As basic as it is to forge work, the scroll can be a challenge. Done as a free-hand process, the scrolling process is important to master. It is the basis of not only the scroll, but of rolling an eye-form or a hinge barrel. The process differs only in degree, radius and application.

In addition, there are a variety of decorative endings that can be forged on the bar prior to scrolling that impact the look of the finished piece. These can range from a simple taper that retains the bar width, to split and flared endings known as fish-tails. French Gothic hinge motifs are often every bit a scroll in form and process but they end in elements that are chased, chiseled or open-face die forged.

The curve in the tip of a leaf as it flips back to contrast the forward thrust of the body of that leaf, the curl of a ram’s horn on a poker are all scrolls. Too many, too often can be trite, but when you need a scroll you should know how to get them right.

Grille Test Panel

The center decoration is the result of a hot repousse’ process. The four large leaf decorations are forged. Both motifs and their respective processes are described in this issue.

Spring 1997
1998 Conference Update
June 17-20, Asheville, North Carolina

Planning for the 1998 ABANA Conference, to be held on the campus of The University of North Carolina, Asheville, has moved into the final stage.

The dates are June 17-20, 1998. The demonstrators have been selected and invited. The four ‘98 Conference Special Projects have been organized, their participants have been notified. Relevant design work has been completed and sent to the team leaders.

The site layout has been completed, canvas arranged and power considerations addressed. There are some very special arrangements under way that will give this Conference several dramatic aspects. This includes, but is not limited to, a permanent facility being underwritten and built at the site by the North Carolina Chapter of ABANA.

The program is complete. The theme has been translated into both the hand-forging sites as well as two other, “non hand-forged”, sites. Education will be addressed through class room presentations, round table discussions, slide showings and hands-on opportunities. In several cases, class room presentations will lead into subsequent forging demonstrations. A strong craft program with aspects for all ages has been put together. There is even some electronic razzle-dazzle in store for attendees.

An ABANA Conference should be all business by day, but it is also an opportunity to meet old friends and enjoy yourself in the evening. To this end a wide variety of entertainment and activities are scheduled after the close of each forging day.

If this sounds both real interesting and real vague, you are right. To find out the details...all you have to do is read The Anvil’s Ring this summer.

Attention Chapter Newsletter Editors
Please add the Editor of The Hammers’ Blow to your Chapter Newsletter mailing list: in this way I can include what is coming up in the way of Chapter and regional Conferences.

And, as always the content of The Hammers’ Blow is available for reprinting. If the article or tip is attributed to other authors then they retain the copyright and you should contact them for permission. Those articles and tips that have no name with them are written by the editor and may be used at your discretion providing The Hammers’ Blow and the editor are credited.

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The Complete Modern Blacksmith
Alexander G. Weygers
Ten Speed Press, Berkeley, California

The long awaited reprint of the three book series by Alexander Weygers has arrived. All three, The Making of Tools, The Modern Blacksmith and The Recycling, Use and Repair of Tools are compiled into one volume; The Complete Modern Blacksmith. The quality of the reprint is very good. The original and profuse illustrations are clear. I will say that there are a couple of power tool modifications that I would strongly caution against copying. However, they are a very minor part of this set and in no way detract from its overall value...just “don’t do that”.

The first book, The Making of Tools is well titled. It covers basic forging and forming steps using a variety of tool types as illustrative projects. Although some of the tools are more geared to stone and wood carving, the process and steps described apply to any blacksmith’s hand tool. Heat treating is explained in simple but thorough terms.

The Modern Blacksmith is a gem. The beginner and intermediate level blacksmith will benefit in the process and tool drawings. The proper sequence and application of a wide range of smithing tools is shown in the margins of every page with well written steps describing the process sandwiched in between. A number of short-cuts and shop forged jigs and fixtures that aid these processes are also depicted. This book ends with a section of projects that apply the lessons of the first two thirds of The Modern Blacksmith.

This brings us to The Recycling, Use and Repair of Tools. This book ranges from a chapter on How To Repair Broken Garden Tools through How To Drill A Square Hole to six chapters on power hammer use. The latter includes shop made tools and tooling for a Little Giant style trip hammer.

I bought the original three volumes one at a time, many years ago. For better or worse, those volumes are why the world has one more blacksmith today. I’m happy to see this reprint and it is no problem to recommend it for every Blacksmith’s Bookshelf.

Where To Get It: The Modern Blacksmith is available through Norm Larson Books and Centaur Forge, addresses and phone numbers of which can be found in any recent copy of The Anvil’s Ring.

Letters...

George,
Concerning the article in The Hammers’ Blow Vol 5, No.1, Forge Welding Basics / The Flux. Last week I contacted Superior Flux Corp. (Editors Note: Source of Anti-Borax Easy Weld) concerning the possible toxic elements of E-Z Weld. E-Z Weld apparently contains just under 15% Boric Acid and the use of E-Z Weld can cause “irritation of nose and throat and coughing”. First aid procedures for: “inhalation; remove to fresh air. Eyes; flush with water and get medical attention. Skin; wash with soap and water. Ingestion; give 2 glasses of water and induce vomiting. Even with adequate ventilation use NIOSH approved mask for dust. Protective gloves and safety glasses suggested. Avoid contact with eyes or breathing dust”.

Daniel M. Nauman
(Editors note: We own Dan a word of thanks for taking the time to inform our community of these facts. Whenever an issue seems unclear or incomplete, I hope everyone will feel free to raise a question of offer information.)

George,
Regarding the molding die in the last issue. One thing I do in die work is to use round stock, which fills the center first.
Bob Bergman

THE HAMMERS’ BLOW
SPRING 1997
The forge, ABANA's E-Mail based informational round table generated the following inquires and responses from among its over 400 members. This growing service which is made possible by your support of ABANA's educational outreach efforts.

To join the forge send an e-mail to: listproc@wugate.wustl.edu and in the message put subscribe theforge and (your name). The parentheses around your name are important.

Question:
Is there any advise that can be given over the internet as to some tricks that can be used for rivets. I am having a small problem using small rivets. When I get the rivet hot enough and then put it with the pieces that I am riveting the rivet cools down to fast. If I heat all three pieces then the rivet doesn't cool down but the other pieces change shape as I hammer the rivet. I am working with very small pieces here, as I am making a trivet. Any suggestions would be appreciated.

Reply from The forge:
Just peen the rivets down cold. They are soft steel and don't need to be heated.
David C. Hufford

Question:
Nuts and Bolts
In the 1700-1900's, I understand that if iron was used to fasten wood together, clinched nails were the preferred fastener and that shims and cans were used whenever possible for items that were meant to be taken apart. But there are some times that items were bolted, iron to wood and iron to iron. I'm interested in learning to make bolts and nuts. I have many books and have done a lot of research but I haven't found much on making nuts, just some ways to head bolts. I have a hand held bolt header, it really looks like it was designed to make carriage bolts, and I have an old threader with an adjustable screw in handle that changes spacing between cutting plates to cut the threads. I assume that a jamb plate was used before this tool. However, in my auction haunts I have not found an old tap. I do have a beautiful felloe saw (frame saw) that has hand made iron wing nuts on the ends of the blade. How was the nut shaped and threaded. Any ideas?
Walt

Reply from The forge:
I bought an anvil from a guy who built cannon carriages for old cannons, he made the nuts with 1 1/4" or 1 1/2 solid square stock, cutting it to the thickness he wanted, drill & tap to size. They looked like an old square nut.
Travis

Reply from The forge:
First came the bolt. This could be hand-filed by the smith, or in case of larger sizes, forged. Care was taken to get the spiral even. Later and more sophisticated smiths had a 'screw plate' that could be used to make the bolt. This was a plate with a number of holes that were threaded. In either case, the bolt came first. Then a nut was forged, and an approximate hole punched. The hot nut was screwed over the chilled bolt, forcing threads into the nut. The exact nature of the thread on the nut and bolt differed a lot in this way, usually so much that nuts were not interchangeable. At some point, taps began to be used. They were often shop made, and lacked standardization. They amounted to a bolt from hard steel with grooves cut to expose a cutting edge. This allowed nuts to be made to match the tap. Bolts could be made from a screw plate that was also threaded with the same taps, providing limited interchange ability, at least in the same shop. True standardization didn't begin until late in the industrial revolution. With the argument still raging between metric and inch systems, perhaps we still haven't finished standardizing!
Marrin T. Fleet

Question:
Getting that Green Look;
I have a customer that wants a candle holder out of black iron but with the look of aged (green) copper. Any idea of a way to do this? I do not want to use any paint. Thanks
John Elliott

Reply from The forge:
John,
At her demo two weeks ago, Dorothy Steigler finished a rose by brushing it while it was hot with a brass brush. It plated brass highlights on the tips and edges of the petals. It occurs to me that you could do the same with your candleholder and then use a copper brass patination product to get your green.
Andy Morrison

THE HAMMERS' BLOW
SPRING 1997
Echo's of the 'Ring'

Bending Fork And Wrench / Bucking Bar
Roy Bellows and George Holliday
Originally printed in the Spring, 1984 issue of The Anvil’s Ring. Vol.15, No.4

A grader blade is good material from which to make a bending fork and wrench. Two blanks are cut to about the final size (1/8” oversize), and annealed. The legs are formed by drilling a hole at the intersection of the legs and the body, and cutting the remaining ligament. The corners of the legs are filed round and smooth. The legs on the two ends of the fork should be of different sizes to accommodate different sized materials. The handle is forged to size after the jaw is formed. Francis [Whitaker] suggests making four forks and wrenches to accommodate a variety of material sizes.

Fork

2 1/2”

4”

1/2”

Bending Fork and Wrench blanks torch cut from a used grader blade.

Stock dimensions.

Wrench

Drill and saw.

File bottom square so the material fits the full depth of the fork.

Bucking Bar

5/16”

1/4”

3/16”

Tapered to fit into small spaces.

A piece of 1 1/4” tool steel or an old axle makes a good bucking bar. The end of the steel is tapered for about 4”. The taper is bent so the top of the bent section is at the main portion of the bar. Three round cupped holes are driven into the side of the taper. Francis suggested the holes be sized for 5/16”, 1/4” and 3/16” rivet heads using appropriate punches. A bucking bar can be made from mild steel. However, after forging, the bar should be heated to an orange and quenched.

1 1/4” stock, 36” long.

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Bucking Bar for backing up rivets in awkward places.
Motif:

Florentine Leaf

Stock: 1/2" square steel or bronze bar.
Tools: Hammer, anvil, medium fuller, chisel.

At a forging heat (bright yellow) set the bar at about a 30 degree angle against the anvil’s edge so that about 5/8" extends up above the surface as shown.

Hold the bar hard against the slightly radiused anvil’s edge (this prevents bounce and multiple shoulder impressions) and drive it onto that corner with a hammer. As the front 5/8” of the bar is driven down, raise the back of the bar until it is parallel with the face of the anvil. The shoulder should be about 2/3 of the bar thickness in depth.

Keep the hammer centered as shown to establish the shoulder.

Flip the bar 90 degrees and draw the shouldered stock out to a blunt point. This point, as well as the entire blank, needs to be left thick to accommodate later tool work. If it is too thin then the tooling caused displacement of metal and the refining steps are less dramatic.

Draw down the stem. If this area gets too thin, especially in relationship to the width of the leaf, scrolling this effect will be difficult since an overly thin stem would be weaker cold than the broader leaf section would be at forging heat.
**Motif:**

The finished blank form.

**Wear Your Safety Glasses**

Cross-forging, or ‘pull’ the leaf material out slightly. Do not get this too thin since the fuller must have material to displace or its effect is minimized.

Take the chisel, cold mark and then hot incise a line as shown. Maintain an even width line to within 1/8" of the tip of the leaf blank. Now draw that blunt, incised tip out further. The tip and the incised line will taper as it is drawn out. Be careful to strike the entire face and side of the tip as it is drawn out to keep from collapsing the incised line. The result will be a negative space, an incised line that tapers far more gracefully than it would be possible to chisel.

Mark the fuller layout cold with the fuller intended for the hot work. Drive the fuller in, stepping it sideways to widen the end of the fullered vein.

Form the finished leaf using a scrolling process. Since the leaf has widely varied cross-sections it is easiest to start to break it over the base of the anvil’s horn. Tighten the curve of the leaf by working towards the tip of the horn. Do not strike the tapered tip of the leaf, leave it straight.

After the desired curve is imparted into the leaf, flip it and scroll the tip in the opposite direction. Contrast is achieved by establishing dynamic and opposite curves. This contrast creates visual tension that conveys the energy of the motif far more effectively than when all aspects of the element flow in the same direction.

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THE HAMMERS’ BLOW
SPRING 1997
Apprentices' Notebook

Repousse' Tools
Lining Tools, Straight and Curved

The lining tool, a fine fuller, has a working-end that is just under 1/16" in diameter. As with many straight tools it is a good idea to make several widths with a common working-end radius. A straight tool can describe curves incrementally, depending on how wide the tool is, a step at a time. If a set of straight lining tools is made (for example in 3/16", 3/8" and 1/2" widths) with a common working-end radius, a wide range of curves can be described with them while they will also do straight lines.

Most importantly, since both the straight and curved versions of a tool set all have the same working-end radius, they will leave impressions in metal that have the same line weight.

Line weight refers to the width of the line a tool leaves, much the same as in calligraphy where the visual weight of the line is controlled by pen tip selection. Picture a line going from straight to various curves seamlessly while maintaining the same visual line effect. This approach to tool making allows moving from one tool to another according to the requirements of the design without leaving rough transitions between tools. It applies to incising chisels, fullers and any other tools that are used to leave a purposeful mark on metal.

In incising, chasing and chisel work the goal should be to do more than impart a line, it should be to control the width, depth and taper (terminus) of the tool effect so that every nuance of the design is achieved as conceived.

Dress the tool as shown with a file or sander and then polish them. Make sure the corners are rounded slightly as shown. This makes dragging the tool easier as it is struck. Dragging refers to the concept of keeping the tool in contact with the metal as it is moved down the pattern while being struck as opposed to lift/place/strike. The latter leaves more tool marks while dragging tends to give a smoother effect.

Forge a flat taper in a piece of tool steel to start either tool blank.

The blank is forged much like a thin slitting chisel.

Front view showing rounded corners.

Wear Your Safety Glasses

Forge, dress and form in a bottom swage.
Scroll Starter:
Stock: 1” X 1 1/2” Tool Steel

Butcher around the end of the 1” X 1 1/2” tool steel bar to start the tenon that will be sized for a hardy hole. This shank can also be vise mounted. How far up the bar the butcher work is laid out is based on the amount of material that the size of the hardy hole on a particular anvil takes to fill. A 1” square hardy hole compared to a 1 1/2” square hardy hole will take significantly different volumes of metal to fill.

Forge the tenon, it should be up to 2” long when done. When the tenon is getting close to the size of the hardy hole, begin to test fit it. When it is very close, drive it in hot to seat the shoulder as the sides are compressed those last few thousands of an inch. The tenon will shrink as it cools so take that into account and do not forge it down too far or it will not be stable in use. Once the tenon is seated, mark the bar about 2 1/2” above the tenon shoulder and cut it off of the parent stock.

Scroll Jig:
Stock: 3/8” X 1 1/4” X 18” Steel.
Tools: Hammer and anvil.

Forge a taper on one end of the bar as shown. Keep that end flared to one side and do not get too thin. As with the scroll starter, keep the end no thinner than 3/32”. By all means make sure that the two ends of these related and respective tools are the same in thickness and curve. Otherwise the scroll jig will not readily accommodate the product of the scroll starter.

Take a heat and forge a 90 degree bend in the bar end opposite the flared taper as shown. Then, at about 2” below that corner, bend the bar back on itself. This gives enough mass to fit a hardy hole and it will also seat in a vise. Draw this bent corner material down as needed to fit the hardy hole of choice.

Forge a scroll on the flared end with the flare oriented as shown relative to the corner bend at the opposite end of the bar.

Why flare the scroll jig stock to one side? The jig must be able to ‘catch’ the started scroll material. The material that sticks up out of the center of the jig (that is the result of flaring it to one side) allows the user to catch and lock a scroll blank fresh off of the scroll starter, for example, further into the center of the form than would be possible if all of the jig were at a single height.
Product: Patinas and related materials.
Manufacturer: EPI (Electrochemical Products, inc.)
Contact: John Cherney (Sales Representative) 216-967-7677

Product: E-Kleen
Like all of the EPI products in this review, it came with a detailed technical data sheet (instructions) and a material safety data sheet. It is described as an “acidic, solvent metal cleaner and mild aluminum etchant.” E-Kleen is made to remove light oil, light rust, light heat treat scale and most “shop soils”. I used it to clean one set of naval bronze test pieces for the patina trials. It worked well, even when diluted 50% with water. As expected, the diluted solution was slower. I did not treat it as an aluminum etchant.
The naval bronze test samples were cleaned according to the instructions. They were clean in a matter of minutes. They were then rinsed and dried, using care not to touch the area to be patinaed later. E-Kleen worked well and is comparable to other ‘pickles’ in both speed and ease of use.
Product rating: 3

Product: INSTA-BLAK S-334
It is described as a “room temperature swab-on / touch-up black finish for iron and steel. “
I prepared a sample of mild steel bar stock by sanding off the mill scale. INSTA-BLAK is intended for bare metal, as in cold rolled or descaled mild steel.. The bright silver of polished steel turned to a dark charcoal gray, then to jet black rapidly as I swabbed the INSTA-BLAK on. Degreasing and rust removal is required prior to use.
The speed with which it works can be slowed by diluting the product with water as per the instructions. The “depth of blackness” and corrosion resistance is enhanced by sealing the blackened metal with one of EPI’s 500-Series finishes or a comparable clear acrylic lacquer.
Product rating: 3
Product Review

Product: B/OX 324

It is described as a “room temperature blackening / antiquing swab-on finish for Brass, Bronze, Muntz Metals and Copper. It produces colors from light brown through brown to black.

As stated in the E-Kleen review, a sample piece of naval bronze was chemically cleaned for this test. Another piece of naval bronze was hand cleaned with a fine (dark red) Scotch Brite (3M) pad by hand. This ‘grit’ leaves fine striations. In effect, it roughs-up the surface. Both test pieces took the patina well. The literature says that the surface may also be cleaned prior to patina with alcohol or a liquid detergent, do not use petroleum based solvents.

Application is swab-on, but B/OX 311, which gives comparable results is intended for dip applications. Q-tips were used for the test, though brushes or a sponge can be used. The B/OX 324 works fast at full strength, so fast that control of the shades is easier with a diluted solution. As with any colorant, some tests and a little practice are needed to get the desired results. Applying the patina, allowing it to dry followed by buffing with a finer (white) Scotch Brite to lighten and high-light the color gives a nice effect and allows more control.

Product rating: 3

Product: B/OX 316-A

It is described as a “room temperature oxidizing solution used to produce antique Verdi-Green finishes on Copper, Brass and Bronze surfaces”.

There are two way to use B/OX 316-A. One is over a ‘primer’ coat of either B/OX 324 or B/OX 31, the other is to use B/OX 316A directly on bare metal. Both a B/OX 324 and a bare metal test were performed.

The two test strips were prepared in the same manner described in the B/OXZ 324 test, one chemical and one abrasive cleaning respectively. As with B/OX 324, B/OX 316A can be diluted to control intensity and speed of coloration. Application can be dip or pump spray bottle, dip was used for this test.

This patina acts in a wholly different manner than the browning and blackening agents reviewed above. It is slower and the color result is not very apparent until the piece has dried. Tests are needed to determine the length of time as well as the solution strength required to achieve the green you want, but you do get some nice shades of green.

Also unlike the B/OX 324, the coloration from B/OX 316A is somewhat fragile until it is sealed with a lacquer. If used over the undercoat of B/OX 324 (or 311) it is less fragile but it still requires a clear coat to retain and protect the coloration. There was a distinct color difference between the undercoated bronze and the bare bronze even though they were on the same piece of metal and were subjected to the same conditions of testing. I was pleased with the colors and the relative ease of achieving a range of greens.

Product rating: 3

Summary: I found all the EPi products tested to be very good. They acted as described in the Technical Data sheets. In all cases I had to play with time and dilution variables to both get the desired result and to get a feel for how this series of patinas worked. This is no different than with any new product. The pricing is favorable when compared to other, similar products and both price sheets and complete literature is available through the company representatives.
The Scroll

The first step in forming a scroll is to forge the end of the stock into whatever prep shape you want to use. In most cases this includes forging a taper on the bar. The length of the taper has a big impact on how graceful the scroll will appear. The taper and the ever-smaller inward turn of the scroll relate visually. Too little taper and the scroll will appear awkward. So start far enough back to give the taper a long transition.

Once the stock is tapered take a forging heat and extend the taper out into space over the anvil's edge by about 1/4". Begin to break the tapered bar in short increments as it is progressively extended past the anvil's edge. Keep the hammer blows light. As the curve of the scroll develops increase the length of each increment to create the ever increasing diameter of the scroll. If the bar kinks or the progression seems awkward, either flatten it slightly or open the kinked area with a bending fork and/or wrench.

The angle of the hammer blow controls the curvature and progression of the scroll. No matter how detailed the written explanation, there is no substitute for trial and error and correction when learning a process. Using scroll templates to visually compare the progressing scroll to helps.

Working with light, repetitive hammer strokes cannot be over-emphasized. Like drawing a curve with a series of dots, each hammer stroke breaks the flat plane of the bar locally into a continuous curve. To few hammer strokes will give a faceted scroll with each bend appearing as a kink. The same error can be caused by hammer strokes that are too hard.

To tighten or adjust a part of a scroll that is too difficult to reach with a hammer it works well to back-up the part to be adjusted with the anvil while striking the opposite side of the scroll.

Scroll Jig set into wood stump, circa 1700.
This scroll template can be traced or photocopied then sized for use as a layout pattern.

Half-penny scroll.

Scroll Jigs (pgs9, 13): Samuel Yellin Tool Collection. This concentric, stacked form allowed a tight scroll to be wrapped, removed, then compressed flat while still hot. Photographed with a grant from The Francis Whitaker Blacksmith Educational Fund, photography by Jenifer Costa, collection owned by George Dixon.
Scroll Templates

These scroll templates, and the one on the previous page, can be traced or photocopied and sized to fit your design requirements. They can also be used to compare a master scroll forging against before it is welded to a plate in making a scroll jig.

To transfer these patterns onto a sheet of steel, first copy and size. Then rub soft chalk powder onto the back of the scroll pattern paper and lay it face up - chalk side down onto a sheet of steel. If the steel version is to be just a comparative ‘chalk jig plate’, one that is used to check free-hand scrolls against during the forging process, 1/8” to 1/4” thick steel is sufficient. However, if the steel plate is to form the base of a hot-work scroll jig then it should be a minimum of 3/8” thick. This type of scroll jig has the master scroll form welded to it.

Never quench your jig plates or scroll jigs, let them air cool. If they are quenched hot, they will soon warp and become useless.

There are enough situations that require short runs or require scroll-like endings, on leaves for example, that it is important to learn to scroll metal freehand and by eye before you become dependent on jigs. A freehand scroll can also become the comparative ‘visual jig’ for a subsequent short run just by doing each of the run in sequential stages that are held against the first, or master scroll as they are formed and adjusted. This skill will save a lot of time when a large number of parts is not required and thus a jig would not be cost efficient.

Elliptical

Round

The two basic scroll types.
Simple Leaf

Stock: 1/2" round steel or bronze.
Tools: Hammer, anvil, tear-drop punch, chisel, top and bottom fuller.

Take a forging heat (orange to orange-yellow) on one end of the stock. Forge a blunt point. The longer and thinner you forge that point the more narrow the leaf will appear. As with all blank forms, leave this one thick.

Fuller in the shoulder of the leaf blank. Either use a top and bottom fuller or a spring fuller and rotate the stock as you set the shoulder. Do not get the fullered area, which will become the stem, too thin at this point. If it is too thin too soon, it is liable to break off during the forging and decorating cycles that are to follow. When all of the leaf-work is done, the thick stem will be forged down and refined into a graceful stem.

Cross-peen and spread the leaf blank. Take it down some and then flip and finish spreading it. This approach helps keep the forging symmetrical. Use the rounded edge of the hammer face to develop a ridge down the center of the leaf blank. Again, keep the leaf blank thick (3/32" to 1/8" at the side edges) to allow for sinking the tear-drop punch.

Refine the shape on edge using the horn of the anvil and a well configured hammer face. The hammer face should be slightly crowned in the center with a seamless transition from face to side.

Layout the leaf blank, cold, with the tear-drop punch. Use the tapered leading edge (toe) of the tear-drop punch on up to the entire tool, depending on the size of the leaf blank and the desired effect. Angle the layout towards the stem.

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Simple Leaf

At a forging heat, sink the tear-drop punch into the layout marks on the leaf blank. Since the tool is the same for layout and hot work, it will ‘feel’ the layout positively even when the blank is too bright to see the layout.

Set the toe of the tear-drop punch down into the hot metal first. As it is struck with steady and moderate strokes, rock it back onto its heel. This will push the metal under the tear-drop punch both down and out towards the back of the tool (heel) and thus outward from the edge of the leaf. This gives the finished leaf a scalloped silhouette and more visual interest.

Another surface effect can be achieved by using the chisel to incise a line between each tear-drop impression. This chisel cut will contrast and enhance the tear-drop effects.

Lastly, take a heat and place the leaf, face side down, onto a block of hardwood. Set a ball-end tool centered on it and drive the tool down, cupping the body of the leaf. The hardwood gives under the tool pressure while it, being softer than hot chased metal, protects the surface work in a manner that a metal form can not. As the final effect on the leaf, extend the tip past the edge of the wood block and lightly hammer, scroll, the leaf’s tip back over the leaf’s face.

When the leaf is done it is time to draw out thin, the stem. Do so with care to avoid marring the shoulder of the finished leaf.
Hot Repoussé’

Hot repoussé’ is a process that was a logical outgrowth of a final step often used in chased forge-work. In that case volume is imparted into a flat, chased effect. The work is placed face down at an orange heat onto a hardwood block and driven from behind with ball tools. This domes the piece as the hardwood supports all but the area being driven down which burns out the wood under the tool driven hot metal.

The hot repoussé’ example will be the rosette shown on the cover. The stock is 16 gauge (16g) mild steel. The tooling is a variety of ball-end tools, lining tools (fine fullers) and a block of oak. While end-grain birch is often used in traditional cold repoussé’ layout, this process calls for a harder wood that is used cross-grain. No preparatory shapes are carved into the wood. The hot metal will sink into the wood under the pressure of the various tools.

To begin, glue a paper pattern onto the 16g steel. In this example the piece is cut out of a sheet, another approach is to work inside the bounds of the sheet metal. Make a layout pass around the perimeter with a chisel. Layout the internal lines with lining tools like the ones described in the Apprentices Notebook section of this issue.

Keep the lining tool layout light. There will be multiple passes down those layout lines and if they are too deep in the layout cracks may occur during the repousse’ and chasing cycles. This also relates to why the repousse’ layout should be done with fine fullers, which leave a ‘U’ shaped depression, instead of chisels which leave a ‘V’ shaped depression. The ‘U’ will flex as the metal moves while the ‘V’ will develop into a crack. Finish cutting the rosette blank out with the chisel.

Cycle Set 1:

Take a heat and place the blank face down onto the wood block. Take a large ball-end tool and drive the hot blank into the wood, working the center more than the edges to develop the dome. If a ball peen hammer is used for the first doming passes, it should be used as a set hammer.
Hot Repousse’

Take another heat on the now domed rosette and place the rosette layout (face) side up. The edges of the domed piece will dig into the wood surface as the chasing begins which helps to keep it from flattening during this part of the process. Use the same lining tools from the layout, begin to chase (drive) down the dome along those layout lines. Be careful to fit the lining tools exactly into the layout lines to prevent double impressions. Repeated heats may be needed.

Drive the lining tools progressively along the layout lines. Be sure the area being chased is hot and develop the effect. It is the localized ‘weakness’ that heat (orange to orange-yellow) supplies which allows the chased effect to develop. This first cycle of chasing may appear to undo the dome as it is chased. So if the chased effect is too ill-defined, either work more gently and/or use a more local heat. A torch works well, especially on small, thin blanks that lose heat rapidly. At the end of the first cycle the chasing will have induced a series of ridges through to the back of the piece. They may appear minimal, but that is what the first cycle generates, a guide for all subsequent passes.

Cycle Set 2:
Take another heat on the rosette. Place it face down onto the wood and begin to drive the smaller ball tools (1/2” round for example) down between the ridges that the previous chasing passes created. This domes the piece again, but in sections. When each of these sections, defined by the chased ridges, have been developed, move to yet another chasing pass. Heat and flip the rosette dome-up and use the lining tools again as chasing tools. Drive the incised layout lines down, further defining the repousse’.

The final effect is a function of how many cycles you choose to use. Experience (AKA: trial and error) will guide this and to a degree it is a matter of design decision as to when any motif is ‘fully’ developed. The piece shown in the center of the Grille Test Panel on the cover has a threaded rod (3/16” diameter) silver soldered to the back for attachment.
Help Wanted

Wanted: Technology Education (Industrial Arts) high school instructor with a strong metals background. Art Blacksmithing and welding are well-established school traditions and are appreciated by the community. To see more, check our web page http://www.Hindmade.com/Maine.htm Applicants should have high school teaching credentials. For more information call Keith A. Leavitt, Winthrop High School, Winthrop, Maine 04364, 207-377-2228 days, 207- 685-4569 evenings, FAX 207-377-9350, leavitt@iname.net.

Blacksmith wanted: The Miracle of America Museum (a 501-C-3 non-profit corporation) is looking for a blacksmith to support him/her self with their work while exhibiting the trade to the public at the museum. The shop is well equipped. Contact: Miracle of America Museum, 406-883-6804

Notices

The ABANA Internet Address is: http://wuarchive.wustl.edu/arts/blacksmithing/ABANA/
or http://sunsite.unc.edu/abana/

ABANA Board Elections A call for Board nominations. It's time again to send in nominations for the ABANA Board of Directors. Nominees shall submit an endorsement containing at least 10 signatures of ABANA members in good standing. Nominees should also submit a resume and photograph with their petition. This information must be postmarked no later than July 15, 1997. Mail it to: ABANA P.O. Box 206, Washington, MO 63090. Call or Fax: 314-390-2133.

The ABANA Travelling Teaching Station is now available. It contains 10 forges, 5 anvils several post vices as well as fire tending and hand tools.

Any ABANA Chapter may schedule this trailer for their Chapter hammer-in or workshop. For details contact: Lou Mueller, 314-225-3252
Conferences & Events

Chapter and Regional Conferences can have their Conference Logo here. All it takes is to send a clear copy of that logo, with a description of the event to the Editor, address shown on page 2 of this publication. Pay attention to the dates listed on that page to be sure of a timely submission. This space will be filled on a first come basis.

Upper Midwest Blacksmiths Association
Spring Conference  May 17 - 18, 1997
Edel Museum, Haverhill, IA

California Blacksmiths Association
Spring Conference  May 15 - 18, 1997
Italian Picnic Grounds, Jackson, CA
Andy Cobb, Beau Hickory, Steve Joslyn, Pete Marron and Dave Reis

Mississippi Forge Council
Annual Conference  May 23 - 25, 1997
Mississippi Agriculture and Forestry Museum
Lakeland Drive, Jackson, MS
Wendel Broussard and George Dixon

Indiana Blacksmithing Association
Annual June Conference  June 7 - 8, 1997
Tipton 4H Fairgrounds, Tipton, IN
Bill Callaway, Paul Hubler, James Rubley

Illinois Valley Blacksmiths Association
June Conference  June 14 - 15, 1997
Thresherman Reunion Grounds, Pontiac, IL

Caniron 1 Biennial Canadian Blacksmith's Conference. It is being held June 28-30, 1997 at the historic O'Keefe Ranch in the Okanagan Valley of British Columbia, Canada. There will be six demonstrations and four teaching sessions per day. CANIRON 1, 681 Caleb Pike Rd. RR#6, Victoria, BC, V9E 1G9, Canada.

Alabama Forge Council
Annual Conference  August 5-7, 1997
Tannehill, AL
Joe Anderson, Tom Clark, George Dixon

Upper Midwest Blacksmiths Association
Summer Conference  August 9 - 10, 1997
Baraboo, WI
Joe Anderson

Rocky Mountain Smiths
1997 Conference  August 13 - 17, 1997
Carbondale, CO
Bob Bergman, George Dixon, Dan Nauman, Dorothy Stiegler and Francis Whitaker

Southern Ohio Forge & Anvil
Quad State 97  September 26 - 28, 1997
Miami County Fair Grounds, Troy, Ohio
Mike Bendele, Bill Fiorini, Derek Glaser, Dorothy Stiegler, Brad Weber

Louisiana Metallsmiths Association
Banging on the Bayou IV  October 4 - 5, 1997
Covington, LA

First Biennial Upper Midwest Blacksmith Conference  October 11 - 12, 1997
Thresherman Reunion Grounds, Pontiac, IL
George Dixon, Peter Renzetti, David Stasiak

Florida Artist Blacksmith Association
Annual Conference  October 11 - 12, 1997
Pioneer Art Settlement, Barberville, FL

Appalachian Blacksmiths Association
Fall Conference  October 11 - 12, 1997
Cedar Lakes State Park, Ripley, WV

To join The Artist-Blacksmith's Association of North America, and get The Anvil's Ring and The Hammers' Blow, call 314-390-2133.

THE HAMMERS' BLOW
SPRING 1997