



SEP 2020

DIGITAL ARCHIVE
EDITION

PRECISION ARMS WORKSHOP

AND THE AMERICAN GUNSMITH ARCHIVE

A TECHNICAL JOURNAL OF CRAFT, REPAIR & RESTORATION

09

ARCHIVE ISSUE NUMBER

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IMI JERICH0 MODEL 941F

STRIKE HOLD • WORKING HOPKINS & ALLEN REVOLVERS, PART 3 • COZAD MANUFACTURING • DESERT EAGLE

ORIGINAL METHODS. MODERN ACCESS.

ARCHIVE EDITION 201

DIGITAL ARCHIVE EDITION

Preserved for the bench.

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AMERICAN GUNSMITH

DIGITAL ARCHIVE EDITION • SEPTEMBER 2020

ISSUE RECORD

ORIGINAL DATE	September 2020
VOLUME	Archive volume not stated
ISSUE NUMBER	09
SOURCE ID	ag-6954eef83ffbb775ae8a0dc0

DIGITAL EDITION

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

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

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FINISHING

Strike Hold

BY AMERICAN GUNSMITH EDITORS SEPTEMBER 2020

ORIGINAL PP. 2

Gun is a fast-acting, penetrating cleaner and lubricant. Originally developed for the U. S. military, it goes on wet and dries in place, leaving a hard finish coating that protects weapons by deterring carbon build-up, contaminants, and corrosion in all weather conditions. As a cleaner, it removes firing residues, gum build-up as well as foreign debris from weapons components. As a lubricant, it contains synthetic-based additives that act like microscopic ball-bearings to reduce friction.

Strike Hold Gun has been battle tested on all types of weapons systems from 9mm pistols to M110 sniper rifles, M4 to .50 caliber, field artillery, and even M1A2 Abrams tanks. Its capillary action coats and reaches all surfaces without retaining dirt, dust, and particulates. It provides along-lasting dry lubricant to greatly reduce friction while preventing carbon build up and removing rust, lead, and copper.

Strike Hold Gun can be repeatedly sprayed onto a surface without gummy build up and it won't harm materials such as rubber, paint, most plastics, and wood finishes. It contains no CFCs or other ozone-depleting substances by using a non-flammable CO2 propellant. The formulation was created by Michael Huggard (formerly of the 504th Parachute Infantry Regiment, 82nd

Airborne Division) to help troops that were experiencing a weapon failure rate of almost 50% due to a sandy, desert environment.

After a request by several Major Generals to fix this, Huggard's solution formed the basis of Strike Hold that works as a lubricant, protectant, and cleaner.

Use of this solution reduced the failure rate to nearly zero. "As a retired Special Forces operator and primary Armorer for the 101st Air Assault Division under General David Petraeus, I can attest to the fact that Strike Hold is by far the most effective cleaner and lubricant on weapons.", says David Foster, Jr. "One of my Ruger Mini 14 rifles has spent close to 30 hours afield with me, and recently when I disassembled it to clean it the Strike Hold was still doing a fine job," says Alaskan gun owner Vic Kennard. "I only needed to clean burnt powder and copper from the action and bore.

The big cold -50 to -65 below are still weeks away, but with what I can see the moisture has not defeated the Strike Hold." Strike Hold's parent company, Force 5, also makes a line of lubricants and cleaners for HVAC, automotive, and marine use in addition to firearms. Case lot sales are available. Contact or StrikeHold.com for more information.

PISTOLS

IMI Jericho Model 941F

Israeli Military Industries makes a number of effective firearms, the Jericho Model 941F pistol among them. Here's how to work it.

BY MARK R. HOLLENSEN SEPTEMBER 2020

ORIGINAL PP. 3-8

The call came in from a potential customer describing that his trusty “9mm ACP pistol” was no longer working properly. He told me that the hammer cocked back to the rear, but when pulling the trigger, nothing happens and the hammer wouldn’t fall. However, if he thumbed the hammer back from the cocked position, he could hear a “click” and then the pistol would fire. I received the pistol shortly thereafter to inspect, test, and finally provide the owner with an estimate of repairs.

Often this is a straight forward process, but on occasion, it isn’t so simple, as was in the case of this pistol. We’re talking about an IMI (Israeli Military Industries) Jericho Model 941F, 9x19mm pistol in satin nickel finish. These pistols are single-action only, have an all-steel construction, sport a 4.5" barrel and have a magazine capacity of 15 rounds. The sights are adjustable for windage only and are low profile.

The finish appears to be durable, looking and feeling much more like a hard-chromed finish rather than their stated satin-nickel finish. The gun feels very solid in the hand and has a very comfortable grip. Trigger pull is really good (when it works properly) and the gun in hand today appears to have been shot quite a bit.

These pistols are reported as being Israeli Police turn-in guns and are identified by a unique Police “star” marking or emblem etched or engraved on the right side of the frame forward of the serial number (the location on this pistol anyway). First and

foremost, I began looking into the history of this pistol, along with parts sources, and to determine if it was under any current repair warranty. I like to begin there before opening up any firearm on the chance that the product is covered under an active warranty.

My research for the pistol first led me to IWI (Israel Weapon Industries, LTD) since the owner’s manual I had on file was printed by them. I spoke with a customer support representative that shared with me that the “IMI Jericho 941F” pistol on my bench had been imported into the United States by K. B. I., Inc. of Harrisburg, PA. And according to source records found, K. B. I. Inc. went out of business on January 29, 2010.

The service representative went on to say that the IMI pistols were not under any IWI warranty and that they don’t recommend utilizing IWI Jericho double-action pistol parts in the IMI guns, stating that they may not work properly since the IMI guns are single action only. After that phone call, I researched further and found that parts are still available for these IMI guns, with most being found on the Numrich (GunPartsCorp.com) website. You will need to look under “Kassnar” to find them.

I also found that in 2005 IMI sold its Magen division (small arms division) to an Israeli privately owned holding company called SK Group and renamed it Israel Weapon Industries. Continuing, I found engraved into the bottom of the trigger guard “C. A. I. Georgia, VT” and “Made in

Israel”. It could be that K. B. I. imported the gun, but the inscription on the trigger guard shows Century Arms International as being the import entry point. I can only report what I am seeing and finding in my research.

Continuing with my research on the pistol, I searched my American The finish on these pistols looks more like a hard-chrome rather than a matte-nickel finish. These pistols were imported from Israel by K. B. I. and C. A. I. The pistol show here has “C. A. I. Georgia, VT” laser etched on the bottom of the trigger guard. Gunsmith library and quickly found an article penned by the late Chick Blood in the January 2010 issue. This article covered the disassembly and reassembly of the K. B.

I. (IWI) Jericho 941 double-action pistol, which is in fact similar to the IMI Jericho pistol we are discussing today. I also noticed that AGM covered the departure of then-editor Keith Lawrence and introduced the new editor—John Buol—in that very same January 2010 edition. Hard to believe it has been 10 years now, John! I can’t [believe it myself!—Ed.]

Getting back to this repair, I was pretty much now armed with some background of the pistol in hand and had a viable source for parts that were (mostly) still available. I opened the pistol up to see what was happening—or in this case, not happening. When working the slide (as if loading the pistol) I found that the hammer would stay cocked to the rear, but the trigger could be pulled

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and released as many times as you cared to and the hammer would not fall. Even sharp raps to the cocked gun resulted in the hammer staying put. However, thumbing the cocked hammer ever so lightly to the rear from the fully cocked position created the clicking sound the customer had mentioned and the gun would then fire. I also found that cocking the hammer by hand with the slide attached, the trigger would move the sear and fire.

I removed the slide assembly and performed hammer cocking tests, resulting in the hammer cocking back and the gun working—without the slide on it. However, with the slide assembly removed, pushing the trigger bar down so the two top protruding ears on the trigger bar were positioned below the slide. The magazine plate shown has loops on both ends that are captured at the top by the magazine plate pin and at the bottom by the hammer spring cup and pin.

The bottom loop shown on the magazine plate fits into the groove in the hammer spring cup and the lanyard loop pin secures them to the frame when reassembled. rails and then cocking the hammer, the gun would not work. So when the slide is on the frame, it pushes the trigger bar down-

ward enough to prevent the sear from fully connecting with the hammer when cocking it to the rear. At this point, functioning tests were pointing directly at the sear engagement.

I noticed that pushing the trigger bar downward while cocking the hammer to full cock, the trigger bar would not come back upward or reset when releasing the trigger. In other words, pulling the trigger (connected to the trigger bar) rearwards, the trigger bar stayed below the slide rails and would not release the sear to drop the hammer. Only when either cocking the hammer rearward a tiny bit more or lightly pushing down on the top of the sear leg did the trigger bar release and allow the gun to go into battery.

Far All that is left attached to the slide is the extractor, extractor pin, and extractor spring. Care should be taken when removing this type of roll pin and one should think carefully before removing any of them as they can be damaged easily. Because this pistol appeared to be well-worn, I contacted the owner to ascertain if he wanted me to move forward with repairs or to stop, due mostly to the estimated costs of getting the pistol working again.

My experience has shown that when you think that one or two parts will repair the malfunctioning gun, it can (and often does) result in having to replace many more parts. And this costs money. So I wanted my customer to know up front the potential “rabbit hole” of this repair turning into a potentially stacking increase in parts and labor costs, depending on what all had to be replaced. He gave me the green light to push forward.

I began by ordering in anew sear, sear spring, and sear pin to determine if those parts corrected the issue. Since the article in the January 2010 article covered the IWI Jericho 941 double-action pistol, I felt it was prudent to cover the complete disassembly and reassembly of this particular pistol, even though the procedure is almost identical to the IWI pistol.

With ten years passing by since that original article was printed, I figured a current one would be beneficial; especially since there are many of these IMI guns floating about the United States now. Disassembly During my research for a schematic and parts listing, I ran across three different variations that included only partially correct information about this particular pistol. One was

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found with the proper parts names but had a different pistol shown in the schematic. Another had the correct schematic but the parts were to a different model pistol. To make the attached schematic and parts list correct, I used the official schematic from the owner's manual and typed out all parts by number based on the seven pages of parts listed in that same manual. Therefore, the schematic and parts list now match and are correct for this particular make and model pistol.

You may want to copy and save it in your files just in case one comes into your shop. With that said, let's get started with the disassembly. Since this pistol was extremely dirty with powder fouling and residue, I completely disassembled it for the deep scrub it deserved. Begin by removing the magazine (not listed or shown in the accompanying schematic and parts listing), pulling the slide fully to the rear and inspecting the chamber to ensure it is unloaded and that no live round are in the chamber.

With that visual inspection done, close the slide. With the hammer still cocked, use your weak hand to move the slide (4) rear-

ward until the dot or dimple located at the left rear back of the slide aligns with the dot located at the back of the receiver just below it. Use your strong hand finger to push the slide catch (47) from the right side of the frame towards the left, removing it completely.

This allows you to simply pull the slide and Below the trigger guard is the trigger bar plunger, trigger bar plunger spring, and safety pin that applies upward spring tension to the underside of the trigger bar. This will come out after the trigger and bar barrel assembly forward and off of the receiver. This completes disassembly for routine cleaning other than removal of the recoil spring and rod assembly (1 & 2), the barrel (3), and the grip panels (35 & 38).

While I am on the topic, I see so many pistols and revolvers that are kept very clean—except for under the grip panels. This area grabs oil, water, perspiration, debris, salt, and just about every contaminant known, trapping them under the grip panels and resulting in corrosion, rust, pitting, and permanently damaging the frame(s). And this

pistol was no exception as it had pits in the frame in the outline of the grip panels on both sides.

I realize that not everyone has hollow ground screwdrivers in their tool boxes but removal of the grip panels or grips depending on what firearm you have is paramount in keeping any firearm in like-new condition or at least preventing corrosion and damage to the frame. This is more important for nickel plated guns.

To me, it is worth either buying the correct hollow ground screwdriver or grinding down (hollow grind) one cheap screwdriver to fit the grip panel screw head so those areas can be properly cleaned and wiped down without damaging the screw head. assembly are lifted out of the frame. Note the position of the trigger spring (long leg) and where it seats in the frame during reassembly. The sear spring is also shown with the short leg in position up against the back of the sear.

The long leg is difficult to see but is in the safety lever leg groove where it captures the safety lever to the sear housing and frame. Also shown is the ejector (part of the sear housing unit) and single leg sear.

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Continuing, completely disassemble the slide assembly, invert the slide on your bench, and depress then remove the recoil spring guide and spring assembly (1 & 2). You will notice this is an assembled (self-contained) unit. To remove and/or replace the recoil spring or rod, drift the spirol spring-type roll pin that secures the small rear washer to the rear end of the recoil guide rod. This will then release the spring tension on that washer so that you can replace the spring or rod. Reassemble in reverse order.

Take note that almost every pin found in this pistol is the spirol roll pin type. Therefore, before you decide that it is absolutely necessary to remove one or more of these pins, you need to know that the spirol or spirol-type roll pins are fragile and can be damaged very easily during removal and/or installation. You might want to perform a search for the replacement roll pin first, before executing the removal of them.

Removal of this allows for the removal of the sear housing inside the frame as the leg on the safety secures the unit in place. Be careful when removing the safety lever as there are two small parts that are easily overlooked or lost attached to the back side of the safety lever plate shown. With the recoil guide rod and spring assembly disas-

sembled and removed, lift the rear of the barrel (3) and pull it out from the underneath of the slide (4).

Note that the barrel lands are polygonal or without sharp cut lands and grooves, therefore, cast bullets might result in poorer accuracy. Continuing, use a pin punch to depress the firing pin (14) at the back of the slide inward until you can pull down on the rear firing pin plate (5) to remove it. Go slowly as the firing pin is under spring tension and can fly away if not contained during removal of the rear plate. Once the rear plate is out, withdraw the firing pin and firing pin coil spring (13).

With the firing pin and spring removed, pull downward on the firing pin blocker (7) and remove it from the underneath of the slide. It has a Far The slide catch spring pin holds the spring in place. Removal of that small pin released this spring from its groove in the frame. This clearly shows the correct position of both the sear spring and trigger spring when assembled correctly in the frame.

This pistol has a fairly simple yet effective design. very small coil spring attached, called a firing pin blocker spring (6), so be careful not to lose it. To complete disassembly of the slide, drift the spirol roll pin located on top of the slide over the extrac-

tor (9) downward towards the bottom of the slide to release the extractor (10) and extractor coil spring (11). Only drift this pin downward enough to remove the extractor and extractor spring as you don't need to fully remove it.

Reassemble these components in reverse order. Moving onward to the receiver (50), begin by removing the grip panel screws (37) and then the grip panels (35 & 38). No parts inside of the frame will fall out, so this is a straight forward grip removal. Looking inside the frame, note along, flat, wide spring called the magazine plate (41). The top of it is retained in the frame by a small straight pin called a magazine plate pin (42).

Depress the "plate" near the pin and push the magazine plate pin out of the frame (either direction). De-cock the hammer (31) so that it is fully forward to take pressure off of the hammer coil spring (40). Holding the frame in the upright position with your weak hand, push downward on the bottom of the frame where the hammer spring cup (39) is protruding to take spring pressure off the hammer spring cup pin (49) that has a loop on the left end of it (located at the bottom of the grip frame).

THIS LANYARD-TYPE LOOP HAMMER SPRING CUP PIN (49) SE-

IMI JERICO MODEL 941F CONTINUED

ORIGINAL PAGE 7

So much of that engagement was removed that it would not cock the hammer into battery when firing or racking the slide. Don't forget to inspect those areas for abnormal or excessive wear when trying to isolate malfunctioning issues. Cures the hammer spring cup and assembly to the receiver. It also secures the bottom of the long, wide magazine plate (41) that is still connected to the hammer spring cup. Depress the hammer spring cup until you can pull out and withdraw the lanyard loop end cup pin (49).

You can use a small pin punch to pull this pin out by inserting the punch inside the lanyard loop hole. Once that end cup pin is removed, get a larger pin punch (preferably brass so as not to scratch) and depress the hammer spring cup (39) inward into the bottom of the frame until you can pull the singlelooped end of the magazine plate out and clear from the groove for it located in the hammer spring cup.

Once that "magazine plate" is removed, remove the hammer spring cup and hammer coil spring from the bottom of the frame. The hammer spring (40) is a coil spring and it just fits into a seat made for it on the top end of the hammer spring cup (39). To separate the spring from the spring cup, twist it back and forth and pull it out of the seat. Remove the sear housing assembly (27). Notice this assembly is similar to the one found on CZ pistols and it comes out as a unit.

Begin by rotating the hammer rearward, then lift the long leg of the sear spring (26) that is resting in a slot on the safety lever leg (44) out of that notch and rest it on the sear housing next to the sear leg (28). Moving this spring leg out from that

notch frees up the safety lever leg so that you can remove it from the frame. Go ahead and rotate the safety lever up and down while pulling on it until it comes out from the left side of the receiver.

Take note that there is a very small coil spring (45) and plate (46) called the safety knock spring and safety knock (small flat plate) attached to the inside of the safety lever (44) plate. Take care not to lose them during assembly or cleaning. Once the safety lever comes out, the sear housing (27) will jump up under spring pressure from the trigger bar (23) but it comes out as an assembled unit. Set the sear housing assembly aside for now as we will cover it at the end of this article.

You can now remove the hammer (31), if needed. However, it is also retained by a larger spirol roll pin that can easily be damaged during removal or reinstallation. Unless you must remove the hammer, it is best to leave it in the frame as you can clean around it. To remove if needed, drift the spirol roll pin (48) out from right to left to remove the hammer and hammer rod or strut (30) assembly. To remove the trigger (22), drift the small spirol roll pin (43) out that retains it to the frame.

This pin is drifted out from left to right. Take note before you do this as the trigger spring (21) is captured by this roll pin. The long leg of the trigger spring points forward and up, resting in a groove in the frame forward of the trigger. The short leg of this same spring rests on the trigger (back right side) during reassembly. Once the spirol roll pin holding the trigger is removed, lift the trigger (22) and trigger bar (23) out from the top of the receiver.

Note, there is a plunger and spring assembly called the trigger bar plunger head (15), trigger bar plunger spring (16), trigger bar plunger (17) and safety pin (18) that applies upward spring tension to the underside of the trigger bar (23). As you lift the trigger bar out, you can then remove the trigger bar plunger head, spring, plunger, and pin that is housed in a frame hole directly behind the trigger.

To separate the trigger (22) from the trigger bar (23), drift out yet another spirol roll pin (24) called the trigger bar pivot that retains the two parts. And again, don't do so unless absolutely necessary (unnecessary for deep cleaning). To remove the slide catch spring (19) located on the inside right of the frame, use a scribe to depress this long wire spring downward at the point nearest to the slide catch spring plunger (20) that retains the spring in the frame.

That will allow you to push that pin (20) out of the frame (either direction but from inside the frame to out is best). This pin has a groove in the center where the slide catch spring will seat into it in order to retain it inside the frame. With that pin removed, lift the slide catch spring (19) out. Take note on how it is in place prior to removal. The dog-legged end of that wire spring points downward and it faces towards the front of the frame during reassembly.

Finally, remove the magazine catch assembly (32, 33 & 34). To remove it, use a small pin punch and insert it into the right side of the magazine catch to depress the magazine catch plunger (34) and

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IMI Jericho Model 941F (Specifications subject to change without notice) 1 Recoil Spring Guide 2 Recoil Guide Spring 3 Barrel 4 Slide 5 Firing Pin Plate 6 Firing Pin Blocker Spring 7 Firing Pin Blocker 8 Front Sight 9 Extractor Pin 10 Extractor 11 Extractor Spring 12 Drifted Rear Sight 13 Firing Pin Spring plunger spring (33) that holds the unit in place. Remove the assembly from the frame. Reassembly of the frame is performed in reverse.

Turning our attention back to the already-removed sear housing assembly (27), notice the sear spring (26) has along and short leg. The longer leg of the spring, with the bend facing upward, rests in the notch for it located on the safety lever leg (44) when reassembled. That longer leg retains the safety lever and prevents it from coming out of the frame during use. The short leg of the sear spring seats up against the back of the sear (28) pointing upward.

On this pistol I replaced the sear (28), sear pin (pivot) (25), and sear spring (26). It wasn't known at first if the safety lever (44) would work 14 Firing Pin 15 T. B. Plunger Head 16 T. B. Plunger Spring 17 Trigger Bar Plunger 18 Trigger Bar Safety Pin 19 Slide Catch Spring 20 S. C.

Spring Plunger 21 Trigger Spring 22 Trigger 23 Trigger Bar 24 Trigger Bar Pivot 25 Sear Pivot 26 Sear Spring 40 Hammer Spring 41 Magazine Plate 42 Magazine Plate Pin 43 Trigger Pin 44 Safety Lever 45 Safety Knock Spring 46 Safety Knock 47 Slide Catch 48 Hammer Pin (Steel) 49 Hammer Spring

Cup Pin 50 Steel Frame 27 Sear Housing 28 Sear 29 Cocking Sear 30 Hammer Rod (Strut) 31 Hammer 32 Magazine Catch 33 Magazine Catch Spring 34 Magazine Catch Plunger 35 Right Grip 36 Serrated Lock Washer 37 Grip Screw (2) 38 Left Grip 39 Hammer Spring Cup properly with this new sear but it did.

I need to point out that during my safety checks, I found that when the hammer was cocked and in battery, and the safety lever was placed in the ON position and the trigger was pulled, the hammer would not drop. However, after placing it to the OFF position, the hammer would sometimes fall; especially when using the slide catch to release the slide from the locked open position. With the sear housing removed from the pistol, remove the sear pin to remove the sear and sear spring.

The new sear was first test fitted to ensure it would fit into the confines of the sear housing and with light fitting, it did. The rear leg of the sear spring was found to be too long, so half of that was removed so it wouldn't interfere with the bottom of the slide. The new sear pin and the sear fit together very well, virtually eliminating the loose movement between the two parts. The original sear pin to sear fit was really loose from wear overtime.

Some light fitting adjustments were done to the sear where the hammer hooks lock onto it. After a few trials, the pistol worked flawlessly. This took care of the hammer not locking and going into battery when

racking the slide. Further, the hammer would not drop when closing the slide with the slide catch from the full locked back position, nor would the hammer drop when cocking it to the rear, applying the safety, pulling the trigger hard rearward, and then placing the safety in the fire position again.

Basically, the pistol passed all functioning and safety checks and tests at the bench. I took it to a range and live fire tested it afterwards and it worked great. No safety issues were found or noted and I was unable to make the pistol unsafe working the safety, slide, etc. Fortunately, this pistol was in decent shape, except for the sear. When inspecting the sear, look for signs of excessive wear. The areas where the hammer hooks lock onto the sear in this pistol were worn down way too far.

And this is most likely what caused the hammer to cock back but not go into full battery. This condition may not always be corrected by a sear replacement, so you will have to look closely at the wear indicators found on the sear, sear pin, and even the safety lever leg to ensure you have isolated the malfunctioning issues at hand.

Hopefully this information will assist you the next time one of these IMI pistols lands on your bench; whether completely disassembled and already in a baggie, missing parts, or not working properly. If it has a similar diagnosis as what I found herein, the sear is the obvious place to begin. AG

PISTOLS

Working Hopkins & Allen Revolvers, Part 3

Article three covers H&A top break revolver models.

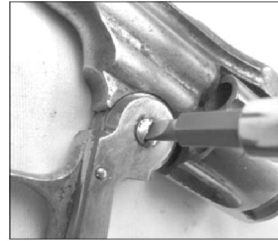
BY BRIAN R. SMITH SEPTEMBER 2020

ORIGINAL PP. 9-13



Right: Top break H&A models are represented in the series by an unnamed model in 38 S&W, featuring a two-piece, nickel-plated, cast iron hinged frame, hard rubber grips, five-shot cylinder, and a selfextracting cylinder.

ORIGINAL ARCHIVE IMAGE • PERMISSION CONFIRMED



Below left: Once the hard rubber grip panels have been removed, pliers are used for removal of the mainspring by grasping the spring, shifting it forward a bit, then sideways and out of the grip frame. Below center/right: It is recommended to remove the hinge pin and separate the two halves of the frame before any further disassembly. It is much easier to work on each half individually than when assembled together. Note that the hinge pin is in two pieces; there is a screw on the left side and a pan-headed, internally threaded smooth pin on the right. Drive out the smooth pin using a punch.

ORIGINAL ARCHIVE IMAGE • PERMISSION CONFIRMED



Below left: Once the hard rubber grip panels have been removed, pliers are used for removal of the mainspring by grasping the spring, shifting it forward a bit, then sideways and out of the grip frame. Below center/right: It is recommended to remove the hinge pin and separate the two halves of the frame before any further disassembly. It is much easier to work on each half individually than when assembled together. Note that the hinge pin is in two pieces; there is a screw on the left side and a pan-headed, internally threaded smooth pin on the right. Drive out the smooth pin using a punch.

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ORIGINAL ARCHIVE IMAGE • PERMISSION CONFIRMED

In the previous issue, the Hopkins & Allen double action, solid frame XL revolvers were examined and disassembly procedures outlined. The third type of Hopkins & Allen revolver under examination is the hinged frame top break with automatic extractor made from 1900 to about 1906. These were predominantly sold in .32 and .38 caliber, with some .22, .41, and .44 models referred to in contemporary advertising.

I tend to think of these as “Webley-style” revolvers because they resemble the well-known, hinged frame, top break, self-ejecting revolvers made by that famous English gunmaker. One of the most significant benefits of the hinged frame break top design is the simultaneous automatic extraction and ejection of cartridges or empty cases when the

Below center/ It is much easier to work on each half individually than when assembled together.

Note that the hinge pin is in two pieces; there is a screw on the left side and a pan-headed, internally threaded smooth pin on the right. Drive out the smooth pin using a punch. revolver is unlatched and opened with the barrel pivoted downward.

This advancement made reloading considerably faster compared to the older single and double action solid frame H&A revolvers which required single extraction and ejection of fired cases, either with the cylinder in place in the frame or with the cylinder removed from the frame. The latter practice incurred the substantial risk of dropping the cylinder or its axis pin in the heat of battle.

Top break revolvers with simultaneous extraction and ejection eliminated that risk and enabled the shooter to quickly unload, reload, and return to shooting. Hopkins & Allen top break revolvers were made from approximately 1906 through the company’s end in 1914-1916, and were sold by distributors and dealers through 1917. Turning to our H&A top break example, it is chambered in 38 S&W, a ubiquitous cartridge of that era. As with many H&A revolvers, it features a cast iron frame and bright nickel plating.

This particular example exhibits a dark bore but the rifling is sharp with no pitting. Lockwork timing is spot on. Given the condition, it is very tempting to put the bullets from a cylinder full of cartridges downrange but due to the cast frame of

WORKING HOPKINS & ALLEN REVOLVERS, PART 3 CONTINUED

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Above left: The two halves of the frame shown separated with the extractor actuator cam in its rest position relative to the two halves. There is a small, U-shaped, stamped spring in the left half of the heart-shaped penetration in the extractor actuator cam that maintains proper positioning when the revolver is assembled. Above center: When disassembling the barreled half of a H&A top break, first remove the cylinder retainer screw from the top strap. Above right: Drive out the retaining cross pin for the T-shaped top strap latch. Be sure to control the top strap latch as it is backed by a spring-loaded plunger.

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Above left: The two halves of the frame shown separated with the extractor actuator cam in its rest position relative to the two halves. There is a small, U-shaped, stamped spring in the left half of the heart-shaped penetration in the extractor actuator cam that maintains proper positioning when the revolver is assembled. Above center: When disassembling the barreled half of a H&A top break, first remove the cylinder retainer screw from the top strap. Above right: Drive out the retaining cross pin for the T-shaped top strap latch. Be sure to control the top strap latch as it is backed by a spring-loaded plunger.

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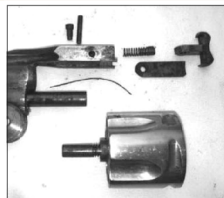
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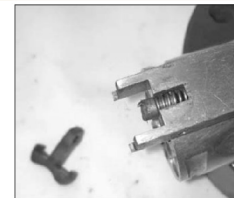
Below left: After the top strap latch retaining pin is removed, the top strap latch is forced forward by its spring and plunger, which are readily removed with small pliers or tweezers. Below center: The stamped cylinder retainer is removed by driving it out to the rear using a punch or small slotted screwdriver against the short edge which the rear face of the cylinder normally contacts. Below right: Exploded view of the upper frame assembly parts clockwise starting from 6 o'clock. Cylinder, barrel section of frame, thin flat spring, cylinder retainer screw, top strap latch cross pin, top strap latch spring and follower assembly, T-shaped top strap latch, and stamped cylinder retainer. Terms used here are descriptive and may not exactly agree with that in H&A literature or parts diagrams, which tend to not be descriptive.

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Below left: After the top strap latch retaining pin is removed, the top strap latch is forced forward by its spring and plunger, which are readily removed with small pliers or tweezers. Below center: The stamped cylinder retainer is removed by driving it out to the rear using a punch or small slotted screwdriver against the short edge which the rear face of the cylinder normally contacts. Below right: Exploded view of the upper frame assembly parts clockwise starting from 6 o'clock. Cylinder, barrel section of frame, thin flat spring, cylinder retainer screw, top strap latch cross pin, top strap latch spring and follower assembly, T-shaped top strap latch, and stamped cylinder retainer. Terms used here are descriptive and may not exactly agree with that in H&A literature or parts diagrams, which tend to not be descriptive.

ORIGINAL ARCHIVE IMAGE • PERMISSION CONFIRMED



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There is a small, U-shaped, stamped spring in the left half of the heart-shaped penetration in the extractor actuator cam that maintains proper positioning when the revolver is assembled. Above center: When disassembling the barreled half of a H&A top break, first remove the cylinder retainer screw from the top strap. Be sure to control the top strap latch as it is backed by a spring-loaded plunger. This and all other H&A revolvers, temptation was successfully resisted while the revolver was entrusted to me.

It bears repeating: Firing Hopkins & Allen revolvers is not recommended due to the lack of metallurgical and manufacturing process control of the time period and the cast iron nature of the revolver frames.

Caution your customers not to fire their H&A revolvers, even with black power loads, and advise them to instead keep the Below center: The stamped cylinder retainer is removed by driving it out to the rear using a punch or small slotted screwdriver against the short edge which the rear face of the cylinder normally contacts.

Cylinder, barrel section of frame, thin flat spring, cylinder retainer screw, top strap latch cross pin, top strap latch spring and follower assembly, T-shaped top strap latch, and stamped cylinder retainer. Terms used here are descriptive and may not exactly agree with that in H&A literature or parts diagrams, which tend to not be descriptive. guns for the firearm history that they represent.

To disassemble a representative H&A top break, first remove the grips by unscrewing the grip screw until it clicks, then gently push on the

screw with the screwdriver to pop off the opposite grip panel. Use a finger or a punch to pop the opposite grip panel off. Grips on these H&A revolvers were mostly hard rubber or wood, and occasionally ivory, mother of pearl, bone, or stag. The black hard rubber when aged can be very brittle, so care is advised in their removal.

It is NEVER good practice to pry the grip panels off with a thin slotted screwdriver or a knife blade since the grip panels can be damaged from such handling. Gently pushing on a loosened grip screw results in force being applied to the approximate center of the grip panel. The grip panel thus tends not to get cocked and possibly cracked. Gentle force is recommended lest the threaded female grip screw escutcheon be pushed out of the grip plate. In that event, it can be held in

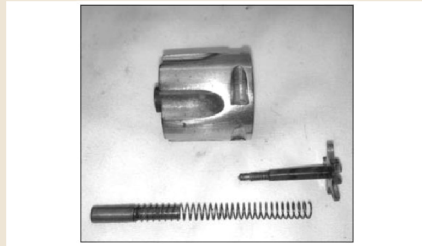
WORKING HOPKINS & ALLEN REVOLVERS, PART 3 CONTINUED

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Above left: The right-hand threaded extractor actuator rod unscrewed from the extractor star on this example using no tools. Pliers with protected soft jaws may be needed for other H&A revolvers. Above center: A brass punch of proper diameter is ideal for pushing out the extractor star. Above right: Exploded view of the cylinder assembly showing the cylinder, extractor, extractor actuator rod, and extractor spring.

ORIGINAL ARCHIVE IMAGE • PERMISSION CONFIRMED



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ORIGINAL ARCHIVE IMAGE • PERMISSION CONFIRMED



Below left: The center penetration in the cylinder and the extractor rod are pentagonal to help keep the extractor from turning in relation to the rest of the cylinder. Below center: The extractor and cylinder are matchmarked by indent punch marks under the serial number on the cylinder and one of the extractor star arms. If you look closely, the serial number can be seen on the extractor star. Below right: When disassembling the lower frame, it helps to hold the trigger to the rear when aligning the hammer for removal from the top of the frame. The hammer must be shifted forward in its slot so that its "tail" clears the rear of the slot.

ORIGINAL ARCHIVE IMAGE • PERMISSION CONFIRMED



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Pliers with protected soft jaws may be needed for other H&A revolvers. Above center: A brass punch of proper diameter is ideal for pushing out the extractor star. place by a small drop of clear epoxy or cyanoacrylate glue. With the grip panels removed, grasp the lower end of the S-shaped mainspring with needle-nose pliers. Pull it forward and then to either side to unseat it from the frame.

Note that the seat for the upper end of the mainspring in the underside of the hammer will be marked by a slightly shiny notch or groove of sorts. Also note that when working Below center: The extractor and cylinder are matchmarked by indent punch marks under the serial number on the cylinder and one of the extractor star arms. If you look closely, the serial number can be seen on the extractor star.

The hammer must be shifted forward in its slot so that its "tail" clears the rear of the slot. on a hammerless top break example, the mainspring is V-shaped with a heavier-sectioned length welded on and engaging the hammer. The other end is bent into a curve and engages the inside of the backstrap. Pay attention to its orientation as you grasp the curved end of the mainspring to remove it. Disassemble the two halves of the frame by removing the hinge pin which is held in place by a flat head screw.

Back out the screw a bit, then push on the screw head with the screwdriver to push the hinge pin out of the frame. Remove the hinge pin screw completely. Using a small diameter punch that clears the female threads in the hinge pin, drive out the hinge pin. Separate the two halves of the frame, paying attention

to the orientation of the extractor actuation cam which is centered between the lower and upper frame halves. When installed, the cam's "tail" points upward toward the barrel and rearward toward the cylinder.

Remove the cylinder retainer plate's screw in the topstrap above the forward area of the cylinder. Then tap out the top strap latch retaining pin and withdraw the T-shaped latch, paying attention to the plunger and spring behind it. Remove those as well, using needle-nose pliers or tweezers as required. Placing a slotted screwdriver or very small diameter punch under the topstrap and above the rear end of the cylinder, tap the cylinder re-

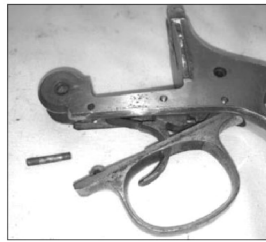
WORKING HOPKINS & ALLEN REVOLVERS, PART 3 CONTINUED

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Below left: Trigger assembly in the frame with hammer rebound lever and rear cross pin. Punch points to trigger surface upon which the hammer rebound lever bears when assembled. Below center: Trigger assembly and hammer rebound lever reinstalled in the frame. Below right: Trigger reset V-spring in its recess in the frame in front of the trigger assembly.

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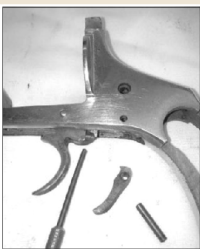
Above left: The punch calls attention to the proper relationship of the trigger and the hammer rebound lever. Above center: Driving out the front cross pin frees the trigger guard to pivot down at the front and then forward for removal. The bottom leg of the V-spring is just visible in front of the trigger. Above right: Exploded view of the lower frame half, clockwise from 12 o'clock. Hammer axis screw, hammer/pawl assembly, lower frame, rear cross pin, hammer rebound lever, trigger assembly with hand and cylinder stop with trigger guard immediately below, trigger axis cross pin, cylinder stop V-spring, and front cross pin.

ORIGINAL ARCHIVE IMAGE • PERMISSION CONFIRMED



Above left: The punch calls attention to the proper relationship of the trigger and the hammer rebound lever. Above center: Driving out the front cross pin frees the trigger guard to pivot down at the front and then forward for removal. The bottom leg of the V-spring is just visible in front of the trigger. Above right: Exploded view of the lower frame half, clockwise from 12 o'clock. Hammer axis screw, hammer/pawl assembly, lower frame, rear cross pin, hammer rebound lever, trigger assembly with hand and cylinder stop with trigger guard immediately below, trigger axis cross pin, cylinder stop V-spring, and front cross pin.

ORIGINAL ARCHIVE IMAGE • PERMISSION CONFIRMED



Below left: Trigger assembly in the frame with hammer rebound lever and rear cross pin. Punch points to trigger surface upon which the hammer rebound lever bears when assembled. Below center: Trigger assembly and hammer rebound lever reinstalled in the frame. Below right: Trigger reset V-spring in its recess in the frame in front of the trigger assembly.

ORIGINAL ARCHIVE IMAGE • PERMISSION CONFIRMED



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ORIGINAL ARCHIVE IMAGE • PERMISSION CONFIRMED



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ORIGINAL ARCHIVE IMAGE • PERMISSION CONFIRMED

Above center: Driving out the front cross pin frees the trigger guard to pivot down at the front and then forward for removal. The bottom leg of the V-spring is just visible in front of the trigger. Hammer axis screw, hammer/pawl assembly, lower frame, rear cross pin, hammer rebound lever, trigger assembly with hand and cylinder stop with trigger guard immediately below, trigger axis cross pin, cylinder stop V-spring, and front cross pin. tainer plate rearward and out of its slot in the underside of the topstrap.

The cylinder can then be slid off its axle shaft to the rear. There's a thin leaf spring in a groove on the top of the cylinder axle shaft, which can be dug out using a jeweler's screwdriver and tweezers. Grasp the extractor shaft between thumb and forefinger.

While holding the cylinder assembly with both hands, unscrew the extractor shaft off counter clockwise. If it is stuck fast, use a pliers with padded jaws to minimize damage.

Once removed, withdraw the extractor shaft to the front and the extractor star to the rear. The extractor star on this example is keyed by means of a pentagonal shaft, a punch mark under the last three digits of the serial number appearing on the cylinder, and a punch mark on one arm of the extractor star. The lockwork is removed by unscrewing the hammer axis screw.

With the trigger held back against the rear of the trigger guard, work Punch points to trigger surface upon which the hammer rebound lever bears when assembled. Below center: Trigger assembly and hammer rebound lever

reinstalled in the frame. the hammer forward so that its "tail" clears the rear of the hammer slot in the frame.

Then drive out the front trigger guard pin (just behind and below the frame hinge) and tilt the trigger guard down and forward so that the boss at the rear of the trigger guard clears the frame. The trigger itself clears its slot in the trigger guard. Drive out the trigger axis pin and remove the trigger from the bottom of the frame. The hand or pawl on the H&A top break revolvers is mated to the left rear of the trigger.

The spring and plunger that provide forward force to the hand are located in a recess in the trigger body. When removing the hand from the trig-

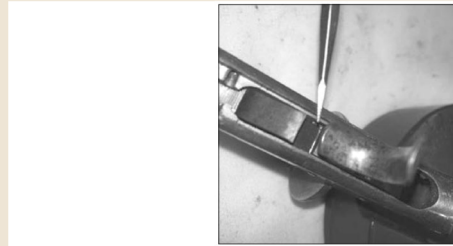
WORKING HOPKINS & ALLEN REVOLVERS, PART 3 CONTINUED

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Far left: A reassembly tip. Cocking the hammer and simultaneously pulling the trigger allows the hammer axis hole to be readily aligned with the cross holes in the frame, permitting easy installation of the hammer axis screw. Left: Screwdriver tip points to the upper leg of the trigger reset V-spring resting on its engagement surface at the front of the trigger assembly.

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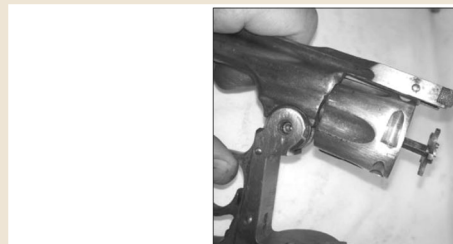
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Far left: Reinstallation of the trig-

ORIGINAL ARCHIVE IMAGE • PERMISSION CONFIRMED



ger guard entails insertion of the hook at the rear of the guard into its recess at the rear end of the trigger guard slot, ensuring that the trigger reset V-spring is in its proper position. The bottom leg is peeking out below frame here. Left: When reassembling the halves of the frame, before installing the hinge pin lock screw, pivot the barrel open to ensure that the cylinder extractor extends and snaps back. This indicates correct installation of the extractor cam in the hinge.

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ger, take care to control the spring and plunger. When reinstalling the hand, use a jeweler's screwdriver to push the spring and plunger into their recess to provide clearance for the base of the hand. Some reassembly tips for H&A top break revolvers. Reinstall the trigger/hand assembly first. Reinstall the hammer rebound lever, taking care to ensure it is properly positioned, i.e., curving upward. Insert the rear of the trigger guard in its recess in the rear of the trigger guard slot in the frame.

With the V-spring installed in its mortise at the front of the trigger guard, rotate the trigger guard up and into the frame at the front, holding it against spring force and reinstalling the front pin. It may help to use a small spring clamp with protected jaws as a "third hand." Reinstall the hammer by manipulating it forward so that its tail clears the rear of the hammer slot in the frame. Then lower it and install the hammer axis screw.

Apply force to the rear of the hammer with a finger, simulating mainspring force, and cycle the lockwork to ensure that all internal com-

ponents are in proper position and alignment. Reinstall the cylinder, cylinder keeper, and top strap latch components before joining the two halves of the frame. The cylinder is installed first, followed by the cylinder keeper and its retaining screw, and finally the top strap latch components.

Assemble the two halves of the frame, taking care that the extractor cam is properly aligned with the hook pointing up and to the rear, looking somewhat like a numeral "6" when positioned correctly. Ensure the top end of the mainspring is properly positioned in its mating seat in the underside of the hammer. Far Cocking the hammer and simultaneously pulling the trigger allows the hammer axis hole to be readily aligned with the cross holes in the frame, permitting easy installation of the hammer axis screw.

As mentioned previously, there were hammerless models in H&A line of top break revolvers and these models used a V-shaped mainspring. These mainsprings had a heavier sectioned length welded on and engaging the hammer. The other end is bent into a small

radius curve and engages a boss on the inside of the frame backstrap. Pay attention to its orientation as you grasp the curved end of the mainspring to remove it.

Also, given that these revolvers were made for black powder cartridges and have cast iron frames, it is strongly recommended that they NOT be fired, even with black powder loads or similar. Many of these revolvers have considerable play in the cylinder when the hammer is cocked and have relatively large gaps between the face of the cylinder and the forcing cone. Owners should be cautioned to preserve them unfired for the pieces of firearms history that they are and to shoot their more modern handguns.

AG Far The bottom leg is peeking out below frame here. This indicates correct installation of the extractor cam in the hinge.

PEOPLE & COMPANIES

Cozad Manufacturing

How a military veteran invented a new part, filed for a patent, and started a company in his basement with a benchtop lathe.

BY ANDREW COZAD SEPTEMBER 2020

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First designed by Arma Lite before it was sold to Colt in 1959, the AR-15/M16 design has been around since the late 1950s. After it was adopted by the U. S. Military in the early 1960s, the weapon has undergone a number of changes and upgrades to improve its overall firing and handling, which has included alterations to its stock, optic sites, rails, grips, triggers, and recoil buffers.

In 2018 I started Cozad Manufacturing to develop and sell my contribution to the improvement of this weapon system with the release of the M-18 model mechanical recoil buffer. This improved recoil buffer mitigates firing recoil of the weapons and aids in sight alignment. It also reduces the rate of fire in select fire weapons to give the shooter more control of rapid follow up shots in multiple target shooting scenarios.

In addition to being the owner of Cozad Manufacturing, I am an Army Reserve Soldier and former law enforcement firearm instructor with over 20 years of firearms handling experience, including two deployments to Iraq and one to Afghanistan as Military Police. The idea behind my buffer was a process that spanned several years. While on my second deployment to Iraq, I bought a hydraulic buffer for anew 6.8mm Remington Special Purpose Cartridge AR-15 I had waiting for me at home.

I knew the 6.8 would have a little more recoil than the standard 5.56 and hoped to make the 6.8 handle the same. However, my first test firing of the hydraulic buffer for the 6.8 gave an unsatisfactory initial performance. I discovered the bolt would short stroke the magazine using the hydraulic buffer and as a result, the bolt would not fully cycle and lock

back on an empty magazine. To counter this problem, I installed an H1 buffer and left the hydraulic one out. This was the beginning.

He now holds a patent and manufactures products based on it in his company's workshop using Haas CNC and Precision Matthews machining equipment. In 2017, one of my friends asked me if it was possible to make a barrel for an AR-10 chambered in 45-70 Government, a cartridge designed to shoot 405 grain bullets. I told him that I didn't think this was possible due to being a rimmed cartridge, however, he later showed me a company online that had successfully done so.

With this as my point of reference, I was able to build one, finishing it in late March of 2018. This project was another push for my M-18. During this process, I began to think of

COZAD MANUFACTURING CONTINUED

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to reduce the recoil of the massive .45 caliber bullet by designing something that was indestructible, affordable, and capable of handling a variety of ammunition types and bullet weights. My First M-18 The initial design for my buffer was built for the AR-15 A2 rifle model and took only a couple hours to make. I used a recoil spring from a Beretta 92, some random aluminum, and some small hardware from around my basement.

The following day, I conducted the first test firing of the prototype and was impressed by how effective it fired on a target 100 yards away before the buffer broke where the spring rides on the operating rod. This first test fire proved my design was effective and also identified weaknesses to be improved upon. I kept plugging away on the design in my basement workshop. Several months later, after several design and material changes, I found the right combination of both.

Using the new and much-improved design in test firing, I successfully fired hundreds of rounds through the rifle using only the buffer with no return spring. I was amazed at how well the buffer held up on only the second prototype model with no damage to the rifle or buffer noted. I then set out to prove the multi-caliber capabilities in 6.8mm, 6.5mm, 300 Blackout, 7.62x39, several 5.56 variants, and 9mm to make sure the buffer worked and fired successfully in a variety of chamberings.

The third test phase of the buffer prototype tests was used with select fire weapons which I had successfully carried out at Veronisi Gunworks in Seminole, Pennsylvania, a licensed Class Three dealer. My M-18 series of buffers works by reducing the recoil impulse caused by the reciprocating mass of the bolt carrier assembly. By adding an additional 10 pounds of spring tension at the last 3/4" of travel of the bolt carrier, the M-18 turns the stock recoil spring into a two-stage type.

This greatly reduces the perceived recoil and dramatically reduces rates of fire in select fire weapons. By slowing the sudden stop at the end of the recoil cycle, the M-18 also reduces shock to any mounted accessories and optics. Built using high grade aluminum alloys, stainless steel, high strength alloy steel, and tungsten alloys, I designed these buffers to last. All aluminum components are hard coat anodized and all steels are heat treated.

Unlike hydraulic buffers, Cozad buffers do not have seals or fluid to break or leak out. If by chance the buffer fails, it is easily fixed. When it came to naming my buffer recoil model, I decided on M-18 for the year of the completion of the model. The Kin its name stands for carbine model and Gfor rifle model. I kept the Hdesignations for the various weights of the carbine model. In September 2018, I filed for my first patent on the M-18 series of buffers and in April 2020 the patent was ready to be issued.

Over that year and a half I had a lot of correspondence with the United States Patent and Trademark Office and was very excited to have my first patent issued. Currently the M-18 is available in two models for the rifle and carbine length stock extensions. The carbine model is available as the M-18k and comes in weights of 3, 3.5, 3.9, and 4.6 ounces. This enables the end user to choose the weight best suited for their individual carbine.

Future offerings will include a dedicated pistol caliber carbine model as well as a model for the Barrett M82-series (M107) 50 BMG rifles. I started my company with an idea, a basement workshop, and a benchtop lathe. That led to successfully filing for a patent, creating a Limited Liability Company, and a full-fledged company (CozadManufacturingLLC.com, marketing several products based on my design. AG

PISTOLS

Desert Eagle

Observations and modifications of the 50 AE Desert Eagle handgun.

BY CHARLIE BRIGGS SEPTEMBER 2020

ORIGINAL PP. 16-17

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The Desert Eagle chambered in 50 Action Express is arguably the most powerful semi-auto handgun in existence. This handgun can also be had in 357 Magnum, 429 DE, and 44 Magnum. It was first brought on the scene for Magnum Research by Israel's Riga Arms Institute around 1983.

It's a beast of a pistol, weighing almost four pounds unloaded, and to carry it concealed a man would have to be the size of a phone booth! (For those too young to remember phone booths, Google "phone booth images.") By 1985, some of its patents were refined by IMI (Israeli Military Industries) and in 2010, Magnum Research was acquired by Kahr Arms of Worcester, Massachusetts. Like the Browning Hi-Power and countless others over the years, different manufacturers have made some design changes along the way.

A variety of largely cosmetic modifications are offered to Desert Eagle owners online, many of which can be viewed on You Tube. However, as is often the case, details are inadvertently left. The central, two-pronged pin looks like a screw but isn't. out, may be incorrect, or may apply to since-changed

examples. A gunsmithing friend of mine says he loves You Tube as many of his first time customers come to him with projects they started via videos found online but never finished. Such was the case for me recently.

A new customer brought me his partially disassembled Desert Eagle. He had plans for having some of its parts plated with titanium nitride (Ti N), an attractive, yet tough gold-colored finish, but the more he studied the innards of the pistol, the more intimidated he became. He decided he wanted someone more knowledgeable to finish the disassembly and make another cosmetic modification he had seen on the Internet. First, I tackled the disassembly.

This was pretty straight forward except for a very stubborn rear sight mounted in the slide which was too large for my sight pusher, and a confusing magazine release. The sight finally yielded to a heavy brass punch and the urging of an even heavier ball peen hammer.

Due to the difficulty of removing it, I recommended to the customer that I open up the dovetail slightly so as to allow reassem-

bly without damaging the soon-to-come new finish and then drill and tap the sight for a set screw similar to that used on Glock pistols. He approved. The magazine release was disguised as John Browning's 1911 design. Like Browning's, it has what looks like an ordinary screw in the middle, but isn't. Unlike Browning's, it isn't a spring loaded catch either!

I searched my decent-sized library of relevant books, (and even tried You Tube) but the only clue came from the Gun Digest Book of Automatic Pistols Assembly/Disassembly where it said "drive out the (screw-looking) pin using a concave tipped punch". So, I carefully made a concave-tipped punch on my lathe, then ruined it on the screw-looking pin! I made and ruined another, then looked at a so-so drawing of the "pin" on the Numrich Gun Parts website where I determined it's a pin with two springy legs.

With that knowledge, using a #3 countersink, (Brownells part # 265-149-503) I made a punch with a cone-shaped cavity at

DESERT EAGLE CONTINUED

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the business end. The cone-shape forces the legs of the screw-looking pin together and drives the pin out. This staking tool is made from a Vise-Grip clone from Harbor Freight. The pliers are riveted together to separate the halves enough to add the “tooth” into the upper jaw, I drilled out the “pivot rivet”, made a tooth out of a hardened masonry nail, drilled a hole in the upper jaw just slightly smaller than the OD of the tooth, and press fitted them together.

I then silver soldered a narrow steel flat on the bottom jaw and threaded the smaller hole where the pivot rivet had been to install a “pivot screw”. On to the modifications the customer wanted. First, the ambidextrous safety mechanism consists of two levers, one on each side of course, and each with a spring detent underneath and connected by a little cylindrical device which prevents the firing pin from doing its job when in the “SAFE” position.

The safety spring detents are simply arched flat springs, 0.018" thick with little detents that snap into divots machined into the sides of the slide. The scratching from the detents

on the areas of the black portions of the slide between the divots leaves little arc-shaped silver grooves, a disfigurement my customer doesn't like. So, he (or someone on YouTube) figured out that shortening the springs (or making new, shorter ones) allows the little “spring trails” to be hidden by their respective levers.

I chose to make new levers out of the old ones. I began by making an actual-sized drawing to determine where to shorten the springs and where I would machine new divots in the slide. To shorten the existing springs, I used a bench grinder with a water tray to keep the springs cool and then a 1500 grit belt grinder to finish them. I thought I could use a tool I made years ago from a Vise-Grip clone to stake 1911 front sights.

After I got a milling machine I quit staking and cut dovetails where necessary, so the modified Vise-Grip staking tool was just waiting to be used again. Before I pressed new detents into the springs I first practiced on some flat spring steel 0.018" thick and

pressed away, adjusting the pliers until I got the depth right. With that found, I used the actual springs and it worked.

I then put a little white paint into the recesses where the new divots would go, reassembled the safety mechanism—modified springs and all—and worked it vigorously; enough to scratch new arcs through the white paint. The new divots would be located at the ends of the new arcs. This created another divot just under the arc. The original “ready to fire” (red) dot (one on each side) remains.

Using the mill for such precise work, I used a #2 countersink followed by a #30 drill bit to drill the four new divots to a suitable depth. I degreased the old divots and filled them flush with J-B Weld, as I think it flows better (flush) than the often-used Acraglas in a case like this.

Whoever ends up doing the Ti N for this customer's pistol will also be doing the slide and frame in a highpolish, black Cerakote. So, after separating all the parts into baggies marked “Ti N”, “Cerakote”, and “Leave As Is”, I was finished with an educational and challenging job. AG

MACHINING

Machine Bolt Action Wrench

Shop-made tools allow customization and quality tools can be made cheaper than buying.

BY NORMAN E. JOHNSON SEPTEMBER 2020

ORIGINAL PP. 18-19

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As the opportunity presents in the design and makeup of a gunsmithing tool, as good or better than that which I can buy, and at less cost, I get right on it. Such was the case in my construction of an action wrench adaptable to the Model 70 Winchester in three different action lengths. Moreover, the barrels are conveniently removed while the scoped action remains undisturbed within the stock.

In the search for suitable material to design and make an action wrench for the aforementioned use, I considered a number of materials in various shape and steel makeup. It had to be of workable diameter to form the later-

ally opposing action wrench lugs at one end and the torque coupling wrench at the other and be adaptable to the longest actions. The steel would also need to be hard enough to withstand the required torque for barrel removal and installation.

I immediately ruled out a length of over sized steel shaft which would have required a major amount of turning and shaping. That's when the idea struck me to use a proper length Grade 5,

3/4-inch machine bolt. The inherent qualities were all there, so all I had to do is lathe turn and mill things to shape.

Making the Action Wrench A 3/4x8" Grade 5 hex head machine bolt would meet all these needs. The first step was to locate centers at each end of the bolt for lathe turning the main bolt shaft and head. The bolt body was turned to just under the Model 70 Winchester bolt size at 0.685" from just inside the bolt head to within an inch of the end where it would later be squared off for 1/2inch socket wrench use. The bolt head was then turned to 0.972", close to the outer diameter of the

MACHINE BOLT ACTION WRENCH CONTINUED

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Far two locking lugs. The linear thickness of the bolt head is 0.465", just right for engagement at the locking lug juncture. The bolt was then removed from the lathe and shaped to size at each end. I first milled the threaded end to 1/2" square to fit a standard half-inch socket wrench drive to a length of 0.875". A very small remnant of bolt thread remained at the corners as a reminder this wrench was made from a machine bolt.

The lugs were then shaped from the bolt head which was already outside turned to M70 locking lug outside diameter of 0.972". The two lugs at the head end of the bolt were (Continued on page 22) milled to a thickness very close to the Model 70 Winchester locking lug race of 0.390". The finished bolt has essentially the same bolt body diameter and

lug specifications as a Model 70 Winchester bolt with minor tolerance differences for universal rifle-to-rifle fit.

The action wrench also conveniently fits my Model 77 Ruger actions... another plus. Finishing Touches There may be considerable torque applied to an action wrench requiring precise positioning of the

MACHINE BOLT ACTION WRENCH CONTINUED

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This set up enables the user to turn a barrel from an action without removing a scoped action from the stock. A barrel can be removed and replaced in five minutes in this manner, all ready to shoot. A special “no scratch, no slip” padded barrel vise is used to hold the barrel. The latest one is at the bot-

tom. Second and forth from top are special wrenches for the Weatherby Mark Vaction. lugs in the bolt races.

If pushed in too far the wrench lugs may fall into the bolt locking lug races, or partially so, while attempting to remove a barrel. This should be avoided. To prevent this I placed three wrench stops for the three different length Model 70 actions. This was accom-

plished by placing conveniently labeled screw-in bolt stops located where the bolt handle drops into the action. Here I drilled and tapped holes for an 8-32 socket head screw at each of these three locations.

Finally, I buffed the entire action wrench to a dull luster with a wire brush. As gunsmiths, we can often make tools better than we can buy. AG

RIFLES

Savage 112 Picatinny Base

Adapting a Picatinny base to the older Savage M112 receiver.

BY NORMAN E. JOHNSON SEPTEMBER 2020

ORIGINAL PP. 20-22

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Not all rifles are readily adaptable to meet our specific needs, but with a bit of ingenuity we may arrive precisely at that which we are seeking. Here I am going to demonstrate how seemingly minor changes may draw us ever nearer the pinnacle of rifle accuracy. When I see a crack of light where accuracy and precision can be improved, I use the resources available to me in attaining this goal. In this particular case, I had an older Model 112B Savage single-shot target rifle with three chamberings.

These include a 243 Winchester with a Douglas 1:8 twist select barrel, a 6.5mm Creedmoor with a 1:8 twist Criterion Match barrel, and a 257 Improved 1:12 twist Pac-Nor select barrel. The three cartridges were delivering good accuracy scoped with Talley two-piece ma- This optional central screw hole was added to fit the existing base screw hole of the altered base. The part seen below will be used to interface the base to the rear of the receiver. chined saddle design bases.

With these bases, recoil shoulders immobilize the rings under heavy recoil. Acceptable accuracy notwithstanding, I was convinced that I could equal or improve performance of this setup with adaptation of a more rigid, precision mounted Picatinny base. I would then use Talley 30mm Tactical rings on a modified Brownells Savage 110 RT solid steel Picatinny base. I was unable to locate a Picatinny base that would precisely fit this particular Savage Model 112B action which has a flat rear receiv-

SAVAGE 112 PICATINNY BASE CONTINUED

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er. The base at the receiver ring is identical to the models 112, 12, and 110. Talley Manufacturing (Talley- Manufacturing.com, and Near Manufacturing (Near Mfg. com, both informed me such a base was not available, so base modification was in my plan. Base Fitting While the front base holes and receiver ring were a perfect fit, the rear underside surface required total revamping.

This involved flattening the rear underside of the new base and interfacing apiece between the underside of the base and atop the rear of the receiver. Precise thickness of the adjoined part was determined after carefully measuring the space between the milled scope base and flat surface of the receiver with the scope base attached at the front. Precise positioning of the new screw holes was accomplished by using ascribe from below through the existing base screw holes.

The new screw holes were then drilled from the bottom of the base. Following drilling, the screw holes were countersunk from the top for correct screw head size. This left an extra base screw hole just back of center of the existing screw holes. I chose to use this existing base screw hole for a third screw. These countersunk holes for the screw heads may be located between the ring locking lug bars but this presents no problem.

Inspection/Testing Inspection and testing of the altered With the rear base spacer correctly fitted, the new part was bonded to the underside of the base. Here I used a film of J-B Weld and clamped the parts squarely together as they set. The resulting part was again attached to the receiver and checked for solid fit. base and rings was required. Seldom will

a scope mounting system fit the receiver without some slight space between parts. This is termed stacking tolerances.

As a positive way to rule out even the slightest scope ring misalignment, Brownells Sleeved Scope Alignment Rods come to the rescue. These rods are set up to be used on both one-inch and 30mm scope rings and will reveal even the slightest asymmetry in scope ring coaxial alignment. The scope can then be mounted and sighted-in with confidence that it is properly aligned.

Though a few scope mount manufacturers feel the two-piece scope base system is essentially as rigid as the onepiece system, like the Picatinny scope base, I have conducted tests that prove otherwise. This proved particularly true in piezometric tests performed on bolt action ri-

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A more durable and precision mounting system would not be possible with a wood stock. Rifle receivers do, indeed, flex and it may be enlightening to know there is something we, as gunsmiths, can do about it. Following carefully controlled tests at the

range, this rifle and others showed measurably improved accuracy with the properly mounted scope on a one piece rail.

This is particularly evident where an added central action screw can be properly positioned, drawing the action into a perfectly bedded stock. I have included an illustration

of a Model 112 Savage receiver with added central action screw bedded solidly into position with Brownells Steel Bed. These, along with a good, one-piece steel scope base, are but one of several adaptable combinations comprising the fundamental keys for the true precision shooter. AG

MACHINING

Reader Forum

BY AMERICAN GUNSMITH EDITORS SEPTEMBER 2020

ORIGINAL PP. 23-24

Hints for Gunsmiths When I retired from the Army, I had the task of finding anew job. As most retirees know, after your time in service, starting out in the civilian world can give one fits. I finally landed a job in a family owned machine shop. There I started learning about lathes, presses, drills, and many other equipment used in making parts and pieces. I only stayed there for a short time, but the knowledge and experience gained was valuable. One thing many gunsmiths love finding is scrap!

Pins, unfinished parts, and pieces. Scrap stock pieces, assorted steels, brass, bronze, aluminum, and what not. Sometimes broken drill bits, saw blades, and old tools. All this can be had for pennies on the pound. I've made a few brass hammers with scrap with brass heads, steel handles, and a piece of old air hose slipped onto the handle for a better grip. Also, shops sometimes sell off their old multiple drawer parts cabinets very cheap.

If you work there, or have a friend who does, they sometimes have deals on micrometers, calipers, and assorted gages. All you need to do is ask. The worse they can say is no. If you do get permission to dig through their scrap bins or drums, wear an apron if you have one, and definitely wear gloves. Metal slivers can be annoying and painful. There will be times you'll need a weird size pin, a small plate to make apart, or even a piece of brass to construct and replace a brass piece on a muzzleloader.

ALL THIS CAN BE HAD FOR PENNIES RATHER

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READER FORUM CONTINUED

ORIGINAL PAGE 24

than spending dollars on a part you can make. There is the enjoyment of the hunt and the surprise when you find unexpected treasures. Frederick 'Ski' Ludwikowski Suppressors Letter In the July 2020 Reader Forum about suppressors, David Allen Dumeah seems to be describing the distortion of the barrel OD resulting from supporting the ends of the barrel during turning. To see if the bore is reasonably straight, insert a rod through the barrel as one would while checking alignment of the installed suppressor.

The rod should be 0.006-0.010" smaller than the land diameter of the barrel. Precision-ground, polished, hardened-steel rods in suitable diameters can be purchased from McMaster-Carr (McMaster.com, SAAMI specs for the caliber under consideration can also be found online to help in determining what sizes of rods to order. Be sure to round off and polish the ends of the rods before using them.

While the undersize dimension may sound too loose, think about what happens when the direction of the bore changes, even very slightly. The rod will tell the truth! The rod should drop all the way through the bore without the least resistance. If the rod will not pass the barrel, I would not cut it or recommend its use. Cut/crown/thread jobs are one of the mainstays of my business, so I do a lot of them. I see many bores that are not concentric with the outside of the barrel, some not even at the ends.

Clarksville, TN I use several methods to achieve alignment to the bore, including turning between centers when possible, and am not interested in how concentric the bore is to the OD of the tube. I also encourage customers to bring the gun back when they get their suppressors so that we can check alignment (a free service to my customers) before they fire the first shot through it.

A few strokes of a file on the back side of the suppressor or its mounting adapter is usually all that is necessary to center the rod in the suppressor on those few that do not center up at first installation. Most fit without issue the first time they are threaded up. Gene Hall Precision Technical Services, LLC 10mm 1911 Troubleshooting After reading RK Campbell's June 2020 article I must consider myself lucky.

I have and shoot two Colt Deltas (an old and a new one), a Colt Double Eagle, two Kimber 1911s, and a SIG P220, all in 10mm. To date, I have had no functioning problems with any of them only using ammunition that I have reloaded myself. Accuracy has come down to my aging eyes. I have heard others complain, but I have been lucky. Of course, now that I have expounded on the matter I just might end up having an issue! Thanks to that article I've now gained some tips should I encounter a problem with a 10mm.

Thank you for your informative magazine! Robert P. Smith Kingston, PA Ruger 1911 I have a Ruger 1911 in my shop and I'm trying to remove the rear Nova sight. I removed the screw and put in a drop of Kroil, allowed it to soak, then tried to tap it out. No luck. I got a bigger hammer but still no luck. Heating it with a heat gun also did not help. Kenneth W. Wright From RK Campbell. Are you trying to move the sight left to right? Direction may make a difference.

Also consider that just because a slide is stainless does not mean that it can not rust. Stainless steel can pit. There are many grades of stainless steel and some are more susceptible to corrosion than others. If that fails you, more force may be needed. A big arbor press can do the business if nothing else will. This last one sounds odd but I have used this before and it worked. Put the slide in the freezer for at least 12 hours. Cold contracts and heat expands.

THE SLIDE MAY SHRINK JUST ENOUGH OFF OF THE SIGHTS TO LET TAPPING WORK! AG

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