N.J.B.A. Newsletter

NJBA Volume 9, Issue 3 11/01/04

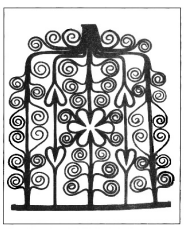
Editors Soapbox

Hi everybody, I hope the end of the summer finds you all well. So far we are having a pleasant fall and hopefully this winter is not too bad. The Pin Oak in front of my house is raining acorns, more than I can remember in about fifteen years, so we'll see what kind of winter it's forecasting. We have a meet in November at the train in Allaire Park (more information in this newsletter) and our holiday party at Marshall and Jan's home in December. Meets for January and February are not set yet so we'll post card the meets to keep you up dated when the plans are set. If you have any ideas for a meet or a location for a meet please contact one of the board members to help get fresh ideas flowing. If you attend a meet (NJBA or otherwise) I would appreciate a small report or write up about the meet. Till next time stay cool and keep hammering.
Larry Brown, Editor

Upcoming events for 2004

Get you calendars out and mark these events down. For those on the web bookmark our web site and check for meet information. Remember most of our meets have an "Iron in the Hat" drawing, so be sure to bring something.

November 13th — Pine Creek Railroad, Allaire State Park, see this page for more information.
December 5th, 2pm— Holiday Party at Jan and Marshall's house, details on page 3.
January—To be announced.
February—To be announced.



Shop Tour and Industrial Riveting Demonstration

Sponsored by New Jersey Museum of Transportation and New Jersey Blacksmith Association

Saturday November 13th, 2004

NJMT (Pine creek Railroad), Allaire State Park.

This will be an introductory meeting between NJBA and NJMT. There will be a complete tour of the NJMT facilities including the shops, storage facilities and an explanation of the current restoration projects. A demonstration of industrial riveting using air hammers will be given.

NJMT has established a forge in the shop to support restoration work that requires blacksmithing techniques such as riveting boilerplate. The museum is also in the process of designing a separate blacksmith shop capable of offering instruction in the local area. Please come and investigate these exciting projects and opportunities.

Lunch will be provided. There will be a brief NJBA business meeting over lunch to elect or reelect officers and discuss up coming events. There will be an Iron in the Hat which helps defer the cost of lunch., so please bring your donations, and buy your tickets often.

Directions;

NJMT is located in Historic Allaire State Park, Route 524, Allaire (Wall Twp) NJ, two miles west of Garden State Parkway Exit 98 and NJ Route 34, and one mile east of I-195 Exit 31.

NEW!!!
Official NJBA Address

NJBA
P.O. Box 761
Mt. Laurel NJ 08054

The old address was:
NJBA, P.O. Box 195
Howell, NJ 07731
This will still be active for a while but please note the change and start using the new address.

The NJBA Web Site!

The NJBA Web Site is up and running at:
`http://njba.abana-chapter.com/`
The Newsletter is at:
http://members.bellatlantic.net/~vze25jcc/index.htm
or the site may be linked to from the NJBA web site.

Rather than use room in the newsletter, All correspondence between ABANA and NJBA is now being posted on the NJBA web site. If you cannot access it there, contact me and I will send you copies

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NJBA Holiday Party!

The holiday party is to be held on December 5th at Jan and Marshall's house starting at 2PM. Many thanks again, to Marshal and Jan for opening their home to us in the holiday season. Guests are asked to bring a covered dish, salad, desert, etc. and your favorite beverage. Please coordinate with Jan on what to bring. NJBA will pick up all of the utensils, plates, cups, and some soda. Members are asked to also bring various trivets, candle holders, or other holiday items they are making to the party.

Folks can either contact David Macauley, to indicate they are coming or contact Marshall or Jan about what specifically to bring. Despite the emphasis on blacksmithing, members are encouraged to bring their families.

Directions to Marshalls' Home:

Marshall and Jan's "cabin" is not on Marshall's farm, but about 3 miles east of it on the same road. Casino Drive is just off Rt. 9, about 3.5 miles north of interstate I. 195 (exit 28). and about 4 miles south of Rt. 33. Either of these routes can be easily reached from the major north-south highways including the Garden Sate Parkway, the NJ Turnpike. 1-295, Rt. 18 or Rt. 34. From Rt. 9 northbound. make a right onto Casino Dr.; southbound. take the jug handle to make a left onto Casino Dr. Continue past Marshalls' Farm to #301 Casino Dr., Howell, N.J.
(ph# 732-938-6577) jlfmib@optonline.net

Report on the Dover Conference

by Bruce Freeman

Since this year, the PV PigFest and NJBA's Red Mill event fell on a different weekend, I was able to attend the conference in Dover, DE, for the first time in a few years. When I got there, I immediately ran into NJBA member, Bill Futer.

I also noted that the attendance seemed low. I didn't get the count, but it appeared to be no more than 2/3 what I'd remembered from previous years. I want to encourage NJBA members to attend this event. It's always worthwhile.

This year, the demonstrators were Bob Compton and Leigh Morrell. Both are from Massachusetts. Bob seems inclined to custom work, including railings, fire screens, and other items. His work is ornate, including much repousse and other ornamentation.

Leigh runs a production shop, manufacturing items of his own design for wholesale to distributors. His operation is geared to efficient use of materials, and reports that he creates very little scrap. He also does custom work.

I took minimal notes on their presentations, but will briefly describe one item Leigh demonstrated. This was simple chandelier of six branches. For this demonstration, he had had the foresight to bring along a number of pieces at different degrees of completion (an excellent idea). This enabled him to skip slow, tedious parts of the process (like normalization) and to merely pick up the next example and proceed with the demonstration from there. However, I will describe the demonstration as if he worked the whole piece through, from start to finish.

He started with a bundle of six ~34"-long quarter-inch rods, with 1" piece tack-welded in the center at either end. (These were 8" or 10" longer than needed for this project, for reasons that will be clarified below.) He forge welded one end, then drew it out to a long taper. He made a 90-degree bend in the taper, then curved it back to make a round, centered hook from which to hang the chandelier.

Next he marked a point about 8" below the weld and slipped another 1" piece of quarter-inch rod into the middle of the bundle. He marked the location of this on all six outer rods, then heated and welded this second point. With all six rods at the same heat (color) he then twisted them snugly together, and immediately untwisted them to open the "basket." He used a large screwdriver to tweak the basket until he was pleased with the appearance.

He then cut off the excess length of the weldment (namely six rods tack-welded together, with a one-inch stub in the center). This piece is perfect for producing a basket handle for a poker, another of his

products. This is one way that he reduces scrap from his shop. Since he welded the bundle on both ends, for ease of forging, he would have to cut off some amount. Might as well make the cut off portion be useful for another purpose!

He was working with common "mild steel," AKA "A-36" or "mystery metal." Therefore, he normalized the rods before doing the rest of the work cold. One by one, he formed all six rods below the basket to "U" shapes around a ~10" mandrel. Then he tweaked these six chandelier arms until he was satisfied with their appearance. He then used a 1/4-20 die, mounted (with a set screw) in a modified deep socket, and driven by a brace. This apparatus enables him to clamp each chandelier arm end in turn in a vise and thread it without using the usual clumsy die handle.

For the drip pans, Leigh brought six ~3" circles of ~16-ga steel, which he dished cold with a rounding hammer in a swage block. He drilled the center (#7 bit), tapped them 1/4-20, and screwed them onto the chandelier arms.

For the candle cups, Leigh has electrical conduit cut cleanly to ~1" long, and pickled of the galvanizing. He places these in a plate resembling a bolster, and, using a ball peen hammer as a die, strikes the other end of the hammer (Caution: For safety, use a brass hammer!) to flair (cold) the end of the tube. He then centers the cup on the pan and solders cup to pan and pan to arm, using muriatic acid as flux, and a propane torch. (Caution - very harmful fumes!) Since his cups and pans are not heated, he continues heating them to create an oxide finish.

Leigh sells these chandeliers complete with mounting kit. This consists of two extensions (something like S-hooks, but with straight shanks and centered hooks at either end, so the shank hangs straight down, for eye-appeal) and a swivel ceiling-mount. The ceiling-mount is of two pieces. To make the mounting plate, he starts with 16-ga steel 3" or 4" square, and sinks the center in a swage block. The corners he brings back to flat, then drills opposite corners for mounting, and the center to receive the swivel hook. (One very good idea of Leigh's is to make this mounting plate large enough to mount on a standard electrical ceiling box, so that the chandelier can replace a ceiling lamp and cover the box.)

The swivel hook starts as a 1/4" rod, which he then heads on one end and draws out on the other, rather like a large nail. He feeds this "nail" through the plate, then bends it 90-degrees and bends a centered hook around, as for the chandelier and extensions.

The resulting chandelier was quite simple and elegant, and, after linseed oil finishing, brought $200 in the auction. (He gets less than that wholesale, but they cost more retail.)

Inspired by this demonstration, I spent the following Monday evening at Marshall's open forge meeting making my own version. I started with two quarter-inch rod, folded each in half, and wired the two pieces together with baling wire. I then forge welded the last two or three inches of the rods together, drew them out and made a hook like Leigh had done.

Next, I slid the baling wire to a point about 7" below the weld, heated this and welded at this point, the wire acting as a marker and joining into the weld. I took a new heat on the bundle, then twisted it snugly, and untwisted to create the basket. After it normalized, I tweaked the basket to my liking.

I chose to hot-bend the chandelier arms, and used a 6" mandrel for this. After getting the four arms approximately equal and properly spaced, I normalized the piece before continuing. I then cut off each arm to an appealing length, and threaded the end (using a standard die and handle).

Meanwhile I cut out four pieces of 14-ga scrap sheet steel to about 2.5" square (or trapezoidal, more nearly. I center-punched each, then heated them and sunk them in a swage block. This produced eye-appealing "square" candle pans. I drilled and tapped the center of each and screwed them onto the chandelier arms. Due to its much smaller size, this chandelier will be used with votive candles. Therefore, no candle cups are needed.

I sharpened the ends of each chandelier arm to points with a file, then reinstalled the pans and soldered them in place. I did not use Leigh's approach to soldering, with muriatic acid. I preferred to "tin" each piece with solder, using a propane torch, soldering paste (flux used for sweating copper pipe) and a minimum of solder. I then screwed the pans onto the chandelier arms, using the torch to re-melt the solder.

I wiped the chandelier down with polyunsaturated vegetable oil, and baked it for an hour at 400F to produce a beautiful black finish. I then mounted four white votive candles on the pans. The result was very nice.

WASHINGTON'S CROSSING ENGINE SHOW

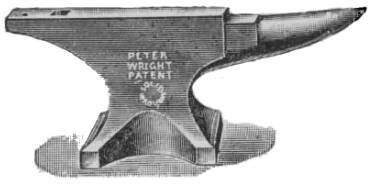
By John Chobrda

I guess that everyone knows how wet the week-end of September 17th thru the 19th was; to say that things got washed out is an understatement. Mike Erdie, Mitch Swirsky, and I arrived at Washington's Crossing Park for The Days of the Past Old Time Power Show a little after eight Friday morning, and set up our equipment. We had a coal forge, a gas forge, two anvils, and leg vice in use by nine. The weather was overcast and threatening most of the day and most of the engine people held off setting up to see what would happen, we kept busy forging a few pieces, a hot cut for Mitch's anvil, Mike worked on a wizard head door knocker, and I forged a few fire strikers (Dr. said I could start using my new shoulder).

Jim Hauck came up with his family and while they were taking in the sights he went to work forging a banana ripener (piece to hang a bunch of bananas from while they ripen), Tom Majewski also came Friday and generally helped out and took pictures. We had quite a few people stop by to watch us work and ask questions, far more than I expected because of the weather. The people who run the show also stopped by and again mentioned what good feedback they got last year about our presence, and to make sure that we would come back in 2005 (they will be advertising our presence for next year's show).

Mike Erdie at the forge

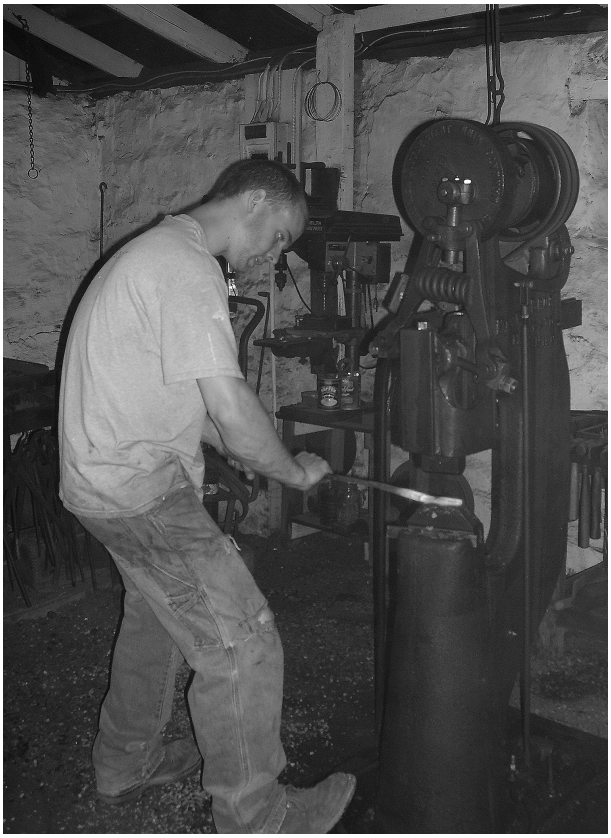
Saturday, as you all know was a total wash out. I arrived at the Park around ten to pack things (Sunday would be Red Mill), Mike and Mitch were already there and so was Tim Suter, we hung around until after twelve then packed and headed for home. As I said before we will be there next year and if you want to come out for a fun day, stop by. Hopefully the Engine show, Peters Valley, and Red Mill will not fall on the same week-end again.



Red Mill Tool Swap and NJBA Picnic

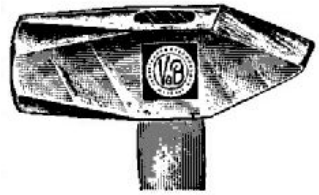
By Larry Brown

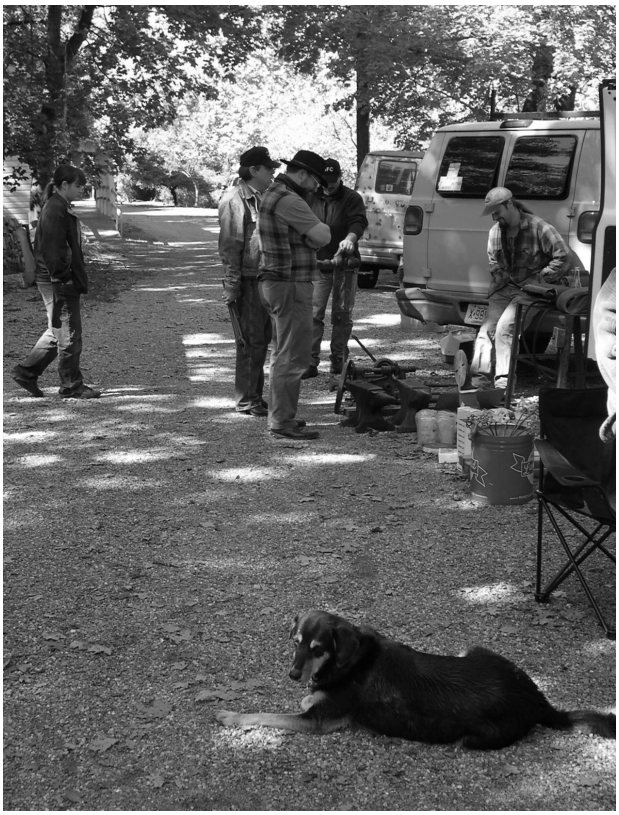
On Sept 19th Adam Howard held the NJBA Picnic and a tool swap at his shop in the Red Mill Museum in Clinton, NJ. Although the weather was nice this day, I think the deluge the day before kept attendance down a bit. Tailgaters set up along the water side of the area and the shop was opened up. Adam had set up the event well and everything seemed to be running smoothly.



Trevor Kent was doing a demonstration inside the shop with various people going in to watch as the day went by. I'm not sure what he was making, I think it was tongs as I admit I spent most of the day outside enjoying the weather (No rain!!). The barbecue grill was soon started and there was plenty of food, cooked on the grill and brought as side dishes by members.

In all the meet was a success, many thanks for the work done by Adam Howard in setting up the meet and opening his shop to us. Hopefully we can repeat this next year!





Blacksmiths Tips

Four Lists for Blacksmiths

By John Careatti (reprinted from The Blacksmith's Guild of the Potomac, July 2001)

10 reasons why spring steel tools crack
1 - It was cracked to begin with
2 - It was forged at too high a temperature
3 - It was forged at too low a heat
4 - The forging heat was only at the surface and did not penetrate through the piece
5 - The tool did not receive a packing heat
6 - It was annealed improperly
7 - It was straightened after annealing
8 - It was hardened at too high a heat
9 - It was straightened after hardening
10 - It was improperly tempered

10 reasons punches stick
1 - Work is too cold
2 - Punching in to anvil face (no bolster)
3 - Punching too far without removing punch
4 - Punch shape is too straight
5 - Punch end is larger than shank (upset)
6 - Punching hole to final size (no drifting)
7 - Deep punching without cooling punch
8 - Punch improperly hardened
9 - Poor quality steel in punch
10 - Material being punched is tougher than punch

10 reasons forge welds don't stick
1 - Work is too cold
2 - Work is too hot (burned)
3 - Too much air in fire
4 - Fire not hot enough to get welding heat
5 - Poor quality steel (eg. Manganese alloys)
6 - High sulfur coal (or other contaminants in fire)
7 - Incorrect or no scarf
8 - Not enough forging after weld is made (it takes more than one heat to complete a forge weld - need forging to refine the weld)
9 - Forging at a low or surface-only heat after welding
10 - Quenching a partially welded piece

10 reasons to use water as a quenchant
1 - It is easy to find
2 - It is low cost
3 - It is the same everywhere
4 - It is nonflammable
5 - It is non poisonous (except in very large doses - do not inhale)
6 - It does not coat the piece with burnt oil - temper colors are easily seen
7 - It is clear so you can watch the piece in the quench
8 - It separates the steels that are workable from the alloys that are too complex to use
9 - The speed of the quench and thus the hardness can be controlled (can quench slower by dipping, etc.)
10 - Using water to cool tools that have been water hardened won't ruin them
Editor - My apologies to John Careatti as I have modified some of the material above a little, but the gist is the same.

Shop Tips and Techniques...

Cleanup Tip
Next time you need to use a magnet to pick nails, metal shavings etc., try placing the magnet in a plastic bag first. Pick up the loose metal and then pull the magnet from the bag while turning the bag inside out. The loose metal is now in the bag and the CLEAN magnet is on the outside of the bag.
Contributed by Tom Strode

Beeswax
Apply beeswax to your shoe or apron string. Your knot will stay tied all day and not come loose.
Contributed by Ben Bradshaw

No work of art is ever finished, it is only abandoned."
Author Unknown
Submitted by Dan Tull

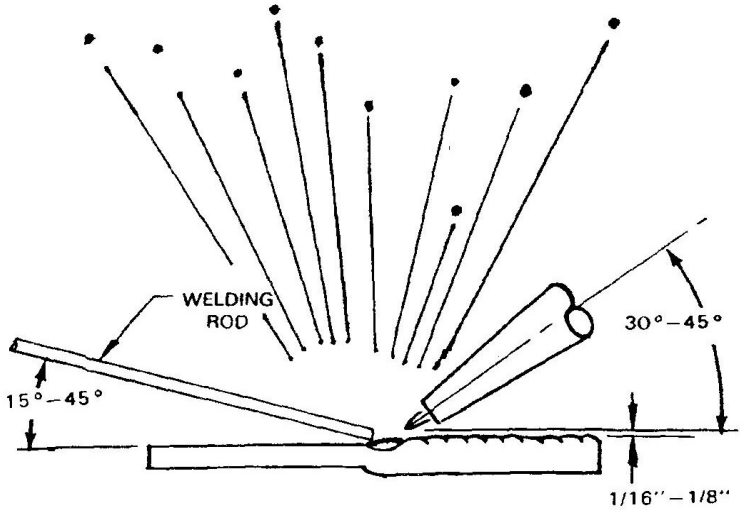
WHY DOES THE GAS WELDING TORCH POP?

Why does the torch pop, taking a big chunk of your oxy-acetylene bead with it and blasting molten steel in all directions? When I found the answer, both the quality of my gas welds and my enjoyment of welding increased dramatically.

As you know, I use gas welding extensively to join forged botanical elements -- leaves, flowers, vines, etc.. As a follow-up to my gas welding demo at the 2000 spring meet in Maine, here are a few tips for preventing one of the gas welders most persistent aggravations.

Note: Right up front I need to say -- do not read beyond this point unless you have tried your hand at gas welding -- or your eyes will glaze over in about 30 seconds. But, if you have experienced "pops" with the accompanying ruined welds and possibly expletive utterances, there may be an answer or two in the following.

This is not a step-by-step "how-to" welding lesson. If you are at the beginner's stage in welding, my best advice is to learn from an experienced welder, not from a book. Take a class. There are many explosive and burn dangers associated with bottled gasses, not to mention the steep learning curve of gas welding. If you have gas welding experience, read on.



QUESTION:

What causes the torch to "POP?" ANSWER: Reflected heat from the flame is directed back at the torch tip, literally exploding the gases inside the nozzle. The explosive force can't return to the hoses due to the anti-backfire valve. The only route of escape is back down at your puddle or molten pool. You know the rest. The hot stuff leaves with a bang, looking for someone who isn't wearing side shields, someone who forgot to button his collar, or for a rag or paper over in the corner. (You knew I would have to bring up the safety thing sooner or later -- but those Red Devils sting. And worse!)

All the welding books I have read list "dirty tip" as the reason for torch pop. In my experience, a distorted flame or "weird whistle" does come from partially plugged tips, but poorly maintained tips seldom cause popping. Popping is induced by excessive reflected heat caused by one or more of the following:

CROWDING

Holding the torch tip too close to the puddle. The flame tip (blue cone) should be raised about 1/16-inch to 1/8-inch above the puddle. It should not protrude into the surface of the puddle.

TORCH TIP TOO SMALL OR LARGE FOR THE JOB AT HAND

Welding manuals give "rule-ofthumb" recommendations for tip size relative to metal thickness -- a good place to start -- but with practice one learns to get a feel for it. An undersized tip invites crowding. A tip that is too large not only pops but can burn through the base metal as well.

ACETYLENE OR OXYGEN PRESSURE TOO LOW:

Once again, insufficient heat leads to crowding and fireworks. Adjust your line pressure with the torch valve open or add 1-2 pounds to operator's

manual specs. Better a tad high than too low. Also, pressure tends to fall off as gas tanks empty.

WELDING IN A HOLE:

That's the best way I know to describe a condition where normal welding heat cannot escape because there is one or more barriers resulting in heat "kickback" and pop. When the joint to be welded is forming a "V," angle the torch so the heat is directed down the trough and away from the tip.

TORCH NOZZLE ANGLE TOO LEFT:

A 45 degree angle -- torch to base metal --is ideal. Start the preheating at 90 degrees, and as soon as the puddle starts to form, drop down to 45 degrees, or expect a hot shower.

WRONG TECHNIQUE:

Not circling, weaving, or pulling away. Some motion is needed to effect a gas weld. Not only the agitation of the puddle, but a progression along the base metal is required. In the case of botanical stems and vines, or in small sculpture, there must be a constant pulling away -- a kind of "puddle interruptus" -- and this in not just a lifting of the torch, but a move off to the side. Otherwise your rose bud falls onto the floor -- adding insult to pop.

DEFECTIVE EQUIPMENT:

The experts at Maine Oxy Company in Auburn, Maine, tell me there is also a problem that some refer to as an "aspirating air" condition. When there is an upstream air leak at the torch O-ring, intermittent popping can occur.

These measures for controlling excessive heat reflection at the torch tip have worked for me. If you know of others, share them with the membership via the newsletter.

Taking the "pop" out of gas welding is not rocket science. I find it very "doable" if I concentrate on what I'm doing to cause this annoying problem.
Keith Leavitt

Tips on Acetylene Torch Usage
From the ABANA Forge List

Question:
Sometimes when cutting it seems that I've burned through, only to later
find that either slag or steel has puddled back into the cut and closed it
up.
Why?

Dave

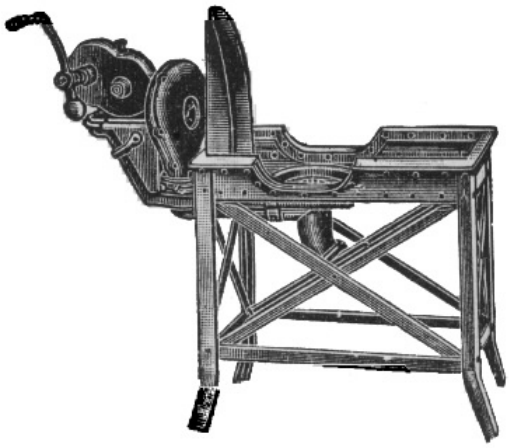
Answer:

Dave and others interested, There are four things you can try, to eliminate this Heavy Slag accumulation. I'm assuming you have a neutral flame adjusted on your preheaters, but you can cut the heat back to the point it will just cut and thus not be "melting" more steel with the preheaters than is necessary. So running a fairly cold (smaller or less in volume) torch flame - can help this situation a lot.

The next thing is don't cut with your tip straight down, make it so your going into or trailing with about a 5 degree angle (with the cut - or you end up with a bevel). This will tend to spit the slag more than puddle it up under your cut.

Third, is cut rate. If you have your flame set with too much heat, your screwed in the first place as your trying to oxidize the material out of the path more than you are melt it out. So with this cooler flame try cutting at just the rate that the top of the plate next to the preheat flames is not causing a puckering or melting action ..... that is the correct cut rate. Any faster and you'll loose the cut.....slower and your top puddles from melting from the heat of the preflames.....adding to the mess your talking about.

Fourth is if your running you oxygen pressure too low.....you get more melt than oxidation. I keep my oxygen regulator on my cutting torch set between 30-50 for a range for 1/4 to 1" plate. Less than 1/4" and I use



the plasma cutter.....or take that five degree angle to a 60 degree steep angle to lessen slag on 1/8 and 3/16. I also have a real small Victor cutting torch with a tip that will leave good results on thin stock. But your normal cutting torch with a mid to large sized tip should be able to cut 1/4 to 1 inch stock comfortably with the correct settings and techniques used. Cutting against a straight edge is also helpful for long straight cuts.

A correctly adjusted flame should yield a cut with hardly any slag on the bottom of it, with good serrated lines (that hardly need grinding) and the slag should chip off in long slivers with a hatchet instead of beating it to death with a chipping hammer or hammer and chisel.

If you master these techniques your torch will become a much appreciated tool with less clean up hassles. As with welding.....using a test piece (of the same thickness) is often a wise idea if your looking for a good clean cut on the edge of your parts - especially if they show. This will show you when the torch is set correctly or if you have to change it once you see how it "should" look. At times you'll get slag on only one side of the cut.....this happens on occasion and I don't really know why - but it does. Nothing scientific to report there on it's occurrence.....

Bottom line: Lots of practice helps to make good cuts.

Ralph Sproul
Fri, 20 Aug 2004

Basic Heat Treating for Smiths

by Scott Lankton
Appalachian Area Chapter NewsLetter
May/June, 2000
Originally appeared in the Michigan Artist Blacksmiths Assn. newsletter, The Upsetter",
May/June 2000

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, lets 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

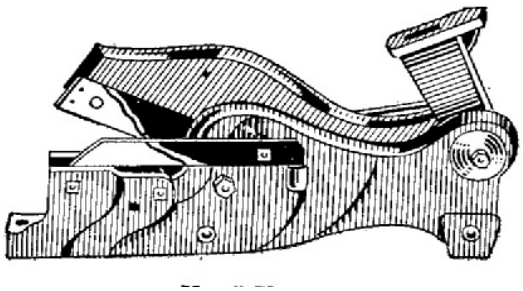
some of the stresses from the forging. It is an important and often overlooked step in heat-treating. Normalizing is similar to "annealing"; the difference is that normalizing is aircooled. When annealing the steel is brought up to the same red (1550F AVERAGE) and cooled as slowly as possible in insulation 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 temp." It is the point at which the steel shifts its crystalline structure from one "phase" to the other. To find the critical temp 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 the steel remains nonmagnetic for a while as it falls below critical temp. This temp is (slightly) different for each alloy of steel.

Back to the 'quench". Common quench media are: air, (for air hardening steel), water (for water hardening steel), oil, (for oil hardening...). 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, ltght 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", Alexander Weyger's books, or Alex Bealers Book.

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 TEMP. (MED. RED), AND NORMALIZE (LET AIR COOL).
3. GRIND OR FILE.
4. HEAT TO JUST ABOVE CRITICAL TEMP (MAGNET?) AND QUENCH (IN OIL USUALLY FOR MOST SMALL TOOLS) FIRE DANGER, DO NOT INHALE SMOKE!
5. LIGHTLY SAND AND HEAT TO DRAW TEMPER. REPEAT SAND AND TEMPER IF YOU WISH.
6. TEST IT. MODIFY AS NEEDED.
7. LEARN BY DOING.
8. ATTEND YOUR LOCAL CHAPTER MEETINGS AND THE BI-YEARLY ABANA CONFERENCE

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. With Hammer and Tongs, Scott Lankton

The Role of Blacksmiths Through The Ages

The blacksmith has played an important role in society down through the ages, according to research compiled by Dr. James M. Jeep Sabo,

In ancient Wales, for example, the blacksmith held a place of honor in the Prince's court with the priest and the poet, and according to Greek mythology, there was even a blacksmith on Olympus.

Vulcan, the son of Zeus and Hera, made tools and weapons and built the houses in which the gods lived. Four beautiful handmaidens, who he made with his own hands and endowed with life assisted him in his forge.

Thor, of the Norsemen, hurled his blacksmiths hammer as a weapon and a tool. It was this fabled blacksmith who some believed caused the thunder to roll.

In old Russia, the blacksmith even participated in weddings. It was his presence that supposedly helped weld men and women together.

Through the years, the blacksmith was essential to transportation. making shoes for horses and oxen and welding and fitting wagon tires and hub rings. Other craftsmen were dependent upon the blacksmith to make their tools.

The blacksmith was the only one of the ancient craftsmen to work with the four elements: fire, air, earth and water. Fire was used to heat the iron, which he took from the earth along with the coal for the fire, and the bellows controlled the air for his purposes. Water was essential to cool and temper the heated metal.

The blacksmith filled a number of rotes in society, from making the tools of war, such as swords and spears, to providing ice skates for children.

Some of the names in history books were involved in blacksmithing:

• Louis XVI had his own blacksmith shop at Versailles, where he designed and made locks for guns and doors.

• Richard the Lion-Hearted is said to have spent much time working in his army's blacksmith shop.

• Maximillian the Great was responsible for the armor of his period.

• Charles V, emperor of the Holy Roman Empire, worked on the guns used by his soldiers.

• George Washington took a great interest in the blacksmith shop at Mount Vernon.

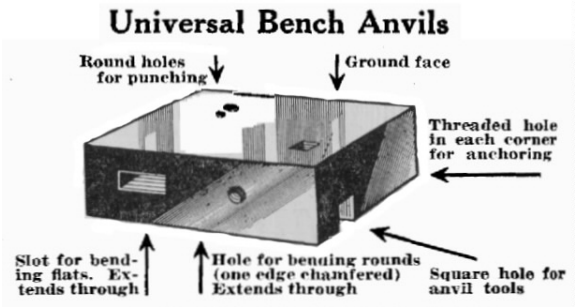
• Thomas Jefferson had a nail factory at Monticello.

• John C Calhoun knew as much about the techniques of blacksmithing us most masters in the trade.

• Sir Winston Churchill was descended from blacksmiths on the American and British sides of his family.

• Richard Sears, founder of Sears, Roebuck and Company, was the son of a blacksmith. His father made the first surgical scalpels for the Mayo Clinic.

(The source of this article was lost– editor.)



More Tips from the Forge List

To: "Darrell"
Subject: Propane Safety

The little hand tightening valve on the side of the valve is called a 10% valve. It is used when filling the tank. The way it works is it is opened while filling the tank. When the liquid propane starts spitting out of the 10% valve, the tank is 80 + % full of liquid propane and the maximum fill should be 85%. If you continue filling the tank until there is a continuous stream of white liquid after the fill valve is shut off, you have exceeded 90% full tank. If you have a tank that releases a "shot of gas every now and again" you have either over filled the tank (VERY dangerous) or you have a bad valve (also very dangerous). If you think your tank is over filled, take the tank outside and open the 10% valve. If white liquid propane comes out, you can either leave the 10% valve open until just gas comes out or you can connect to a high use item such as a forge and use the gas (which will also cool the tank.) If clear gas comes out and you are having "shot of gas every now and again" have the valve changed before you blow something up.

Darrell

Engraving Tools from Concrete Nails

My name is William L. Howard, Bill for short, and I have made my living as a metalsmith for the last 30 years. I am considered a master goldsmith by those who care about such things and I also engrave, sculpt, mint, cast, forge, make prototypes, teach, consult, appraise, drink scotch and whatever else might be available, weld, do seminars and most anything else which is legal, fun, informative and earns fair wages. I live with my wife, Kathy and our kids, Aaron & Missy, in Stoughton, Wisconsin where we operate our business and do all the usual stuff.

I've had to do some pretty weird things with metal in the course of making custom orders and one of the most useful skills I ever learned was how to make those special tools you couldn't buy if you wanted to but really make the job happen faster. The following constitutes the lecture part of a demo I did for the blacksmiths at the '95 QUAD STATE ROUNDUP in Ohio. It was received well and I wish to thank my hosts who treated me very well. Not everyone has vast resources of cash or tools so I have presented this information based on a low tech, low cost approach. You will need some concrete nails, a belt sander or grinder, a heat source, hammer, striking surface, a can of water, a vise and about 20 minutes.

==========

SAFETY TIPS: For those of you who have lawyers please observe the following advice. You are responsible for your own safety and work habits. Use safety glasses when using grinders, torches, hammers and all potentially dangerous (especially rotary) power equipment and tools. Avoid burns, if it gets hot let go! Remember that black heat (not glowing red) can burn you. You can hold work with your hands while forging but if you're not a quick worker be prepared to let go quick. Enough said about the obvious.

==========

NAIL TOOLS: Making an engraving chisel…

Heat the heads of several concrete nails (bigger is better) and let them air cool to anneal (or soften) the striking surface to avoid chips etc. Heat only about 1/4" to red/orange or until it's non magnetic. If you over heat, the steel will emit sparks which means you are losing carbon content which you don't want to do.

Heat the pointed end to red/orange and forge flat as shown in figure 1. If you're quick you can hold this with your fingers. During the same heat, hammer a slight bend near the tip as shown in figure 3. This will save you some grinding later.

There are three basic parts to an engraving tool - FACE, HEEL & SHAFT

a. You sharpen the face
b. You shape the heel for the cut shape you want
c. You hold or mount the shaft

The cutting edge is where the face and the bottom of the heel meet. The profile of the face is a cross section which has been ground off the tip, above the heel, at an angle. This will cut different shaped grooves into your work. The best one to start with is the 1/2 round.

Grind the heel slowly with the point up to make the bottom edge 1/2 round. If you rotate it back and forth too fast, you will get a pointed shape instead of rounded. When you're happy, smooth it off with a little wet or dry sandpaper as this will make a smoother cut.

Next grind the angle you want for your face. Eyeballing is good enough. Grind with the heel up if you can as this will reduce burrs and try to get the plane of the face ground perpendicular to the shaft. If its off to the right or left it won't cut straight. See large figure.

So far you have been working with annealed or softened tool steel which you will now harden by heating the business end to red/orange or non-magnetic and quenching vertically in water. Don't stir, swirl or move it. Your tool is now hardened and ready to sharpen. Use a light touch and avoid over heating by quenching frequently in a can of water. If you can, keep the face flat and true to the original angle. If it cuts your finger nail, it will cut mild steel or annealed tool steel.

To cut steel, hold at a steep angle and enter the metal with one tap. Continue tapping with a light hammer while lowering the other end until the face starts to cut through the metal.

To cut continuous lines hold your tool at a constant angle. Too high and it dives into the metal and too low causes it to surface. With a little practice you can cut a straight line at even depth.

To cut curved lines you must either rotate your vise or move around the work piece as you tap the tool through the metal

IS IT RIGHT?: If your tool has developed a mushroomed tip and won't cut it is too soft. If the tip has chipped or fractured it is too hard. Anneal & re-harden. The nail will stand this a good number of times as long as you don't overheat and burn out the carbon (emitting sparks during a heat).

SPARK TESTING TOOL STEEL: Take the suspect stock and grind it hard enough to create a shower of sparks. If the sparks are straight and not too bright you have non-tool steel or iron. If the sparks fork and fan out in a bright pattern you have tool steel. Use a wood nail and an old drill bit for comparison. Compare a wood nail (bends) and a concrete nail (breaks) for spark patterns. This is a scroungers' test and will not provide an alloy number or hardening information but can lead to results with a little trial and error experimentation. Junk is cheap, high tech tool steel ain't.

IF YOU CAN DRAW IT YOU CAN ENGRAVE IT:

Can't draw? Use this Xerox trick!
Draw, trace etc. your pattern on paper.
Xerox it bigger or smaller as you wish.
Clean your metal with Acetone or Lacquer thinner.
Tape your Xerox face down on the work surface.

Rub the back of the Xerox design with a rag which is damp with Acetone so the paper looks translucent and you can see the pattern through it.

Before it dries or gets moved, press down with the dry end of your rag on the design until it is dry (60 seconds max).

Peel the paper, which will stick a little where the toner transferred, away from your work piece and see if the design is all there.

This produces a durable pattern which you can spray clear lacquer over for longevity of complicated designs. It will not rub off easily and can be transferred to anything the solvent won't eat!

NOTE: Your pattern is a mirror image of the original! You may want to trace the back of your design and Xerox that to allow the lettering to transfer as readable, etcetera. It works great for making stamp or die patterns which must be reversed anyway.

If you want to do it over, just clean the metal with acetone and repeat.

HELPFUL TIPS: If your Xerox transfer smears, you either got it too wet or your copy moved during the rubbing procedure. This transfer will not resist heat like soapstone lines will for cutting purposes.

Once you have a good pattern, you only have to follow the lines until you have cut them all to your satisfaction. Beware brushing off your work surface with your hand as the burrs you have raised at the end of your cuts will cut lines in your hand until they are removed with an exit cut. (SEE ILLUS.) This is designed to get rid of them and save your hide from damage. While cutting, your graver acts like a plow or a wing according to the angle of attack. Steep angles cut deep and vice versa. The more taps per inch of line cut the smoother your cut will appear. Numerous light taps will work better than heavy blows for delicate line work.

If you find that the shank of your graver is bending it is because it got too hot during forging or some other part of the process and didn't get hardened later. Heat the center and quench to try and remedy this. Take care to keep the ends cold or you will have to fix them next.

Engraving and penmanship have much in common. Everyone has a different style so experiment with face shapes and angles as well as heel angles. Use the bottom and sides to create compound or beveled cuts and tapered lines etc.

These tools can be hammered, which is the usual method for cutting steel or they can be mounted in handles for cutting softer metals and fine work in steel by hand. The plates for printing our money are hand cut in steel for example. This is highly advanced work not recommended for beginners or amateur counterfeiters. A clever combination can be had by mounting your shaft in a handle you can use and including a short steel striker of smaller diameter which contacts the shaft through the other end of the handle. This allows you to cut by hand or hammer cut with the same tool. Handle shapes are usually shaped like a mushroom cut in 1/2 from cap to stem. The shaft is mounted in the stem end with the heel and the flat part of the handle on the down side.

Stamps, dies and trademarks can be made with your new skills. Coining dies, embossing dies for shaping thin metal and a multitude of other techniques are now available to you. You can also do decorative gun engraving, inlay work and a variety of other things which I highly

recommend you practice first before you cobble up a valuable shotgun etc.!

Steel is hard and mistakes you make are hard to erase! Try planning your cuts, working some from two directions. This works well with curves. Most cuts work well if you cut from right to left (southpaws may ignore) and you don't have to make a cut all at once. It can be segmented and cut from different angles and directions as with lettering.

Last but not least, use finesse. Most novice engravers try to make a deep cut all at once when a better and more controllable approach is to shave it down in stages. A power slip can spoil hours of work or require the removal of a sharp tool from some part of your body. I know, I've done both. Try and plan your mistakes with the "what if game".

STOCK FOR MAKING A STAMP or TOUCHMARK:

If you want to avoid the trial and error method of finding junk to make a stamp with and you can spare a few bucks; call your local tool and die or machine shop. Ask for W1 or W2, water hardening tool steel. It is adequate for our needs here and comes in a variety of shapes. I recommend round or square about 1/2" to 3/4" for stamps. It depends on what size your finished mark is to be. Water hardening is simple and easy. For those of you with the right stuff there are other steels with oil and air hardening properties which are useful but more high tech. Size and cut your stock to a length which is appropriate to the use. Don't hit a stamp 3" x 3/16" with a sledge, use a tap hammer. Old chisels and punches are a good source for heavier duty stamps. Drill bits will work fine for light work but tend to be brittle unless tempered for heavy use.

MAKING A STAMP OR PATTERNED PUNCH:

Heat red/orange and forge work end to shape desired. Soften striking end. I recommend forging a short taper towards the work end - approx. 1/3 the total length or as required to shape and size the tip. Heat and air cool to anneal and normalize (even out hardness of forged portion) the working end of your stamp.

Trim off the end of your stock so that the face of your stamp is perpendicular to the shaft and as flat as possible (90 degrees). If it will stand on the face on a flat, level surface you got it right.

Engrave or punch design into the end of the stamp. Letters and numbers must appear backwards like a mirror image if the mark from the stamp is to come out right. Don't cut or punch too deep as 1/32" is usually adequate to produce a legible mark. Keep your cuts neat and to an even depth so the resulting mark will have an even height. Use modeling clay, wax or lead for test strikes and to check your progress.

Grind or file an even bevel all around the edge. This will make a nice "frame" around your maker's mark.

Clean up the face and make sure all burrs are neatly removed. Double check your work. A good stamp will make 1000's of impressions for you and if there is a flaw it will multiply.

Harden by heating to red/orange or non-magnetic heat and quenching vertically in water. Just hold it still until it quits steaming and is cool to the touch. Clean up with a fine steel brush and test strike in lead or soft metal. If you are going to mark iron work, stamp the work while at least cherry red or hotter. Non-ferrous metals such as copper, brass, bronze gold etc. can be stamped cold. If you worked it hot stamp it hot.

QUENCH your stamp after using it on hot iron or you will eventually ruin it through gradually softening the face. Air hardening steel eliminates this problem but water hardening steel is just fine and a bit easier to work for your first stamp. NEED HELP? or DID IT WORK FIRST TRY?: Send me sample of your work and I'll provide a constructive critique of your engraving or maker's mark etc. if you send a SASE. NO charge but donations are gleefully accepted.

William L. Howard
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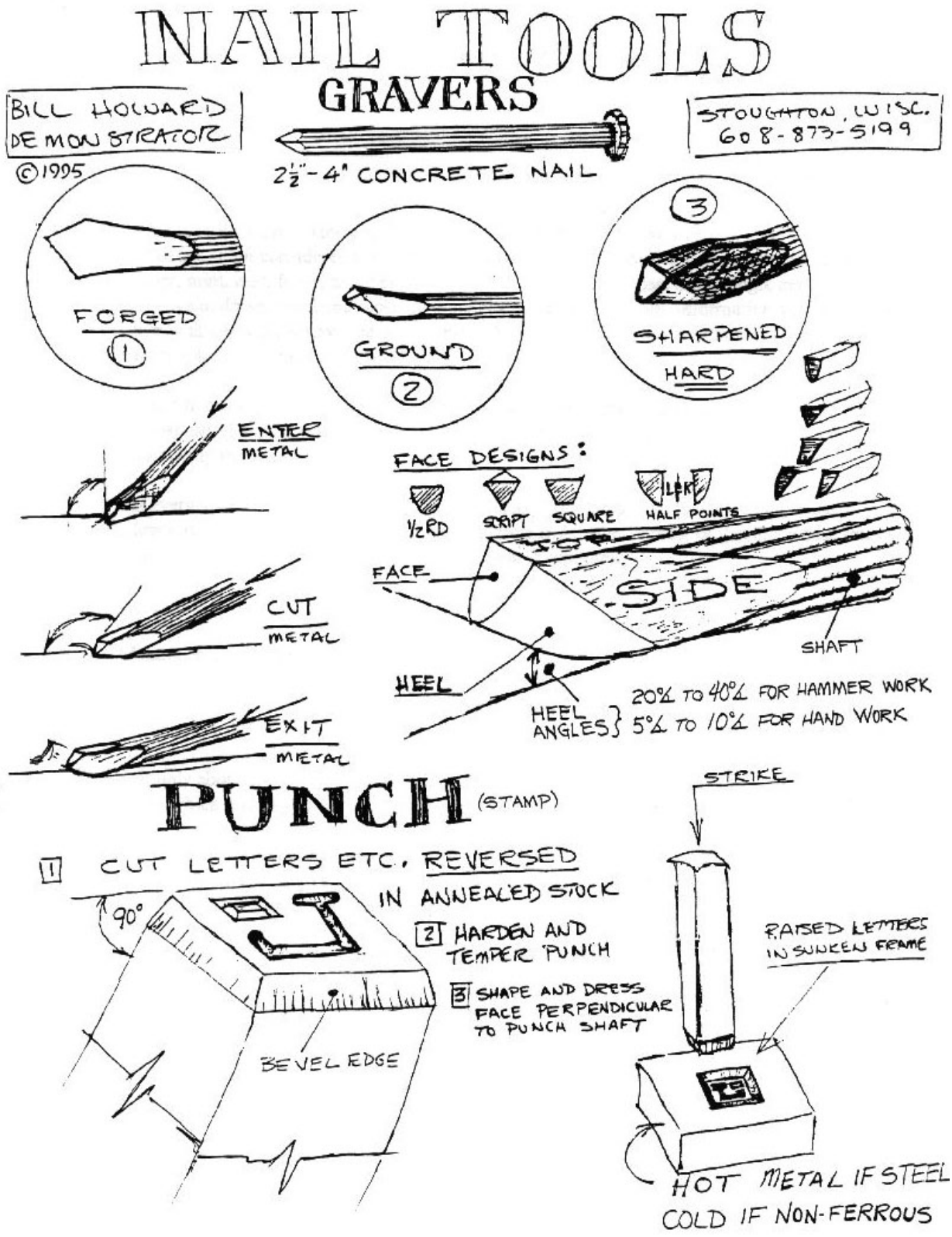
PO Box 472
188 W. Main
Stoughton, WI 53589
Phone - 608-873-5199
www.howard-academy.com


NAIL TOOLS
GRAVERS
BILL HOWARD
DEMONSTRATOR
©1995
STOUGHTON, WISC.
608-873-5199
2½"-4" CONCRETE NAIL
FORGED
1
GROUND
2
3
SHARPENED
HARD
ENTER
METAL
CUT
METAL
EXIT
METAL
FACE DESIGNS:
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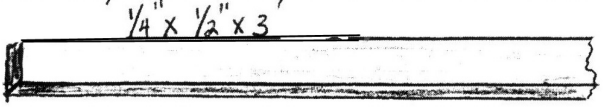
SQUARE
HALF POINTS
FACE
SIDE
SHAFT
HEEL
HEEL ANGLES
20° TO 40° FOR HAMMER WORK
5° TO 10° FOR HAND WORK
PUNCH (STAMP)
1 CUT LETTERS ETC. REVERSED IN ANNEALED STOCK
2 HARDEN AND TEMPER PUNCH
3 SHAPE AND DRESS FACE PERPENDICULAR TO PUNCH SHAFT
90°
BEVEL EDGE
STRIKE
RAISED LETTERS IN SUNKEN FRAME
HOT METAL IF STEEL
COLD IF NON-FERROUS

I have several of these picture demo's from this newsletter featuring this artist, which I will feature in the next few newsletters—Larry Brown NJBA Editor

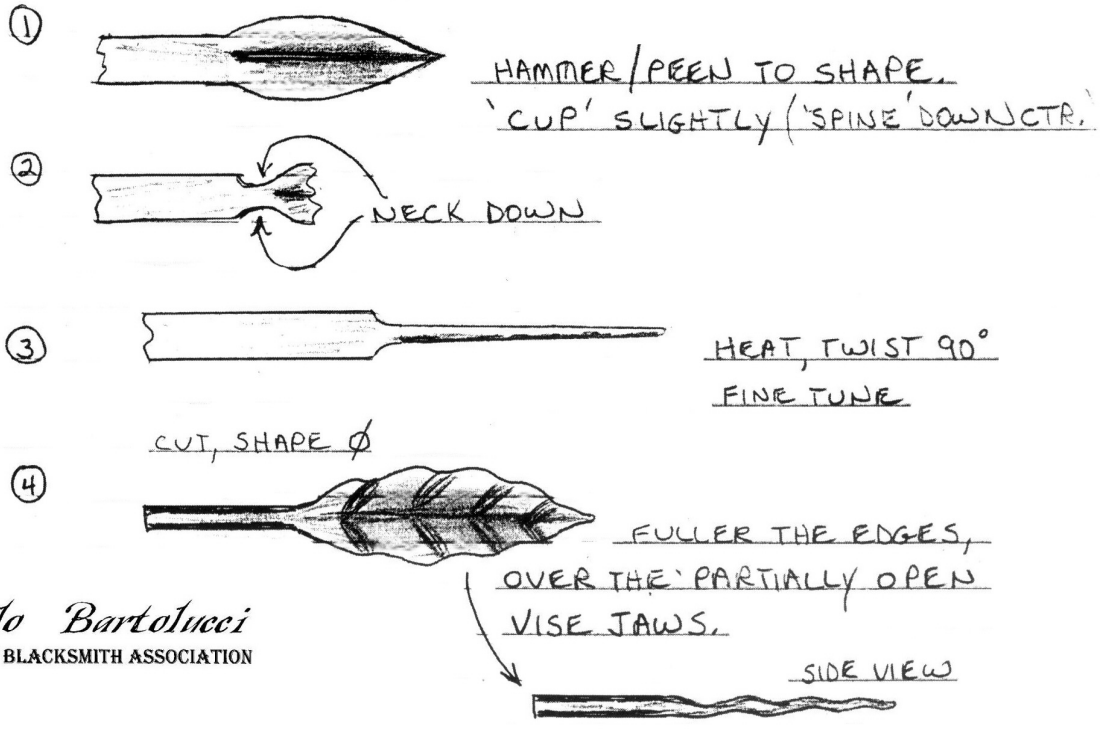
NWBA SPRING CONF. 5/26/02

ANGELO BARTOLUCCI

LEAVES, ETC. FROM WROUGHT IRON

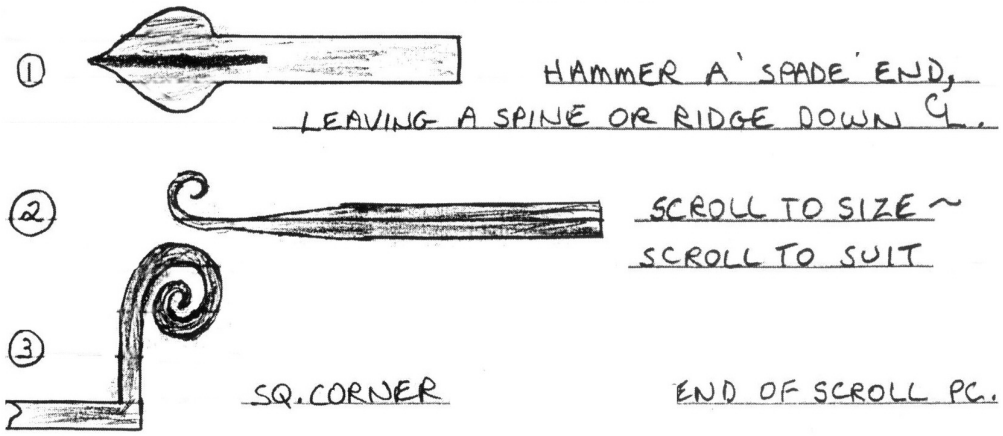


LEAF



Angelo Bartolucci
NORTH WEST BLACKSMITH ASSOCIATION

SPADE END SCROLL END OF LEAF PC.



Blacksmithing Workshops and Classes:

Peters Valley Craft Education Center
19 Kuhn Rd., Layton, NJ 07851 (973)948-5200
pv@warwick.net www.pvcrafts.org

Academy of Traditional Arts
Carrol County Farm Museum
500 South Center St. Westminster, MD 21157
(410)848-7775 (410)876-2667

Touchstone Center for Crafts
R.D.#1, Box 60, Farmington, PA 15437
(724)329-1370 Fax: (724)329-1371

John C Campbell Folk School
One Folk School Rd.
Brasstown, NC 28902
1-800-365-5724 www.folkschool.com

Red Mill Forge
Contact Adam Howard about workshops and per diem use of the shop (908)735-4573

BLACKSMITH TOOLS FOR SALE!
John Chobrda

Has a large selection of tools for sale.
Anvils – Forges - Leg Vices—Blowers
Tongs – Hammers
Will also repair and/or resurface Anvils
Call John for prices and availability
Evening (609) 443-3106

Wanted: Donations for the NJBA Trailer
We need hand tools, files,
Tongs (Old, new and repairable),
Safety Glasses and assorted rivets.
Look around and see what you have to donate.
Contact; Dave Macauley, Directors list, Page 2

Business Members
We would like to thank those who joined with our new Business Membership category
Please show them our support

Marshall Bienstock
663 Casino Dr., Howell, NJ 07731
(732) 938– 6577, (732) 780-0871
John Chobrda, Pine Barrens Forge
231 Morrison Ave., Hightstown, NJ 08520
609-443-3106 JChob@earthlink.net
Eric Cuper Artist Blacksmith
109 Lehman Lane, Neshanic Station, NJ 08853
908 642-6420 ericuper@msn.com
Bruce Hay, Jr.
50 Pine St., Lincroft, NJ 07738
Jayesh Shah Architectural Iron Design
950 S. 2nd St., Plainfield, NJ 07063
jay@archirondesign.com

Open Forges

We are looking for members who are interested in opening their forges up to members as a open forge. This does not have to be a weekly forge as is Marshall's the others can meet once or twice a month. Please contact, Larry Brown, Editor.
We want to encourage all to join us at:

Monday Night Open Forge in N.J.

Marshall Bienstock is hosting an open forge in his shop at 7 pm almost every Monday night (Please call ahead on holidays to make sure , (732)780-0871)

Open Forge in Long Island

Sunday from 10:00 am to 6pm.
Starting the 1st Sunday in November until the end of April. Please call ahead to confirm and get directions.
Ron Grabowski, 110 Burlington Blvd. Smithtown, NY
(631) 265-1564
Ronsforge@aol.com

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Join ABANA or Check out other area chapters!

Northeast Blacksmiths Association

Northeast Blacksmiths holds its meets twice a year at the Ashokan Field Campus in New York State.

The Ashokan campus is located in Olivebridge, N.Y., several miles west of Kingston, N.Y. The meets are held the first weekend in May and in the first weekend in October every year. The main demonstration is in the blacksmith shop and there is a "Hands On" workshop for beginners. A main demonstrator is brought in for each meet, food and bunk-house style lodging are provided as part of the cost of the weekend long meet.

Contact : Tim Neu
to register for hammer-ins
or subscribe to the newsletter;
Tim Neu, Ashokan Field Campus,
447 Beaverkill Rd.
Olivebridge, N.Y. 12461 [914]657-8333
For more information check out the web site; <http://nba.abana-chapter.com/>

Join The Pennsylvania Blacksmiths Association!

Name _____

Address _____

City, State, Zip code _____

Home / work Phone # **E-mail (optional)**

ABANA Member? O **Yes** O **No**
Can you host a PABA meeting? O **Yes** O **No**
Are you willing to demonstrate at a PABA meeting? O **Yes** O **No**

Suggestions for PABA demonstrations _____

What is your skill level?
O Beginner O Intermediate O Advanced O Professional

Send your completed application with $ 10 (one year dues) to;
Treasurer Gene Degenhardt
271 Stoney Lane
Lancaster, PA 17603

PABA Membership Application
Membership is from
Jan. 1 — Dec. 31

PENNSYLVANIA Artist BLACKSMITHS' ASSOCIATION

New Jersey
Blacksmiths Association
90 William Avenue
Staten Island, New York 10308
Attn: Larry Brown, Editor

How to Join or Renew your Membership in NJBA:

NJBA Dues are $18 per year (as of July 1, 2001).
Please make your check out to: "NJBA"
Please mail checks to:
NJBA, P.O. Box 761, Mt. Laurel, NJ 08054

Please include payment with the information listed below. You will receive a postcard confirmation of your membership, and will receive a newsletter within a month. NJBA's "year" runs from June to June. If you join mid-year, the postcard will offer a prorated dues option which will then allow you to extend your membership till the following June. The following information will be listed in a roster available to other members.

Name _____ Home Phone_____
Address _____ Day Phone _____
City _____
State _____ Zip _____
E-Mail _____ Skill Level (optional)_____
Comments _____