. The Master Bench Block is designed to improve the installation and disassembly process of critical pins on AR-15s, handling 14 of them from five different components. The block is wrapped in an over-molding that grips to the bench.

Clear, engraved labels aid in organization of component placement and the punch size needed for each pin is listed. Magnets inside the holding areas keep pins from getting lost. MSRP \$29.99

NEW FOR 2018 CONTINUED

ORIGINAL PAGE 22

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The Smart-Fit AR-15 Vise Block provides solid support for lower receivers by inserting into the magazine well. Adjustments customize the fit to any lower and the Pivot Lock positions it as needed. This block can also be used with an inverted lower receiver to work on pistol grips or to allow easy access to the underside. MSRP \$29.99. Real Avid. com, Otis The Bore Stick is composed of VCI corrosion inhibitor to protect guns from rust and corrosion.

When inserted into a barrel, the flexible Bore Stick slowly emits molecules that create a protective barrier on the metal surface. Using the included plug to date and cap the muzzle and with a closed action, the sealed chamber will last for two years. Available in rifle, shotgun and pistol lengths. Foaming Bore Cleaner expands on its own and does much of the cleaning work for you. When sprayed into the breech end, the foam expands and fills in, ensuring complete coverage before breaking down when done.

The residue can be easily wiped away with a standard cleaning cord or rod and patch. OtisTec.com, 800/OTIS-GUN XS Sights F8 Night Sights are high-visibility personal defense sights for fast target acquisition in all light conditions. Featuring a figure-eight, inline sight picture for two-point alignment, the F8 sights are designed to increase front sight focus due to the large (0.160" wide) high-contrast front sight with a photo luminescent orange-colored ring surrounding the tritium.

This proprietary, durable XS Orange paint is formulated with a focus on yellow, one of the most visible colors in low light, making it easier to see in rapidly changing light conditions. In addition to the tritium, F8 Night Sights also absorb ambient light, increasing the glow in differing light levels and providing illumination before the tritium becomes visible. The chamfered notch eliminates the bottom edges of the sight, drawing focus to the top edges for proper alignment.

The overhung rear sight reduces glare in bright daylight for greater sight definition and its angled ledge aids in one-handed slide manipulations in emergency situations. F8 Night Sights have a ten-year, "no questions asked" warranty. After 10 years, XS will replace the sight at a discounted price. MSRP: \$184.99. XSsights.com, CMC Barrels CMC's Match Precision Barrels are upgrade, drop-in barrels for Gen 3 and 4 Glock 17, 19, and 34 pistols.

Machined from certified, DFARs compliant, pre-hardened 416R stainless to tight tolerances and exacting details with CMC's propriety, in-house machining process, the barrels are six groove, cut rifled, 1:10 twist right hand and double honed (rough and finish) with a max Roughness Average (RA) of 12 or better. The finished bore dimensions are held to +/- 0.0005" toler-

NEW FOR 2018 CONTINUED

ORIGINAL PAGE 23

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ance from nominal groove and bore dimensions but the dimensions are uniform to within 0.0002 for maximum consistency. Three finish options include stainless satin blast finish, bronze Ti CN, and black DLC, all with a low friction h BN (Hexagonal Boron Nitride) bore and chamber. Available with and without suppressor threads in 1/2-28 TPI RH. MSRP \$199.

CMCtriggers.com, T-Worx Holdings The Intelligent Rail AR-15/M4 upgrade kit is an integrated power and data communications system that is easily installed on any AR-style modern sporting rifle. Included in the Sportsman kit is a buttstock, handguard with M-Lok, integrated I-Rail quad-rail, a three-button switch pad, tactical light, and wireless communications module. The Defender kit includes a Steiner DBAL aiming laser and an integrated Silynrx radio push-to-talk module.

The custom buttstock houses a 12-cell AA battery pack that routes power to the I-Rail through an armored sleeve and connector. Within the kit is a floating handguard with M-Lok outfitted with a powered rail system with Picatinny profile. Unique to the Intelligent Rail kit is a patented power core and data connection embedded into the rail system, providing managed power to compatible accessories, such as lights and cameras.

A software developer kit is available for accessory manufacturers to adapt the power and data to their devices. T.Worx. com, JP Enterprises The Fire

Control Module is a dropin unit that easily installs, requires no adjustments, and includes an ambidextrous safety and swappable trigger shoes. The new safety drum is compatible with all JP safety levers and trigger shoes and can be swapped in just a few minutes. The pull weight is adjustable with changeable hammer springs.

The included yellow and red hammer springs can be swapped out by the user to create 3.0-3.5lbs (yellow) or 3.5-4.0lbs (red) pull weights. This will fit any receiver with standard mil-spec pin geometry. JP Rifles.com, Gunwerks Gunwerks announced their new Stockwerks line of stocks for 2018. The Clymr is intended for mountain rifles with titanium actions and carbon Proof Research barrels where weight reduction is a premium.

Using carbon fiber layup technology, the stock has an aluminum bedding block, flush-mount bipod rail, and full length-of-pull adjustability while remaining among the lightest stocks available. The Magnus is a do-all rifle stock that's light enough to carry anywhere yet capable of extended range performance. Built of light carbon fiber construction and configurable CNC inletting, this stock has adjustable recoil pad hardware to fit the shooter and a flush-mount bipod rail.

The Verdict is designed for maximizing performance at extreme range. A fully configurable and adjustable rifle stock system built with carbon fiber composite layup, it comes with optional M-LOK accessory rails, inletting that can be precisely machined to match any barrel

and action combination, adjustable negative comb, adjustable butt pad, and adjustable cheekpiece. Gunwerks.com, 877/GUN-WERKS Skyhorse Publishing Completely updated with new color photographs throughout, Small Bore Rifles by C.

Rodney James provides a starting point for the beginner as well as a current summary of the state of smallbore rifles, ammunition, and shooting for intermediate shooters. The tested tips, tactics, and techniques for smallbore rimfires includes sections on ammunition, rifle selection, shooting techniques, maintenance, hunting, competition shooting, and field performance for smallbore rifles. The Guns & Ammo series includes two books from the editors and writing staff of Guns & Ammo magazine.

The Guns & Ammo Guide to AR-15s covers a range of topics, including AR home defense, military view points, bore conditions that affect a cold-bore shot, Geissele triggers, aperture sights, High Power competition, and historical AR systems.

The Guns & Ammo Guide to AK-47s covers the most widely-distributed firearm in history and includes topics such as building an AK, mounting optics, devices for minimizing felt recoil and flash, cold-weather training, making an AK California-legal, zeroing and ballistic information, and AK variants from around the world. Skyhorse-Publishing.com, G

PISTOLS

Reader Forum

BY AMERICAN GUNSMITH EDITORS APRIL 2018

ORIGINAL PP. 24

M1 Carbine I noticed several letters in recent Reader Forums regarding the M1 Carbine. One answer mentions the Carbine being made by Singer and International Harvester, however, neither was involved. International made M1 rifles during Korea and Singer made a very small number of M1911-A1 pistols but neither made Carbines or parts.

Carbines were made by Inland Division, General Motors, Winchester Repeating Arms, Irwin-Pedersen, Saginaw Steering Gear Division of General Motors, Underwood Elliot Fisher, National Postal Meter, Quality Hardware Manufacturing Corp., International Business Machines, Standard Products, Rock-Ola Manufacturing Corporation, and Commercial Controls Corporation. Commercial Controls made slightly over 200 and are the most rare.

Concerning the operation rod sometimes being hard to manually pull back, the recoil spring would have nothing to do with the problem. Most likely cause is a corroded chamber if the problem occurs with the gun loaded. Although the U. S. never used corrosive primers in Carbine ammo, large quantities of corrosive cartridges were imported in the 1980s from China. It was headstamped "LC 52" since that was the captured ammo it was copied from.

With an Iver Johnson, the next thing I'd look at would be a worn bolt lug or operating arm. The op arms were only stamped steel and not of good quality. Daniel P. Horn Steve Gerhardt S. D. Gerhardt, Gunsmith Author RK Campbell responds. Thanks so much for reading and for the information. I am filing this away for future reference. High Standard Help I'm trying to find a barrel for a High Standard HD Military .22. I currently have a damaged 6 3/4-inch barrel.

Also, what is the BATF stance concerning charging gunsmiths for another license if they have to make apart for a customers firearm? Mark Wiggins Availability usually depends on whether they made the gun or not but calling High Standard to find out is free. They're located in Houston, Texas (HighStandard.com Regarding the part question, it depends on the BATF inspector's interpretation of such a rule. If the part is available from a manufacturer or the aftermarket, it's only a replacement.

If it isn't and you are not altering the original operating principle of the weapon, you probably won't need a manufacturer's license. Producers of firearms must have one. AG

ORIGINAL SOURCE PAGE

24

SEARCHABLE ISSUE RECORD

Archive index

DEFCON 4SD American Gunsmith Editors	2	Handgun Grip Reconstruction Norman E. Johnson	14–15
The “Untouched” Martini- Henry, Part Two Paul Mazan	3–5	The Mauser C96 John M. Buol Jr.	16–20
Making Odd Ones Shoot Ray Ordorica	6–10	New For 2018 American Gunsmith Staff	21–23
Finding Information Ed Nutter	11–13	Reader Forum American Gunsmith Editors	24

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