Phili[

On the Anvil

October 13, 2010

The last meeting for the Philip Simmons Blacksmith Artist Guild was held at Jeff Hatfield's shop on October 9, 2010. The meeting was hosted by Jeff and Tammie. I would like to thank them for all that they do. The wives, that is, they have to do a lot of work when us guys host a meeting. So, lets not ever forget that.

I was told that Mark Aspery did a great demo and we had pretty good iron in hat , I'm .sorry had to miss it

Well it's that time again, election time is coming in February. My time as president is up. We also need to elect a new Vice President, if Meck decides not to run and two Board members. John Outlaw and Jesse Barfield's terms are up. Jesse wants to remain on the ballot for the next time. John has not yet decided. Send in your nominations or give them to a Board member at the December meeting. We will have a ballot in the next newsletter.

I would like to thank ever one for there support and friendship over last two years. I think we have done a lot of positive things thanks to the hard work of lot good folks. And special thanks to Meck, Ray, Barry, Jeff, Jesse, John and Mike for all of there help and input.

I hope to see you on December 11th in Sumter . The meeting is at my place.

Adrian Parks is our webmeister, if have any photos of projects or pieces you have done, send him your images and information so the gallery can be updated. His contact information is glowmaster@gmail.com.

Sincerely, Michael Tucker

Iron in the Hat

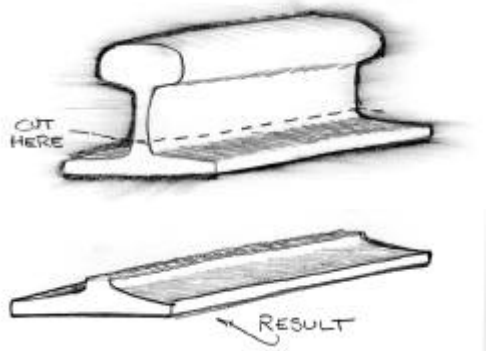
Item	Donated By	Won By
Bush Hog Blades	In memory of Jimmy Suggs	Toby Tarver
Drill Rod	In memory of Jimmy Suggs	Jeff Lindsay
Chain Saw Damascus Knife Kit	In memory of Jimmy Suggs	Lauren Hatfield
Insulators	In memory of Jimmy Suggs	Pam Etheridge
Horse Shoe Hummingbird	Barry Myers	Larry Wilds
Shelf Brackets	In memory of Jimmy Suggs	Linda Creek
Roller Chain	In memory of Jimmy Suggs	Toby Tarver
Machinist Vise	Larry Wiles	Johnny Marks
OxyAcetylene Hoses	Larry Wiles	John Tanner
Caulk Gun and Caulk	In memory of Jimmy Suggs	Barry Myers
Wire Cable	In memory of Jimmy Suggs	Bill Burgess
RR Spikes	In memory of Jimmy Suggs	Bill Burgess
Coil Springs from '54 Buick	Johnny Marks	Bob Kaltenbach
Tomahawk with hand made handle	Tony Etheridge	Michael Bodman
Bowl Form	In memory of Jimmy Suggs	Pam Campbell
Leaf Key Fob that looked like brass	Ray Pearre	Martha Marks
Squirrel Cage Blower	Bill Burgess	Toby Tarver
Multimeter	Bill Burgess	Ken Payne
Explosion Damascus Knife with Buffalo Nickel Tooled Sheath	Meck Hartfield	Bob Kaltenbach
Iron Basket with Welding Rod Carrier	Jeff Hatfield	Jamie Stevens
Steel Blades and Air Reducer	Jeff Hatfield	Jeff Lindsay
Monkey Wrench	Jim Bausman	Ray Pearre
Non-Wizard Bottle Opener	Jim Bausman	Jesse Barfield
Horse Head Letter Opener	Jerry Fowler	Linda Creek
Demo Wizard Head Bottle Opener	Mark Aspery	Pam Campbell
Another Demo Wizard Head Bottle Opener!	Mark Aspery	Pam Campbell
Pipe Wrench	Jody Durham	Jamie Stevens
Horseshoe Rasps	Cary Epps	Bob Kaltenbach
Horseshoe Rasps	Cary Epps	Jeff Hatfield
Harness Hook	Jesse Barfield	Michael Bodman
Mark Aspery-Style Chisel	Jesse Barfield	Jeff Hatfield
Horse Head Hook	Bill Creek	John Tanner
Welding Gloves	Donald Shively	Jesse Barfield
Welding Helmet, Goggles and Lenses	Pete, the heavy equipment operator	Bill Burgess
Knife and Sheath	Gary Miller	Meck Hartfield because he didn't have any knives
Draw Knife in need of handles and sharpening	John Tanner	Jeff Lindsay
Letter Opener with brassy top	Jamie Stevens	Really-lucky-today-Bill Burgess
Mark Aspery-Style Chisel	Mark Aspery	Pam Campbell
Bag o' picks	The Unknown Blacksmith	Johnny Marks

Thank you one and all for coming and supporting our Guild to such a high degree! We made $519 for the Guild scholarship funds. Thanks.

Railroad Rail Tooling

By Steve Howell
Ballard Forge, Seattle, Washington

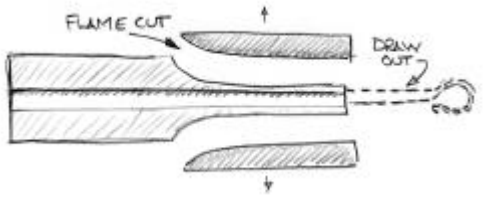
Here are a couple of very useful tools made from scrap railroad rail. Railroad rail is commonly in the 1080 range, and there are different sizes and grades… line rail, yard rail, smaller-sized trolley rail… all will work for these projects. *If you've got a long piece, you can cut it the way the pros do… burn through the thick part of the rail with a torch, and then blast it with a heavy, two-handed sledge hammer. Gandy-dancer chants are optional-Ed.*

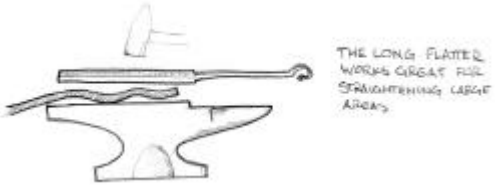


Flatter

Torch cut just above the high point on the base of the rail. Grind the rib until you get a softer, rounded profile. Radius the corners on all sides.

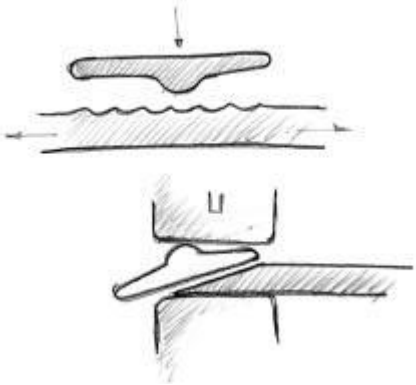
I have two of these flatters. One is about 10" long, the other about 6". One has a handle forged from the material itself. The





majority of the handle was cut with a torch, the final drawingout was done on a power hammer. The other has a 3/8" round handle arc-welded on. The long flatter is used to straighten long bars.

The short flatter is great for power hammer work in the traditional manner. Upside down, it can be used for spreading and fullering; used normally it's useful for finishing, smoothing hammer



hammer marks, and cleaning up tapers. If you can find it, a smaller trolley rail would be a good size to use for this flatter.

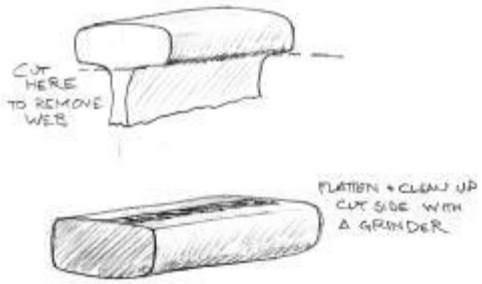
Heat Treating

I usually heat to non-magnetic and normalize by cooling slowly in ashes or vermiculite, or I'll water-quench at a non-magnetic heat and go for a pretty high temper… like five or six hundred degrees… enough to get a file to bite. Regardless, these tools should never be glass hard. Always check with a file. If a file slips off the tool without biting, it's too hard to use, and you risk injury from a shattered tool, so be careful!

For welding handles, pre-heat to a dull red and use MIG, 7018, or stainless rod. Normalize the weld area on the tool to relieve stress and ensure the longevity of the handle.

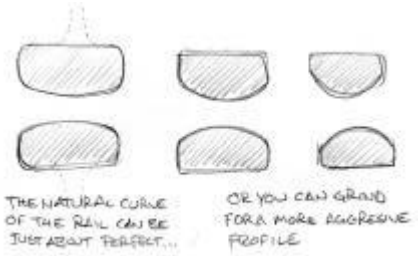
Spring Swages

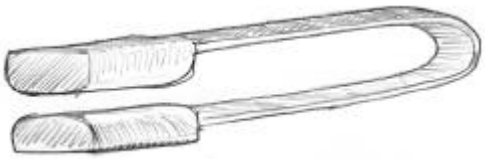
Once you've made a flatter or two, the top section of the rail can be used to make some spring swages. Torch cut just below the cap to get a profile.

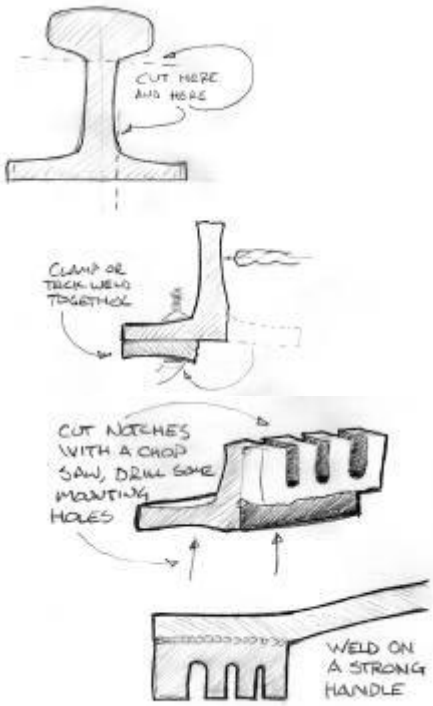


Clean up the flat side with a grinder, chop the steel into chunks and match pairs. Fine-tune the radius to your preference. I like a profile that has a small flat section in the center of the die, then gradually drops off for a "soft" edge. A more aggressive pair that are crowned more like arcs of a circle might be useful. And the natural curve in the cap rail is often just about perfect.

Arc weld to flat stock for the spring, and remember to pre- and post-heat the weld area.







Twist Shear

One other tool that would be useful to make was shown years ago in The Blacksmith's Journal. *It could be handy for hacking off rough lengths of flat stock. It requires a torch and a chop saw to make. Burn the top off about six or eight inches of rail. Set the cap aside for spring swages, and cut one of the sides off of the resulting "T" shape. You're left with a L-shaped piece of steel six inches long, and a six-inch piece of bar.*

Anneal the L-shape, and drill three holes to mount. Cut some slots opposite the mounting holes. A 1/8", 1/4", and 3/8" slot would do. Cut matching slots in the flat piece. It would probably be easiest to tack weld the two pieces together and cut the slots at the same time. Separate the two pieces and weld a good, substantial handle onto the flat piece. Weld carefully, with pre-heating and post-heating. A weld failure at the handle would likely cause an injury with this tool. Harden in oil, and I'd temper to about 500 degrees to be on the safe side.

To use, bolt the L-shaped piece to a stout bench and lay a piece of flat bar in the tightest slot. Lay the handled piece flush against the stationary cutter, with the stock in the appropriate slot. Use the handled piece to twist off the stock.- Editor

Reprinted with permission from ABANA's Hammer's Blow, Winter 2005

At the ABANA Conference in Memphis, Brian Brazeal had the stationary portion of this tool mounted to his forge table, shown below:

TOOLMAKING

Basic Heat-Treating for Smiths

By Scott Lankton

There are many alloys, or "recipes" for steels today. They are designed for specific uses in manufacturing.

Smiths often make good tools from junkyard steels for which the exact formula and corresponding heat treatment procedure is not known. However, some basic guidelines will usually work to get serviceable tools for a variety of applications. The most influential and common element in modern steels is carbon (after iron, of course.) The amount of carbon primarily determines the hardenabilty of most steel. Other elements in the mix also affect the characteristics of the hardening process, but I am going to ignore this and many other important things so that this doesn't become a book. There are many good books on the subject.

The amount of carbon in steel varies but is usually between 0.05% and 2.5%. Steel with a low carbon (such as 0.10%) is written as 1010. Steel with 0.45% carbon is called 1045, and is medium carbon. A file typically has about 1% and is high carbon. Carbon is dissolved in iron in the same way that salt dissolves in water. It will only hold so much. For general smithing tool purposes steels with 1% or more carbon may be too brittle for striking tools. Cast iron may have 2.5% carbon. Wrought iron has very little. The bottom line is, more carbon, more hardenabilty…up to a point.

Forget all of the above; you may not really need it. It's just interesting. To make a tool, let's say a chisel, find yourself a coil spring (do not take one off of your neighbor's car, unless he has already rolled it up on one side). Straighten out a section, forge it to the desired shape, then take a medium-red heat (1550F), and let it air cool. This is called "normalizing" and it has relaxed the grain, made it smaller, more uniform, and removed some of the stresses from the forging. It is an important and often overlooked step in heat-treating.

Normalizing is similar to "annealing;" the difference is that normalizing is air-cooled. When annealing, the steel is brought up to the same red (1550ºF average) and cooled as slowly as possible in insulation such as vermiculite, mica, or ceramic fiber. This renders the steel as soft as it gets. When it is cool, grind or file to shape as needed, do not get it real hot.

The next step is "hardening." The steel is brought up to the same red heat as before and quenched in something. More on that shortly. This red heat I keep harping on is something called "critical temperature." It is the point at which the steel shifts its crystalline structure from one "phase" to the other. To find the critical temperature, one can use a small magnet on a wire.

SLOWLY heat a sample of the steel, checking it for "stick" with the magnet as you go. When it loses its stick (non-magnetic) you have reached critical temp for that alloy of steel. Memorize that color. This must be done on a "rising heat" because

A coil spring can yield enough steel for dozens of tools

the steel remains non-magnetic for a while as it falls below critical temp. This temperature is (slightly) different for each alloy of steel.

Back to the "quench." Common quench media are: air, (for airhardening steel), water (for water-hardening steel), oil, (for oilhardening...). There are also a variety of brine solutions and formulas such as "superquench" for hardening low carbon (mild) steels. Superquench is the fastest cooling, followed by brine, cold water, warm water, cold oil, warm oil, and air. Bottom line, the faster steel cools, the harder it gets.

For most small tools, oil (such as transmission oil) is a best choice, though caution should be used to avoid fires. Back to the chisel. Heat an inch or two of it to just above critical temp and quench completely in oil. It should be hard (and also brittle). Now it MUST be tempered immediately or it may crack.

The word tempering is often misused. Tempering is heating the steel to between 250F and 750F (this is a generalization). What this operation does is greatly relieve the stresses caused by hardening as well as slightly reducing the hardness from the quenching. For a chisel, removing the oil may do this, then sanding the tool (so the colors can be seen) and using a torch to heat SLOWLY above the hardened area and letting the "temper colors" (blue, purple, brown, straw, light yellow) conduct down towards the business end. For a chisel I like to stop the color (by quenching) so that the cutting edge is brown to purple (500F- 550F). This step may (should) be repeated to insure a good average temper. This is called "double or triple drawing." If you overheat the tool now, thus making it too soft, you must start over with the normalizing step.

For more on this I recommend Jack Andrews' New Edge of the Anvil (published by Skipjack Press, www.bookmasters.com/skipjack/), Alexander Weyger's books (All three have been republished by Ten Speed press as The Complete Modern Blacksmith…

a bargain at $20), or Alex Bealer's Book, The Art of Blacksmithing. All these books are available from Norm Larson Books, 800/743 4766, larbooks@impulse.net

Four things affect how hard steel gets:
One–The alloy mix, especially the amount of carbon.
Two–Temperature at quenching.
Three–Speed of quenching, (medium)
Four– Tempering heat.

SUMMARY.

1. Forge to shape.
2. Heat to critical temperature. (medium red), and normalize (Let air cool).
3. Grind or file.
4. Heat to just above critical temperature (magnetic) and quench (usually in oil for most small tools) FIRE DANGER, AND DO NOT INHALE SMOKE!
5. Lightly sand and heat to draw temper, repeat sanding and tempering if you wish.
6. Test it and modify as needed.
7. Learn by doing.
8. Attend your local chapter meetings and the ABANA conference
in Richmond, Kentucky, July 7-11, 2004.

Remember, some smiths learn by reading, some by watching, and many of us just have to pee on the electric fence for ourselves. Be careful out there.

Making Superquench

This formula was developed by Robb Gunter. He wasn't allowed to use a lye quench (10% NaOH dissolved in water is a typical solution) while at Sandia National Labs because of toxicity issues—it's poisonous, reactive, should not be inhaled, damaging to skin and eyes, etc. This solution yields nearly the same hardness, yet uses no toxic substances…it's basically a combination of soap, salt, and water.

Here's the formula:

5 gallons water
24 oz concentrated Dawn dish soap (formerly 32 oz.)
5 lbs table salt
8 oz Shaklee Basic I wetting agent

Heat A36 to 1550ºf (cherry red but below an orange). Quench in Superquench. Rinse in clear water. A chisel treated this way is reported to hold an edge long enough to cut through the parent stock six or seven times while still holding its basic shape.
While Superquench doesn't magically turn mild steel into tool steel, it is really useful stuff. It makes good hot-work and short-run tools. Medium-carbon steel can get very hard with it, up to 62 points Rockwell C. It's too severe to use with anything containing 55 points of carbon or higher, and you'll see lots of cracks and part failures.

Reprinted from the Hammer's Blow, Winter 2004

There has been a discussion about metal finishes on the ABANA "The Forge" email site. One of the old favorite finishes that we haven't put in the newsletter for a while is Doug Merkel's. Doug is an NCABANA member from Hickory and here is his formula for his metal treating solution:

1 Cup Johnson's Paste Wax
1 Cup Boiled Linseed Oil
1 Cup Turpentine
1/2 Cup shaved pieces of Beeswax
2 Tablespoons Japan Dryer

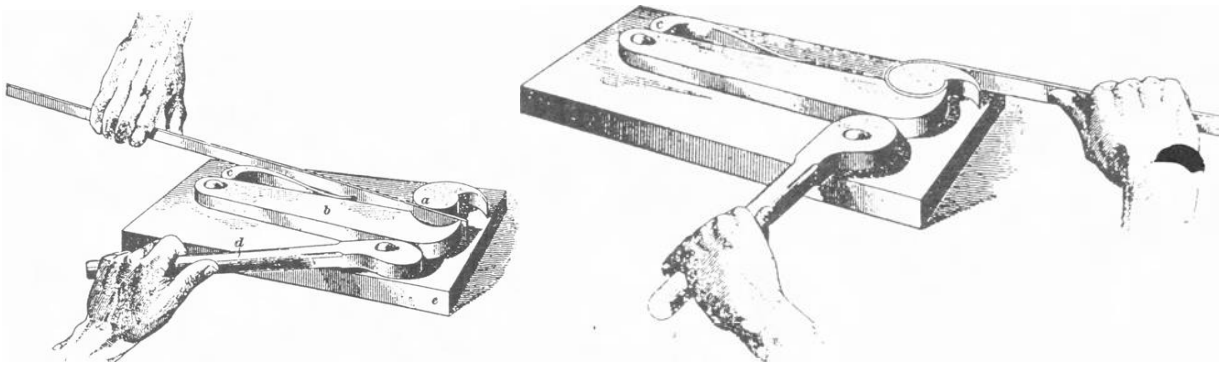
Clay Spencer has made a booklet on his tools for the Tire hammer. its pretty good at explaining each one he uses as well.http://www.alaforge.org/Tools.html It is FREE! But, it is about 16 pages. Download it yourself!

For those of you who are still not ABANA members, this quarter's *Anvil's Ring* and *Hammer's Blow* touted some of our members! Howard McCall's shop was featured in both - his shop in the Anvil's Ring and his new Tom Latane' Clemson Tiger door knocker in the Hammer's Blow. Remember a few years ago when Howard hosted a meeting in his shop. I wasn't there, but I saw all the pictures and drooled over them.

Danny Ard's stained glass anvil was shown in the Anvil's Ring coverage of the Memphis Convention. It was a big hit at the auction and brought as much money as Mike's snake and my betty lamp.

Also, John Tanner is running for the ABANA Board. His letter of campaign is in the Anvil's Ring. Read it and consider voting for John. I don't think we have ever had a PSABG member run for the Board.

Barry



Interesting scroll bender reprinted with permission from the BLACKSMITHS ASSOCIATION OF WESTERN AUSTRALIA

For Sale

Fire Bricks – Brand New, Industrial Grade. $1 ea. Ed Sylvester
803.414.2487 803.796.3749

127 pound Peter Wright Anvil, Chip in face on side $325 Barry Myers

Iron City post vise 90 pounds, jaws are 5 3/4 in. comes with stand
price $225.00 Mike Tucker

Chain Saw Damascus

By Carson Sams

Reprinted from Irons in the Fire, Newsletter of the Central Virginia Blacksmiths Guild, March-April-May 2009

Several people at the Pasture Party asked me about forging chain saw chain and how it is done. So I have put together a few steps. I hope this helps and does not confuse anyone.

1. I cut the chain saw chain into 4-inch pieces
2. I stack four 4-inch pieces on top of each other and electric weld the ends and spot weld in the middle to keep the chain from moving. I now call this a var.
3. I weld a handle onto the bar, I use rebar.
4. I place the bar in warm Muriatic acid for about 20 minutes.
5. Caution when using the Muriatic acid, it is very dangerous. Make sure to read the instructions in case of a spill or getting the acid on you. Make sure you have plenty of baking soda around for neutralizing and you wear the proper safety equipment: gloves, apron and goggles are a must.
6. I warm the acid by placing a piece of hot steel into the acid, before I place the bar into it. Warmer acid works faster than cold acid.
7. Take the bar out of the acid and into the quench tank. I use a fine stainless steel brush. One like you would use for stripping paint, not the big stiff scale brushes to clean the bar with water. The water will flush out the remaining pieces of scale and dirty and debris from the chain.
8. At this point, the forge must be ready to go. The bar will rust quickly.
9. I use code or charcoal for my fuel, green coal will not work.
10. Place the bar on top of the coke and rake coke onto the bar. With a slow heat, bring the bar up to a black heat, right to cherry.
11. Pull the bar and flux. I use anhydrous borax flux; I buy it off EBay, from the Wagonman. If you flux too soon the flux will not stick; if you flux too late scale will have started to form.
12. Put the bar back into the fire and bring the bar up to a good orange heat. Pull from the fire and clean the bar with your brush and reflux. Some people think this is a wasteful step, but it is very important to make sure the chain is clean. There are a lot of crevices in the chain; the flux will help clean them.
13. Put the bar back into the fire and bring up to a welding heat.
14. In the meantime, I put water on my anvil. Yes, water, when the hot steel touches the water, the water turns to steam. Steam expands very quickly and with a lot of force. If you trap this energy it will explode and taking with it any scale on your bar. This is called Spit Fire.
15. When the bar starts to spark, quickly pull it from the fire and hammer the first two inches or so. I'm hammering the flat of the chain, not the tooth part. I also do not try to hammer all four inches at one time. There is a lot going on in the chain links and the last thing you want is a cold shut or blister to show up.
16. Clean the bar with your wire brush and reflux. The bar should still be at a dull orange heat, do not let the bar get too cold.
17. Place the bar back into the fire and bring the rest of the bar back up to a welding heat.
18. Remember to clean and re-wet the anvil after every heat. The anvil must stay clean, scale is your enemy.

19. Once again, when the bar starts to spark pull the bar and weld the rest of it.

20. Now I concentrate on making the bar as evenly flat as possible. I'm not trying to turn the bar into a sheet of paper; I just want it smooth and flat.

21. Flux and heat to an orange, pull the bar and with a hot cutter or the edge of the anvil, cut a groove across the bar half way down. At first, it is hard to judge the distance, but it gets easier with time. Fold the bar until the two halves almost touch. Flux and put back into the fire.

22. Bring the bar back up to a welding heat, pull from the fire and re-weld, starting from the top and working your way down. If you did not weld the entire bar in one heat, just re-flux and try again.

23. At this point the bar is nice and flat and even. The side edges have not been addressed. Now, the moment of truth comes into play. Re-flux, put the bar back into fire and once again bring up to a welding heat.

24. Pull from fire and square up the edges. If the welds are strong this will not be a problem. If not, you will see cracks in the layers and separations or you will see blusters in the middle of the bar. The world has not come to an end, these problems can be fixed.

25. Bring the bar back up to heat one more time, just for smoothing out the bar. Make sure it is even and square. Place the bar in some powdered lime and leave it to cool slowly.

26. All right, that's bar number one. You will need four to five bars to make a 4-5 inch hunting knife. With a little practice, you can make a bar in about 20 minutes.

27. Cut all the bars off their handles and grind the flats smooth with a grinder or belt sander and backing into the Muriatic acid they go.

28. Just like last time, stack the bars on top of each other and electric weld ends together and weld a handle on.

29. Now repeat steps 7-20. At this point there is a decision to be made. How many layers do I want?

If you have been following the math:

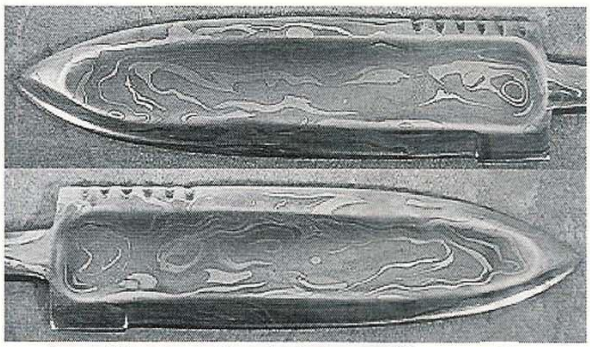
a. 4 layers of chain folded once equals 8 layers equals one bar
b. One bar stacked four high equals 32 layers
c. Folded once again equals 64 layers
d. Most of the time I am after 512 layers (64 x 2 = 128 x 2 = 256 x 2 = 512 = 1 billet)

This where your creativity steps in. At this point, you can do endless things with your billet. You can twist the billet and make a slow twist pattern. You can grind grooves across the billet and make the ladder pattern. You can roll the billet up and make the jelly roll pattern, the possibilities are endless.

I hope this helps, if you have any questions or comments give me a call or email me.

Thanks, Carson Sams

Editor's Notes: misspellings were corrected without, hopefully, altering the intent of this article; another issue with Muriatic acid is to have proper ventilation, and my in-house expert recommends doing that step outdoors.



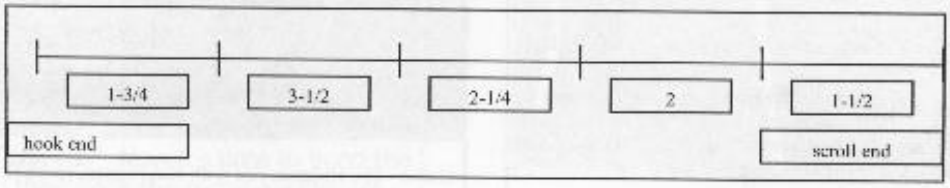
http://www.radharcknives.com/Processes.htm

http://www.cavemen.net/lewisknives/damascus.htm

A CUTE LITTLE WALL HOOK

By: George Epperson

I found this cool little wall hook hanging in the smithy at the Sandy Spring Museum. I thought it would be an easy item to make for a beginner like me. I first made a pattern fo the original wall hook and then made a shop drawing. The hook is made from ¼" square stock and the back plate is made from 20 gauge sheet metal. To make the hook, I started with an 11 inch piece of stock and marked it with a punch at the transition points. I then broke the sharp corners for a more soft appearance. The hook end was drawn out to a square taper from 1-3/4 to 2-1/2 inches. I drew the scroll end out to a flat taper from 1-1/2 inches to 2-1/4 inches. The scroll was made, then the hook, and last the bends. At this point I remember it was a bit of a trick to drill holes so you might want to do this before you make the bends. DONE.



The back plate was cut with aviation snips, quite crudely, and then cleaned using a grinder and some files. I found that holding the metal close to the edge, between two pieces of wood worked quite well. The two mounting holes were then drilled. These holes will be used to register the back plate on the form. I used the shop drawing as a template and just glued it to the metal. The back plate has a little belly, so I had to make a form to create it. I cut the center oval out of a piece of hard maple and installed registration pins. I didn't drill the holes large enough for the pins, and split the thing. So it got glued and screwed to a piece of plywood, which worked well as reinforcement against the pounding. The back plate was set over registration pins and a repousse hammer with a low ellipse was used starting around the outside edge of the oval form and then working to the center.

Work until there is a nice little belly, but not a potbelly. Attach the two pieces with rivets. I used 10 gauge copper wire for rivets. DONE

I've been told this is a Moravian design. I just like the looks of it. Enjoy

Reprinted from some other guild's newsletter, God only knows who's…Barry

Philip Simmons Artist Blacksmith Guild

www.simmons.abana-chapter.com

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843-832-1053/ forged_art@yahoo.com

Board Member
John Outlaw
4925 Lodebar Road,
Sumter, SC 29150
803-469-6913

Board Member
Jesse Barfield
2423 Stribling Circle, Lancaster, SC 29720
803-287-0929
jhbarfie@duke-energy.com

Board Member
Jeff Hatfield
800 Waddell Rd, Woodruff, SC 29388
864-476-7477 864-216-3707
shadetreeforge05@yahoo.com

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Membership Application
Dues: $15 per person/family, annually

New member: __/__/__ Renewal: __/__/__

Name:_____

Address:_____

City:_____State:_____Zip_____

Phone:_____E-mail_____

Please remit dues to: Ray Pearre, 4605 Durant Ave., N. Charleston, SC 29405

ACKNOWLEDGEMENT AND ASSUMPTION OF RISK

I acknowledge that blacksmithing and related activities are inherently dangerous and involve risks and dangers to participants and spectators that may result in serious injury or death. I have considered these risks and I knowingly assume them. I agree that I am responsible for my own safety during Guild events, including wearing appropriate clothing and protective gear and remaining a safe distance from all dangerous activities. I agree to hold Philip Simmons Artist Blacksmith Guild harmless from liability and expenses arising out of my actions or omissions.

December 11, 2010, 10AM

Jerry Darnell will demonstrate Colonial Blacksmithing!

Bring something nice, maybe something you've forged for Iron-in-the-hat and a side or dessert

Our host: Mike Tucker
122 N.Salem Ave., Sumter, SC 29150 803-773-6853

From I-20: Take **exit 98** to merge onto **US-521 S/Sumter Hwy**
Continue to follow US-521 S for 25.6 miles. Turn **right** at **Chestnut St** 0.2 mile.
Turn **right** at **Haynsworth St**. Take the **1st left** onto **N Salem Ave.** Mike's will be on the right

From I-95: Take Manning exit for **US-521 N**. for 17.1 miles. Turn **right** at **US-15 N**.
Go 1.8 miles. Turn **left** at **E Liberty St**. Go 0.8 miles and turn **right** at **N Salem Ave.**
Mike's will be on the **left**

See you there!