

The Anvil's Horn

A Publication of the Arizona Artist Blacksmith Association

Issue No. 207 November 2020



*Skulls made by Jaime Escobedo
as a guest demonstrator for a blacksmithing class at Mesa Community College.*

President's Message

Hey Everyone! I hope you all are well and are keeping cool as we wrap up summer and move into fall here in the southwest. Normally we would be looking forward to getting together at our annual auction and banquet in just a month or so. It's one of my favorite times of the year with AABA because it's when most of us are able to get together and enjoy each other's company. Let's hope that we can return to these kinds of events soon! If you're reminiscing about these events and remembering that you haven't seen a friend in a while, pick up the phone and call them. Don't wait! Do it as soon as you think about it. We need to stay connected more than ever and a phone call can mean so much more than a post on social media.

I also wanted to share a note below I had written a couple of years ago. I know for me, I needed to see it again after something I just experienced before writing this. Failures are tough to accept but we can learn from them and they are never a true failure unless we give up. Until then, they are just another stepping stone towards success.

"I've been seeing some common things lately especially on social media. Someone will ask a question whether they should do A or B as their first project. Or they will ask if they should get this tool or that tool for their first one. Sometimes when we are starting out in something new, we over analyze to the point we never get started. Sometime you just need to start and figure it out as you go. You can watch videos over and over but if you don't pick up a hammer you won't get anywhere. It's ok to fail and honestly you need to fail to progress. Accept that failure is part of the growth and enjoy it when it happens. If you look at these failures as stepping stones in your education, you can see where and how you can grow. Before long, you'll look back at your original work and see how far you've come. You can decrease this learning curve by seeking out a mentor or taking a class. Both will exponentially fast forward your abilities, but if you can't do either, just start with what you have."

Keep on forging!

Jason LaBrash

Contents

3	November demo (virtual) announcement	10-11	Calendar and other announcements
3	Annual meeting (virtual) announcement	12-13	Peacock Project Tooling, Part 1 - Jaime Escobedo
4	September Demo Report	14-16	One Ring to Wow Them All
4,7	Interesting Web Links	16	Punching and drifting challenge - simple
5	Fabrication tips from Len Ledet	17	ABANA information
5	Notes from the Field - Steve Miller	18	Benefits of AABA Membership
8	Product Review: Brodback Belt Grinder	19	Sources for tools and materials
9	Winterfest IV	19	AABA Membership Form

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Demonstration: November 2020

A virtual demonstration
A link will be posted on the AABA website.

Demonstrator: Paul Diefenderfer

Dief will demonstrate making an ocotillo form and other stuff using his 16-ton press.



*Dief's 16-ton press
You will have to watch the video to see how
he uses it.*

Meet Artist Blacksmith, Paul “Dief” Diefenderfer

Paul Diefenderfer, known to most as just “Dief”, was instantly hooked on blacksmithing when he saw a blacksmith demonstrating his skills at an arts & crafts festival in 2001.

Prior to becoming a blacksmith, Dief was a computer programmer – before PCs and a mountain guide. In 1992 he started Phoenix Rock Gym, Arizona’s first indoor climbing gym. His two passions in life are rock climbing and blacksmithing.

There is something magical about forming hot 2000 degree steel with a hammer. The hammer becomes an extension of Dief’s arm as he works the pliable metal. His hammers range from little 1-pounders up to a 110-pound “BigBlu” power hammer. Steel can take on an amazing variety of textures as it is heated in the forge and worked with various hammers.

Art is everywhere. Dief’s artistic abilities have been expressed in gates, railings, door pulls, wall hangings, candlesticks and even resort luggage carts to name just a few.

When he is not at the forge, Dief can be found climbing, hiking, rescuing animals and exploring Arizona.

For more information: <http://www.desertratforge.com/>

Annual Meeting, Banquet, and Auction

We will hold an annual meeting of the AABA membership — online. It will be a noon on Saturday, December 5, 2020. A meeting of the AABA Board of Directors will immediately follow the annual membership meeting. Sadly, the our annual banquet and auction are canceled for 2020. We're looking forward to 2021.

Here is the zoom link to the call.

Topic: AABA Annual Meeting

Time: December 5, 2020 12:00 PM Arizona

Join Zoom Meeting

<https://zoom.us/j/99583614016?pwd=Ungzblppem01aE8rSy9tdGpQMjU0Zz09>

(or, for bad typists: <https://tinyurl.com/yxffzjy4>)

Meeting ID: 995 8361 4016

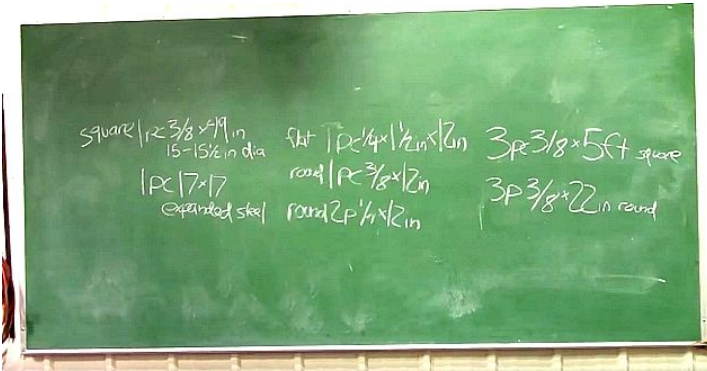
Passcode: 5rBNep

September Demo Report

Bill Ganoe

Photos: screen shots from the video

Matt Marzolf, an instructor at Desert Metal Craft in Tucson, stepped through the process of making a portable campfire tripod complete with a grill and trammel. This video is about 1 hour and 15 minutes long. It is available on the AABA website, <http://azblacksmiths.org>, under **Plans & Videos** or directly at: <http://azblacksmiths.org/plans/>



Matt included a parts list at the beginning of the video.



Matt explained making consistent tripod leg.



Matt showed how he used the jig he made to help make the rings.



The finished tripod with grill and trammel

Interesting Web Links

A wall mural showing the history of modern blacksmithing at:

<https://abana.org/wall-mural-timeline-of-the-blacksmithing-revival/>

From the legend on the ABANA website:

"The revival and growth of smithing in North America over the past fifty years has been remarkable. To comprehend the revival, explore the first timeline below. As a wall mural, it measures 90 x 45 inches. But, consider the timeline between 1970 and the present day as but the second revival. The first modern revival was from 1890 to 1940 and is revealed in the second timeline below. It honors Gardner of Britain, Schramm of Germany, Robert of France, Mazzucotelli of Italy and many more and explains the decline of our artisan trade by the mid-twentieth century. To view the timelines closely, one should download the .png file to one's computer."

Tips and Hints

Len Ledet had to construct a frame for a seven-foot desk using a joinery technique he learned from Peter Sevin several years ago. He said the technique made assembly easier and produced strong joints. He used 1"x 2" tubing with 0.083" wall, and cut the joint sections on a band saw.



Notes From The Field

Now that I'm a blacksmith, I notice that Hollywood doesn't really understand blacksmithing. For instance, while watching reruns of Gunsmoke, the blacksmith shop is covered with hay. Why would a blacksmith cover his shop with combustible materials with hot sparks and steel all around? On the same show, the blacksmith Quint Asper, played by Burt Reynolds, pulls a piece of hot iron from the forge, quenches it and then then takes it to the anvil to pound on it. All very contrary to all that I've been taught.

— Steve Miller

Boy Scout Blacksmithing

Steve Miller

At this year's Winterfest Conference my co-chair, Richard Rozinski, surprised me with my first merit badge. It was a replica of the original Blacksmithing Merit Badge. I was a Boy Scout, just barely, before my family moved to a new neighborhood without a troop. I became an adult Scouting leader for my boys, both of whom made Eagle Scout. Yes, I'm proud of them.



I thought it might be fun to go through the requirements for the Blacksmithing Merit Badge and look at how they changed over 110 years. To my surprise, they started out what I consider quite difficult for a 12 to 18 yr old boy. Here are the original requirements from 1911:

1. Upset and weld a one-inch iron rod.
2. Make a horseshoe.
3. Know how to tire a wheel, use a sledge-hammer and forge, shoe a horse correctly and roughshoe a horse.
4. Be able to temper iron and steel.

I don't even have a horse or know anyone that would trust me shoeing their horse, not to mention a wooded wagon wheel that needed a new "tire". These are some pretty serious requirements, but I will attempt them all. I might need a waiver on shoeing the horse.

The standalone Blacksmithing Merit Badge was discontinued in 1952 and combined with the Metalworking Merit Badge. The requirements had changed somewhat. A Scout no longer needed his own horse or access to his neighbor's. Here are the requirements from 1952:

1. Make an open link of 3/4-inch stock.
2. Forge a chain hook out of 3/4 x 1/2-inch soft steel or 3/4-inch round iron.
3. Make a bolt of 1/2-inch iron.
4. Bend and weld three links and form them into a chain, these links to be fastened to the hook of Requirement 2 by a ring, and links and ring to be made out of 3/8-inch iron.
5. Make a straight lap weld of 1/4 x 1-inch stock.
6. Make a rock drill.
7. Temper a rock drill.
8. Explain how to harden and temper a cold chisel.

Making chain from 3/4-inch stock is a serious chain! I'm not sure what the purpose of a 3/4-inch chain joined to a hook with a 3/8-inch ring is, but I'll go with it. I did find a reprint of the Blacksmithing Merit Badge Pamphlet which provides all the answers. So, I'll find out what knowledge awaits me when it arrives later this month.

I found some thoughts on why the Blacksmithing Merit Badge was discontinued including that blacksmithing has lost its relevance. If you look at the purpose of a merit badge, which is to explore possible career choices, you can begin to understand that after the industrial revolution there was less and less demand for a blacksmith, but then what career choices are there in stamp collecting? Some merit badges should be kept just for exploring hobby ideas if they're not a career choice. Who knew in 1952 there would be a TV show called Forged in Fire and there would be so many blacksmiths keeping the craft alive today?

Boy Scout Blacksmithing (cont.)

After 1952 the requirements changed again and are more in line with the artist blacksmith work of today. The blacksmith portion is just part of the Metal Working Merit Badge with these blacksmithing requirements:

- 1 Name and describe the use of a blacksmith's basic tools.
2. Make a sketch of two objects to hot-forge. Include each component's dimensions on your sketch, which need not be to scale.
3. Using low-carbon steel at least 1/4-inch thick, perform the following exercises:
 - (a) Draw out by forging a taper.
 - (b) Use the horn of the anvil by forging a U-shaped bend.
 - (c) Form a decorative twist in a piece of square steel.
 - (d) Use the edge of the anvil to bend metal by forging an L-shaped bend.
4. Using low-carbon steel at least 1/4-inch thick, make the two objects you sketched that require hot-forging. Be sure you have your counselor's approval before you begin.
 - (a) Include a decorative twist on one object.
 - (b) Include a hammer-riveted joint in one object.
 - (c) Preserve your work from oxidation.

How many of these requirements will you do? I admit some of the early requirements are a bit general, like make a bolt. There must have been some really tough scouts in the beginning years of the Scouting program, but hey just go for it and have fun. I'll let you know how many of them I get done and how well I do.

Interesting Web Links

How to make a hammer eye.

<https://tinyurl.com/y3gg5nsd>

(<https://preview.tinyurl.com/y3gg5nsd>: It should confirm that you will be sent to a video on youtube.)

This is a recorded class on Zoom. In addition to the technical content, it shows how Zoom can be a great learning tool, especially if you have some experience with the techniques being discussed. But it's still pretty obvious that video conferences can't completely replace hands-on classes.

There's a lot of good information for punching hammer eyes — and ideas that can be useful for punching in general. For example: One of the reasons for using coal dust to lubricate punches is that dust from green coal still has the volatiles in. The volatiles will vaporize from the heat in the hole, and may help to expel the punch.

>>> If you're not familiar with video conferencing tools like Zoom, you can get an idea of how they work as you watch this video.

Product Review

Brodbeck Ironworks Belt Grinder

David Bridenbaugh

I first heard about the Brodbeck Ironworks belt grinder from the ABANA Hammers Blow magazine, Volume 28, Number 1, Winter 2020. The article was about the Cinnicinnati Blacksmiths Guild 2019 Holiday Hammer-In. The article mentioned that Ryan Brodbeck had demonstrated the belt grinder that evening. It didn't say too much more than that but it was enough to get me interested since I had never heard of that brand before.

I ended up buying the grinder with the motor speed control, and I'm quite happy with it. It is smooth, stable and easy to use. It's easy to swap the arms to use a different contact wheel. The table to support your work is strong and stiff. It works well with the flat platten or any of the contact wheels in horizontal or vertical orientation.

They have one model that uses 2x72 belts. It is available in different configurations of motors, contact wheels and accessories. You can also buy just the chassis if you already have a motor.

It comes as a kit so don't plan on using it the same day it arrives. The design is really very clever. All the parts interlock like a jigsaw puzzle. Everything bolts together and it is a very rigid frame when

completed. The assembly instructions are available on their web page. The nuts, bolts and other small parts are well organized and the parts needed for each step are grouped together. About a fourth of the steel parts had to be filled to fit together. It didn't take a lot of filling and I would rather do that to ensure a tight, rigid frame.

The small wheel attachment comes with 3/4" and 1" diameter wheels. The overall length of these wheels are 3.5". This is a different size than the Beaumont Metal Works wheels which are 3.1". This isn't a problem or criticism just be aware that there isn't a standard size among belt grinders for the small contact wheels.

The belt is tensioned with a Suspa 20 pound hydraulic piston. The aluminum arms are 1-1/2 square which is a common size for belt grinders. I have some 1-1/2 cold rolled steel that also fits. The grinder is easily tilted between vertical and horizontal. All the nuts and bolts that you need to adjust have threaded handles. The handle is adjustable so you can orient it in any convenient direction.



Interesting use of Unistrut

Winterfest IV is still coming!

Winterfest IV was planned for January 2021, but has been postponed until January 2022 because of the continuing COVID-19 pandemic. Detailed planning and organizing will begin organizing in February 2021. Standby until then for volunteer opportunities. We have some great surprises planned.



A participant in one of Richard Rozinski's forge building workshops, with the forge he will take home.

Calendar 2020-2021

Dec. 5, 2020	AABA Annual Membership Meeting	Online (Zoom)	See page 3
Early Dec. 2020	AABA Annual Banquet and Auction	* Canceled *	Phoenix (?)
Jan. 2021	Winterfest IV	* Canceled *	Tucson

Your dues for 2020 are due now!

Many of us renew in person at a demonstration early in the year. But those opportunities are limited this year. If you haven't gotten around to renewing this year, please mail your renewal now using the form on page 19.

MCC Blacksmithing & Welding

The Mesa Community College blacksmithing program is an excellent deal - over 60 hours of instruction including material and propane! Classes are on Wednesday during the day with instructor Richard Rozinski, Tuesday and Thursday evenings with instructor Dan Jennings, and on Saturdays with instructor Robert Ratliff. Blacksmithing is listed as WLD103 in the class schedule.

TIG, MIG, Arc, Gas, and Art classes are all available, as is certification in any of those welding methods at Mesa Community College, Southern and Dobson in Mesa.

Classes fill up early, but waiting lists may be available. For more information go to: www.mesacc.edu

Sahuaro Ranch News

After being destroyed by fire on September 25, 2017, the reconstruction of the blacksmith shop at Sahuaro Ranch in Glendale is essentially complete. Jay Griffin and Ronald Wicklund were forging at the blacksmith shop on February 8. Watch The Anvil's Horn for upcoming events at the Sahuaro Ranch blacksmith shop.

Deadline for the January 2021 issue

December 1, 2020 is the deadline submitting photos and articles for the January 2021 issue of the Anvil's Horn.

Send articles, pictures, etc. by email to:

editor@azblacksmiths.org

or by regular mail to:

Bill Ganoe, PO Box 40233, Tucson, AZ 85717

Welcome New Members

Leslie Cook	Houston TX
Milan McMannis	Scottsdale
Tony Cordaro	Tucson
Solomon Galyon	Vail AZ

Classes at Pieh Tool Beginning/Intermediate Blacksmithing

• Beginning/Intermediate blacksmithing classes with Dylan Cook

Oct. 23-25

Nov. 6-8

Dec. 4-6

Registration is \$570.

Students will make several simple projects to take home.

For more details call 888-743-4866 or browse to www.piehtoolco.com.

Workshops in Tucson

Sam Rivera is in the early stages of planning a couple of workshops at his shop in Tucson.

• Refacing old anvils

Sam is definately going to run the anvil repair workshop. He's just working on the scheduling.

• Building a Ron Kinyon vise.

Sam is looking for people who would be interested in building a vise designed by Ron Kinyon. (see The Anvil's Horn, March 2012 .)

Sam hasn't worked out schedules or prices yet, but if you are interested in either or both, text Sam at: **520-591-4700**.

AABA Website: www.azblacksmiths.org

Open Forge: Tucson

We don't have a definite date to resume open forges in Tucson, but there may be some pick-up events now and then before we get back on a regular schedule. Check <http://www.desertmetalcraft.org>, for upcoming events at Desert Metal Craft. If you are on the email list for southern Arizona, you will get notices about any last-minute AABA open forges. If you aren't on that email list, send a request to editor@azblacksmiths.org.

Open Forge: Grizzly Iron

Don't have a power hammer? Use one at Grizzly Iron, 1329 W. Lincoln St., Phoenix, 4:30 PM to 8:30 PM, more or less. There are a lot of changes in dates, times, and restrictions, and those changes may be made on short notice during the COVID-19 pandemic. Keep checking the website:

<http://grizzlyiron.com/classes-and-workshops> or the **Grizzly Iron Open Forge and Workshops** group on Facebook for current details.

Open Forge: Desert Rat Forge (Phoenix area)

Paul Diefenderfer will host an open forge at Desert Rat Forge on Saturday, November 7 and Saturday, December 5, 2020, from 9 to noon followed by lunch (You gotta' buy your own.) at the world famous Big Earl's Greasy Eats in Cave Creek. Desert Rat Forge is at: 7645 E. Highland Rd., Cave Creek. 602-509-1543 or dief@phoenixrockgym.com.

Directions: From the center of Cave Creek – 4-way stop at Cave Creek Rd & School House Rd. Head north on School House 1.2 miles to Highland Rd (if you get to the 4-way stop at Fleming Springs you've gone a tad too far). Turn right (east) on Highland. After about 1 mile the pavement ends. Please drive slow to avoid kicking up dust. As the gravel road makes a turn to the left there will be a single lane gravel road on the right with a sign for 7645. Drive down this road for bit until you see the big anvil. You are there! Park in the pullout if there is room – please do not park on top of any vegetation! If no room return to main dirt road and park along the north edge and walk to the 700ft back to property.

If You Are Attending An Open Forge...

These open forges are part of AABA educational activities, but AABA does not provide funds for these events. They are hosted by our members for all of our benefit. So if you participate in forging, welding, use shop materials, or accidentally damaged something, please put something in the donation box to help our hosts with their expenses. Thank you! From all of your open forge hosts. **You will need to wear safety glasses. Hearing protection is recommended.**

AABA Membership: The AABA membership form has been moved to page 19.

Classes and Events at AABA Members' Shops

Desert Metal Craft

544 E. 24th St., Tucson, AZ

“Desert Metal Craft is the only school in the southwest dedicated to teaching blacksmithing, bladesmithing and fabrication together with the modern science behind the craft of metalworking.”

- Rich Greenwood

The schedule at Desert Metal Craft features a wide range of classes and workshops. Check the website: <http://www.desertmetalcraft.org>, for on-line events, details of specific events, and to register for each class or workshop

Grizzly Iron

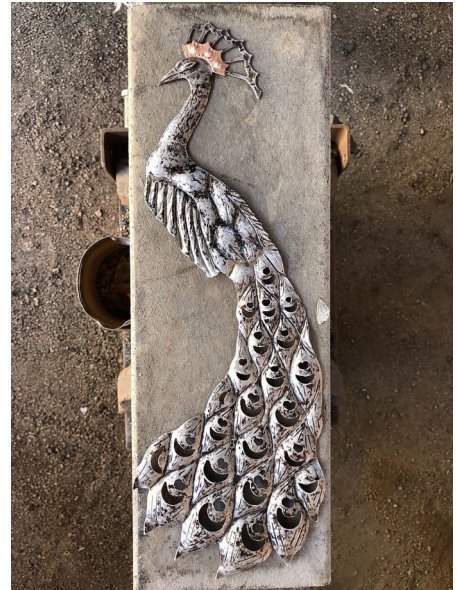
1329 W. Lincoln St., Phoenix, AZ

The schedule at Grizzly Iron features a wide range of classes, open forges, and workshops. For the current schedule, prices, and registration check the website: <http://grizzlyiron.com/classes-and-workshops>, or the **Grizzly Iron Open Forge and Workshops** group on Facebook for current details.

Peacock Project Tooling Part 1

Jaime Escobedo

I recently completed a sheet metal peacock project that I plan to use as the centerpiece in the door of a small 11 bottle wine vault. I primarily used stake repousse techniques to complete the peacock. I photographed some of the tooling I used and figured others may be able to benefit from this type of fairly simple tooling as well.



*The peacock is 6" x 15"
20-ga. steel*

After tracing my pattern and cutting on a band saw, I drew on the feather patterns and holes to be punched in the tail feather train. To punch the holes I used a series of five small fish mouthed punches I made from 1/2" square high carbon steel spikes. After annealing and filing in the fish mouth profile for all five sizes, they were hardened and tempered to a dark bronze. These were made 17 years ago.

I used a punch block I made from a 4" x 4" x 6" piece of Trex I had left over from rebuilding my deck. I simply screwed on a length of 1" square for a hardy stub. It works really well. In fact, I think it works just as well as the end grain of a hardwood block. It's easy to dress with a farrier's rasp once it's filled with punch outs. Obviously, being a wood and plastic composite, it can only be used for cold punching.



Sizes range from approximately 3/32" to 1/4".



Trex punch block with hardy stub

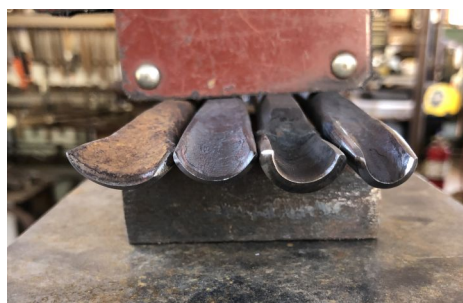
After all the holes were punched, it was time to file the holes in the tail feathers to the correct shape. For that I used a vise mounted wooden filing/sawing jig I fashioned some years ago. It has gone through several different iterations, but most recently I've added an octagon shaped bottom 2" x 2" x 2" mounting block to allow me to position the device in a variety of positions within the jaws. I can position the jig in line with the vise jaws, perpendicular to the jaws, or at a 45 degree angle for clearance of files or saws, or for leg room while I'm seated at the vise. The main portion of the jig is just a piece of 1" x 4" white pine with a "V" sawed into one end and several different sized holes on the other. The mounting plate and mounting block are both made of Trex, because... I have a ton of this stuff laying around. I had some 1" x 6" Trex that I could have used for the main portion, but I found that the work piece slid around too easily while filing due to the composite make up which makes it very slippery.



As for the files used with this project, I went the strict cheapo route. I have four or five dozen needle files I bought at Harbor Freight over the last couple of decades. Yes, Harbor Freight (I told you I was cheap). Actually, these little needle files have performed flawlessly on this thin sheet steel and they're dirt cheap. I have really abused some of them by storing them improperly, but they still cut really well. I've noticed that HF steel cutting implements, such as drill bits, are usually way too brittle and break easily and I avoid them. However, I've only broken four or five of these little files over the years, and primarily because of user error. They don't usually come with any handles on them, and using them without a handle is a no-no. So, I do what everybody else does and use a golf ball. I just drill an 1/8" hole in the ball and push them in. They work and handle well. It also makes them easy to store by hanging in a small rack. I only used four needle files for this project.



Needle files



Small curved chisels

To cut the larger "smiley" holes in the tail feather train, I used four curved chisels with different curvatures and length of curvature. I have several of these types of chisels, but only two that were small enough for this project which required me to make the other two. Cutting the curves wasn't all that clean of a process. The corners where the chisels met left a bit of a rag which had to be filed out. It really wasn't much of a chore since every single cut had to be filed clean anyway.

Part 2 will feature some of the stake repousse tooling (hammers, stakes, etc.) used in this project.

How good are your precision punching and drifting skills?

This 2-1/2 page article reprinted from Bituminous Bits ~ Journal of the Alabama Forge Council JUL/AUG2018

One Ring to Wow Them All By Steve Alford Athens, Alabama

The Kuhn Ring Challenge began innocently enough. Travis Fleming sent a picture of an unidentified bit of ironwork to Al Stephens and Ronnie Howard. Al was recovering from shoulder surgery under doctor's orders to take it easy, so he started doing a little research. The picture was from a piece of the Schoner Brunnen Nurnberg, or Beautiful Fountain, in Nuremberg, Germany. The fence was built in 1587 by Andreas Kuhn.

Idle hands... with post-surgical restrictions still in effect, Al started making drawings. "If they could build it, we can too." Interest turned into obsession. Eventually a team of five -Travis Fleming, Ronnie Howard, Dustin Patterson, Saxon Reynolds, and Al Stephens - put in 11 work sessions with 2 to 5 members working 3 to 8 hours per session in Alabama summer heat. That works out to over 200 man hours to complete the ring! Dustin was the chief fire-tender and never burned a piece.

The team fabricated - and fitted together - 15 separate pieces, including 9 rings and 6 straight bars. The straight bars were 3/4 inch square and the interior rings were 5/8 inch round. The outer ring was 1/2 x 1-1/2 inch flat bar. There are 61 pass-throughs in the 3 foot diameter project. The finished ring weighs 75 pounds.

The finished ring was displayed for the first time at the July meeting of Athens Forge. The ring was suspended from the ceiling so it hung at eye level and everyone tried to imagine the assembly sequence and where all the rings were closed!

This project is inspirational.

Ring Element Challenge

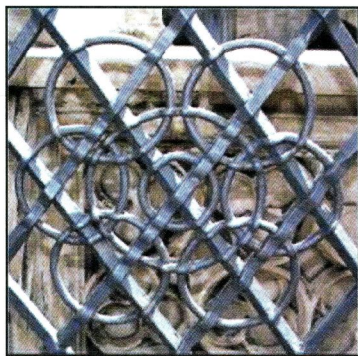
by Al Stephens (photos by Steve Alford and Al)

This project started with Travis Fleming sending the original photo below to myself and Ronnie Howard, with the text "This gives me a headache." I was recovering from shoulder surgery, and lots of time on my hands, so I replied "Let me think about it, if they did it, we can do it." Yes, obsession has innocent beginnings.

Please note. This will not be a follow steps 1-1,000 and you will have this project completed sort of article. The team has decided to

leave the installation details of the various rings for anyone else that accepts the challenge to do in the manner they think will work best.

One of the first things done was the original picture was posted on / Forge Iron, asking if anyone on that world wide forum had any more information about it. Thomas Powers from Texas thought it might be a section of the



Schoner Brunnen Niirnberg. That translates to Beautiful Fountain in Nuremberg Germany. That information led me to pictures of the fountain and fence and an article by Hans Schlosser, http://www.beautifuliron.com/beautiful_fountain.htm. The fence is attributed to locksmith Andreas Kuhn in 1587.

One Ring to Wow Them All (Cont.)

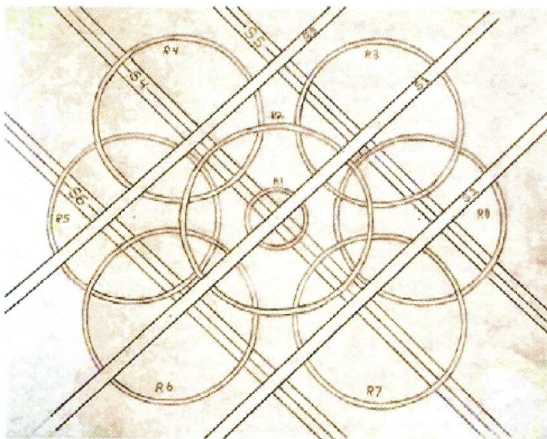
This 2-1/2 page article reprinted from Bituminous Bits ~ Journal of the Alabama Forge Council JUL/AUG2018

We dissected the original photo by enlarging and breaking it down into individual pieces, noting where there were square holes and round holes and how the individual pieces interacted with each other.

After looking at hundreds of pictures of the fountain and surrounding fence, and using pictures of people in close proximity to the fence, I decided to start the layout based on a 9 inch square. We decided very early in the process that a square would be easier to plan and work around than the diamond pattern. The "Challenge" was produced with material that was at hand, 3/4 inch square, 5/8 inch round, 1/2 inch x 1&1/2 inch flat stock. A scale drawing was produced starting at the center of the sheet, and the grid pattern was laid out. Again, starting from the center, the various sized rings were drawn, and placed into correct orientation with each other.

On the first scale drawing the outer rings were placed wrong, so the entire drawing had to be scrubbed and started over the next day. This drawing was used throughout the process to check size, hole location, and alignment.

There are 6 square straight bars, and 8 rings made of round stock in the original design. The parts have a total of 61 holes in them, every hole has another piece passing through it. The individual pieces were done in the following order.



S = square stock

R = round stock ring

- S1 This square bar is on one centerline and has 8 round holes in it and 3 square holes.
- R1 Center ring, 2 square holes. Note all interior element rings made from round stock
- R2 Largest ring, 12 round, holes, 2 square, holes.
- S4 This square bar will be on the diagonal in the design, no holes.
- R4&7 The accuracy of your drawing will decide if these two parts are identical. 2 round holes, 2 square holes.

- S2&3 They will ultimately have 4 round holes and 3 square holes each.
- S5&6 These are also on the diagonal and will help hold everything square, but the way we assembled the project, they needed to be slid in and out until inner elements were completely assembled.
- R3&6 They have 2 round holes, 2 square holes.
- R5&8 2 square holes.
- Frame Ring was attached to inner element with blind rivets.



All of the tools used on the project were pretty basic. There were specific size punches and drifts made. A radius jig was made for rings 3-8, since they were all the same diameter. A radius jig was made for the frame ring. We made a "measure ring" marked at 1 inch increments to help locate holes in R3-8. A set of top and bottom tools was made to tighten all intersections after assembly. The team was composed of Travis Fleming, professional blacksmith / welder for 30+ years; Ronnie Howard, machinist, tool and die maker with 30+ years experience; Dustin Patterson, boilermaker, gunsmith, blacksmithing about 18 months (Dustin handled much of the coal fire maintenance and work, and NEVER burned a piece); Saxon Reynolds, college student, chain mail maker and Al Stephens, professional blacksmith 30+ years.



One Ring to Wow Them All (Cont.)

There were 11 work sessions spent on this project, with anywhere from 2-5 team members and from 3-8 hours per session involved. Individual members spent time on their own making tools.

On a personal note, this project was conceived and completed while I was recovering from yet another shoulder surgery. I was unable, not to mention not permitted, to do very much of the physical work. My participation in it allowed me to fill many hours. Thank you all. If there are any unintentional errors in any of this information the blame is mine, and I apologize for them. The praise goes to the rest of the team.



If you don't feel up to making Devil's Grille yet (see The Anvil's Horn, July 2020), you might want to tackle a project like this one done by Alexis Villafaña Hernandez from Chile.



Artist-Blacksmith Association of North America

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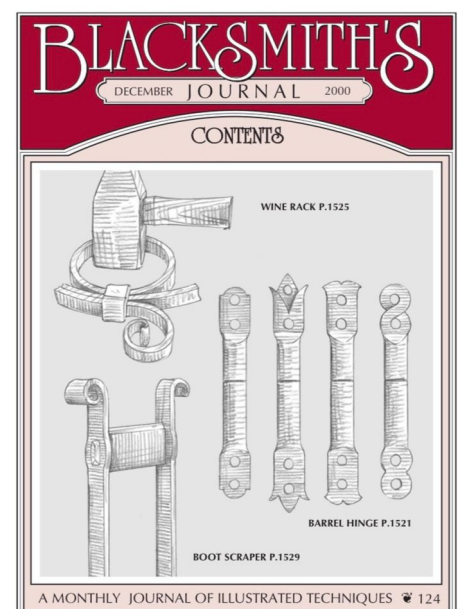
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For membership information or address change, contact:
Wally Warnke, 7070 E. Dogwood Trail, Cornville, AZ 86325, 480-323-5003, desert.rat51wb@gmail.com

Your dues for 2020 are due now!

Many of us renew in person at a demonstration early in the year. But those opportunities are limited this year. If you haven't gotten around to renewing this year, please mail your renewal now using the form on page 19.



From a recent open forge at Desert Rat Forge. Marty & Angelo with their projects. Marty forged spikes for a steel and glass sculpture. Angelo made tongs to hold RR spikes from 2 RR spikes.