

Part 2

Functional Improvements (MODIFICATIONS)



WALTHER P22 BIBLE

1917-1911M

As you have probably read the "test gun" frame developed a hairline crack at approximately 27,500 rounds. There was absolutely no wear to the frame rails or slide grooves, only cosmetic wear to the finish. The pistol still fired very reliably with the cracked frame but I doubted the safety of continued use. S&W offered to repair the pistol or send me a new one - free. I chose the new pistol. I haven't fired it.

I removed the new slide, found damage from sharp trigger bar ears and haven't put it back together. So why am I modifying a new P-22? There are several inherent problems I've seen with all P-22s regardless of whether they fire reliably or not. These are problems that sooner or later, in my opinion, need addressing. I intend to address them up-front and then enjoy plenty of trouble free shooting. Three items can't be modified to prevent problems; a slide or frame that fractures and hammer spring breakage. Any of these S&W must either repair or send new parts.

I am not a gunsmith with formal training so take anything I post with a grain of salt. Anything in this thread you don't understand will be clear to a gunsmith. Get expert help if you need it. With a little practice and patience you won't need it.

Routine, recurring, solvable problems are:

1. Sharp trigger bar ears that damage the slide and ears that don't fully engage the slide ramp which can cause accelerated wear even with polished ears.
2. A hammer tip that catches on the safety bar causing the slide to fail to complete it's cycle and in the process fail to chamber a round. The stock hammer tip will also peen the metal on the bottom of the breech block and is usually not square but rather drags on one side or the other.
3. Poor spent casing ejection direction resulting in hot brass flying everywhere including between the eyes. One member recently reported his wife actually hitting a spent case that was ejected forward with the next round. This is not only aggravating but is not safe.
4. A safety that can rotate from safe to fire or just the opposite on it's own from the hammer tip dragging on/across the safety bar or from vibration caused by a hammer strike or firing.
5. A barrel nut and two frame screws that will not stay tight without blue threadlocker or similar.
6. Check the magazines received with the pistol to see that they freely hold 10 rounds of ammo. If that 10th one has to be shoved in really hard don't expect the slide to operate correctly.

7. Grease and oil packed in interior spaces of the pistol. We have determined that these two products collect spent powder and other debris resulting in an abrasive mixture that is damaging to the zinc pistol. All traces of oil and grease should be removed and replaced with dry lubricants and/or powdered lubricants of teflon or molybdenum.

Before disassembling the pistol insert and eject a fully loaded magazines several times. It should smoothly lock and unlock from the pistol without undue effort. I recently inspected a pistol that was extremely hard to lock or unlock a magazine in. I removed the inner spring from the double set that control this feature. This made magazine insertion/ejection much easier. Regardless of how I held the pistol or shook it while operating the trigger without a magazine, I could not engage the hammer. Therefore, removing the extra spring did not immobilize the magazine safety. Other pistols work fine with both springs.

One other test I do with the slide off is to depress the sear arm so I can manually thumb the hammer back and forth 100 times or so. If the hammer spring is going to break, I want it to break now so that I can replace it while the pistol is apart.

The above problems can all be solved with simple modifications where required. Following are the details on what I do. When I'm through I will be able to let the slide forward slowly even with 10 rounds in a magazine, even trying to make it hang up yet it will complete its cycle each time I release my grip. Follow along if you wish.

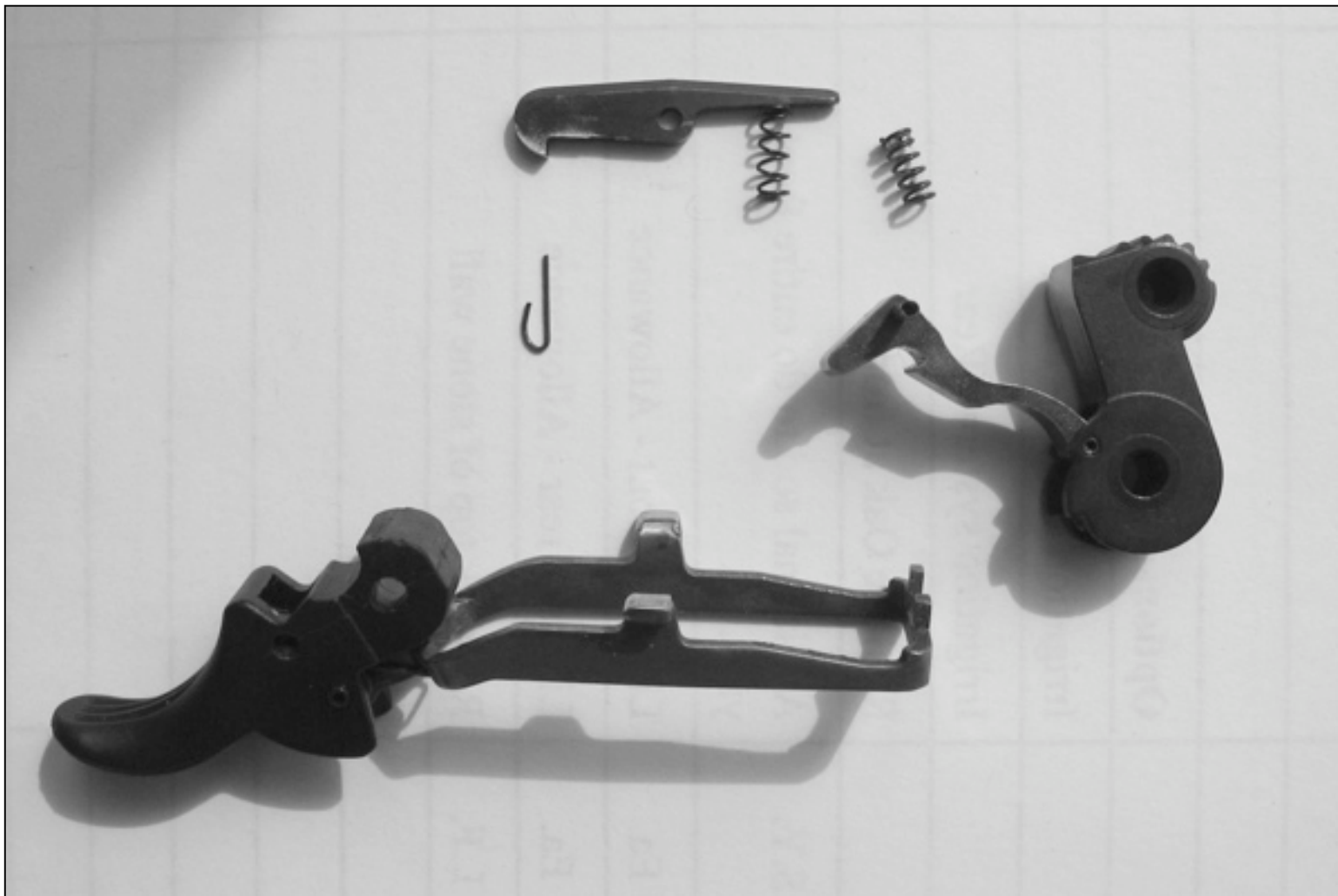


After testing how the magazines lock and unlock, remove all ammo from the pistol, make sure any magazines you might use for additional tests are empty and relocate all ammo to a drawer or some place separate from where you are working on the pistol. Gather your tools and find a comfortable work space, desk top or bench.

Tools; small hammer, two drifts, a flat or Phillips screwdriver for removing the frame screws, the barrel nut wrench, an assortment of emery paper, 220 grit, 320, 400, and 600 That will be enough, some clean rags, Remington Remoil and Gunscrubber or other similar products, some emery fingernail files, a Dremel with attachments and some Permatex "blue" threadlocker or similar. Not red. Camera if you're keeping track of all your work for the fine folks at the Walther section of RFC.



I completely disassemble the pistol as shown above. This gives me a chance to inspect the parts and perform any needed modifications and clean them. Refer to the disassembly/reassembly thread if necessary.



These are the parts that I found needing modifications in my new '06 P-22. The J spring holds the internal safety in whatever position you place it. My spring wasn't expanded enough at the bottom of the J and didn't fit tight against the safety bar. It could fall out. If you find this situation, simply expand it so that when you install it tension keeps it locked in it's place in the frame.

Also show is the extractor which will be peened to correct ejection direction, a modified (stretched) extractor spring as compared to a stock one, the trigger bar and hammer with it's troublesome "tip". Notice that in this picture some of the parts are already modified. Ignore that for the present.

**Functional Improvements
(MODIFICATIONS)**

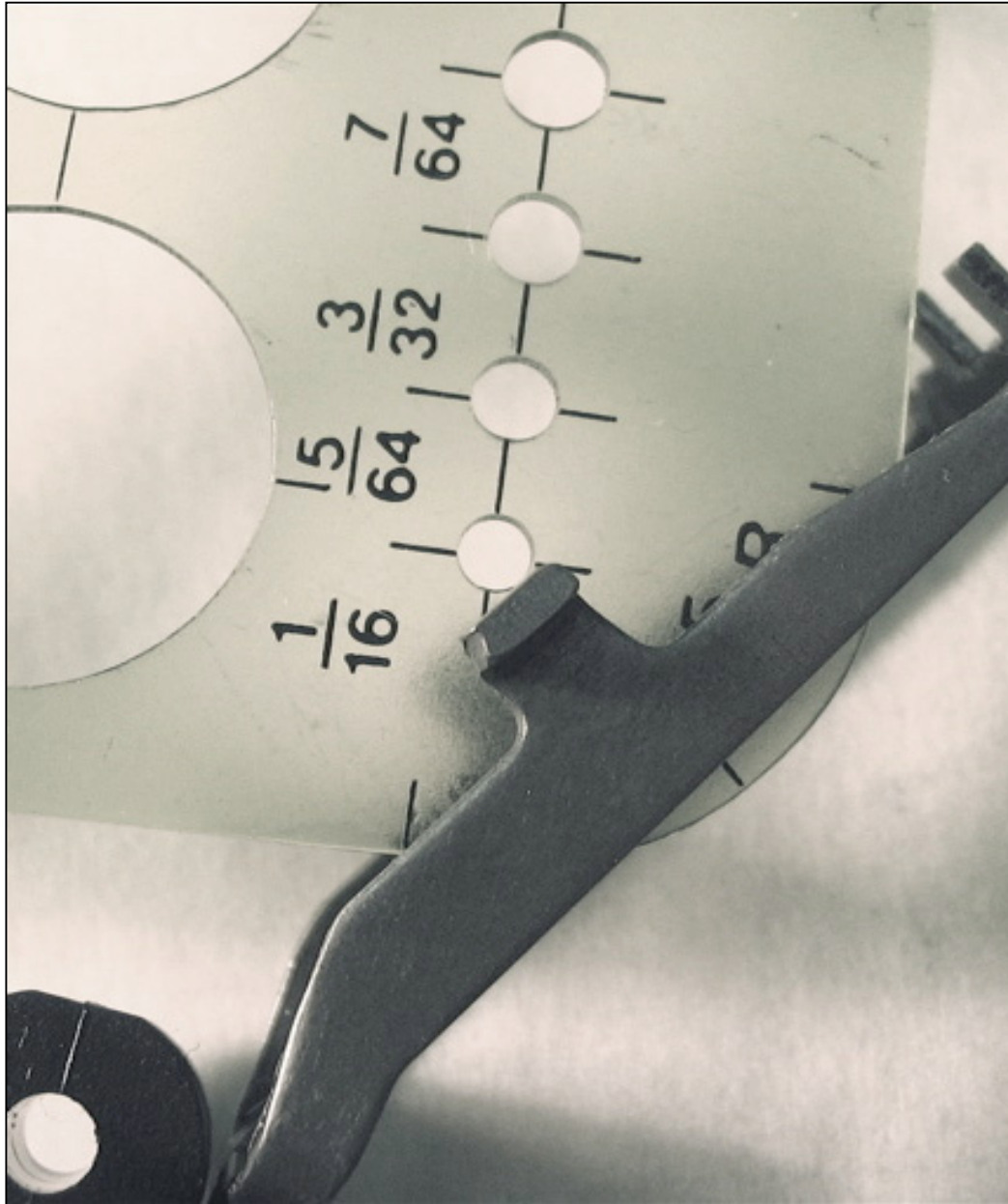
Trigger Bar Ear Fix



In the above picture you will see some sizable chunks of zinc that have been taken out of the slide by the sharp trigger bar ear. I say ear because only one ear is hitting the slide. This pistol has only been fired once by Walther and the slide then removed by me. The trigger bar ears causing this amount of damage won't do. Imagine the damage from 1,000 rounds. Also notice for later modification discussion that the ear is only engaging about 1/2 of the ramp. Wear here will be less with more surface contact.



The top front edge of the trigger bar is usually the only portion requiring radiusing and polishing. On this pistol, not only was the front edge sharp but the sides and the top. All of these edges will now require smoothing and polishing. You only want to remove enough material to get the job done, not grind the ears away.



This is a photo of the other ear. Notice how sharp the top front edge of this ear is. When the slide moves rearward the ear slides down a "ramp" located on the underside of the slide. This ramp presses the ear/trigger bar down disengaging it from the hammer assembly. This interaction occurs each time you fire a shot and it occurs very rapidly.



This photo show just how rough these ears are from the front, not only the front edge but the sides and the top.



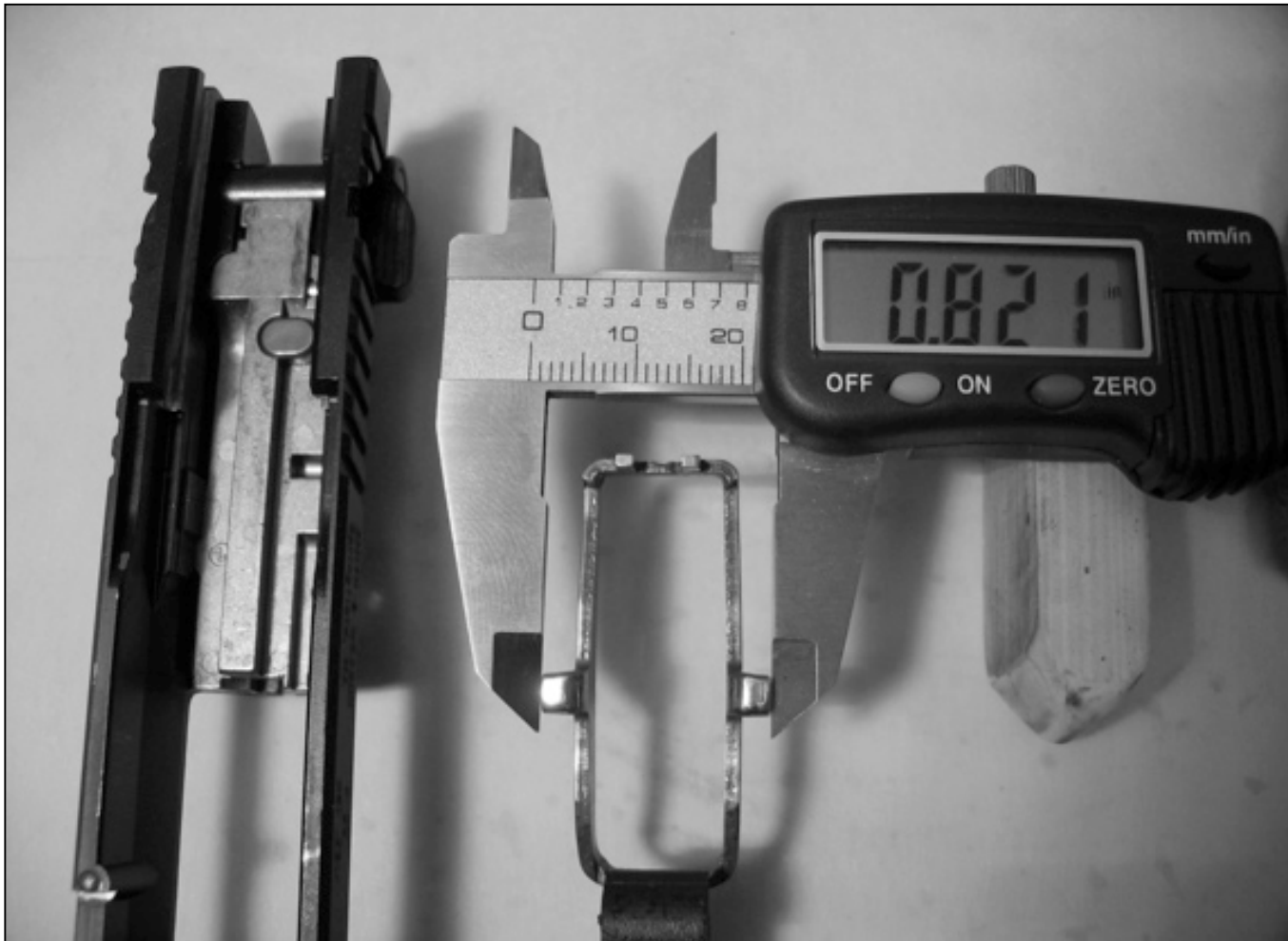
I placed a small piece of 220 grit emery paper flat on a hard surface of my work bench. I then turned the trigger bar upside down and with the top of the ears placed flat on the emery paper, I gently rubbed them back and forth just enough to remove the raised protrusions. I then used the Dremel to remove just enough of the material from the front edge to begin the radiusing process. Careful now, don't get carried away with that Dremel. Just barely round the top of that front edge. Remember, power tools can cut very quickly and jump around on you. You could do all this by hand but tools sometimes speed you up a bit. The Dremel will really come in handy when polishing.



I then use fingernail files, not the sandpaper kind but the better ones you can find in the grocery or drugstore. They have emery grit on them, are durable, come in grades from coarse to very, very fine, 1500 grit or finer. An added benefit for most applications is that they "give" if you press your work piece into them which rounds the edges of whatever you are polishing without any extra effort. If you don't want any rounding, lay a piece of emery paper on a hard surface like your desk top or glue a piece to a popsicle stick.



Take your Dremel, put on the polishing attachment and polish those ears . Don't forget to polish the top, front and ends. You might also touch up the rear legs just "because" you can.

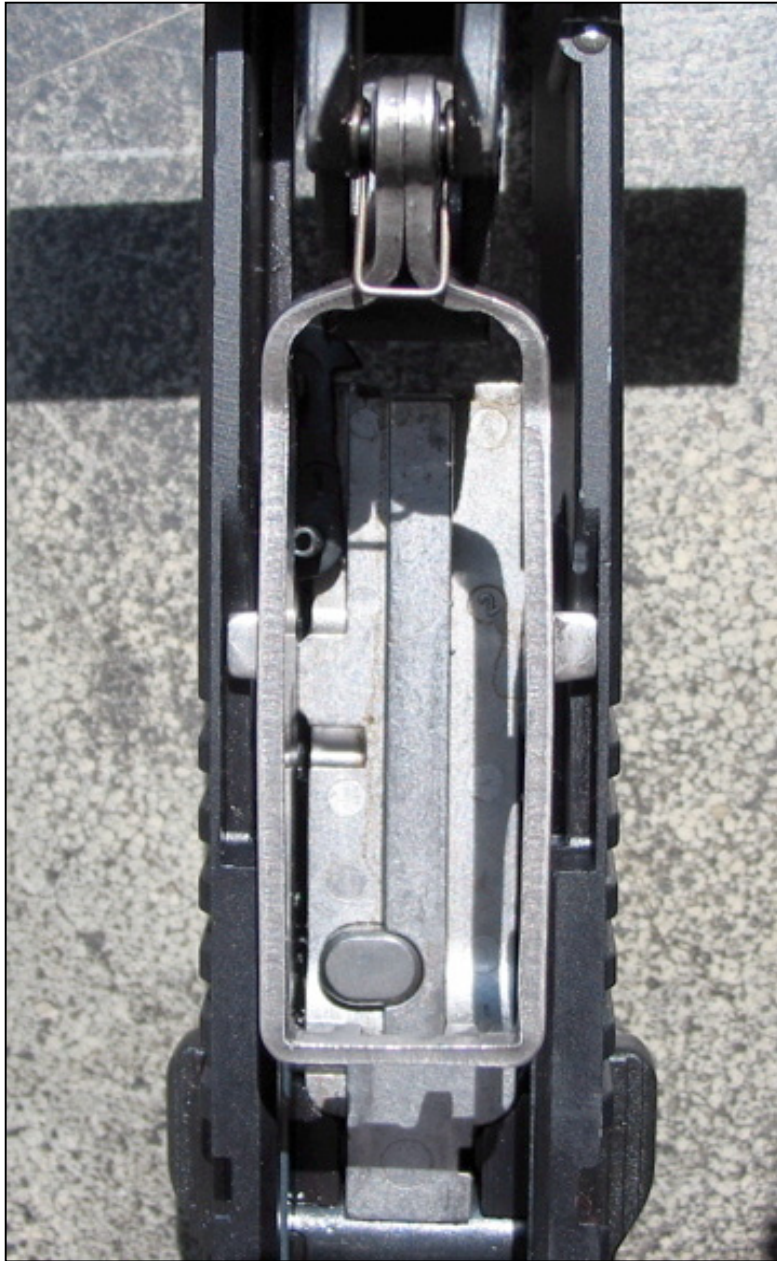


I want those smooth trigger bar ears to spread the impact over most of the ramp width under the slide. The inside dimensions of the slide measures 0.830" here and the stock ears measure 0.785". This leaves quite a gap and the ears are only rubbing on about 1/2 of the slide ramp. I want to spread them to the point where they are just slightly narrower than the slide width here yet don't bind in any way. The above trigger bar has been spread so that the ears are within 0.009" of the two ramps overall width.

Warning: Some of the mods I'm showing here are really kind of touchy to do. Rounding the ears and polishing them is easy and will provide 10's of thousands of rounds fired through the pistol with denting of the underside of the slide but the pistol will still function properly. Don't go overboard just because I did. I'm really familiar with the P-22 and enjoy fooling with it. You may not want to go to some of the detailing I do.



In order to make the ears spread I placed the trigger bar on top of a large socket and then took a smoothly tapered socket and lightly hammered it. This process spreads the trigger bar ears just right. What you want is to spread the ears without spreading the bottom rails of the trigger bar too much or they will drag on the frame. Like a lot of other things on this pistol, just the right touch is required or several attempts to get it just right. I'll get a measurement for the rail spread and add it here shortly. If the rails spread too much, simply press them back together with you fingers or tap very lightly with a hammer. One way to keep them from spreading too much is to place them in a vise or in the jaws of a crescent wrench to hold them steady while you spread the ears. This is all very easy to do.



Nine thousandths of an inch looks just right and a test run of sliding the trigger bar up and down the slide ramps, even with it slightly cocked to one side or the other indicates smooth running here. Notice how much more of the ramp is engaged as compared to where the sharp ear took a bite out of the ramp. One important note here is that the width of the frame where the trigger bar moves is 0.610" wide so the trigger bars (not the ears) can't be spread quite this far.

If you choose to spread the trigger bar ears reassemble the frame halves without all the other components just the trigger and trigger bar to make sure you still have clearance and a smoothly operating trigger. Insert the ears in the slide and move them up an down the ramps. Make sure you have a little clearance. The trigger bar ears can't drag on the slide from being too wide, neither can the trigger bar rails inside the frame. My measurements are at the max.

**Functional Improvements
(MODIFICATIONS)**

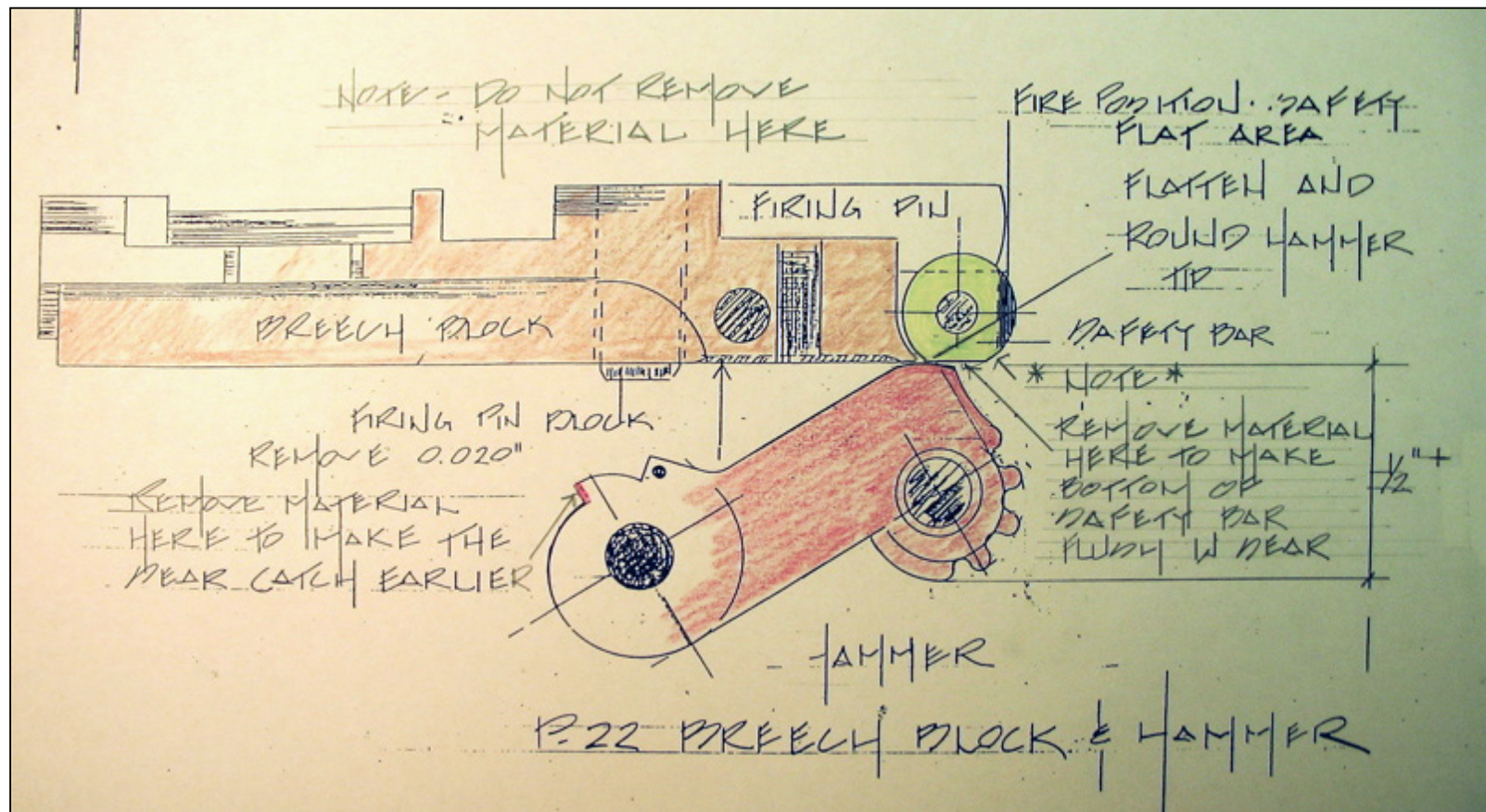
**Hammer and Breech
Block/Safety Bar Fixes**



The next area to check is the safety bar. The hammer tip on many P-22s catches in the small valley that is between the round safety bar and the rear of the breech block. On some P-22s the safety bar actually hangs down below the breech block and makes this situation worse. This is one way to determine if yours does. As this piece of straight bar is lying flush across the bottom of the breech block and the safety bar, this safety bar is not hanging down and requires no further treatment.



The old "test gun's" safety bar hung down below the breech block. Since the only time I would really be concerned about increased drag here is when I am "firing" the pistol, I place the safety lever in the "fire" position and grind off just enough material to make the bottom of the bar flush with the breech block. This needs to be done for the entire width of the hammer. This is not the area that blocks the hammer when in the safe position but is close to it so don't get carried away here. Remember, safety in the "fire" position for doing this.



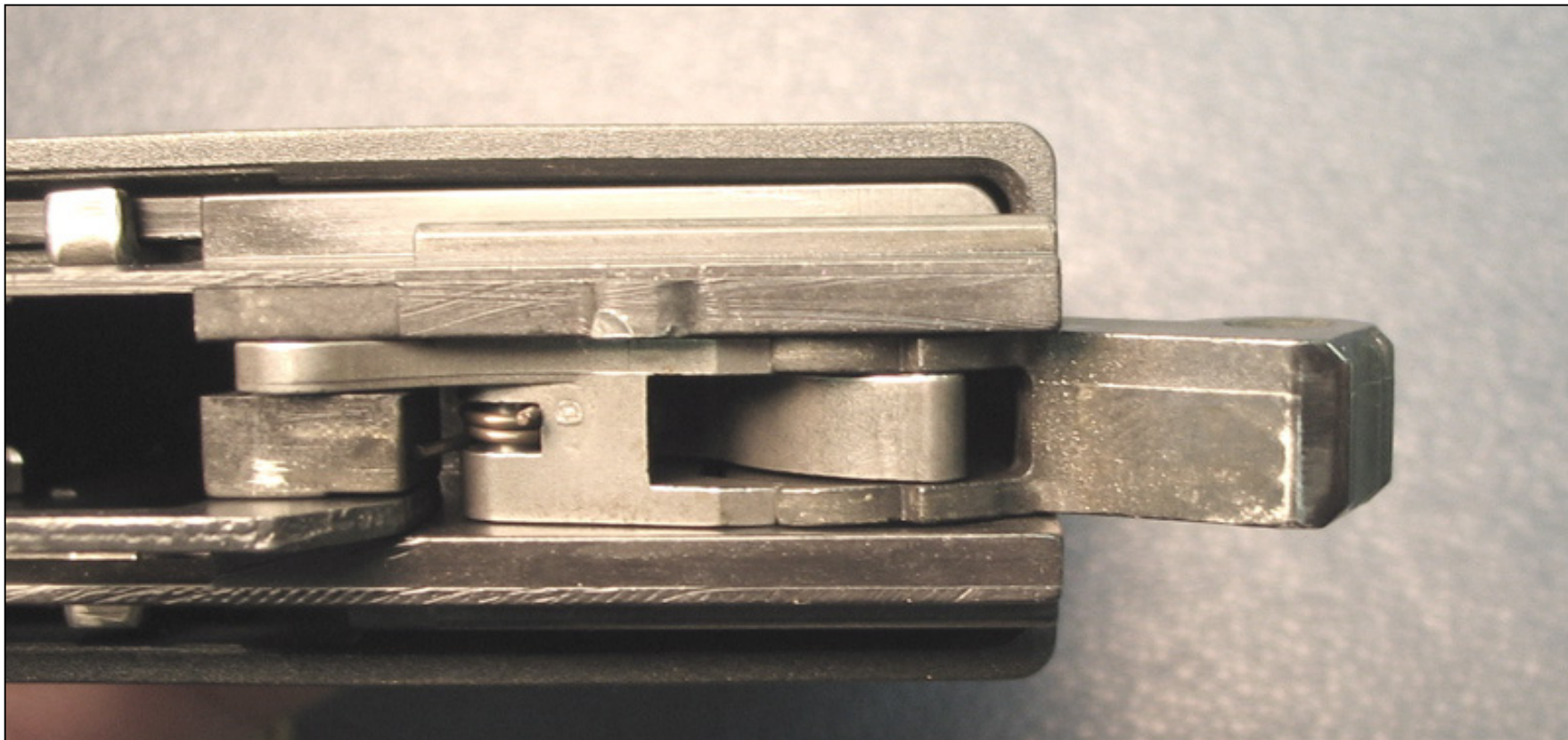
This is a drawing of the processes we are doing and will be discussing regarding re-profiling the hammer's tip, removing material from a safety bar that hangs below the breech block, if your gun has that situation. Also shown is where to remove material from the hammer's cock notch should you remove too much material from the hammer tip in the process of reprofiling it causing the slide to no longer be able to cock the hammer. You may also have to modify this notch if you have slide wear in the grooves and the slide is lifting and no longer cocking the hammer.

WARNING. This is the area where the sear engages the cocked hammer. Work in this area is serious business. Done improperly and the cocked hammer could slip off the sear causing the pistol to discharge. Work here is not difficult but you "must" know what you are doing. If you don't understand it, see a gunsmith. It's that important.

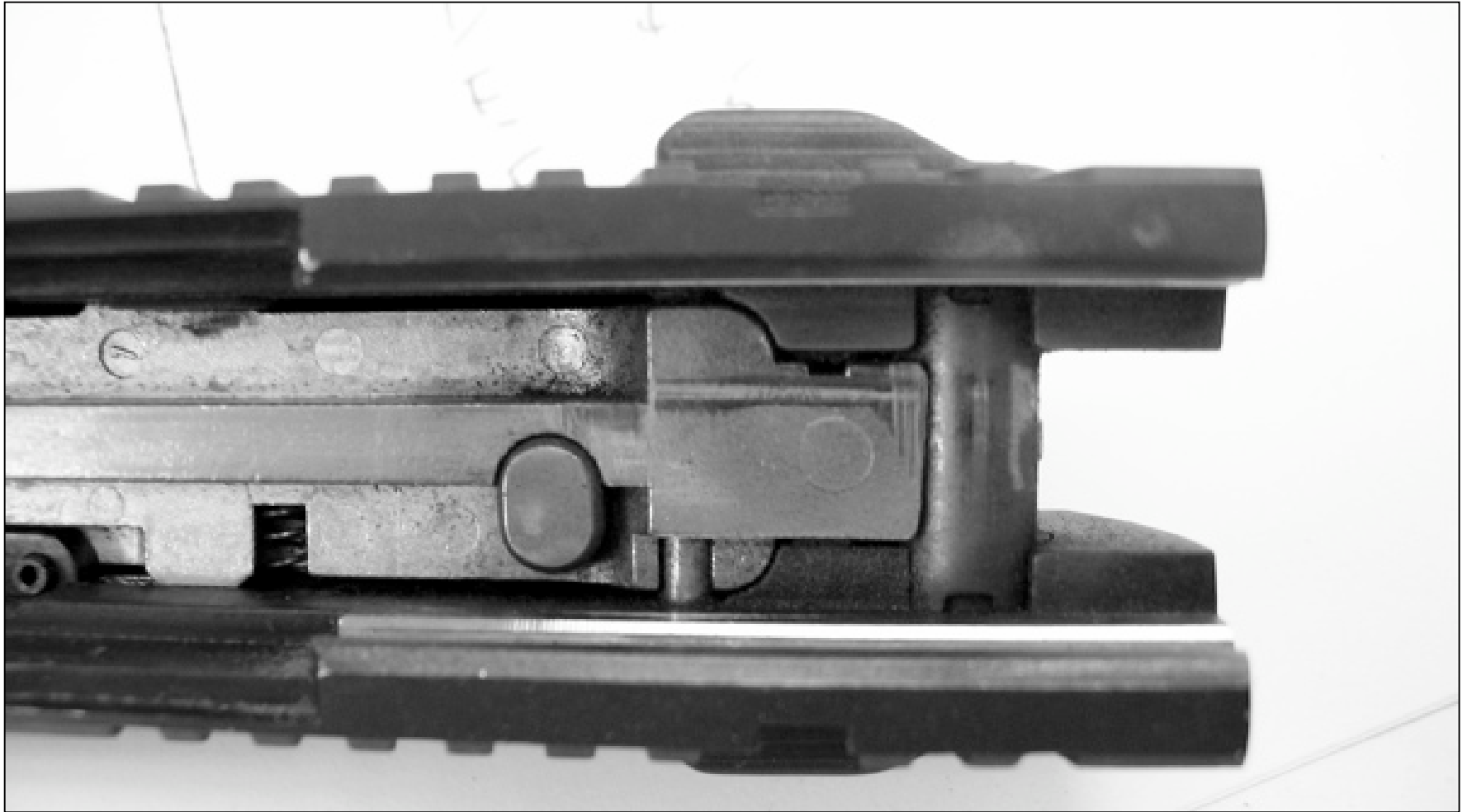
NOTE: Removal of the 0.020" refers to removing material from the bottom of the breech block so that once a cocked hammer clears the safety bar it no longer drags on the breech. Advanced work for the expert. Please disregard. Also the statement "flush with the sear" should say "flush with the bottom of the breech block". Carry on.



I lifted this picture of an original style, unmodified hammer from a recent tread without permission. Don't say anything. This "tip" was especially prone to catching in the roll bar/breech valley.



But, the new style hammer still has a "tip" as Walther didn't get it quite right. See the shiny area at the new tip where it rubs on the safety bar/breech bottom. It will still catch in the valley. Next we will discuss re-profiling the hammer tip to eliminate this.



While we are re-profiling the hammer's tip, we might as well square it up. Nearly all I've seen drag down one side or the other and if you look close you will see where the hammer tip, even the new one, is actually peening the bottom of the breech block. See the three lines just in front of the safety bar. A "re-profiled" tip cures all here. We are now spanning the valley and squarely.



You begin by rubbing the hammer tip on a piece of 220/320 grit emery paper to eliminate any "point". Frequently check your work and make sure you are removing material from the right area and doing so squarely. Remember we are looking for a profile similar to the one in the drawing, flattened the top of the hammer parallel with the bottom of the breech block and then slightly round it.

Yes you can do this with the hammer in the pistol and an emery stick but you must be the kind of person that is very patient and you must thoroughly flush the pistol and lube when finished. Gotta take it apart anyway some time or the other to replace that broken hammer spring.



New style hammer ready for re-profiling.



This is what an unmodified new style hammer measures face to rear of thumb grip.



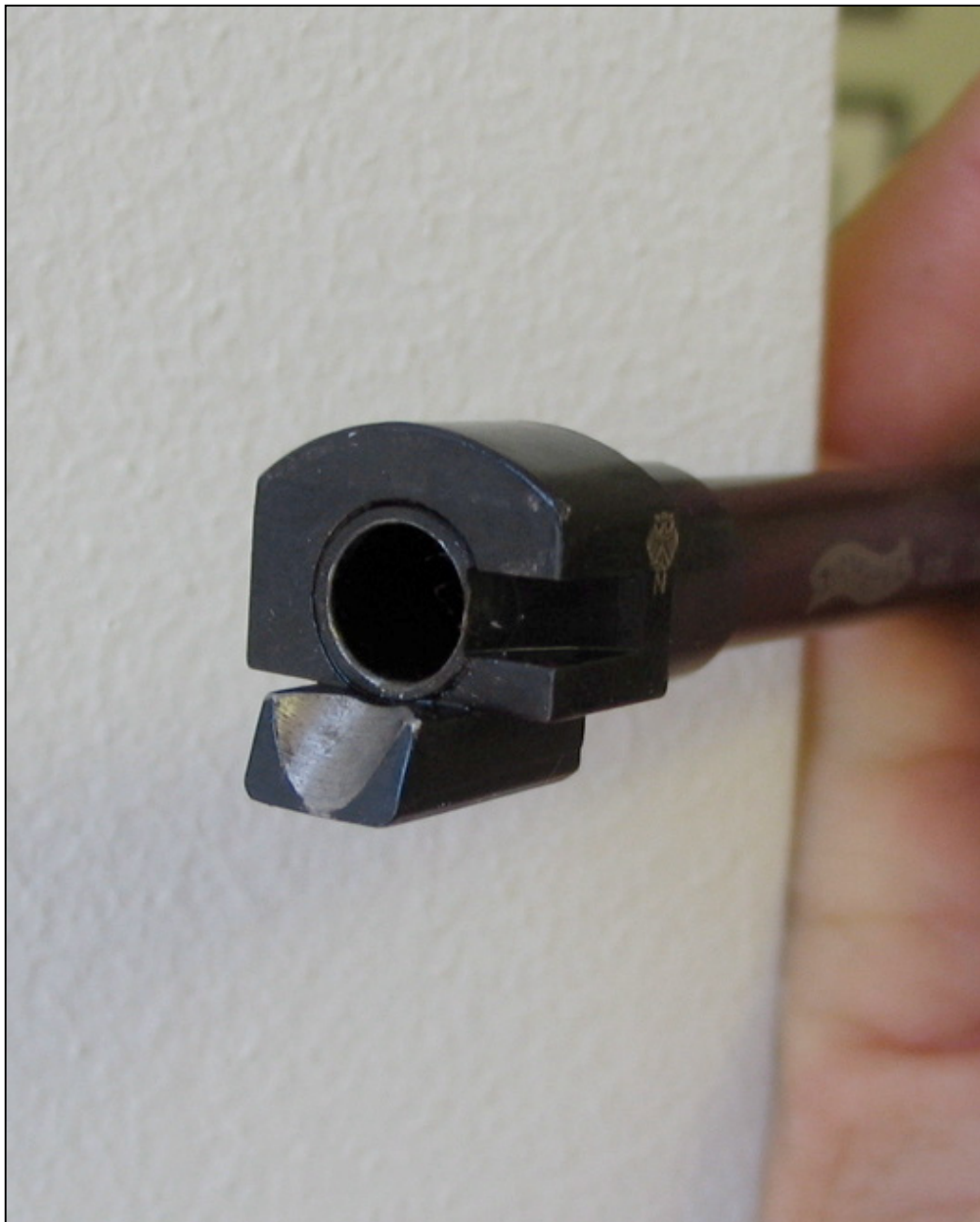
After about 1 min of sanding on the emery paper the hammer will look like this.



When you have finished the new hammer profile will look like this and be about as thick as the caliper measurement shows for this modified one. BTW, when I reassembled the pistol, the slide still cocked this hammer so if you have access to a dial or digital caliper stop right around this thickness and you should be good to go. All that remains now is some buffing with 400 grit emery paper, then 600 grit, then the Dremel. Then you can see your smile in the reflection given off by the hammer's new face.

Functional Improvements
(MODIFICATIONS)

Chamber Lip Enhancement
for Improved Hollow
Point Feeding



One area I do a little modification on "just in case" is to lower the bottom lip of the chamber so hollow points won't catch here. Pictured here is a stock chamber rim. I do this with a carbide tapered Dremel cutter, #9910.

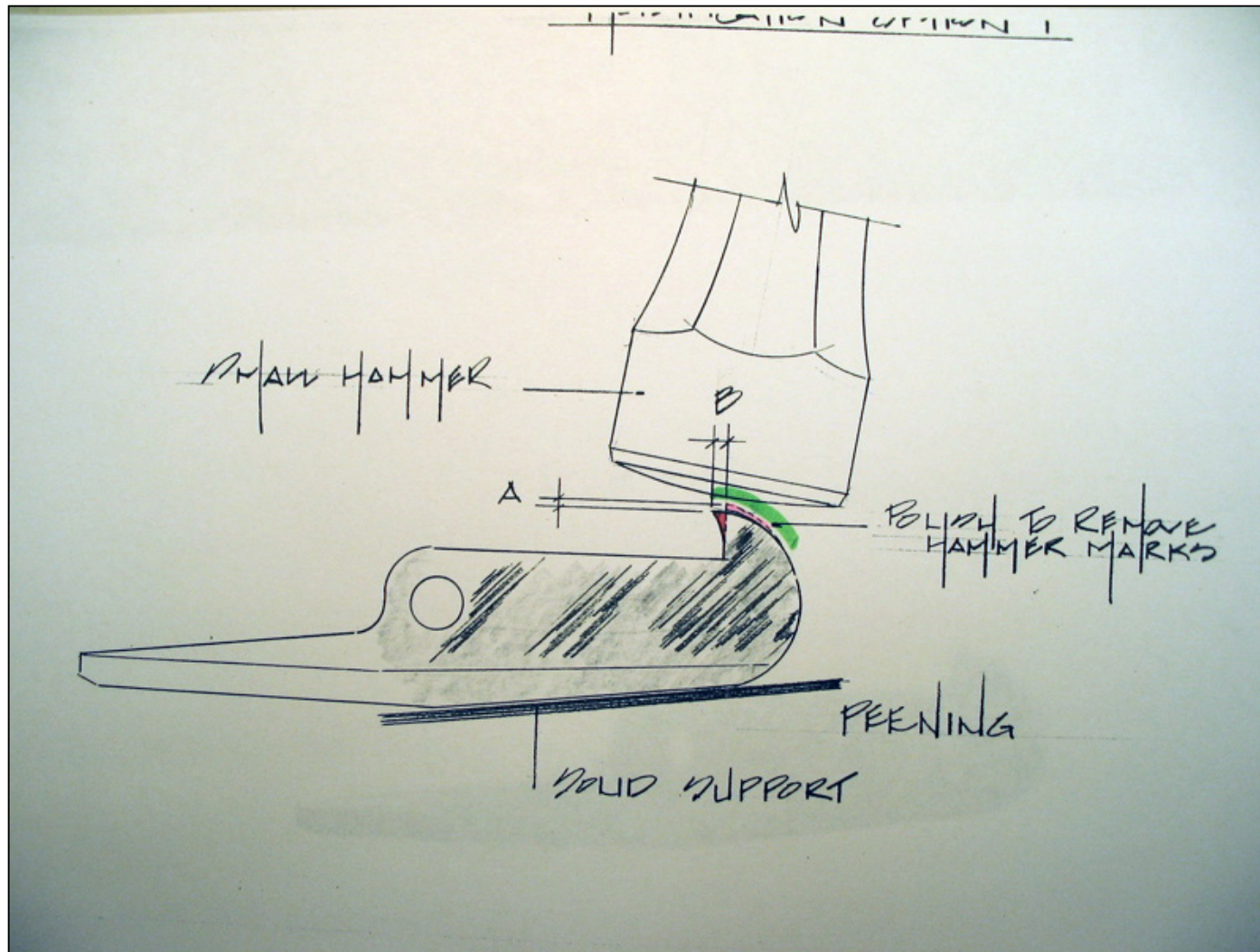
Very lightly now, then polish. You can feel the improvement just by slipping the nose of a hollow-point over the feed ramp and into the chamber by hand.



This is what the final product looks like all polished up. Be sure you clean the barrel really well after this procedure.

**Functional Improvements
(MODIFICATIONS)**

Extractor Enhancement



P-22s typically eject spent cases in all directions including forward, against the bottom of the red dot or scope mount causing jams and right between your eyes. This is annoying. Until I figure out how to improve this situation with a new hand-made extractor this is the best I've come up with and it works. Not like a Ruger MK or 10-22 but much better. First stretch your extractor spring.

That will help but if you aren't satisfied you've got to peen. What we are trying to achieve is pictured here. The gap from the face of the extractor to a chambered rounds base is reduced and the sharp edge extracts/ejects the round better. I've never been able to affect any improvement with work to the ejector. I leave it alone.



My anvil, a 2 lb hammer head and a small hammer. Many light taps required. I beat the heck out of the sides of one today and nothing gave. Whatever this material is, it is hard to change it's shape. It is brittle also. Don't hit it hard.



Picture of the new extractor modified in such a manner and installed in the pistol. This peened one will work much better than the stock one. Be sure to polish the backside of the head where you were hammering so it will ride smoothly against the slot in the barrel chamber.



Finally if your new magazine won't comfortably hold 10 rounds you might take a look at lowering the taller spring retaining nub shown on the left as compared to the older models. Why the change? Beats me. I never had any trouble with the old style.

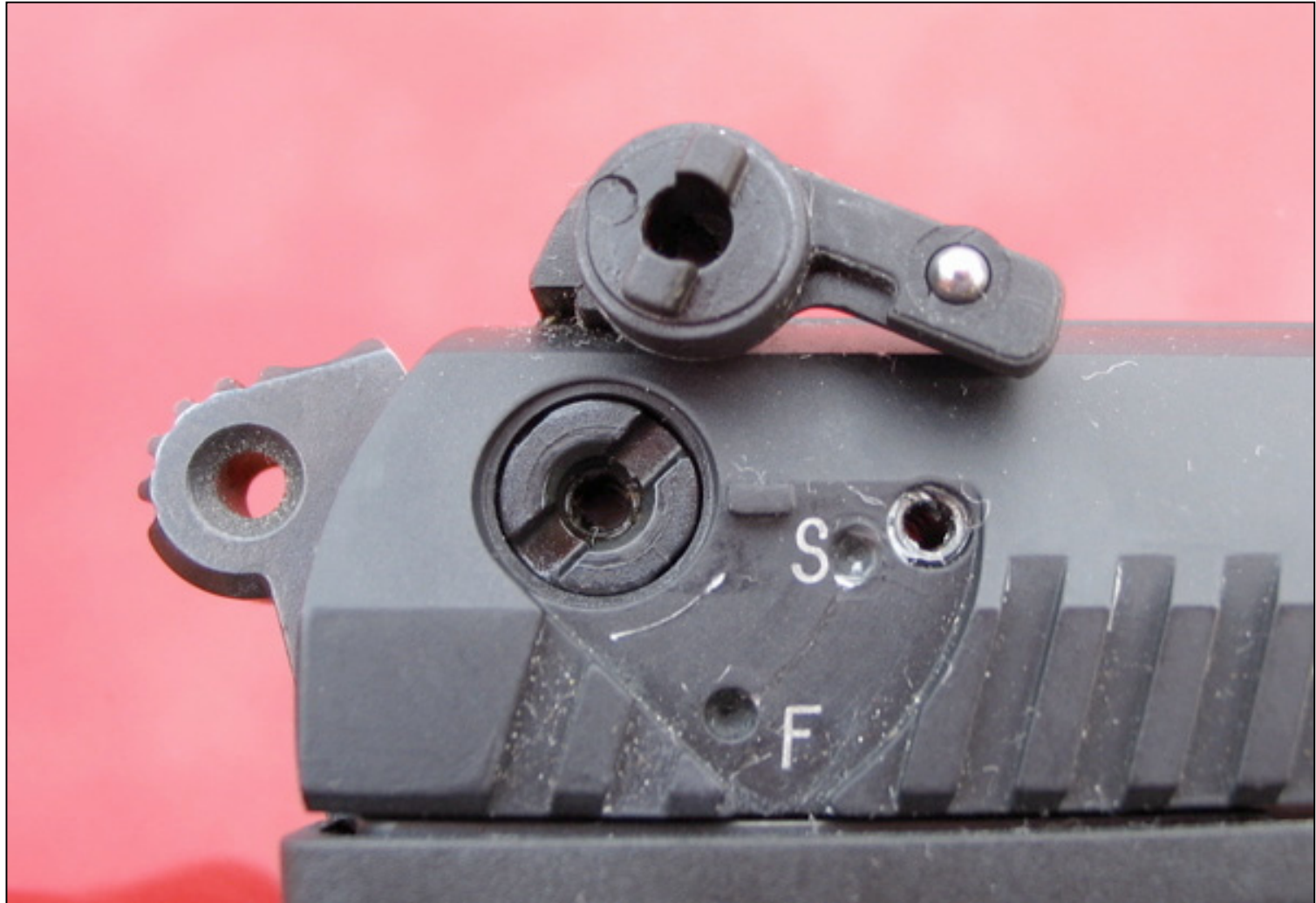
Reassembly:

Clean all grease off the pistol and magazines, spray them down with Birchwood Casey Gunscrubber or similar, blow dry or allow to dry then spray with something like Remington RemOil with Teflon. I blow off any excess with compressed air. I then rub a dry powdered mixture of moly/teflon on the frame grooves and slide rails and on the barrel sleeve. I rub some on the bottom of the breech block and hammer face before reassembly. I also apply a little to the slide ramps where the trigger bar ears hit. I've just started doing this, hadn't thought of it before.

I apply a small amount of blue Threadlocker to the frame screw ends and the barrel nut and tighten them securely. Make sure all oil and grease is removed from the male and female threads or the Threadlocker won't stick. I do this after temporarily reassembling my pistol to check to see that the slide will still cock my newly profiled hammer tip. If it won't I disassemble the pistol and carefully file a very little material off the face of the hammer's cock notch until reliable cocking is achieved. Then I put the screws in with Threadlocker. You are then good to go for at least 27,500 rounds. I clean appx every 500 to 1000 rounds. If I left something out we'll catch it soon. Always release the slide by pulling it back allowing the slide stop to drop then release it. That way you won't wear out the slide catch notch on the slide. Hope this helps. M1911

**Functional Improvements
(MODIFICATIONS)**

**Fix for “Walking” Safety
Lever**

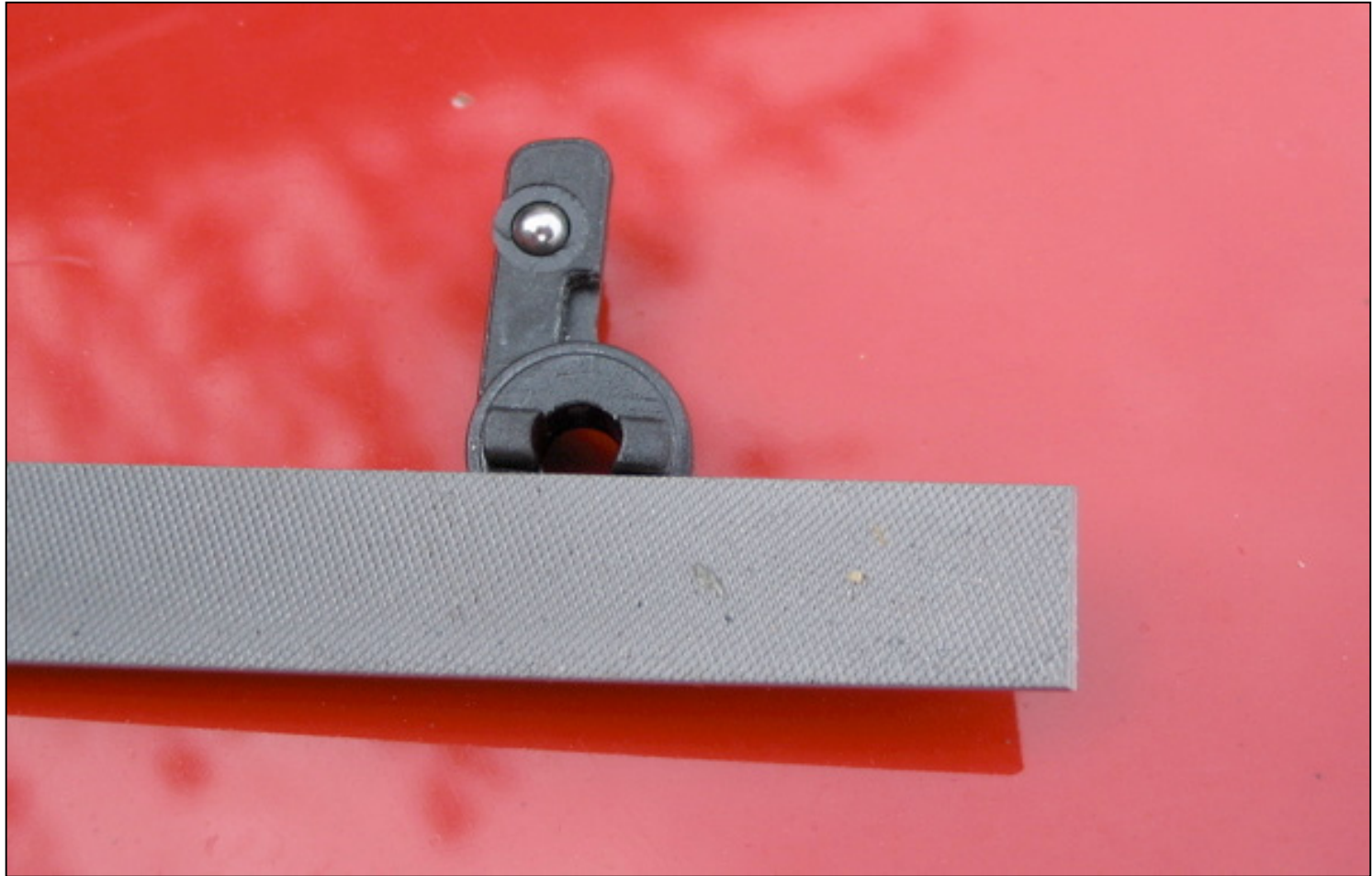


Before you do any modifications make sure that the detents are clean and try tightening both the safety lever screws a bit. That might be all your pistol needs.

If not, make sure the pistol is unloaded, then with the proper sized screwdriver you remove one of the safety levers, do the following work, reinstall it and repeat on the other side. Here the lever has been removed. Note the detent ball that drops in the detent holes. Note the center bar on the safety lever that drops into the receiver inside the slide. This item must not be entirely ground off or the levers won't rotate the safety.



Picture of the safety lever and associated screw.



Take a small file or emery paper and lightly file/sand "each" shoulder just a little. Here a small file is resting on one shoulder. Then you lightly file/sand the tip sticking up removing the same amount of material you did from the shoulders. e.g., If you removed 0.005" from the shoulders, remove 0.005" from the center catch. What you are doing is removing just a little material so that the ears will sit a little closer/tighter against the slide. Don't remove so much that the levers themselves begin to drag on the slide nor should that be necessary.

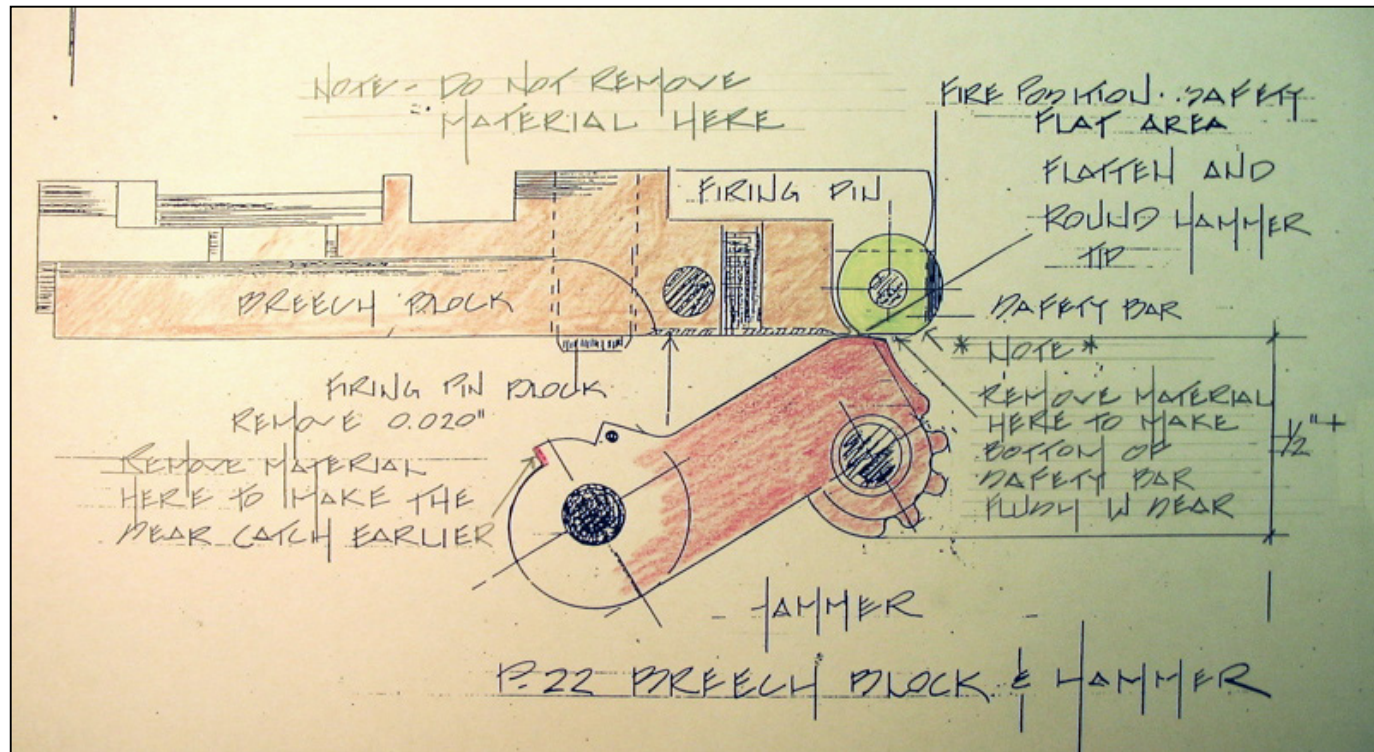
This will cause the detent ball under the safety lever to be pressed tighter against the detent holes firming up movement of the levers. Reinstall the safety lever. Still loose, file a little more. Keep your work neat and square. Don't get carried away, remove a little at a time. You can always take more off, you can't put any back on. Put a little blue Threadlocker on that clean screw once you're good to go and ready for final assembly. Make sure the screws are tight upon reassembly.

Functional Improvements
(MODIFICATIONS)

Reducing Hammer Drag on
Slide

WARNING

Advanced Skills and
CAUTION required.

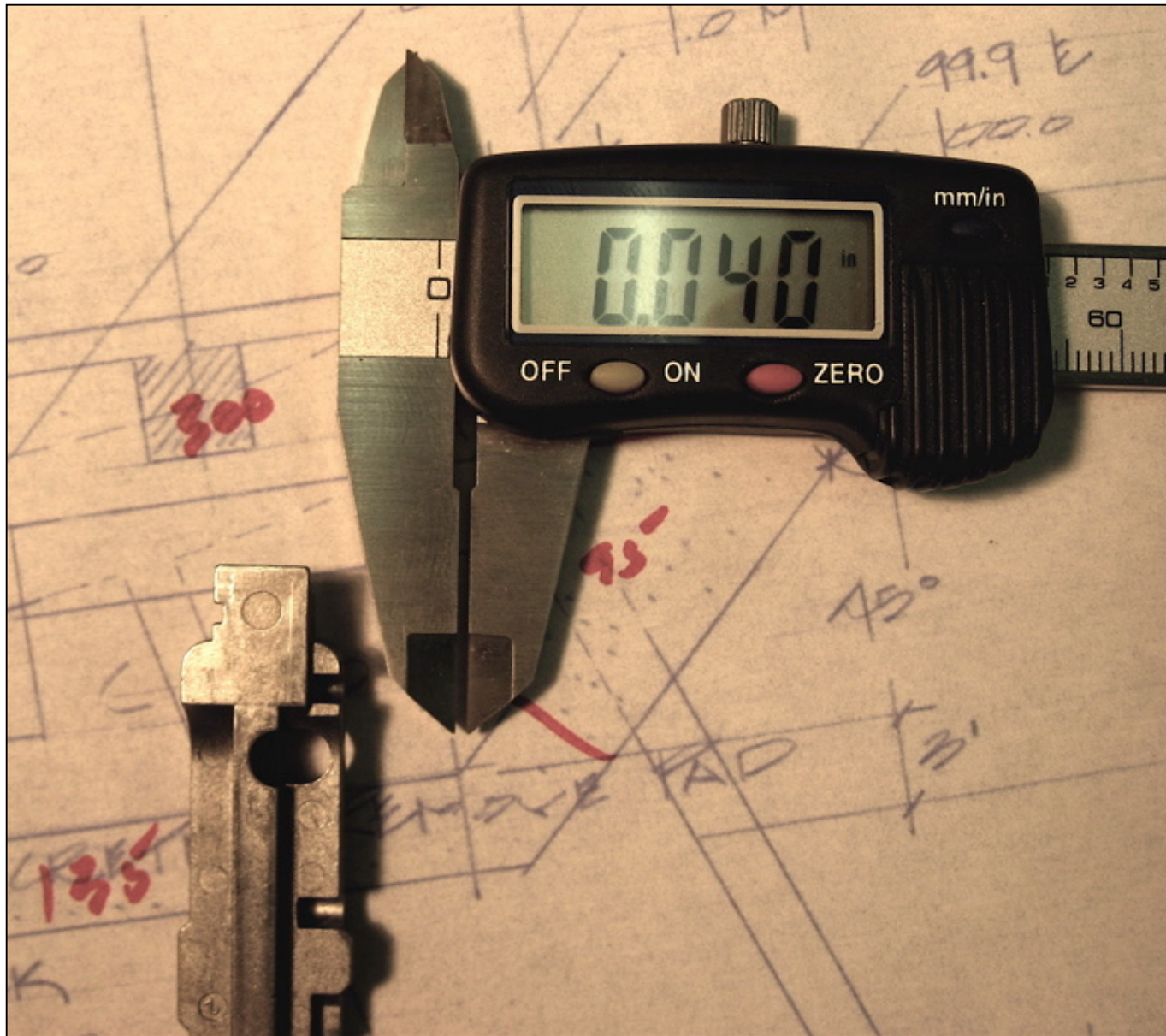


There are several concerns associated with the manner in which the P-22 hammer and breech interface. It is imperative that the relatively low powered .22 cal round be able to cycle the slide which accomplishes several critical operations. Working against the pressure of the slide return spring, friction of the barrel sleeve, the frame rails and grooves, hammer tip dragging on the bottom of the breech block, extract and eject a spent cartridge, cock the hammer and strip a round from the magazine and chamber it for the next shot.

The P-22 has a simple torsion spring that keeps forward pressure on the hammer at all times and especially when being cocked and while cocked. The pressure of the hammer is greatest when it is cocked. The pressure of the cocked hammer against the bottom of the breech block is not relieved simply because the hammer is cocked. In fact it is greatest when the slide is fully rearward, a time when the bearing surfaces between the slide grooves and frame rails is at it's least. I expect 1/4" or less of these components are engaged at this point.

As the slide moves rearward and forward, the hammer tip not only lifts it with considerable force but contributes considerable drag. Nothing can be done about the slide/breech having to expend energy cocking the hammer but I wanted to modify the breech so that as it continues rearward and then forward it was free of most of the hammers drag and uplift. This should provide more energy for other functions and less wear to the critical slide components.

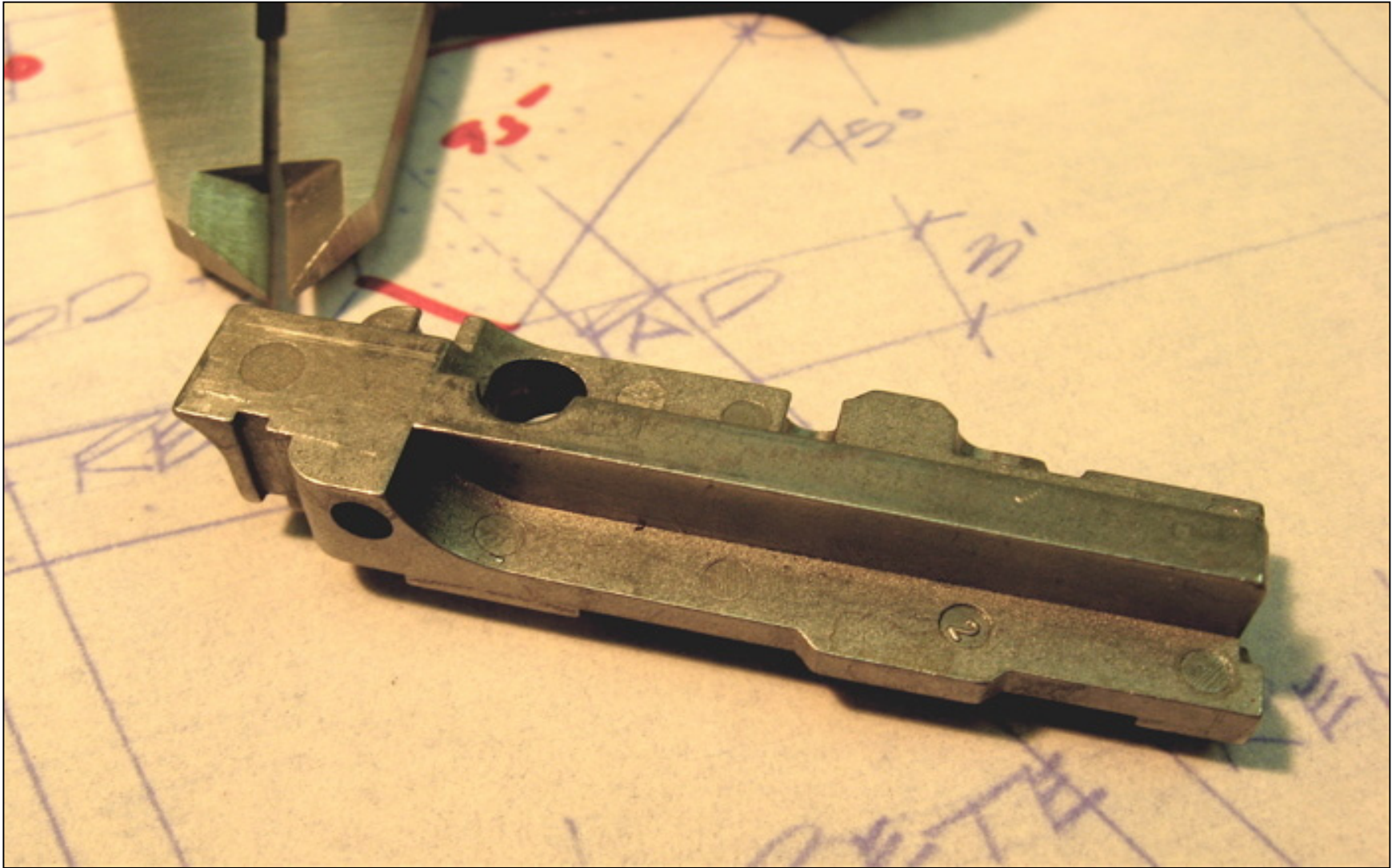
Unload your P-22, remove the slide spring and guide bar, cock the hammer, reinstall the slide, lock the take down, then drag the slide/breech bottom back and forth across the hammer tip and you will see the drag I'm talking about. This mod eliminates it except for the safety bar and that is necessary for cocking. This is also easy to do, just don't remove too much material and weaken the metal where the roll pin goes through. Keep your work square. This is advanced work and not for everyone.



The hammer tip drags across appx. 1/2 inch of the rear of the breech block. The recent test of lubricants indicates that even with the best more than 1 lb of energy is required to pull the breech across the hammer tip here. I had determined by careful measurement that the hammer rebounds appx. 0.020" after being cocked. This allows it to drag on the bottom of the breech block.



There is 0.040 inch of metal between the bottom of the breech block retaining pin hole and bottom of the breech or just enough to remove 0.020 so the hammer tip will no longer drag.



When removing material here I want to leave a ramp at the very rear of the breech to glide the hammer up onto the safety bar and to keep full thickness at the firing pin block.



Having only the finest milling equipment, unlike top Dog, I proceeded in the shop with files and emery paper.



This photo shows the 0.020" of material removed from the bottom rear of the breech block.



This picture shows what my milling effort turned out to look like. The ramp isn't as smooth as could be accomplished with more time and better equipment but the end result is that once the safety bar cocks the hammer the hammer tip does not touch the breech block, especially at the critical very rear position. When the slide moves forward the tip rides over the ramp and roll bar. Friction is almost totally removed except for the brief moment the hammer passes over the safety bar.

I did this to the "test gun" a long time ago so I knew it worked. This is the 0.020" shown in the drawing. I'm not saying do this but it sure frees up the slide and I think helps eliminate slide wear. Drag with any lubricant is now less than 1 oz as the hammer tip doesn't touch.