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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 Farrel Wells, Membership Secretary
(765) 768-6235.**

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

The Indiana Blacksmithing Association, Inc., its staff, officers, directors, members, and hosts and the *Forge Fire*, specifically disclaim any responsibility or liability for damages or injuries as a result of any construction, design, use, manufacture or other activity undertaken as a result of the use, or application of, information contained in any articles in the *Forge Fire*. The Indiana Blacksmithing Association, Inc. And the *Forge Fire* assumes no responsibility or liability for the accuracy, fitness, proper design, safety, or safe use of any information contained in the *Forge Fire*.

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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.

No October Hammer In

**Check IBA Facebook site for up
to date news about hammer ins**



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Editors Message

Please check to see if you are up to date on IBA dues. Farrel indicated about 100 people were out of date. If you need to renew your membership the application form is on the IBA website. Complete and mail to Farrel Wells.

I do not have any IBA news, updates or changes as COVID19 continues to dominate our daily activities.

We do have some interesting articles shared from other groups:

Page 4 has an article on scrolls reprinted from the October 2020 edition of the Florida Artist Blacksmith Association newsletter. We have shared similar information in the past, but scrolls are vital element in many projects. The visual balance and flow of scroll can make a huge impact on the overall success of the project.

Page 5 starts an article on decorative finials reprinted from the September–October edition of The Bituminous Bits The Journal of the Alabama Forge Council.

Page 11 has an article on quench oils that is also reprinted for the September–October edition of Bituminous Bits.

The following item comes from the September–October edition of Bituminous Bits

History of Modern Artistic Blacksmithing

ABANA has two wall murals available on their website showing the history of “the two modern revivals of artistic blacksmithing”. The first shows events from 1890 to 1940. The second starts around 1970 and features names and events that will be more familiar to AFC members. The Spencer/Clontz Tire Hammer is on there, as are the Ypres poppies and the Devil’s Blacksmith hinge by Walfrid Huber. So are Francis Whitaker, Clifton Ralph’s power hammer tapes, Jim Batson’s forging press book, the Mark Aspery books, Randy McDaniel’s forging press book, and Uri Hofi’s hand hammer technique.

Search “ABANA wall mural timeline” on your browser to find the murals. The files can be downloaded.

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: Ray Sease (812) 522-7722

3) Wabash Valley Blacksmith Shop

Meet: 2nd Saturday at 9 AM
 Contacts: Doug Moreland (217) 284-3457
 Max Hoopengartner (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

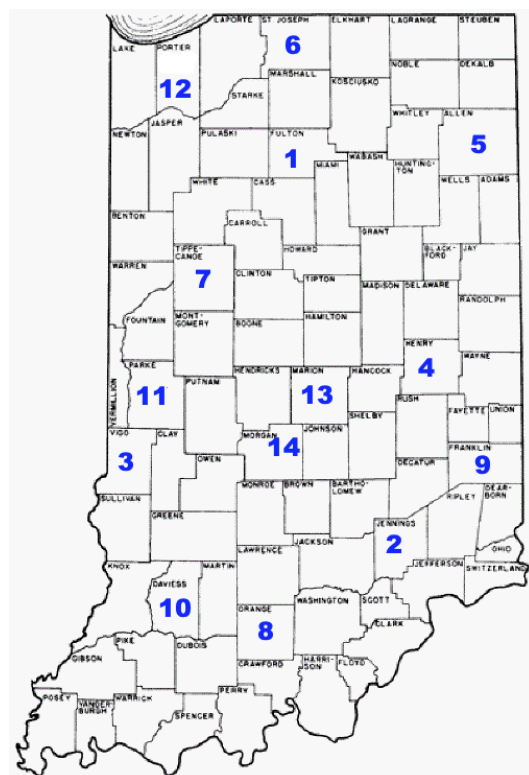
Meet: 1st Saturday
 Contact: Rod Marvel (219) 241-0628

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 Jennings County Historical Society Blacksmiths met on the 12th with 13 signing in. We started with Kevin Welsh monster lifting the leg vise stand out of the ground. A newcomer, Bryan Gray, jumped right in and finished digging the rest of the stump out. The two then mixed cement and set a new post. Dave Good and Bill Kendrick worked hard making a side-cut hardy tool. Nathan Pelter mentored Samantha Weaver on some basics. Someone upgraded some much needed electrical work - many thanks! Some painting also took place- also thanks. Many things get done that do not always get proper thanks. I hope this does not deter anyone from doing things when they have the opportunity. Hope to see you on the 10th. As usual, bring iron in the hat, and your wallet!

Paul Bray

Standard #8 Scroll Work: Make two different types of scrolls

By David Sandlin (reprinted from the October 2020 edition of The Florida Clinker Breaker)

FABA Journeyman Standard #8

Scroll Work: Make two different types of scrolls.

The problem with this standard is there are far too many options. For example, in the King Architectural Metals catalog, 772 types of scrolls are listed! (For examples and inspiration see <http://steel.kingmetals.com/>).

However, in truth there are an infinite number of scrolls one could make. So, how to break this standard down into something that is a bit more quantifiable?

First off, what is a scroll? A scroll is defined as "a spiral or convoluted form in ornamental design derived from the curves of a loosely or partly rolled parchment scroll." Therefore a scroll is anything from a single bend to a series of bends, all with a decreasing radius.

Scrolls can be simple to highly ornamental and several can be put together to make artistic and interesting work. However, even with this unlimited palette there are actually only two types of scrolls that are used to make all the variations, the Archimedean Spiral and the Golden Spiral.

The Archimedean Spiral (also known as a Regular scroll) is defined by an equal distance between compass turnings, which gives us a concentric appearance. To draw an Archimedean Spiral follow these steps:

Step 1: On a horizontal line, draw a semicircle that's as small as possible. This is the first turning of the spiral, and the two points where it cuts the line are the construction points.

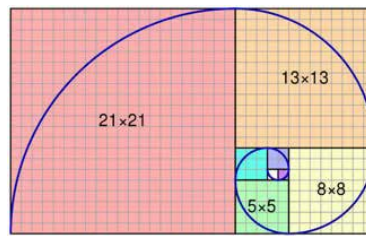
Step 2: Place the compass on one of the points, open it to meet the other, and draw a semicircle on the other side of the line. The two semicircles make a continuous curve.

Step 3: Move the compass back to the first point, open it to meet the end of the curve, and draw another semicircle.

Step 4: Continue in this vein, moving the compass from one of the construction points to the other and adjusting the opening each time to take up the curves where you left off.

Although the above example uses a base figure of a straight line, the base figure could alternately be a triangle, a square, or any other equilateral multisided object. The more points, the tighter and more perfect the spiral, but more sides also makes construction more tedious, consequently a hexagon is the highest one usually goes.

The Golden Spiral is very common in the natural world, think about the shell of a Nautilus. The Golden Spiral can be closely approximated using the Fibonacci sequence, a big word meaning a sequence where each

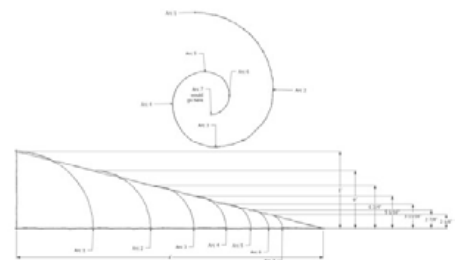


number is the sum of the two preceding ones, starting from 0 and 1. The sequence looks like this: 0, 1, 1, 2, 3, 5, 8, 13, 21, ... If you were to use graph paper to make a paper square represent-

ing of each of the numbers in the sequence and then were to stack the squares as shown you could get a very good approximation of the golden spiral by drawing circular arcs connecting the opposite corners of squares in the tiling (above). You could also make these Fibonacci sequence squares by using just a compass to create a series of Golden Rectangles, each nested inside of the next; but that's an exercise for another day.

However, if you wanted to tighten or loosen your Golden Spiral you can use a compass and a triangle to draw the spiral, a method that allows you to draw as many variations of the Golden Spiral as required to fit your needs. First layout a triangle that is 1 unit high and X units long. In my example below I choose 1 to 4. Next draw an arc with your compass starting at the right angle corner of the triangle, the arc should be 1 unit high. Where the arc intercepts the base leg (or

"opposite") of the triangle is where you start your next arc and the height of the arc is where the vertical from that point intercepts the hypotenuse of the triangle (this is much more obvious in the picture below). As each arc is defined it can be placed on your template surface and connected to the previous arc to make a golden spiral.



A great video demonstrating this technique is www.youtube.com/watch?v=wJCiwhKJZo0 (DK in the Shop) So why go to all this effort to draw the spiral? Well, if you cannot visualize your work how can you make your project, or more importantly how can you sell your customer on the idea that you intend to produce? Granted you can just hammer out a scroll as "Black Bear" does in this video:

www.youtube.com/watch?v=39-hEXUb26k

But as John Switzer also says in the video; "drawing the spiral allows you to measure the amount of material require before you start work. Not that John uses a string on his drawing to measure the material required. I usually set my dividers to 1 inch and "walk" the dividers down the line to measure my scrolls.

Fun With Finials

By Steve Alford of Athens Forge

This has the feel of a belated article about Ernie Dorrill's demonstration at the 2009 Tannehill conference. I suspect Ernie's presentation was a first introduction to Gothic ironwork for many of us. There have been a good many workshops and a lot of great projects featuring Gothic designs – lamps, coffer, wall sconces, door knockers, and so on. I'm just sorry I missed almost all of those great workshops. Too many leisure hours lost to work!

I've thought about these finials for years – since that 2009 conference, in fact. I don't have any larger project that needs finials like this, but some of the best shop times are just making elements, just for the fun of it. After I showed my first couple tries someone asked for more of a HowTo, so I made another one and took pictures as I went along.

I started with 1/4 x 1 inch flat bar and used a guillotine tool in my treadle hammer to fuller both sides an inch back. A spring fuller would also work, at the anvil, the treadle hammer, or even a power hammer. After drawing a taper back from the fullers to the parent stock I had a 1 inch square piece isolated on the end of the bar. I worked near the edge of the anvil and drove the corners in to turn that square into a diamond. It's important to alternate from one side to the other and also keep the piece flat while making the diamond. If I got carried away with knocking one corner down the piece could get all wonky and never become a nice



Demo piece by Ernie Dorrill at the 2009 AFC Conference.



Three pieces cleaned up and ready to finish.



Start by butchering both edges with a guillotine tool an inch from the end.

This article reprinted from the Sept-Oct 2020 edition of Bituminous Bits The Journal of the Alabama Forge Council



Taper the shoulders back to make a "stem".



Forge the end to a diamond on the edge of the anvil.



Spread the diamond to finish the preform. The sides of this one were about 1-3/4 inches.

symmetric diamond.

Next I used the cross peen of the hammer to spread the diamond. I tried to work both directions equally and evenly and also frequently went back to working the edges near the edge of the anvil to keep the diamond symmetric. The sides of my diamond turned out to be about 1 3/4 inches.

I call this diamond on the end of the bar a preform. With the preform done, it's time for the art! A real project might have a lot of these finials that would have to be as nearly alike as I could make them. But for this fun time I can just dream up shapes or look at my collection of tools and pick out some I want to try. Once I have a good idea of what I want to make I like to sketch it on the steel with a Sharpie marker. From John Crawford's coffee scoop demonstration at the 2019 conference I learned to actually trace around my tools with the Sharpie.



Preform with the design sketched in Sharpie and then gone over cold with the chisels.



Vise Grips style 7LW for holding half-inch S-7 tools while working at the treadle hammer.



Treadle hammer cutting plate. 1/2" mild steel plate with a shank to fit.



Tools for cutting out the shape. Two curved chisels and a straight.

I like to go over the Sharpie marks with the chasing tools with the work cold. This leaves marks in the steel that I can feel with the tools when the work is hot and the marker is all burned off. Something always turns out wrong when I try to work by eye without marks. Sometimes I do the cold tracing at the anvil with a hand hammer, sometimes at the treadle hammer. When I do it at the treadle hammer, it's also a chance to see how I need to turn the tools in my visegrips for when I'm working hot. I haven't made a stop for my treadle hammer to keep the head from hitting the anvil, so I never put my fingers under there, even when working cold.

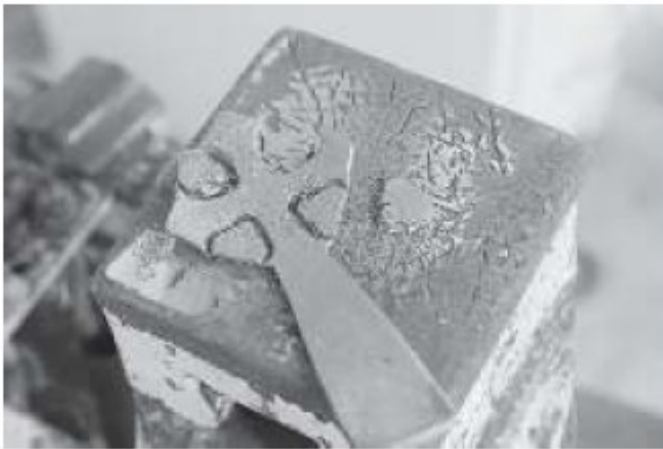
Working hot, I go over all my marks as many times, taking as many heats as necessary to cut through or cut as deep as I want to. Rushing through just leads to mistakes, so I try to take my time and think about how nice those fine beveled chisel cuts are going to be, with a lot less effort than sawing or plasma cutting and then trying to file the bevels. Ha. If I have more than one chisel to make my pattern, I make all the cuts with one chisel, then all the cuts with the next, and so on, around and around. Usually I start with the curved chisels and then connect the curved cuts with the straight ones. Cutting all the way through on these finials took three or four passes.

I made a cutting plate for my treadle hammer. It's a block of 1/2" thick mild steel with a shank to fit the die holder so that I don't mess up my nice smooth bottom die when I'm cutting through.

I chase in more decoration after I have the outline cut out. For this piece I used a pair of curved tear drop chisels – I call them comma tools – on the ends and then used a straight chisel to make “veins”. Finally I used a hammer with rounded faces to drive the piece face down into a depression in my swage block, just slightly curving the piece and giving it a little extra body. I finished the forging by wire brushing while it was still hot.



Comma tools. I think I have three sizes - three pairs - and need to make more.



Several passes with curved and straight chisels to cut out the pattern.



Dressing up the piece with the comma tools.



Use a flatter to straighten everything out when the cutting leaves it a little out of shape.



Veins cut in with straight chisels.

Now I said that using chisels makes nice edges without all the filing that it would take to clean up saw or plasma cuts. But that doesn't mean there's no filing at all! The bottoms of the chisel cuts always have burrs and sharp edges that must be removed. I just find the filing to clean up chisel cuts to be more enjoyable and less tedious than the filing that would put a nice looking bevel on a saw cut.

After filing the edges I use a piece of an old grinding belt – usually either 120 or 220 grit – to go over the piece. This sanding smooths everything out, sometimes knocks off some loose scale, and brightens the high spots. After sanding I go over everything again with a piece of maroon Scotchbrite. Scotchbrite comes in different colors, similar to different grits in sandpaper. Maroon is more abrasive than the green stuff they have at the grocery store for cleaning dishes. I bought mine from Enco, back when there was an Enco. I would think that MSC might have it now.

All this sanding doesn't really take that long and I always find it rewarding in terms of making the piece easier on the eyes and the fingers. The idea is not to sand down to bare metal and polish it bright all over, but to brighten up the edges of chisel cuts and the high spots that were pushed up by punches, while leaving the wider flat or concave areas dark with scale. The use of sandpaper and then Scotchbrite came from Ernie's presentation.



Rounded ball peen and swage block to give the finial some depth.



Finished forging, ready to clean up the burrs from the cutting.



Small round and half-round files for cleaning up burrs.

The finish I chose also came from Ernie. I call it "L.O.T." He described a mixture of equal parts of linseed oil and turpentine, with just a little Japan drier to help it dry faster. Safety warning here, linseed oil and turpentine aren't good to drink, and I believe Japan drier is also nasty stuff that you don't want to drink, breathe, or have on your hands. Be safe. I keep a jar of the stuff, wear blue nitrile gloves, and avoid breathing it in. Just wet a rag or a brush, apply it all over the piece, and let it dry. This isn't a good finish for something that has to live outdoors, but inside it preserves the look of a piece and adds a little glow.



Ready for sandpaper and scotch-brite.

The finials after sanding and finishing with L.O.T. are on the back cover of this issue.

A 9disc set of DVDs of Ernie's 2009 conference presentation is available from the AFC. Contact Judd Clem at clem.judd@att.net.



Portable Folding Hammer and Tong Rack By Jacob Willson



I don't have a dedicated shop for hot work and I do my forging in the driveway. I wanted a rack that would hold my hammers, tongs, and what I was working on. This rack would also need to be compact for storage when not in use. I wanted to share what I came up with to help anyone else in the same situation or anyone that may like an extra table that folds up when not in use. I built this with materials I had on hand, it has a nice rusty patina, so feel free to modify with what you have. The cross racks or tool holders are $\frac{1}{4}$ " x $1\frac{1}{2}$ " flat bar, 20" long and the legs are 1" angle, 36" long, making a table height of 30". (Tip - Pythagorean



Theorem) The racks have $\frac{7}{8}$ " holes on each end and one end pivot's on $\frac{1}{2}$ " pipe with $\frac{1}{2}$ " all thread through bolted to the legs. My original plan was to weld the flat bar to the pipe, but I'm still playing with the spacing and don't think it is really necessary. On the other end of the bars, I cut notches at an angle (see picture) to hold on the other end when in use. For the cross members holding the legs together, I used some rod with threads on the end from an old washing machine, that's why it is 12" deep. You can use all thread or weld bolts to a small piece of pipe, be creative.

To fold up, just pull the end cross members together and either flip the rack over or let them fall down. It folds up and stores pretty compact until it is needed again. It's nice to have all your tools needed for a project organized and readily available. It's portable and allows for easy storage.

This article reprinted from the August 2020 edition of the Pittsburgh Area Artist-Blacksmith Association newsletter. Additional photos on the back cover.

Measuring the "Speed" of Quench Oil

In Josh Foran's brut de forge knife forging demonstration he talked about quenching in an "11second oil". I've heard quench oils described that way before, but this time I really wondered what that means?

I found a paper, "Care and Maintenance of Quench Oils" by two engineers at Houghton International, D. Scott MacKenzie and I. Lazarev. Houghton makes quench oils.

Quench oils can be classified as normal, medium, or fast based on the General Motors quenchometer speed (GMQS) test. This test is also known as the nickel ball test or ASTM Method D 3520. This test calls for heating a nickel ball to 1620 degrees and then quenching in 200 mL (about 6.76 ounces) of oil. Nickel is nonmagnetic at 1620 degrees and becomes magnetic when it cools to 670 degrees. A magnet beside the container of oil attracts the ball when it becomes magnetic. Thus the time for the oil to quench the ball from 1620 to 670 degrees can be measured. This test can also show the effect of contaminants, age, and oil temperature on the performance of a quench oil. Normal speed oil measures 13 to 20 seconds on the GMQS test. Medium speed oil measures 10 to

12 seconds, and fast oils measure 7 to 9 seconds. The well-known

Park 50 is a 7-9 second oil and Park AAA is a 9-11 second. From Houghton, Houghto-Quench K is a 7-9 second oil and Houghto-Quench G is a 10-12 second oil. Houghto-Quench 100 is a slower, 15-22 second

oil. Anecdotaly, canola oil is said to be just slightly faster than an 11 second oil.

Canola seems to be regarded as the best choice among the readily available cooking oils for use in quenching. Water is faster than any of these oils, but may shock and crack steels that are designed for oil quenching.

Advantages of engineered quench oils include reliability, longer and more stable life as a quenchant, and a cooling rate that varies as the steel cools for even hardening. Finding engineered quench oils in reasonable quantities for home shops can be a challenge. Many of the knifemaker supply outfits such as USA Knifemaker or Jantz Supply stock quench oils.

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Indiana Blacksmithing Association, Inc.

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First Class Mail

Address Correction Requested
If Undeliverable return to
sender

Portable Folding Hammer and Tong Rack By Jacob Willson

Additional photos

