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AND THE AMERICAN GUNSMITH ARCHIVE

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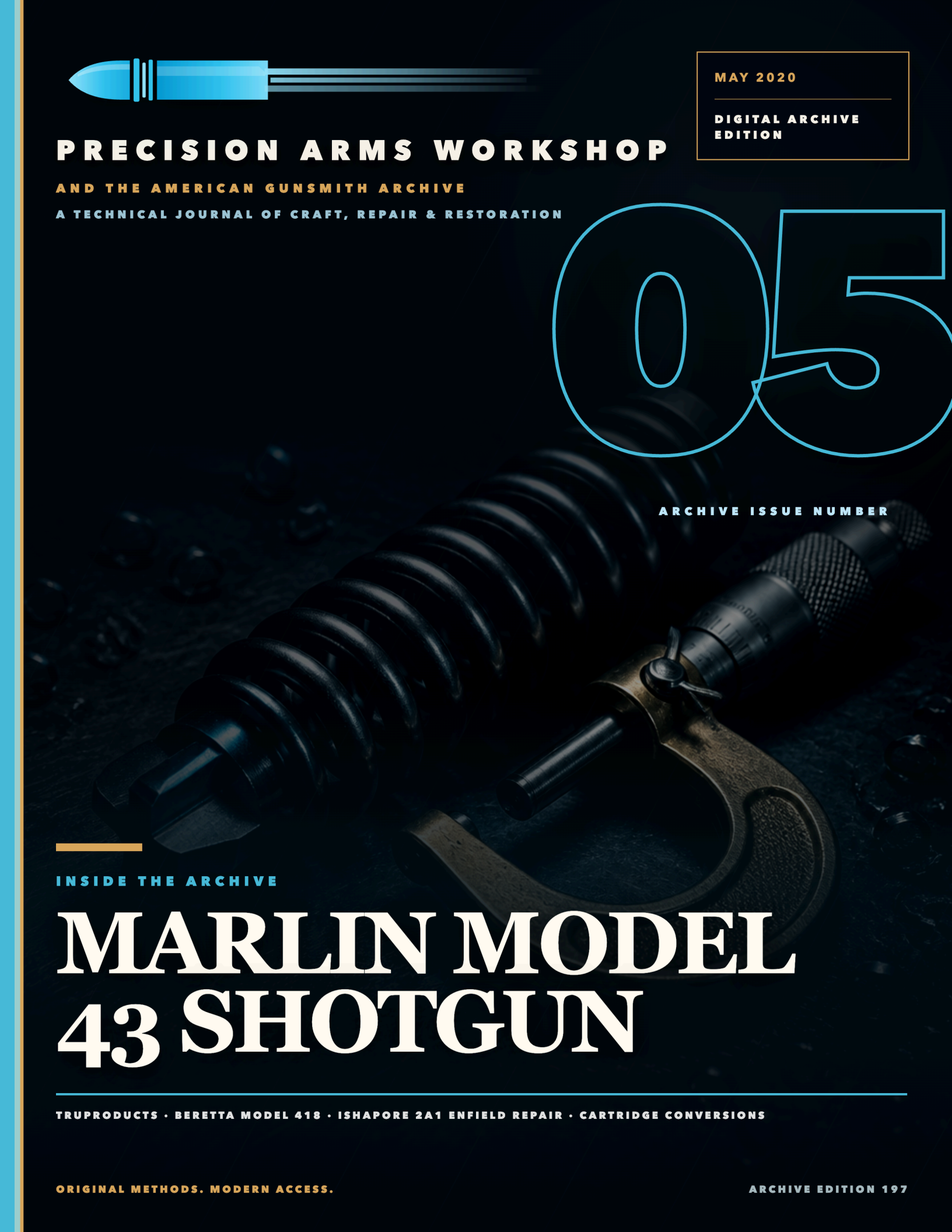

INSIDE THE ARCHIVE

MARLIN MODEL 43 SHOTGUN

TRUPRODUCTS · BERETTA MODEL 418 · ISHAPORE 2A1 ENFIELD REPAIR · CARTRIDGE CONVERSIONS

DIGITAL ARCHIVE EDITION

Preserved for the bench.

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AMERICAN GUNSMITH

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Contents

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

MAINTENANCE & REPAIR

TruProducts

BY AMERICAN GUNSMITH EDITORS MAY 2020 ORIGINAL PP. 2

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Tru Products are designed for cleaning, lubricating, and protecting the metal of outdoor gear based on 100% synthetic oils engineered to bond to metal and create a lasting barrier of protection and lubrication for hunting and fishing equipment. Tru Products do not separate from metal in the presence of moisture, debris, or extreme high and low temperatures. Field and laboratory testing performed over the years prove Tru Products outlast traditional oils and lubricants every time.

They minimize maintenance time and expense, reduce equipment failures, and decrease replacement costs. Tru Products Tru Recoil is Tru Product's line of multipurpose, synthetic lubricants for firearms tested in temperatures over 350 degrees and under -65 degrees. Tru-Recoil's strong molecular structure resists oxidation, evaporation, and chemical changes, unlike oil-based products that begin to decompose upon exposure to air. This prevents a sludge-like residue sometimes seen with petroleum products.

Available in four or two ounce bottles and in Gun Oil (wet) and Dry Wipes. In addition to lubrication and surface protection, Tru Products carries a line of mult-caliber cleaning kits (Portable Tactical, Multi Caliber Pistol, and Gun Care/Range Bag) with pull-through cables intended for field use. Tru Product's blend of additives penetrate the surface protected, push impurities to the surface, and leave a barrier of protection against oxidation, rust, and wear from friction.

In addition to firearm protection, Tru Products also offers Tru Cast for fishing gear used in fresh and salt water fishing, Tru Cycle for bikes and motorcycles, Tru Draw for archery, Tru Reed for Water Fowl field use, and Tru EZE as their industrial-strength all purpose home, farm, and auto oil. Tru Products also maintains a line of industrial products for manufacturing, welding, machining, and other uses. Contact or TruProducts.com for more information.

METALWORKING

Beretta Model 418

Beretta's 418 .25 ACP handgun is an early pocket pistol. Dating from the 1930s, it was used by the world's most famous secret agent.

BY GLEN CALVERT MAY 2020 ORIGINAL PP. 3-5

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Beretta started produc ing .25 ACP (6.35x15 mm) handguns around 1919. The Model 1920 was followed by successive models: 1926, 1926-31, 1934, 318, and 418. These area straight blowback design and have a spring-loaded firing pin instead of an internal or external hammer. The magazines hold seven or eight rounds. The later models have a grip safety and in the mid-1930s, a cocking indicator pin that protrudes from the rear of the slide was added, giving a visual and tactile sign that the gun was ready to fire.

At the same time, the name was changed from "IBREV" to "Brevettata". Starting in 1952, they were marketed in the United States as "Bantam" and in 1958 renamed "Panther". James Bond, Agent 007, was created by author Ian Fleming in the 1950s and soon became well known around the world. In the early novels, Bond carried a .25 Beretta automatic with "skeleton" grip, meaning the grips were removed. A model number was not specified but sources indicate that Fleming was referring to the Model 418.

After a problem with a suppressorequipped 418 in From Russia with Love, Bond's boss insisted upon an upgrade to a 7.65mm Walther PPK and the little Beretta was history. The upgrade was recommended to Fleming by gun expert and Bond fan, Geoffrey Boothroyd. Fleming thanked Boothroyd by naming the fictional MI6 armorer after him in the next novel, Dr. No. I personally had not seen one of these handguns so I was glad to have the opportunity to inspect the one in this article.

It is obviously very small and only weighs 15.5 ounces loaded with a 2.25" barrel. The slide is stamped with the manufacturing date of 1937. It has plastic grips with Beretta's initials that are backed and edged with thin steel shells. The sights are tiny, not surprising on this vintage pistol. The magazine release is on the heel of the frame and the safety on the left side of the frame blocks the trigger and acts as the slide lock.

The trigger has a 7.5 pound pull and the grip safety blocks the sear; a nice feature, in my opinion. The 418 is a very simple design with relatively few parts and is easy to disassemble and reassemble. Press-

BERETTA MODEL 418 CONTINUED ORIGINAL PAGE 4

65mm Walther PPK. Removing the thin grips doesn't make much difference in width and can allow debris to get into the gun. Not a practical choice. Far Left to right, .22 LR, .25 ACP, .380 ACP, and 9 mm Luger. ing the trigger rearward moves the trigger bar to the rear and downward. The notch on the trigger bar acts on the notch of the sear. The sear pivots downward, releasing the striker (note, I will use the term "striker" in place of "firing pin").

As the slide moves rearward during recoil, it pushes down on the top of the vertical leg of the trigger bar that fits in a tapered groove on the bottom of the slide. Pushing down on the trigger bar disengages its notch from the sear and the sear re-engages the striker into the cocked position. Releasing the trigger allows the trigger bar to move forward and upward and re-engage the sear notch. Disassembly Remove the magazine and make sure the chamber is empty. Lock back the slide with the safety lever.

Push the front of the barrel rearward to release it from the frame. The safety lever has to be on Safe to remove the barrel. The safety lever pin has a detent that retains the barrel when it's in the Fire position. The rear of the barrel is tipped up and the barrel is removed through the top of the slide. The slide is held back and the safety is released, allowing the slide to go forward and be removed. The recoil spring and rod are removed along with the safety lever.

The striker is in the cocked position, held by the sear. Holding the striker and spring, compress the spring and slide the striker off the sear. Remove the grips to inspect the trigger transfer bar, sear and grip safety. This pistol was clean and functioned correctly so I did not disassemble it any further. Reassembly The striker and spring are installed on the frame, restraining the striker with the sear.

Alternatively, the striker and spring can be installed in the slide and the striker captured by the sear when the slide is in-

BERETTA MODEL 418 CONTINUED ORIGINAL PAGE 5

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Far stalled on the frame. The concern is making sure the spring and cocking indicator pin are aligned with the retainer on the top of the frame to avoid potentially damaging them. The striker spring is light; it does not take much force to compress and install it and the striker before the slide is installed. The safety lever is installed in the Safe position, then the recoil spring and rod. They seat against the safety lever pin and retain the safety lever in the frame.

Install the slide on the frame and lock it to the rear. Drop the barrel in through the top of the slide and push it forward until it clicks into the frame. Release the slide and check for proper function. At the Range This handgun is fun to shoot with low recoil compared to slightly larger pistols in .380 ACP or 9mm. Accuracy at seven yards is acceptable, although the small sights don't help.

The .25 ACP is not the first choice (or second or third…) for self defense for most people but its small size makes it easy to conceal. Per the old saying, in a bad situation, any gun is better than no gun. Recently, ammo manufacturers have developed self defense loads for small caliber rounds that give significantly greater stopping power than what's been available in the past, and certainly what Fleming's Bond likely used before prompting the use of something else! AG Far Striker Pin is protruding, gun is cocked.

MAINTENANCE & REPAIR

Ishapore 2A1 Enfield Repair

Here's how I fixed a magazine feeding failure in an Ishapore 2A1.

BY BRIAN R. SMITH MAY 2020 ORIGINAL PP. 6-9

Above: The Indian Ishapore 2A/2A1 appears to be just another No. 1 Mk III Enfield at first, but at closer inspection the sharp corners of the magazine box are a large clue that this is a different sort of Enfield animal.*

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Below left: Left side of the buttstock socket is stamped with R.F.I. signifying "Rifle Factory Ishapore" beneath the "7.62mm 2A" chambering and model designation, capped by the State Emblem of India, known as the "Lion Capital of Ahoka at Sarnath." Below right: The 2A/2A1 features No. 1 Mk III features, including the charger guide "bridge" on top of the rear of the receiver, track-guided bolt head, and extrenal box magazine.*

ORIGINAL ARCHIVE IMAGE · PERMISSION CONFIRMED

Below left: Left side of the buttstock socket is stamped with R.F.I. signifying "Rifle Factory Ishapore" beneath the "7.62mm 2A" chambering and model designation, capped by the State Emblem of India, known as the "Lion Capital of Ahoka at Sarnath." Below right: The 2A/2A1 features No. 1 Mk III features, including the charger guide "bridge" on top of the rear of the receiver, track-guided bolt head, and extrenal box magazine.*

ORIGINAL ARCHIVE IMAGE · PERMISSION CONFIRMED

This Indian 7.62 NATO Enfield wouldn't strip rounds from the magazine, and the owner wouldn't allow use of conventional repair techniques that involved modification of his rifle. That left reversal of the actual process that damaged the rifle as the only option. The Ishapore 2A/2A1 is a bolt action rifle chambered in 7.62×51mm NATO, and heavily derived from the .303 No.1 Mk III* Rifle, SMLE. It was produced by the Rifle Factory Ishapore just north of Kolkata (Calcutta) in West Bengal, India.

The 2A was formally adopted by the Indian Armed Forces Reserve in 1963 and the improved version, 2A1, entered service about two years later. The Ishapore 2A/2A1 is the last bolt ac- F.

I. signifying "Rifle Factory Ishapore" beneath the "7.62mm 2A" chambering and model designation, capped by the State Emblem of India, known as the "Lion Capital of Ahoka at Sarnath." 1 Mk III* features, including the charger guide "bridge" on top of the rear of the receiver, track-guided bolt head, and extrenal box magazine. 1 Mk III* Enfield at first, but at closer inspection the sharp corners of the magazine box area large clue that this is a different sort of Enfield animal. tion rifle designed to be used by a regular military infantry forces and the rifle is still used by units of the Indian police.

The Ishapore arsenal had produced variants of the .303 Lee-Enfield since 1901 and the No.1 Mk III* SMLE for some 50 years at the time the 2A was introduced. There are some notable improvements in the 2A/2A1 compared to much of the former .303 No. 1 Mk III* rifles, most notably the use of nickel steel in the receiver and bolt. This improvement began in the mid 1950s and carried through to the early 1980s when production of the "Type 56" No. 1 Mk III* rifle finally ceased.

The original Ishapore 2A incorporated the historically standard Lee–Enfield No.1 Mk III* rear sight which has graduations out to an optimistic 2,000 yards. The improved Rifle 7.62mm 2A1" introduced in 1965 incorporated a more realistic 800 meter rear sight. The buttstock is a No. 1 Mk. III stock, fitted with the aluminum alloy buttplate of the Indian FAL rifle and includes a reinforcing steel flat head wood screw installed crosswise from the left side of the stock in a location forward of the magazine well.

There are two visibly distinctive features of a 2A or 2A1 rifle. First, the bot-

ISHAPORE 2A1 ENFIELD REPAIR CONTINUED ORIGINAL PAGE 7

Above left: Spine of the 2A/2A1 magazine box. The magazine catch surface is below the stamped serial number. Above right: Note distinctive nose cap of the 2A/2A1 rifle, with unique vertically oriented rectangular ears protecting the front sight.
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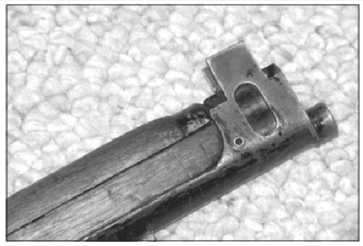

Above left: Spine of the 2A/2A1 magazine box. The magazine catch surface is below the stamped serial number. Above right: Note distinctive nose cap of the 2A/2A1 rifle, with unique vertically oriented rectangular ears protecting the front sight.
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Below: The 2A1 rear sight was graduated to a more realistic 800 meters as opposed to the overly optimistic 2,000+ yards of the 2A and No. 1 Mk III rear sight. Far right: Two of the three serial numbered parts are shown; the rear surface of the bolt handle and the right side of the receiver ring. The third part is the nose cap, which is serial numbered on the round projection over which the bayonet ring is mounted.*
ORIGINAL ARCHIVE IMAGE · PERMISSION CONFIRMED

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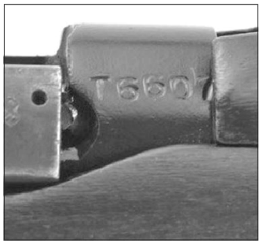

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ORIGINAL ARCHIVE IMAGE · PERMISSION CONFIRMED

The magazine catch surface is below the stamped serial number. tom corners of the 7.62 magazine incorporate sharp angles as opposed to the radiused corners of the .303 magazine. Second, the nose cap is more angular and the sight protector ears are straight and rectangular in section, not curved outward and radiused at the top.

These angular nose caps were also incorporated on post-WWII Ishapore .303 rifles which can be visually differentiated from the 2A/2A1 rifles by their magazines with radiused bottom corners. 1 Mk III* rear sight. Far The third part is the nose cap, which is serial numbered on the round projection over which the bayonet ring is mounted.

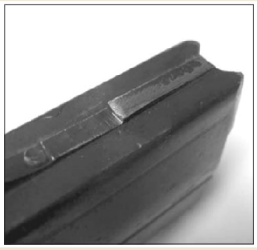
Disassembly is pure Enfield SMLE: First remove the magazine (35) and then rotate the breechbolt (55) counterclockwise and withdraw it fully to the rear.

Disengage the bolt head (58) from its retaining spring (26) by rotating it up and counterclockwise. Withdraw the bolt assembly from action body (10). Regarding the bolt assembly, remove the striker screw (53), and then unscrew the bolt head from the forward end of the bolt. To remove the striker (57), it is necessary to have a special wrench, available from Brownells and other sources. It is suggested to clamp the bolt body in padded vise jaws to free up both hands.

Insert the tool into the front end of the bolt assembly until the prongs engage corresponding notches in the striker collar. Unscrew the striker from the cocking piece (54) while maintaining axial force on the wrench to control the mainspring (56) from launching the striker when it becomes fully unscrewed from cocking piece. Remove both trigger guard screws (16 & 33). Remove the trigger guard (34). Remove both nose cap screws (46 and 50) and pull the nose cap (48) forward off rifle.

Remove the inner band screw (4) and swivel screw (18) from the outer band (43). Open and lift away the

ISHAPORE 2A1 ENFIELD REPAIR CONTINUED ORIGINAL PAGE 8



Right: The now-peened but not file-dressed magazine catch surface on the magazine box spine is shown in the center of the photo. Peening the edge of the catch and back about 1/8 to 3/16" from the edge effectively lowered the engagement surface, raising the body of the magazine inside the receiver and enabling the bolt head to strip rounds and feed them. It was not the preferred method but it kept the customer happy.. Far right: The mating surface on the magazine catch lever that is pivoted in the trigger guard is shown in the center. The magazine catch lever is hardened and does not lend itself to being peened. Working this component was not an option.

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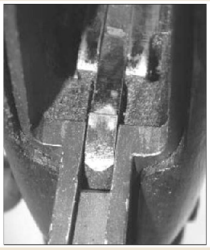

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ORIGINAL ARCHIVE IMAGE · PERMISSION CONFIRMED

Below: Modified magazine reinstalled in the rifle. Note the follower is directly beneath the bolt head, ensuring that approximately 30% of the cartridge head will engage the bolt face and be driven forward into the chamber.

ORIGINAL ARCHIVE IMAGE · PERMISSION CONFIRMED

Peening the edge of the catch and back about 1/8 to 3/16" from the edge effectively lowered the engagement surface, raising the body of the magazine inside the receiver and enabling the bolt head to strip rounds and feed them. It was not the preferred method but it kept the customer happy.. Far The magazine catch lever is hardened and does not lend itself to being peened. Working this component was not an option. outer band. Remove the front handguard (67), forend (65), and rear handguard (66), in that order.

Remove the retaining spring screw (28) and lift away retaining spring (26), sear (30), and sear spring (29). Drift out the magazine catch pin (25, right arrow) and remove the magazine catch (27). To remove the buttstock (64), open the butt plate trap (37) and use apiece of bent wire to fish out the leather stock bolt wad (24) if it is present. With the aid of a flashlight, insert along, square-shanked, largebladed, slotted screwdriver into the head of the stock bolt (23).

While applying downward force, place an appropriately sized open-end wrench on the square screwdriver shank and loosen the stock bolt counter-clockwise. Several drops of penetrating oil applied with a needled oiler to the buttstock screw threads from the butt stock socket end may aid this operation as the bolts are often rusted in. Reassemble rifle in reverse.

Magazine Fix The subject rifle arrived with the customer complaint that it would not strip cartridges from the magazine; in most cases the bolt slid over them to close on an empty chamber. This wasn't the usual and customary problem with 2A/2A1 rifle magazines where the rounds get caught or bound up partially stripped out of the magazine due to misaligned sheetmetal feed lips.

Upon closer examination and using .308 snap caps it was found that the dummies would feed if the magazine was held up a bit; there was clearly some vertical play at the rear of magazine when latched in. When inspected, the magazine catch surface on the magazine's spine exhibited considerable "mushrooming" at the catch surface, almost as if someone took a hammer and tool steel flat punch to it.

The mating surface on the magazine catch itself in the front of the trigger guard was not the least bit worn or peened, so it was obvious that the magazine catch was hardened, unlike the magazine catch surface on the bottom of the magazine. Since original 2A/2A1 magazines are somewhat scarce due to demand from surplus rifle enthusiasts, the customer's choice boiled down to three options: Waiting for an original magazine to turn up on the Inter-

Ishapore 2A1 Enfield (Speci ications subject to change without notice) 1 Barrel 2 Front Sight Blade 3 Inner Band 4 Inner Band Screw 5 Rear Sight Assembly 6 Rear Sight Protector 7 R. S. Protector Screw 8 Fore-end Collar 9 Protector Nut 10 Receiver 11 Safety Catch 12 Locking Bolt 13 Safety Catch Washer 14 Safety Spring 15 Safety Spring Screw 16 Rear T. G.

Screw 17 Stock Bolt Plate webz or gun show and taking a risk at what the price would be, purchasing an aftermarket replacement made by Pro Mag, or performing a repair on the existing magazine. The customer opted for the third option since the magazine was serial numbered to the rifle. However, I was given a caveat: No welding.

This was a set of hand- 18 Swivel Screw 19 Butt Swivel Bracket 20 Swivel Bracket Screw 21 Sling Swivel 22 Stock Bolt Washer 23 Stock Bolt 24 Stuck Bolt Wad 25 Magazine Catch Pin 26 Retaining Spring 27 Magazine Catch 28 Retaining Spring Screw 29 Sear Spring 30 Sear 31 Trigger Pin 32 Trigger 33 Front T. G.

Screw 34 Trigger Guard 52 Ejector Screw 53 Striker Screw 54 Cocking Piece 55 Breech Bolt 56 Mainspring 57 Striker 58 Breech Bolt Head 59 Extractor Screw 60 Extractor 61 Extractor Spring 62 Magazine Cutoff 63 Cut-Off Screw 64 Buttstock 65 Forend 66 Rear Hand Guard 67 Front Hand Guard 35 Magazine 36 Front T. G. Screw 37 Buttplate Trap 38 Buttplate Trap Pin 39 Buttplate Screw 40 Buttplate 41 Buttplate Trap Spring 42 Buttplate T. S.

Screw 43 Outer Band 44 Forend Stud Spring 45 Forend Stud 46 Rear Nose Cap Screw 47 Stocking Swivel 48 Nose Cap 49 Nose Cap Nut 50 Front Nose Cap Screw 51 Band Screw Spring cuffs for me because I was planning on adding on a bit of metal to the catch and carefully filing it to fit. The customer was adamant he did not want any "permanent changes" to the rifle or any of its parts. Oh, and it had to be inexpensive. Well, sure.

The customer's restrictions left me to consider Plan B—the metal on the magazine's catch surface was peened down over time, so I resolved to push it all back into place the best I could. This required fabrication of a robust holding fixture to immobilize the magazine and to "back up" the spine portion. The magazine was disassembled and a conveniently-sized block of steel was inserted into it and held fast with a wedge and spring clamp. The magazine went into a small vise with padded jaws, spine side up.

To project the black paint finish on the magazine body some thin leather pads were fitted between vise jaws and magazine. The point was to move the metal slowly. A 3/16" steel punch and a small ball peen hammer were employed, tapping here, tapping there, on the sides and back of the catch. It turned out not to be as tedious as it sounds because the metal was remarkably soft. I suspected as much before starting, considering how flattened the contact surface was.

I alternated sides, taking timeouts to digitally caliper the progress. Peening did form a sort of raised edge, but I took the metal farther than it needed to be so that a few fine file strokes removed the wire edge. A few additional strokes were required to get the magazine catch to snap into engagement when the magazine was installed. Of importance was no vertical play of the magazine following the procedure. The magazine feed lips were snug up against the underside of the receiver feed slot.

The bolt stripped and fed .308 snap caps right from the first dummy upon reinstallation of the magazine. Since the snap caps fed into battery fine, I did not touch the sheet metal feed lips at all. This total procedure time was just under 90 minutes. The customer picked up the 2A1 and called a few days later, ecstatic that his rifle fed 7.62 NATO ammunition reliably. The repair procedure described above should work for .303 Enfields as well. AG

MEASUREMENT & INSPECTION

Marlin Model 43 Shotgun

Produced in the early 1920s, this Marlin 12 gauge pump shotgun had a cracked stock and needed a thorough cleaning. This is how it was disassembled and repaired.

BY GLEN CALVERT MAY 2020 ORIGINAL PP. 10-14

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AG-89FA4EB0BB-A2330-P10-F04

The Model 43 was produced by Marlin Firearms Co. from 1922 until 1930. It was made in 12 gauge only and the serial numbers ranged from 537 to 17411. The 22XX serial number on this shotgun indicated it was assembled in 1923. The Model 43 is one of the more complex firearm designs that I have seen. This one had been worked on at sometime in its life as several of the screw heads were damaged and there was a big scratch on the side plate. The receiver was dinged up next to the barrel locknut.

This one is not a collectible, but it's unfortunate that people don't use care and the proper tools when working on a firearm. Disassembly Make sure the magazine and chamber are empty. Removing the stock first makes it easier to work on the shotgun. Remove the buttplate and use along, straight-blade screw- Cartridge release button is above the ejection port. Release lever retaining screw location is next to the ejection port. driver to remove the stock screw.

Remove the trigger assembly screws—two on the left side, one on the right side, and one on the bottom, behind the trigger guard. The screws are different sizes, so keep track of where they go. Slide the trigger assembly out of the receiver. I sprayed the trigger assembly with solvent, scrubbed it with cotton swabs, and then dried it; I did not disassemble it. Far Sear (hook shaped part) is right of the hammer. The safety is in front of the trigger.

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Far Cartridge release lever is located next to the magazine tube. The cartridge cutoff is in the front of the side plate. Ejector tab fits in groove in the bolt. The bolt locks into the recess at the top of the receiver. Bolt assembly shown at bottom of photo. Remove the slide release lever from the bottom of the left side of the receiver. It pivots on a pin and has a spring that fits into a slot. Push the slide to the rear to retract the bolt. The side plate screws and side plate are removed.

The side plate has a tab that fits into a slot in the top of the receiver. This tab must be inserted into the receiver first when the side plate is installed during reassembly. The side plate has a small cartridge cutoff lever at the front; it did not need to be removed. The carrier retaining screw and carrier are removed. Push the bolt and slide forward about half of its travel so the bolt assembly can be lifted off the action Tube must be lifted slightly to loosen the screw. bar pin and out of the receiver.

Carefully set the bolt assembly aside for now —cautiously, as it can disassemble itself if you're not careful (we'll get to the fun part later). Remove the ejector (small leaf spring) from its recess in the left side receiver wall. It is retained by a screw. This spring must be compressed slightly to reinstall the bolt and makes life a little more difficult. The small tab fits into a groove in the bolt. The cartridge release has an external button on the left side of the receiver.

The button pushes on a springloaded lever that pivots on a small screw on the bottom of the receiver wall. An eyeglass screwdriver is required to remove the screw. All of this results in an empty receiver that is easily cleaned. The magazine tube and slide are removed by first squeezing the latch on the outer plug of the magazine tube and pulling it forward until the detent button on the inside of the tube pops into its hole.

The screw that holds the tube to the barrel is now visible and can be re- Latch on the outer plug engages the slot on the inner plug to retain the tube in the operating position.

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Forend nut is on lower left. moved. This screw is retained by a smaller screw so the magazine tube must be lifted slightly while loosening or tightening the barrel screw. The action rod slides in a guide on the magazine tube band on the bottom of the barrel; this band supports the receiver end of the mag tube. The band is dovetailed to the barrel and it is pushed to the right to make room for the action rod to slide through it. The outer plug is retained in the mag tube with two screws.

After it is removed, the inner plug with the barrel screw and detent button can be removed along with the spring and follower. The slide is removed from the mag tube by removing the forend nut on the front of the slide and pulling the tube out of the slide. I cleaned the inside of the magazine tube and slide with solvent The operating rod pin rides in the slot in the link (lower left). Bottom, link and locking latch. on a paper towel rolled into a cylinder and pushed through with a wooden dowel.

I followed this with dry and lightlyoiled towels. The barrel is threaded into the receiver with left hand threads. No interrupted threads here. The lock nut on the barrel is a split ring design. The small screw on the lock nut is loosened and the nut is rotated slightly counterclockwise (looking from the muzzle). This allows the receiver to be removed from the barrel by rotating it clockwise.

Bolt Disassembly/Reassembly The bolt assembly is comprised of five major components: breech block, bolt, locking latch, link, and guard plate. The breech block contains the front firing pin and the extractors. The bolt pivots on the breech block and contains the rear firing pin. The locking latch and link are held together by the spring-loaded pin in the latch. The guard plate pivots with the bolt and acts as a dust cover. The locking latch and link are easily removed from the bolt.

The latch and link are retained on the bolt by the round pin in the center of the link and the end of the latch that sets on the end of the bolt opposite the breech block. That end of the bolt has a groove on the side that the end of the latch seats on. The breech block, bolt, and guard plate are disassembled as follows.

With the breech block pointed to the right and the guard plate facing up, the bolt is rotated clockwise 90 degrees relative to the breech block (the rear firing pin needs to be pushed away from the breech block). The bolt and guard plate are

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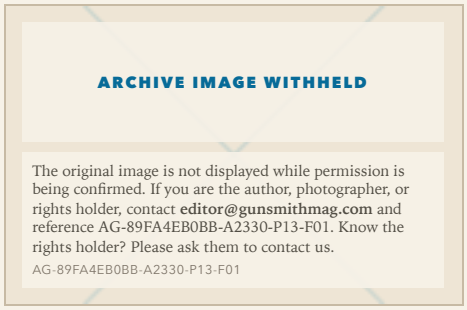

lifted out of the breech block. The guard plate is then rotated 90 degrees counterclockwise and lifted out of the bolt. The front firing pin is not retained in the breech block and can fall out. Reassembly of these parts is the opposite of the disassembly. The latch and link are assembled with the latch spring pin seated against the link. The round pin of the link is inserted into the bolt and the tapered pin inserted into the slot on the end of the bolt (the firing pin is pushed to the rear for this).

The end of the latch is pulled onto the end of Stock Repair The stock was cracked on both sides, starting at the receiver and extending about 2" in length from the outside into the center hole. I drilled a small hole in the center of each of the cracks, about 1.5" long, following the angle of the cracks. I forced glue into the cracks with a small diameter dowel until the glue was visible on the outside of the stock along the full length of the cracks.

I used heavy rubber bands to compress the cracked areas, wiped off the excess glue, and set the stock aside for 24 hours. Shotgun Reassembly After thoroughly cleaning all the parts and applying a little oil where the bolt by compressing the spring and the end of the latch sets on the groove on the rear of the bolt. When the bolt assembly is installed in the receiver, care must be taken to not dislodge the end of the latch from the bolt. needed, I started the reassembly.

The barrel is installed on the receiver (left hand threads). I left the lock nut loose until the mag tube was installed into the receiver to ensure alignment. The mag tube is

MARLIN MODEL 43 SHOTGUN CONTINUED

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Far Breech block contains front firing pin. Bolt contains rear firing pin. slid into the band on the rear of the barrel. The action bar fits through the slot on the band. The barrel screw is tightened while lifting the mag tube slightly. The detent button on the mag tube is depressed and the tube pushed fully into the receiver. The latch on the outer plug engages the slot on the inner plug and locks the tube in position.

The barrel lock nut is tightened (clockwise direction) against the receiver and its screw tightened. Install the cartridge release button, lever, and screw. Install the ejector and its retaining screw. Slide the action bar to the rear of its travel. Place the bolt assembly at the rear of the receiver. This gets it partially behind the ejector which pushes up on the bolt assembly and makes assembly a little more difficult. The ejector fits into the slot on the bolt so the bolt must be aligned with the ejector.

The action bar is moved forward until its pin fits into the slot on the link. Pushing down on the bolt assembly helps to line up the parts. Install the carrier in the receiver, the pin on the link fits into the slot on the back of the carrier. The bolt is pulled forward slowly until closed with a little downward pressure on the bolt to keep the pins engaged. Install the side plate and its screws. The tab on the top of the side plate must be installed first.

Install the slide release lever on the pin on the inside of the receiver and push its spring into the recess. The trigger assembly is slid forward into the receiver, the sear hook fits under the carrier lever (shotgun inverted). Start all the screws and then tighten. Install the stock and buttplate. Perform a function check with snap caps. Compared to more modern shotguns, pump or semi-auto, the Model 43 design seems overly complicated for its purpose.

The machining of the receiver and the complex bolt assembly, along with the magazine tube assembly, increases cost when there are simpler, less expensive, ways to do the same function. Whatever the reasons, this was an interesting project to work on. AG Far Rear firing pin is protruding from bolt.

FROM THE ARCHIVE

Cartridge Conversions

Doddering old fools may not be tactical, but there are other reasons for gun projects. Here are mine for cartridge conversions.

BY PAUL MAZAN MAY 2020 ORIGINAL PP. 15-17

As a young man, I worked on the guns I had to or needed to. Now that I am retired, I get to work on the guns and projects I want to. In my case today, that means old single shot black powder cartridge guns. I have changed the mix of guns several times as my interests changed and now my interest is with strange old beasts with exotic old names like Martini-Henry, Snider, Gras, and Rolling Block on the military side along with Model 95 Winchester, Model 8 Remington, and Polish-made Mauser rifles.

The handguns have followed the same path but it is the rifles that really interest me. The guns themselves are fun and interesting and my passion has become to buy old relics and refurbish them into shooters. I'm just enough of a romantic to like the idea that guns that were once inches from the scrap heap will still be bringing pleasure to some guy long after I am 41 Swiss from .348 Winchester; an easy conversion. The case is cut to length, fire formed, and ready to load. gone.

One aspect of the process that makes it so much fun is putting together ammunition to shoot in these old warhorses. Most are chambered in what today are considered oddball calibers. You simply won't be able to walk down to your local superstore and pick up a couple of boxes of .577-450 Martini-Henry, .43 Mauser, .41 Swiss, or even .25 Remington, to mention just a few.

However, the availability has improved over the past several years and I have found brass for some of these old codgers available from companies like Graf & Sons and Buffalo Arms. While the increased availability is nice, the prices area bit extreme so I tend to still craft them myself. If you want to 348 Winchester; a more difficult conversion.

Because the rim is too thin, the twine on the case on the right is used as a spacer to fire form the case to headspace on the shoulder. shoot these old warriors and don't have the tools or desire to make the cases yourself these area couple of places you may find brass for them.

If you're a reloader, history buff, black powder shooter, or simply interested in the black powder cartridge rifles that were the transition pieces between muzzleloaders and modern smokeless repeaters and want to shoot your collection of "experienced" guns, you're a candidate to join the wonderful world of cartridge conversions. Depending on the cartridge, converting an existing case to fit and function in a gun chambered in an obsolete caliber ranges from relatively easy to incredibility difficult.

The best source I have found for instructions on what cartridge to use and how to convert it to what you need is a book titled The Handloader's Manual of Cartridge Conversions by John J. Donnelly. Of course, the Internet is an invaluable source of information. It's also a

41 Swiss and 11mm Gras. Two very different rounds from the same .348 Winchester parent case. 300 Winchester Magnum to 11mm Mauser. The belt must be turned off the case, then the case cut to length and annealed well before fire forming. source of misinformation; the trick is to be able to tell them apart. Let's take a couple of examples just to help you decide if this is something you might like to take on. Knowledge and restraint are the most important parts of gunsmithing.

Understanding the firearm and its design limitations is critical. If the gun was designed and built for black powder loads, please stick to black powder. Most of these guns are over 100 years old and many have been roughly treated and show the scars and wear. Don't put your life and limbs in danger trying to prove how tough they are. Stick to moderate black powder loads! Nobody is looking after your safety but you.

An easy one, and the one that got me started in this silly pastime, is converting the .30-06 case to 8x57 Mauser. Yes, 8mm Mauser is available but when I was shooting my M1 Garand obtained from the DCM (Department of Civilian Marksmanship, the predecessor to the current Civilian Marksmanship Program) in competition I was accumulating a lot of empty military .30-06 cases 30-30 to .25 Remington.

This one really requires a lathe because the rim must be turned off, an extractor grove cut in, and then a run through a .25 Remington die before cutting to length. from DCM matches where they supplied the ammo. So, I had a couple thousand .30-06 cases available to me and knew all I needed to do to convert them to 8mm Mauser was cut them to length and run them through a 8x57mm die. Ta-da! Free 8mm Mauser cases! I figured free was good and I was hooked.

My next venture came when I acquired an Austrian M95 straight pull bolt rifle in 8x56mm R as adopted by Austria and Hungary in the 1930s. Back in the 1980s, ammo was pretty scarce for these. Although much more available today, it does represent another common step in converting cartridges. The round is made from the 7.62x54mm R Russian cartridge with the case rim is turned down to 0.554 diameter. This can be done on a lathe or with the case chucked in a drill press and a file.

The case is then cut to 2.25 overall length, annealed, and fire formed. In case those are new terms to you, annealing the case simply means heating the neck and shoulder area with a propane torch until it glows orange and quenching it in cold water. This softens the brass so it is less likely to crack on the next step.

The case is then loaded with a light charge of a fast-burning pistol powder, the case is topped with a filler (cornmeal, Cream of Wheat, or similar material) and either a card or a plug of wax is placed in the neck. Chamber in the rifle, point in a safe direction, and fire it. This will expand the case to fill the chamber, fire forming it into the wanted dimensions. The conversions we have discussed so far have been relatively easy but this foolishness can get pretty complex.

In reality, each cartridge is a puzzle unto itself and you will have to research each one. For a taste of what you have awaiting you, I'll talk about two other examples. The first is the .41 Swiss round used in the Swiss Vetterli rifle. This was originally a rimfire cartridge but later in their history, the guns were converted to centerfire. There are a

43/11mm Mauser round can be made by converting the .300 Win Mag case. The belt is turned off, the case cut to length, and then fire formed. lot of the older rimfires that were never converted on the market. I was fortunate to find one that had been converted to centerfire and the ammunition was relatively simple to make. Converting to .41 Swiss starts with a .348 Winchester case, cutting it to length, annealing, and fire forming it. The example other is the French .43 Gras.

This is also made from .348 Winchester brass but here it is necessary to thicken the rim to 0.08. Making the rim thicker is a job for an experienced lathe operator who can turn what are basically washers of the proper thickness, both the inside and outside diameter, to fit the cartridge. However, there is an alternative method of making this case usable.

Rather than trying to machine a brass washer, I wound some twine around the case just forward of the rim until I found how much it would take to get a light crush fit when the round was chambered. When the case was fire formed, the shoulder was moved forward. With the twine removed, the case headspaced on the shoulder like a rimless cartridge rather on the rim. As long as you restrict yourself to black powder loads, this has proved to be a perfectly acceptable solution, at least for my gun.

One of the more complex conversions I have personally done was to convert .30-30 Winchester cases to .25 Remington for my Model 8 semi-automatic rifle. I took new .30-30 cases, chucked them in my little mini lathe, turned off the rim, and then cut an extractor groove in each case. Cases were then annealed, run through a .25 Remington die, trimmed to length, and loaded. They worked perfectly, cycled the action properly, and gave good accuracy with no misfeeds or jams.

I have since discovered that the brass is available from Graf & Sons so have not converted any more .30-30 cases. I instead use the time on converting brass for cartridges I cannot obtain or can't afford. A final word of caution. I have touched on just a few conversions of the hundreds that can be done for obsolete ammunition in both rifle and handgun calibers. Please, thoroughly inspect the firearm or have it looked over by someone that can verify that it is safe to fire. Research any project you take on.

Slug the bore of your gun and be sure to use a bullet of appropriate diameter and weight. Keep powder charges on the light side until you are confident it is safe to increase the charge. Better yet, confine yourself to light loads and enjoy the firearm for its historical value. If you want and need a magnum load there are plenty of modern rifles in currently-available calibers that are better suited to that task. Always err on the side of safety and caution.

WE ARE ALL DOING THIS FOR PLEASURE, SO BE SAFE AND HAVE FUN. AG

MACHINING

Morse Taper and Shotgun Repair

Self-opening and self-locking shotgun bolting systems and their relation to the old Morse taper.

BY SERGEY LYALKO MAY 2020

ORIGINAL PP. 18-20

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A machine taper secures machine tool spindles, with the taper fitting inside alike-angled socket. The old mechanical Morse principle, a selfholding variety of taper, helps in understanding failures of the shotgun bolting systems and their repair. The evolution of muzzleloading firearms into breech loaders created anew challenge for the gun makers: the design of a strong Breech Bolting System (BBS). This mechanical portion of the gun ensures a tight breech seal for the duration of the shot.

The bolting system takes a hard beating on every shot since the pressure in the chamber is trying to open the breech. This is universally true for any firearm and any bolting system but the subject of this article is a BBS of the break-open shotgun. Right after the first appearance of the break-open design of Casimir Le Faucheux, patented in 1836, his hinge-and-bite bolting of the pin-fire shotgun brought up disbelieve and skepticism on the part of traditionalists.

This is a natural Skeptics pointed out weaknesses in the BBS. The bolt is controlled by the under-lever. reaction since muzzleloading firearms were at their peak of development and popularity then. The major point of skepticism was the weakness of the hinge-and-bite BBS, holding barrels from opening during the shot. Indeed, this simple design was not strong enough. The opening force of each shot was quickly loosening this bolt, making it inefficient. Improvement of this BBS was a real challenge.

After the presentation of Le Faucheux's gun at the Great Exhibition of 1851 at Hyde Park, skeptical British gunmakers took this challenge on and created the whole specter of the shotgun bolting systems, competing for the best one. Everything has been tried: single or multiple bites, third fasteners, Greener cross bolts, "doll's head" extensions, Kersten locks, trunnions and hinges, as well as bottom, central, and This schematic shows the bolt engaged with bite and the angle of engagement. top bolts.

Each one has advantages and disadvantages. The marathon of these designs started out at the break of 19th and 20th century and never stopped. The major goal is to create a BBS which is strong enough to keep closed on every shot, to withstand deformation ("keep face") for as long as possible, and provide convenient manual opening and closing. Now, after more than 100 years of this search, the dominating BBS design of the break-open shotgun can be generally illustrated as shown in the sketch in this article.

The sketch depicts one bolt and one bite, which is typical for the Browning-type cluster of shotguns. However, a wide variety of popular designs like the top bolts in the Remington 32 and Krieghoff, locking pins with Beretta, the rotating bolt found in Fox, and many others can be merged into this group for the failures of BBS discussed in this article. These failures are self-opening and self-locking of the breech at the shot. Excluded from this group are the true Greener crossbolts and their variations.

IN OTHER WORDS, THE CROSS-BOLTED AC-

MORSE TAPER AND SHOTGUN REPAIR CONTINUED ORIGINAL PAGE 19

tions never open and never lock themselves at the shot. Morse Taper Surprisingly, principles of BBS are tightly related to the principles of a Morse taper, invented in 1864 by Stephen A. Morse for reliable joining of two machine components. We all are using lathes and mills where a Morse taper is a usual accessory. The major quality of this taper is its self-locking ability. There is a number of different tapers in machinery. Some are selflocking as Morse or Jacobs tapers while others are self-releasing.

To disconnect female and male parts of the self-locking taper we Fr is a force trying to open the breech. Ful is pushing the bolt out of bite, an unlocking force. Flk is a force exerted on the bolt by the top lever spring. Fn does not contribute into any bolt motion. Qis a bolt and bite angle of engagement. The angle of the locking bolt is greater then 7° and therefore is self-releasing. need to apply force. With self-releasing taper it's the opposite and we have to apply force to keep them engaged.

Everything depends on the angle of tapering. For Morse it is around 3°. The smaller the angle, the stronger the self-locking; the greater is the angle, the stronger the self-releasing. The borderline is at 7°. Every taper of 7° or less is self-locking and greater than 7° is self-releasing. As the dominating BBS design illustration shows, the bolt-bite engagement of the gun is a joint controlled by the taper angle. If so, the bolt-bite taper should not be less than 7°.

It also should not be much more than 7°, otherwise the locking spring needs to be much stronger, which prevents easy opening of the gun. This way, we come to a principle: the bolt-bite taper should be as close to 7° as possible. Let's look at selfopening of a BBS. It happens quite often. In most cases it is a result of a natural wear and shot-forging of the bolts and hinge. It is not noticeable right away.

The first indication of selfopening is a position of the top lever turned to the right from its original position after the shot. This will be shown by the position of the top lever. The left side labeled "A" shows the position of the top lever before the shot and "B" is its position after the shot. If not fixed, this problem grows, ending up with barrels breaking open. Self-opening often comes with offface condition when the barrels become loose in the action.

I have never seen any danger associated with this unpleasant situation but this is a failure which needs to be repaired. Otherwise, besides opening, the ejectors and firing pins stop doing their job. Also, the point of impact on the second shot changes its position. Consider the forces applied to the bolt during the shot. There is a distribution of forces applied to bolt during the shot. Here, Fr is a force that is trying to open the breech. In other words, rotate the barrels around the hinge.

I call it rotating force. Ful is pushing the bolt out of bite and is called unlocking force. Flk is a force exerted on bolt by the top lever spring. It pushes the bolt inside the bite and is called locking force. Fn does not contribute into any bolt motion and is neutral. Qis a bolt and bite angle of engagement.

MORSE TAPER AND SHOTGUN REPAIR CONTINUED ORIGINAL PAGE 20

The area is blued to better show the brazing compound where a steel plate has been added and angle adjusted to about 7°. The metal template shows the 7° angle. For self-opening BBS it is always greater than 7° and making the taper self-releasing. Note that selfopening can happen in only one way, when the bolt retracts back from the bite into standing breech and leaves the barrels unlocked. The resulting force Fres affecting the bolt can be described as Fres = Ful - Flk = Fr * sin(Q) - Flk.

If Fres < 0, the gun is locked. If Fres > 0, the bolt is retracted, the gun is unlocked, and the barrels open. The formulae shows that for the greater angle Qand a weaker top lever spring, the self-opening is more probable. The repair of self-opening involves installation of the stronger spring and/or changing the angle Qto a smaller one. The later is more efficient, especially when the top lever spring is of the complicated V-shape and hard to replace.

Important is that by reducing the angle Qalone we can achieve as little unlocking force as desired and make sure that barrels stay locked. We just need to remember that making this angle smaller than 7° will convert it to a self-locking, which makes opening of the barrels really hard. Sometimes turning the top lever for opening the barrels after the shot becomes impossible, as discussed below.

Consider a modified bite angle, shown here with a blued area to better show the brass brazing compound where a steel plate was added and angle adjusted to about 7°. The angle on the bolt itself has to be modified accordingly. This is shown as take two with the bolt after adding metal by welding and adjusting the angle to 7°. The metal template of the 7° angle is quite useful for adjusting bolt-bite. The self-locking BBS is somewhat puzzling.

Imagine that the gun was used for awhile without any problems and suddenly you cannot turn the top lever for opening the barrels. What is going on? When I first faced this problem my guess was that the friction in the bolt-bite somehow grew up. After polishing the surfaces of the bolt and bite, the problem with opening became even worse. This seems strange but is easy 4°, which is self-locking taper. Bite angle A and bolt angle Bof the self-locking shotgun are shown to be less than 7°.

Bolt Bis horizontally positioned in the vise before measuring angle. to u ndersta nd knowing that it is a Morse taper. These self-locking tapers “glue up” much stronger when their surfaces are closer to each other. So, in the process of working together the bolt and bite polish themselves to a closer match and bond stronger. Deep in physics the Morse principle is explained by inter-molecular forces but this is beyond our scope. A self-locking BBS does not open, even with a force of 10Kg (about 22 pounds).

In fact, this gun opens at about 26 pounds of force, making it not operable. The bolt-bite angle of this gun taking 26 pounds of force to open is 4.4°, which is self-locking taper. It needs to be increased to 7°. To increase the angle one has to first add metal on the bolt and bite and then adjust the angle. I add metal on the bolt by welding and by brass brazing the steel plate.

Conclusion Two widespread failures of the Breech Bolting System of the breakopen shotguns can be explained by the principles of the Morse taper. These failures are self-opening and self-locking of the barrels. First is when the gun is opening at the shot. The other is when the opening after the shot becomes hard or even impossible as the top lever cannot be of their repair is to adjust the bolt-bite engagement angle to about 7°.

All said above is associated with shotguns but is true for any break-open firearm, including rifles, drillings, single shot, or combination guns with breech bolting shown here. AG

SAFETY & COMPLIANCE

Keeping Safety First

Overview of gunsmith safety procedures.

BY ROBERT K. CAMPBELL MAY 2020 ORIGINAL PP. 21-23

There are basic safety rules when handling firearms. Like many of us after long experience, we have stories to tell of those that mishandled a firearm. The results can be embarrassing and sometimes something is damaged—hopefully only property. But truly tragic events have occurred from poor gun handling. Gunsmiths handle both firearms and power tools. The combination is one that must be approached with a healthy respect.

We must know a bit about electricity, about proper hook-ups and avoiding overloads, and observe safety rules when using things like lathes and drill presses. Hand tools are also demanding of careful handling. I think that one of the worst accidents occurred with one of the finest craftsmen I have known and a hand made knife. He was moving gently and perhaps not holding the knife quite as rigidly as he could have. The knife was grabbed by the sander—perhaps the sander hit a rough spot—and thrust upward. It bounced off a guard. The knife was taken from his grasp, flew into the air, and came down on his back, running in point first. He trudged to his house (like many of us, his work shop was behind his home) and had his wife pull the sticker out and render first aid. With sufficient gauze taped to the wound, they rushed to the hospital. I cannot recall how many stitches were needed but it was minimal.

And his wife was asked a number of embarrassing questions, the poor These are office type tools such as a price stamper; while seldom used they are nicely tucked away. woman. Still, this could have been much worse. While an extreme example, injuries to the eyes and extremities are more common. Another example is a conscientious gunsmith who was working on a SIG P226 handgun. Somehow, it escaped from his grasp. While he was certain the handgun wasn't loaded, he did not wish an expensive handgun to land on the concrete floor of the shop area. He caught the handgun on his foot and getting badly bruised through his tennis shoe. Perhaps we should all wear steel toed shoes for this reason. I know another 'smith that slipped and let a rifle butt hit his big toe. He ended up losing the nail and it was pretty painful. If something is falling, let it. Don't try to grab it, particularly anything with sharp edges.

Otherwise injury is almost guaranteed. Once the basics are handled we have to consider children as well. Many of us work at home. Small children have no business in the shop. My children grew up with firearms in the house and they learned common sense safety very early. Guns should be locked at all times. While I have been guilty of having disassembled guns laying about the work table, I try to do one project at a time. If I am waiting for parts, I lock the gun in the

safe. This is especially important if children are in the home and you work there. Ammunition should never be in the work area of the shop! I have a detached workshop and there isn't a single round in the shop where work is done on guns— save the Government Model .45 I usually have on my belt or the .38 Special in my pocket. If I walk out of the shop or go to lunch, the shop is locked and the guns are not left unsecured. The loaded sidearms travel with me.

When they were young, I taught my children —now 37, 34, and 23— to never to touch a gun or gun part. As an aside I once had a particularly rough Hi-Power clone I was working with. I could not convince the trigger to jump back into the gun. I left it on the living room coffee table and went for a walk. My son returned home from high school, a junior at the time. He spotted the pistol in pieces and put the gun back together for me. While this was pretty cool, it was poor safety on my part.

I should have locked the gun away. Of course, this was a young man familiar with firearms, not a child. The changeable point is first class and well tempered. Teaching children not to touch gun parts has a practical aspect besides safety. We do not need to lose parts; we can misplace enough of them without anyone's help! Children just are not mature enough to exercise good judgment. We may not realize that children pick up on our safety and what we do.

As an example, when my daughter was very young she would not have known there were guns in the house, or so I thought, because I was very safety conscious. One day I was developing film—back in the days of 35mm—and I found a perfectly framed and back lighted shot of her water pistol. My four year old copied my work. I did not even know she had borrowed my very expensive camera. While not as potentially dangerous as a firearm, it was the most expensive camera I had owned to that point.

Her brother had broken a 35mm at a similar age, so, watch all your expensive tools! Children are very observant and don't be sure you have hidden anything. When working with a gun, no matter what we have done the previous day it is time to check the firearm again the next time it is handled. All guns are always loaded is the Far Don't set up a vise where it will be ran into. primary rule. Another rule is never to cover anything with the muzzle you do not wish to see destroyed.

Always clear the firearm and check for ammunition in the magazine, cylinder, and chamber. I think we are all aware of the stuck cartridge in lever action tube magazines and rimfire feed devices. A matter of great concern is checking a gun into the shop. Never assume the customer has cleared their firearms. My friends working security at gun shows tell me they have never worked a show without at least one loaded gun coming into the booth to be checked and tagged; at most shows, it is several.

Your customers come from the same gene pool. The same is true at pawn shops. People bring in loaded guns to pawn, often unaware of that fact. Know how to clear every type of firearm as it is essential for safety. One shop I visited as a youth had a special clearing station at the far end of the shop just for this purpose. My grandfather pointed out a bullet hole (pockmark) in the concrete wall of his country store where someone discharged while unloading one of those "damn automatics".

This made an even bigger impression on me as a child. A fairly common problem is a loaded gun that must be brought into the shop. This may be a revolver with a squib load that has stuck a bullet in the forcing cone. The cylinder will not rotate and cannot be opened. Then there are

rifles that have suffered a swollen case and the bolt will not open. Never assume the cartridge in the chamber isn't alive round! These handguns and long guns should be handled carefully. As an example, one customer described a single action automatic pistol that had failed to chamber fully. The cartridge case (an off-spec handload) was stuck in the chamber, the slide wouldn't close, and the hammer was cocked.

I told him he was traveling at this own risk with that firearm and that needed to contain it in a hard case in the trunk to suspend movement. When he arrived at the shop I met him at the door and removed the firearm myself, carefully taking it to the work area. I have a fixture that handles such things. While a dowel must often be placed in the barrel to exert pressure to the rear, I do so at an angle so that a launched bullet would go toward a backstop.

Also, I spray penetrating oil and WD-40 liberally in the chamber to kill the primer and powder. I haven't had a I assure you at least the band aids will be used. discharge with this method but it could happen. Shop Gear As for tools there are any number of rules. We have all had bruises, punctures, and scratches but far more serious injuries are possible. A number one rule for safety and good gunsmithing is to use the right tool. It is common for a screwdriver to slip; worsened when ill fitting.

You may mar a finish or gouge yourself. Use heavy work gloves when possible and nitrile industrial-rated gloves to protect from harsh chemicals. I have quite a few screwdrivers of different sizes, some hand cut and others purchased, but they are discarded when at the end of their useful life. Long-handled tools are best for jobs needing more leverage and short handles allow close work when finesse is more important.

Because using a hand tool repeatedly potentially can harm your joints and cause carpal tunnel and even lead to muscle and nerve strain, the Far While some see less use, all are handy from time to time. Even the super size rat trap has seen use. tool's handling and ergonomics are important. This applied to mallets, screwdrivers, chisels, and files. Look out for pinching when in use and be certain the surface is non slip. Hold your wrist straight when using a tool and the elbows slightly bent for better leverage.

Use a vise to secure your firearm or part. Don't get into an awkward angle that will cause back strain. If the tools have cracks in the handle or the working head has mushroomed and expanded, chances are the tool will be prone to slipping and cause an accident. Keep tools clean and lubricated as needed. Discard any that are no longer viable. The single most important thing to always wear are good quality safety glasses.

The rules of geometry tend to support the theory that anything that flies from the firearm will strike your eyes. Fluid, solvent, and oil is spilled out in many operations and we tend to rack the slide or bolt at eye level—at least I do. Some glasses have a bifocal element and that is an advantage. Never fail to don safety glasses. A good quality shop apron will prevent ruined clothing as well as pinches, burns, and cuts. I also find I can catch dropped parts in the apron as well.

Good lighting enhances safety, prevents eyestrain and possibly accidents from things you may overlook in a shadow. Use the right tool for the job, wear appropriate safety gear, and keep a first aid kit handy for minor scraps. Always let safety come first. AG

PISTOLS

Reader Forum

BY AMERICAN GUNSMITH EDITORS MAY 2020

ORIGINAL PP. 24

Converting Revolver Cylinders I enjoyed RK Campbell's "Converting Revolver Cylinders" (February 2020) very much as I have worked with several conversions with customers over the years. The article included several tips that I sure could have used!

It did bother me somewhat when I read, "Still, if someone has a .22 LR revolver they like, I suppose it is okay to fit a .22 Magnum cylinder." I understand that the .22 Magnum has a larger diameter bullet and requires a larger diameter barrel and that factory revolvers using both cylinders have the larger diameter barrel for the .22 Magnum cartridges. I have no proof of this, however, as I have not gone to the trouble to measure the barrel diameters.

When the .22 Magnum first came out I read that Winchester warned about not rechambering .22 LR guns to the new .22 Magnum but they didn't say why. My shade tree gunsmith friends were sure it was because Winchester didn't want to lose any potential market for any new guns. To investigate their reasoning, I chambered a .22 LR single-shot rifle to 22 Magnum. It was a big mistake. The cartridge case ruptured, expelling gas and unburned powder out the extractor slot.

A two-inch free bore did cure the problem to save the rifle. I think I still have that ruptured cartridge case in my "goof up" box to remind me of my stupidity. I am not sure if the same problem would occur in revolvers with their gaps before the bullets reach the rifling, but maybe you know. Keep up your inputs to our magazine. I enjoy them very much. Fletcher M. Pool Ordway, CO RK Campbell responds. Point well taken!

Regarding .22 caliber handguns the article discussed primarily single action revolvers such as the Heritage .22 and Ruger Single Six .22. The Ruger is supplied with a Magnum cylinder and the Heritage is the same handgun with either the spare cylinder or not. I was mentioning the trouble in fitting a cylinder to a handgun that did not have a spare cylinder primarily as a result of a loss. I would not attempt re-chambering a rifle at all.

Lantac Bolt Carriers Concerning your articles covering AR-15 bolt carrier tilt and your fixes, have you seen the Lantac enhanced bolt carriers? Do they align the bolt carrier like your modification does? Trey Badd From author Joe Carlos. I have tested the Lantac carrier and found it to be no better than conventional carriers. There is not enough build up on the bottom rear of the Lantac to raise it up enough to be level in the upper receiver.

Unfortunately, it still tilts the back of the carrier down which throws the bolt face at an angle to the bore of the barrel. AG

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