



## **ADDITIONAL FITTING NOTES;**

After reading the instructions, you will see that many of the steps are already done.

You will only have to drill two metal holes, and tap 5 (drill and taps provided).

I usually put the butt plate and toe plate on first, just in case a drop is made you won't have to worry about breaking the toe off.

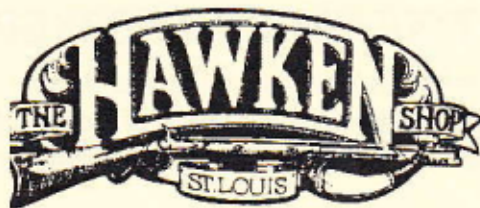
When fitting the lock plate, be sure to use the bottom and front of the mortice to locate the plate. This will give the best location for nipple alignment.

### **FIT THE TRIGGER PLATE USING THE BACK END TO LOCATE IT PROPERLY.**

This will allow the group to be as far to the muzzle as possible, making better sear/trigger alignment. (The back is the narrow pointy, end). Tighten the trigger plate in place to check fit before fitting the front, square end of the unit.

### **FINISH BUILDING THE RIFLE COMPLETELY BEFORE YOU START THE FINISH SANDING OF THE WOOD AND POLISHING ON THE METAL!!!**

Be patient and you will have a truly fine Hawken rifle.



## BEFORE STARTING THE ASSEMBLY

Experienced builder or not, we feel these instructions will be of valuable assistance. Please read them completely before you start assembly and constantly refer to them as you work!

As you have probably already noted, a full-size plan comes with the parts as well. The full-size drawing will be invaluable and will complement the written instructions. All dimensions needed can be, measured directly from the drawings. The following instructions will be brief and they will only take the builder up to having the rifle completed in the white. For instructions on finishing both the wood and the metal, the builder is asked to consult the directions usually supplied-with the finishing agent, whether it be stock stain, stock finishing, or browning solution.

To refer to the written instructions as complete would be false, but they could be considered a very detailed sequence of steps to take for assembly and it is in this light that we hope they will prove beneficial.

## ASSEMBLY

In order to accomplish any task of importance, a plan must be formulated and an orderly sequence of events must take place. It is no different in building a muzzle loading rifle. The components furnished by The Hawken Shop are of the finest quality and materials, and thanks to much devoted research and planning under the supervision of Mr. Art Ressel, 90% of the work essential to the assembly of an authentic copy of an original Hawken rifle has been done for you. These facts notwithstanding, there are still right ways and wrong ways to assemble the component package.

In order to preserve the authenticity of the finished piece and ensure proper fitting of the parts, we have outlined the following list of steps in their order of importance. A more detailed explanation is given in the text.

- |  |  |
|--|--|
| 1. Fit tang to hooked breech           | 10. Cut underrib to length and install upper thimbles  |
| 2. Inlet barrel and tang into stock    | 11. Install rib onto barrel                            |
| 3. Secure barrel to stock              | 12. Install toe plate                                  |
| 4. Position lock and inlet into stock  | 13. Refine lock mortice shape and thickness            |
| 5. Drill and tap lock bolt             | 14. Dress down wood to finish line                     |
| 6. Position and inlet trigger assembly | 15. Install barrel key escutcheons and lock bolt inlay |
| 7. Drill and tap for tang bolts        | 16. Install sights                                     |
| 8. Install rear thimble                | 17. Fill solder pocket on end of underrib              |
| 9. Install nose cap                    | 18. Finish wood and metal                              |

Although you may deviate from this sequence if You wish, we strongly recommend that Steps 1 through 9 be executed in sequential order as listed.

After Step 9 the sequence is less important as you have, by this time, positioned all major components on the stock and the remainder of the shaping and inletting is governed by the position of the parts installed in Steps 1 through 9.



## **STEP 1: FITTING TANG TO HOOKED BREECH**

If this hasn't been done, do so by using inletting black and a flat file. Be sure you don't disturb the flat milled end of the breech plug or the tang, but file only on the hooked portion of the breech. (If inletting black is not available, soot from a candle flame will do very well.) Carefully remove any casting protrusions ~from tang face or breech butt to ensure flush fit.

## **STEP 2: INLET BARREL AND TANG**

Install patent breech to barrel making sure breech is correctly aligned and positioning marks on the bottom match.

Fit the tang to the hooked breech and making sure the two surfaces mate as tightly and squarely as possible, proceed to inlet the tapered barrel.

Because the barrel is tapered, you may have to remove a small amount of wood from both sides of the barrel channel. The amount of wood removed is relatively small and can be done with scrapers and varying grits of sandpaper backed by a piece of wood. A carpenter's edge plane can be of assistance in this area if used with care.

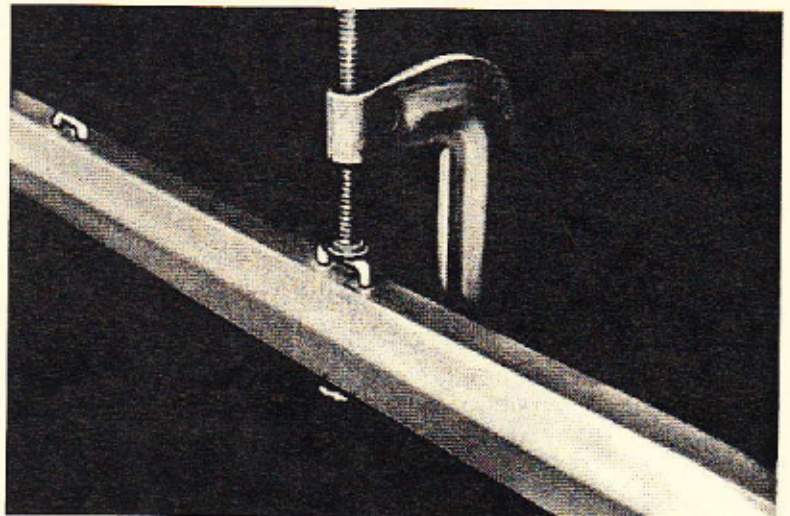
Since there is only a hair line of wood to be removed at the forward end of the barrel channel, where the nose cap will be, the barrel will probably start to fit down in the channel at this point before the thicker breech area. As this happens, you will be able to use the forward end of the forearm as an anchor point and a point of reference to reaffirm the amount of wood to be removed from the rest of the barrel channel so as to keep the barrel in direct line with

the tang and the center line of the butt stock.

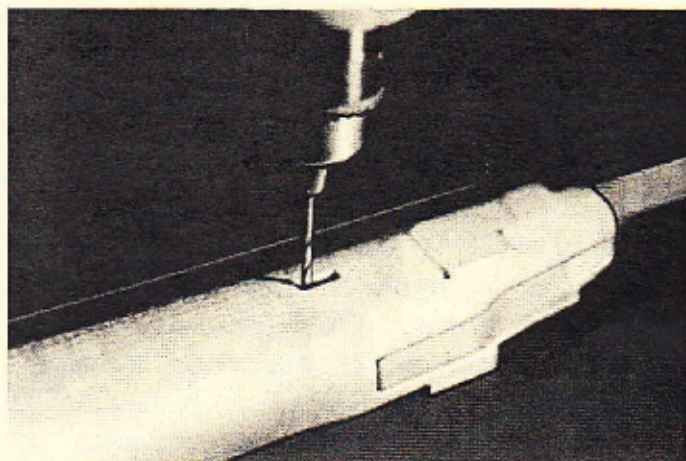
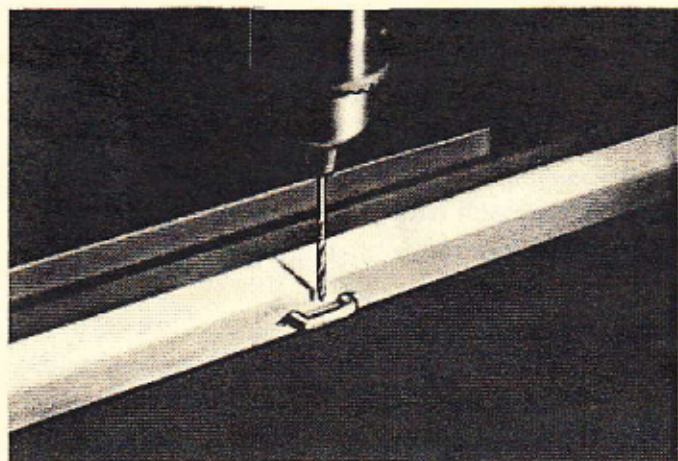
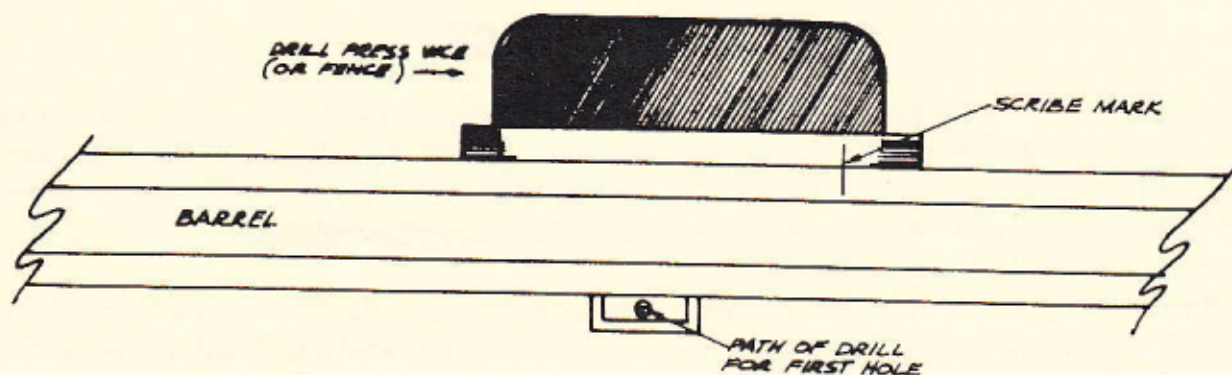
Now it is advisable to soft solder the hooked breech and tang together so that they may be properly inletted into the stock. This will ensure that the tang and breech will fit squarely together when completely inletted into the stock. In order to acquire an almost invisible line at the juncture of tang and breech, it may be necessary to "pean" the edges of either or both parts ever so slightly on the top, and side flats, thereby "stretching" the metal to cover any gaps, then file slightly to level.

## **STEP 3: MOUNT BARREL TENNONS AND SECURE BARREL**

With the tennons installed and inletted, you are now ready to .A drill the holes which will become the slots for the barrel keys. Remove the barrel from the stock and place in the drill press with the top flat of the barrel against the fence.





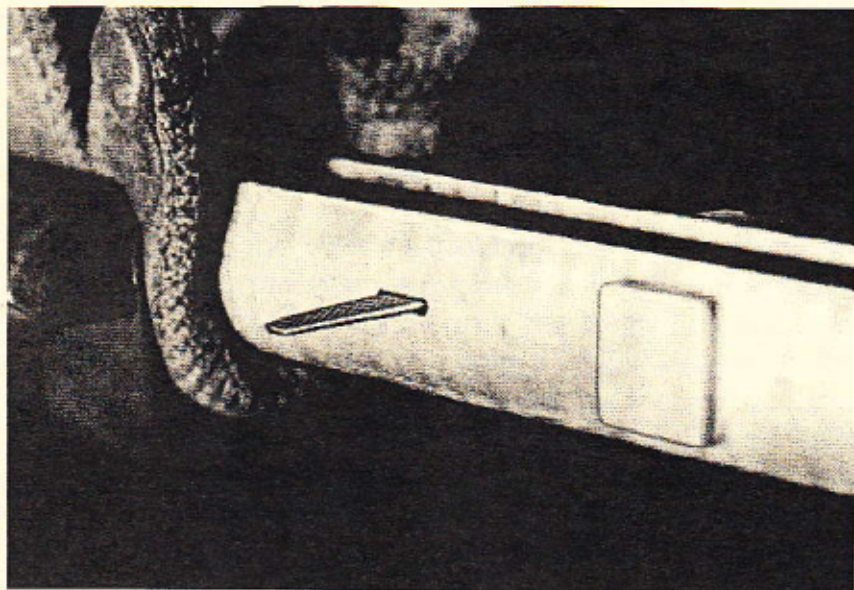


(The fence can be a piece of angle iron clamped to the drill press table with C-clamps, the drill press vise, or any other fixed surface which is fixed to the drill press table.)

With the barrel against the fence, align the drill press so that the drill passes through the loop of one of the tenons, as in photo (A) above, and scribe a line on both the barrel and the fence so that this same position can be attained when the barrel is in the stock and the tenon is not visible.

Remove the barrel from the drill press and remount it securely in the stock. Now place the whole assembly (barrel with tang and stock), on the drill press with the top flat of the barrel against the fence, and align the scribe mark which was made on both barrel and fence. Clamp in place and drill, as in photo (B) above, to go only halfway through the stock. Turn the assembly over and repeat the process. Having now established the approximate center of the loop with this first drill hole, proceed to drill additional holes on either side of the first until you have reached the approximate width of the key which will pass through this slot when completed. Drill slowly and do not drill so that these holes touch as the drill will wander into the adjacent hole.

When the drilling for both tenons is complete, take the barrel out of the stock and with a small chisel remove the wood between the drill holes. Using a small file, as shown in photo (C), enlarge the cavity so you can obtain a light drive fit for the key. Small margin for error prevails in slot cutting as escutcheon will surround the slot.





## STEP 4: INLET LOCK

Disassemble the lock but leave the hammer and tumbler in place. Position the lock plate over the pre-inletted area so that the cut-out area of the lock plate lines up with the snail of the hooked breech. With the lock plate held in this position, rotate the hammer down toward the nipple as if you had just fired the rifle. With a nipple already installed in the breech you should now be able to verify visually that the hammer will be on or near the nipple with the lock plate in this position. If the hammer does not look centered on the nipple, you should mark the area of the lock plate around the hooked breech, to be relieved so that the plate can be positioned such to allow the hammer to closer align with the nipple. SPECIAL NOTE: I wish to emphasize that any movement of the lock plate to align the hammer with the nipple Wil-1-1 be very small and in most cases will not be required at all. You should also be conscious of the pre-inlet lock area of the stock while considering any change of location in the lock plate. Since the inletting for the lock is very close to complete, you will not be permitted to make very much of a positioning change lest a gap be created around the edge of the

lock plate when inletted into the stock. Should a gap be eminent, heating and slightly bending the hammer should be considered. Altering the lock position will also affect sear/trigger relationship.

Do not be guided by the cut-out in the lock plate for the snail. If necessary, weld this closed and re-cut. If using a lock plate without a cut-out for snail inlet plate into stock with barrel and breech removed. Carefully install barrel to point where snail touches lock plate and mark lock plate. With a rattail or other rounded file cut out lockplate for snail to fit, checking often for correct fit and not too snug at forward end as to prevent barrel from being removed with lock in place. As mentioned previously, hammer throw may be changed accordingly later if necessary.

After the lock plate is inlet into the stock to your satisfaction, reassemble the lock so that it is complete and functional. Mark the internal lock parts with inletting black and remove wood where necessary to ensure unobstructed movement of all internal parts.

## STEP 5: DRILL AND TAP FOR LOCK BOLT

With the inletting for the lock complete, again remove the lock from the stock and completely disassemble so that the lock plate is stripped of all other parts, including hammer and tumbler.

Using the full-size drawings as reference, determine the point at which the lock bolt will pass through the lock plate and mark this location on the thick raised inside portion of the lock plate, just behind where the snail of the breech will be located. If done correctly, the lock bolt should not come in contact with any portion of the hooked breech or tang.

Having determined the proper location of the lock bolt on the plate, center punch this point, insert into drill press, and drill completely through plate with a #36 drill. Using this hole as a pilot, insert the lock plate back into the stock and drill through stock. With your pilot hole drilled, you can now enlarge the hole in the wood to allow the bolt to pass through easily and also drill out the hole in the lock plate to the proper size for the screw thread which you will use. A #29 drill is

the proper size for a #8 x 32thd. screw and a #21 drill is correct for a #10 x 32thd.

When threading is completed, insert lock plate back into the stock and pull down snug with lock bolt making sure that there is no binding and that lock bolt threads easily. Remove any excess threads of the lock bolt which may protrude from the lock plate when bolt is tightened down snug.

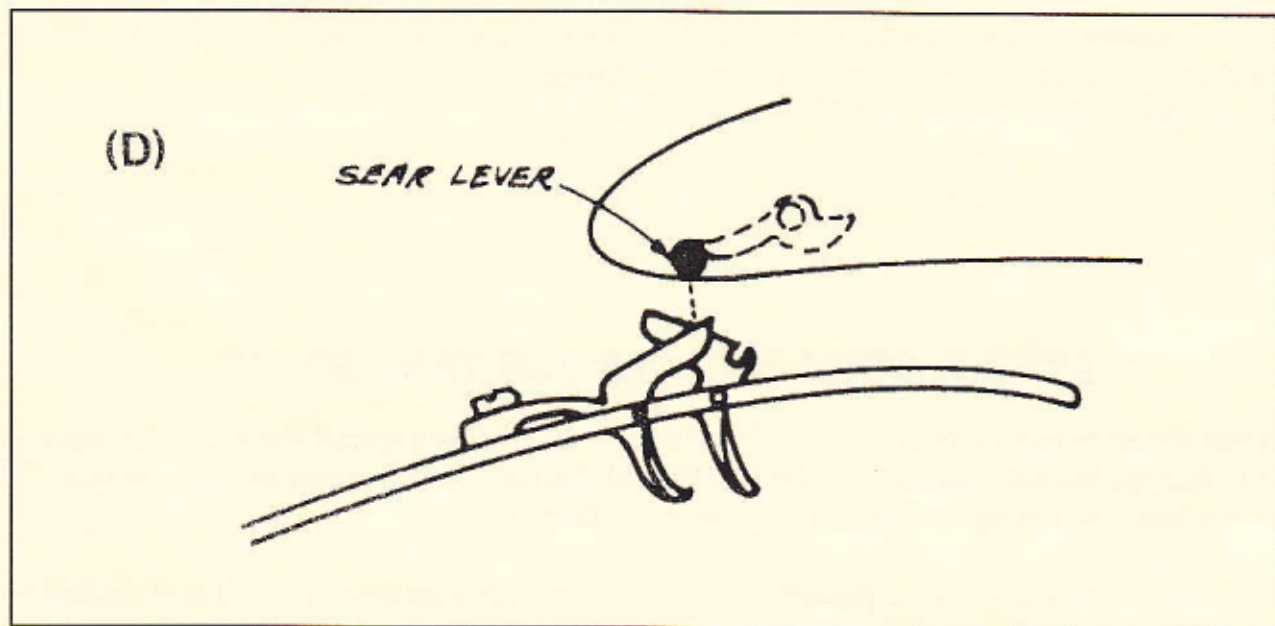
Reassemble the lock and screw in place with lock bolt. Make sure that you still have completely free movement of all internal parts. Remove wood where necessary.



## STEP 6: POSITION AND INLET TRIGGER ASSEMBLY

With the triggers released and the rear trigger in its rest position, pull back on the front trigger until its lever and the lever of the rear trigger form an "X".

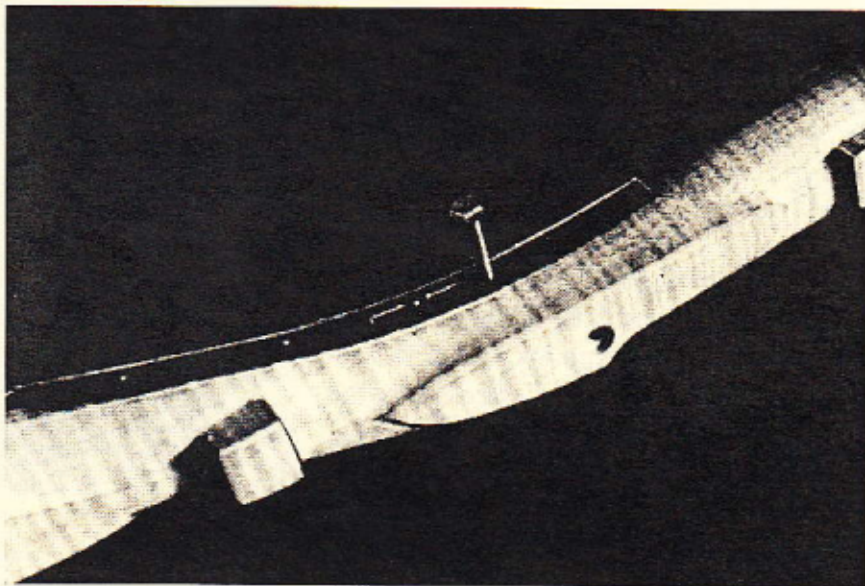
This intersection should be centered on the sear lever of the lock as in drawing below.



Remember, for these triggers to operate properly, the rear trigger lever, when released, should fly up and strike the sear, releasing it and allowing the hammer to fall. After striking the sear, the rear trigger lever should then fall back slightly so as not to bear on the sear. The fly in the tumbler prevents the sear from engaging the half cock notch, and with the rear trigger not applying constant pressure on the sear, you have the capability of cocking and firing the rifle using only the front trigger, in the unset condition.

Before disassembling the triggers, match the position of the sear lever to the center of the fore and aft trigger levers. See figure D. It can be handy to scratch a mark on the outside of the lock plate to indicate the position of the sear. Lay the trigger assembly along the stock and line up these two locations. Having satisfied yourself that you have the proper arrangement of triggers to sear, mark the stock to indicate where the forward end of the trigger bar stops. Transfer this mark across the bottom of the stock where the trigger inletting has been started for you and after disassembling the triggers, inlet the bar until it is in the wood to it's full depth.

In order to facilitate removal of the trigger bar while inletting is proceeding in this area, it is helpful to screw a bolt into the threaded hole provided for the forward end of the trigger guard as shown to the right.





This will provide you with a handle to assist in removal should the fit be very tight. "DO NOT" use the slots in the trigger bar as pry points!

After the trigger bar is inletted to its full depth, reassemble the triggers and check that they release the sear when activated. If they do not come in contact with the sear, it will be necessary to remove a little more wood from beneath the trigger bar and seat the triggers deeper in the wood. Special Note: It is essential here to re-

member that the entire bottom line of the forestock is determined by the front end of the trigger bar, which will be more or less a straight line from trigger bar to entry pipe. Remember also, your stock has been pre-carved leaving approximately 1/4" of excess wood overall to allow you to finish and final shape all parts. Therefore you can inlet the trigger bar deeper if necessary in order to make sear contact. SPECIAL NOTE: see Appendix "A"

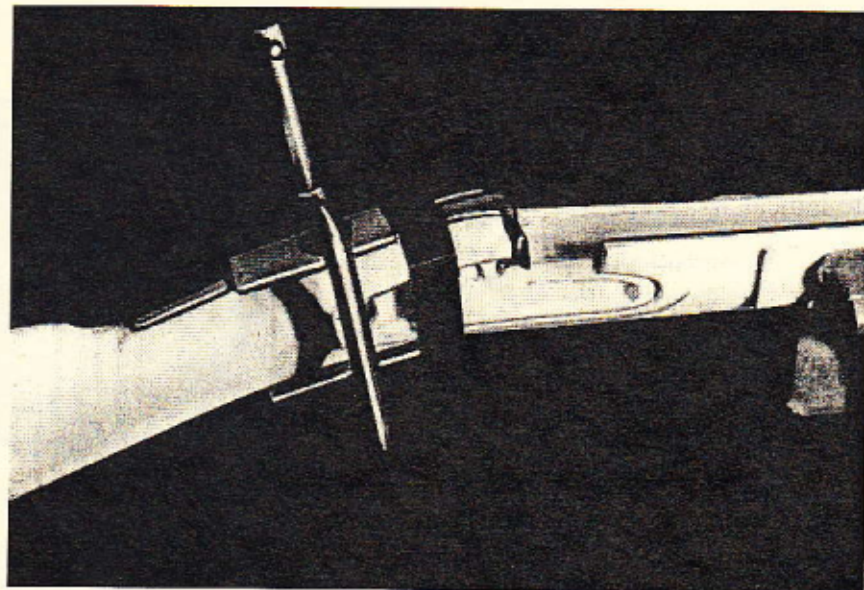
## STEP 7: DRILL AND TAP FOR TANG BOLTS

Now that you are ready to drill the holes for the tang bolts, I will discuss a special tool that will make it almost foolproof to drill the holes so that they are centered on both the tang and the trigger bar and you won't have to worry about where you're going to come out with the point of the drill.

This tool is simply a straight, threaded, pointed post of 3/8" diameter passing through the table of the drill press at some spot where it can be aligned directly below the drill point. It could be made from larger stock if desired but should be at least 3/8" to eliminate wobble. The threaded portion of the shank is to be screwed through a correspondingly threaded hole in the drill press table. The length of the threaded section will depend on the type of vise used on the drill press and its height from the table, so until you know exactly how everything is going to be positioned, I suggest that you make this threaded section rather long and thus allow for more adjustment up or down.

Before you do the drilling though, there is a little preliminary work to do. From the full-size drawings, measure the locations at which the bolts pass through the tang and trigger bar and mark these points. Center punch these spots and drill, but only drill enough to make a nice clean little cone in the metal to be used for alignment. Do this on the outside of both the tang and the trigger bar.

With the lock removed from the stock and the triggers disassembled, clamp the tang and trigger bar together as shown in the picture. Be sure to leave enough room for the chuck of the drill press to pass the handle of the clamp.



With the special tool threaded through the drill press table and a #29 drill in the drill press chuck, align the point of the drill with the point of the special tool. Now place the stock in the drill press so that the small cone, indicating where the forward tang bolt will come out of the trigger bar, rests atop the point of the special tool.



With the stock resting in this manner, angle the stock up or down so that the drill bit also aligns with the cone in the tang for this same screw. Once this alignment has been achieved, clamp the stock tightly in the vise and proceed to drill. Because the point of the tool is resting where the drill bit will come out, you cannot drill completely through the trigger bar, but you should drill far enough to allow the bit to start cutting its hole on the inside surface of the trigger bar. After the rear tang screw is aligned and drilled in the same manner (again not drilling all the way through the trigger bar) the stock can be removed from the drill press and finished with a hand drill using the same #29 drill bit.

After you have finished drilling through the trigger bar with the #29 drill, temporarily remove the trigger bar

from the stock and drill through the tang and stock with a #11 drill to provide clearance for the tang bolt. Then reinstall the trigger bar in the stock, clamp in place with c-clamp as before and with a #8 x 32thd. tap inserted down through the tang and stock, tap the hole in the trigger bar.

When the threading is complete and you have tried the tang bolts to ensure that they thread freely, you can now countersink the tang to accommodate the heads of the tang bolts. Remember to leave the heads of these bolts a little high so they can be filed down to the same contour as the tang. Don't forget all screw slots should line up with the long axis of the rifle - and vertically through the butt plate.

## STEP 8: INSTALL REAR THIMBLE

The most common way of attaching the entry thimble is with a single pin through the stock. Another way is to use 1 or 2 screws through the stock from the bottom flat of the barrel channel as is done with the nose cap. If the pin method is desired, proceed with the inletting of the rear thimble using inletting block to mark the wood to be removed. Insert a section of 1/2" dowel through the thimble and a short way into the ram rod hole to check alignment and to insure unobstructed passage of the ram rod into the ram rod hole. When the thimble is at its proper depth the dowel will pass into the ram rod hole without running into the sides of the hole and the dowel will be parallel to the bottom flat of the barrel.

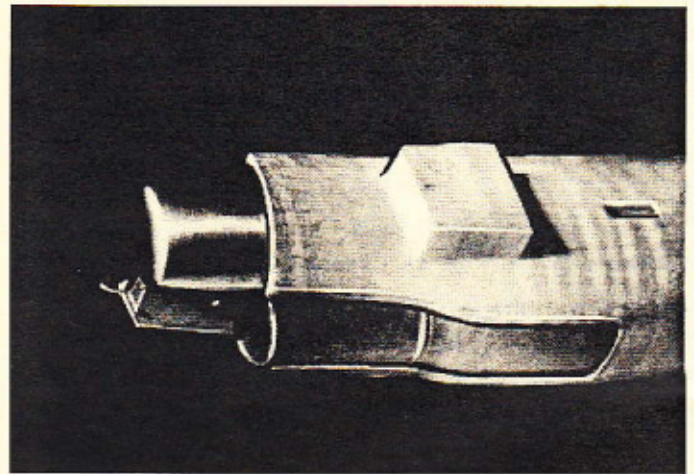
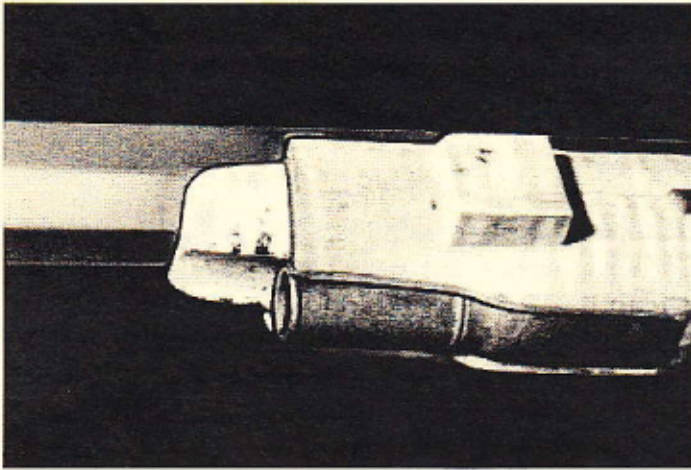
With the rear thimble at its proper depth, remove it from the stock and measure from the bottom of the thimble to the midpoint of the fin at the top of the thimble. Put the thimble back in the stock, clamp in place, and transfer the measurement just taken, to the side of the forearm. Drill through the side of the stock, the fin on the entry pipe, and out the other side of the stock. Use a drill that will provide a friction fit with the pin. ---Pecial Note: It is important to the looks of the rifle that the ram r

the entry thimble hole to the bottom barrel flat, figuring in the thickness of the under rib to make sure the bottom of the under rib is parallel to the top edge of the entry thimble opening. If not, inlet thimble deeper at front end and ream ram rod channel in stock to match thimble hole when thimble is finally inlet and secure at proper depth.

od lay flat to the under rib. You may at this point wish to check the distance from the upper outside edge of



## STEP 9: INSTALL NOSE CAP

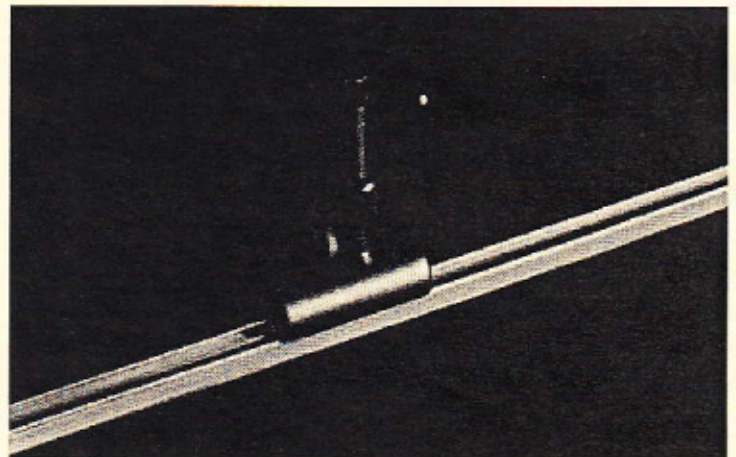
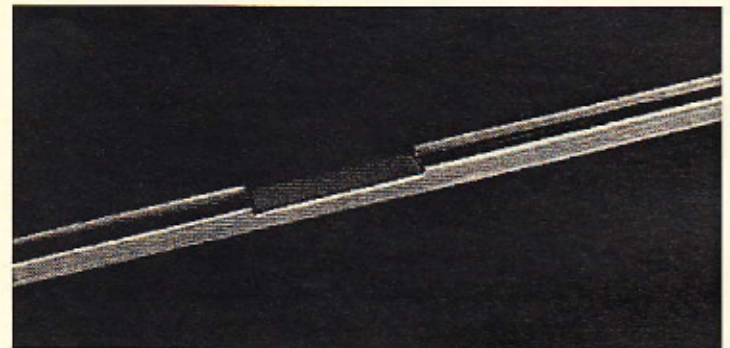


Use inletting black and fit this piece so that the groove for the ram rod lines up with the inner surface of the hole in the entry thimble. At the same time, maintain a good match on the vertical line of the nose cap where it meets with the stock.

With the barrel removed from the stock, firmly clamp the nose cap in position and drill through the hole in the bottom of the nose cap, through the stock and into the barrel channel. Next, countersink the hole inside the barrel channel just enough to allow the head of the flat head screw to be flush with the bottom flat of the barrel channel. Remove any excess screw threads protruding from the bottom of the nose cap with a rat-tail file. Special Note: We have included our 1-1/8" nose cap which is from original gUn\_wil=1-1/8" straight barrel. By bending or squeezing in vise slightly, it can be a perfect fit for your tapered barrel.

## STEP 10: CUT UNDER RIB TO LENGTH AND INSTALL UPPER THIMBLES

You will notice that on one end of the under rib there is a scooped out half round area, cutting back about 1/2" from the end. This is the end of the rib that goes at the muzzle next to the bottom barrel flat. Measure from the recessed portion of the nose cap to the very end of the barrel and cut the rib to this length.\* Next, go to the full-size drawings and measure the locations of the thimbles on the rib. With these locations marked on the rib, file a flat in both locations so that the thimble can sit down in the rib allowing the inner surface of the thimble to be aligned with the convex surface of the under rib. This will prevent a space from being formed between the ram rod and the under rib.

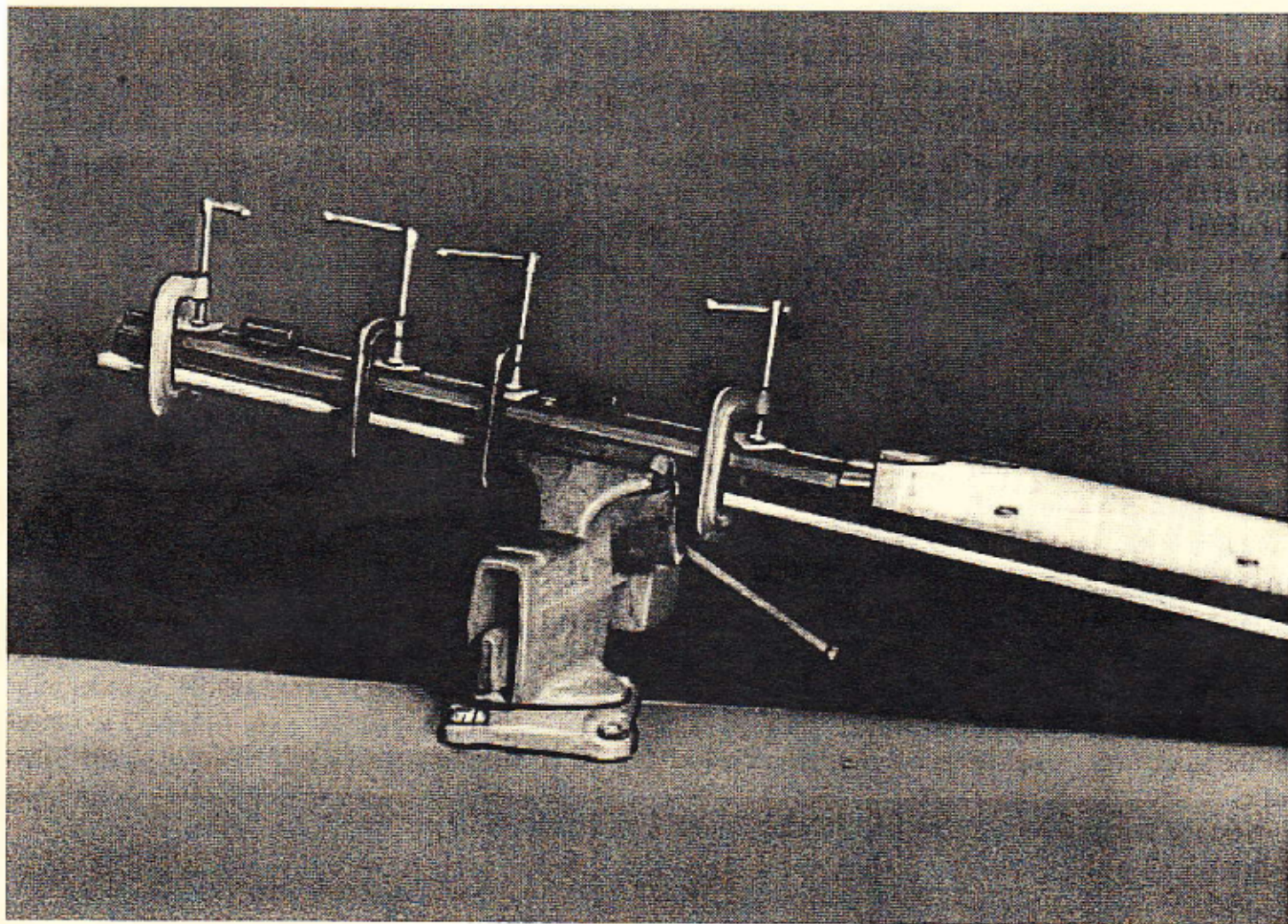


Clamp the thimbles to the under rib and solder in place.

*\*Leave at least 1/32" distance between nose cap face and under rib to allow for clearance when removing barrel when under rib is affixed.*



## STEP II: INSTALL UNDER RIB ON BARREL



With all these operations complete and the rib screwed to the barrel, remount the barrel in the stock and check that you have clearance for the rib to pass the nose cap when the barrel is hinged down in the stock. If the rib contacts the nose cap, preventing the barrel from seating completely, remove a small amount of metal from the under rib to allow passage.

It should be explained at this point that the half round milled section of the under rib, which is at the muzzle end of the rib, is intended to be filled with solder, thereby firmly affixing the tip of the rib to the barrel and preventing it from being snagged and pulled away from the barrel. It would be possible to solder this cupped area at this time, if you wish, but that would mean that you could not remove the rib from the barrel during the remainder of the finishing process without unsoldering this area. From previous experience, I prefer to brown the under rib and thimbles separate from the barrel.

If you are using the hot brown method, I would especially recommend removal of the rib when browning the barrel as it is possible to get the metal hot enough to melt the solder holding the thimbles to the rib. If you brown the rib separately, it is much easier to control the heat on the rib and avoid melting the solder.



## **STEP 12: INSTALL TOE PLATE**

With a file and coarse sandpaper, dress down the bottom of the stock to a finish line between the butt plate and the trigger bar. As will be noted from the full-size drawings, this area between the butt plate and the trigger bar may not be a perfectly straight line. This portion of the stock might have a slight belly to it and although it is very slight, it is still noticeable, a feature which is determined by the length of pull set up on this specific rifle.

Once your shaping is completed, inset the toe plate into this surface and secure it using 2 flat head wood screws countersunk flush with the toe plate surface. Again, the screw slots should be aligned with the length of the barrel.

The toe plate should now be dressed with a file to form a continuation of the line at the back of the stock where it mates with the butt plate.

## **STEP 13: REFINE LOCK MORTICE SHAPE AND THICKNESS**

Remove the lock from the stock and disassemble, then put the lock plate back into the stock and tighten down with the lock bolt. With sandpaper and files, dress down the wood around the lock so it is flush with the lock surface. Once this is done, dress down the opposite side of the stock to the same thickness from centerline of rifle.

Next use sandpaper backed with a half round file to

refine the shape of the lock mortices to conform to the full-size drawings. Refer to any and all photos and drawings possible when refining these areas, remember again, an excess of wood has been left in order to let you refine. It is a common error to leave too much wood BUT proceed with care -- use the plans where possible and let your good sense of "feel" prevail. Use templates provided on plans, if necessary.

## **STEP 14: DRESS DOWN STOCK TO FINISH LINE**

With sandpaper and files dress down the entire stock to its finish line, using the plans to get "finished" measurements.

It should be noted that, just as there may be a slight belly in the underside of the stock between the butt plate and the trigger bar, there also may be a slight

belly to the fore arm. Again, this shape should be very subtle but also is a characteristic on some Hawken rifles.

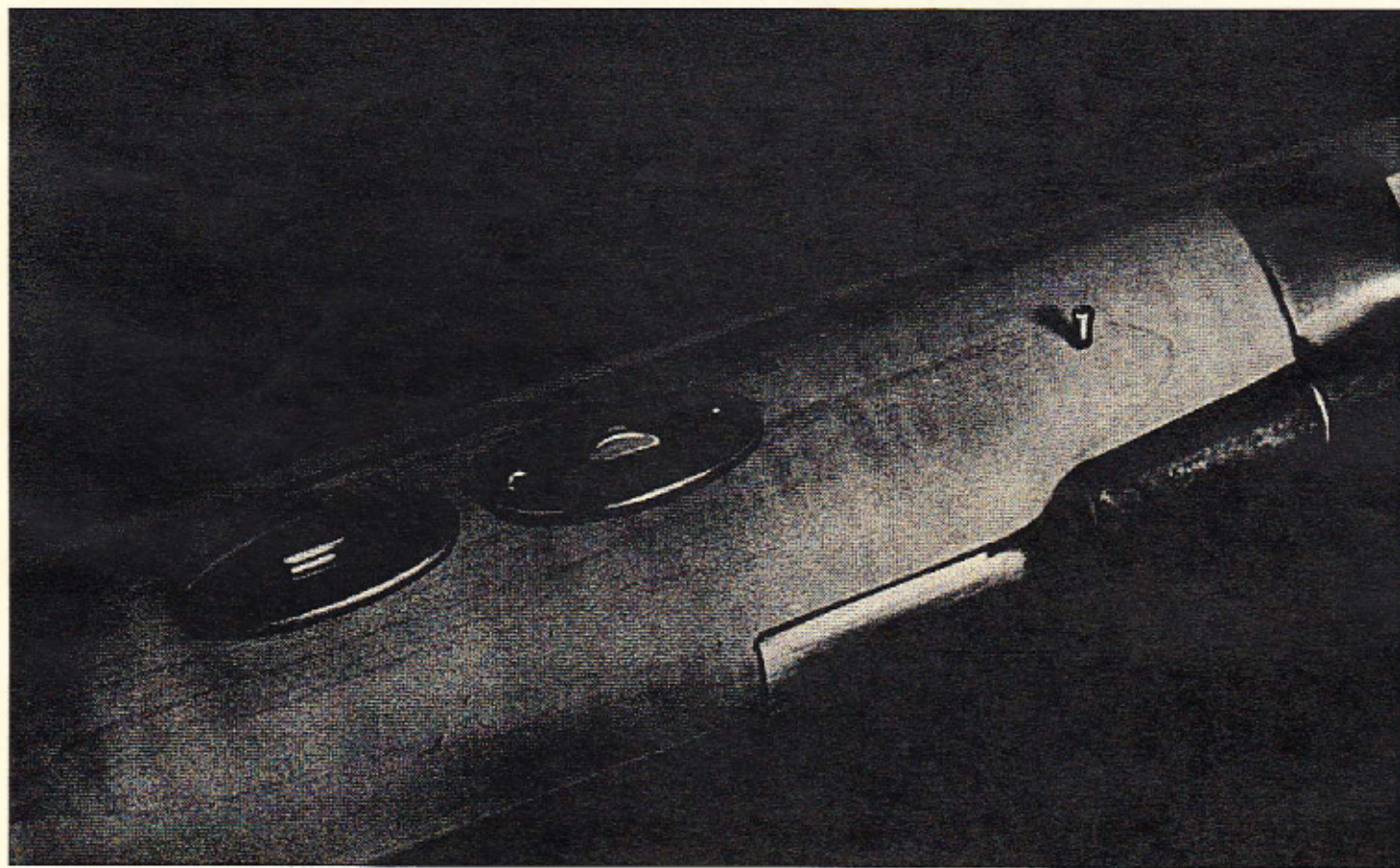
\*"Dremel" tool is a hand-held flex shaft tool with drilling or grinding attachments.



## STEP 15: INSTALL BARREL KEY ESCUTCHENS AND LOCK BOLT INLAY

Place the lock bolt inlay on the lock bolt outside in and tighten down. Mark the outline of the inlay with a sharp, pointed pencil and, working inside this outline, proceed to inlet the inlay into the stock. Leave a very slight amount of the inlay protruding from the stock and file flush with the wood. Be careful when filing that your file is clean so that you won't scratch the wood around the inlay.

To locate the area to be inletted for the barrel key escutchen, hold the escutchen against the stock and slide the barrel key through the slot in the key. NOTE: These slots may have to be enlarged slightly to allow the key to pass through. With the escutchen held in place by the key, trace its outline with a sharp pencil and start inletting, always working inside the pencil line.



After you have made your initial inletting cuts, again place the escutchen on the stock and pass the key through it. Tap lightly and remove. You will now be able to see where the inlay has compressed the wood along the edge of the inletting, showing you where more wood needs to be removed. It is a good idea to scratch an arrow on the inlay so you can determine that you are putting it on the stock the same way each time you try the fit of the inletting.

Once you have removed enough wood to allow the

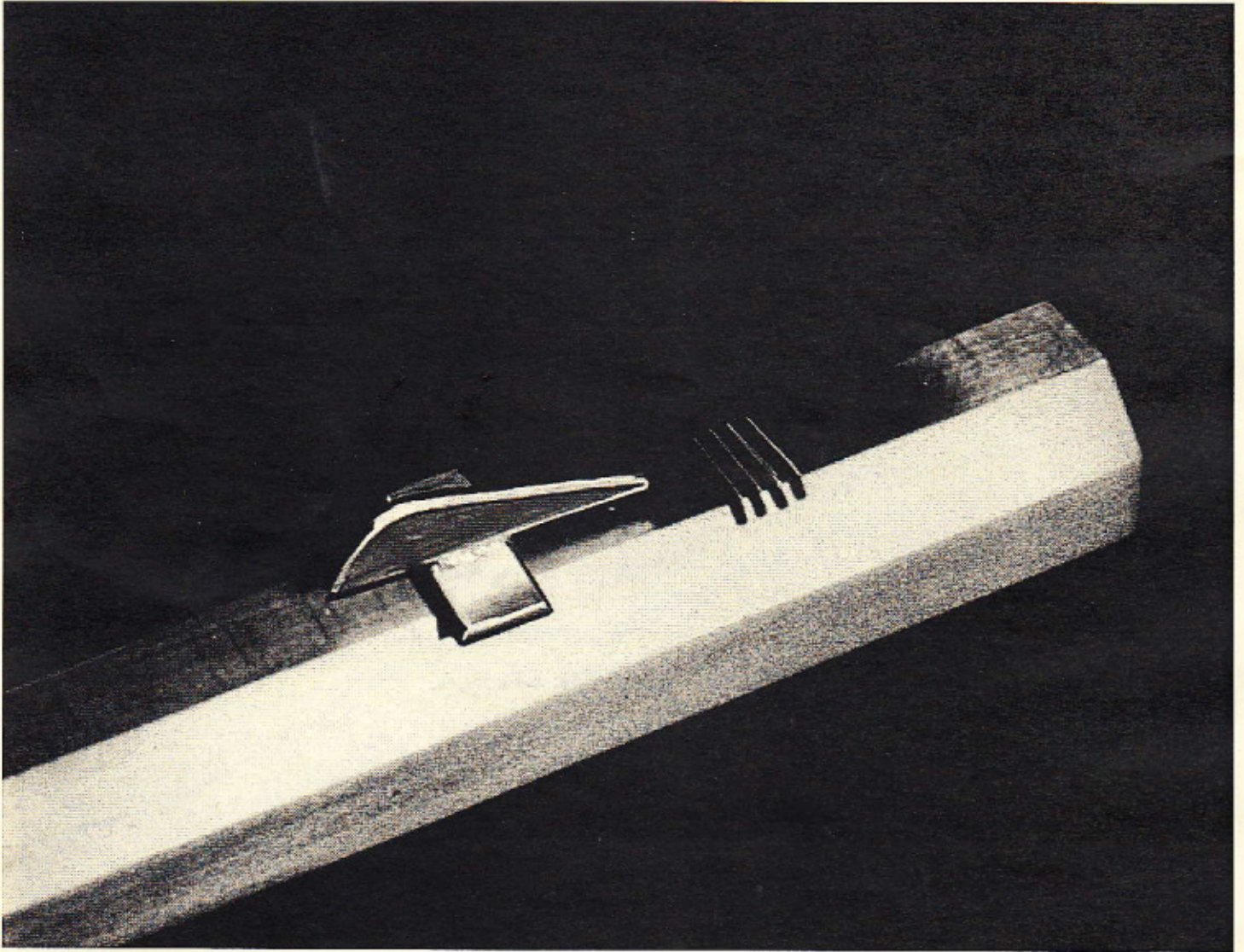
escutchen to lay almost flush with the wood, counter sink the holes for the mounting screws and fasten to the stock. Then remove the key and file the edges of the inlay flush with the rest of the stock. Use a fine toothed file, work slowly, and always file from wood toward metal as this prevents the file from carrying metal chips into the wood and scratching it.

When all 4 escutchens are inletted, block sand the entire fore arm, including escutchens, with very fine sand paper.



## STEP 16: INSTALL SIGHTS

The location of the front sight can be taken directly from the plans. Use a hack saw and cut across the barrel several times until you have reached the width of the top surface of the sight base, or in other words, the smallest dimension of the sight base when viewed from the side. File away the metal between these, cut with a triangular file with the teeth ground off bottom side. This will allow you to under cut the ends of the dovetail without making the bottom of the dovetail any deeper.



As of this writing revisions are being made to add more "meat" to the top edge of the triggers (when they come in contact with the sear) thereby allowing the builder to keep the correct alignment of trigger bar by taking metal off the top edge of triggers as he inlets the unit into stock. This gives our trigger unit capabilities of being used on other guns where regulating this height becomes essential.

Upon completion of your gun send photos and we will issue you a certificate acknowledging you are the builder of a Hawken Rifle from the Hawken Shop.



P.O. Box 593 • Oak Harbor, WA 98277