



**AUGUST 2006**

Saltfork Craftsmen  
Artist-Blacksmith Association

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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.

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**Visit our Saltfork Craftsmen Website:**  
[www.saltforkcraftsmen.org](http://www.saltforkcraftsmen.org)

## LIBRARY LIST

- A Traditional Suite: Sword Making, set hammers
- A Water powered Smithy
- ABANA comes of AGE: 1994 NOMN Exhibit
- Basic Blacksmithing with Hershel House
- Basic Blacksmithing with Hershel House part 2
- Basic Blacksmithing with Hershel House part 3
- Bill Bastus: Guthrie 2002 SFC tapes 1-6
- Bob Patrick-Forge Welding
- Broom making for the Blacksmith
- Doug Merkel: Misc. projects
- Doug Merkel: Nail Header
- Doug Merkel: Saw tooth Trammel
- Doug Merkel: Tomahawk and Misc.
- Elmer Roush: Colonial American Hardware and Fixtures
- European masters Fire and Fantasy
- Forge Welding with Bob Patrick
- Frank Turley-Tool making tapes 3,4,5
- Hammer man in Williamsburg: An 18<sup>th</sup> Century Blacksmith
- Hershel House: Blacksmithing part 2 and part 3
- Jerry Darnell: 18<sup>th</sup> Century HDW-Hinge pintles tape 4
- Jerry Darnell: 18<sup>th</sup> Century HDW-strap Hinges tape 3
- Jerry Darnell: 18<sup>th</sup> Century HDW- Suffolk Door Latch tape 2 Jerry Darnell: 18<sup>th</sup> Century Lighting- Tapes 1,2 and 3 Jim & Kathleen Poor: Tool making-Guthrie 2001 tapes 3,4 and 5
- Jim Hrisoulas: Forging Damascus Part 1
- Jim Hrisoulas: Forging Damascus Part 2
- Omey's 2002: Kendall and Dyer- Table
- Omey's 1997: Ted Sawyer 4 tapes
- Rob Gunter: Hammers Tape 2
- Rob Gunter: Hollow Forging
- Rob Gunter: Hollow Forging tape 4 & 5
- Rob Gunter: Scrolls Tape 7
- Samuel Yellin's Legacy; The story of a Metal working shop
- The Loveless Legend
- Tom Smith at Hartdner
- Yellin Foundation: Manfred Bredohl
- RD-1 1990 Metal Madness
- RD-2 Ivan Bailey and Paul Hubler
- RD-9 1992 BAM Ozark Conference
- Knife making with William White.
- RD-69 2002 UMBA Conference with Roger Lorange
- RD-79 2003 UMBA Conference with Bob Tuftee
- RD-82 Wooden Wagon Wheel workshop, Perry Ok.
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- RD-69 2002 UMBA Conference with Roger Lorange
- RD-79 2003 UMBA Conference with Bob Tuftee
- RD-82 Wooden Wagon Wheel workshop, Perry Ok.
- 2005 SCABA Conference tapes

*If you are interested in borrowing any of these tapes, contact Gerald Franklin at a meeting or call him at 580-252-6002.*

## TRADING POST

### **For Sale:**

3/4" round bar of 5160 (\$3.30 per foot plus shipping)  
3/4" 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

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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 broomcorn brooms on your handle or mine. \$15.00 plus shipping. Contact Diana Davis, lazyassforge@tds.net or 1-580-549-6824  
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Hand Pump Rivet Forge all there but needs work \$300.00; Hand crank post dill missing hand crank \$50.00; Leg vise \$50.00  
Contact Bill Kendall 918-691-2173 or Jeff Kendall 918-607-8495  
bill@ttownmetalmen.com  
jeff@ttownmetalmen.com  
More information and pictures are posted on the Saltfork Website "Tailgate" Section  
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## Club Coal

Saltfork Craftsmen have Arkansas coal for sale. The coal is \$95/ton to members and \$145/ton to non-members.

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. The coal is in large chunks; bring something to break up the coal into manageable size pieces.

*We now have a load of coal in the S/C Region. This 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.*

*Cost for this coal is .06/pound or \$120.00/ton. NO SALES to non-members.*

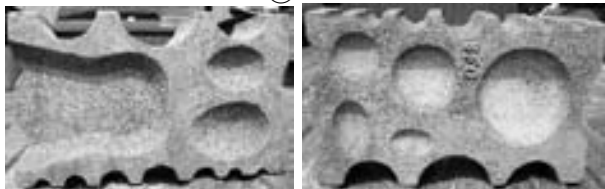
*Max Scrudder can be contacted at (405)226-9951*

Rebuilt Little Giant Trip Hammers! Better than New! 25#-\$3495; 50#-\$4595; Misc. leg vices and hand cranked and electric blowers. Contact Mike George at 1-580-327-5235 or Mike-marideth@sbcglobal.net

**Sold out....."New supply arriving soon."**

Saltfork Craftsmen Swage Blocks \$85.00 each plus shipping. SCABA members can purchase one block for a special members price of \$60.00

Contact Mike George at 1-580-327-5235 or mike-marideth@sbcglobal.net or Jim Carothers at 1-580-336-9213 or colonel@fullnet.net



**Wanted:**

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

Send your ads to Diana Davis, 23966 NE Wolf Rd. Fletcher, Okla. 73541 or email them to lazyassforge@tds.net

## CALENDAR OF EVENTS

### August

**NE Regional meeting** (August 12, 2006) open  
**South/Central Regional** (August 19, 2006) hosted by Gregory George. Gregory has chosen a critter as the trade item.

**NW Regional meeting** (August 26, 2006) hosted by Mike George

### September

**NE Regional meeting** (Sept. 9, 2006) hosted by Pat Cowart.

**South/Central meeting** (Sept. 16, 2006) hosted by Terry Jenkins at the Sulphur tractor show.

**NW Regional meeting** (Sept. 23, 2006) open

### October

**October 14 and 15, 2006 SCABA Conference\**

**South/Central meeting** (Oct. 21, 2006) open

**NW Regional meeting** (Oct. 28, 2006) open

### November

**NE Regional meeting** (Nov. 11, 2006) open

**South/Central meeting** (Nov. 18, 2006) hosted by Bill Davis

**NW Regional meeting** (Nov 25, 2006) open

### December

**NE Regional meeting** (Dec. 9, 2006) open

**South/Central meeting** (Dec. 16, 2006) hosted by Larry Morefield

**NW Regional meeting** (Dec. 23, 2006) open

## 2006 DEMO REQUEST

**August 31.** Fletcher Tractor Show. The school lets the kids out to come and look around. There is also a livestock show going on at the same time. The group has asked if we would be able to hang around after 6 pm so people at the livestock show could come by and see the blacksmithing demonstration. Contact Diana Davis for more info.

**September 22-23** Oklahoma John Deere Two Cyl Tractor Show and Old Time Threshing Bee. Possible location for a NW Regional Meeting.

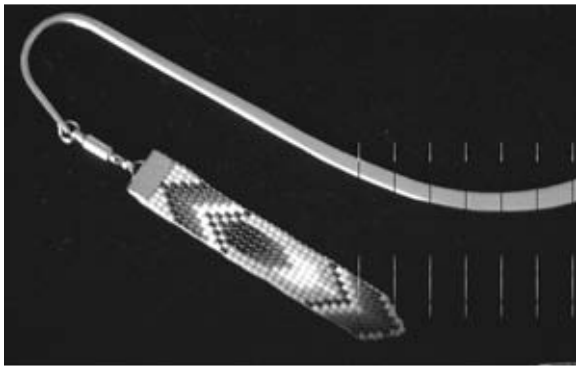
**September 29-30** Don Colwell Heritage Days It is located at the Cache School Grounds. Friday is school day. Friday evening the Cache FFA will host

a Free Brisket Dinner to all exhibitors and others starting around 5:30 pm. Also the Cache School will provide lunch for all exhibitors on Friday. For more information contact Diana Davis at 580-549-6824 or Tommy Hawthorne at 580-429-8200.

**Sept. 30** Gracemont City fest. The city of Gracemont have invited the SCBA to be a part of their festival. They would like to have a blacksmithing demonstration on Sat. 30<sup>th</sup> of Sept. Member Delbert Stallings is going to be there and would appreciate anyone that can come and help him to let him know and he will give you the needed information. There is no charge and they invite you to sell anything you make.

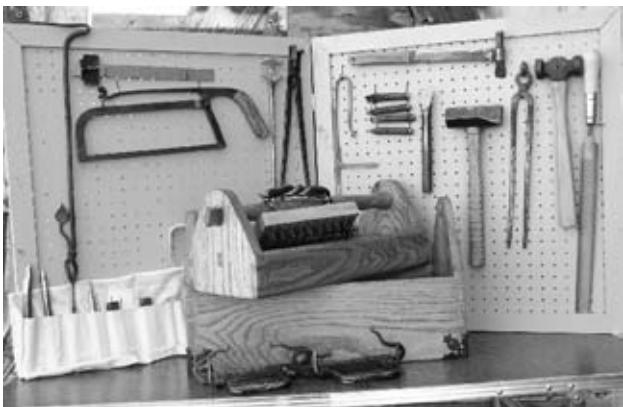
**October 13-14** D-Boone Days at Henrietta, Ok. Contact Marvin Boatwright at 918-625-7338 for more information.

## MEMBER'S HANDYWORK



This is a new item that Teresa Gabrish has designed. It is a bookmark made from a metal bookmark with a swivel and a piece of beadwork made on a loom. Teresa and Diana Davis will be teaching a class on making this style bookmark at the Oct. Conference. The classes will be limited to 10 and there can be up to 3 classes during the conference if there is enough interest. There will be a nominal charge for this class.

## Saltfork Craftsmen ABA Tool Box



Anyone can purchase tickets and you don't have to be present to win and the club will pay for shipment, if necessary, anywhere within the continental USA.

The tickets sell for \$2.00 each. Diana Davis is the chairperson for this drawing. If you would like to purchase tickets or get some to sell for the club you can contact her at 580-549-6824 or lazyassforge@tds.net. I can accept payment for tickets by PayPal if buying 10 tickets or more and you will need to add \$1.00 to cover PayPal charges. So for 10 tickets @ 2.00 each = \$20.00 plus Paypal charges of \$1.00 = \$21.00. When I get confirmation of payment I will mail you back the ticket stubs along with a receipt for the payment. *Please email me if you plan to buy tickets this way because I don't normally check the PayPal account unless expecting payment for something.*

By: Diana Davis

## CONFERENCE UPDATE

Bill Kendal and others have managed to get a lot of the groundwork finalized for the conference. It looks like this is going to be a really good conference.

### Demonstrators:

Ed Brazeal and Tal Harris

**Date:** October 14-15 2006

**Location:** Noble County Fairgrounds, Perry, Okla.

**Registrar:** Aubrey Washington

### Family Classes:

- Copper enameling, this class will repeat The techniques that were taught last year and then add new projects, teacher John Burns
- Indian beadwork, this is a bookmark with a piece of beadwork created on a loom, teacher Teresa Gabrish
- Broom tying, this class will teach you the basics of tying a broom on a wood or metal handle. You will need to bring your own handle or ask one of the blacksmiths to make one for you before the class. teacher Diana Davis

**Auctioneer:** H.O. Hodge, he was the auctioneer last year.

**Meals:** Catered by Stagecoach Catering  
"Menu"

**Saturday-12:00 (Sandwiches)**

Roast Beef  
Chicken  
Ham  
Bread  
Potato Salad  
Desert (Cookies)  
Cheese  
Condiments  
Tea or Lemonade

**Saturday-6:00P.M.**

Brisket  
Ribs  
Chicken  
Potato Salad  
Baked Beans  
Cole Slaw  
Homemade bread  
Fruit Cobbler  
Iced Tea  
Lemonade  
Condiments

**Sunday -12:00 Noon**

Beef Tips with noodles  
Green beans  
Homemade bread  
Butter  
Tea or lemonade  
Chocolate sheet cake

*Due to caterers requirements pre-registration for the conference is required if you plan to eat one of the catered meals. We need a final count for meals by October 2<sup>nd</sup>.*

**CONFERENCE SETUP**

Those that can come up to the conference early are asked to help setup. Set up will start at 9 A.M. on Friday October 13.

We need someone to take over the Coffee and Donut duty. Gerald Franklin did this job last year but will not be able to come to the conference until Sunday. Anyone interested in this job can contact Gerald to volunteer and get the needed information. It is not a hard job, just takes some planning ahead of time. I (Diana Davis) have two

coffee makers that were used last year and can be used again this year.

**NORTHEAST REGIONAL MEETING**

Mark and Dakota Coatney hosted the N.E. Regional meeting at Mark's home in Chouteau. The tall open-ended shop, a light Oklahoma breeze, and the shade of the home-place trees provided a really comfortable place to work at the forge. Tom Nelson and I arrived shortly after noon; there were two coal forges and a gas forge going; about 10 Saltfork members were on hand.



Mark had chosen a gig (fish, frog, or crawdad type) as the trade item. He had several old examples on hand. These very nice gigs

had been made by a local craftsman who is now well into his 80's.

We really could have used this old gent's advice and mentoring. Both Mark and I proved that making a gig is not an easy task. We also proved that burning up a partially completed piece *is* an easy task. Actually, I think we may have showed how easy it is to burn up a piece of high carbon (spring) steel more than once. The completed gig shown here is one that Dakota (Mark's son) made.



As some of you already know, Mark is a really good welder and can make about anything out of scrap. He built a nice portable forge using an old disk and an 8" pipe cap for the fire pot. For

a "blower" Mark used a piece of 6" light wall pipe (vertical) and a plunger made from several thicknesses of cardboard. The plunger has a hole through it and a piece of rubber over that hole to serve as a check valve. When the

plunger is pushed down the 6" pipe it compresses and sends air to the forge; when the plunger is raised, the flapper valve opens so that air is not drawn down through the fire. This works like a single chamber bellows.



In just a short time, we had the new forge going. Dakota was making a hoof pick from an old horse shoe when Tom and I had to head for home. I think everyone

there had a good time; thanks for hosting the meeting Mark.

Jim C.

## SOUTH/CENTRAL MEETING

It was hot and dry at Max Scruders. Only a couple of members were brave enough to step close enough to a lit forge to do any work. Most of the rest of us just found some shade, fan and tall glass of ice water and visited.



Alex was one of the ones that needed to work on his trade item. He would work awhile and then stop and go get cooled off. Being younger than the rest of us he was

able to stand the heat longer before needing to get away from it.

David Seigrist was another one that tried some forging in the heat. He was showing a couple of boys how to heat up a rod and start tapering it down.



Max had several nice hacksaws on the trade table. JC Banks, Gregory George, Alex Scrudder and one other member that I can't remember all tried their hand at making the hacksaw and they were all well made.



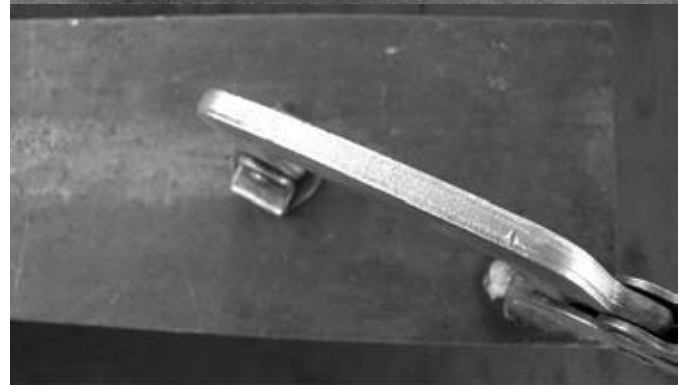
One of the things that Max likes to host is a "largest Clinker contest" Until now there haven't been any really large clinkers show up but Richard Blasius found this one and brought it to show. Max and Ann served a very good smoked Brisket lunch will all the fixings.



### SHOP TIP

JC Banks brought a neat idea for a hold down for the anvil. It is a pair of C-type vice grips that have had the lower jaw removed and then welded to a plate with a square hardy

shank welded to it. The vice grip is welded at an angle so that long pieces can be clamped.



## NORTHWEST MEETING AT LEHENBAUER'S

Gerald Franklin

The July Northwest Regional meeting was held on July 22d at Ron Lehenbauer's shop in Waukomis, OK. The weather really gave us a needed break from the heat. The temp stayed in the low 90's and there was a nice breeze all day long. The trade item was a barbecue fork. There were



about a half dozen excellent pieces on the trade item table showing our membership's forging skills.



Lynn Clowdus brought his knife sharpening equipment, and spent most of the morning giving many members'

knives a much needed edge renewal. Tom Nelson brought a stair rail bracket that will be used to hang a new stair



railing in his "new" house which is the old Douglas Depot building that he is restoring. Parent stock for the bracket is 5/16" X 1 1/4" flat strap

Ron provided a good lunch of sandwiches, beans, coleslaw and chips for the crowd.

There was enough chow for a small army and if anybody left hungry, it was their own fault. It was good to see such a large crowd,



representing all three SCABA Regions, enjoying a day of smithing. Thanks, Ron for hosting another successful meeting.

## AUGUST NOTES

If you have been reading the Saltfork Newsletters for the past few months, you will have noticed that club members have been doing quite a few living history smithing demonstrations. Looking at the calendar of events there are even more in our schedule. We have a number of new members in Saltfork; many of these learned about the club at a demo or through a class.

However, some of our new members may not be familiar with our public smithing demonstrations. Since founding in March of 1995, Saltfork has been committed to high quality educational opportunities for our members and for the general public in our region - all of Oklahoma, some of TX, and parts of KS. At demonstrations, members of Saltfork provide a portable blacksmith "shop" and do smithing demonstrations on site -- similar to what you would see at Silver Dollar City near Branson, Missouri or at the Ozark Folk Center at Mountain View, Arkansas.

About all we need is a good shady spot and access to a few buckets of water for the smith's slack tub. Saltfork members are routinely seen at the local museums, town celebrations, craft shows, and antique

tractor events putting on live, hands-on, blacksmithing demonstrations. At these demonstrations, we make items by hand and hammer using a coal fired forge and anvil the way iron and steel items have been made for centuries. We do the smithing demonstrations for fun and to help educate folks about the basic beginnings of our modern technology.

2007 will mark Oklahoma's state hood Centennial. There will be many organizations around the state that will be pulling out all the stops to show our spirit and pride in the Centennial Celebrations. You can be assured that Saltfork demos will be in greater demand in 2007 than ever before. Now is not too early to be getting these events listed with Bill Davis -- Saltfork Events Coordinator.

Jim C.

## STRATFORD PEACH FESTIVAL

On July 15th, Jerry Cathey, and I demoed as part of the annual Stratford Peach Festival held at the Stratford (OK) City Park. We hated to miss Max's meeting, and we had planned to go, but a last minute phone call from the Stratford Chamber of Commerce diverted us away from the meeting. We were set up close to a peach vending group near the entrance to the park. Weather was hot and dry, as you might expect July in Central Oklahoma to be, but turnout was good. There were 20 to 30 onlookers at our forges for most of the day. The crowd around our forges probably had something to do with the shade of a large pecan tree that we were under. Several folks expressed an interest in Salt Fork Craftsmen so we may pick up a few new members from the effort. We set up a display and sales table and sales were good. Jerry Cathey had a run on banana holders and couldn't make them fast enough. There was a lot going on at this event. We were close to the flint knappers, broom makers, and rope makers. There was live entertainment all day long. There will be room for more demonstrators at next year's affair so plan to come to Stratford for a good time.

Gerald Franklin

### Three Kinds of People a Blacksmith will meet:

- 1) The people who learn from watching
- 2) The people who learn from reading
- 3) All the other people who have to touch the steel themselves to see if it's really hot.

## IFORGEIRON NEWS

IforgeIron is now hosting a forum for Blacksmithing Groups. If any of you would like a full featured forum for the SCABA group you need to contact Glenn.

This section is now on the IforgeIron.com forum.

This forum can be used by the group to post photos, to ask question, to keep in touch with their members. We ask that a representative of each group request that it be set up and a member of that group act as a moderator.

*Ask a blacksmith why  $2+3=255$  pounds, but  $1+1+1=141$  pounds*

## SALTFORK CRAFTSMEN GET RECOGNITION

Recently in a copy of the "Friends of Pawnee Bill Ranch" Newsletter for July 2006, Saltfork Craftsmen member Adam Hall was singled out for a thank you. Adam made several trips over to Pawnee and the old blacksmith shop where he personally restored and re-installed the shop blower. The old shop forge is now operational again for use by the on-site living history interpreters. Contributions by Saltfork members to man the annual May blacksmith class and our participation for 3 weekends in June at the Wild West Show have also been recognized.

## SCABA AUCTION IDEAS

Last year Susan Allen came up with a list of items that would be good additons to the SCABA conference auction. I am reprinting the list this year because they are still great ideas.

- |                                                      |                       |
|------------------------------------------------------|-----------------------|
| Fireplace tool set                                   | Chairs-indoor/outdoor |
| Bar stools, or stools for bathroom or dressing table |                       |
| Small tables for patio or side tables                |                       |
| Plant holders                                        | trivets               |
| Bakers rack                                          | lamp                  |
| Campfire set                                         | quilt rack            |
| Candle holders                                       | coat rack             |



Sets of drawer pulls (at least 4-6)  
Mirror frame with mirror  
Decorative boot scrapers  
Garden art-big bugs, butterflies, wind chimes  
Garden signs, decorative plant stakes,  
Small garden gates

Decorative metal grills or wall hangings  
Unique door knockers  
Beginners forge tools: shovel, fire-rake, water can,  
poker  
Other smithing tools: hardie cutoff, hammers, hot  
cut, spring fuller, tongs, etc.

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Fax: 1-303-646-5913

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Website: [www.greyeaglepress.com](http://www.greyeaglepress.com)

July 10, 2006

**Book Announcement**

**THE SHOP BUILT POWER HAMMER – HANS PEOT**

40 pages, 8 1/2" x 11", comb bound, \$25.00

I've enclosed a copy of our most recent book for your review in 'Anvil's Ring'.

I've known Hans for a long time and I'm pleased to present this material to the blacksmith community. His background in project management and engineering bring to us a solution to the question of "how can I get a new 'Little Giant' style hammer".

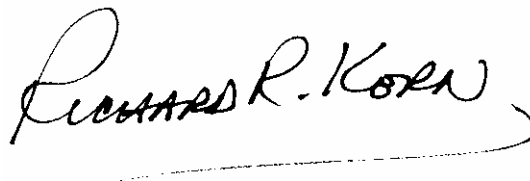
This book offers the only plans for successfully building a power hammer like the well-known 'Little Giant' and other similar mechanical hammers. The machine in the book is the same as a 50 lb unit and works very well. I've seen these hammers in operation; they are smooth and do the work on a sustained basis. You get the details for the clutch, top shaft, motor drive and arm linkages plus a complete materials list. With detailed drawings that are keyed to the materials list you have the makings of your own successful power hammer project. You also get a suggested build sequence that keeps all parts in order and alignment. One of the advantages of this project is the adaptability of the design to the materials you can gather. Only a few dimensions and items are critical and the rest can use your available material.

This is not a beginners project and it will require good welding and layout skills. But it does offer you the traditional mechanical hammer functionality and the pleasure of building your own equipment. If you are even considering a hammer project, this book deserves your attention and it can help make your project a success.

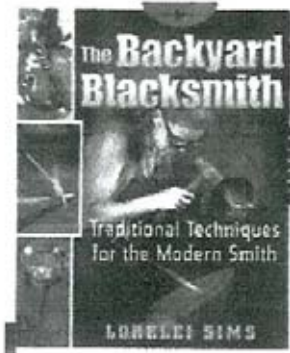
Retail sources include:

Thanks:

Norm Larson Books  
Pieh Tool Company  
MetalCraftTools.com  
CopperStarways.com



August 2006



FOR IMMEDIATE RELEASE

Liz Polay-Wettengel  
978-282-3511

Quarry Books  
liz@rockpub.com

# The Backyard Blacksmith

## Traditional Techniques for the Modern Smith

By Lorelei Sims

not the *magic*....

There is an increasing interest and revival in the art of blacksmithing as a hobby and art, and both men and women are becoming at-home blacksmiths. Blacksmithing is a simple, rewarding craft anyone can enjoy in their backyard or home workshop—even beginners can produce useful and beautiful projects on their first try.

**The Backyard Blacksmith** (Quarry Books/June 2006/\$24.99 paperback) shows how—with some patience and a working knowledge of metals, basic tools, and techniques—blacksmithing can be easy to learn, and a rewarding hobby. Through instructions and illustrations, we will learn to make simple tools and useful items, such as nails, hinges, and handles, and also an interesting mix of artful projects, such as letter openers, door knockers and botanical ornaments.

**The Backyard Blacksmith** features:

- ★ Detailed step-by-step full color exercises teach all the universal skills and techniques used to forge iron; it's like having a master blacksmith by your side
- ★ Provides us with an understanding of the properties and characteristics of forging hot metal, making the craft accessible to those without previous experience
- ★ Over 20 beautiful and function projects organized by difficulty level allow new blacksmiths to progressive at their own pace and master the skills they learned in earlier chapters such as a pot

and utensil rack, a leaf letter opener and a scroll candle holder

**Lorelei Sims** is an artist and blacksmith who specializes in creating hand-forged functional ironwork. Her public art commissions include the Omaha Botanical Gardens in Nebraska, Lincoln Log State Historic Site in Illinois, and Fordham University in New York. In addition to teaching blacksmithing classes and workshops, Lorelei has been a featured demonstrator for blacksmithing conferences throughout North America. She lives in Illinois.

**The Backyard Blacksmith: Traditional Techniques for the Modern Smith**

By Lorelei Sims

Quarry Books

June 2006

\$24.99 paperback

ISBN: 1-59253-251-9

176 pages

250 color photographs

Contact Liz for excerpt material, images, author interviews, or any other information

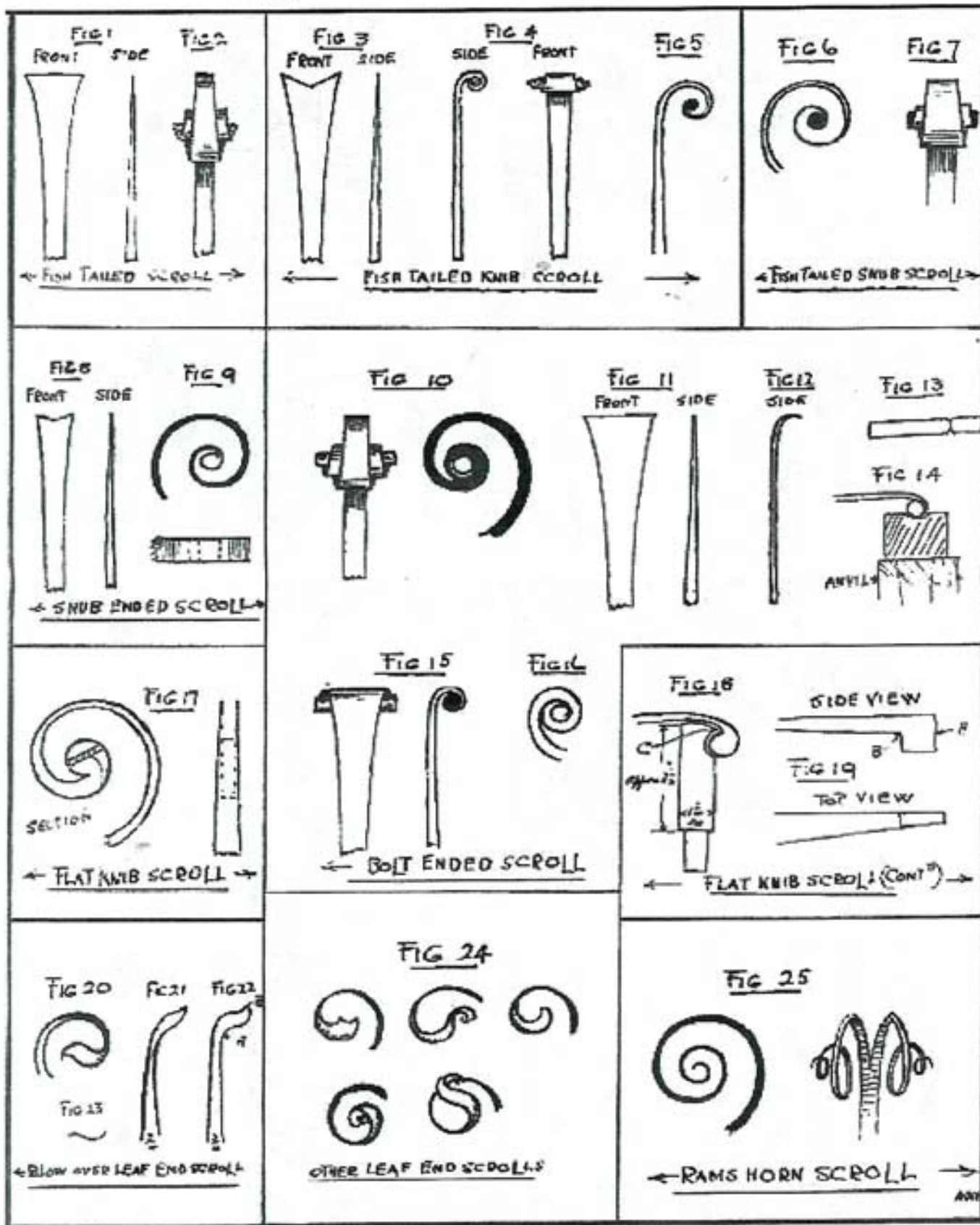


QUARRY

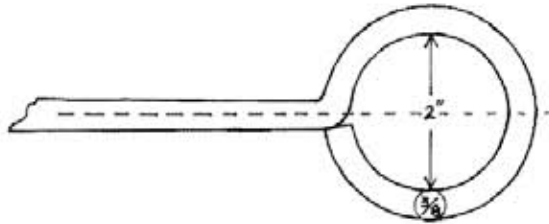
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www.QuaysidePublishingGroup.com

# Scroll Types

Reprinted from the Hammer's Blow spring 1996



# Bending



**Text by Bob Fredell,**

**illustrations by Tom Latané**

**Lesson #15-** Forge an eye on the end of a bar.

*Definition:* Altering the centerline of a bar.

*Intent:* To learn to forge a well-rounded eye to a specific diameter.

*Tools:* Anvil, hammer.

*Material:* 3/8" round x 24" mild steel.

**Note:**

The reader is referred to two earlier articles in the *Controlled Hand Forging* series: (1) *Bending Bar Stock* by Jay Close, *Hammer's Blow*, Vol. 11, # 2, Spring 2003, (2) *Drawing, Punching and Bending* by Peter Ross, *Hammer's Blow*, Vol. 11, #3, Summer 2003. Read these articles. They detail the forging dynamics and the process of bending bar stock. The directions in this lesson are not as comprehensive as the two previous lessons.

**Step One**

The formula to determine the length of material needed for the eye is:

Inside diameter of the eye + thickness of the stock x  $\pi$  = length of stock.

OR

$$2" + .38" \times 3.14 = 7.5", \text{ or } 7\frac{1}{2}."$$

The numbers for this lesson are written using decimals. If you prefer to use fractions, 3 1/7" is used for  $\pi$  and 3/8" for stock size.

*Tip:* If you are overwhelmed by the mathematics, the same information can be gleaned from a full-sized sketch of the finished eye. Use a piece of wire or string along the median circumference of the sketch to get the needed stock requirement for the bend. Or step it off with dividers set at, say, 1/2 inch. Lifting dimensions from a drawing is an important skill to develop. Many forms—such as scrolls—will not readily submit to a mathematical approach.

Center a punch mark 7 1/2" from the end of the bar. There is more than one way to hold the bar while center punching. It may be placed in the corner of the anvil's step, or set on the vise with the jaws opened to slightly less than the diameter of the bar.

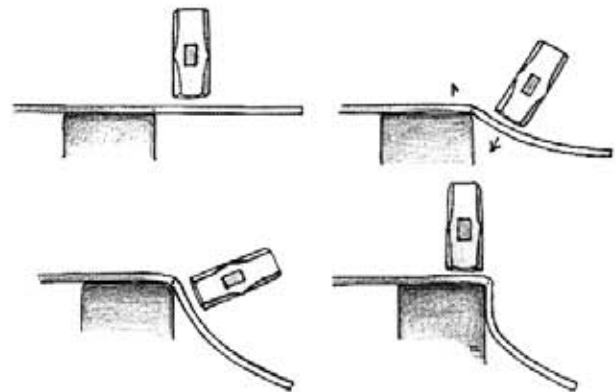
**Step Two**

Heat the entire 7 1/2" portion of stock, plus about another inch, to light yellow.

a.) Place the punch mark at the far rounded edge of the anvil with the punch mark facing to the side where you can see it and keep track of it.

Be certain to keep the bar stock horizontal and flat to the anvil face.

Strike next to the bend—not near the tip of the bar, and bend the bar down 90°. As you do this you will probably note two



*Making the first bend and correcting the counter bend.*

counter bends.

b.) The portion of the heated bar on the face of the anvil will likely have lifted slightly off the anvil in a counter curve. This is caused by the edge of the anvil acting as a fulcrum. As you strike down on one side, the bar levers up on the other. Forge down this unwanted counter bend without reducing the bar dimension.

If you have directed your bending blows near the bend itself, you will likely notice the tip of the bar curving up. The inertia of the bar's end is tending to keep it stationary as the remainder of the bar is forced to bend. The result is a curve like a reversed "J". Do not straighten this! Use it in the next step.

## CONTROLLED HAND FORGING

### Step Three

Go to the anvil horn quickly to use the same heat as in Step Two.

Flip the bar over with the bent portion pointing up.

Raise the hand holding the bar high so you can place the tip of bar horizontally on the anvil horn.

The tip should extend over the horn about 1/4". You have a head start if the tip already has a slight bend (see Step Two).

To make it curve, strike the hot bar that extends beyond the horn. You are working on the side of the horn that is furthest from the smith. Do not pinch the bar between the hammer and horn, as that will not bend it. That will only reduce its dimensions by drawing it out.

Continue to feed the bar across the horn in short increments of about one half of an inch. Never strike the bar twice in the same place. Continue working in this manner until the hammer blows approach the point of the initial 90-degree bend of Step Two.

Inspect your progress frequently. Are you bending a sufficient



*Progressive bends form the eye.*

curve? Is the curve too tight? You may need to go back to an already bent section of the eye for correction. Alter the position of your holding hand—raising it or lowering it—so that the correcting blow is as near vertical as possible.

Sometimes the eye seems to spiral like a coil. Pay attention to how it contacts the horn and how you hit it. Remove the coil effect with a flattening blow or two on the anvil face.

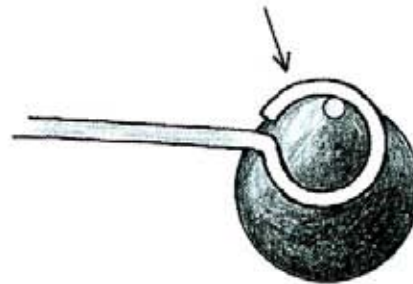
Note: A common error is to hold the hammer at such an angle that the hammer edge strikes the hot bar, making unwanted dents. Only the hammer face is to strike the hot bar.

Depending on how the eye is forming, you may find it necessary to flip the eye so the termination is on the top side of the horn. In this orientation the bending hammer blows will come on the side of the horn nearest the smith.

Note- Making such a bend is really a matter of approximations



*Returning the eye to the proper plane.*



*Eye flipped to an area of insufficient bend.*

and ongoing corrections.

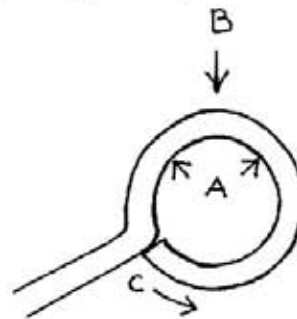
With experience, this step can be completed in one heat. However, the beginner should work for control and accuracy, not speed.

The eye is now formed, but may need further refinement.

#### *Troubleshooting and corrections*

-Look at the eye you have formed. Make mental notes if it is not true to your specifications. It may exhibit "kinks" where the curve is too tight and "flats" where it is too gentle.

-To remove a kink, with the eye heated to a light orange, place the high spot of the kink on the top of the horn where the horn is wide enough to support the eye on either side of the kink.



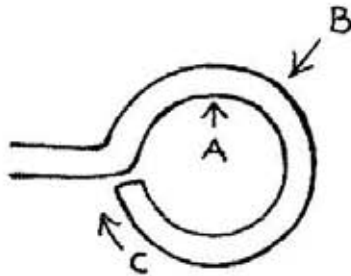
*Opening a kink—eye contacts horn at points A, struck at point B, resulting in movement at C.*

## CONTROLLED HAND FORGING

Sometimes you need to angle the work on the horn to get such a bridging effect with a small diameter. Strike the top of the kink, then make a note of any change of shape, i.e., not enough, too much, or just right.

-To remove a flat spot, place the flat spot on the top of the horn so that the flat spot is supported. Gently strike the eye on the far side of the horn slightly past where the bar contacts the horn. Check your progress. Is the adjustment better, worse or just right?

-These techniques are also used to adjust the tip of the eye to meet the parent stock.

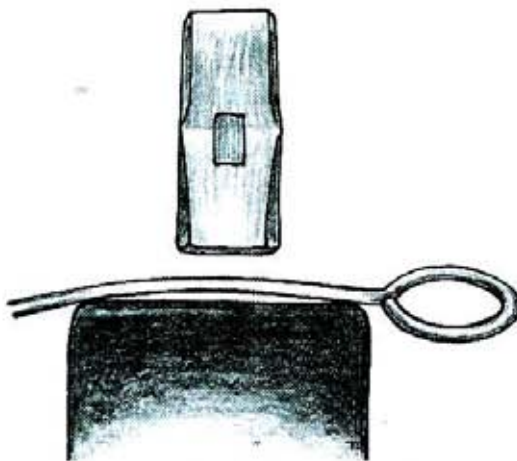


*Removing a flat spot—eye contacts horn at point A, struck at point B, resulting in movement at C.*

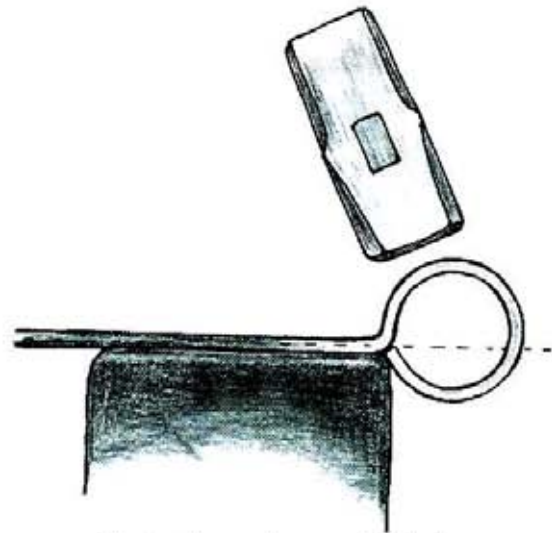
-You may need to raise or lower the holding hand as needed to present the correction conveniently to the hammer.

-The handle and its alignment with the eye may need correction. If so, first straighten the handle so you can accurately read its relationship to the eye. Once the handle is satisfactory, assess its alignment to the eye. The handle must point straight to the center of the eye.

-If the eye is out of alignment, proceed by heating the area of the



*Straightening the "handle" portion of the bar.*



*Aligning the eye to be centered on the bar.*

initial 90-degree bend. Lay the handle across the anvil with the bend on the far rounded edge and the eye placed so that any offset is up. Forge it down into alignment and then make any small corrections to the eye and handle that may be needed.

### Targets:

-The eye has a 2" inside diameter, and has an error of no more than 1/16".

-The end of the bar that forms the eye is to touch the bend at the handle.

-No twists, kinks, or flat spots.

-The handle is to point directly to the center of the eye.