

Hot Iron News



FIRST QUARTER 2021



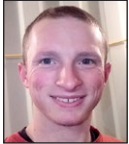
Northwest Blacksmith Association

"To promote and preserve the Art and Craft of Blacksmithing while building friendship and good will."

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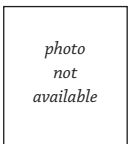


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- **Swaptober IV (2021) Subcommittee:** David Tuthill (Chair), Silas Maddox, Kellen Bateham, Bart Turner

NOMINATIONS & ELECTIONS COMMITTEE: Jim Garrett (Chair), Clair Guy

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Quick Reference for NWBA Members

Submit articles, photos, how-to's to HIN: nwbainfo@gmail.com

NWBA Website: www.blacksmith.org

For NWBA correspondence or membership, or to change your address (must be in writing)

send to: **Northwest Blacksmith Association**
4742 42nd Ave SW #185
Seattle, WA 98116

2021 annual dues: \$60 (foreign, \$70). Dues include quarterly subscription to Hot Iron News. Dues may also be paid online at <http://blacksmith.org/membership-payment-gateway/>

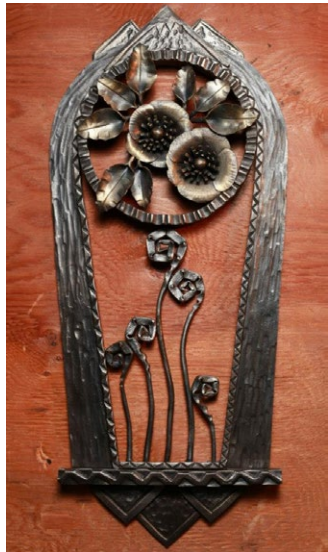
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Sign up to receive email announcements monthly so you don't have to miss another event! <http://blacksmith.org/sign-up-email-announcements/>

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On the Cover:

An example of the creative work of Ben Czyhold, Walla Walla, Washington



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Contributions to the NWBA are greatly appreciated as we continue to serve our membership during this challenging time. No donation is too small. Northwest Blacksmith Association (NWBA) is a 501(c)(3) educational nonprofit, your donation is tax deductible.

To make an online donation visit www.blacksmith.org and click "Our Association" on the Header Bar then scroll down to the Donate Tab. You also may send donations to NWBA at 4742 42nd Ave SW #185; Seattle, WA 98116. Be sure to note "Donation" on your check.

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NWBA Calendar of Events

- March 4 Fireside Chat 7-8 p.m. PST
- March 9 Hammer Talk with James Binnion 6-7 p.m. PST
- March 13 Digital Demo # 30 with James Binnion 10 a.m. PST
- March 18 Knifemaker's Corner #6 6-7p.m. PST
- March 20 Education Spotlight with Southern Illinois U-Carbondale 10 a.m. PST
- March 27 Digital Demo #31 with Leslie Tharp 10 a.m. PST
- March 27 Beginning Blacksmithing with Tim Middaugh- Old West Forge, White Salmon, WA
- April 24 NWBA Board of Director Virtual Meeting
- ***** Cancelled -CBA Spring Conference – Vista, CA
- ***** Cancelled due to COVID- NWBA Spring Conference
- Oct 14-16 ABANA Iron to Art Festival – Johnstown, PA

Additional Digital Demos, Blade Making, and Youth Programs to be posted on the website as presenters are confirmed. Watch your email for ongoing notifications.

A Word From Our President

Greetings NWBA members!

I hope this finds all of you staying healthy and busy in this New Year. I've got high hopes that 2021 will bring many exciting and prosperous times to all of us! 2020 was full of challenges for the NWBA but those challenges turned into some great opportunities. I also have hopes that we will be able to start utilizing the Mentoring Center again in the coming months and will be able to host Swaptoberfest in the fall.

Only time will tell how quickly these things can happen but until then, there is a calendar full of online things you can join to participate in the NWBA Community.

Speaking of the online NWBA Community, I'd like to give a big shout out and THANK YOU to the Communications and Digital Committees for hosting over 30 online events last year! Most of these are now available to watch on YouTube thanks to the editing and uploading skills of William Ottaviani, thank you Billy-O! These events have kept many members engaged and has raised operating money that otherwise wouldn't have been there. Thank you to all who have come and a HUGE thank you to everyone who has donated their time, energy, and funds to the NWBA!

Some of you may be aware that ABANA has been working towards adopting a national education curriculum that is largely based off of the California Blacksmith Association's curriculum. The NWBA is excited to help this move forward and once things are a bit more official we should be able to start offering classes and workshops



based around this national standard. We are looking for instructors who are willing to teach these structured lessons so if that sounds like you, then please contact us and we'll keep you in the loop as things move forward.

I'd also like to welcome new Board Member Andrew Windisch, who has graciously taken on the role of our Treasurer. This is a very important job and I'm confident that he will excel at it once he gets his feet under him. Likewise, I'd like to

thank returning Board Members as well as Committee Members for their continued work and would encourage you to consider how you could help the NWBA. It takes volunteers to keep things running and moving forward so please consider volunteering your time and expertise. If you aren't really looking for a longer-term volunteer commitment, I suggest writing a how-to article for the Hot Iron News.

Continued membership is equally important to keeping our community strong. Our very talented Editor, Patricia Dawson, has recently sent out reminders to expiring memberships as well as to lapsed members. This effort will hopefully keep our roster growing but it's up to you to make sure that you renew! We now have multiple options of membership types so tell your friends and colleagues to join if they aren't members already.

Keep your fires burning and your metal hot!

Kellen Bateham ~*El presidente*

NWBA receives ArtsWA CARES Relief Grant



Washington State Arts Commission (ArtsWA) in collaboration with the Washington State Department of Commerce provided rapid response funding to Washington State arts and cultural organizations impacted by the COVID-19 pandemic. The program was supported by a grant awarded by the US Dept. of Treasury. The highly competitive grants were awarded to organizations and fiscally sponsored arts and cultural groups that demonstrated significant financial hardship related to the COVID-19 pandemic. NWBA was honored to be awarded a grant of \$8,269 this December which has proven most helpful during our closure of the Mentoring Center. Thank You ArtsWA!

A NOTE FROM THE EDITOR



While the current setting has proven challenging with COVID-19, we continue to applaud the creative energies of those who have stepped up to the plate to guide NWBA forward. Thank you to our NWBA members who have agreed to serve as 2021 NWBA Board of Directors and Committee Members. Contact details for those individuals are listed on page two of this issue of Hot Iron News.

Despite the discouragement of still not being able to meet face-to-face, our Communications Committee has not missed a beat. New this Quarter is the Virtual and Print “Hammer Talk” Series. We are so honored to feature long-time NWBA member, Ike Bay in our first print “Hammer Talk” series. Ike shares his blacksmithing memories on pages 8-9. The Digital Demonstrations continue to grow in popularity, and we have noted an increase in membership which we attribute to our Digital efforts. Read more about this quarter’s sessions which included stops to Africa, Brazil, Canada, Illinois, Oregon, and Washington on pages 16-18. A huge thank you to all who have assisted in bringing these excellent membership resources to a reality. If you have not yet attended one of the “Digital Demos” we encourage you to join us soon. Watch your email and our NWBA website for upcoming topics and how to participate as well as how to link to the posted demonstrations. Hats off to Billy Ottaviani who continues to put in countless hours to load the “Digital Demos” onto the NWBA YouTube channel... be sure to check the sessions out...they are amazing!!!!

Hot Iron News welcomes a new “Tips for your Shop” contributor to the team this quarter and I am sure you will be impressed. Please welcome Mike Clifton who provides outstanding guidance for “Drilling Holes” on pages 24-27 of this issue. You won’t want to miss Jim Garrett’s article “Forging a New Stem for the Gyrfalcon” found on pages 12-13. His explanations and photos of the repair work for the Gyrfalcon are amazing! We are also pleased to continue to enjoy contributions from Stephen McGehee who kindly shares pieces from his “Irony” collection on pages 20-23. For a “Look at the Past” we revisit an excellent article from 2011 covering Ben Czyhold’s techniques for building a Hook Rack which you will find on pages 28-31. We express deep appreciation to our ABANA affiliate associations and respective editors for offering publication content to best serve blacksmith membership across the nation. A shout out to Steve Bloom Ironflower Forge ~Florida, members of the California Blacksmith Association and Michigan Artist Blacksmiths for sharing their expertise with readers in our “Tips for your Shop” section.

As we move into the 2021 season, we need your assistance. We are seeking NWBA members to lend a hand with the HIN “How To” section by sharing shop tips, project how-to notes, and project photographs. It is also our turn to share articles from the Northwest with our fellow Associations...fear not...we can assist with editing and formatting. Have an idea but not sure where to begin? Send it to Editor, Patricia Dawson at NWBAINfo@gmail.com and we can discuss.

We look forward to seeing you soon! ~ Patricia



WANTED

Share photos and brief explanations of your completed projects with fellow members of NWBA.

Kindly send to HIN Editor, Patricia Dawson at nwbainfo@gmail.com.

TREASURER’S REPORT

Andrew Windisch, Treasurer

Profit & Loss: January-December 2020 (Accrual Basis)

ORDINARY INCOME/EXPENSE

INCOME

Donation	2,695.00
Grant	8,674.00
Membership Dues	26,181.41
Online Auction Sales	1,487.11
PayPal Sales	5,875.00
Workshop Fees	1,445.00

Total Income **46,357.52**

Gross Profit **\$ 46,357.52**

EXPENSES

Advertising & Marketing	172.96
Bank Charges & Fees	325.00
Board Meeting Expense	1,076.99
Contractors	22,310.44
HIN Publishing	8,790.09
Insurance	1,626.25
Legal & Professional Services	1,100.00
Mentoring Center - Supplies	180.39
Office Supplies & Software	623.57
PayPal Fees	1,386.44
Rent or Lease of Buildings	9,850.00
Taxes & Licenses	120.00
Utilities	170.68
Workshop Demonstrator Fee	2,037.08

Total Expenses **49,769.89**

NET INCOME **\$ -3,412.37**



Attention:

Please check the mailing label on the back page of Hot Iron News and note your NWBA membership expiration date. Kindly renew prior to the expiration date to continue to receive Hot Iron News and NWBA event notifications. Thank You!

ELECTION RESULTS

2021-2022 NWBA BOARD MEMBERS

By **Jim Garrett**, Nominations & Elections Committee Chair

The ballots have been counted and we offer a hearty THANK YOU to everyone who cast a vote!!

With 69 ballots cast, the count was:

John Huffstutter	66
Bhakti Sa	69
Bart Turner	68
Andrew Windisch	66
Tim Middaugh (<i>write-in</i>)	1
John Dorfield (<i>write-in</i>)	1
Torvold Sorenson (<i>write-in</i>)	1
Mark Koffler (<i>write-in</i>)	1
Frank Zappa (<i>write-in</i>)	1

Board Officers were elected by the Board of Directors at the January 23, 2021 Board Meeting. Refer to page 2 for contact details.

ELECTED OFFICERS FOR 2021

PRESIDENT: Kellen Bateham
VICE PRESIDENT: Morgan Kirk
TREASURER: Andrew Windisch
SECRETARY: Bhakti Sa

DIRECTORS AT LARGE FOR 2021

John Huffstutter
John Karlick
Silas Maddox
Pele Risley-Warnock
Bart Turner

Thank you, new and returning Board members for stepping up to guide NWBA! Thank you to all the members who voted! And thank



you to our retiring Board member, Spencer Knight who is moving on to other things. The NWBA deeply appreciates the commitment of our board members to our community and the efforts they make to help our association grow.

The next Board of Directors meeting of 2021 will be held virtually Saturday, April 24th. Connection details will be posted on the NWBA website and emailed to the membership in early April. All current NWBA members are welcome to attend.

NWBA MEMBERS: SHARE YOUR EXPERTISE

Hot Iron News is looking for simple “How To” articles, “Tips & Tricks” and photos of completed projects to share in upcoming issues of our publication. Don’t worry about writing style as we are happy to assist with edits and formats. Contact our Hot Iron News Editor, Patricia Dawson at nwbainfo@gmail.com for details.



In Memoriam

Jim von Mosch

Rising with the sun, tending his animals, brewing tea, a simple bowl of oatmeal. Reading a million books in Spanish & English. Enjoying music: Classic to Willy Nelson & Bob Dylan. Sharing Monty Python, Bloom Country, and The Far Side with his kids. A builder, sailor, teller of “Dad” jokes. A forester by training, he applied this knowledge to reforest & care for the land. Jim envisioned and created an oasis of natural beauty for our family.

A real Boy Scout, Jim delighted in reciting, rapid fire, “A Scout is trustworthy, loyal, helpful, friendly, courteous, kind, obedient, cheerful, thrifty, brave, clean and reverent”. Jim lived those words. Fellow scouts and leaders recognized this. At 14, Jim was tapped into the Order of the Arrow, the BSA Honor Society, its watchword Service. A member of the first Snowden Community Council were crucial land planning protected wildlife. Twenty-eight years on the Volunteer Fire Department, eighteen as Chief. A First Responder, EMT, Scout Master, and founder of the Youth Soccer Program. As the owner/operator of Pronto Plumbing, Jim trained many apprentices, guiding them into successful careers. After retiring in 2008, Jim joined the U.S. Peace Corps, sharing the life of campesinos in the mountains of northern Nicaragua. Jim loved that adventure.

In smithing Jim found a match for his skills & personality. Tim Middaugh of Old West Forge, his first teacher, became a dear friend. Taking on the Treasurer’s job, Jim dug into the accounts, putting them in business order. He looked forward to the yearly NWBA Convention and loved swapping tall tales around a fire or a forge. A recent highlight was coordinating the production of 100+ poppies forged by NWBA members. In 2018, those 100+ poppies, and thousands sent from around the world, formed a memorial



for the 100th Anniversary of the WWI Armistice. This event, in Ypres, Belgium, honored the work of smiths during WWI. Jim met his pal Jeff Cawley in Ypres, and “a good time was had by all.”

Learning to Blacksmith fulfilled a lifelong dream. His first “shop” was under the swooping branches of an old fir, using odds & ends acquired over years. When Jim hit the hot iron, he was in heaven.

Northwest Blacksmith Association has lost a true blacksmith and friend. Jim von Mosch’s devotion to the blacksmith craft, his desire to educate and perpetuate the art and his service to NWBA will be greatly missed.

Memoriam Policy: NWBA strives to recognize members who have passed. Please submit brief obituaries of 250 words or less (Word format), links to published obituaries if available, and one to two photographs (PDF/JPEG/TIFF) to Patricia Dawson, Editor at nwbainfo@gmail.com.

The Blacksmith Under the Old Fir Tree

Jim von Mosch 1946-2020



HAMMER TALK

with **IKE BAY**

Q What was your first experience working with metal or learning about forging?

IKE: My interest in blacksmithing started in grade school when my parents took the family to Disneyland and Colonial Williamsburg. When I got out of the U.S. Navy I set up a small forge with an old coal forge, hand cranked blower and Vulcan anvil. As I grew up, my interest in blacksmithing joined with other hobby interests like draft horses and black powder guns – since both these areas need hand forged items to get projects finished. My first real learning at the anvil came from Phil Baldwin at the Oregon School of Arts and Crafts in Portland. Phil's the one who sent me to Eatonville, WA for a multi day intro to blacksmithing course with Darryl Nelson and Terry Carson.



Williamsburg mini horseshoe made for the tourist trade many, many years ago back when Ike was in 6th grade!

shops. There have also been advantages in the years we've become much bigger, like having a Mentoring Center in Longview, WA that's dedicated to hosting demos, workshops and conferences.

Q Who have been your influences and inspirations over your forging career?

IKE: Peter Ross, the Mastersmith at Colonial Williamsburg for many years, and Darryl Nelson, one of the founders of the NWBA as well as the Mastersmith at Timberline Lodge on Mt. Hood. Both have had prolific careers filled with forging and teaching at the anvil, though other smiths have been of great help too.

Q What are some conferences, workshops, or blacksmith gatherings that you've attended which stand out in your mind as exceptional and why?

IKE: They were all great experiences. For well over 20 years a smith from Colonial Williamsburg would visit Fort Vancouver, WA to demo



and offer hands-on workshops which I very much enjoyed. They also did a few NWBA conference demos that were wonderful.

Q What projects do you most enjoy forging?

IKE: I enjoy forging things that have function and use. I also find teaching the craft to be very enjoyable. Teaching makes you really look at the knowledge and skills you think you have mastered, which can be a journey of self discovery that is significant!



Hearth cooking grill and shelf bracket, both pieces from Williamsburg Hands-on Workshops, picture by Dan Bowyer

Q What's a memory of one of your favorite projects you've worked on at the forge?

IKE: There was a skills workshop taught by Peter Ross where we did a great number of drills. There are two demo boards on the wall at the Mentoring Center that display examples from those workshop.



Above: Demo board showing 17 examples forged during a Peter Ross Workshop in 1996.



Right: Scrolling tongs with box joint – more robust than pliers



Q What do you think the future of the craft looks like?

IKE: The future looks wonderful but in a very different way. New smiths can learn from YouTube without joining a group – though there is much to be gained from in-person learning and group interactions around a forge which organizations like the NWBA provide.

Q Is there something you'd like our readers to know that we didn't ask?

IKE: When you learn something new at the forge, also learn to teach it – you will find you haven't learned as much as you thought! Figure out what you want to do in the craft and how you learn best. I like doing living history presentations and have put in a lot of time at Fort Vancouver Historical Site in Washington and Yamhill Valley Cultural Center in Oregon for period smithing in front of the general public. Teaching kids has become a growing area at Yamhill and something I get a great deal of joy from. Both of these organizations get volunteers who have not forged before, so if you want to get more involved in period smithing, they have a need for instruction for both kids and adults.



Above Left: Straight pein forging hammer weighing around 3 lbs



Above Right: Demo board showing examples from a Forging Skills Workshop with Peter Ross in 1997. One of the exercises was a three legged stand all forge welded together.

Q What advice would you offer someone who's just getting into forging?

IKE: Take every learning opportunity you can and practice as much as possible. Don't just forge one item and be done with it. Forge multiples of the same item and practice how similar you can get each one, one after the other.

I'd also advise beginners to watch the pros demonstrate because the steel seems to willingly submit to their hammer blows, which is great to see. What's not so great is everyone's first efforts at the forge – when the material seems to flip you off and do everything except what is desired! Which is why I suggest taking extensive notes and pictures during the demos you attend and to expand on those notes and processes with a mind dump sometime in the following days. If you're not a good note taker, it's worth it to buddy up with someone who is.

In the end, it's up to you to set your own standards – and it's up to you to hold yourself to them. Learning to recognize when a piece is beyond recovery and you need to start fresh is a skill of the mind, not of the hand. Study the work of others so you learn to recognize what poor quality looks like and do not accept it in your own work at the forge. It's important to understand that honing your mental awareness can quickly lift the quality of your work without relying on a single change in your hands' abilities.



Youth forging under Ike's instruction

THE GOSPEL ACCORDING TO PETER ROSS

Transcribed by Hardie Swage

Peter is the retired master of the blacksmith shop at Colonial Williamsburg and considered one of the top smiths in North America dealing with iron work from the colonial period.

- If you want to create high quality work, you must first master the blacksmithing basics: tapers, octagons, rounds, bends, scrolls.
- If you can't do these to high tolerances, it is impossible to produce high quality work.
- Work from one end of the piece to the other.
- Use the first part of the heat to move metal, use the last part to realign the piece. Always keep your work under control (straight, square, even) as you work it.
- Use Bastard Cut files in 6", 8", 10", 12" length to duplicate the finish on 18th century work. The shorter the bastard file, the finer the cut. Use shop rags to wrap the piece and protect from marring by the vice jaws.
- Work on your mental game as well as hand skills:
- Hold yourself to a high standard. In the classic learning system, the Master sets the standard for the apprentice. In the world of the self taught (most of us) you must do this for yourself.
- Use appropriate tools to check your work, until your eye gets trained to recognize it ... rule, straight edge, calipers, dividers, etc.
- Use the same standard in all your work. No matter how fancy or plain the final form. Also, each preliminary step leading to the final form is done to the same high standard.
- Listen to your hands. The work and the hammer talk to you through your hands and tell you when things are not right.
- Look, Think, Study... see your work as it really is, never do just enough to get by. Study your work closely, the more you look - the more you see.
- Discard substandard work and start again.

AUTHOR'S NOTE: Examples of forging practice items by Peter are on display in the NWBA Mentoring Center in Longview, WA. They are worthy of your serious study and review.

Hot Iron News ...the Perfect Gift!

Looking for a gift for a friend or student who wants to learn more about blacksmithing? If so, consider ordering them a subscription to Hot Iron News. An annual subscription is only \$30 per year (\$40 international) and includes the quarterly Black & White Print publication mailed directly to their home or business as well as the quarterly Color PDF version sent directly to their email. Contact our Editor, Patricia Dawson at nwbainfo@gmail.com for additional information.

To subscribe, go to <https://blacksmith.org/hot-iron-news/subscribe/> note gift instructions within the detail box.



Center Punch Variants

By **Steve Bloom**,
Ironflower Forge

Since we all have had more time in our forges lately, you might like a shop project.

Tips
FOR
YOUR
Shop



My first center punch was part of a file - I could not resist considering the 'Flat Bastard' markings. While this has served for 35 years, it has limitations in terms of grip and point sharpening.



Some while back, I acquired a mill and -as a result- a collection of broken end-mills. A 5" scrap piece of 5/8" diameter bar can be drilled to accept 3/8" end-mills. Drill and tap a 10-32 set screw and you are good to go. If you have a knife grinder or a bench grinder and a hand drill, putting a point on is easy.



The next variant came about due to ageing eyes and glasses. I needed a punch that I could position on the work with a bit more precision. The handle is a scrap of 7/8" square tubing (from a NordicTrack if I remember correctly) with a slug of 3/4" square stock welded on. The slug was drilled to accept 3/8" end mills, was slit from the end to the hole and a 1/4" hole with bolt was added to squeeze the slit and lock the end mill in place.

I found that for some projects, I needed more precision and a third hand. What I came up with consists of a base (6" x 3.75"), a curved arm (5.5" x 1/4"), a piece of pipe (3/4" Sch 40) and a scaled-up version (7/8" x 6") of the end-mill holder.



After using this unit for awhile, I found it really helpful to add a mount for a small flashlight. Not only does this help when punching, it means I can find a flashlight when I need one. Occasionally I need to drill round stock, so welding up some scrap angle iron as shown here is worth the time. All of these various dimensions were not planned - they just happened to be what I found in the scrap pile.

Thanks to my wonderful wife - Kimmy for proofreading this and many other write-ups.

* See ironflower.com for other writeups and blades I have made.

Our grateful thank you to Steve Bloom, Ironflower Forge for sharing his work with our readers. Steve served as the Editor of Florida's "Clinker Breaker" for many years.

Forging a New Stem Iron for the Gyrfalcon

by **Jim Garrett** ~NWBA Member

The call came in early October 2018, when we were driving back from Quemado to the Albuquerque airport: Could we forge a new stem iron for a wooden boat? Kathleen and I had spent the night at Walter De Maria's Lightning Field, were heading back to Port Townsend, and had just reentered cell reception when I picked up the message. I told Blaise I'd stop by the shipyard when I was back in town.

The 88-foot Gyrfalcon was one of two boats built in 1941 to survey the Alaskan coast. No one knew whether the inlets and harbors were mined, so the hulls were fastened and fitted with non-magnetic materials. The

original stem iron was cast in tin bronze, and, 77 years later, the vessel struck a rock up north and limped back to Port Townsend for repairs. The current owners wanted to replace the mangled stem iron with a new one forged from silicon bronze.

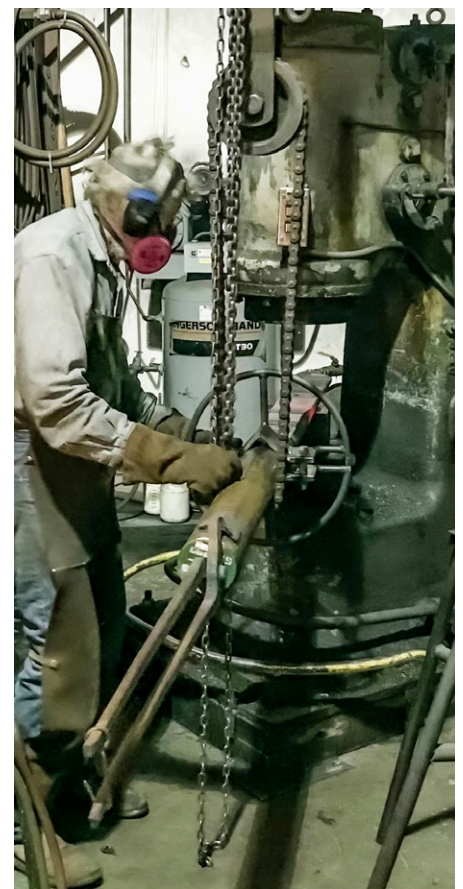
I was familiar with the need for non-magnetic fasteners used on mine sweepers. In the early 80s, Grant Sarver and I were sharing shop space and machinery; he had gotten a contract to make new bolts for the Navy's fleet of wooden vessels. With heading tools scavenged from Brekke Brothers in Ballard and my hydraulic press, we made several hundred 1/2-inch and 5/8-inch fin-head bolts to secure planking and dozens of 1-1/4-inch and 1-1/2-inch

oval-head keel bolts out of silicon bronze to replace the original Monel bolts, which had a slight magnetic signature due to the nickel in the alloy and were therefore considered no longer safe to use. These boats were subsequently used in the First Gulf War, then retired.

After measuring what was left of Gyrfalcon's stem iron, I decided that 4-1/2-inch round would be large enough to forge a new one. I found a piece long enough in Texas and had it shipped to my shop. I learned years ago, forging bronze, that if you can see the color in the forge, it was too



Original and future stem irons



Starting the forging



Halfway



Bending

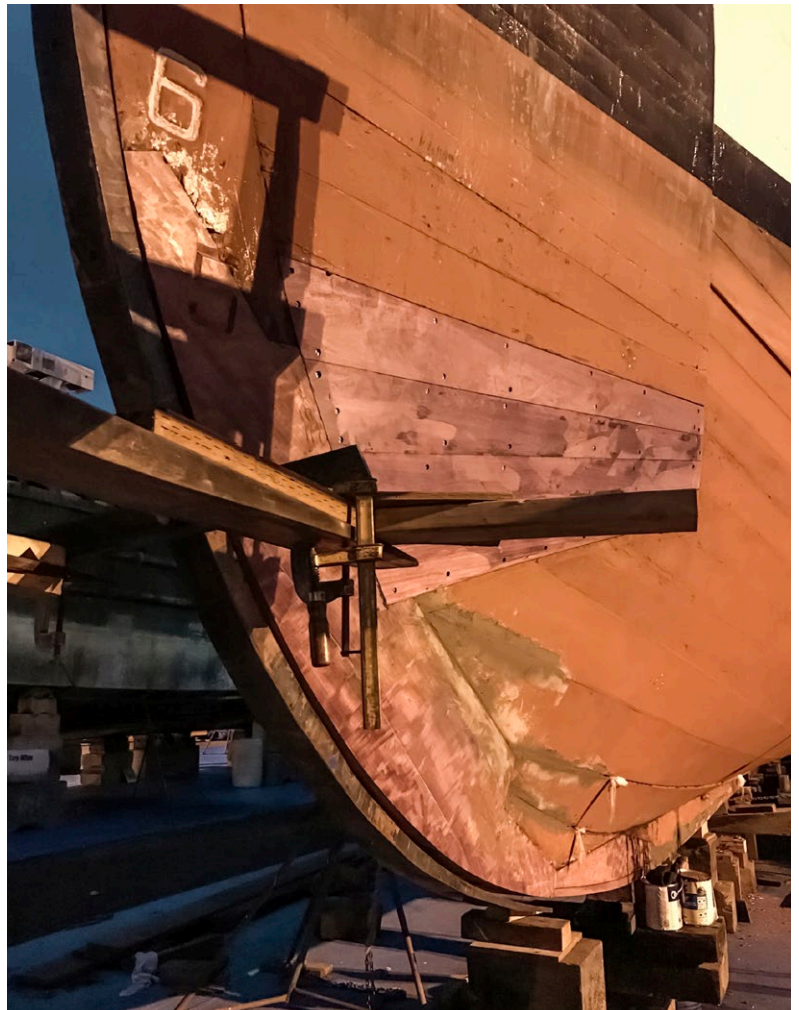


Drilling

late. Pieces this large could not be moved in and out of the forge easily and needed to be supported to prevent sagging and bending while in the hammer. The heating was done with million-and-a-half BTU torches—two of them—fueled with propane and liquid oxygen. A plywood template was made; the finished forging was 15 feet long, bent to fit, and drilled for securing to the repaired bow, hewn from the largest Purpleheart timbers I'd ever seen!

Kathleen and I heated the bar, weighing several hundred pounds, while it hung from the crane. As it stretched to full length, we needed additional stands and sawhorses to support it, and a fitted steering wheel to guide it through the hammer. The final, tapered bar was bent to fit short sections of overlapping templates in order to match the curve of the full template. This was done using the hydraulic press (the same press used to make the Navy's bronze bolts 36 years earlier). The trickiest part was suspending the stem iron from the crane for drilling such thick sections of sticky silicon bronze. Drill bits for this metal need to be sharpened at a shallower angle with less rake so they don't grab and try to self-feed into the material.

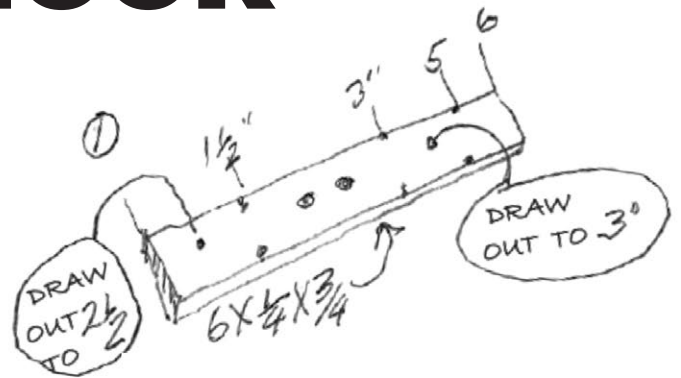
For installation, we bolted an angle to the top of the stem iron and lifted it into place with a forklift, while the bottom was secured under the keel with a 50-ton jack.



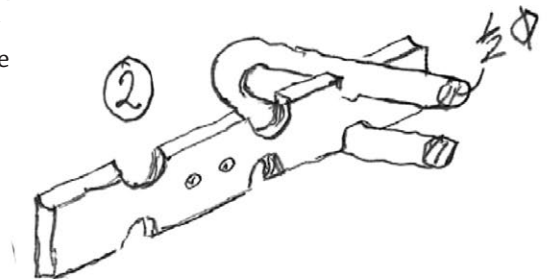
Fitting

Sunflower Hook

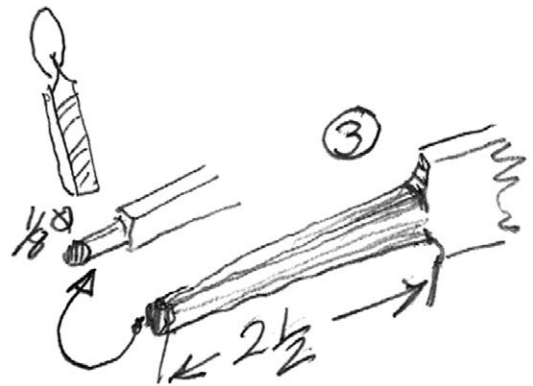
By **Steve Alling**,
a MABA member



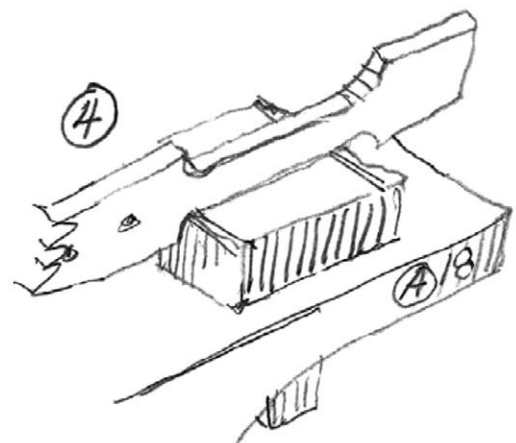
1. Mark stock out, this may be used as the backside.



2. Put your three fullerings in, I used a 1/2 inch fuller.

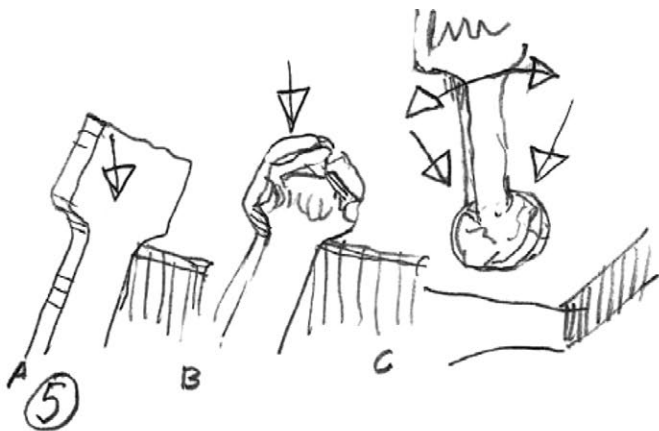


3. Draw out, but leave the end full enough to make a tenon for riveting the flower. File the tenon.

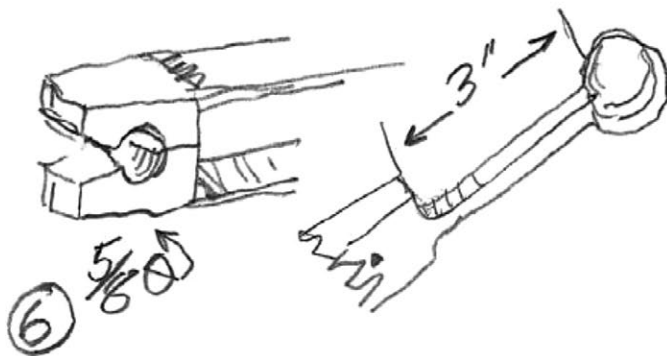


4. Draw out for the hook but leave full.

Tips
FOR
YOUR
Shop

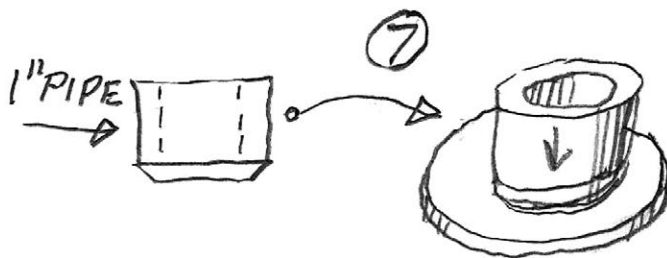


5. Make the ball on the end, you can make this all on the anvil but I sweeten it up



6. Draw out and round up for the hook

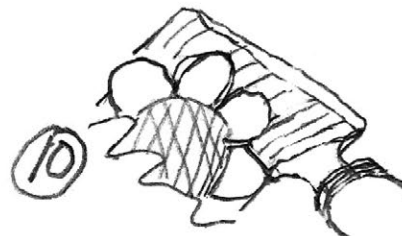
7. Cut out a round disc 1 3/4 inches in diameter out of 11 or 18 gauge sheet metal. I made a round fuller out of a short length of 1 inch black pipe by putting a sharp edge on it that gives you a nice



8. Fuller for the seeds making the lines cross at a 45 or so degree angle so the seeds look like diamonds.



9. Cut the petals with a 4 1/2 inch grinder with a 1/8 inch cutting wheel. This leaves a gap that you wouldn't get by hot cutting and you'll need the gap so the petals don't overlap when full-



10. File the petals to shape.



11. With a ball end fuller shape the petals.



12. Depress from the back with appropriate size ball peen hammer into either wood or a short piece of pipe. Adjust any distortion. By riveting the flower on while the hook is straight you can clamp it in the vise which makes riveting easier. Drill and rivet the flower into place. Now heat the whole thing and bend to the appropriate shape, holes can be drilled for fastening.



NWBA's Digital Demo Sessions Celebrate One Year of Success

By the time Hot Iron News reaches your mailbox it will have been just about a year since NWBA launched Digital Demonstrations to serve our membership during COVID-19. Without a doubt, the journey has proven to be an amazing outreach opportunity for NWBA.

To-date, twenty-nine Digital Demonstrations have been conducted with viewers from across the world. This quarter, our viewers were treated to "front row seats" as they enjoyed presentations from blacksmith shops in Africa, Brazil, Canada, Illinois, Oregon, and Washington. Programs covered a broad range of topics ranging from making beautiful, sculptured art, to forging practical pliers to jeweler's basics.

The monthly "Knife Maker's Corner" chaired by Bhakti Sa continues to grow

in popularity with three additional sessions this quarter. The NWBA Communications Committee added a new Digital experience this quarter titled "Hammer Talk" which is designed to provide an interactive interview with Digital Demonstrators prior to their demonstration. Typically, these are scheduled on Tuesday's at 6:00 P.M. PST the week of a respective Digital Demo and are a great way to view examples of the demonstrator's work, learn about their background and more!

NWBA is excited to launch a new Digital experience with the Metal Programs at Southern Illinois University in Carbondale thanks to our connection with MFA student, Lisa Geertsen. We can look forward to sessions conducted by their MFA students over the next few months!



ABOVE: ABANA member John Williams shared details for a blacksmith voluntary program of study titled the National Curriculum during the monthly Fireside Chat in February.

LEFT: For our 26th Digital Demo we traveled to Walla Walla, Washington where Ben Cyzhold, Artificer Forge shared techniques to forge an organic, single-bottle wine rack featuring a stunning leaf and pea pod motifs.



For our fourth Knifemaker's session we joined Bhakti Sa from Arachne Forge who covered disc and belt grinder basics, which are the two primary abrasive tools used by almost any knifemaker to transform a forged blade to a finished edge. This was an excellent chance for those who were new to these tools to learn what they're about and for experienced users to share the tips and tricks they've picked up along the way.



During David Tuthill's Knifemaker's Corner #3, beginners to damascus learned how to hand weld a billet of steel on the anvil with no heavy equipment. Experienced pattern welders were shown how to step up their pattern retention game with the elusive "dry weld" that involves no flux in the welding process.

Digital Demos *Continued from Page 16*

If you just want to reach out and say hi to fellow blacksmiths, then be sure to join in on the next Fireside Chats. These casual sessions are tailored simply as a nice time to visit with each other, share stories and enjoy fellowship. Grab your favorite beverage, a fun story, an unusual tool or photo and plan on participating in the next Fireside Chat.

NWBA would like to offer a special THANK YOU to those who volunteered to demonstrate this quarter as well as their camera crew and shop assistants. We extend a huge round of applause to Kellen Bateham, Ben Cyzhold, Steve Douglas, Lisa Geertsen, Isaac-Hertic Forge, Jake James, Bhakti Sa, Renan Távora, David Tuthill and John Williams. These

continued on Page 18



We were fortunate to live stream to the University of Southern Illinois in Carbondale to join Lisa Geertsen for our 27th Digital Demo. Lisa is working on her MFA which is a three year program at Carbondale. No stranger to NWBA, Lisa is a talented artist blacksmith known across the country for her amazing techniques.



We were a little envious of the tropical setting of Renan Távora's shop in Brazil! During his live stream, Renan demonstrated forging a rounding hammer in the Brian Brazeal style. Renan forged a 3.5lb rounding hammer from start to finish. The hammer was forged with a striker at the striking anvil.



Digital Demonstration #27 Sculptural forging with Lisa Geertsen

52 views · Feb 9, 2021

Like 3 Dislike 0 Share

https://www.youtube.com/watch?v=SgXzZfXi_B8

Subscribe to the NWBA YouTube Channel

Check out the NWBA's YouTube Digital Demo series and watch Lisa Geertsen discuss sculptural forging during NWBA's 27th digital demo, or select from one of our numerous other excellent offerings. Subscribe to our channel at Northwest Blacksmith Association and tune in as we upload our growing collection of recorded Digital Demos.

Many thanks to Billy Ottaviani for managing our YouTube account.



We joined Jake James at his shop in British Columbia for our 29th digital Demo to learn his approach to forging sculptural forms.

Digital Demos Continued from Page 17

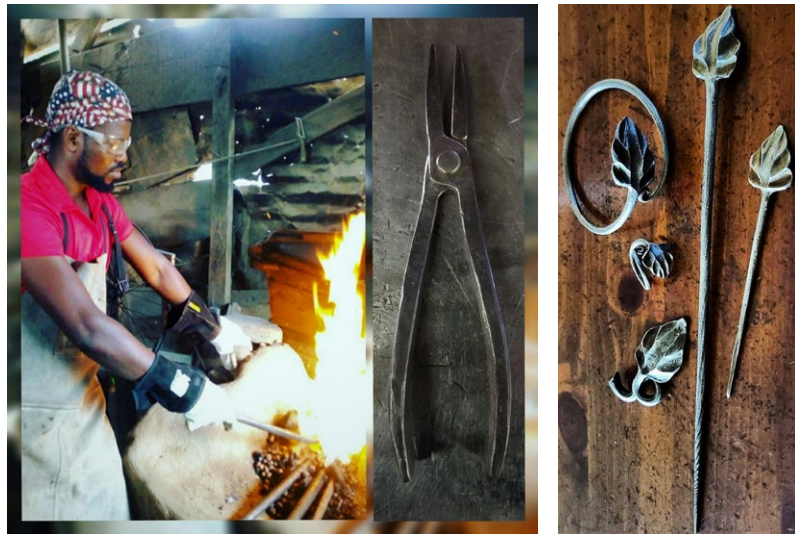
individuals made tremendous efforts towards their live streamed events with presentations ranging 1.3 – 2 hours including time for questions and answers throughout. We have enjoyed learning from each of these individuals and their shop tours have been an additional treat!

As we go to press, more digital demos are in the planning phases. Our goal is to offer 3 sessions per month, generally Saturday mornings starting at 10:00 a.m. If you are a current NWBA Member, check your email or visit our NWBA website and Facebook page for notification of upcoming sessions and how to link to the program. (If you do not see it in your inbox, be sure to check other inboxes like Spam or Promotions or send an email to webmaster@blacksmith.org. To attend the sessions, you may need to download the Zoom app on your phone or computer. If you need assistance in setting up the app, please email webmaster@blacksmith.org and we will do what we can to help you get set up! If you have not been able to attend the sessions – worry not! We record all Digital Demo Sessions and will upload them to our NWBA YouTube page approximately one month after the demo once they have been polished with a little editing. Hats off to Billy Ottaviani, who has generously donated his time to edit and post the digital demos to the YouTube site. Thank You Billy!

If you would like to join our list of demonstrators for live streamed or prerecorded demos, or if you would like to lend a hand with hosting a session or helping to prepare the content for posting on YouTube just email webmaster@blacksmith.org!



For this COMAG Collab we explored why a goldsmith would need a laser and how this technology fits into the work flow of traditional jewelry fabrication with Steven Douglas of The Sunstone Store in Grants Pass, Oregon. It was fun to team up with the Central Oregon Metal Arts Guild for this session.



We reached out to Ghana W. Africa to assist Isaac at Hertic Forge in upgrading his blacksmith shop during our 25th Digital Demo with a fundraiser to outfit his shop with electricity. Isaac learned blacksmithing from his father and makes everything from recycled auto parts. During the demo, Kellen Bateham forged a set of pliers for the fundraiser and Brian Brazeal donated the three beautiful pieces for the auction shown above.

Fundraiser for Hertic Forge is a Success!

NWBA heard back from Isaac with Hertic Forge. He is thrilled that our fundraiser brought in sufficient funds to help hook up electricity at his new workshop.

Quotes from Isaac:

“They (NWBA) made me see a different perspective of life! Joining force together to see me succeed as a BLACKSMITH is something I can never take for granted! I am so overwhelmed for the tremendous support everyone who joined the live feed shown me! I would like to take the opportunity to thank all the beautiful souls (fellow blacksmith’s) who provided some of their forge works for auction in support of the fundraising.

Much love and respect to yah all for extending a helping hand to the needy. And to the audience, you know without you the show would not have been so successful.

Honestly, I thoroughly appreciate you all for the support.

Horseshoe to Heart

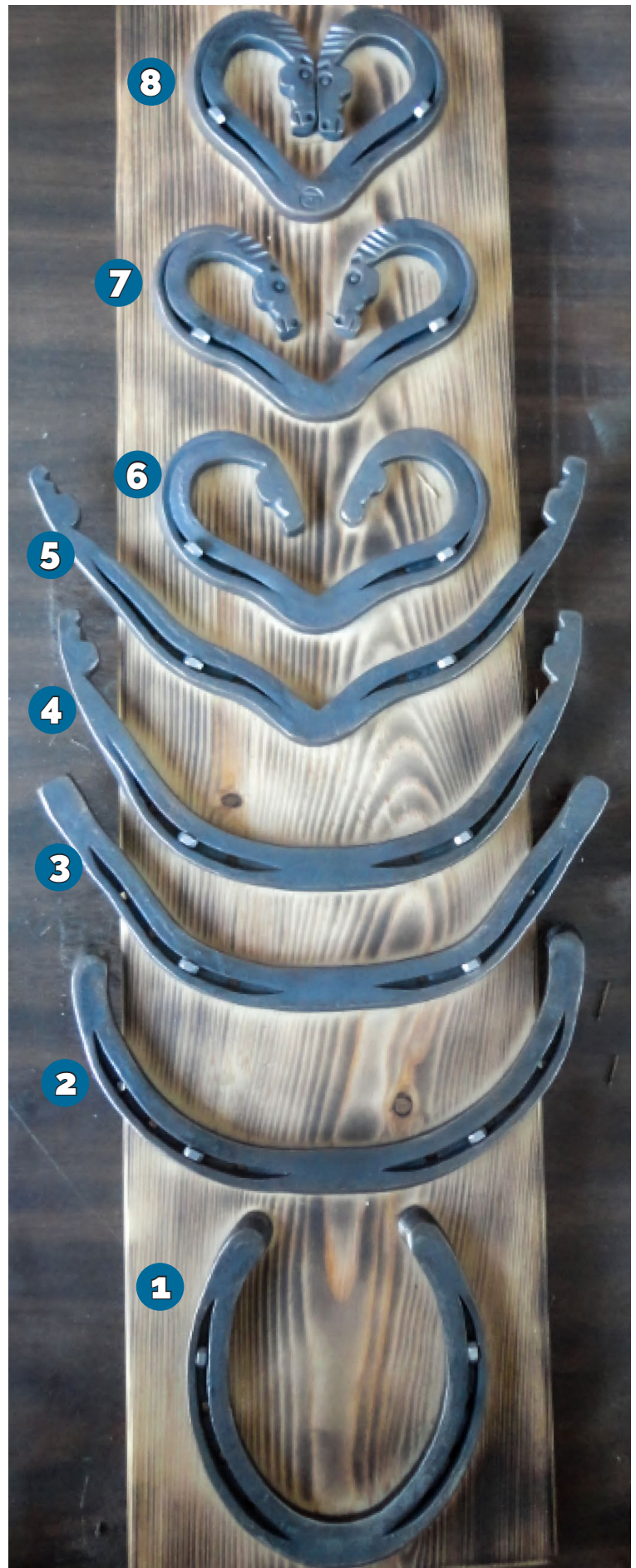
Tips FOR YOUR Shop

An Exquisite Storyboard

By: **Steve Taylor**

- 1** Your basic horseshoe.
- 2** Bend outwards, being careful to avoid collapsing the center groove.
- 3** Straighten the ends.
- 4** Create the neck-to-head transition (step): half on/ half-off blows over a sharp corner of the anvil, or use a side set to make the step. Draw the lower face out. Use a small fuller to make the two indents to define the snout.
- 5** Locate the center of the horseshoe, then over a vee-block or double bar bottom tool, use a fuller to make the center indent.
- 6** Bend the heads around, keeping both curves even and matching.
- 7** Punch in the eyes, nostril, mouth, and mane. This will probably take several heats.
- 8** Bring the heads together and even. Tweak as necessary.
- 9** Clean and enjoy!

Our grateful thanks to the California Blacksmith Association for sharing content from their publication "California Blacksmith" March/April 21 No. 21-02S.

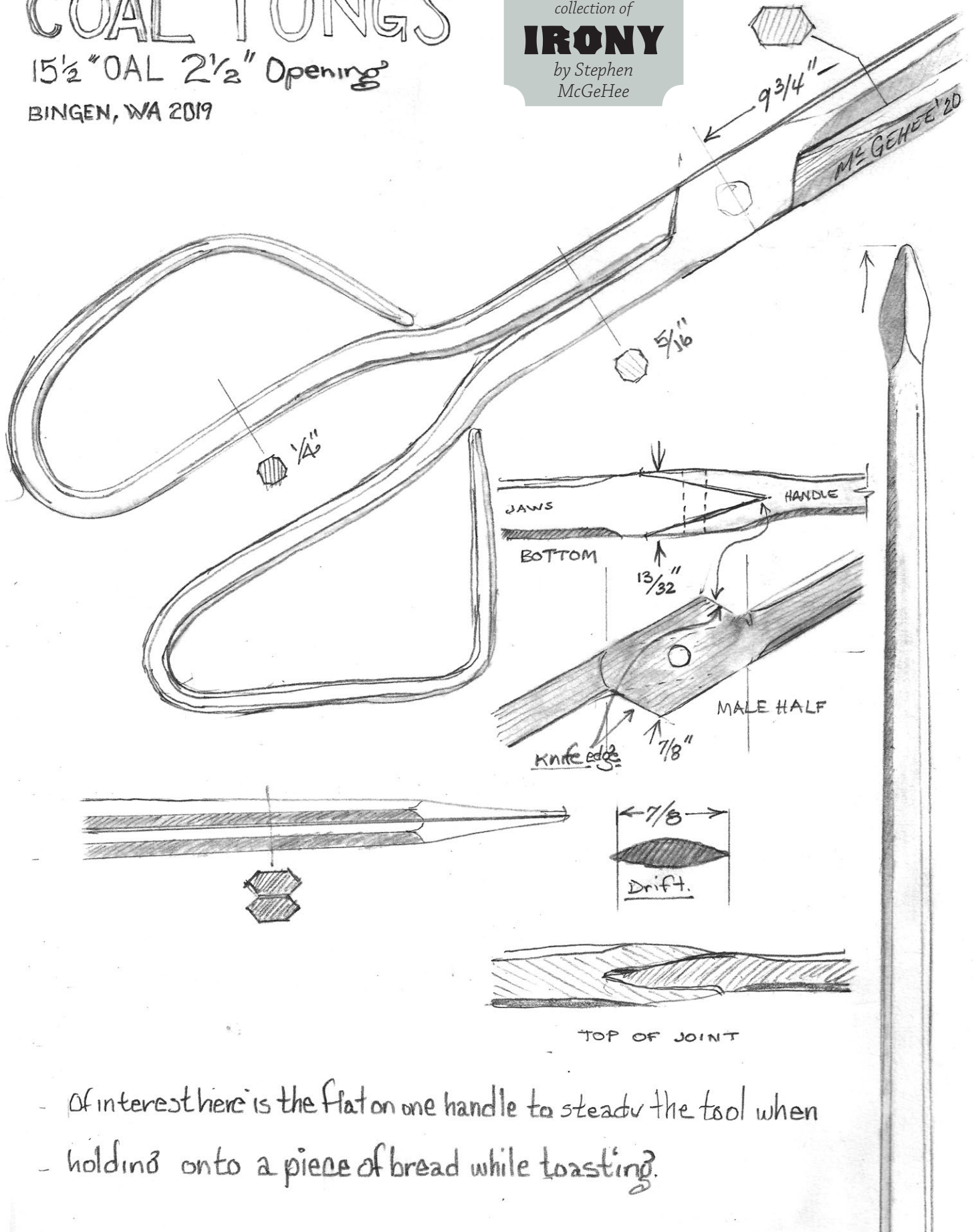


COAL TONGS

15 1/2" OAL 2 1/2" Opening

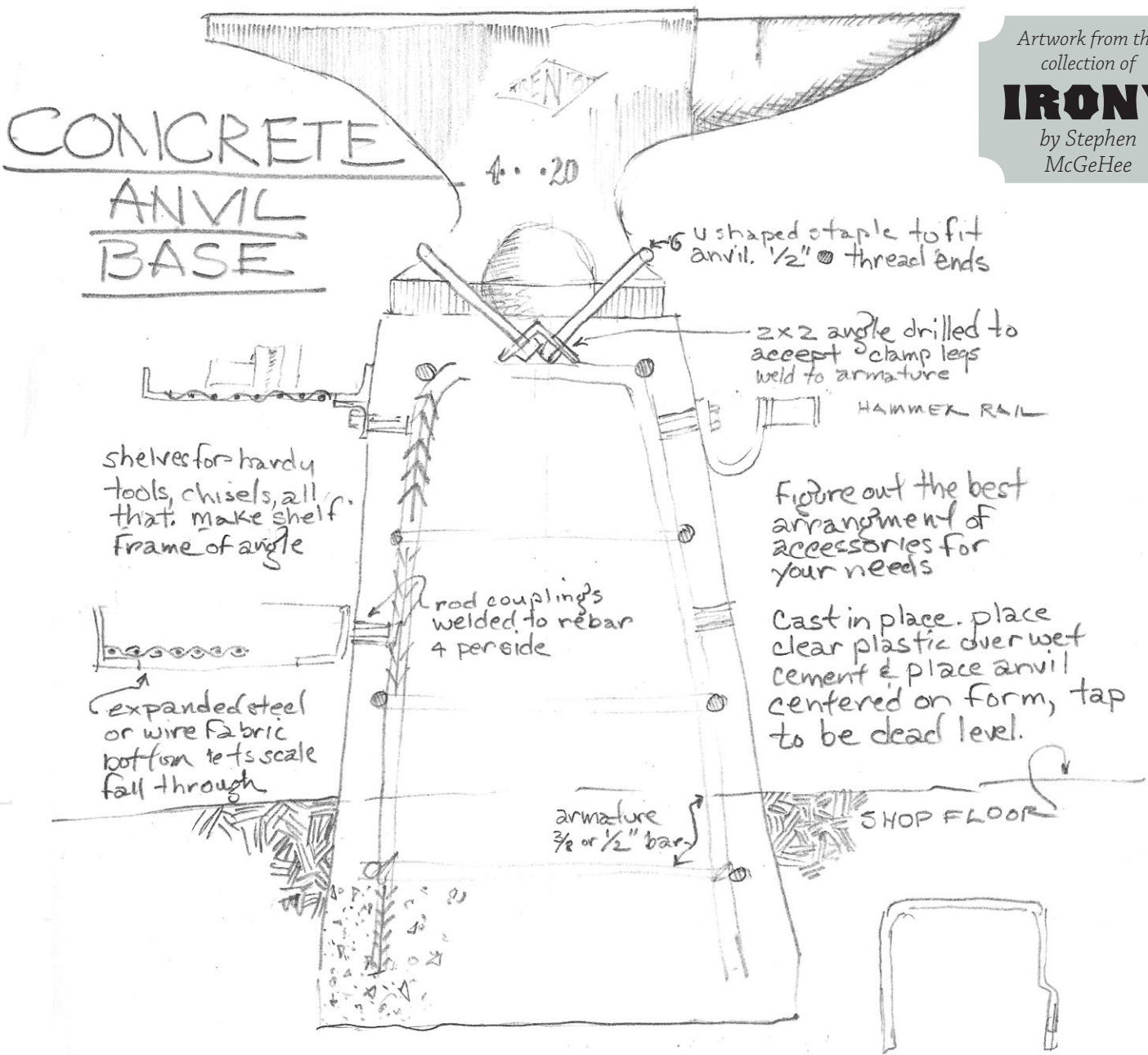
BINGEN, WA 2019

Artwork from the
collection of
IRONY
by Stephen
McGehee



- of interest here is the flat on one handle to steady the tool when
- holding onto a piece of bread while toasting?

CONCRETE ANVIL BASE



shelves for handy tools, chisels, all that make shelf. frame of angle

expanded steel or wire fabric bottom 1/2" scale fall through

rod couplings welded to rebar 4 per side

2x2 angle drilled to accept clamp legs weld to rebar

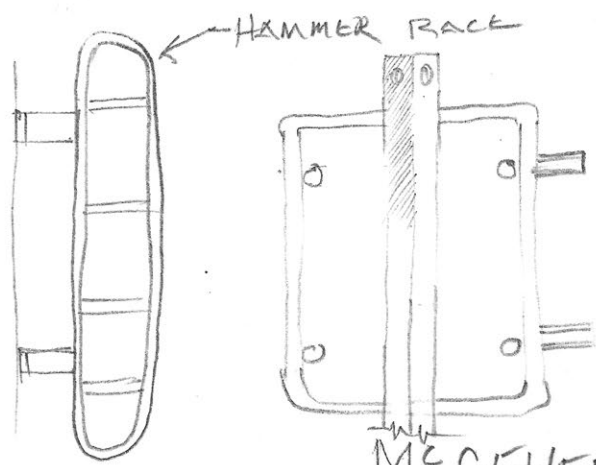
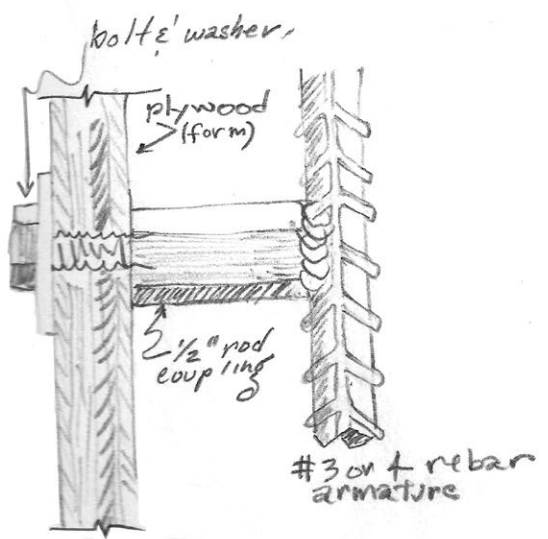
HAMMER RAIL

figure out the best arrangement of accessories for your needs

Cast in place. place clear plastic over wet cement & place anvil centered on form, tap to be dead level.

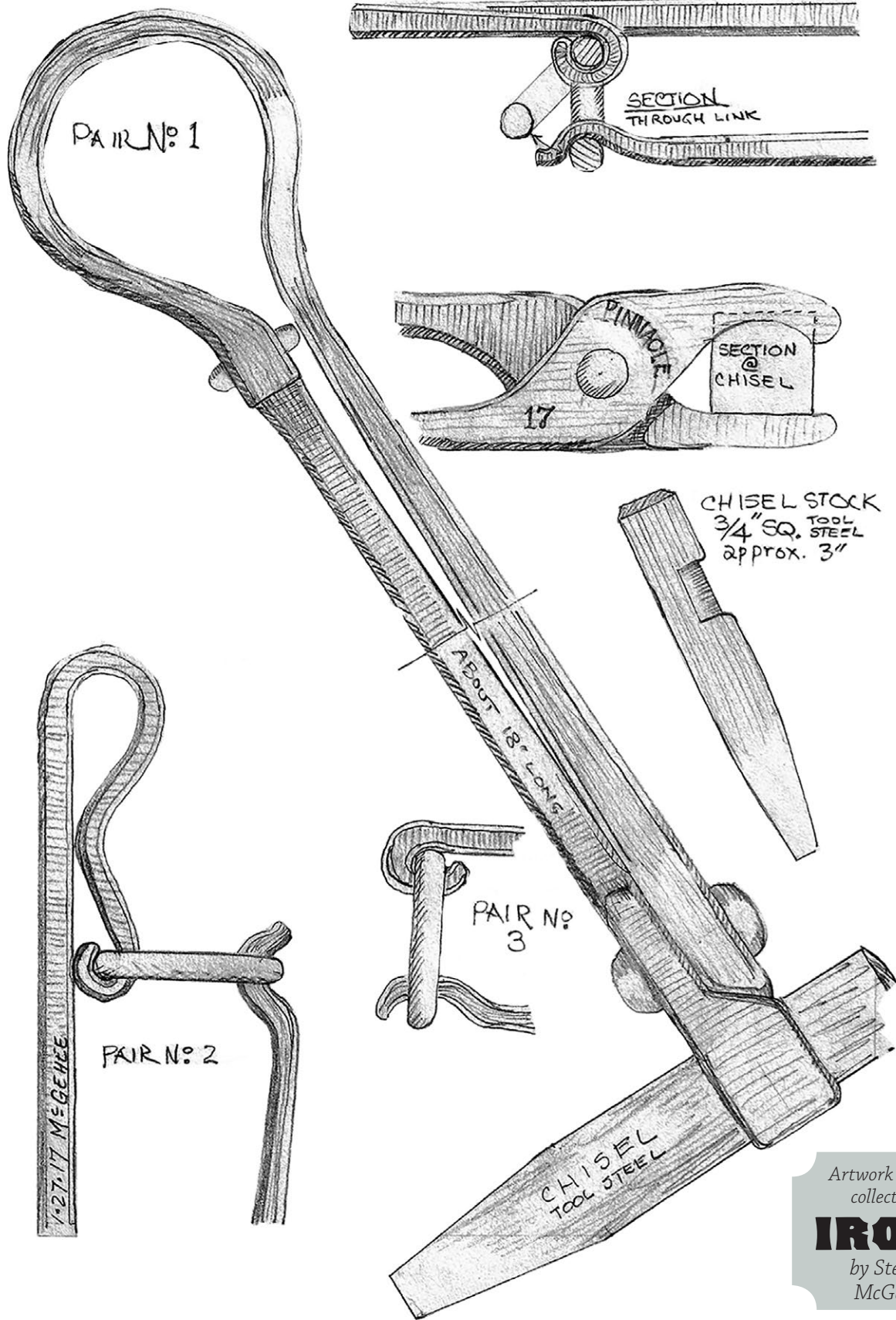
rebar 3/2 or 1/2" bar

SHOP FLOOR



McGEHEE '16

Bob Patrick Tongs



Artwork from the
collection of

IRONY

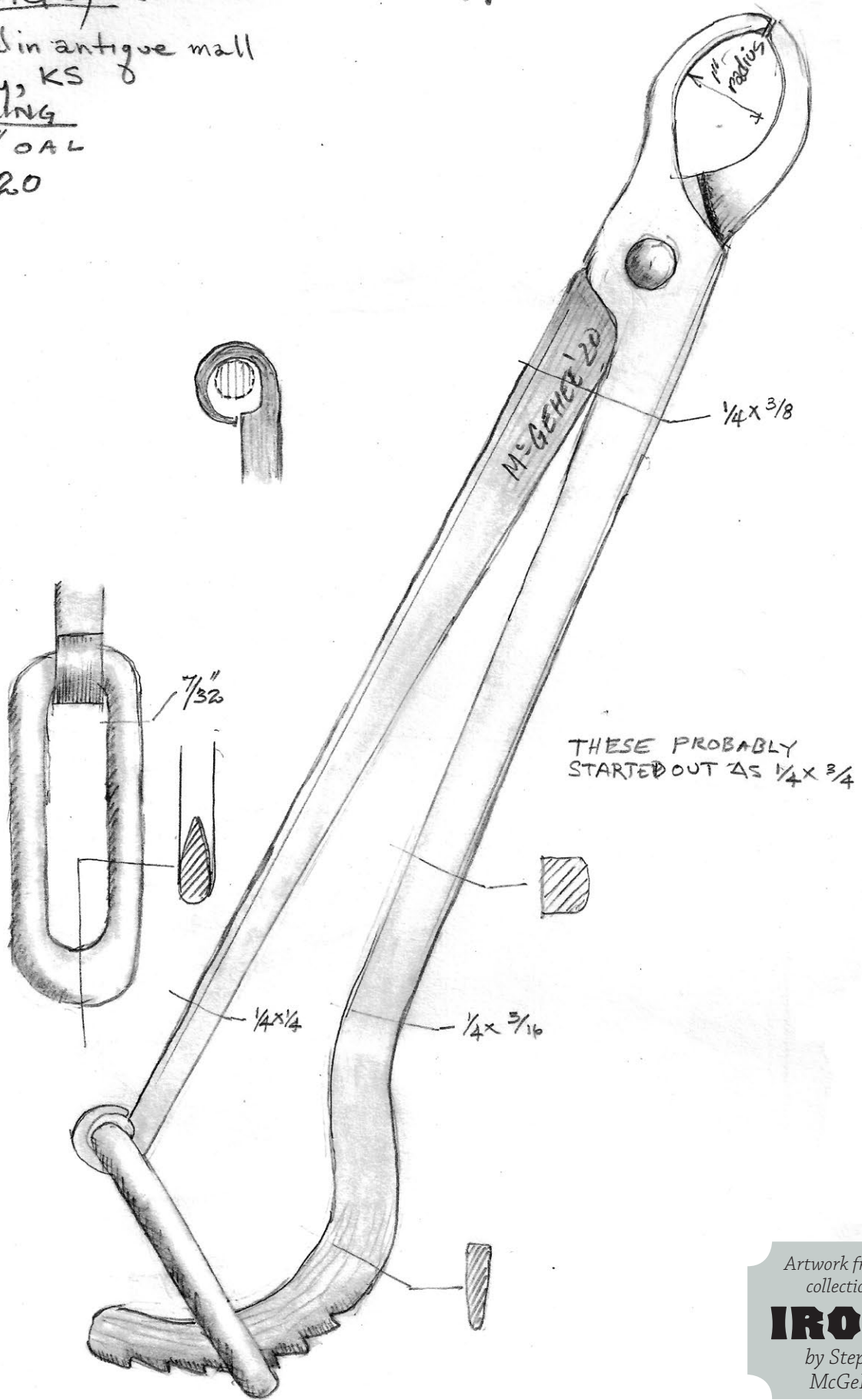
by Stephen
McGehee

TONGS, CHISEL HOLDING

Found in antique mall
Colby, KS

TRACING

9 1/2" OAL
8.2.20
LYLE



Artwork from the
collection of
IRONY
by Stephen
McGeHee

DRILLING HOLES: A Few Pointers From A Machinist



By **Mike Clifton**

INTRODUCTION

When working with metal, frequently the need arises to drill a hole. I'm sure you have multiple personal examples of when you have had a small drill bit break, or a larger drill bit becoming dull because the cutting edge overheated, or some other drilling struggle. Here, I will talk about how to adjust your RPM and drilling pressure, along with what cutting fluids might help you, based on what type of drilling you are doing. I will also mention some different cutting speeds for different metals. A very common fabricating material is low carbon steel, so many of my examples will be for low carbon steel.

“Cutting speed” or “Surface Feet” (240 divided by drill bit diameter equals RPM)

When drilling a small hole, the initial tendency is to have your RPM too slow. This often results in the drill bit breaking, because the pressure being applied (the “feed rate”) at low speed results in too much “chip load,” meaning it’s trying to cut too much in one revolution. If you were to calculate your RPM using formulas for “cutting speed” or “surface footage” (they are the same thing) you might be surprised at what the speed should be.

For example, if I were to run a ½” drill bit at 480 RPM, that would generate the same amount of “cutting speed” as if I ran a 1/8” drill bit at 1920 RPM. If you are running a small bit at a higher speed the same amount of downward pressure will create a much smaller chip and put less torque on the drill bit. This will help you with 2 things: One, you will have less tendency to break the drill; and two, you will get through the hole faster.

From my observations, people naturally tend to get the correct “cutting speed” when using a drill around ½ inch. What I have seen commonly is the tendency to run smaller drills at too low an RPM, which puts too much torque on the drill, and it tends to break. Conversely, the tendency is to run larger drills at too high an RPM, which generates too much heat, and the cutting edge will tend to burn up



in a very short time – sometimes less than one second.

For example, if I were to run a ¾ inch drill bit at 500 RPM that would be too fast.

The RPM that would equal the “cutting speed” in the ½ inch example would be 320 RPM. A lot of drill presses and larger hand drills have trouble going that slow. To take this one step further, if I ran a 2-inch hole saw, the RPM would be 120 to achieve the same “cutting speed.”

HOW TO DETERMINE YOUR “CUTTING SPEED”

Here is the simplest formula to come up with an RPM that will work with a wide variety of low-carbon steels:

$$\frac{240}{\text{drill bit diameter}} = \text{RPM}$$

Here is the math behind the formula. For all low and medium carbon steels, a “cutting speed” of 60 will work, and for high carbon and stainless steels, 30 will work. For aluminum, a “cutting speed” of 400 will work. There is a range of “cutting speeds” and many variables for these metals, but this is me keeping it as straightforward as possible. You can get these numbers from the internet, cutting tool manufacturers, the Machinery’s Handbook, an experienced person, or many other sources. There is a more complex formula called out in technical reference manuals;

however, I have reduced it here. This more complex formula matters if you are machining at over 10,000 RPM, but this is simpler and works just fine for our purposes here. This formula will work for a lathe, a mill, a band saw – anywhere you have a cutter moving across metal.

You would take the 60 times 4, divided by the diameter of your drill bit.

$$\frac{60 \times 4}{\text{drill bit diameter}} = \text{RPM}$$

For example, if I wanted to run a 1/2" drill bit at a cutting speed of 60, I would take 60 times 4 and divide by .5, which would equal 480 RPM. After teaching machining for over 20 years, I found many sources that said for mild or low-carbon steel using a high-speed steel drill bit (versus carbide), you can run at a cutting speed between 40 and 120. I found that 120 works well when using a CNC machine and running some kind of a cutting fluid to keep the heat down. I found that with beginning students, running a cutting speed between 60 to 100 surface feet worked out well for them. Many times, they had cutters that were a little dull or setups that were a little weak, and very rarely were they running cutting fluid (sometimes used to cool, sometimes used to lubricate). I would use a cutting speed of 40 surface feet if I were using a very low-quality drill bit.

ESTIMATING YOUR RPM AND USING COOLANT

So, what do you do when using a hand drill and you don't know what RPM you are running? Start with guessing. We all can tell if the drill is running at its full speed or barely turning. For small drills, pay attention to your chip. If you start seeing your chip get very thick, you need more RPM and less pressure. For larger drills, if your chips are blue you are starting to run too fast.

Let's take the problem of blue chips and let's say that you're running as slow as your drill will go. What you then need is something to remove the heat. The 3 most basic choices are air, oil, and water. Compressed air can help remove the chips and cool the drill bit. Oil does have a cooling effect but tends to smoke and does not cool nearly as well as water. Oil is much better at lubricating than cooling. If you have the choice, "coolant" works the best. Coolant is water-soluble oil or synthetic mixed with water. There are many on the market. Most coolants are over 90% water and for that reason if you don't have coolant, use water. If you spray water or coolant on the drill bit and it steams, it is helping cool the

drill. If it doesn't steam you probably don't need it. (The only reason not to use it is that it is messy).

I was drilling a hole in an implement for my tractor, using a hand drill, and I needed a 7/8" diameter hole. The drill I was using ran at 600 RPM which was too fast; it would have burned up the cutting tips on my drill. I needed to get rid of the heat, but I didn't have flood coolant (coolant from a hose versus a spray bottle or mister); however, I did have a hose and water. My friend held the hose on the drill bit with a slow water flow, and we made it through a piece of 3/8" steel without having to sharpen the drill bit.

DRILLING A LARGE HOLE

When drilling larger holes, a common practice is to drill a small hole in your material, and then work your way up. The reasoning is that it takes less force or pressure to move the drill through the material. The problem is that the drill bit tends to grab, which can break the bit, or it can get stuck. For example, if you are drilling a 1/2" hole, the tendency is to drill a 3/16", then a 3/8", and then your 1/2" hole. I am recommending that you try using a pilot hole just a bit larger than the chisel point on your final drill bit, and drill the hole in two steps. (Drill a 3/16" hole, and then your 1/2"). This reduces the pressure needed and still avoids most of the grabbing and chattering. Of course, as in all of these examples, there are so many variables that there is no one guaranteed solution. Variables can include hot-rolled versus cold-rolled steel, high-helix versus low-helix drill bits, drills with extra wide webs for good strength, using a hand drill versus a drill press versus a milling machine, cutting dry versus using fluids; the list is considerable.

Another tip to note: A drill bit with a split point will take less pressure than a drill bit with a chisel point.



SPLIT POINT DRILL BIT

continued on Page 26

If you look at the center of the drill you can see the chisel point is split, creating two cutting edges on the point. This will take less pressure because the chisel point only pushes metal away whereas the split point is actually cutting.



CHISEL POINT DRILL BIT

TYPES OF DRILL BITS

What kind of drill bit works best for drilling steel? This is a very complicated question and there are entire companies that are devoted to creating all different kinds of drill bits. Gehring is one that will show you the astonishing variety of drill bits. Their printed catalog of drill bits looks like an old-fashioned city phone book. I am not going to attempt to go into any depth on drill bits. I am going to look at the three drill bits for metal I see most commonly in a hardware store.

One will be black and most likely the least expensive there. It may have a lower quality finish grind, and many times does not have a

split point. Works well for drilling wood. Another will have a gold coating and it's probably a very good choice. This gold coating is harder and more slippery and works better than the substrate that the drill is made of. That doesn't mean you can't sharpen one of these drills - you just lose the benefit of the coating.

The third common option you may have at the hardware store will be a cobalt drill bit and this is usually the best drill bit you can find there for drilling steels. These are usually better-quality drills in regard to grind and finish, but they are usually the most expensive. Cobalt increases what is called "red hardness." Red Hardness means that the cutting edge stays strong even when it gets red-hot. The cobalt gives it strength and keeps it from breaking down. Notice that your drill bit may not be red-hot but the very fine cutting edge that is doing the bulk of the work can become red-hot. If you buy your drill bits from a tool supply house or some other source that has more choices you will see that some of the most common choices are cobalt at 3%, 5% and 7%. As the percentage of cobalt goes up, the drill will do a better job of holding up to heat.

STAINLESS STEEL

When drilling stainless steel, I have found at least 5% cobalt holds up well. I will very briefly cover helix and web thickness. When a drill has a "high helix," or a lot of twist, the cutting angle changes. This can work well in stainless steel and aluminum. When your drill has a thick "web" (the center shaft), this makes your drill much stronger, but you will need more force. You need that web thickness if you are being

aggressive and drilling through a tough material like stainless. I'm not going to cover carbide drills because most of us can only get the carbide drills available for drilling concrete.

Stainless is tougher than low carbon steel but it is not necessarily "harder" so it's more like drilling rubber than glass. Toughness is the metal's ability to resist impact, and hardness is the metal's ability to resist penetration. For stainless, you need a sharp drill bit (Will the cutting edge of the drill scratch your fingernail? If not, it's not sharp enough for stainless). You'll need to slow your cutting speed down to somewhere close to 35 to calculate your RPM. You do not want your drill bit to rub. This can cause "work hardening." To keep your drill bit from rubbing you need a little higher feed rate or more pressure. If you're not making a chip you're rubbing. What is "work hardening"? Hardening a metal as a result of "cold-working." "Work-hardening" is when your drill rubs and creates a hard spot a few thousandths thick where you are drilling. (Hammering can also cause "work hardening"). There are three grain structures in steel, including stainless: Austenitic, Ferritic, and Martensitic. "Work hardening" for the most part only happens in Austenitic stainless. Knife steel is usually Martensitic. Austenitic is frequently used in marine hardware. Ferritic may be the exhaust system on a motorcycle.

I would use oil, or coolant with a higher percent of cutting fluid, not water. Stainless needs the lubrication. The other thing that can help is to peck drill. This can help any time you are drilling a

deep hole or need to keep the cutting fluid at the tip of the cutter. Peck drilling is when you drill a little and then pull your drill out of the hole to remove the chips and to get cutting fluid down in the hole.

BRIEF NOTE ON ALUMINUM AND BRASS:

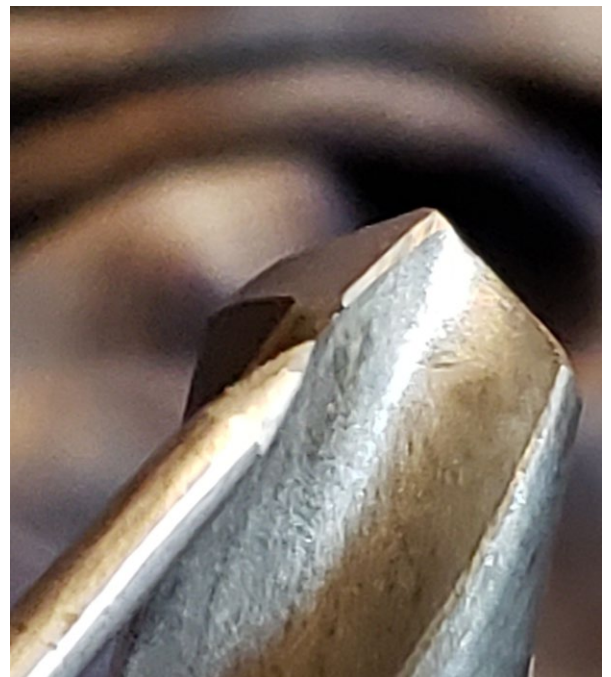
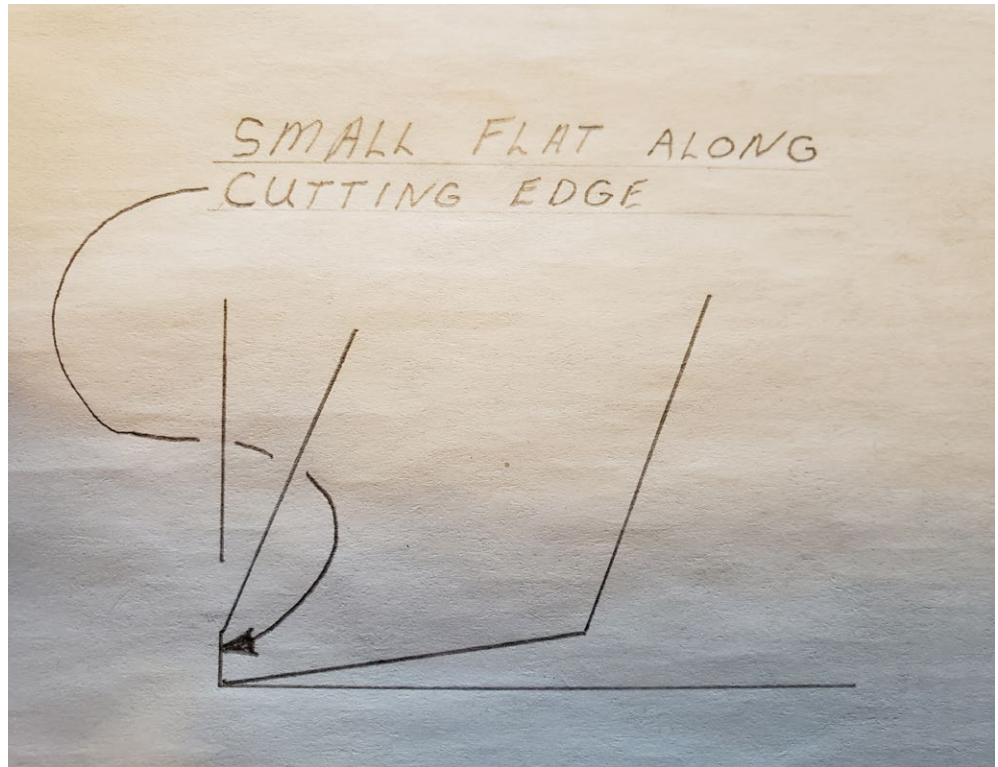
When drilling in aluminum, you can run at a very high cutting speed. 400 to 600 surface feet is common. That means a 1/2" drill bit could run at 4,000 to 5,000 RPM. One problem you will start to see is that the material will start to melt and stick to your drill bit. A small amount of cutting oil can greatly improve your success when drilling aluminum. Even though I may not be running at the high speeds mentioned above, I quite commonly will put a little cutting fluid on my drill bit. When I'm at home I've been known to use WD-40.

When drilling brass, you typically don't need any cutting fluid. But if you are drilling a deep hole in brass, you may experience the problem that your drill bit gets stuck in the hole. The brass is slippery enough that the drill starts working like a screw and cannot eject the chips as fast as it's being pulled into the material. A common solution for this is "dubbing" the drill bit.

"Dubbing" the drill bit is using a stone or lightly touch it to a grinding wheel to remove the helix, or "rake angle," from the cutting edge. The flat needs to be greater than your chip thickness, typically between .005 and .030 thousandths.

The diagram above shows the small flat, or removal of the helix, parallel to the center of the drill.

There are many techniques and tips in here that can be done in different ways, using different methods and numbers. My goal was to introduce you to a lot of these concepts and try to keep things simple.



DUBBED DRILL BIT

Editor's Note: We are pleased to welcome Mike Clifton to Hot Iron News as a regular contributor. Mike has worked in machining for his entire career of nearly 50 years. He has worked in the Aerospace, marine and nuclear industries. For the last 22 years, he taught both manual and CNC machining. He lives with his family on their small horse farm in Snohomish, Washington. Mike has always loved building things. He has shops for woodworking, blacksmithing, and welding; and enjoys using them and his tractors to keep his farm running smoothly. Thank you Mike for so generously agreeing to share your expertise with the readers of Hot Iron News.



FORGING PROJECTS:

Hook Rack with Fish Motif

By *Ben Czyhold*

Greetings to the membership. The following is a complete forging procedure to make a wall mounted coat or hat rack. The project will be detailed with a fish theme in both the back bar and the hooks.

STOCK: 1/4"x1 1/4"x21"
3/16"x3/4"x5" (x3)
1/4" rivets 3/4" long (x3)

TOOLS: 1/4" round punch
1/4" radius fuller
1/4" round eye punch
hot cut chisel
large, curved chisel
small side set (in this case 5/8" wide)
countersink dap (similar to a center punch, 1/2" on end, with 60 degree included angle)
rounding hammer (hammer with a pronounced convex face)

Note: The fuller, hot cut chisel, and side set need to have crowned profiles.

Layout

On the back bar, find the middle of the stock and mark with center punch centered between edges.

Measure 8" to the left and to the right of the center mark along the bars length. Then with the center punch mark 1/8" in from each edge on each end. This will determine where the daps will go. The daps are placed 16" apart to match standard stud placement in a building.

Measure 4" to the left and to the right from the center and mark in the center of bars width. The three marks in the middle of the back bar will determine where the holes for the hooks will be punched.

On the three lengths of smaller flat bar, measure from one end back 2 1/2". These marks will determine where the holes for the hooks will be punched.



Forging

We will be punching the holes first. Place the bar in the fire to heat the middle of the bar. Once at heat take the back bar and place on the anvil face, place your 1/4" round punch directly on top of one for the center punch marks. Strike once, then check to make sure you are centered on the mark. You should be able to see your center punch mark at the bottom of the depression. If you are off, reposition the punch and strike again as needed.

With your hole where it needs to be, place the punch into the depression, strike three times then immediately quench the punches tip in water to preserve its temper. While striking the punch you will feel the punch sinking into the steel. Since the bar is not very thick, with your last strike you will feel the punch stop, this is the punch striking against a thin wafer of steel on the anvil. With the heat remaining, turn the steel over, you will see a slight rise in the form of a faint circle. Place your punch directly over the circle and strike again two to three times, you will feel far less resistance this time. This is done at a red heat to promote a shearing action. Once you feel the wafer shear and the punch penetrate the steel, move the bar and punch immediately to the anvils pritchel hole and strike again to push out the wafer. The punch tip should be through to the other side of the steel.

Immediately move the bar and punch to the anvil face, and with light blows strike the bar around the punch to release it from the hole. Then immediately quench the punch to preserve the temper. The first hole is now finished.

Do likewise to the other two center punch marks in the middle of the bar. In most cases when working with a bar it is best to do any necessary forging to the middle of the bar first.

This is especially true in a gas forge, as it will keep any potentially thin or detailed portions from burning or excessively scaling in the fire.

We will now work on the fish. These will be forged on each end of the back bar. Cool one end of the bar so you can hang onto it and place the opposite end into the fire. First forge a one-sided taper off the end. This taper should have a crowned profile and be about 1 1/4" long.

Take your large, curved chisel and place it so the edge is ninety degrees to the bar and just in front of where the taper transitions back to full width. Before making the cut to put in the gill slit be sure you are imparting it to the side with the center punch marks for the daps up. The cut does not need to be very deep. Then with the remaining heat add the mouth of the fish along the flat edge of the taper.

Now take your side set and place it in the gill cut with its beveled edge facing away from the tapered end. Holding the side set straight up and down run the side set down the cut to define the head and accent the gills.

With your dap apply the countersinks right into the marks near the bar edges.

We will now apply the first fin to the fish. Using the 1/4" fuller place it at a 45-degree angle to the bar, just behind the gills. You will want the fullers edge to be half on and half off the bar to allow the steel to be forged out and away to form the fin. Once the first groove is in then in the same heat pivot the fuller back with its corner at the top of the previous groove. Then forge in another groove into the untouched steel immediately behind the first groove. The two grooves should become one and form a fin with a tapered shape.

The next step is to apply the long fin on the back of the fish. Take your fuller and place so it is half on and half off the steel and at about a 45-degree angle. Apply the first short groove just ahead of the top dap. Then apply about 4 grooves just behind the top dap close enough to give the impression of a ribbed fin. For both fins be sure not to forge the grooves too deep at the risk of making the edges sharp.

Next, we will define the rest of the fish's body and tail. Take your hot cut chisel and make a shallow cut 90 degrees to the bar and across its width about 5/8" from the edge of the closest punched hole. This will be the

continued on Page 30



edge of the tail. Then cut two lines to shape the outline of the rest of the fish's body. Start them just behind where the long fin ends. Make these two cuts about 1 1/4" long, then bring two more cuts up meet the ends of the first and the ends of the two others, to shape the fish's tail.

Now using your side set work the side set through all five cuts, the beveled edge facing away from the body of the fish. This will set the body of the fish apart from the rest of the back bar. Once this is complete there may be sharp points where the bevel meets the edge of the bar. To eliminate these, turn the bar on its edge and place one of the points on the horn of your anvil. Then carefully tuck in the points so they do not protrude, do likewise on all the points where the bevels meet the edge of the bar.



It is now time to detail the tail of our fish. Take your fuller and make a groove in the center of the tail. Then forge in additional grooves at angles to follow the shape of the tail, similar to the back fin leave narrow ridges between the grooves.

We will now add the rest of the details to the fish. Add the eye to the fish with the 1/4" round eye punch. Then use your chisel to add the center line to the fish.

At this point we now need to joggle the end of the bar, since we are using rivets to attach the hooks, we need space for the heads on the back side. In this case we are going to joggle the ends without tooling. First take a heat in the middle of the fish itself try to keep the heat out of the tail, otherwise the steel will want to bend in the bevel behind the tail. Now slide the bar with the detailed side up over a heavily rounded corner of your anvil. Slide the bar ahead so that the daps are just off the anvils corner, then gently bend the fish down about 30 degrees. Then in the same heat turn the bar over with the detailed side down, and place on the opposite corner. Hold the bar at the angle of the first bend so the end is contacting the anvil face. Then slide the bar so that the daps are just on the face of the anvil. Then while lowering your hand that is holding the stock strike the end with light blows to bring the end back parallel with the rest of the bar. Be careful not to strike the stock over the corner or this might leave a mark on the detailed side. Now check the joggle by turning it on edge and comparing it to a straight edge, be it a steel ruler or a straight length of bar. Check to see that the daps and the surface in front of them is parallel with the rest of the bar length and that there is at least 3/16" of stand off between the back of the bar and your straight edge. Adjust as needed.

Now that the first fish is complete you may now quench it to forge the next one. Follow the previous steps except have the fish facing in the opposite direction. Joggle the same as well, being sure to keep the same stand off and keeping the bar parallel with the joggled portions.

The next process is to forge the hooks. All three are forged the same way. First forge a 3 1/2" long taper off one end. Do not taper beyond the center punch mark. Chamfer the edges of the taper.

Now punch the hole where the center punch mark is. Punch the holes as described earlier.





We will now forge the opposite end of the hook into a decorative fish tail. First place the bar on edge onto the horn of your anvil. Find a radius on your horn that matches closest to your rounding hammer. Then using your rounding hammer forge in a necking just above the hole, also isolate about a square of material on the end. Be sure to carry dimensions and chamfer corners. To finish the tail fin use a cross peen hammer with a sharp peen to forge the isolated mass into its final shape. Using the peen end start spreading in the center and work your way to the outside edges, pivoting the stock in place to give the impression of a fish tail. With the last of your heat shape the edge of the tail as needed.

Lastly, forge the taper into a hook. First forge a tiny scroll on the end of the taper, scrolling it down and away from the detailed side. Then quench the scroll and forge the remainder into a J shaped profile. Be sure the tip of the hook does not hinder a direct line to the hole; this will make assembly easier.

Assembly

At this point in the project, it is best to brush off all loose scale and clean the surface of the parts as you wish. We will now rivet the hooks to the back bar. I personally start with the hook in the middle. Place one of your rivets through one of your hooks and then through the back bar. Then have the head of the rivet resting against the face of your anvil with the hook and back bar in place, this is

best done on the heel of your anvil. The remainder of the rivet will now be upset into a head in order to lock the hook in place. Prior to heating make sure the hook is 90 degrees to the back bar. Now heat the end of the rivet with an oxygen/acetylene torch from its tip to where it comes out of the back bar. Heat to about a yellow heat, then turn off the torch and strike the rivet with firm blows straight down. Keep hammering till you get a head 1/4" to 3/16" tall, chamfer and crown the head with the remaining heat. If you hear a ticking sound as the rivet cools this is a good indication that the joint is going to be tight. If it is a little loose strike the rivet cold with moderate blows to tighten it up.

Do likewise to the other hooks. Then clean off any loose scale and apply the finish of your choice.

This concludes the project; I hope you enjoyed reading my article. This project has many possibilities when it comes to forging the bar and the hooks. I encourage you to try the project and incorporate your own motifs and elements. Thank you for reading my article. Stay safe and good forging~ Ben.

Editor's Note: Our grateful thank you to Ben Czyhold, Artificer Forge, Walla Walla, Washington. Ben is an active member of the Northwest Blacksmith Association and is highly respected for his excellent demonstrations and beautiful metal designs. This article originally appeared in the 4th Quarter, 2011 Hot Iron News

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Northwest Blacksmith Association

"To promote and preserve the Art and Craft of Blacksmithing while building friendship and good will"

2021-2022 MEMBERSHIP REGISTRATION FORM

The Northwest Blacksmith Association is a Washington corporation and a 501(c)3 non-profit charitable organization founded in 1979. Now over 500 strong and growing, we have something to offer anyone with an interest in blacksmithing, from the beginner to the serious professional.

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I hereby acknowledge that I have voluntarily applied to become a member of the NorthWest Blacksmith Association, NWBA.

I understand that blacksmithing is an inherently dangerous activity that involves certain risks and dangers. I acknowledge and understand that those risks include the potential for bodily injury.

Nevertheless, in full knowledge and understanding of the above risks, hazards, or dangers, I freely, voluntarily and knowingly agree to assume those risks. By my signature below, I hereby agree to assume all responsibility for myself and my property and hereby release and discharge Northwest Blacksmith Association, NWBA; its members, employees, representatives, associates, independent contractors, and board from any and all claims, demands, damages, expenses, and any other liability for injuries or damages of any description which may occur as a result of my participation in this organization as a member. This Release shall be legally binding on heirs, my assigns, successors, estate, legal guardians, executors and me.

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Advertising in the Hot Iron News

A publication of Northwest Blacksmith Association

ADVERTISING POLICY

We are now accepting ads for publication in the Hot Iron News for the upcoming Spring 2021 Issues. See below for the pertinent information. ***Advertising space is very limited in each issue and is available on a first come first serve basis***

UPCOMING ADVERTISING SUBMISSION DEADLINES:

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Ph: 360.293.8257
W: thornemetals.com
Current classes are listed at <http://learnblacksmithing.com>

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McMinnville, OR 97128
Located South of McMinnville on Highway 18 at the intersection of Durham Lane
Ph: 503.472.2842
E: Events@YamhillCountyHistory.org
W: <https://www.yamhillcountyhistory.org/yamhill-valley-heritage-center>

If you would like to list your blacksmith school here, please send your information to nwbainfo@gmail.com.

Editor's note: As a 501(c)3 non-profit organization there are limitations to how we are allowed promote our members' businesses. The listings will now include contact information and one descriptive sentence for your school, a policy subject to change.

To publicize your class you may send your event listing to the editor for inclusion in our online calendar. A short paragraph about the class and time, location, and fee information only please. Please send information about your events, school and class listings to nwbainfo@gmail.com.

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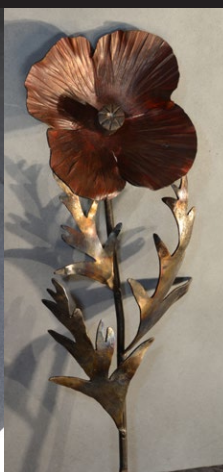
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