N.J.B.A. Newsletter

NJBA Volume 13, Issue 3 10/31/08
http://njba.abana-chapter.com

Editors Soapbox

Hi, We still have some great events for this year and we are working on next year. As editor I would appreciate some help in writing up events for the newsletter. You don't have to be a gifted writer just send me something about the event as I can't make all of them or remember everything.
Larry Brown, Editor

Upcoming events for 2008—09

Get you calendars out and mark these events down. Please bookmark our web site and check for updated meet information. Remember most of our meets have an "Iron in the Hat" drawing, so be sure to bring something. Meet information starts on this page and continues on page 3

November 16th, Dr. Wm. Robinson Plantation & Museum, Clark NJ. Information this page.
November 29 and 30 New Jersey Museum of Transportation, Pine Creek Railroad Information this page.
December 7th, 3PM, Holiday Party information on page 3
January 31 9am NJBA/PABA Meet at Eric Cupers Information on page 5.

November Meets

November 16th, Dr. Wm. Robinson Plantation & Museum, Clark NJ, Circa 1690. We are going to set up a demonstration at this Museum. The hours are from Noon till 4, so come out and we will see if we can turn this into a yearly event.
Directions:
William Robinson Plantation
593 Madison Hill Rd, Clark, NJ - (732) 381-3081
http://www.clarkhistoricalsociety.org
From the Garden State Parkway northbound take exit 135 toward Westfield/Clark, Partial toll road 0.1 mi . Keep right at the fork, follow signs for RAHWAY/BRANT Ave and merge onto Brant Ave 0.4 mi . Turn left at Westfield Ave 0.6 mi. Turn right at Madison Hill Rd, Destination will be on the left.

New Jersey Museum of Transportation

Pine Creek Railroad, http://www.njmt.org/
Get away from the family and recover from Thanksgiving by going to a NJBA Meet!
If you want bring the family! We will have outside demos going on at NJMT for the weekend of 11/29 and 30. All smiths are welcomed to participate. We will have two forges available. Might also have a gas forge running. We will of course be forging railroad spikes into something new or making some tongs. Come out and get some time in the fire.

Directions;
From the Garden State Parkway take exit 98 for State Hwy 34/State Hwy 138 E toward I-195/ Trenton/Belmar/Pt. Pleasant, 0.9 mi. Keep left at the fork to continue toward RT-34 0.2 mi. Keep left at the fork, follow signs for Manasquan/Pt Pleasant/State Hwy 34 S/Spring Lake and merge onto RT-34, 0.7 mi. Slight right toward Allenwood Rd 430 ft. Turn right at Allenwood Rd 0.7 mi. Turn right at Atlantic Ave 0.5 mi. Sharp right at Allaire Rd 384 ft Pine Creek Railroad, Allaire State Rd, Farmingdale, NJ 07727

Notice

Recently NJBA member Jeff Morelli passed away. Any donations NJBA members are able to make to an educational fund for the benefit of Jeffrey's children would be appreciated. Donations should be written to "Morelli Children Fund" and sent to Mark Cubberley, 282 Main Street, Groveville, NJ 08620.

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 use the link on the NJBA web site for the newsletter.

Official NJBA Address

NJBA
P.O. Box 224
Farmingdale, NJ
07727-9998

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. ABANA is communicating again so check it out

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732-842-9355 evonarx@hotmail.com

NJBA Holiday Party!

The holiday party is to be held on December 7th, 3PM at Jan and Marshall's house. Many thanks again, to Marshal and Jan for opening their home to us in the holiday season. Members are asked to also bring various trivets, candle holders, or other holiday items they are making to the party.

Despite the emphasis on blacksmithing, members are encouraged to bring their families. Bring a dish, beverage or dessert. Contact Jan or Marshal for advise on what to bring.

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

Old Time Engine Show at Washingtons Crossing, September 12-14th

This is a great engine show to see with old cars trucks, tractors and small engines. John Chobrda brought his trailer and forge setup to the event for the three days. I went on Friday this year as I was busy for the weekend with work, but it was bad timing. I got to the show and met Mitch Swirsky and Tom Majewski in the tailgating area and made it over to the spot where John sets up near the entrance. All went fine for a little while and I worked with Mitch on forging some bronze bar he had and then it started to rain hard. It was decided to call it a day and I left hoping for better weather next year. Larry Brown

Middlesex County Fair

August 4th –10th East Brunswick NJ

I went to the fair on the last day and when I got there Tom Majewski was working at the forge and David Macauley showed up soon afterwards. I worked in the fire a while as did Tom and David and we had a few young girls come by to try their hand at blacksmithing. The day was heavily overcast and it soon started to rain and we decided to pack up as it was the last day anyway. Larry Brown

Red Mill at Clinton, NJ

This is a yearly meet was on September 28th this year instead of being in August, great idea but it rained. We can't help that but we had a fair turnout of members and tailgaters and had an election for the board members. There was a pretty constant demonstration by various smiths and Bob Bozzay in the shop during the day and a few people visiting during the day stopped by to see what we are all about. Thanks to Eric Cuper and Bob Bozzay for setting up and coordinating the meet. Larry Brown

Peters Valley Ironfest and Pig Roast

The Peters Valley Ironfest and Pig Roast was held on October 11th this year and as usual it was a great time and party. Eric Cuper and Dan O'Sullivan (Both NJBA board members) demonstrated in the shop as the day went on and there was a good size tailgating area. There was an auction of contributed iron work, much from the smiths who taught there over the Summer. As usual the food was GREAT!

This event was a benefit to help the teaching program in the blacksmith shop. I don't know how much they made at the end but I hope it was worth doing so they'll repeat this great event again next year. Keep your eyes on their web site for the calendar of next years classes and sign up for one and increase your skill level. The Web site is; www.petersvalley.org, Phone 973-948-5200

I'll try to see if I can get some pictures and do a better write up for the next newsletter (If you were there with a camera, send me a few pictures). Catch Eric and Dan at the NJBA/PABA meet at Eric's shop in Easton on January 31st! Larry Brown

Better Late Than Never Tuckerton Seaport Report

On May 18 NJBA had a demo at the Tuckerton Seaport in Southern, NJ. The demo was held during their Blues and Wine Festival. The recreated shore community was a different atmosphere than most of our events, and with the food and music it was an enjoyable day.

I forgot or didn't know everybody's names, excuse me as I am bad with names, but I would like to thank everybody who took the time to come out for some forging and fun. It was a nice day even though it as cut short by the weather. I would like to thank John Chobrda for volunteering his trailer and equipment. Tom Majewski

Old Millstone Forge

The Old Millstone Forge Blacksmith Shop and Museum is in the process of restoration and could use the help of all who can donate to the restoration. Ben Suhaka is involved with the site and the restoration and has been a long time member of NJBA. For information about the restoration visit their web site; www.oldmillstoneforge.org and to visit, it is located at North River St., Millstone NJ 08844, phone 908-448-6624 email blacksmiths@oldmillstoneforge.org

Donald Streeter's Approach to Making a Rivet Shear

Donald Streeter showed a different approach to the problem of shearing rivets in his book, Professional Smithing.

Instead of having one tool with multiple uses, he went with a dedicated tool, and if you have a lot of rivets to resize, his method probably works better and would certainly be easier.

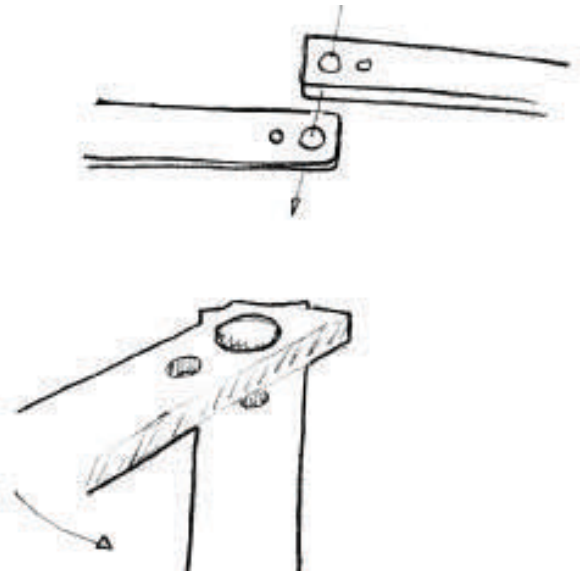
Get two bars of annealed tool steel, 12-18" long. It helps if one of the bars is the same thickness as the rivets you'll need… for example, if you have a bag of 1" rivets and you need them 3/4" long, make one of the bars of your rivet shear 3/4" thick, and one, say 5/8". Inserted one way, the rivet shears at 3/4", but from the other side, it shears 5/8".

Drill a hole at the end larger than the diameter of rivet you have to shear, and pin the two together so that the two bars pivot.

About a half inch away, drill a hole the size of your rivet. It isn't necessary to harden these bars, since rivets are so soft. Drop your rivet in and pull, and you'll get a clean sheared rivet of the correct length.

Of course, you need to make one for each size rivet that you'll be working, but most folks only keep a few sizes of rivets in stock anyway, so three or four of these would cover 98% of your rivet sizing needs.

Hammers Blow 8 3 SUMMER 2000



Donald Streeter's Rivet Shear

Blacksmithing Demonstration
Eric Cuper and Daniel O'Sullivan at Cuper Studios
Saturday, January 31, starting at 9am.

Eric and Dan are teaming up again to present a scintillating demonstration for NJBA, PABA, and others. All are welcome! As always, there will be an Iron In The Hat, tailgating is welcome (try to leave parking spaces in front of the garage doors for tailgaters), and maybe I'll turn the heat all the way up to 60 (don't tell my employees). Coffee and Donuts will arrive at 8:45ish, demos starts at 9ish, lunch and IITH at 12ish, more demos from1 until 4. We usually order out for lunch and request contributions. I only have a few chairs so if you want to sit, you might want to bring a chair.

The Demonstrators

Eric Cuper, an NJBA Board member, began blacksmithing at Peters Valley Craft Center in 1996 (which is where he first heard of NJBA). From there he attended Southern Illinois University at Carbondale to receive his BFA and MFA degrees specializing in blacksmithing. While at SIUC, Eric's forged sculptures were shown nationally and won several prestigious awards. His work can also be found in several books on forge work.

Since 2004, Eric has been operating Cuper Studios LLC in Easton, PA. Cuper Studios is an architectural metalsmithing company currently producing railings, lighting, gates, furniture, fireplace accessories, sheet metal work, sculpture, and other house jewelry. Check out www.cuperstudiosllc.com for some of Eric's work.

Daniel O'Sullivan received a BFA from Parsons School of Design, completed a traditional Ornamental Ironworker Apprenticeship followed by Stage Forge at the International School of French Wrought Ironwork in Muizon, France. He taught blacksmithing in County Mayo, Ireland, and worked for an exclusive European metalworking company. Daniel is now proud to be a Local 483 Union Ironworker and is on the Board of the NJBA.

Eric and Dan are currently planning a team demo to produce a finished piece suitable for auction. A good time should be had by all, hope to see you there.

Directions to Cuper Studios

Shop address is 1301 Lynn Street, Easton, PA 18042. Phone 610-438-8694.
Email: www.ericuper@msn.com

From NJ: Take 22 West into PA. After you leave the toll booth, stay in the right lane. Take the first exit immediately off the bridge. Keep right on the exit, going under 22, to a stop sign. Turn left at stop onto Larry Holmes Drive. Take Larry Holmes Drives thru 2 lights and turn left onto Lehigh Drive (immediately following Wawa strip mall). Lynn Street will be your first right and my building is the first big beige building with maroon trim on the right.

From PA: Take Route 22 East towards Easton. Take the 248/ 25th Street Exit. At the end of the exit turn right onto and follow 25th Street heading South. Turn right onto Lehigh Drive. After the intersection with a stop sign and the bridge for the park, Lynn Street will be the 4th left.

Attention blacksmiths,

The Bethlehem Steel tour is finally here! On November 15th the National Museum of Industrial History will be running a tour of the derelict Bethlehem Steel facility in Bethlehem, PA. It has not been approved by the casino yet but this should not be a problem. The tour will be from 9 to noon and cost $15 in the form of a check made out to the Museum or cash. Please pay upon arrival. You must be able walk and stand for long periods of time, climb stairs and it will be cold and possibly wet. Also, I would like to remind you that this facility has not been maintained for over a decade and safety is of the utmost importance. You will be required to sign a general liability form, wear work boots, steel tips if you have them, a hard hat, long pants and gloves. If you do not have a hard hat, the Museum will provide you with one.

Now for the good stuff. The tour begins @ 9:00 sharp at the NMIH offices in Southside Bethlehem (the address is listed below). From there we will enter the facility and tour the Tool Annex, Blast Furnace "E", the Blowing Engine House, and Iron Foundry. I strongly encourage you to bring a camera and flashlight if you want to be able to see and record everything on the tour.

If you are interested in attending this tour, please contact Calum Learn by phone at 215-489-1742 or via e-mail at cjfdlearn@verizon.net as soon as possible. There are only 20 spots, so please sign up only if you are committed to attending.

Thank you and I hope to see you on the 15th.

Calum Learn

National Museum of Industrial History
530 E. Third Street
Bethlehem, PA 18015

Phone: 610-694-6644
Fax: 610-694-6641
E-mail: nmih@fast.net

Atlantic Coast Blacksmiths Regional Conference

The first Atlantic Coast Blacksmiths Regional Conference (ACBC) was held on September 4th through the 7th at the Ashokan Center outside Kingston NY. For those who attended I have to assume you had a great conference and for those who didn't I'm sorry to say you missed the opportunity. The groups involver in the planning of the conference will soon be considering any site that may be suggested for the next one. So hopefully in two or three years the next one will be held. NJBA should consider being officially involved when the opportunity arises.

Main Pavilion Demo Area

The ACBC began as the groundwork done by the Northeast Blacksmiths Association (NBA) in preparation for the 2008 ABANA Conference. The conference had been approved by ABANA at the 06 conference in Seattle and was to be held on the grounds of SUNY New Paltz. The plans were being finalized with the site and demonstrators were being arranged and then ABANA decided they didn't have the seed money needed to support the conference after problems in Seattle and they pulled the plug canceling their conference.

Green Coal Workshop and Demo Area

ABANA suggested to the affiliates that they have regional conferences without ABANA's assistance. NBA contacted groups from Virginia to New England trying to set up a regional conference based in the planned area. With the response that was received it was decided that a conference would be possible with seed money from the groups that agreed to sponsor the event. It was decided to hold the conference at the Ashokan Field Campus (Now the Ashokan Center) if the limit of 300 participants was set as the site could handle the food, camping and lodging for that many at the facility.

The event sponsors were:
Northeast Blacksmiths Association
New England Blacksmiths Association
Blacksmith Guild of Central Maryland

With the support of:
Connecticut Blacksmiths
Capitol District Smiths
Berkshire Blacksmiths
Blacksmith Guild of the Potomac
Pennsylvania Artist Blacksmiths Association

Demo Tent and Tailgate Area

I arrived the day before to assist in set up as needed. The Ashokan Center is currently comprised of three levels; on the lower level was the dining hall and conference room, the bunkhouse and path to the camping area. The next level normally is a field and a pavilion, but for the conference it had a large tent set up for a demonstration area on the end of the field opposite the pavilion and the field was devoted to being a tailgating area. The upper level had the tent for the green coal training area, an area for the outside food vender (If you didn't use the meal plan) and the centers pewter shop which the display gallery was set up.

There were three main demonstrators, Mark Aspery, Peter Ross and David Norrie. Each demonstrator had three demonstration slots and a talk or slide show held in the evening. There were 4 mini demonstrations by Bob Compton, Fletcher Coddington, Rich Waugh and Bill Clemens. There were four one hour lectures by Fletcher Coddington, Bob Bergman, Dave Caccamo and Mike Sarri. I attended one demonstration by Peter Ross, two by Mark Aspery, two by David Norrie and part of a design lecture by Dave Caccamo. These were up close easy to see demos making the conference a great experience. After lunch on Sunday the entire site was broken down and packed away except for the tents, which had been set up by a rental place, and the last of us started to go home.

There was a gallery set up in the building the center usually uses as a Pewter shop. Many smiths brought work to display and the demonstrators judged the pieces and gave their picks. There was a lot of high quality work in this small area!

Peter Ross X Garnett Hinge

I haven't had time to write up Peter's demo from my notes and Marshals, I hope to by next newsletter. I watched this part of the demo, but I only watched parts of his following demos. So much to see! For the demo Peter made a X Garnett hinge which is a product originally imported in large quantities from England. These were made in small workshops and shipped to America by weight and sold by size.

Mark Aspery Forging Techniques

Mark is a European Journeyman Blacksmith currently an associate of the Worshipful Company of Blacksmiths in the United Kingdom. He currently owns and operates the Mark Aspery School of Blacksmithing in California. Throughout the demonstrations Mark produced a large number of items, A welded rose hip, a collar on a square bar, a leafing hammer, a chisel, a swage and a crimping stake. He then used these items to make a water leaf. For his lecture he discussed heat treating and case hardening. Mark gave a great high energy demonstration that I enjoyed every minute of.

David Norrie Architectural Ironwork

David was originally from Canada but has been in Boulder Colorado since 2001. He runs a three man shop making architectural ironwork. His demo was to recreate the center parts of a railing he designed showing how to make the symmetrical pieces and allowing the correct amounts of material for forging.

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

Brookfield Craft Center
286 Whisconier Road
P. O. Box 122
Brookfield, CT 06804-0122
203.775.4526

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

If any members have a forge at home and work in the evenings or weekends and want to open it up to help a few local guys, let me know, Larry Brown, editor, as we get requests from members who have a hard time traveling to some of the open forge locations.

Business Members

We would like to thank those who joined with our new Business Membership category .
Business dues are $40
Please show them our support

John Chobrda, Pine Barrens Forge
231 Morrison Ave., Hightstown, NJ 08520
609-443-3106 JChob@earthlink.net
Grant Clark, GWC Forge
PO Box 158 Perrineville NJ 08535
732 446-2638, 732 446-2638
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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
Louise Pezzi, Blacksmith
1241 Carpenter St
Philadelphia, PA 19147
215 336 6023 pezziandjr@gmail.com

Search

I am looking for a #250 fisher anvil in good shape. If you have one for sale or run across one, contact me; Larry Brown, NJBA Editor. (718) 967-4776

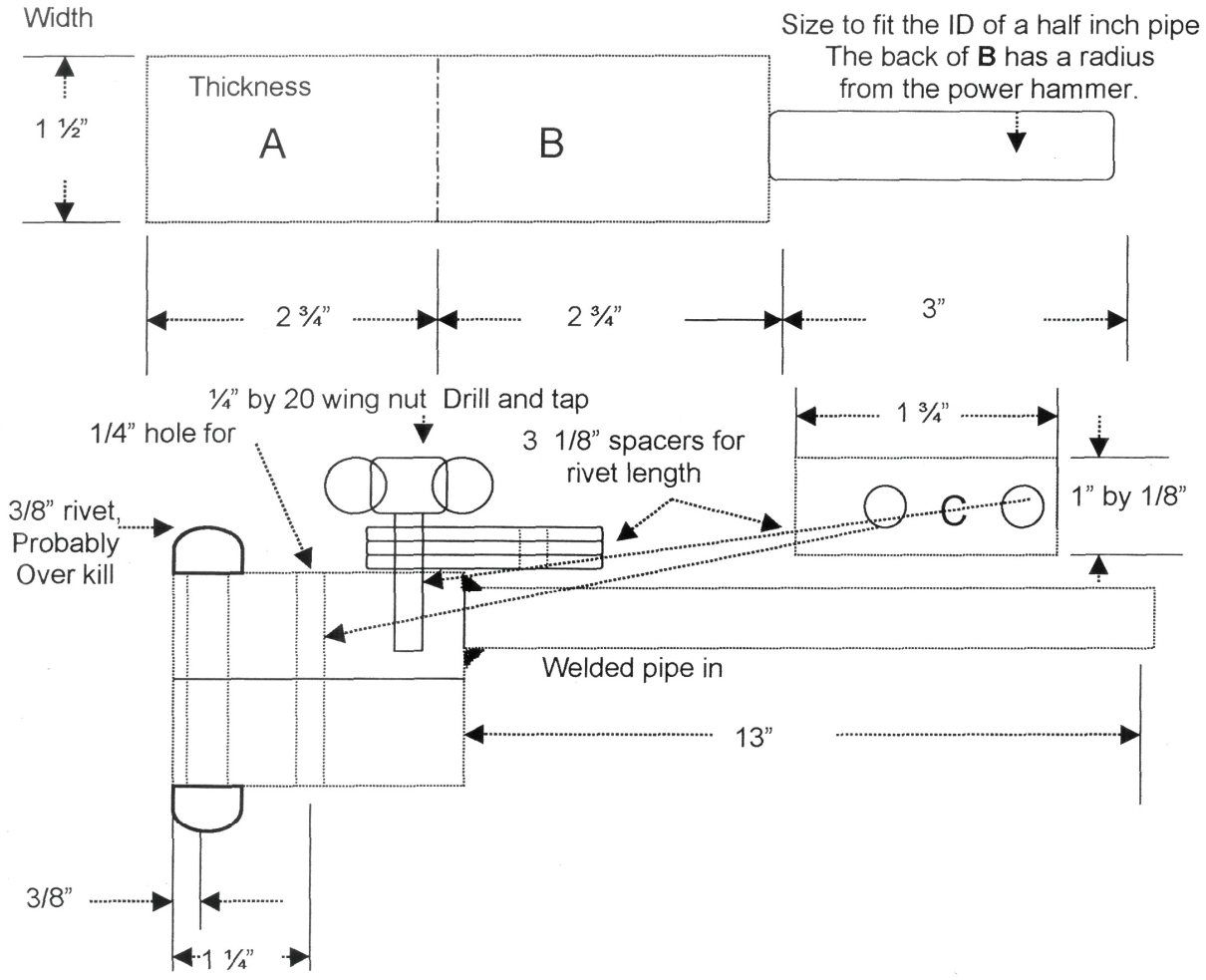
BLACKSMITH TOOLS FOR SALE!
John Chobrda
Has a large selection of tools for sale.
Anvils – Forges - Leg Vices—Blowers
Tongs – Hammers
and/or resurfaced Anvils
Call John for prices and availability
Evening 609-610-3501

Making a Rivet Shear

by Rick Hartline, NC ABANA

I was in need of rivets of several lengths so I thought it might be practical to make a rivet shear. It worked out well. I wrote this article for anyone who might want to make one. All measurements are for general guide purposes as measured from my finished shear.

Start by using a piece of tool type steel, (I used a piece of jack hammer bit). Draw it out to a rectangle with a tang to fit into a ½ inch pipe. Cut/ saw at **A/B**. **NOTE**: The final thickness of **B** is determined by the shortest rivet length to be cut. I used ½" for both but you may want to thin **B** after cutting.



What do you do when you're 'stuck' for a good design idea?

Back off, do something else, or put off working on it for a day. You'll see it in a new way when you get back to it. Work backwards, removing some of the layers of the design, then start rebuilding it in a new way. Start over using a new approach, but incorporate some elements of the original idea. Jerry Hoffman

Here is something I do with my students. Get a piece of paper, and make lines. At first, there are only scribbles, but then... a rabbit or perhaps a candlestick. I call this the "school of looking." Most people run around with closed eyes, but designs are everywhere. Sometimes the designs are very small… once I did a piece for a doctor , so I found pictures of cells through an electron microscope, and designed from there. It wasn't my idea... God made it. Get out and look... work with open eyes. Manfred Bredohl

When stuck for a design idea, my advice is above all, be persistent, keep trying for the 'right' idea. Alternatively, give it a break and relax, then try again later. Look to nature, to history, to whatever inspires you. Sometimes that muse is just plain hard to find, keep looking. And draw. Draw and draw and draw. I use a cheap fax/copy machine to 'freeze' drawings before I change them and tracing paper to make changes, etc. Though its true that the first idea is often the best, it often needs a lot of evolution to make it work at a specific site. Scott Lankton

When I'm stuck on a design, I stop what I'm doing & go on to something else. Then I come back later, sometimes the same day, or it may be several days. Regardless, I just wait until I feel the urge to finish the design work. Good designs flow, they can't be forced. Enrique Vega

•When I am stuck for a good design idea, I go to Francis Whitaker's books, the Schmirler books, Yellens stuff and I look at the examples. I always find something that will be fun, different and fill the bill. I never stay stuck long...ever. Dorothy Stiegler

I often ask my students to consider certain design exercises by requiring them to write down the design criteria before drafting an idea: How must it function and how should it relate to a given piece of architecture or a specific site? … dozens of details, not yet considered, quickly stack up on the paper. Carefully noting all the functional and aesthetic requirements clears the mind of superfluous ornament, allowing room for essential expression. This process results in details that enliven the piece and, due to their necessity, are inexplicably missed when they are not present at all. When this list is drawn up, often an appropriate design unfolds almost miraculously.
Tom Joyce, from an interview by Rob Edwards, Anvil Magazine, October 1999

I start by clearing my desk for action, getting rid of extraneous material, sharpening my pencils, getting my favorite pens all laid out and ready to use. I make myself a nice cup of tea. I play music that inspires me. I may get out some books and just spend some time looking through them. I doodle, write notes to myself on rolls of architects tracing paper (cheap). I lay out the pictures that I have taken of the site. With my new digital camera I can tape a blown up picture to my desk, cover it with tracing paper and doodle designs imposed upon the building, or inside in the kitchen, fireplace, etc. Finally, I trust my dreams. If I go to sleep thinking about the design problem for several nights, I will surely dream some answers in the early morning. Then after doing step number one above, the rest is a cinch.... Nol Putnam

Heat-"Treating Data for Selected Tool Steels

(All temperatures are in °F)

Steel Notes	Forging Tempera-ture (start/stop)	Anneal From	Harden From'	Quench In	Temper Tem-perature'
W-1, W-2	1900-1825/1500-1450	1425-1400	1450-1410	water/brine	300-600, 3
0-1	1900/1500	1450	1475	oil	300-6005,8
0-6	1950/1500	1500	1450-1480	oil	300-1000, 4,8
L-6	1900/1650	1375	1500-1550	oil	200-700
A-2	2050/1700	1650	1775	air	300-1300, 4,5,8
A-6	2025/1675	1375	1525-1600	air	200-1000, 5,8
D-2	2050/1700	1650	1850	air	900-1200(900-960 Rc59)4,5,6,7,8
D-3	1900/1700	1600	1740	warm oil	400-1300, 5,8
D-5	2000/1750	1650	1850-1875	air	300-1000,4,5,7,8
S-I	2100/1660	1475	1750	oil	300-1200, 4,9
S-3	1900/1700	1375-1525	1600 (1450)	oil (water)	300-400, 10
S-5	1950/1650	1450	1600	oil	300-1300, 9
S-7	2050/1700	1550	1725	air <2' inch	300-1300, 4,5,6
H-13	2150/1650	1600	1850	air	1050-1150, 4,5
6150	2250/1950	1550	1550--1600	oil	400-900

Notes:

1. Variations in temperature may depend on size, and higher temperatures may give greater hardness at the expense of in-creased grain size.
2. Higher temperatures give higher toughness and lower hardness. Generally the lowest temperature gives about Rc 60 and the highest about Rc 30.
3. W-1 and W-2 come in different carbon contents. The higher the carbon, the lower the forging, annealing, and hardening tem-peratures. This also applies to the SAE 10xx carbon steels.
4. Steel needs an intermediate temperature (about 1200°) soak before heating to final hardening temperature.
5. Controlled atmosphere furnace preferred, but packing in a neutral medium like cast iron chips is also possible to prevent decarburization. Air hardening steels may be wrapped in stainless steel foil during heating to prevent decarburization and scaling.
6. Large sizes (generally >2 1/2-- 6 inches) are quenched in oil
7. Draw temper twice, with the second draw about 50° lower than the first.
8. Furnace cooling required for annealing (20 °F/hour maximum). It is not realistically possible to anneal these steels properly in a blacksmith shop.
9. May be quenched in water for simple sections.
10. There are different heat-treating procedures (oil/water/case harden/temperature) available for different purposes.

Submitted by Jan Kochansky Blacksmith Guild of the Potomac March/April 2007

ALLOY CONTENT OF VARIOUS TOOL STEELS SUPPLIED BY NOTED KNIFE SMITH

WAYNE GODDARD

	C	Mn	Si	Cr	Ni	Mo	Co	V	W
Vascowear	1.12	0.30	1.20	7.75	/	1.60	/	2.40	1.10
A-7	2.25	0.70	0.40	5.25	/	1.15	/	4.75	1.25
T-15	1.50	0.25	0.25	4.50	/	0.50	0.50	5.00	12.50
M-2	0.85	0.25	0.25	4.00	/	0.50	/	1.90	6.00
BG-42	1.15	0.15	0.30	14.50	/	4.00	/	1.20	/
CPM T440-V	2.20	0.5	0.5	17.50	/	0.50	/	5.75	/

	C	Mn	Si	Cr	Ni	Mo	V	W
1095	0.95	0.40	/	/	/	/	/	/
52100	1.10	0.35	0.35	1.50	/	/	/	/
O-1	0.90	1.60	/	0.50	/	/	/	0.50
L-3 (BB)	1.00	/	/	1.50	/	/	0.20	/
L-6	0.75	0.70	0.25	0.80	1.50	0.30	/	/
Alpha Knife– Champaloy	0.66	0.39	0.20	0.74	1.47	0.12	/	/
8670M	0.75	0.50	0.25	0.40	0.80	0.08	/	/
Large Round-saw Uddeholm	0.80	0.30	0.25	0.20	2.20	/	/	/
Sandvik Bandsaw 15N20	0.75	0.25	0.35	/	2.00	/	/	/
5160	0.60	0.80	/	0.80	/	/	/	/
W-2	1.00	0.35	0.35	/	/	/	0.20	/

Shady Grove Blacksmith Shop . Dick Nietfeld . www.blksmth.com 4/11/2007

HEAT TREATING STEEL - QUICK GUIDE

Temperatures in Degrees Fahrenheit

Type of Steel	1045	1095	4140	5160	52100	L6	O1	A2	H13	S1	S7
Quenching medium	Water	Water	W& Oil	Oil	Oil	Oil	Oil	Air	Air	Air/ Oil	Air/ Oil
Forging Preheat	None	None	1250	None	None	None	None	1250	1400	None	None
Not Over	2275	2100	2250	2200	2100	2000	1950	2000	2100	2050	2050
Not Under	1600	1500	1600	1600	1700	1550	1550	1700	1650	1600	1700
Normalizing (Air)	1650	1575	1600	1600	1625	1600	1600	Do Not	Do Not	Do Not	Do Not
Annealing:	1550	1475	1550	1450	1450	1400	1400	1800	1600	1475	1500
Down To	1200	1200	1200	1200	1275	1000	1275	1000	1000	1000	950
Max. Drop/Hour	50	50	25	Air cool	10	40	40	20	50	40	25
Preheat Soak	None	None	None	None	None	None	1200	1200	1175	1200	1250
Hardening Temp	1550	1475	1575	1525	1550	1550	1475	1750	1700	1700	1725
Low Temp Required before Tempering	100	150	150	150	125	125	175	150	125	150	150
Tempering: After Quenching Temper All to At least 300 Degrees F											
45RC	600	800	750	425	800	1000	Not Rec	1200	1100	1100	1150
50RC	400	700	600	350	650	900	Not Rec	900	1050	800	875
55RC	As Quen ched	600	As quen-ched	300	500	700	600	550	As Quen-ched	450	600
60RC		400		As Quen ched	350	400	475	400		As Quen-ched	300
62RC or Higher		As Quen-ched			As Quen-ched	As Quen-ched	As Quen-ched	As Quen-ched		As Quen-ched	As Quen-ched

Industrial heat treating practices such as soak times, Variations for steel thickness, alternate hardening temperatures, alternate quenching mediums and temperatures, various annealing practices and more accurate tempering temperatures will be

EFFECTS OF COMMON ALLOYING ELEMENTS IN STEEL

By definition, steel is a combination of iron and carbon. Steel is alloyed with various elements to improve physical properties and to produce special properties such as resistance to corrosion or heat. Specific effects of the addition of such elements are outlined below:

Carbon (C) is the most important constituent of steel. It raises tensile strength, hardness, and resistance to wear and abrasion. It lowers ductility, toughness and machinability.

Manganese (Mn) is a deoxidizer and degasifier and reacts with sulfur to improve forgeability. It increases tensile strength, hardness, hardenability and resistance to wear. It decreases tendency toward scaling and distortion. It increases the rate of carbon-penetration in carburizing.

Phosphorus (P) increases strength and hardness and improves machinability. However, it adds marked brittleness or cold-shortness to steel.

Sulfur (S) improves machinability in free-cutting steels, but without sufficient manganese it produces brittleness at red heat. It decreases weldability, impact toughness and ductility.

Silicon (Si) is a deoxidizer and degasifier. It increases tensile and yield strength, hardness, forgeability and magnetic permeability.

Chromium (Cr) increases tensile strength, hardness, hardenability, toughness, resistance to wear and abrasion, resistance to corrosion, and scaling at elevated temperatures.

Nickel (Ni) increases strength and hardness without sacrificing ductility and toughness. It also increases resistance to corrosion and scaling at elevated temperatures when introduced in suitable quantities in high-chromium (stainless) steels.

Molybdenum (Mo) increases strength, hardness, hardenability, and toughness, as well as creep resistance and strength at elevated temperatures. It improves machinability and resistance to corrosion and it intensifies the effects of other alloying elements. In hot-work steels and high speed steels, it increases red-hardness properties.

Tungsten (W) increases strength, wear resistance, hardness and toughness. Tungsten steels have superior hot-working and greater cutting efficiency at elevated temperatures.

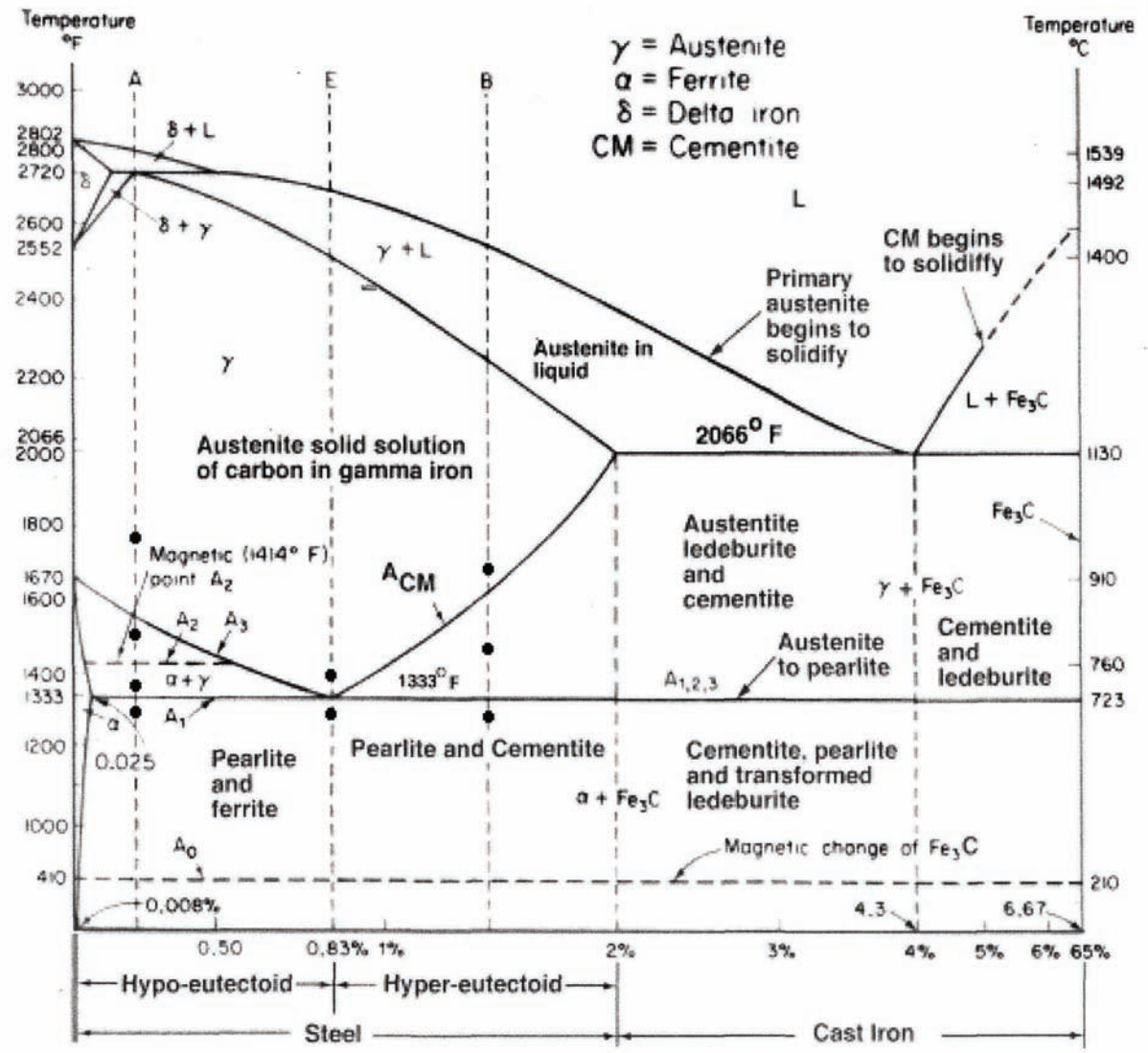
Vanadium (V) increases strength, hardness, wear resistance and resistance to shock impact. It retards grain growth, permitting higher quenching temperatures. It also enhances the red-hardness properties of high-speed metal cutting tools.

Cobalt (Co) increases strength and hardness and permits higher quenching temperatures and increases the red hardness of high speed steel. It also intensifies the individual effects of other major elements in more complex steels.

Aluminum (Al) is a deoxidizer and degasifier. It retards grain growth and is used to control austenitic grain size. In nitriding steels it aids in producing a uniformly hard and strong nitrided case when used in amounts 1.00% -1.25%.

Titanium, Columbium, and Tantalum (Ti, Cb, Ta) are used as stabilizing elements in stainless steels. Each has a high affinity for carbon and forms carbides, which are uniformly dispersed throughout the steel.--Thus, localized precipitation of carbides at grain boundaries is prevented.

Lead (Pb) while not strictly an alloying element, is added to improve machining characteristics. It is almost completely insoluble in steel and minute lead particles, well dispersed, reduces friction where the cutting edge contacts the work. Addition of lead also improves chip-breaking formations.



IRON-CARBON CEMENTITE PHASE DIAGRAM

I highly recommend an excellent book on heat treating tool steels titled:

Heat treatment selection and application of tools steels by Bill Bryson. Published by Hanson Gardner publications, published 1997

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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/>

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New Jersey Blacksmiths Association
Attn: Larry Brown, Editor
90 William Avenue
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