# N.J.B.A. Newsletter

NJBA Volume 9, Issue 3 11/01/04

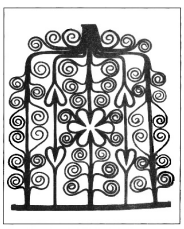
## Editors Soapbox

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

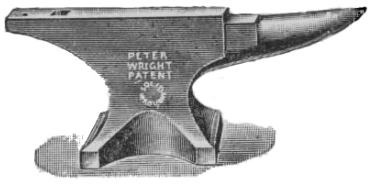
**By John Chobrda**

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**

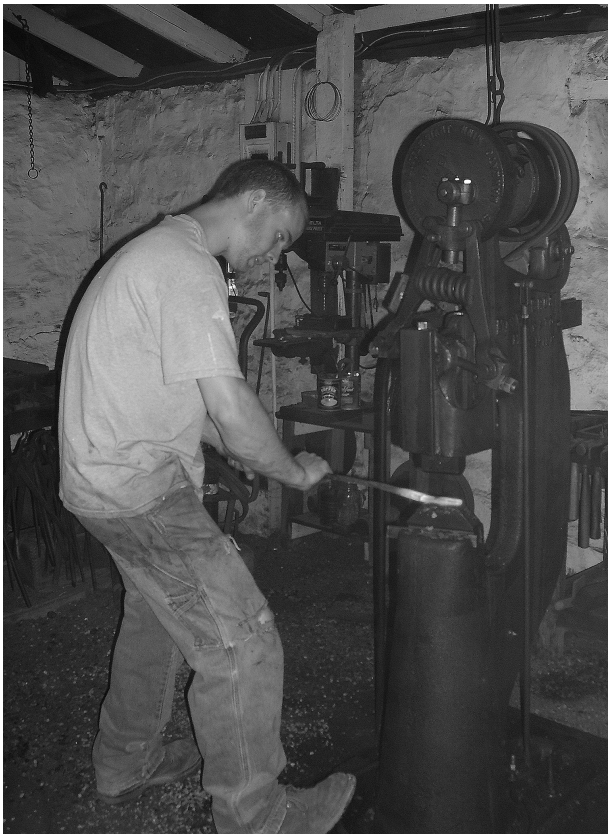
Saturday, as you all know was a total wash out. I arrived at the Park around ten to pack things (Sunday would be Red Mill), Mike and Mitch were already there and so was Tim Suter, we hung around until after twelve then packed and headed for home. As I said before we will be there next year and if you 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

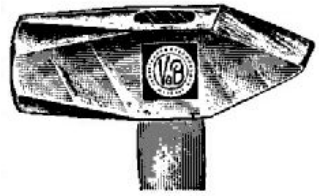
**By Larry Brown**

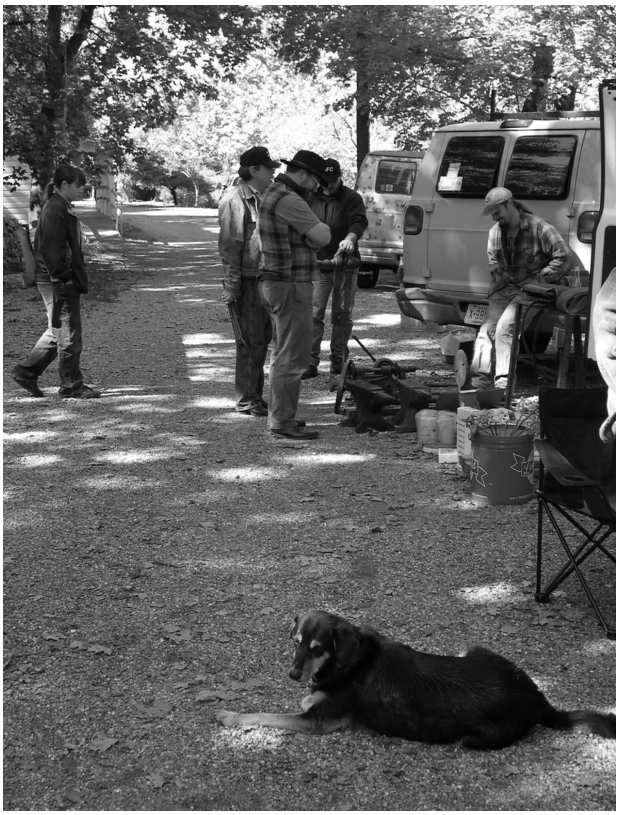
On Sept 19th Adam Howard held the NJBA Picnic and a tool swap at his shop in the Red Mill Museum in Clinton, NJ. Although the weather was nice this day, I think the deluge the day before kept attendance down a bit. Tailgaters set up along the water side of the area and the shop was opened up. Adam had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

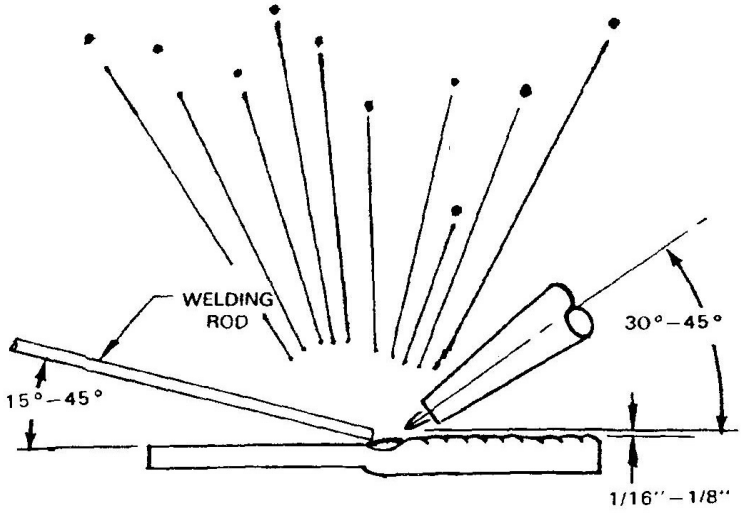
# WHY DOES THE GAS WELDING TORCH POP?

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

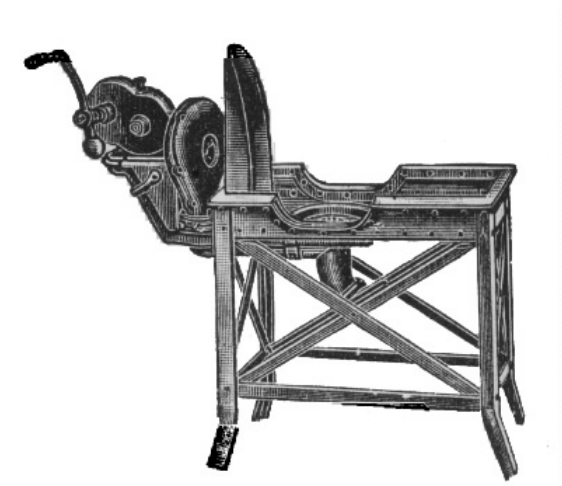
**Answer:**

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