Saltfork Craftsmen

Artist-Blacksmith Association

January 2009

Snowman drawn by Ricky Nusbaum Thanks Ricky for all the holiday sketches they are really great.

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The Saltfork Craftsmen Artist-Blacksmith Association, a non-profit organization of amateur and professional artist and craftsmen, publishes this newsletter monthly. Our purposes are the sharing of knowledge, education and to promote a more general appreciation of the fine craftsmanship everywhere. We are a chapter of the Artist-Blacksmith Association of North America.

Visit our Saltfork Craftsmen Website:
www.saltforkcraftsmen.org

Trading Post

For Sale:
¾" round bar of 5160 ($3.30 per foot plus shipping)
¾" and 1" round bar of 52100 ($6.00 and $9.45 per foot plus shipping) Contact Ray Kirk, ray@rakerknives.com or 1-918-456-1519

Army surplus round nosed pliers that make good scroll pliers for small items. They are 6" long $5.00 each plus shipping. I also tie brooms on your handle or mine. $20.00 plus shipping. Diana Davis 580-549-6824 or lazyassforge@tds.net

Due to health problems, I have decided not to rebuild any more Little Giant hammers. I have for sale: One decent used 100# hammer ($3,500), one completely rebuilt 50# hammer ($4,500). One good condition used 50# hammer (3,500). One early style rebuildable 50# hammer ($1750), and one transition style rebuildable 50# hammer ($2,250). I have some miscellaneous parts, dies, babbit mandrels, and etc. for sale. Contact Mike George at 580-327-5235 (home), 580-829-1968 (cell) or Mike-marideth@sbcglobal.net

Wanted:
Advertising Coal Hammers, Contact Mike George at 1-580-327-5235or o Mike-Marideth@sbcglobal.net

Complete blacksmith line-shaft. Good Running Condition with post drill, pedestal grinder/wire wheel and 40 lb Perfect Power Hammer, Lots of extras, Call for info. 817-329-5297 Jim White

Club Coal

Saltfork Craftsmen has coal for sale. Coal is in 1-2" size pieces The coal is $140.00/ton or .07 /pound to members .No sales to non-members.

NW Region coal location:
Bring your own containers. Contact Tom Nelson at 1-580-862-7691 to make arrangements to pick up a load. **DO NOT CALL AFTER 9 P.M.** If you make arrangement well in advance, Tom can load your truck or trailer with his skid steer loader. Otherwise you will need to bring a shovel. The coal can be weighed out at the Douglas Coop Elevator scales.

S/C Region coal location: Coal is in 1-2" size pieces. Bring your own container. The coal is at Max Scrudder's place in Mountain View. Contact Max for load out instructions.
Max Scrudder can be contacted at (405) 226-9951

NE Region coal location: Dan Cowart also has coal to sell. He can be contacted at dacowart@dishmail.net or CowartPat@gmail.com

We are currently sold out of SCABA swage blocks. Look for information about new shipments in future newsletters.

Mail your ads to the editor or email them to lazyassforge@tds.net

MEETING SCHEDULE

January

NE Regional meeting (Jan, 10) will be hosted by Gary Gloden. Lunch will be provided but bring a side dish. Trade item is a letter opener. Look for a map to their home in back of newsletter.

S/C regional meeting (Jan 17) will be hosted by JC Banks. The meeting will be held at his home North of Altus, Ok. There will be a spring swage making workshop. Bring any ideas you have or patterns that you want to make a swage for. Suggestion would be a ball, acorn, leaf, etc. Lunch will be provided but bring a side dish to help out. JC's address is 2 miles east of the altus airport on county road 160, then turn south on county road 206. First house on the west side of the road.

SE Regional meeting (Jan 3rd) The meeting will be hosted by Howard Bost .North of Paris Texas. Lunch will be provided, bring a side dish to help out. Plenty of room to set up your forge so bring your forge and plan to enjoy a day for forging.

NW Regional meeting date (open)

February

SE Regional meeting (Feb, 7) Hosted by Howard Bost at his shop North of Paris Texas. Lunch provided, trade item will be something made from a horseshoe. Bring your forge and come enjoy the day.

NE Regional meeting. (Feb 14) open at this time.

S/C Regional meeting (Feb 21) Hosted by Gerald Franklin at his shop east of Duncan, Ok. Lunch provided. Trade item is a forge/fire tool.

NW Regional meeting (Feb 28) Hosted by Ron Lehenbauer at his home at Wakomis, Ok. Lunch is on your own. Brown bag or there are two café in town. Trade item is anything you would be proud enough to take home. Matt Wills from Kansas will be coming down and doing a rose making demo. Matt makes some really nice roses. The demo will start at 10:00 am.

*****Look for maps to meeting locations in back of newsletter.*****

NE Regional meeting at Charlie McGee's

There were six members and three visitors at the meeting. Lunch was beans and cornbread which went great on the windy, cold Oklahoma day. Charlie chose a bell for the trade items and all of them were good examples of the pride and effort we all put forth.

We are looking forward to the next meeting. Karen McGee

The Saltfork Scholarships / Grants Program and Application:
[Don Bellah Memorial Scholarship]

Since founding in March of 1995, the Saltfork Craftsmen ABA has been committed to high quality educational opportunities for our members and our region. The purpose of the Don Bellah Memorial / Saltfork Craftsmen ABA Scholarship / Grants Program is to provide Club Members with financial assistance toward that end.

The Scholarship / Grants Program will provide funding each year to aid in increasing skills and abilities through participation in schools, conferences, or special classes. The total amount of funding and the distribution limit per person / application will be set annually at the First Board / Trustees Meeting. Unused monies will be rolled over for use the following year.

Because the Saltfork Craftsmen ABA desires to promote and sustain an interest in blacksmithing and other crafts, funding is available to interested blacksmiths, blacksmith educators, other craftsmen, and other craft educators at all skill levels – novice to journeyman.

Requirements for Selection of Scholarship / Grant Funding:

The applicant must be an active member of the Saltfork Craftsmen ABA for at least one year – 12 consecutive calendar months. The applicant must have attended at least 4 general or area Saltfork meetings in the past 12 months.

The applied for conference, school, or class must be deemed to also be of benefit to other members of the Saltfork Craftsmen ABA by the Scholarship / Grant Committee. The school, class, or conference is not limited to just blacksmithing.

As long as funding is available, applications will be considered once each quarter of the calendar year at the Saltfork Board / Trustees meetings.

Should there be more applications than there is money available in the Scholarship / Grant fund, applicants will be selected by drawing of names and the funds divided by the Scholarship / Grant Committee.

Recipients of previous Scholarship or Grant awards are not eligible to submit another application for two years after the completion of the conference, school, or class and fulfillment of the Applicants Responsibilities listed below.

Applicant's Responsibilities for Selection of Funding:

As a condition of receiving Saltfork Craftsmen ABA Scholarship / Grant funding, all recipients are required to share the results of their learning with other Saltfork members.
The recipient is further encouraged to share this learning with other ABANA Chapters and / or ABANA proper.

The recipient will fulfill this responsibility by at least two of the following forms of presentation:

A public demonstration, lecture, or organized workshop at a General Meeting of the Saltfork Craftsmen ABA covering what was learned in the class or conference.

The submission of an article for the Saltfork Newsletter and / or ABANA or other artist-blacksmith association newsletter or related publication.

Making and donating an item for the Annual Conference "item in the hat" or other Saltfork Auction. The item should be from the class or conference. Money received from this item, if auctioned, will be added to the Scholarship / Grant Program account.

The fulfillment of the Applicant's Responsibilities, as listed above, must be completed within 6 calendar months after the course of study is completed.

The Saltfork Craftsmen ABA Scholarships / Grants Committee will have the final say as to whether the requirements are deemed as being met.

Don Bellah Memorial / Saltfork Craftsmen ABA Scholarship / Grant Application Form

[Please type or print all application data clearly]

Name: _____

Address: _____

_____

City, State, Zip Code: _____

Member of Saltfork since: Month, Day, Year _____

Telephone: Home _____ **Work** _____

E-mail: _____

Have you applied for Saltfork Craftsmen ABA Scholarship / Grant Funding in the past?

Yes _____ **No** _____. **If Yes, date you applied:** _____

Results of that application _____

Describe the School, Conference, Workshop, or Class for which you are seeking Saltfork funding. List the location, dates, and published cost. If known, list whom the instructor(s) will be. Attach a Conference, Workshop, School, or Class flyer (or copy) if possible. State how you plan to fulfill the Applicant's Responsibilities. Use the back of this sheet and additional paper as necessary.

_____

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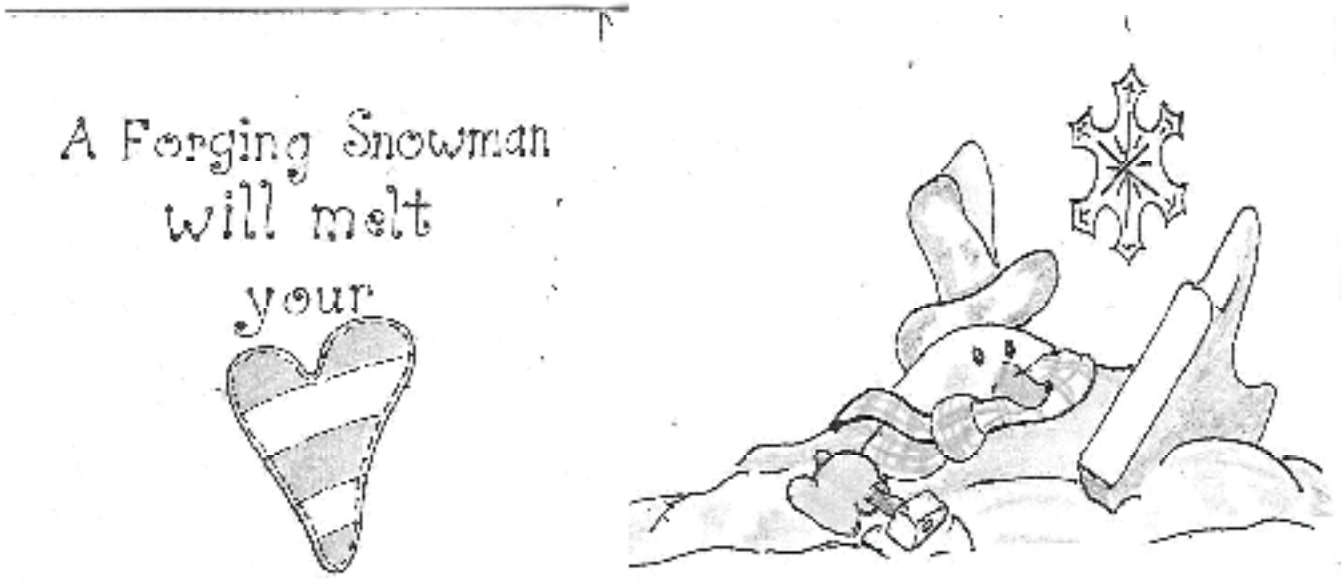


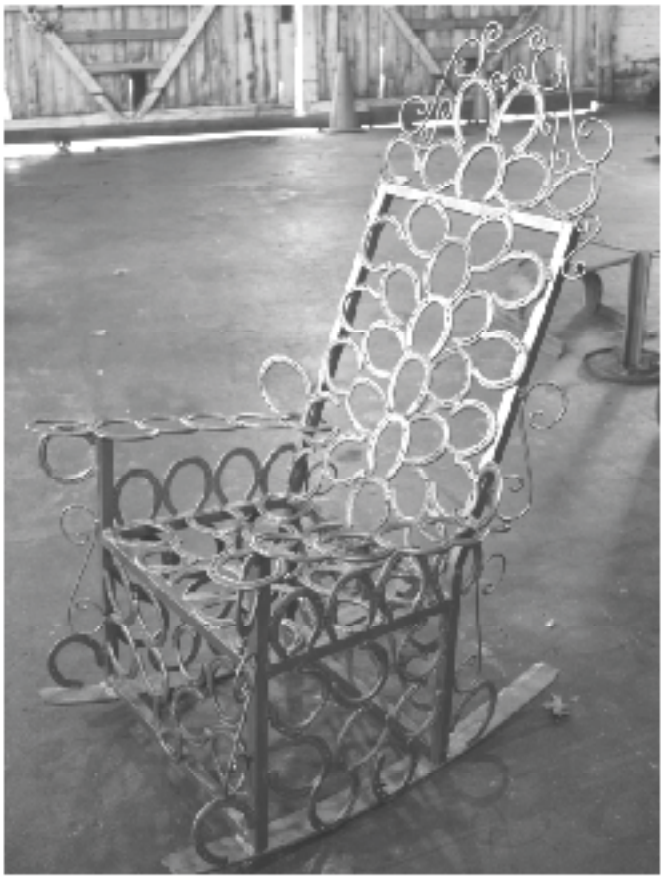
Southeast Saltfork group forges leaves and barstools in Paris.

By James Allcorn

The Southeast chapter of Saltfork Craftsmen met on December 6, 2008 at Cindy and James Allcorn's Bois d'Arc Forge Blacksmith Shop, located in the historic downtown section of Paris, Texas. Subject of the meeting included forging barstools by James Allcorn and a forged leaf demonstration by Bill Kendall.

We had a good meeting with eleven participants. Melvin White, Howard Bost and Jerry Cauble expressed interest in hosting meetings in the future. Howard passed around maps to his place in Northwestern Lamar County (Texas) as he laid the groundwork for the January 3 meeting he plans on hosting.

Howard Bost brought his horseshoe rocking chair, made from 190 used horseshoes. This chair got quite a few comments, especially from the visitors we had stop by the shop during the meeting. I got a kick out of Howard telling about his SF newsletter being delivered late last month and he allowed how he looks forward to it each month as being, "The highlight of his month" and he tries making all the projects diagrammed in it.



The meeting kicked off at 9 a.m. sharp and the main project for the day was construction of a barstool after a pattern I had recently made for a client. We began with a short discussion on the many ways one could adapt this project by using twists and other methods of making the stools decorative. While we didn't get completely finished with the project, we got far enough to demonstrate all the steps involved and it was my impression from the group that they enjoyed the start-to-finish concept. The work involved using coal and gas forges, hand hammer work, power hammer work, MIG welding and scroll bending on two different jigs.

About 10:30 several groups of visitors came into the shop to look at the goings on and some stayed and watched as long as 30 or 40 minutes. I think 14 or 15 visitors total came in. One group of 6 or 7 stayed to watch as we bent hot scrolls just out of the gas forge in 3-D around the 16" pipe jig. Too bad I didn't get a picture of that but too much was going on.

After lunch, Bill Kendall demonstrated his leaf technique from the Campbell folk school. This is a project several of us are going to try it out in the coming week. Bill does really good work and if you haven't seen him use a hammer, he is very deliberate and does not waste any effort. Bill is an excellent demonstrator who makes each step clear with before and after comments to ensure his audience does not miss even the smallest detail.

As is normal for a Saltfork meeting, several members pitched in and helped me with holding hot work, positioning pieces for welding, scroll making, etc. Since I usually work alone, it was really enjoyable to get to work with other smiths and their ideas and comments during the process were welcome and quite helpful.

At the end of the day, a good discussion was held on patinas and the various chemicals that can be used to remove scale prior to application of patinas and ways to produce various finishes. During this discussion I demonstrated the use of a pneumatic air needle scale-removing tool to quickly remove rust, dirt, old paint or weld

slag in preparation for finishing. Other methods such as chemical baths, sandblasting, wire brushing, etc. could also be used to prep the metal for finishing. We discussed various finishes including rust patinas, painting, dry-brush painting techniques and products for sealing patinas.

Jerry Cauble, Howard Bost, Larry Strohm, Alan Hamn, Cedric Cope and Bill Kendall assembling a scroll on the barstool.

NORTH EAST REGIONAL MEETING DATES

January 10, 2009
Host: Gary Gloden

February 14, 2009
Host:

March 14, 2009
Host: Dan Cowart

April 11, 2009
Host:
Phone #:

May 16, 2009
Host: *State meeting*
Phone #:

June 13, 2009
Host:
Phone #:
Trade item:

July 11, 2009
Host:
Phone #:

August 8, 2009
Host:
Phone#

Sept. 12, 2009
Host: Dan Cowart
Phone #:
Trade item

October 17-18, 2009
SCABA Conference

November 7, 2009
Host:
Phone #:
Trade item

December 12, 2009
Host:
Phone #:

NORTH WEST REGIONAL MEETING DATES

January 24, 2009
Host:

February 28, 2009
Host: Ron Lehenbauer

March 28, 2009
Host:
Phone #:

April 25, 2009
Host: Phone #:

May 16, 2009
Host: State meeting –No regional meetings
Phone #:

June 27, 2009
Host:
Phone #:

July 25, 2009
Host:
Phone #:

August 22, 2009
Host:
Phone #:

Sept. 26, 2009
Host:
Phone #:

October 17-18, 2009
SCABA Conference

November 28, 2009
Host:
Phone #:

December 26, 2009
Host:
Phone #:

SOUTH CENTRAL REGIONAL MEETING DATES

January 17, 2009
Host: JC Banks
Phone #

February 21, 2009
Host: Gerald Franklin
Phone #:

March 21, 2009
Host: Terry Jenkins
Phone #

April 18, 2009
Host:
Phone #

May 16, 2009
Host: State picnic at Norman
No regional meetings

June 20, 2009
Host:
Phone #:

July 18, 2009
Host: Max Scrudder
Phone #:

August 15, 2009
Host: Richard Simpson
Phone #:

Sept. 19, 2009
Host: Anelia Hadick (?)
Phone #:

October 17-18, 2009
Host: : SCABA Conference Perry, Okla.

November 21, 2009
Host: Bill and Diana Davis
Phone #: 580-549-6824

December 19, 2009
Host: Anelia Hadick
Phone #:

SOUTH EAST REGIONAL MEETING DATES

January 3, 2009
Host: Howard Bost
Phone #:1-903-785-0864

February 7, 2009
Host: Howard Bost
Phone #: 1-903-785-0864

March 7, 2009
Host:
Phone #:

April 4, 2009
Host:
Phone #:

May 16, 2009
Host: State meeting in Norman Ok

June 6, 2009
Host:
Phone #:

July 4, 2009
Host:
Phone #:

August 1, 2009
Host:
Phone #:

Sept. 5, 2009
Host:
Phone

October 3 2009
Host:
Phone #:

November 7, 2009
Host:
Phone #:

December 5, 2009
Host:
Phone #

South/Central Regional meeting….

Anela, Kent and Brahk Hadick hosted the meeting at their home in Midwest City. When we left the weatherman was still saying that the cold front wouldn't come through that area until mid afternoon so we thought we would have a few hours of reasonably warm temperatures and light winds. Well you know about weather men. They missed their timing by a long ways. We arrived at Anelia about 9:00 AM and the wind was starting to change directions and get up at that time. Within an hour it was definitely COLD and WINDY.

Kent had his forge going and was forging on something, not sure what. I think is was more for heat than forging. They also have a pit fireplace out beside the building and it was going strong. Several members took advantage of the heat through out the morning. There wasn't a lot of forging going on, mostly just drinking coffee or hot chocolate and visiting. There was a nice selection of items on the table for trade.

Brahk had chosen a vessel as the trade item during the meeting last year and everyone had a whole year to figure out what type of vessel they wanted to make. There were boxes, bowls and vases and even a copper canoe.

Those not standing around outside where staying out of the wind inside the building.

About 10:30 Brahk started a second forge and soon Bill Davis was pounding out hot metal. He did a brief demo on forge welding.

At noon we all enjoyed a bowl of chili and some rice and sausage casserole, both hit the spot and helped to warm everyone up. Your editor had given up on staying warm outside and had gone inside to visit and watch Teresa make wire wrapped rings and pendants. After lunch the hardier ones went back outside to finish forging. Everyone decided that it wasn't going to get any warmer and by 3:00 were starting to say their good by and head for home. Anela requested a meeting date during a warmer part of the year She will probably get her pick of months seeing as the calendar is far from filled up.

Steels Useful for Tools

by Dave Smucker
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Appalachian Area Chapter of Blacksmiths

What is important in a tool steel? Why do we have so many different types?

Well, mostly because no one steel can do all things for all people and do it at a low cost. It is kind of like you can have a hard steel, a tough steel, a low distortion steel, a lower cost steel pick any two of the four. In other words, a steel can be designed for a given application -- but usually is a mixture of various trade-offs.

If you want to select a steel for a given application or tool, you need to look at the following characteristics:

1. Heat resistance or hot hardness. How does it perform at higher temperatures? Can we use it on hot metal?
2. Shock resistance. How tough is the steel? How strong? What is the depth of hardness?
3. Wear resistance. How well does it handle abrasion, how well does it hold an edge? How hard is it?
4. Machinability. How easy is it to saw, drill and machine in its soft or annealed state?
5. Forgeability. How easy is it to forge? How small is the forging temperature range? Does it go "hot short"?
6. Ease of heat-treating. What is used to quench from critical temperature: water, oil, air, etc.? How prone to cracking is the steel on quenching? How much does it distort?
7. Availability. While cost is a factor, in most cases "availability" to the blacksmith in small quantities and reasonable sizes is the big issue. In addition, can we find the material as scrap?

How do alloying elements affect these characteristics?

Carbon (C) is the basic element that gives tool steels their hardness and lets us do the heat-treating. It is essential in low alloy tool steels -- needs to be 0.60 percent (or 60 points) and higher. At the high end of the percentage range, up to 1.00 percent plus (100 -- points of carbon) it adds considerably to the wear resistance. It is the element that makes the very important blacksmith tool steel W1 what it is.

Manganese (Mn) improves forgeability and reduces brittleness. In low alloy tool steels, it may allow the use of oil for quenching in some applications.

Silicon (Si) is not a major element in most tool steel but is important in their manufacture as a deoxidizer. In conjunction with Manganese, it is important in S5, which is an extremely tough Silicon-Manganese tool steel with outstanding shock and abrasion resistance. S5 was the tool steel most favored by my pre-retirement employer (Alcoa) for use in air hammer tooling used by the brick masons. Alcoa uses a great number of these tools in rebuilding melting furnaces.

Tungsten (W) is a very important element in many tool steels giving both hot hardness and wear resistance. T1 (18.0 percent Tungsten) was the first of the high-speed tool steels used for cutting tools in machine shops. It has been around since about 1900.
The chemical symbol W is from the German name for the element, "Wolfram". (My German friends don't call it TIG welding but rather WIG welding.)

Vanadium (V) acts as a grain refiner and thus improves the forgeability of the tool steel. It also forms a very hard Vanadium carbine that improves both hardness and wear. In large amounts (above 1.0 percent), it makes the tool steel much harder to grind.

Molybdenum (Mo) At low percentages Moly improves both deep hardening and toughness. In high percentages, it is used in some tool steels to replace Tungsten.

Cobalt (Co) increases the hot hardness of tool steels used in some cutting tool applications. It also increases the critical temperature making heat-treating more difficult and leading to decarburization.

Chromium (Cr) is a major alloying element in many tool steels improving hardenability (depth of hardness) and can improve both wear resistance and toughness. We find it in many steels including the alloy steels, 4140 (chrome moly engineering steel), 5160 (spring steel) and 52100 (bearing steel) all of which are useful to blacksmiths because we can find them at low cost as 9260.

Nickel (Ni) Used with other elements, such as chrome, to improve the toughness of some tool and alloy steels. An important element in L6.

What tool and alloy steels are useful to the Blacksmith?

With all of the above as just so much information you may be saying, OK, what tool steels are useful to me as a blacksmith, how do I forge and heat treat them and where can I find the stuff? What follows is my opinion on some of the tool and alloy steels based on my industrial and blacksmithing experience.

I sure would like to hear from some of you on your experience and what has worked and not worked for you for various blacksmithing applications. I would like to report that information in future articles. Here is what I think of some of these steels:

TOOL STEELS

W1 also sometimes found as 1095 and as "Water hardening drill rod." This is the basic old-line blacksmithing tool steel. For many applications, it remains one of the best steels for the blacksmith. It is defined as a cold work tool steel, since it loses its hardness at hot metal temperature -- and therefore is not a hot working tool steel. It still is a good steel for making punches and cold cuts. I like it for things like "eye" punches. You just have to remember to cool it after each use to avoid drawing the temper.

Francis Whitaker used it for making a great deal of his tooling and I believe liked it for things like hammers. (I prefer 4140 or 1080 for hammers.) It makes some of the finest woodworking tools and many of the knife makers use it a great deal. Most old files are made from W1. It requires quenching with water to obtain good hardness. Because of this, the depth of hardness is limited (usually about a max. of 0.060 inch) and tools retain a rather tough core. I think that W1 and how to use it should be part of the blacksmiths basic knowledge or "tool kit".

Clay Spencer uses W1 for a lot of his treadle hammer tool. He like it for most tools with the exception of hot cuts.

H13, Hot work tool steel. Another of my favored tool steels, this time for making tools intended for long exposure to hot metal. This includes hot cuts, hot hardies and heavy-duty punches. It also makes good drifts for opening up holes etc., although I use 5160 spring steel for most of these.

The hot work tool steels were developed for heavy hot working industrial applications such as forging dies, extrusion dies and hot mill rolls. The reason to use H13 over any of the other "H" steels is that you can find it in small sections both round and plate.

It is available in small quantities and a number of smiths sell it as a "tail gate" item at various blacksmith meetings. Reportedly, it is also used in guide pin application in plastic molding and may be available to use as drops from some "die shops". It is an air-quenching tool steel, and very difficult to anneal with simple equipment. So if you want to saw it or machine it, that needs to be done before any forging or heat treatment.

Joe Miller loves H13 and uses it for both hot tools and a number of the cold work dies he uses under his power hammers. He has had very good life in this application using it in many production runs.

S7, A Shock-Resisting Tool Steel can be found in some jackhammer tools or bits (they can also be S1 or S5). It is a very tough steel that takes impact loading extremely well. It also has good hot work properties and is used in applications up to 1000 degrees F. I have used it for hot cuts, and for that application don't see any major difference from H13. Many blacksmiths make hardies from S7, where they have obtained the steel from old jack hammer bits.

Some blacksmiths have used S7 to make special power hammer tools where they machined a pattern into the tool and then used that tool on hot metal under the power hammer. It is an air hardening (air quenching) tool steel and heat treating it is much like working with H13. Because it is air hardening and very tough, many machine shops like it for tooling applications and it has replaced O1 in many tooling applications. You can buy it in most common drill rod sizes.

Some manufacturers make their power hammer dies from S7.

If I could have only one tool steel in addition to W1, it would be S7. I know many blacksmiths love H13 but I really think that for

TOOL STEELS

Letter Symbol	Category Designation	Group Designation	Some Typical End Uses
M	High-Speed Tool Steels (the M is for Molybdenum)	Molybdenum types	Drill bits, end mills, taps, threading dies
T	High-Speed Tool Steels (the T is for Tool or maybe Tungsten?)	Tungsten types (the chemical symbol for Tungsten is W)	Milling cutters, lathe bits
H1 – H19	Hot-Work Tool Steels (the H is for Hot)	Chromium types	Hot cuts, extrusion dies, hot mill rolls
H20 - H39	Hot-Work Tool Steels (the H is for Hot)	Tungsten types	Extrusion dies, hot forging dies
H40 - H59	Hot Work Tool Steels (the H is for Hot)	Molybdenum types	Special high temperature hot work
D	Cold Work Tool Steel (the D is for Die)	High carbon, high chromium types	Metal forming dies (cold work) coining dies, bread rolling dies
A	Cold-Work Tool Steel (the A is for Air)	Medium alloy, air quenching types	Die casting, shear knifes, trimming dies
O	Cold Work Tool Steel (the O is for Oil)	Oil quenching types	Drawing dies, coining dies, die casting dies
W	Water-quenching Tool Steel, also a Cold-Work Tool Steel	Low alloy, high carbon (the W is for water quenching)	Hand tools, blacksmith tools, wood working tools
S	Shock-Resisting Tool Steel (the S is for Shock)	Lower carbon, alloyed for toughness	Pneumatic Chisels, Blacksmithing and hollermaker's tools
P	Mold Steels (P is for plastic)	Carburizing steel (case hardening)	Plastics molds
L	Special-Purpose Tool Steels (L is for Low alloy)	Low-Alloy types (L6, does have 1.5 percent nickel)	Large sawmill band saw blades
	Special-Purpose Tool Steels (F is for, "I don't have a clue")	Carbon tungsten type	Some abrasion-resistant applications

ALLOY STEELS			
Name	Category or type	Make up of steel	Some typical uses
4140 or 4340	Eng nearing steel, widely use for equipment applications	Chrome Moly steel or Chrome Moly Nickel steel -- 0.40 C	hammers, tongs, anvil tools, power hammer tooling, power hammer dies
4119	Timken bearing steel	Deep case hardened used in roller bearing from Timken	Both rollers and races can be reforged into tools
5160	Coil and flat spring steel	Medium high carbon chrome steel with 0.60 C	Drifts, punches, and power hammer tooling.
52100	Ball Bearing Steel	Most non Timken bearings	Tooling
8620	Case hardening steel -- gearing	Nickel Chrome Moly steel used in case hardening applications	Tongs
Railroad rail,	Specification is in weight per yard, such as 115 pound rail	Steel varies by manufacturer but is similar to 1080 with about 1 percent manganese	Power hammer tooling, hammers

most applications, both hot and cold, that S7 is even better.

O1, is not a tool steel that I like – I use either A2 or S7 or even W1 instead, but you will find it as one of the most common drill rod steels. (It was widely used by machine shops because of low distortion in heat treatment. Today A2 fills that bill better.)

A2, The most common air hardening (air quench) tool steel in the USA today. I haven't used this steel for blacksmithing tools, but like it very well for tools and gauges etc. that are machined and then heat treated. Some folks have made woodworking tools from A2.

Steve Williamson has made a number of his hardie/hold punches out of A2 and likes it for these tools.

4140 and 4340 are the most common general purpose engineering steels today. Used for many equipment applications, I like these steels for making hammers and tongs. Many smiths use mild steel for making tongs, but I like to use either 4140 or 4340 because of their much greater strength and toughness. This allows you to make the tongs with thinner jaws along with smaller and springier reins or handles. The one major limitation with these alloy tongs is that you can't quench them from a red heat. You must let them cool well into the black range if you are going to cool them in your slack tub.

5160, Spring steel, found in some automotive coil and most flat springs. I like this steel for power hammer tooling and for heavy duty, "bash on it tooling" like drifts. I have even made a few hot cuts and punches from this material. From time to time I have had cracking problems with some of this material -- likely from cracks already in the old springs. Not all springs are 5160 so your results may depend on the type of steel in the spring. Read the article on "Break-Testing".

Railroad rail or 1080 steel with the addition of about 1 percent manganese. A very high quality, very clean steel that makes good hammers and power hammer dies. You can buy this material as scrap at reasonable prices. If you are going to try to saw railroad rail, cut from the bottom up as the rail head is usually work hardened. If you have a power hammer, you can work rail into very useful sections for many tool applications. It's not quite as high in carbon as W1 but still at 0.80 carbon will heat treat very well as water quench steel. For small tools, you can use an oil quench.

Rebar is Junk, not quality scrap steel useful for tools. It is one material I think you are really wasting your time trying to use for tools. I also don't think A36 is useful for much except handles and tongs. A36 can be used for female dies for use in the treadle or power hammer, but if you can make these out of better material, you will get much longer life.

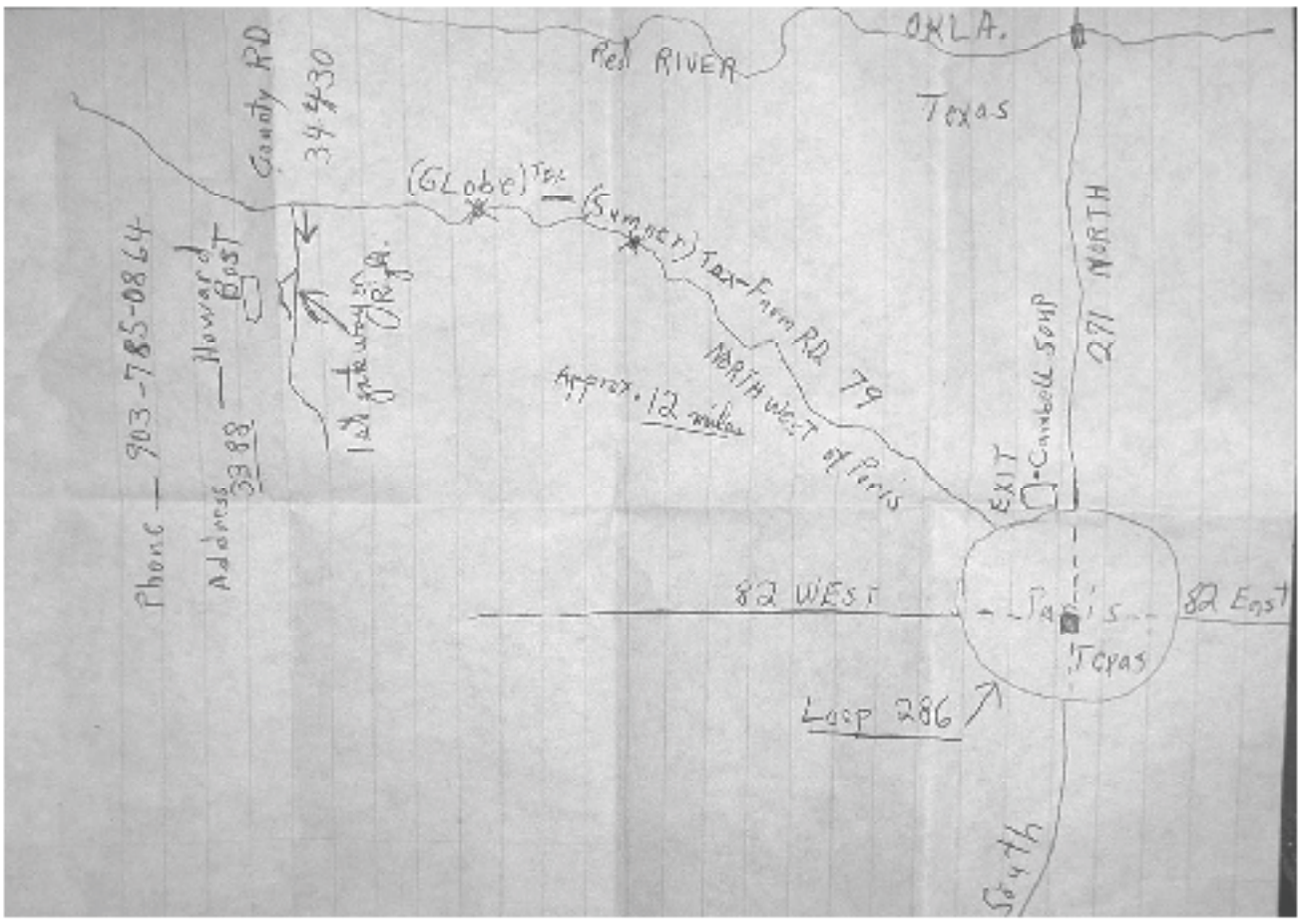
If you want more information, background or detail on these and other steels, see the following references:

Machinery's Handbook; now in its 27th edition edited by Robert E. Green and Christopher J. McCauley. Industrial Press Inc. (I was using the 25th for this article. Every blacksmith, machinist or mechanical engineer should have a copy of this handbook. You can find older editions of this book at good prices in the used book market.)

Heat Treatment, Selection and Application of Tool Steels, by Bill Bryson, Hanser Gardner Publications

Engineering Properties of Steel, Philip D. Harvey Editor, American Society for Metals

Map to Howard Bost place NW of Paris Texas.



Heart Hook

DEMONSTRATION

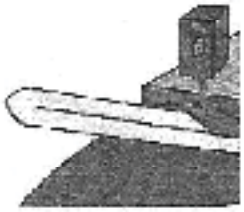
By Bill Epps

Earlier in this issue I mentioned several web sites with directions for various projects to be made. In honor of the upcoming Valentines Day holiday, I am going to include the directions from the iForge section of the Anvilfire web page. I hope this sample will encourage you to explore this wonderful site. ed. www.anvilfire.com

What we are going to do tonight is one way of making a Heart. Hearts always sell good at shows, the Ladies love them.

For this piece I am using 3/8" Round. The same technique can be used on whatever size heart you want to make. This is going to be a simple hook, I also use them for a wall sconce out of larger stock, Candle Holders, a key chain fob out of smaller stock. We scarf the end of the bar and prepare it for welding.

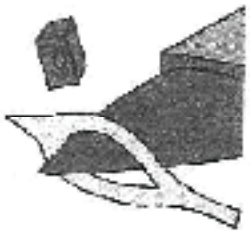
Fold the piece over the side of the anvil 90 deg. and back over itself and weld it. This fold is about 5" because that is the width of my anvil face.



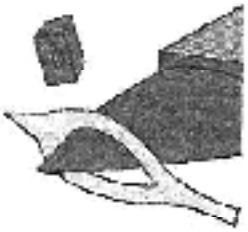
I forge weld these, but you can tack it with a mig, flux it, bring it up to a welding heat, and hammer the weld out any few know the difference. When welding this you don't want to thin the weld down too much. Center it back up like shown here.

Then we come to the other end and draw it down to as short a point as possible. This needs to be good and hot when you draw that point down. Keep it even by working it one side then the other equally so you don't end up with a thin side on it.

Take a good heat, then use a pointed punch (I use an old cold chisel) to spread the center open (depending on the size of the heart), but on this one here, I open it up to about 1". You want to spread the top more than the back side.



I round the top of the opening on the horn of the anvil

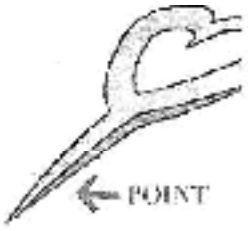


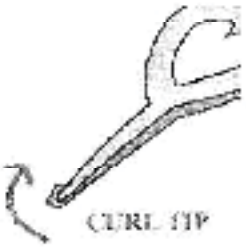
This is just to smooth things out and keep everything centered.

Right at the end of the tip, fold it down over the side of the anvil at 90 degrees. Turn it over and fold it back over itself until it is flat. Now you have your heart shape.

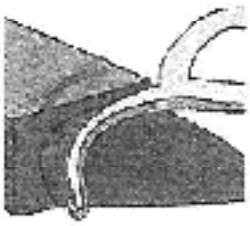
Now I start beveling the top of the curves to spread the heart and give it some character and definition. Also, takes out the twist marks. I do this by holding my hammer at an angle and hitting straight down. Start from the center of the bar and working outward at the edge of the anvil face.

The heart should be thick on the inside and beveled out to a thin edge. Go back to the horn of the anvil to keep the heart symmetrical, and we are going to cut off just below the weld for this hook.





Now we are going to draw out the piece which serves as the point that forms the hook. When you are working a weld, keep it at or near a welding heat to keep from beating your weld apart. With the the tapered side of the heart up, curl the very tip of the hood point down.



With the tip curl up, form it down over the horn to make the hook

Wire brush. Drill two small mounting holes, and apply finish.

It should end up looking something like this.

This project is also a very good one to practice forge welding on. No tongs required.

These can also be used mounted above a window for holding curtain Rods!

When you folded the point down to form the center of the heart, leave the fold on the front side so you can hammer it out when beveling the top edges of the heart.

I use this same technique out of 1/2" bar for a candle holder as well as a Wall Sconce. Vince Herod makes a cute little Key Chain Fog out of 2/15 and 1/4"

Use care when working a weld, even a perfect weld, if you try to work it too cold, will come apart. In many of the books you'll see it referred to as a "light welding heat"

With practice one of these can be made in about 15 min.

For Craft Shows

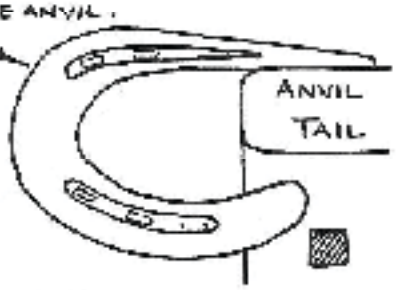
A PROJECT BY CLARK POWELL

THE OCMULGEE BLACKSMITHS GUILD - GEORGIA

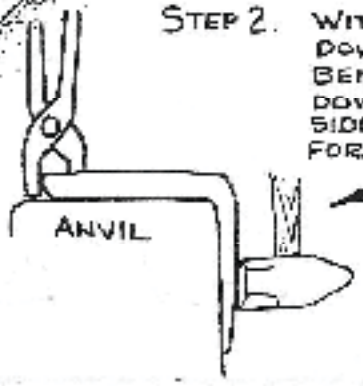
Horse Shoe Hat and Coat Hook

BECAUSE OF MOST FOLKS' SHORT ATTENTION SPAN, QUICK PROJECTS SUCH AS THIS ONE WORK WELL WHEN WORKING IN FRONT OF THE PUBLIC. COLLECT USED SHOES FROM FARRIERS OR RIDING STABLES TO SAVE $.

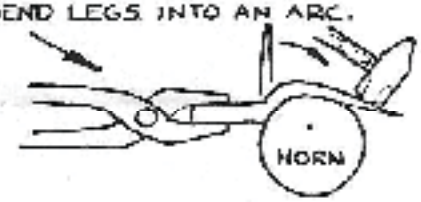
STEP 1 · DRAW OUT ABOUT 1/5 OF EACH LEG OF THE SHOE TO A LONG TAPERED POINT OVER HORN THEN OVER THE TAIL OF THE ANVIL.



STEP 2. WITH SHOE FACE DOWN ON ANVIL, BEND EACH LEG DOWN AGAINST SIDE OF ANVIL FORMING 90° BEND

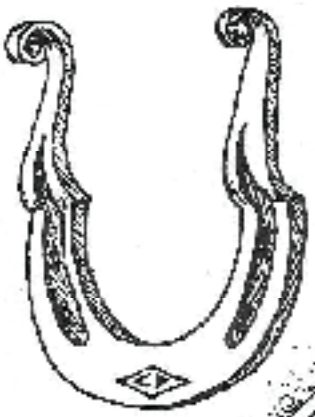


STEP 3 · OVER THE HORN OF THE ANVIL, BEND LEGS INTO AN ARC.



STEP 4. FORM SMALL PIGTAIL SCROLL ON TIP OF EACH LEG OVER THE EDGE OF THE ANVIL.

STEP 5 · FINISH WHILE STILL WARM BY VIGOROUS WIRE BRUSHING THEN COATING WITH 50/50 MIX OF TURPINTINE AND LINSEED OIL.



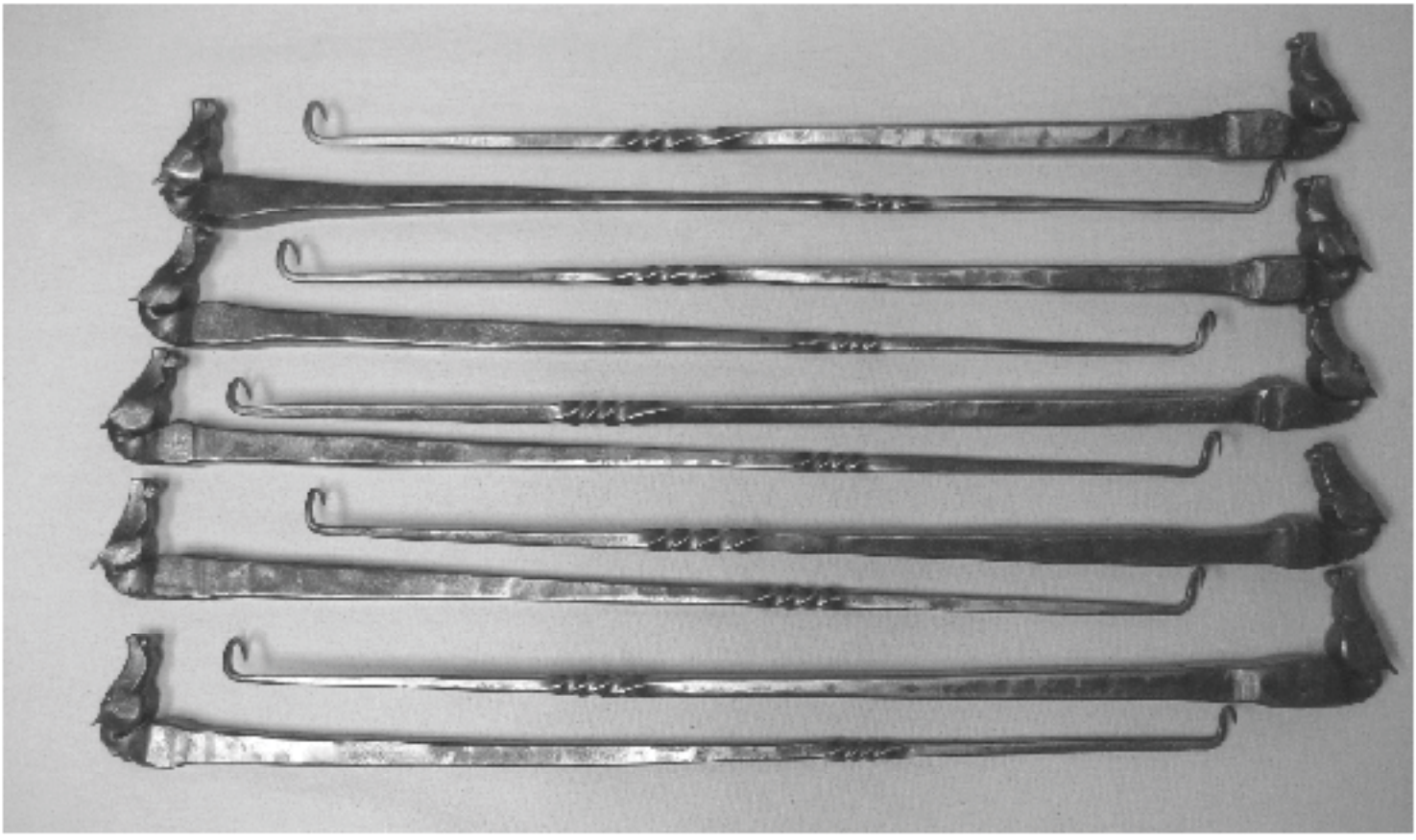
TIP: SAVE THE LARGER SHOES AND BY USING THE SAME STEPS YOU CAN MAKE GUN RACKS. JUST ADD RED OR GREEN FELT FABRIC TO THE BACK SIDE WITH CONTACT CEMENT. NAIL A PAIR TO AN OLD WEATHERED BOARD. IF YOU CAN'T FIND OLD WOOD, YOU CAN ARTIFICIALLY AGE NEW PIECES OF 1X6 LUMBER BY SANDBLASTING IT OR GOING OVER IT WITH A WIRE CUP BRUSH IN YOUR SIDE GRINDER. PUT IT OUT IN THE WEATHER FOR A MONTH OR SO AND IT WILL TURN GRAY AND LOOK LIKE IT'S 50 YEARS OLD.

ILLUSTRATED BY: B. Tidwell

- **Horse head steak turners made by JC Banks.**
-

- JC recently attended an animal heads workshop that was held at Gerald Franklins place. The instructor was Daryle Nelson from Washington State. The horse head was only one of the animal heads that was shown during the class.
- JC got a request for some steak tuners and here they are. There are 10 nice turners all with house heads on them. They will make great gifts.

Thanks JC for send in the pictures of your work. Editor



News from all around …

* **Gary Gloden has a new email address so update your information….**
ggforge@wildblue.net

* **Dawnavan Crawford won the $500 scholarship from ABANA/Blacksmith Supply voting raffle.**

* **The Don Bellah memorial Scholarship Committee has approved the following applications for $750 each:**

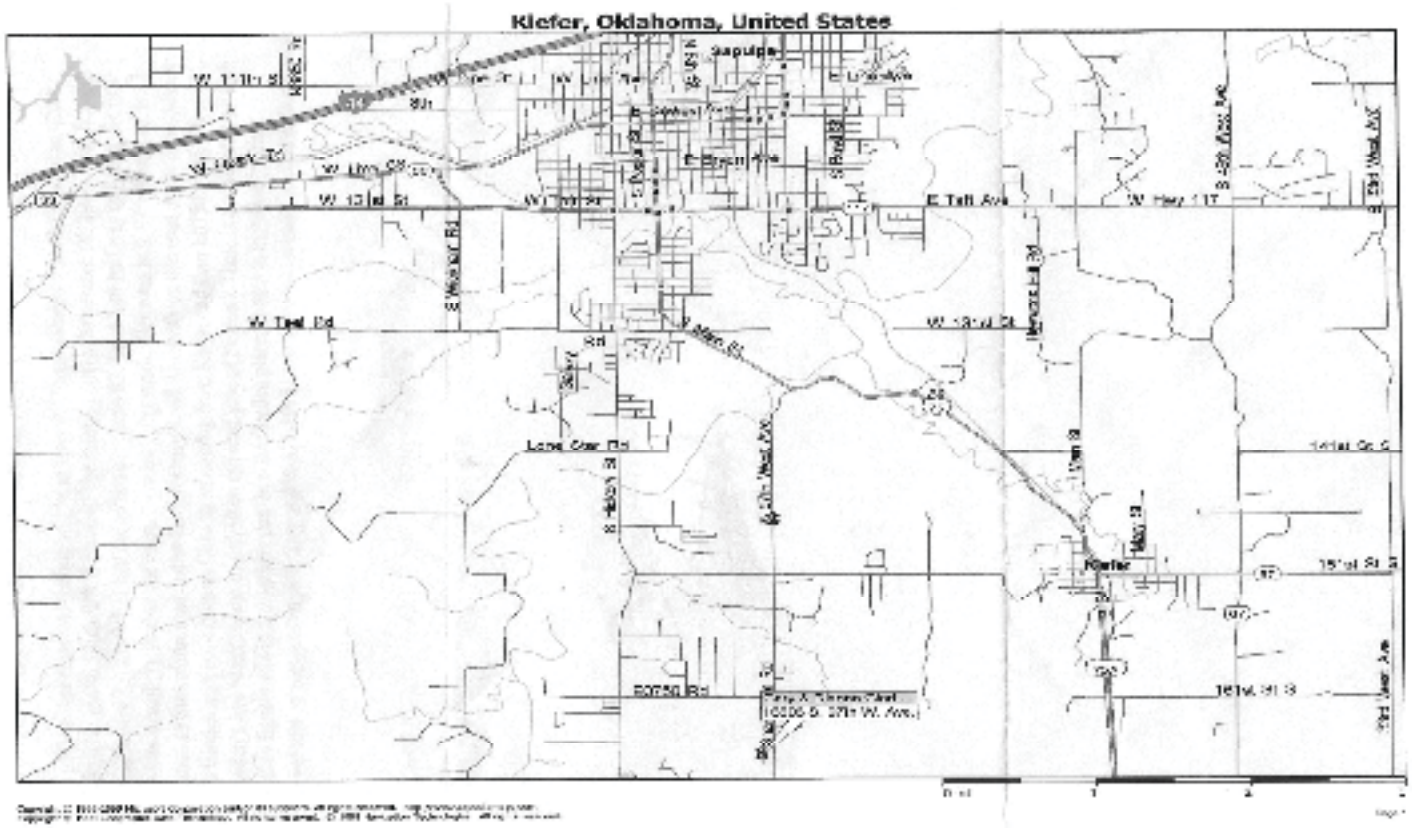
1). Brabk Hadick—to John C. Campbell Folk school
2). Bill Kendall—to John C. Campbell Folk school

Both of the classes these members of Saltfork plan to attend are late in January of 2009

* **Roger Degner 781@mchsi.com has Blacksmith conferences on DVD-R**
150 titles averaging 5 1/2 hours long
$5.00 each permanent rental never return them
$2.00 postage per order to the U.S.
See listing at www.anvilsonline.org
Then click on library for complete list and order instructions.

* **Darryl Nelson has a Bear's head demo on DVD for sale . It shows a 2D and a 3D bears head. The cost is $35.00 plus $2.50 for postage and handling for a total cost of $37.50. you can mail him a check to:**
Meridian Forge
37010 Meridian E.
Eatonville, WA 98328

Map to Gary Gloden's place:



Not just blacksmithing …

Many of you are familiar with the beadwork made by Teresa Gabrish. Teresa has taught several classes in the past few years at our annual conference. This year Teresa is branching out to try her hand at wire wrapping of semi precious stones to make unique and one of a kind jewelry. Here are some examples of her recent works. If you like what you see and would like to learn to make your own, Teresa will be teaching a class at this years conference or if that is not soon enough check with her because she tries to attend as many of the S/C regional meeting that she can. She works with sterling silver and has been trying some square copper and brass wires as accents.

This bracelet is silver and copper wires. The stone is a blue/green color.

Ladies sterling silver ring with a moss agate cab for the setting

Sterling silver ring with a imitation amethyst setting.

Sterling silver and copper twist ring.

Sterling silver cross necklace with a imitation amethyst setting.

Sterling silver pendant With blue abalone shell Stone.

Ring from silver, copper and brass. Some of the wires have been twisted so they catch the light and seem to sparkle.

Bending

Text and Photos by Dan Nauman

Lesson #14– Forging a 90-degree corner

Definition: Altering the centerline of a bar.

Intent: To learn how to forge a sharp 90-degree corner while maintaining the parent stock dimensions throughout the bend, and have the resulting two legs measure to a predetermined length.

Tools: Anvil, 16- to 20-ounce cross-pein hammer, center punch, steel square.

Materials: 1/2" square x 20" mild steel.

Step One

Note: When producing a bend of this nature you will lose some length, equal to half of the parent stock thickness, on both legs.

Also, when figuring how much metal will be needed for this bend in a project, remember that your measurements should be taken from the center (or mean line) of the bar on your layout, and not from the inside or outside corners.

Our target length for the short leg that will be formed is 3 3/4", and a target length of 13 3/4" for the long leg. With that in mind, measure 4" from the end of the bar, and mark with the center punch.

Step Two

Heat the bar to bright yellow, with the center punch mark centered in the heat.

Note: A short heat for this step will reduce the work in succeeding heats. The length of the heat when initially pulled from the fire will be too long. If this heat is not minimized, the resulting bend will require more effort to achieve your goal.

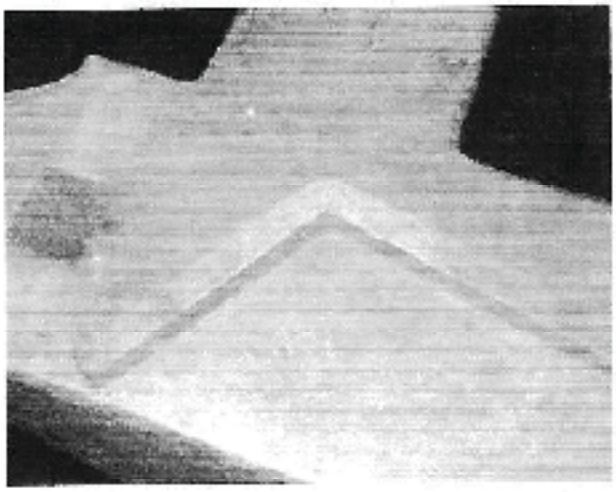
The bright yellow heat will give you some time to quench the bar. Using a dripping can, quench the bar (with water) down to 1/2" on either side of the center punch mark so that the heated area is confined to about 1 1/2"... ideal for this initial bend.

After you have minimized the heat, make sure the center punch mark is visible on the side of the bar, and position the bar so that the center punch mark is over a 1/8" radius on the bar edge of the anvil. Proceed to bend the bar over the edge of the anvil by striking the end of the bar down. Bend the bar so that it is at about a 100 degree angle. (See photo #1)

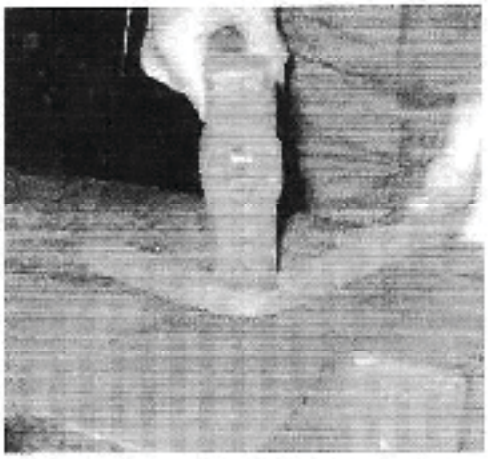
Notes: Do not use a sharp corner of the anvil or the vise to make the initial bend. This can lead to galling on the inside corner which may lead to forming a shut (overlap) during subsequent steps. A shut in steel can form into a crack, weakening the piece. A shut in wrought iron will cause the leg to fall off.

Our goal is to teach you to make this bend with a minimum of tools. However, some smiths prefer to use the vise to perform a controlled, gentle bend in Step Two (avoiding a gall), and then use it for a brace (or back-up) in succeeding steps. While this practice is not necessarily wrong, it must be noted that it takes precious time to place the piece in the vise. Also, the vise acts as a heat sink, robbing precious heat from the metal. These facts combined reduce your window of time to forge the corner.

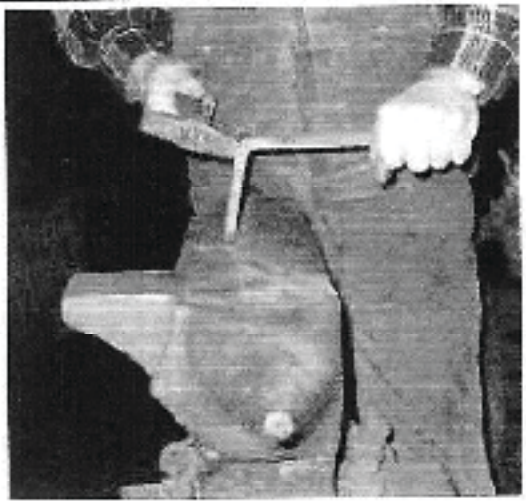
Forging dynamics: From bending, the inside corner has now increased in cross-section from compression, and the outside corner has decreased in cross-section from stretching. This excess material on the inside corner can be moved to help replace the loss of material on the outside corner. The next step will help accomplish this task.



1. After the initial bend, the angle should be approximately 100 degrees, as shown here.



2. Position the hammer as shown when over-peening the corner. Be mindful that you do not reduce the cross-section smaller than that of the parent stock.



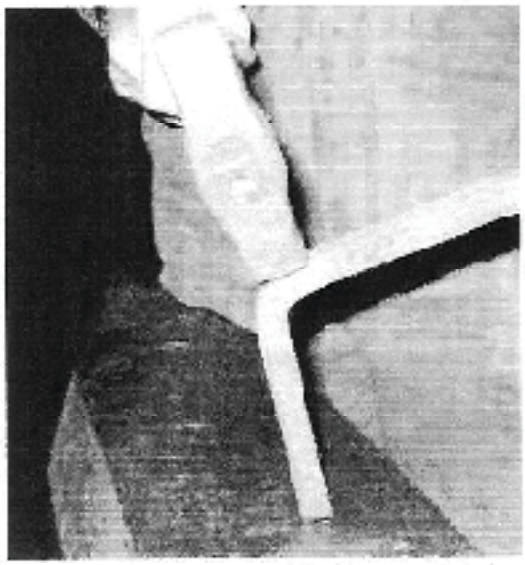
3. Stand at the heel of the anvil to forge this horn.

Step Three

In the same heat from step two, lay the bar on its side so the anvil so both legs are resting on the face. Using the cross peen of the hammer, carefully forge down the excess material on the inside corner back down to 1/2". The peen should strike the bend, perpendicular to the 50 degree mean angle, so that the metal pushes to the outside corner. The legs themselves will help prevent the metal from flowing into the inside corner. (See photo #2)

Step Four

Heat the bend to bright yellow. Quench the bar to concentrate the heat to 1/2" on each side of the bend.

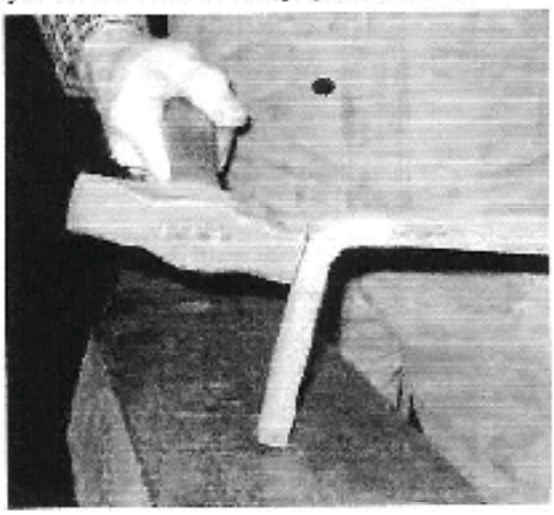


4. Vertical blow– note the position of the hammer and the short leg.

Note: Your stance at the anvil is important for this step. It will be easier for you to swing the hammer if you position yourself with your shoulders square to the heel of the anvil. (See photo #3)

Place the short leg ten degrees to the right of vertical (ten degrees to the left if you are left handed), with the end down on the face of the anvil. Strike the bar five or six times with hard blows. The blows should be focused so that the hammer face is in the same plane with the long leg, and slightly to the inside of the axis of the short leg. (See photo #4)

In the same heat, position the bar ten degrees to the left (or ten degrees to the right if you are left handed), and redirect your blows with the hammer's face in the same plane as the short leg, and just below the axis of the long leg. (See photo #5)



5. Horizontal blow from the position of the hammer and the short leg.

Proceed to strike the bar with seven to nine blows.

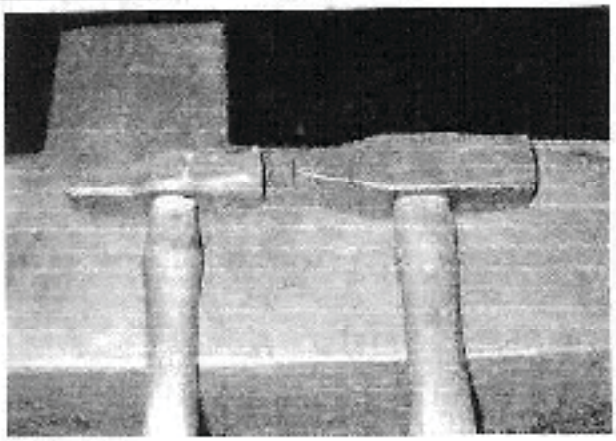
Alternate back and forth from the short leg to the long leg until the metal reaches a dull orange color. Maintain an angle of about 100 degrees. Count your blows as explained above.

Forging dynamics. The reason you strike more blows horizontally is that your head is not as solid a brace as the anvil is for the vertical blows, thereby requiring more blows to accomplish the same task of moving material towards the corner.

Also, using a lighter hammer such as a 16 to 20-ounce hammer minimizes the possibility of forging too much material to the inside corner of the bend (which could happen when using heavier hammers). The force delivered by a lighter hammer is expended on the surface of the bar. (See photo #6 of 1.8# ball pein vs.1# hammer.)

Step Five

Your work thus far has also increased the cross-section of the bar at the inside corner. As you did in step three, use the peen to



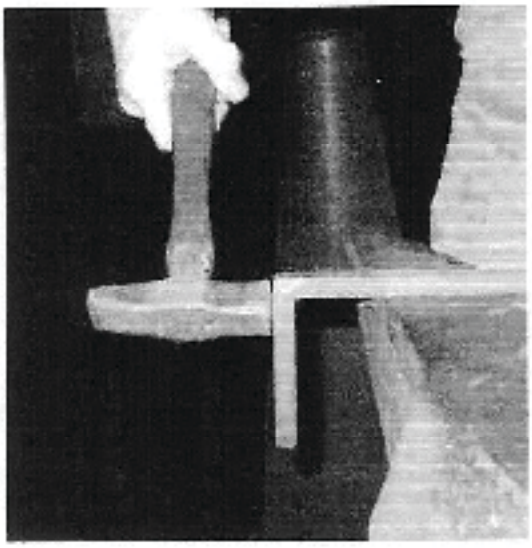
6. Use a smaller hammer to do this operation. The hammer on the left is a cross-pein hammer—a good hammer weight for the task. The hammer on the right is a 1.5 pound hammer which is too heavy for this item.

stock tangentially reduce the cross-section, and push the excess material to the outside corner. Smooth with the face of the hammer. Be careful, as you do not want to reduce this corner to less than the parent stock size.

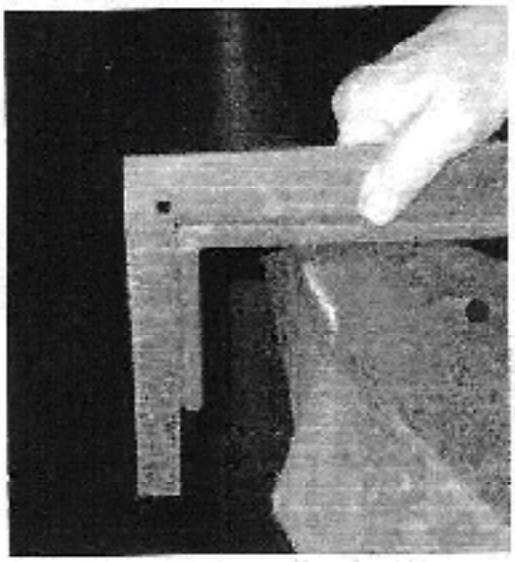
Step Six

Repeat steps four and five until the outside corner is visibly sharp (no greater than a 1/32" to 1/64" radius).

Note: If the legs begin to bend during any part of these procedures, straighten them at once or the energy from your blows will do more to continue bending the legs, rather than forging the corner.



7. When starting the angle to 90 degrees, keep the short leg away from the anvil or almost bare. Doing so will keep you from reducing the cross-section of the bar beneath the parent stock size.



8. Check your work with a square. Note that the legs are square, but there is a gap near the corner of the long leg, which should be addressed.

Step Seven

Heat the corner to bright yellow. Quench as in step four. Lay the long leg on top of the anvil. The short leg should point down off the anvil, with the inside corner away from the side of the anvil. With light blows striking horizontally towards the short leg, close the angle of the corner to 90 degrees. (See photo #7). The legs can be straightened by lightly rapping on the anvil in any orientation that suits the task. Use the steel square to check your progress. (See photo #8.)

Note: Resist forging down on the bar on the corner of the anvil to achieve the 90-degree bend, or to straighten the legs. What you are trying to do at this point is to bend the bar to 90 degrees, not forge the bar to 90 degrees. Forging down on the legs to achieve the bend will reduce the cross-section of the legs near the corner.

Targets:

The short leg is 3 3/4" long, and the long leg is 15 3/4" long, plus or minus 1/16".

Both legs lie in the same plane. No twists or bends.

-The stock size remains 1/2" throughout the forging.

-The corner is 90 degrees, with a radius of 1/64" to 1/32" for an outside corner.

- The legs are straight, and do not slope down to the corner.

-The surface of the bars are smooth.

-With practice, the corner should be forged in two to six heats.

-There is no scarf (overlap) on the inside corner.

Saltfork Craftsmen

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April 2008 thru March 2009

Please accept my application Date:_____

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I have enclosed $20.00 for dues to March 30, 2009

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