

Mark Silver 1983
5640 Hwy 614
Cedar, Mich 49621 (616) 946-7616

GUNSMITHING SEMINAR
WESTERN KENTUCKY UNIVERSITY

I. Assembly and Modification of Siler Locks

- A. Functional Modifications. These methods provide a far superior lock than that which is possible using kit instructions, and may be adapted for use on other locks. Read through all these suggestions before starting work.
1. Use lock plate jig and tapping fluid for all drilling and tapping of lock plate holes.
 2. Use correct size "number" drills for all holes to be tapped (not fractional sizes listed by Siler).
 3. Fit pan tightly to plate, drill and tap for pan screw, peen closed any offensive gaps.
 4. Ream tumbler/hole after drilling 1/64" undersize.
 5. Drill clearance size hole in bridle boss (foot), drill and tap corresponding hole in lock plate. Install bridle with the one screw.
 6. Locate sear screw hole at far forward edge of drill location, recenter punch, drill and tap. Then use point of tap turned in from front of plate to scribe location for sear screw hole in bridle. Then drill for clearance hole, alternatively, if you can tig weld up drill location, swivel bridle down far enough to allow for desired cock movement estimated per discussion, drill, tap and mark as above. This increases cock movement.
 7. Install bridle with both screws.
 8. Ream tumbler hole, use lock plate jig.
 9. To pre-drill small tumbler hole in bridle, use #4 piloted countersink/center drill (dull large diameter cutting edges). Run it through the tumbler hole in plate and drill small hole.
 10. Ream small tumbler hole, plate and bridle still in jig.
 11. Drill clearance hole in sear and install.
 12. Fit cock to tumbler shaft. A slight taper on both parts helps.
 13. Open up mainspring and put slight curve in lower leaf to provide 3/8" drop below tumbler foot. All spring bench must be done at 1550°F. Bend lower leaf slightly away from plate face if necessary. Reharden at 1550°F and draw for one hour at 850°- 900°F. File lower leaf to smooth taper to insure movement of leaf along whole length, not just last 1/3 of length.
 14. File mainspring pin to smaller diameter for a tight fit in a number drill size hole.

15. Drill appropriate size hole in plate for mainspring pin. Locate at far rear edge of cast in drill location. Or if you can tig weld cast in drill location, estimate new position far enough toward tumbler so tip of hook will ride up almost to touch tumbler shaft at full cock. This provides smoother movement and easier cocking past half cock.
16. File curve into foot of tumbler.
17. When cocking the above set up for the first time, be careful! If it feels too tight, extend curve of tumbler foot further toward shaft.
18. File underside of tumbler where sear nose rests to allow sear arm to rest at bottom edge of lock plate when lock is at rest. Make sure you finish any stle changes to plate outline before filing this in. (This allows sear to put slight tension on trigger to eliminate rattle.)
19. Turn and file frictionless bolsters on tumbler and sear, drill and tap cock screw hole which tumbler is chucked in lathe. *.010 inch*
20. Adjust tension of sear spring, you may have to heat and bend leaf to more open position. Rearden and temper at 1550°F and 850° if necessary.
21. Fit frizzen to plate and pan tightly after polishing bearing areas of pivot and pan arm. Clamp frizzin in place with .002" shim under front edge of frizzen. Drill and tap using jig. Keep clamp in place throughout whole operation.
22. Frizzen spring. Straighten tap leaf at 1550°F adjust so tap leaf doesn't scrape plate. Open it so it will provide 1/8" to 5/32" of tension with frizzen closed. File pin to bit smaller # size hole. Drill hole for pin in plate. Install on plate and clamp in place, drill through frizzen spring screw boss with clearance size drill to mark the new location, finish with tap size drill and then tap. Install frizzen and spring.
23. Fit pan cover of frizzen to pan using prussian blue transfer color. It is best to do this while mainspring is at half cock, frizzen spring in place.
24. Polish all working bearing surfaces to a minimum of 320 grit 600 is better. The "scratcher" should run in some direction as movement.
25. Install fly and adjust for proper function.
26. Carefully touch up sear nose and notch for crisp pull. Final stoning after hardening.
27. Harden parts per Siler instructions.
28. Caseharden plate and bridle if possible.

B. Aethetic Modifications of Siler Locks. Studying period arms and locks provides almost limitless variations which can be applied to Siler locks. Changes may be effected by file work reshaping of parts, parts may be welded to add metal where needed, or entirely hand made parts may be substituted.

1. Reshape exterior parts per your individual taste, style and period of lock desired. Strive to use as much imagination and creativity as possible, but make sure your changes are appropriate to the arm you are building. Research is very important and usually enjoyable as well.

2. Refile interior parts reflect to 18th century work. File bevels on all springs, including sear spring. Reshape bridle to a more graceful shape after fitting. Make the small decorative cuts on tumbler, bridle, and springs so characteristic of 18th century work.
3. Bend top of spur on cock slightly. Leave just enough room for free movement of top jaw screw. (This is a cold bend.)
4. Reshape top jaw screw with files while turning it in drill press chuck. File small finial on threaded end.
5. File all parts to their desired shapes, maintaining and increasing sharpness of planes, bevels, edges, always keeping in mind the grace of the part and overall lock.
6. Reshape frizzin spring finial per your research.
7. Relief chisel either single or double quarter rounded border on bevels, as appropriate to style and period.
8. Polish all parts using techniques outlined, taking care to maintain the grace you have created. Never use a buffing wheel, rounded edges, indistinct planes and curves will ruin all your good work. On many average quality 18th Century pieces interior parts were left entirely as filed except for bearing points. Better quality guns had polishes ranging all the way up to 600 or 800 grit polishes that are the hallmark of best grade work done in London, Paris, and Berlin.
9. Round off and polish all screw ends protruding through lock plate, make them just long enough so no threads come out past plate surface.
10. Round off frizzin spring screw head to slight dome shape-filister head, do the same to all interior lock screws.
11. Normally cock screw (holds to tumbler) is smaller diameter and domed off. Turn it to shape per your research.

II. Polishing Techniques. I normally use a combination of all these techniques. Experiment and find out what works best on different parts. Be careful not to let the stone, paper wrapped file, etc. "drop" when moving over the edge of a flat, bevel, etc. Any rounding of edges, ill definition of flats, bevels, or curves will ruin any file work you've done. Sharp edges, planes and well defined curves "direct" the eye and create the grace and architectural beauty of a fine lock.

- A. Carefully file finish all parts to be polished.
- B. Use dissolvable "mold makers" stones in 150, 240, 400, 600 grits.
- C. Use 280, 400, 600 grit wet or dry production paper.
- D. Polish to 600 grit with "stones" or 400 with paper. Always finish with "scratches" running lengthwise for best appearance. Use "0000" steel wool dipped in 600 grit polishing compound to put final finish on part.
- E. Go over part with 600 grit compound on balsa wood stick, leather pad, or paper towel for higher gloss.

- F. Use "hard" stones, i.e. India or Arkansas as substitute for 150, 240, 400 grits on delicate chiseled detail, etc. Then switch to stick with 400 or 600 grit compounds. Use maple stick first then go to balsa.
- G. "Cross" polishing insures proper elimination of all previous grit marks. Finish with "lengthwise" strokes.

III. Browning and Rust Blurring

- A. Browning. These instructions will produce a lustrous red/brown with good translucency.

- 1. Formula, "Niedner's Blue"

Nitric Acid	2½ oz.
Hydrochloric acid	2 oz.
Clean Wire Nails	1 oz.
Distilled Water	30 oz.

Mix outdoors in "crock" mix acids, add nails, let them dissolve. I have heard it advised to always add acids to water. So use 3 crocks if you can. Be careful and avoid fumes, wear safety glasses, and rubber gloves. Store in brown bottle.

- 2. For most browning, use this formula cut 50% with distilled water. If temperature and humidity hit approximately 90° F and 50% you may want to dilute formula to 33% or even 25%.
- 3. Draw file barrel and then polish to 280 grit with production paper.
- 4. Plug bore with 6" or 8" tight fitting dowel to use as a handle.
- 5. Degrease with alcohol. Rub down barrel with powdered "whiting" on cotton balls. Wear cotton gloves during this and from here on out when handling barrel.
- 6. Wet cotton ball with solution and squeeze it out thoroughly.
- 7. Make one slow pass on each flat. The first flat should be dry by the time you finish the last. Then repeat to make sure of coverage.
- 8. Let barrel rust for 1-3 hrs. It takes a fair amount of experience to know when to card a barrel off. We're looking for a slow build-up of a light coat of oxide. It is far better to card off sooner than necessary than even a little late. If in doubt, card it!
- 9. Card using .003 diameter wire wheel turning at approx. 250 R.P.M. steel wool is not a good substitute.
- 10. In very hot, humid weather, you may have to "kill" acid residue on barrel after carding if it is to be left overnight (otherwise you may wake up to a polishing job in the morning). Use baking soda in water.
- 11. When you've reached what you want, usually 3 days of 3 coats per day, wash down barrel with saturated solution of baking soda and water.
- 12. Clean and oil bore.
- 13. Apply coat of "Simony" wax to surface.