February 2024

THE FORGE FIRE

The Newsletter of the Indiana Blacksmithing Association, Inc.

An Affiliate Of The Artists-Blacksmiths' Association of North America, Inc.

IBA is a Not For Profit Indiana Corporation recognized by the IRS under section 501(c)(3)

9:30 AM is the regular meeting time for IBA Hammer-Ins
with beginner training available at 9:00 AM.
PLEASE MAKE SURE TO ASK FOR HELP!

If you would like an IBA membership application form, please contact Rob Hough, Membership Secretary (317) 517-0427.

BULK LOTS ARE AVAILABLE TO DEMONSTRATORS,
SHOPS, SHOWS AND OTHERS WILLING TO MAKE THEM AVAILABLE.
WE APPRECIATE YOUR HELP.

The Forge Fire is the newsletter of the Indiana Blacksmithing Association Inc. (IBA) IBA is an affiliate of the Artist-Blacksmiths Association of North America Inc.

More nearby resources and organizations for blacksmiths:

Rural Smiths of Mid-America:
Meetings are on the first Saturday of each month
Call Ron Gill
317-374-8323 for details

IBA MEETING SCHEDULE

Check the latest *Forge Fire* for monthly **IBA** revisions.

Feb 17 2024	**KEN DETTMER COLUMBUS, IN**
Mar 16 2024	**ANNUAL BUSINESS MEETING CARTERSBURG, IN**
Apr 20 2024	**JOHN BENNETT ROSEDALE, IN**
May 18 2024	**ROB HOUGH ALBANY, IN**

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Dates to Remember

February 17
Hammer In at Ken Dettmer's

March 16
Annual Business
Belleville Lodge,
Cartersburg

May 31—June 2
IBA Conference
Tipton Co.
Fair Grounds

Editors Message

This edition of the Forge Fire does not include a ballot for the 2 IBA board of directors positions. There were only 2 people who expressed interest in serving. If anyone would like to serve on the board, they should attend the business meeting in March.

I am asking for help in gathering input articles for the Forge Fire. With changes to my email, I am not receiving many of the newsletters from other ABANA groups. Those newsletters supplied most of the tools, techniques and projects that appeared in past Forge Fire editions. This edition has an article from Bill Corey on how to determine the length of starting material when drawing down or tapering to a smaller material. If you have something to share, please send pictures and descriptions to me at cmikendrick@gmail.com. I can work to generate supporting text. In the mean time I will be reprising articles from older newsletters.

The **IBA Conference** will be coming up in just a few months **(May 30—June 2)**. Be sure to save the dates and start thinking about auction and iron-in-the-hat items.

ABANA Conference June 6-9

Registration is now open for the ABANA 50th Anniversary Celebration & Conference. We've got a ton in store for you!

Derek Melton will give an induction forge demonstration. Artist-blacksmith Artem Marshak will be forging a piece of sculpture. Demonstrations on traditional forging techniques will be given by Jennifer Petrila, while Randy McDaniel will focus on working with the hydraulic forging press. Bladesmith Steve Rollert will be demonstrating his specialty - pattern welded steel. Patrick Quinn will give a demo on the power hammer with a focus on forging tongs.

Mark Aspery, Becky Schimpff, Bob Menard, Mark Sperry, Ron Nichols, and Philip Waters will be in the Education Tents teaching the ABANA National Curriculum.

Doug Hayes and Sam Hayes will be instructing in the Beginner's Tent to lend a hand to first-timers and novices.

Gabriel Craig will lecture on Detroit ironwork and his discoveries of "hidden" works by Samuel Yellin.

And don't forget about the Gallery of Ironwork, the Art Auction, Iron-in-the-Hat Raffle, Vendors, a tour of the Center for Metal Arts, Food, Festivities, and more.

IBA website: www.indianablacksmithing.org IBA Facebook page: www.facebook.com/groups/IndianaBlacksmithingAssociation/

IBA Satellite Groups and News

1) Sutton-Terock Memorial Blacksmith Shop
Meet: 2nd Saturday at 9 AM
Contacts: Fred Oden (574) 223-3508
Tim Pearson (574) 298-8595

2) Jennings County Historical Society Blacksmith Shop
Meet: 2nd Saturday at 9 AM
Contact: Paul Bray (812) 521-7177

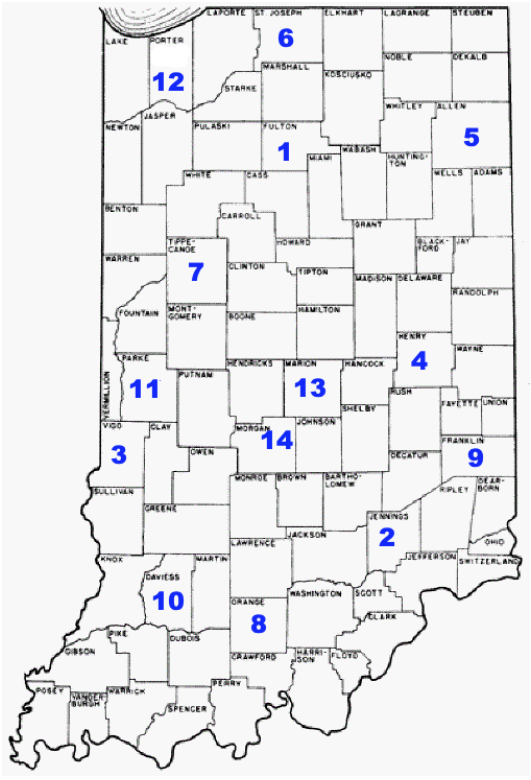
3) Wabash Valley Blacksmith Shop
Meet: 3rd Saturday at 9 AM
Contacts: Bill Cochran (812) 241-8447
Max Hoopengarner (812) 249-8303

4) Fall Creek Blacksmith Shop
Meet: 4th Saturday at 9 AM
Contacts: Gary Phillips (260) 251-4670

5) Maumee Valley Blacksmiths
Meet: 2nd Saturday
Contacts: Clint Casey (260) 627-6270
Mark Thomas (260) 758 2332

6) St. Joe Valley Forgers
Meet: 4th Saturday at 9 AM
Contacts: Bill Conyers (574) 277-8729
John Latowski (574) 344-1730

7) Rocky Forge Blacksmith Guild
Meet: 2nd Saturday at 9 AM
Contacts: Ted Stout (765) 572-2467



8) Meteorite Mashers
Contacts: Mike Mills (812) 633-4273
Steve King (812) 797-0059
Jeff Reinhardt 812-949-7163

9) Whitewater Valley Blacksmiths
Meet: 2nd Saturday
Contact: Keith Hicks (765) 914-6584

10) Bunkum Valley Metalsmiths
Meet: 1st Saturday
Contacts: Jim Malone (812) 725-3311
Terry Byers (812) 275-7150
Carol Baker (317) 809-0314

11) Covered Bridge Blacksmith Guild
Meet: 1st Saturday
Contact: John Bennett (812) 877-7274

12) Snake Road Forge
Meet: 1st Saturday
Contact: Rod Marvel (219) 241-0628

13) Satellite 13
Meet: 4th Saturday
Contact: Darrin Burch (317) 607-3170
Doug Wilson (317) 439-7684

14) Old Town Waverly Blacksmiths
Meet: 2nd Saturday
Contacts: Mike Lyvers (317-728-5771),
Kenny Hale (765-318-3390),
Mike Jackson (317-509-9115).

Jennings County Historical Society Blacksmith Shop

The Vernon blacksmiths met at the forge of Dave Good on Jan. 13. Dave was the first demonstrator. He began working his magic on his new hammer. he made a beautiful camp fork about 12 or so inches long. He then proceeded to make a meat cleaver and temper the edge. He wasn't satisfied with the outcome and resolved to work on it later. Xander Good worked on a trammel, punching the holes rather than drilling. the working hanger was 1/4" round stock. He also made a nice "s" hook.

Kenny Dettmer will be hosting February10 meeting. Kenny's shop is located at 15721 S 250W Columbus. Bring a dish to share. The State meeting will follow on the third Saturday at the same place. Bring lots of iron in the hat and buy lots of tickets. Paul Bray

IBA Satellite Groups and News (continued)

Meteorite Mashers

We held the January meeting of the Meteorite mashers at Steve King's very nice shop in Paoli in conjunction with the IBA State meeting. Zack Rapattoni demonstrated a squirrel cooker. There was lots of activity in the forge shop and at the other end of the shop was the hard core story telling etc. (And as Billy Merrit was fond of saying "When all was said and done, more was said then done) A large and good iron in the hat was held, and as always we ate very well. Excellent turnout on a very cold day. Steve had his shop nice and warm inside in contrast to the near zero outside temps.

The next meeting will be at Jeff Reinhardt's shop in Floyds Knobs.

Calculations by Bill Corey

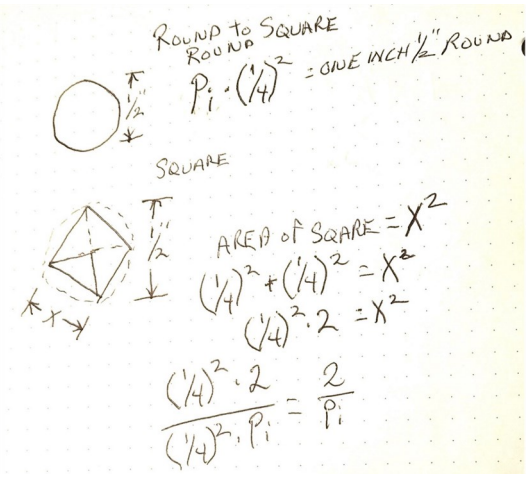
With the cold weather having me spend way too much time in my easy chair I have spent some of that time putting pencil to paper, working my old brain on teachings of years way past. And to this point I have made some self-discoveries. Nothing groundbreaking for sure as I realize nothing my brain can make my hand scribble down has not been something that anyone of very little mathematical knowledge could come up with, and there's a very good probability that I was taught all of this in those "teachings of years way past" but I was not really paying that much attention at that time.

I'm also quite sure that these mathematical equations are no great discovery to quite a few of the readers of this however I thought some may gain some knowledge from my own "AHA Moments" so I thought I'd share them. Also I'm not taking into account any real loss for mill scale from forging.

1. As many of you probably know, if you draw down a square bar to half its size it gains 4 times that in length. So 1" of ½" square bar drawn down to ¼" square bar will be 4" long. And the same holds true too round bar. Draw down 1" of ½" round bar to ¼" and you'll have 4" of it. Or if you are drawing out ¾" round bar to 3/8" for reins on some tongs and you want 12" of reins, start out with 3" of ¾" round.
2. Also dealing with square and round, a cone is 1/3 of a cylinder and a pyramid is 1/3 of a square bar.
3. If you forge a round bar into the maximum sized, 1" long, square bar it will make you'll need to forge approximately 5/8" of the round bar, or 2/Pi .

   To explain this I'll start out with, for example, ½" round. For every one inch the area of the bar will be (1/4)^2 * Pi (or pi times radius square).

   1If X is the width of the largest square forged from this round bar and we denote the side of that square as X, then X^2 would be the area of 1" of it. We know that the hypotenuse of a right angle is a^2 + b^2 = X^2 so ((1/4)^2)+((1/4)^2) = X^2 = ((1/4)^2)*2. That divided by the area of the ½" round would give you the length of ½" round bar you'd need to forge to get 1" of square bar or 2 divided by Pi. And yes, I'll include my work.

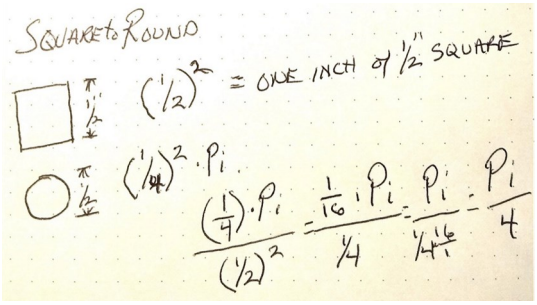


Calculations continued

4. If you on the other hand, forge square to the maximum size round bar, 1" long, you'll need approximately ¾" of the round bar, or Pi/4.

   To explain this I'll start out with ½" square bar. The area of 1" of it would be (1/2)^2.

   The largest round bar would have a diameter of ½" and the ¼". So to get a 1" length of ½" round bar from a ½" square bar you'd need ((1/4)^2)*Pi) / ((1/2)^2) of it or Pi divided by 4.



"So what?" you ask. Well, if you are forging a set of tongs, or anything as far as that goes, the above can be used to estimate how much stock you'll need to start out with if you want to end up with a certain length. If you want 12" of 3/8" reins and you are forging ¾" square bar, for every 4" of 3/8" round you'll need 1" of ¾" so you'll need 3" total. And for that 3" of ¾" round you'll need 3* (Pi/4) of the ¾" square or 2.3561945 or approximately 2 3/8"

5. One last little helpful item, especially if you use a calculator to help with these calculations, to convert a decimal to a fraction, just multiply that decimal by the denominator of the fraction you are going for. For example, in the above example of 2.3561945 I multiplied 0.3561945*8 and ended up with 2.85 and rounding that up to 3 or just a little under 3/8.

To wrap it up, we are always drawing pieces out, going from square to round, round to square, drawing out a taper. With just a little bit of math prior to starting you can get a real close idea how much of that stock you'll need that you probably don't have, or you have and you saw it a couple of days ago but can't find it now.

Editor's Notes:

- **The previous article (and table below) provide the correct mathematical solution without allowance for material loss during forging. Some loss due to scale formation should be expected. An often quoted general rule is 5% material loss for every heat.**
- **For those who do not want to run calculations, the table below shows the starting length of material to achieve a 1" length at the desired final dimension. Starting lengths greater than 1" means the material must be upset to reach the final round or square dimension.**

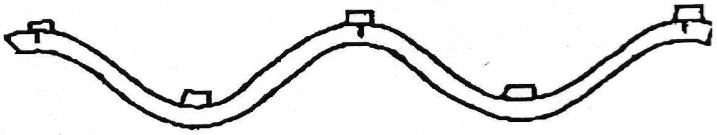
			Final Dimension at 1" Length													
			Round							Square						
			1/4	3/8	1/2	5/8	3/4	7/8	1	1/4	3/8	1/2	5/8	3/4	7/8	1
Starting Dimension	Round	1/4		2.25	4	6.25	9	12.25	16	1.27	2.86	5.09	7.96	11.46	15.60	20.37
		3/8	0.44		1.78	2.78	4.00	5.44	7.11	0.57	1.27	2.26	3.54	5.09	6.93	9.05
		1/2	0.25	0.56		1.56	2.25	3.06	4	0.32	0.72	1.27	1.99	2.86	3.90	5.09
		5/8	0.16	0.36	0.64		1.44	1.96	2.56	0.20	0.46	0.81	1.27	1.83	2.50	3.26
		3/4	0.11	0.25	0.44	0.69		1.36	1.78	0.14	0.32	0.57	0.88	1.27	1.73	2.26
		7/8	0.08	0.18	0.33	0.51	0.73		1.31	0.10	0.23	0.42	0.65	0.94	1.27	1.66
		1	0.06	0.14	0.25	0.39	0.56	0.77		0.08	0.18	0.32	0.50	0.72	0.97	1.27
	Square	1/4	0.79	1.77	3.14	4.91	7.07	9.62	12.57		2.25	4	6.25	9	12.25	16
		3/8	0.35	0.79	1.40	2.18	3.14	4.28	5.59	0.44		1.78	2.78	4.00	5.44	7.11
		1/2	0.20	0.44	0.79	1.23	1.77	2.41	3.14	0.25	0.56		1.56	2.25	3.06	4
		5/8	0.13	0.28	0.50	0.79	1.13	1.54	2.01	0.16	0.36	0.64		1.44	1.96	2.56
		3/4	0.09	0.20	0.35	0.55	0.79	1.07	1.40	0.11	0.25	0.44	0.69		1.36	1.78
		7/8	0.06	0.14	0.26	0.40	0.58	0.79	1.03	0.08	0.18	0.33	0.51	0.73		1.31
		1	0.05	0.11	0.20	0.31	0.44	0.60	0.79	0.06	0.14	0.25	0.39	0.56	0.77	

The following 4-page article is reprinted from the July-August 1991 edition of Bituminous Bits, the journal of the Alabama Forge Council.

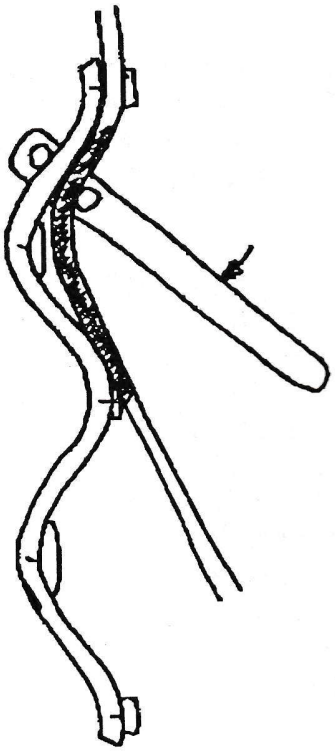
Wavy Bars by Grady Holley

Grady Holley started by demonstrating how he made the wavy bars he put in a large grill. The bars were joined with collars at the points where they met. When the bars are joined the waves make circles. It was shown in The Anvil's Ring, Vol. 16, No. 2, Fall 1988.

Since many bars had to meet at exact points, it was necessary to use a jig to put the curves in and another to size each bar for width and length. Grady first made a full size drawing and used it to make the jig. The jig was made



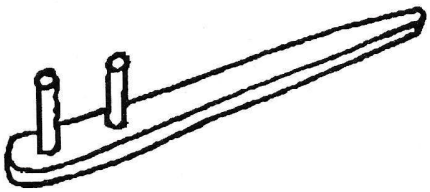
from 3/4" square and register marks were put on the high points of the waves. There is a keeper on one end and ledges at all the points where the curves change direction. The centers between waves are 7" apart. At least 2 waves are required in the jig so that the last completed wave can be clamped in position while the next is being formed.



Break the corners on all bars before you start. The stock was 3/8" square.

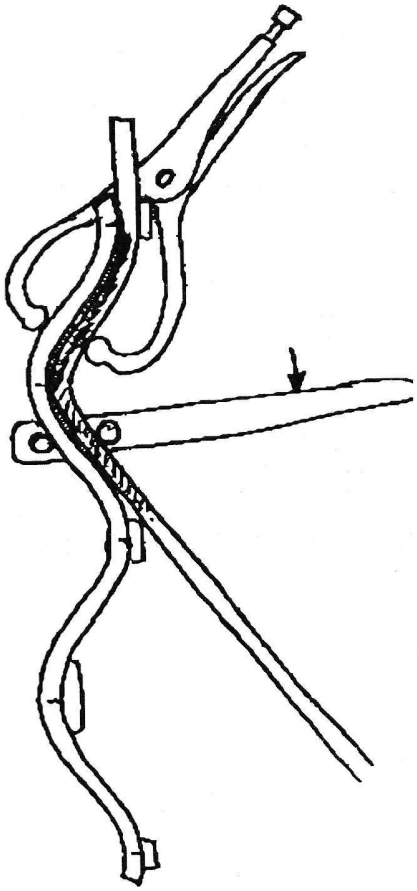
Clamp the jig in a vise and heat a long section of the bar. Grady says to let the end run wild or a little over length and cut off later.

Take a long heat, at least 10 –12" long. Grady recommends a gas forge for a long even heat. Put the end in the keeper and use a wide bending wrench (about 1 1/2" between the forks) to bend the hot bar to conform with the jig. Use the wrench



both from top and bottom to help keep the bar from twisting.

When the bar is bent into the first hollow and fits well, clamp the bar to the jig with vise grips. Continue to work the hot stock to fit the jig.

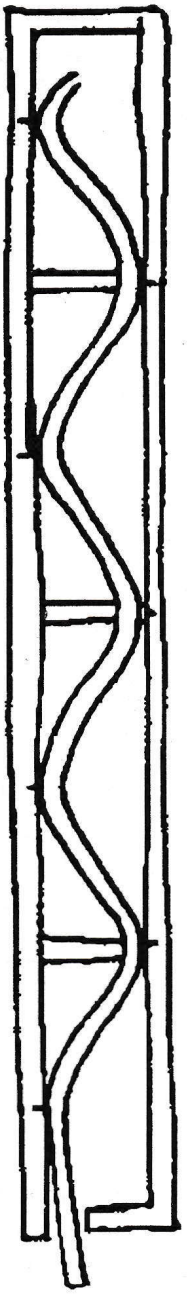


Don't continue bending after stock is cold. Make light register marks on the bar to match the jig marks. Leave the stock clamped until it is cool. Remove from the jig and straighten in the other plane.

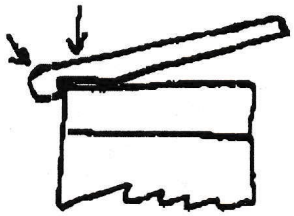
Heat the next section, clamp the bent part in the first sec-

Wavy Bars by Grady Holley

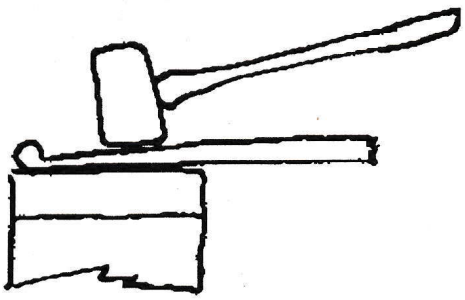
tion of the jig and proceed to fit the next section to the jig as before.
Continue bending in the jig to get as many waves as you need.
Grady used a rectangular frame to verify that the wavy bars are the proper width and length. He had register marks on this frame also. One end was open so that the running end could get out of the frame. On his demo piece, Grady made 3 full waves, each exactly 7" long. He made two pieces so he could collar them together.
He marked and cut the ends of each bar off at the same length and forged scrolls.



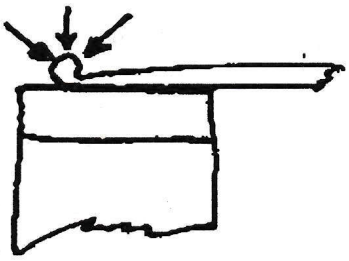
Forge the solid snub end scrolls by putting 3/8" of the 3/8" square stock over the edge of the anvil and necking down the stock just behind the



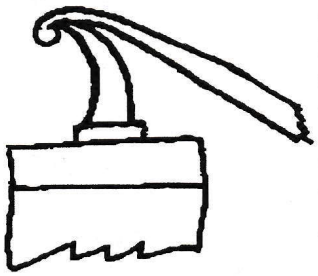
snub end to 1/8" thick. Turn the stock over and taper the 4" of stock behind the snub to a smooth taper.



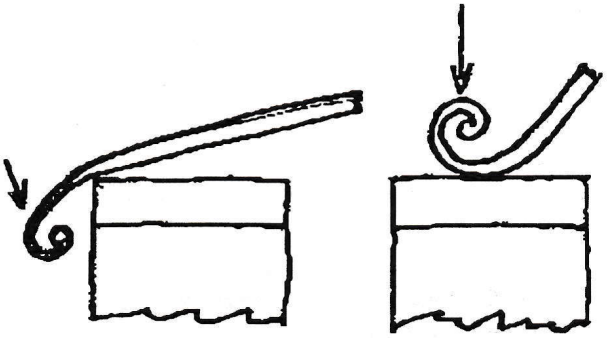
Round the snub end by hammering on the corners. Start the scroll by bending the snub end back close to the to the shank.



Grady used a curved scroll starter. It looks like a tall hardy bent in a smooth curve. Continue the scroll by bending over the anvil edge and then turn up and bend the end to tighten the curve. Form a smooth curve tight in center and opening up evenly.



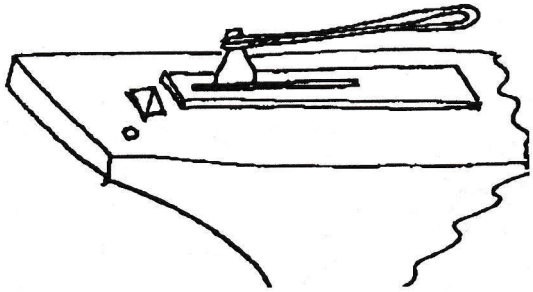
Forge snub ends and scroll all four ends, making sure they all match. Grady fit the bars in the frame to be sure the scroll ends fit. Try the bars against each other. Make any small adjustments as required.



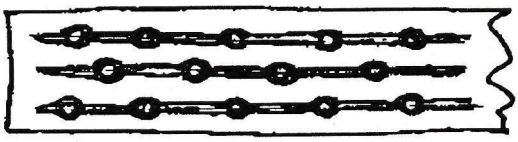
Collars to hold the bars together may be plain or decorated. Even a simple line down the middle makes a big difference. T he ends may be square and butted or tapered and overlapped. The length of collar is perimeter of bars + 2 1/2 times the thickness of the collar stock. This is true for either tapered or butted ends.

Wavy Bars by Grady Holley

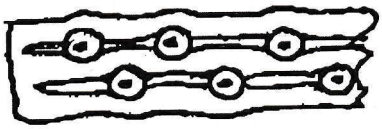
Any decoration is put in the bars before they are cut. Grady made a sample piece showing one decoration. Make three grooves in a piece



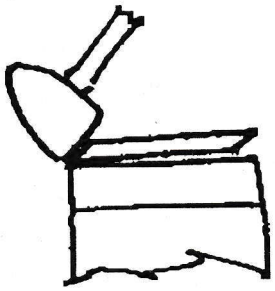
of 1" wide stock. The chisel or hot cut should have a rounded end so it can be rocked along and kept in the same groove. Grady used a handle made of 1/4" round stock wrapped around the chisel so that it could be re-quenched and tempered easily.
He then used a center punch to make indentations in the groves about 1/2" apart. The



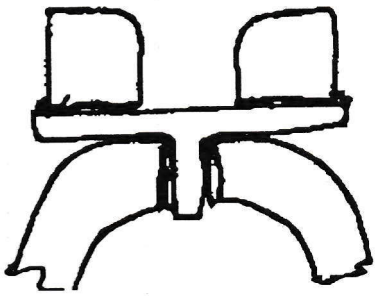
marks are staggered. Follow the center punch with a small round punch, about 1/4" diameter.
Grady made two collars and fastened them around two bars.
One was plain and the other had a single groove.



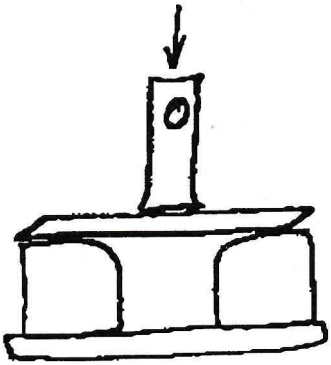
Cut the collar to length. The stock was 1/8" x 1/2". Heat and make a very short taper on the end of the stock at the edge of the anvil. The length of the taper was about 2 times stock thickness or 1/4". Heat the other end and taper this end on the other side so that they will lap.



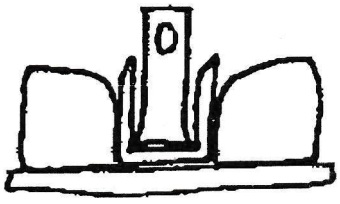
Grady used a jig to form the collars to the U shape. The collar jig is the width of the bars + two thicknesses of the collar. The set is the width of the bars and has sharp edges at the end. The sides above the sharp edges are relieved so you can easily remove the set and collar from the jig.



Heat the collar and center over the jig.
The collar must be square across the jig or it will be twisted.

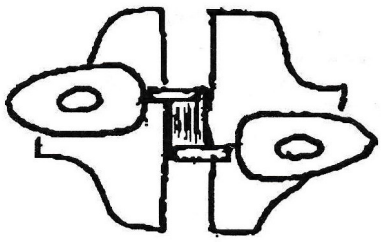


Drive the set into the collar to form sharp inside corners in the U.

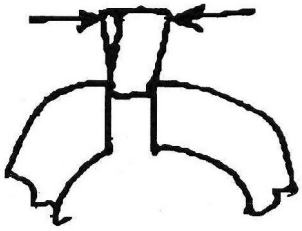


Check the collar for twist. Put the bot-

Wavy Bars by Grady Holley

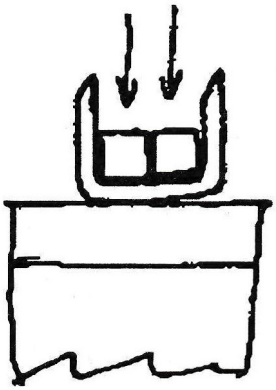


tom of the collar in a vise and bend the ends to straighten. It will still be twisted but you can hammer it straight while closing it.



Heat the collar and drive the bars into the collar to set it in tight.

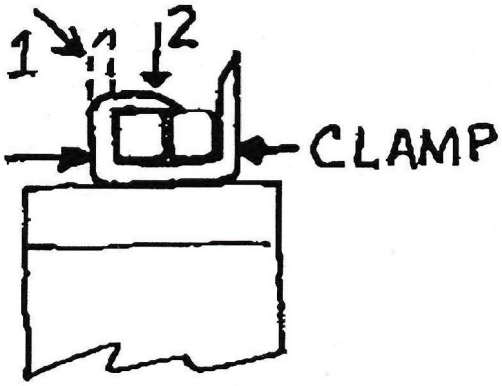
Quickly clamp the sides.



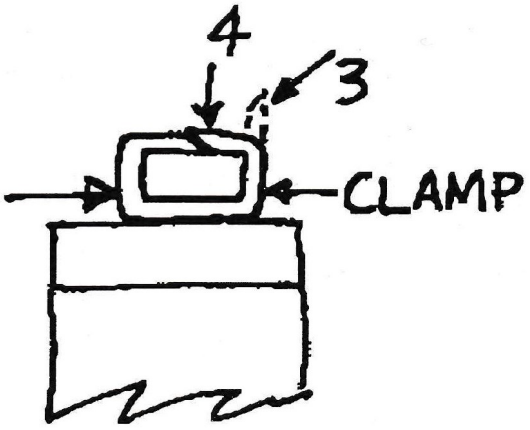
Fold one end in and down flat very quickly with two hammer blows. Then fold the other side down on top and flat with 2 hammer blows.

Do not hammer any more than necessary. It draws out the collar and makes it loose.

Closing the collars is done better and quicker



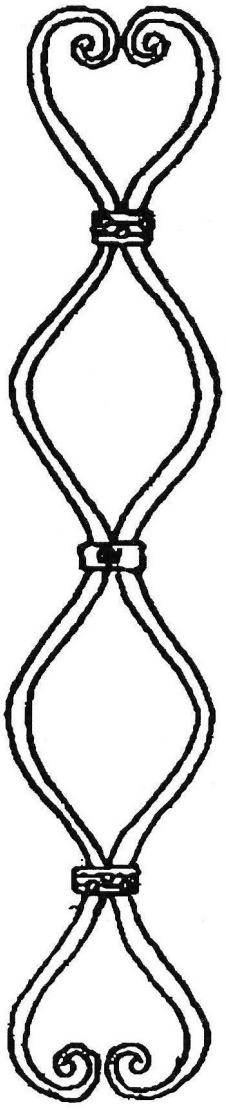
with two people. Grady says it is good to have



someone just heating the collars, also.

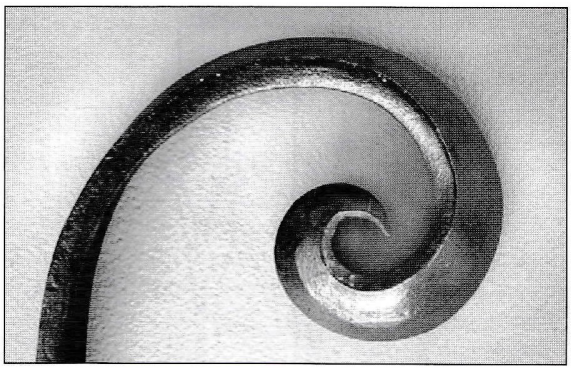
Grady collared the wavy bars with three collars. One was decorated as he demonstrated with the grooves and punch marks, another was decorated with alternating round circles made with an eye punch or rivet set and the other was decorated with his touchmark.

Clean up with wire brush and apply a finish of equal parts of beeswax and turpentine. This finish is alright for inside work and needs rewaxing about every 6 months.



The Beveled Scroll

by Mark Aspery, Springville, California



This 2-page article reprinted from the September/October 2005 edition of California Blacksmith the newsletter of the California Blacksmith Association

This scroll is the sister to the blown over beveled leaf scroll. The techniques are very similar.

To start, draw a slightly round taper of at least 2" on the end of the bar. Bring the end down to a sharp point, **Steps 1A through 1C.**

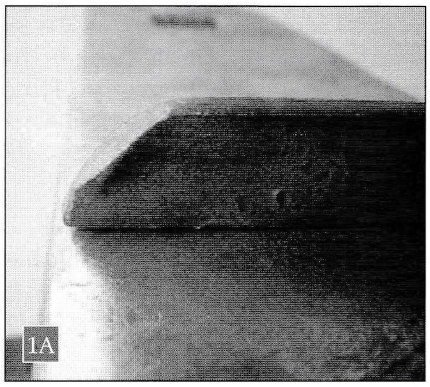
The next step will dictate the shape and size of the finished scroll. Turning the bar on edge, turn a scroll on the end of the bar. I like to start a bit back from the end.

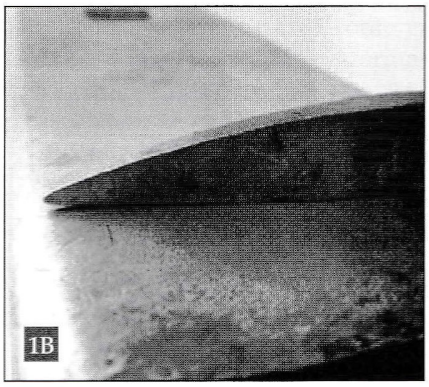
Bend as much as you can from the top and then place the bar underneath the bick and bend the majority of what is left. I like the scroll to make about one complete turn through 360°, **Steps 2A through 2C.** The result of working on the bick is shown in **Step 2D.**

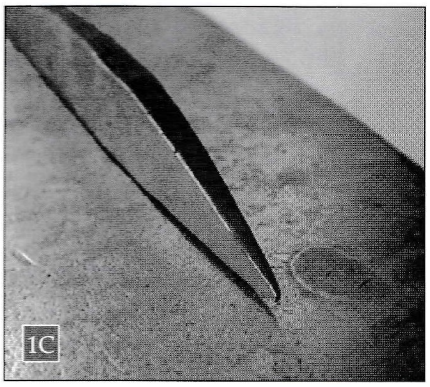
Getting to the very end of the scroll can be difficult. In order to get to the end, you will have to knock the end out of alignment. Take **Step 2E** and finish scrolling, using your hand hammer on the face of the anvil.

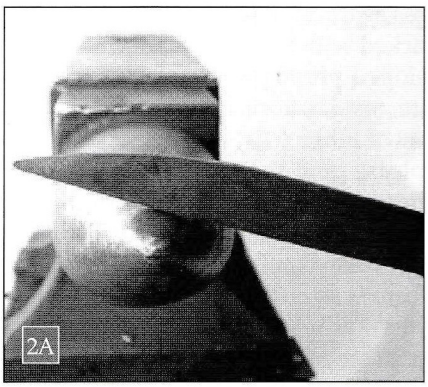
Once the scroll is formed, edgeways on the bar, decide whether this will be a left or right-handed scroll. This type of scroll has a front and a back, making it one-sided visually. When you lay it on the anvil face to be beveled, if the bar scrolls to the right, it will produce a right-facing scroll, and of course vice versa, **Step 2F.**

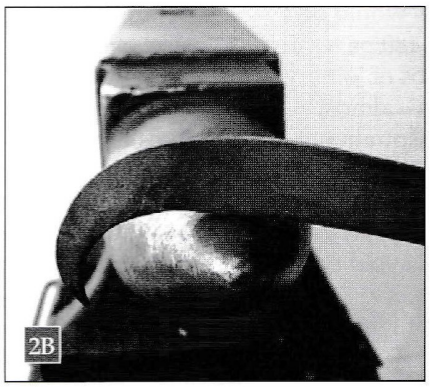
At this stage bevel the edges. The inside edge will receive most attention visually and so requires a little more effort than the outside edge.

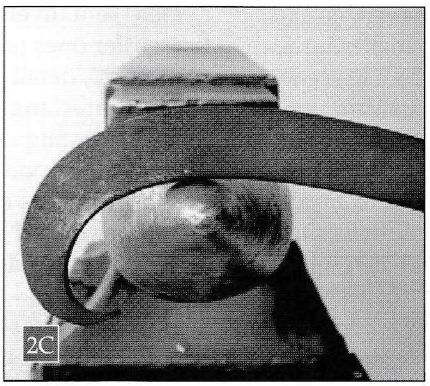


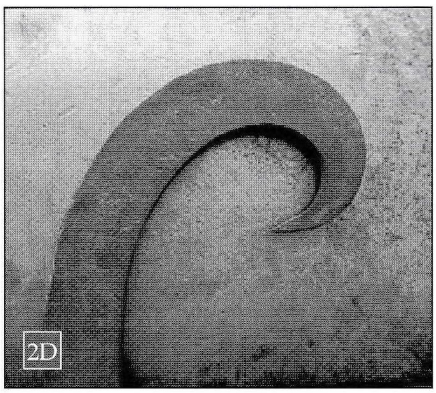


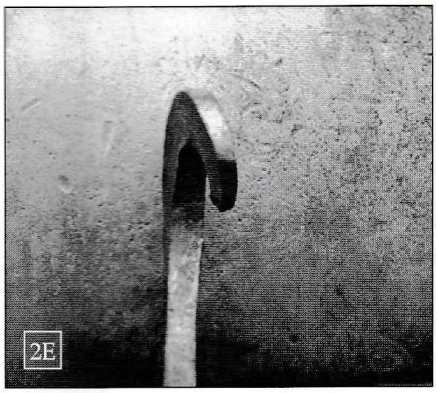


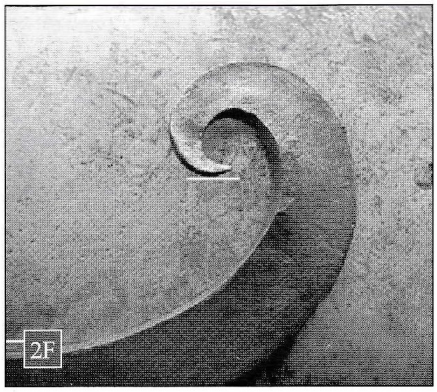












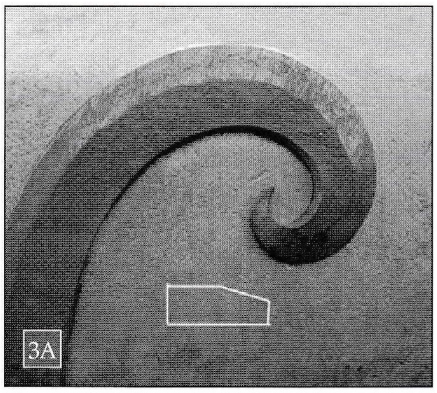
When you bevel the inside edge, the scroll will open; when you bevel the outside edge, it will close the scroll, making it tighter.

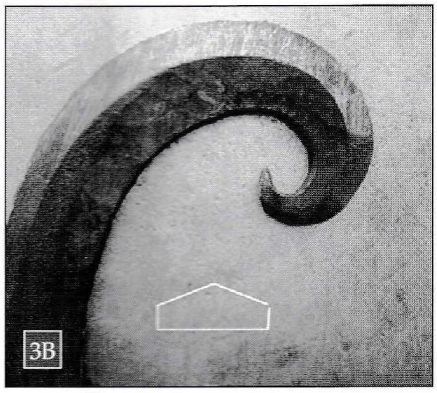
I like to have the chamfers meet in the middle of the bar for the first couple of inches, **Steps 3A and 3B.**

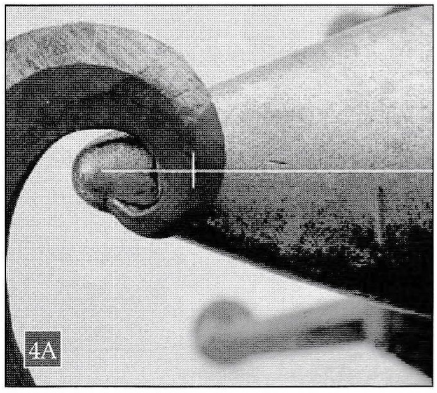
After the chamfers are complete, the scroll must now be turned 90° to the parent bar.

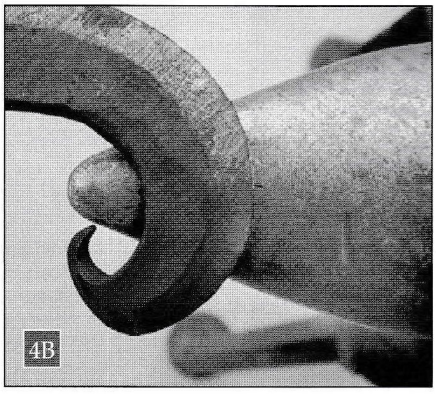
And now to the scrolling part: in order to better understand how to turn this type of scroll, get a piece of cardboard (a breakfast cereal box will do nicely) and draw the outline of your forged scroll on the cardboard. Cut out the cardboard scroll with scissors.

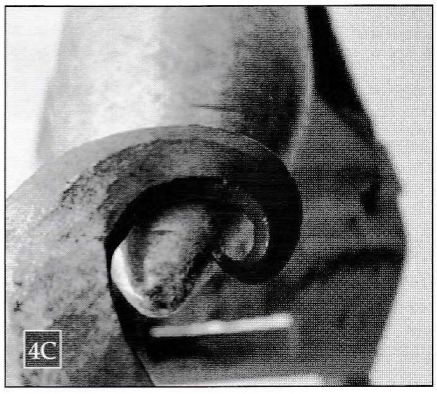
Holding the cardboard in one hand between the thumb and forefinger, start at the end and make a bend 90° to the centerline of the scroll. Feed about ¼" out and do the same thing. Continue along the entire scroll. You should find that the scroll end has made a slow 90° turn and is now resting in line with the rest of the scroll. That knowledge helps you when you go to the anvil. You could turn these scrolls off the side of the face of the anvil if you didn't need some clearance for the turning end. As such, we turn these scrolls on the end of the bick as it allows us the clearance that we need for turning the scroll, **Steps 4A through 4D.** ♣

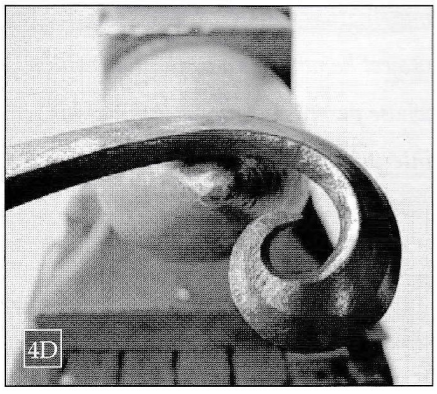












The *FORGE FIRE*
Newsletter of the
Indiana Blacksmithing Association, Inc.

Rob Hough
Membership Secretary
9790 N Sharp Bend Rd
Albany, IN 47320

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February 17 Hammer In
Kenny Dettmer's Shop

15721 S 250W Columbus, IN

From the North: take I 65 S to Ogilville / Walesboro (exit 64) turn. right. Go to the 1st cross-roads (300 W). Turn left. Approx 1 mile to the "T' . Turn left (600s). Go to 250W. Approx. 4 miles to a brick house on your left.
From the South: I 65N to Jonesville exit 55 turn. right, go to road 950 (in Jonesville). Turn left. Go to 250W turn. right. Kenny's house is approx 1/2 mile on your right .

Please bring a dish to share.

March 16 Annual Business Meeting
Belleville Masonic Lodge

4252 Cartersburg Rd, Plainfield, IN 46168

From Indianapolis: take I-465 exit #12 (Washington St/US-40 West). Follow US-40 about 10 miles through Plainfield. Turn right Cartersburg Rd. Masonic Lodge is about 1 mile on left.

Pitch in lunch