

Tuning the Pietta Cap & Ball for Competition  
Part 1: Diagnosing the Problem Areas  
By  
Larsen E. Pettifogger  
SASS # 32933L

Cap and ball handguns are fun to shoot and if tuned properly can be very reliable. However, many pards buy a pair, go to a match, have problems, and then quickly become disillusioned with them and write them off as difficult and unreliable. We are going to go through the steps necessary to tune a Pietta C&B for competition. Like many things, a picture is worth a thousand words. So, I will try to illustrate as much as possible what needs to be done and try to suggest tools and ways of doing the job that a good home gun tinkerer can use to tune his/her Pietta.

The revolver chosen for our tuning exercise is shown in Photo 1.



I picked up a pair of these from EMF at EOT 2007. They were under \$200.00 each and it is amazing that these guns can be produced, shipped halfway around the world, and still sold for such an amazingly low price. They are described in the EMF catalog as the "1851 Navy Sheriff Model in .44 caliber with a 5 1/2" barrel." As an historical note, there is no such thing as a .44 Navy. Whenever Colt advertised a revolver as being of "Navy" caliber, by definition it meant a .36. A revolver of "Army" caliber was a .44. Uberti tends to offer only guns that copy original Colts. Pietta mixes and matches parts to come up with a wide variety of interesting, but historically incorrect models. Our revolver is actually an 1860 Army frame and cylinder mated to a set of "Navy" grips with an octagon barrel bored out to .44. Although listed as a 5 1/2" barrel, it is actually closer to

4 3/4". It will be a great shooter when we are done with it, and the shorter barrel will be quicker out of the holster than a 7 1/2" or 8" model.

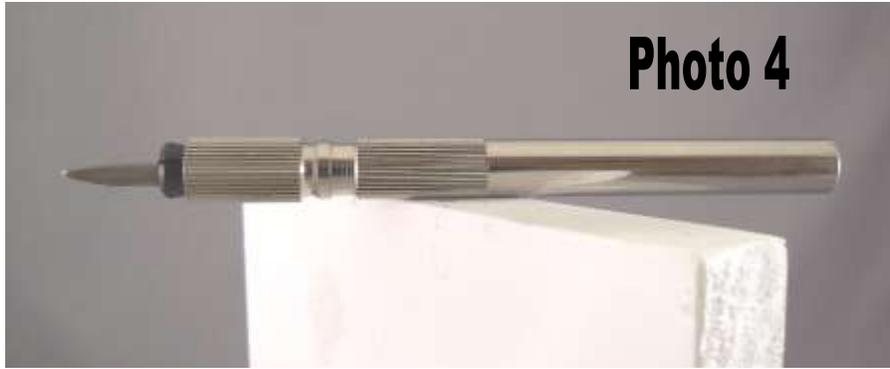
Before we get started we need to discuss some of the tools needed for our tune-up. The first thing anyone needs when working on guns is a quality set of hollow ground screwdrivers. Hollow ground screwdrivers are machined so the sides of the tip that enter the screw slot are parallel. A regular screwdriver simply has tapered sides that taper all the way to the tip. Photo 2 shows a hollow ground and a standard screwdriver.



The parallel sides of a hollow ground screwdriver fit the screw slot tightly from the top to the bottom of the screw slot. A standard screwdriver fits in the slot like a wedge and only engages the top part of the screw slot. The quickest way to bugger a gun screw is to use the wrong type of screwdriver. We are going to be doing a lot of internal work and its hard to get light down inside the gun to see what is going on. Photo 3 shows an LED light that has a twistable neck and a magnet on the end of the base.

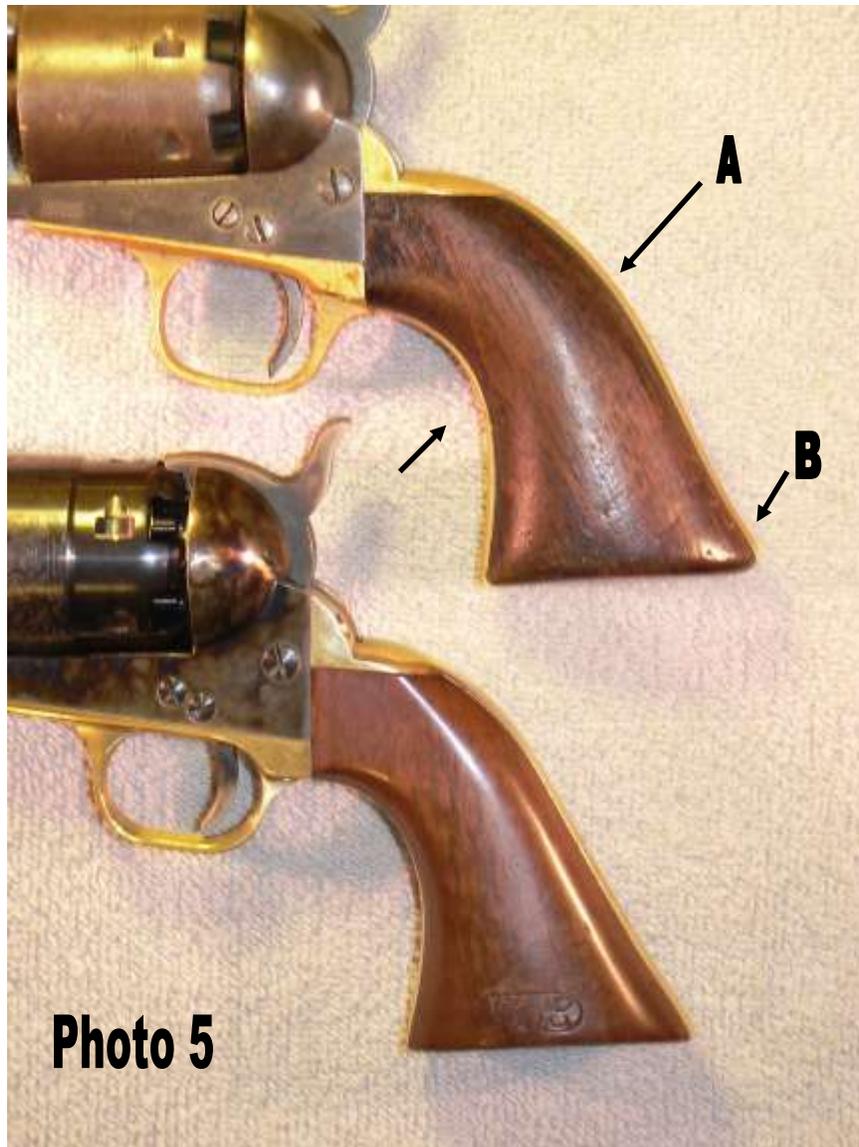


I picked this thing up in the checkout line at Walgreens Drug Store. It is an amazing little tool that costs less than \$5.00 and can be found at a lot of drug and hardware stores. No matter what kind of light you have, your head or something always seems in the way and you can't see down in small holes. This little gizmo solves that problem. Photo 4 shows a burr remover/metal scraper.



If your Pietta is like most, you will need one of these for the tune-up. (As an example, go to [Enco.com](http://Enco.com) and type in #380-0840. This should take you to a simple de-burr/scrapper tool.) You will also need a variety of needle files, preferably fine diamond needle files (since some parts are hardened and difficult to file with a regular file), and some honing stones. Lastly, you will need a drill press and drill press vise.

The first step in any tune-up is to inspect the exterior of the gun and test the action to identify problem areas that will need fixing. The first thing, which isn't exactly a "problem" but is an issue for many, is the grip shape. Photo 5 shows an original 1861 Navy (same grip as a 51 Navy) on top with our Pietta below.



Colt spent a lot of time coming up with what many believe is the best grip ever put on a handgun. The 1851 Navy grip was so popular it was carried over into the Single Action Army. The original back strap has a compound curve (Photo 5, A) that starts at the top of the back strap and runs almost to the bottom of the grip frame and then curves slightly outward at the bottom (Photo 5, B). The Pietta grip is narrower front to back at "A" and the back strap is absolutely flat before turning out at "B". The Pietta grip looks more like a trumpet bell. The wooden grip itself on the Colt is also thinner than the Pietta. For some, because of the angle of the back strap, the Pietta grip tends to cause the gun to point high. (Much like a Colt 1911 with a flat or arched mainspring housing.) We will modify the grip to be slightly more like an original Colt. The front strap is pretty close to an original and is fine as is.

Cock the action and look for anything that causes friction or binding. Raise and lower the hammer a few times and put SLIGHT pressure side-to-side on the hammer. On our

gun, the hammer was hitting on the left side of the frame and had already turned up a burr even though the gun has never been fired. Photo 6.



Something else that seems to be a problem on many new C&B's is that the wedge is pounded in so tight it is difficult to remove. On our gun, the wedge didn't stick out of the right side of the barrel and had been hammered in so hard it had puckered the metal. Photo 7.

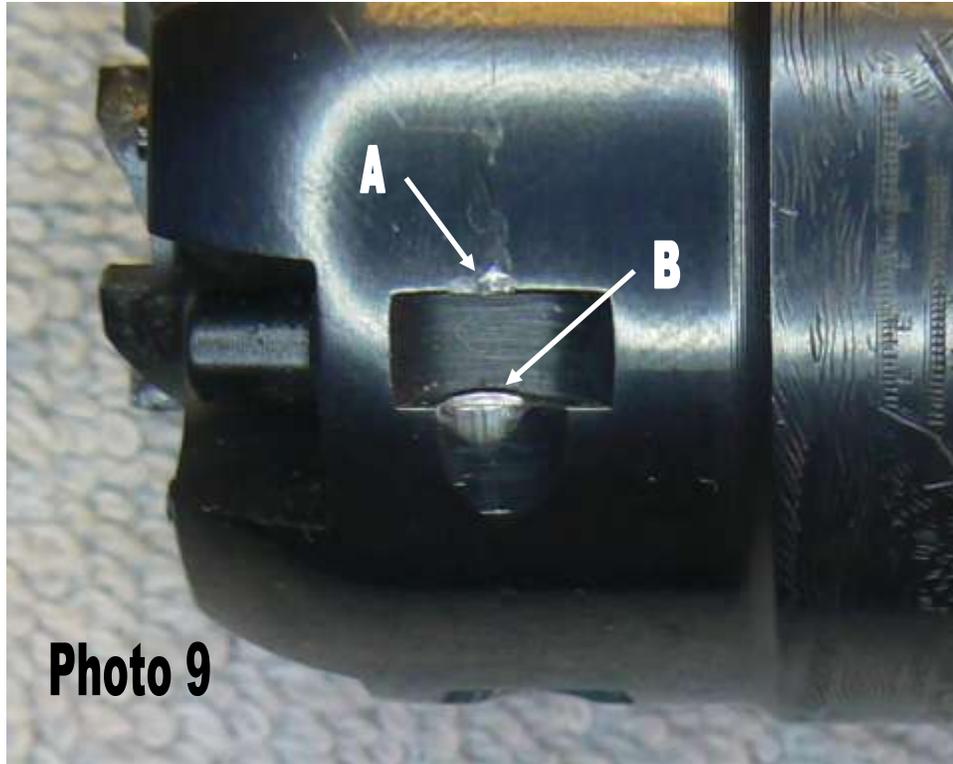


On a Single Action Army the frame is flat under the cylinder and you can visually check the timing of the bolt. On a Colt C&B the frame is curved, the cylinder is much closer to the frame, and you cannot see the bolt. About all you can do is slowly cock the hammer and listen for the bolt drop and then watch the cylinder to see how far it moves before the bolt locks up. The bolt drop will be the second “click” while cocking (make sure you keep your finger off the trigger or you won’t hear that first click), and you can look at the top locking slot in front of the hammer as a reference to see how far the cylinder is turning after the bolt drops. It should only move about the width of the lead-in groove. Our gun is new, so timing was fairly good. Next, put some MODERATE back pressure on the cylinder. Photo 8.



Do this for each chamber. On this gun, its mate, and several other Piettas I handled at EOT, most of them would unlock on at least one chamber. So, even though most Piettas (we are talking about the newer Colt style Piettas made in the last five years or so) feel like they are locked up “bank-vault” tight, they are not and that is the primary problem we will address in our tune-up.

Next, remove the barrel and cylinder. If the wedge is hammered in tight like our project gun, it will have to be hammered out with an aluminum or brass punch. Don't use a steel punch or you will almost certainly mar the barrel. Proper wedge fitting is an issue we will address in our tune-up. If the barrel won't come off, put the hammer on half cock, rotate the cylinder so one of the chamber walls is below the rammer and use the rammer to push the barrel off the frame. With a magnifying glass or magnifying visor, carefully inspect all of the cylinder notches. Our project gun has never been fired and has only been cycled a dozen or so times. Yet, all of the cylinder notches are already beginning to show wear. Photo 9 shows a notch with a little damage on the solid side (A) and a definite ridge already showing on the lead-in groove side (B).



What is happening is that rather than locking bank vault tight, our cylinder is simply getting a wedgie from the bolt. Fitting the bolt is the main part of our tune up. With the cylinder off, Photo 10 shows the frame is slightly miscast.

**Photo 10**



The left side of the frame is over 1/16" higher than the right side. This is cosmetic and won't affect gun function.

Next, we need to test the fit of the arbor. With the cylinder out of the gun, place the barrel on the arbor at a 90-degree angle to the frame and make sure the arbor is bottomed in the arbor hole. Photo 11.



(Make sure you stick the arbor in the arbor hole and not the bore!) Now, rotate the bottom of the barrel down until it contacts the frame. The barrel should set flush with the frame or just a few thousandths up or down from the frame. Photo 12 shows our Pietta barrel mates perfectly with the frame.

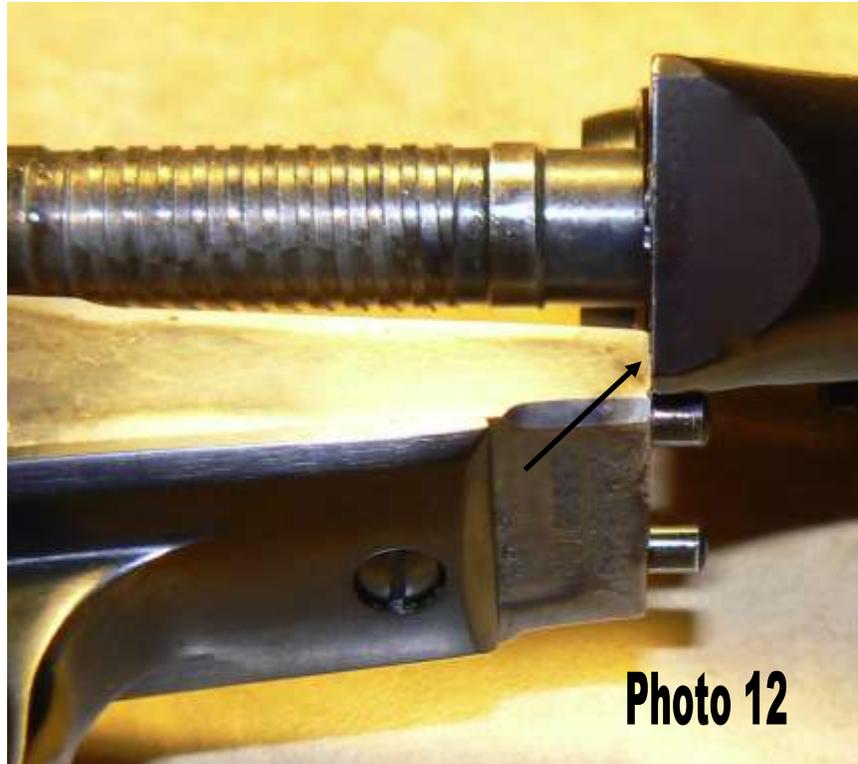
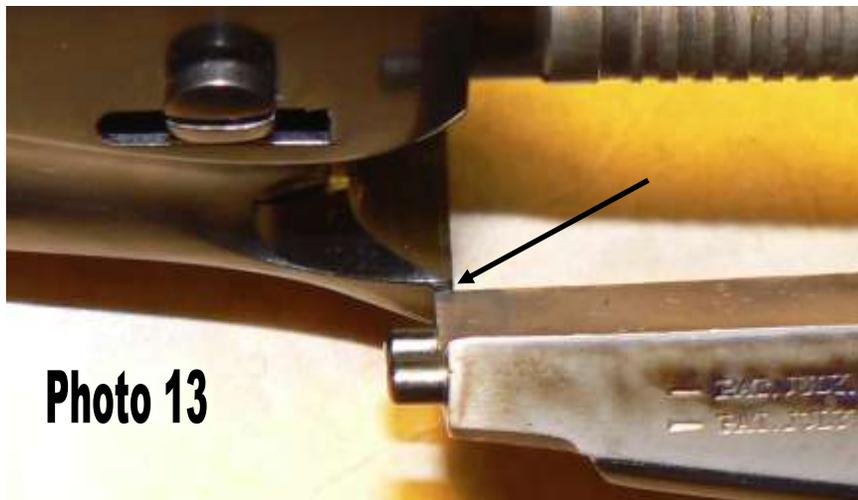


Photo 13 shows an Uberti.

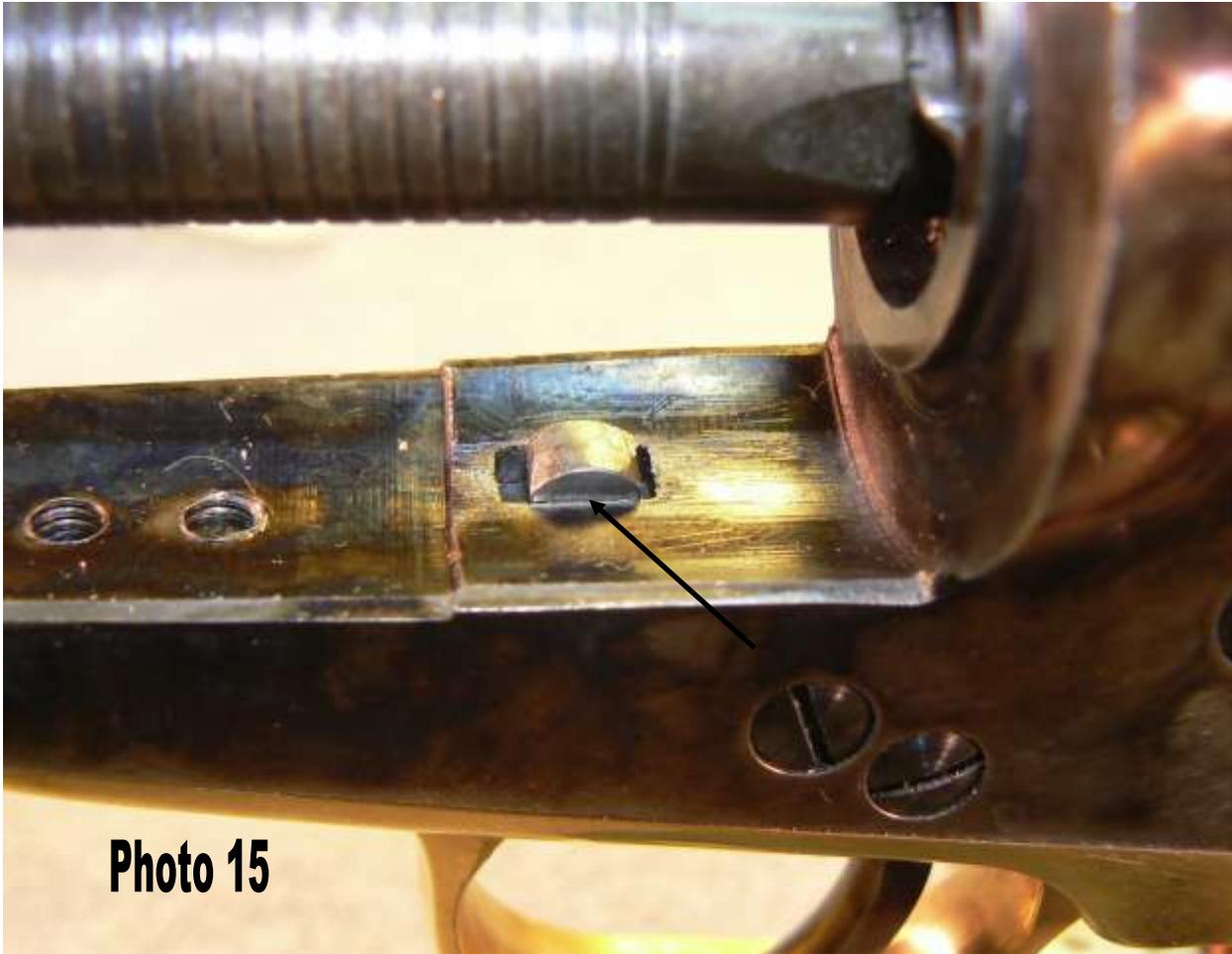


The Uberti arbor is far too short and the barrel sets well behind the front of the frame. There are exceptions to all rules, but in general Piettas have poorly fitted bolts and good arbor fit. Ubertis have properly fitted bolts and poor arbor fit. (We will tune an Uberti in a future article and fix a poorly fitted arbor.) Now we will begin final disassembly of our Pietta and look for obvious internal problems.

Remove the rear grip frame. On our project Pietta, as soon as the upper grip frame screws were removed the frame sprang down and back. Photo 14.



I could not get the screws restarted in the upper grip frame. The bottom screw also had quite a bit of resistance coming out. (Be particularly careful with any screw that is threaded into brass as they are easily stripped.) This will be corrected when we re-contour the back strap. Before removing the trigger guard and internals, the bolt head should be carefully inspected. In order to get our gun to lock properly we are going to modify the bolt head. However, we need to be slightly cautious with the bolt. In order to lock up properly there are three things involved. First, there is the width of the bolt window (the little rectangular opening that the bolt sticks up through) in the frame. Next there is the fit of the bolt in the bolt window and, finally, the fit of the bolt to the cylinder notches. On our project gun, the bolt does not fit the cylinder correctly. Widening the bolt slots in the cylinder is beyond the capacity of most home gun tuners, so the only alternative is to narrow the bolt head. HOWEVER, we only want to narrow that part of the bolt sticking out above the bolt window in the frame. Photo 15.

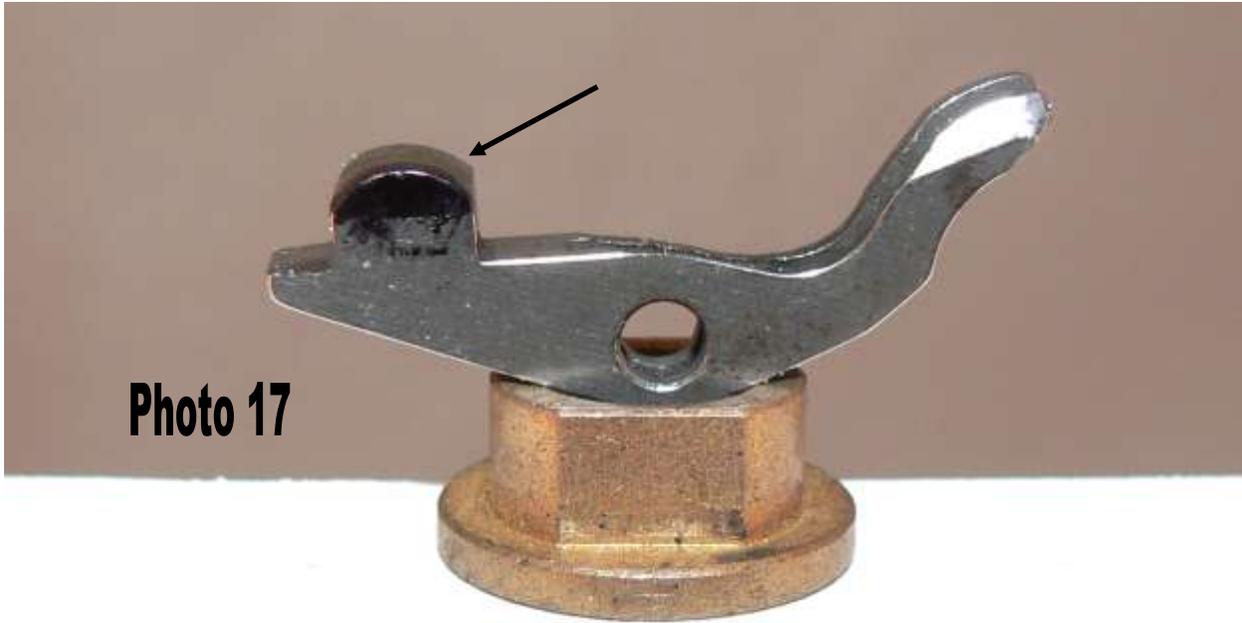


If we narrow the entire head of the bolt it will fit the cylinder notches, but it will fit too loosely in the frame window and the cylinder will have excessive side-to-side play. Just to make sure what area needs to be narrowed, take a Sharpie and color the side of the bolt as shown in photo 16. (Only color the side shown, we will not take material from the other side.)

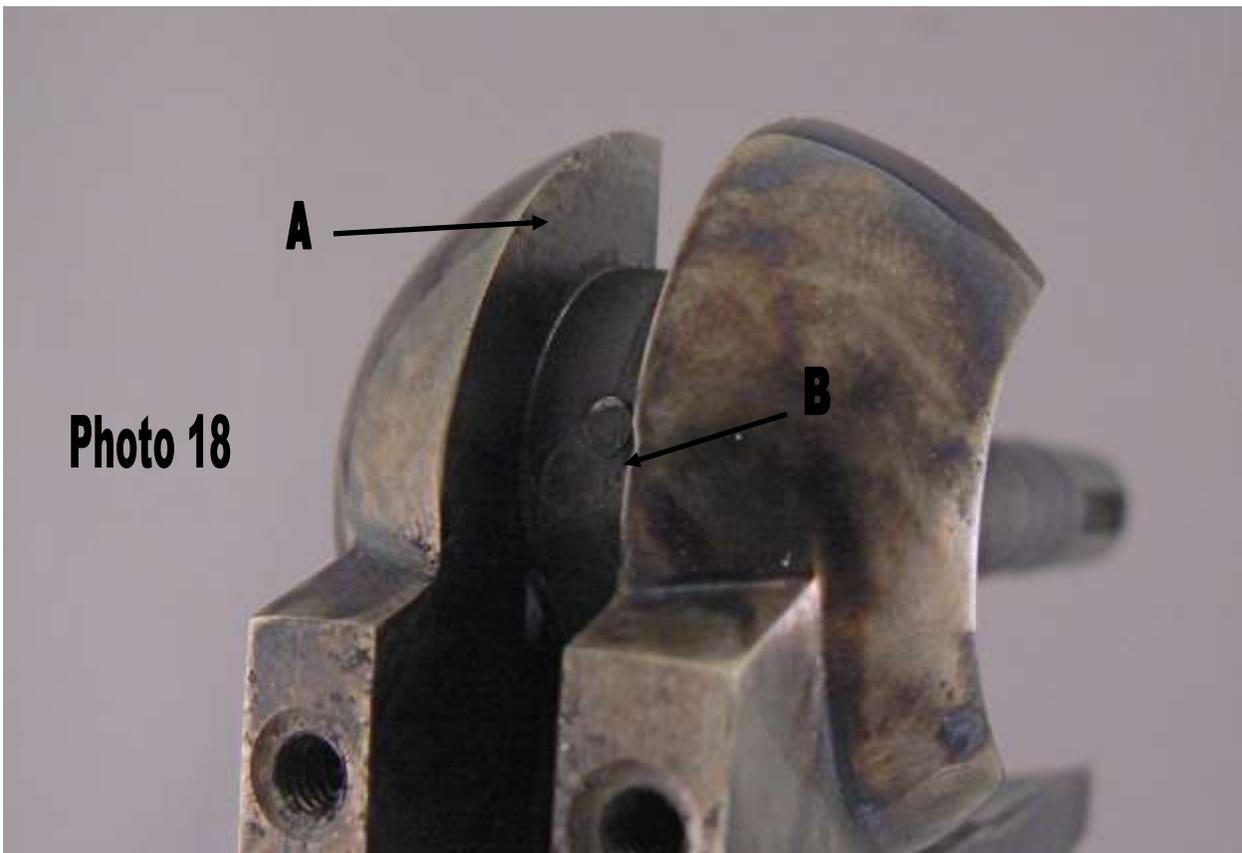


**Photo 16**

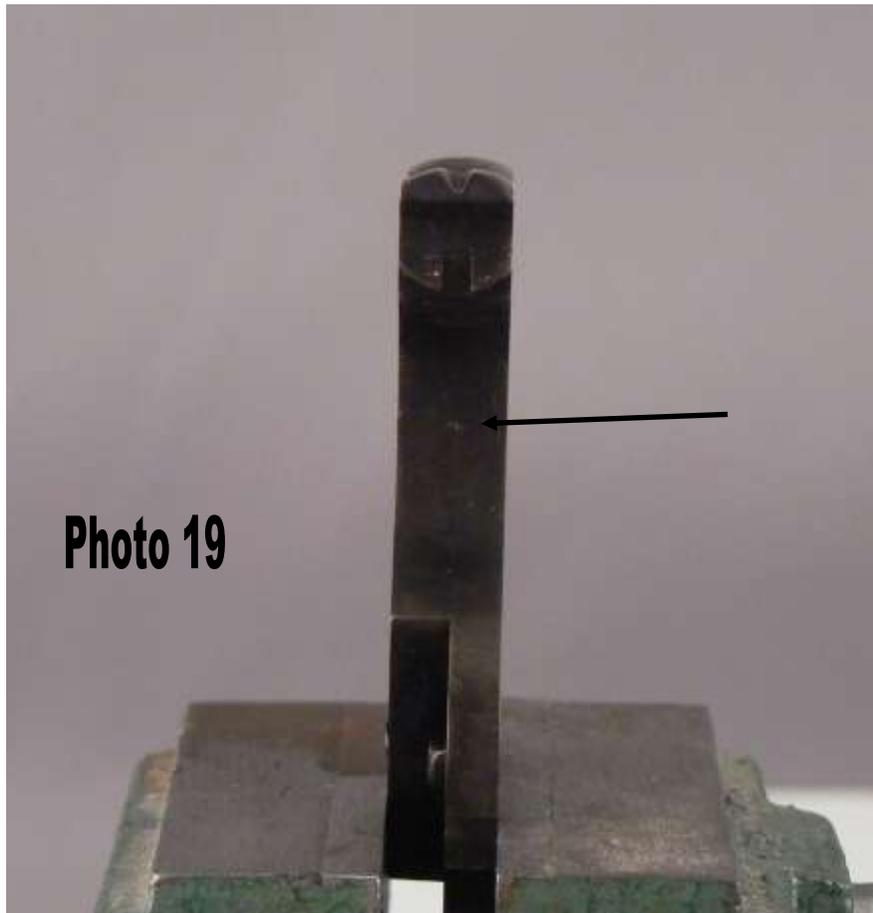
Now, remove the main spring, the trigger guard, the bolt/sear spring, the trigger, the bolt, and finally, the hammer and hand (some people refer to it as a pawl). Now that the bolt is out, be careful not to rub off the black color until we get around to fitting the bolt. Photo 17 shows the bolt and the area in black that is ABOVE the bolt window in the frame.



We do not want to remove material below the marked area. Photo 18 (A) shows the burr we identified when cycling the hammer.



With everything apart, it was also noticed that the arbor staking pin was sticking out and hitting the hammer. Photo 18 (B) and Photo 19.



Before ending this month's installment, we'll look at the relationship of the internal parts and explain how they operate so we will know what is needed when we refit the parts during our tune up. Photo 20 shows the hammer and it has a very nicely made and smooth hammer cam.

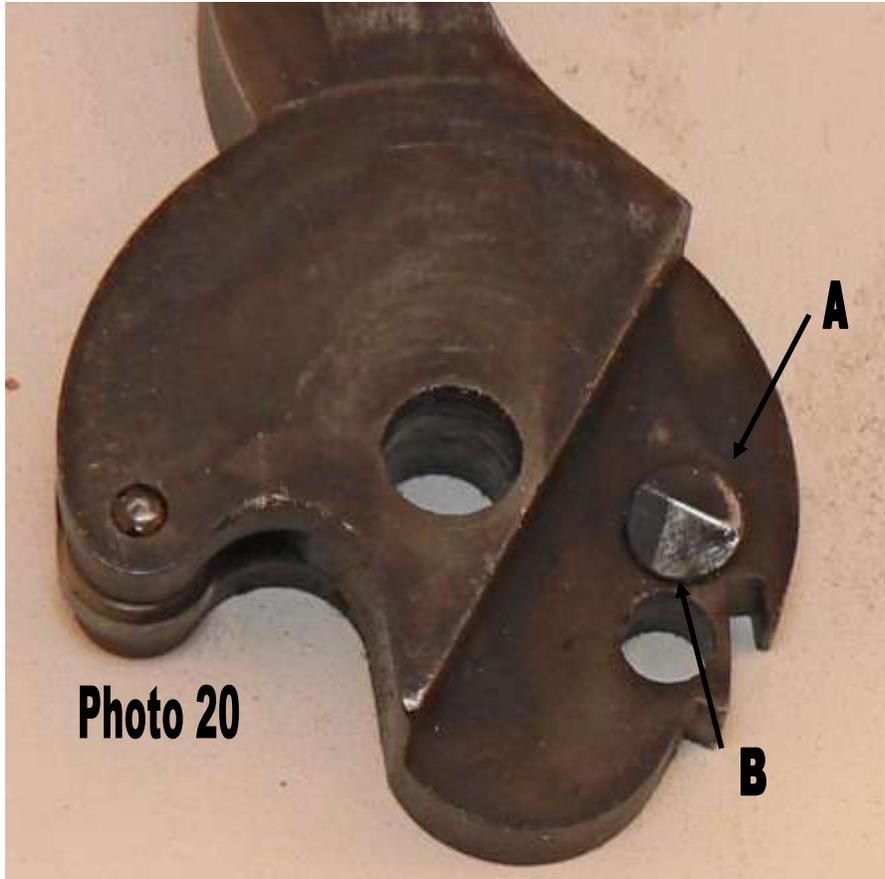
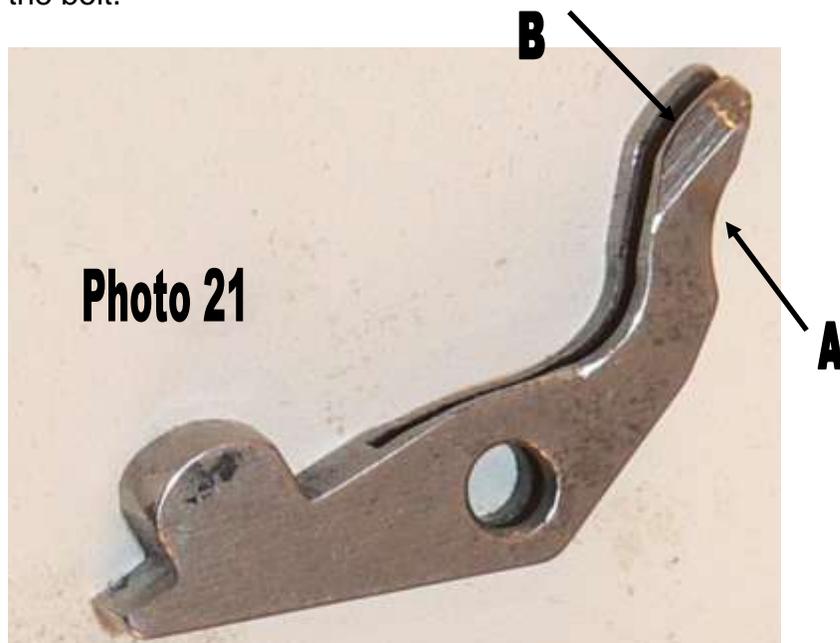


Photo 21 shows the bolt.

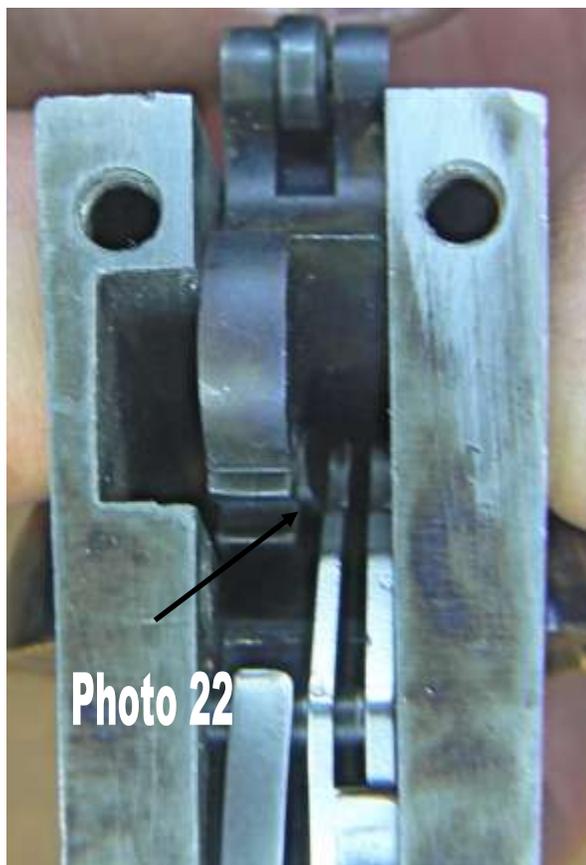


Although the Pietta bolt head is typically too wide, the bolt body is very nicely made and very smooth compared to many other Colt clones. It has a very nice bevel on the end of the bolt leg that rides on the hammer cam. See above Photo 21 (B).

Many bolts are fitted with virtually no bevel or a very roughly ground one. Essentially, how the bolt operates is that at rest, the bottom curve on the bolt is sitting just above the top of the hammer cam. See above Photos 20 and 21 (A).

As the hammer is cocked, the top of the hammer cam pushes up on the bottom of the bolt and the front of the bolt tips down (like a teeter-totter) and unlocks the cylinder. As the hammer travels further to the rear, the bolt leg slips off the top of the hammer cam and the bolt rises to lock the cylinder.

The bottom of the hammer cam is shaped like a hatchet head pointing down. The bolt bevel is shaped like a hatchet head pointing up. See above Photos 20 and 21 (B). When the trigger is pulled the hammer drops down and the two hatchet heads pass each other. Since the hammer is stationary vis-à-vis side-to-side movement and is stronger than the leg on the bolt, the hammer cam pushes the leg of the bolt inward. Photo 22.



When the hammer is all the way down, the leg of the bolt snaps back over the top of the hammer cam and the process begins again for the next shot. (In Photo 22, the bent leg

is riding over the hammer cam and will snap back to the left when it reaches the top of the cam.) That's why we need the little light described in the beginning of this article. We are going to modify the bolt and need to be able to see that it is working properly. Finally, Photo 23 shows the relationship of the hammer and trigger.



The top of the trigger above the trigger screw hole slides along the front of the hammer until the trigger tip drops into the half cock or full cock notches. On a lot of guns, the back of the trigger or front of the hammer is very roughly ground and you can feel grittiness while cocking the hammer as the trigger drags over the front of the hammer. On our project gun, the front of the hammer and back of the trigger is smooth and need little, if any, polishing.

Next month we will correct all of the problems we have identified and reassemble and test our Pietta. Make sure you keep this issue of the Chronicle as we may need to refer to some of the photos when correcting problems or reassembling our gun.