

Saltfork Craftsmen Artist-Blacksmith Association

August 2013



It's T-Shirt design time...

Get you designing caps on and start coming up with ideas for the 17th annual Saltfork Craftsmen conference t-shirts. The dates are Oct 19-20 2013 at Perry Okla.

We have used the "Flames on the Plains" theme for the past several years and I personally would like to see some new ideas. Deadline for submissions will be August 19th. This is so they can be discussed and one chosen during the board of directors meeting.

There is no limit to how many ideas you submit but they do need to be submitted on 8x10 size paper. You do not have to be an artist just be able to draw good enough to get your idea across.

If you are good with a computer, there are a lot of clip-art designs out there that are in the public domain that you can use along with a nice font and a little creativity.

Send you submissions to the Saltfork Craftsman Editor:

Diana Davis
23966 NE Wolf Rd
Fletcher, Ok 73541

Or email as an attachment to:
diana.copperrose@gmail.com

Must be received (by the editor) NO later than August 19th to be considered.

*To Date I have received only ONE design.
Come on people surly there is more than
one creative person out there. Get them in
the mail or email them to me before Au-
gust 19th. I have extended the deadline by
one week to help you procrastinators.*

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Editors ramblings....

The rain the past couple of weeks has been a blessing. It will help with the fire danger that we experience each summer.

In getting ready for the State Fair and the Annual Conference we have come up with some unfortunate situations.

Hotel rooms during the conference are going to be had to get. It seems we have once again competing with a home coming game and oil field workers claiming most of the rooms in the Perry area. The board did block some rooms but they are going fast. So if you know that you are going to attend check with the Super 8 and make sure you tell them you are with Saltfork. There maybe still a room left. It will still be possible to camp out at the fair grounds if that is an option that you would consider.

The State Fair has lost one of its Hotel sponsors and is having trouble providing rooms for some of their invited groups. I have been asked to make sure that if we request a room we can fill it on every night of the fair. So far I only need the room for Friday and Saturday nights the first weekend and Saturday night the last weekend. Unless someone from out of town signs up to work the fair and needs the room in the next week I will tell the fair board these days and hope they can get us a room. I am also having trouble getting people to let me know if they want to work or not. The week of 16th –20th needs one more worker for every day and two more on Thursday and Friday. I plan to work some of the days that week but would prefer if some other members step up and take a day or two. I am trying to get another Lady Blacksmith to come and work with me on Opening day and have it a Lady Blacksmith only day. Teresa Gabrish has agreed to take a day off and do copper fold forming and bowl making as part of her demonstrations. If there are any other Lady Smiths out there that want to help show the public that Smithing is not just for men, get in contact with me. Thanks...Editor

Diana Davis

The Saltfork Craftsmen Artist-Blacksmith Association, a non-profit organization of amateur and professional artist and craftsmen, publishes this newsletter monthly. Our purposes are the sharing of knowledge, education and to promote a more general appreciation of the fine craftsmanship everywhere. We are a chapter of the Artist-Blacksmith Association of North America.

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Visit our Saltfork Craftsmen Website:
www.saltforkcraftsmen.org

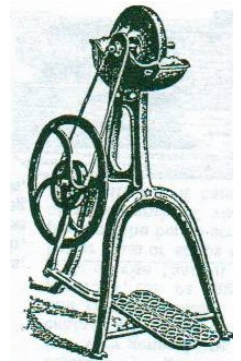
August Presidents notes....

Hey folks! The state fair is closing in on us and we need people to fill our booth. I've been told that if we can't fill the Free guest motel room EVERY NIGHT that we can't have it at all! So if you're planning to make use of it, we need to know pronto! Don't know what to tell the folks that wait till the last minute, then want a room. It will probably be just too bad. If you haven't demonstrated there before, I think you should give it a try. Don't be bashful. I am always a bit nervous about being in front of people while hammering. My palms sweat on the way and I worry that I won't even be able to get the fire lit! But once I start, that all goes away and my adrenalin kicks in. I always have a blast and usually don't want to quit when I'm supposed to! Please at least give it a try.

The club is trying to get coal replenished at Douglas and some at my place so everyone should be able to get coal a little easier.

Hope everyone has been enjoying the summer. I've been trying to actually plant grass. Always before I've wondered why anyone would plant and fertilize that stuff. (seemed like a good way to wear out a perfectly good lawnmower!) Anyway it sure grows good everywhere except the washouts where I want it to . I'll close by once more asking folks to please sign up for the fair. Get in touch with Diana or me and we will all have a good time!

Thanks! Byron



Upcoming 5th Saturday workshops...'

August 31 2013 at the Route 66 Museum

Hammer Class

Teachers—Don Garner and Mandell Greteman

Limit 6 students

Cost of class is \$50.00 (Lunch and Materials –hammer blank provided)

Please Contact Gary Seigrist at (580)243-8228 between 6pm and 8pm only Please)

November 30th 2013 at the Route 66 Museum

Intermediate Blacksmith Class

Teachers– Don Garner, Mandell Greteman and Dorvan Ivey

Limit 10 people

Cost of class is \$35.00 (Lunch and Materials provided)

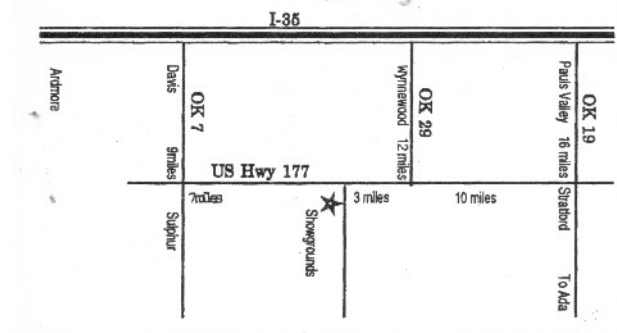
Please contact Gary Seigrist at (580) 243-8228 between 6pm and 8pm only Please.

August meetings...

- SE Regional meeting (Aug 3rd) will be hosted by Eddie Horton at Ft. Towson Historic Site. The trade items is a campfire tool. Lunch will be provided by Mr. Wallace who will be doing Dutch Oven cooking.
- NE Regional meeting is Open.
- SC Regional meeting (Aug. 17th) will be hosted by Richard Simpson at his home at 19046 County Line Ave. Blanchard Okla. The trade items is a campfire tool. Lunch is provided so bring a side dish.
- NW Regional meeting (Aug. 24th) will be hosted by Cheryl Overstreet at the Route 66 Blacksmith shop/Museum in Elk City. (2717 W. 3rd St) The trade items is something made from copper. Lunch is provided so bring a side dish. *There is also a Board of Directors meeting after lunch so if you have anything to bring before the board please call or email Dan Cowart to get put on the agenda.*

September meetings....

- ◇ SE Regional meeting , (September 7th) (Open)
- ◇ NE Regional meeting (September 14th) Is being hosted by James Mayberry. He has decided to hold it in conjunction with the Rogers County Fair and will be at the Claremore Expo at 400 S Veterans Pkwy, Claremore, Ok. Directions: From Hwy 66; turn west on Will Rogers Blvd and go through 3 stop lights. Take Hwy 20 west and the Expo and Rec. Center are on the left. Look for us on the lawn in front of the Expo. Due to the change in location and the amount of Fair food available Lunch will probably be on your own. (James didn't tell me this for sure). The trade item is undecided.
- ◇ SC Regional meeting (September 21st) is hosted by Jim Dyer and being held in conjunction with the Murry County Antique tractor Show in Sulphur Okla. (see map) Lunch is being provided and there is a Exhibitor Dinner at 5pm. No trade item.
- ◇ NW Regional meeting (September 28th) Is being hosted by Dorvan Ivy at the Route 66 Museum and Blacksmith shop In Elk City. Lunch is provided but bring a Side dish. The Trade item is a fork with a Leaf on the end.
Directions: Museum complex is located on The West side of Elk city on 3rd Street.



October Regional meeting....

- ⇒ SE Regional meeting (October 5th) (Open)
- ⇒ NE Regional meeting (October 12th) hosted by Ed McCormack at 15100 N. 270 Rd Okmulgee, Okla. Lunch provided, bring a side dish. Trade item a knife.
- ⇒ SC regional meeting (October 19th-20th) Annual SCABA conference. Perry Okla.
- ⇒ NW Regional meeting (October 26th) hosted by Don Garner at home in Thomas Okla. Lunch provided, bring a side dish to help out. Trade item is a cooking tool. Directions: hwy 33 west side of Thomas. 2 north 3/4 west on county road 860. white house on North side of road.



Basic Blacksmithing Workshop

Saltfork sponsored a Basic Blacksmithing Workshop for some of its newer members (two brand new) on June 29, 2013. The class had seven smiths. We had five forges going.

The workshop was held at T-Town Metal Men Metal Work shop in Tulsa as guests of Bill Kendall. Things got kicked off at 9AM. **Special thanks to Bill for allowing us the use of his facility.**

Tracy Cowart was the instructor with help from Danny Cowart. We started out talking about safety and then we went over some basic tools and terms. Once the initial talking was over with, we got to work on S-hooks. Tracy demonstrated and then put everyone to work. Some of the students were a little more experienced and the “old hands” helped the newer smiths get several hooks forged. A lot of time was spent on fire maintenance and getting familiar with different hammer blows.

As everyone got warmed up Tracy demonstrated leaves. We forged a basic leaf on the end of a piece of 5/16” round stock, veined it, and then forged out the stem into a key fob. Some of the students made several fobs, some only got through one. As with any class, there was a variety of experience and skill levels and, since it’s not a race for production, everyone was allowed to move at their own pace.

After the key fobs were complete, it was time to go and get lunch. Bill Kendall picked up some Pizza from Cici’s and everyone cooled down a bit in the shade. After lunch, we jumped into tool making. We talked about some of the different kinds of tool steels that smiths are likely to use. We also talked about the basics (and why’s and why - nots) of heat treatment. Then it was back to the forges to try our hands at forging a hot cut chisel. Dan Cowart forged a demo piece and then turned the students loose to forge their own chisel. This “stiffness” and overall forging difficulty of the tool steel was an eye - opener to all of the students who had spent all morning forging mild steel. Everyone got their chisel hardened and tempered to a dark straw, and all tested out very well. Everyone was very proud to have completed the Chisel. By then, it was time for a break and another question and answer session. The heat was taking its toll and we decided to wind down for the day.

As always it was a fine day to smith and we all learned a bit and had a good time with people that share an



equal desire. Never a bad thing!!

SC Regional meeting...

The July meeting for the SC region of Saltfork was hosted by Bill and Diana Davis at our home west of Rush Springs Okla.. There was a good turnout for as hot as it has been with between 30 and 35 coming out to enjoy the day under the shade trees in our yard. With the heat there were only a few forges going. Ron Lehenbauer brought his small bellow forge (I wanted to take a better look at it) and a rivet forge that was set up under the trees. Bill had his coal forge and at one time the propane forge going at the same time inside the shop. Teresa Gabrish came down with some of her jewelry and Shirley McKelvin asked her to show her how to do loom beading. When Shirley left she had completed one earring, now she has to make a second one to match. Shirley also got a quick lesson on making a T-Shirt quilt. It was a day for the ladies to stay inside the Buggy barn under the cool breeze of the swamp coolers that we had going.

Lunch was a simple one of hot dogs along with whatever fixing the rest of the group brought. We had a nice selection of summer time treats like watermelon, cantaloupe and Cole slaw and deserts were pecan pie, pineapple pie and cake and brownies. To say we had plenty to eat is an understatement.



In the blacksmith shop Bill was showing how to make a tomahawk from a horseshoe rasp. He also gave a new member some help with forge welding. I didn't get to see all of them but they told me we had a nice selection of trade items.

Ricky Vardell came by the weekend before and was showing us the beautiful knife and cross that he had made from some wrought iron. Him and Bill went out back and came back with some square stock that they worked on and here are some pictures of one of the crosses they made. The crosses were soaked in acid over night to bring out the wood look grain that the wrought iron has. By looking at the difference in the knife he had made and the two crosses you could tell how refined each of the samples were. The horse shoe (knife), was the least refined. The wagon rim (used for a cross) was next with the square stock that had come from a bridge was the most refined. The wood like grain getting tighter the more refined the metal.

These pictures are from the bridge iron. You will have to come to Ricky Vardell's meeting in December to see the other samples unless he brings them to the conference.

Sorry for the lack of pictures but I only came up for air a few times and kept forgetting to grab the camera.



Thanks for coming...Diana

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Johathan	Denton	141 Dolton lane	Mustang	Ok	73064	salcedawgg@gmail.com	405-323-3743
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Rutledge	Levi	Summerfield 8	Woodward	OK	73801		580-256-8512
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Stubbs	Jim	650 72nd Ave. SE	Norman	OK	73026	blacksmithingone@gmail.com	405-209-3329
Sutterfield	Brett	11209 SE 59th	Oklahoma city	OK	73150	suttfim@sbcglobal.net	405-733-1382
Sypher	Dustin	615 Welton	Pratt	Ks	67124	tailgrassforge@yahoo.com	620-388-8672
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Taylor	Kenneth	1715 W. Chambers Rd	McAlester	Ok	74501		918-423-5001
Tedlock	Jeff	14741 Cedar Rd	Henryetta	Ok	74437		918-650-5668
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Willenberg	Bruce	12250 Nelson Ln.	Norman	Ok	73026	brsk@netzero.net	405-227-4547
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Zickrick	Fred	926 W. Morton St.	Denison	Tx	75020	fredz72@cableone.net	903-465-5937

2013 tool box list



Item

Donated By:

- | | |
|---|------------------|
| 1. Box | Charles McDevitt |
| 2. Cross Peen hammer | Gary Seigrist |
| 3. Straight peen hammer | |
| 4. Rounding hammer | |
| 5. Wooden mallet | |
| 6. Handled slot punch 1/2 | |
| 7. Handled slot punch 3/4 | |
| 8. Handled slot punch | |
| 9. Hot rasp | Gerald Brostek |
| 10. Tongs | |
| 11. 1/4 bolt | |
| 12. 3/8 bolt | |
| 13. 1/4 V bit | |
| 14. 3/8 V bit | |
| 15. 1/2 V bit | |
| 16. 3/4 V bit | |
| 17. 1/4 flat | |
| 18. 3/8 flat | |
| 19. 1/2 flat | |
| 20. 3/4 flat | |
| 21. Farrier's tongs | |
| 22. Scrolling tongs | |
| 23. Side grip tongs | |
| 24. Pick-up tongs | |
| 25. Fire Tools (shovel, rake, poker) | |
| 26. Hot Cut Hardy | |
| 27. Twisting wrench | |
| 28. Treadle/Hand Hammer Tooling | |
| 29. Set of punches and holder | |
| 30. Center punch | |
| 31. Eye punches | Gerald Franklin |
| 32. Chisel (large) | |
| 33. Chisel (small) | |
| 34. Slitting Chisel | |
| 35. Hold down | |
| 36. Flat wire brush with handle | Terry Jenkins |
| 37. Set of monkey tools | |
| 38. Rivet setting tool | |
| 39. Hacksaw | |
| 40. Bolter plate | |
| 41. Square | |
| 42. Dividers/compass | |
| 43. Scribe | |
| 44. Bending forks | Jim Carothers |
| 45. Spring swage/fuller | |
| 46. Flux spoon | Jim Carothers |
| 47. Flux | Jim Carothers |
| 48. Metal folding ruler | |
| 49. Soapstone and holder | Gerald Brostek |
| 50. Ball tool (round blunt nose punch) | |
| 51. Hook ruler | |
| 52. Finish wax | |
| 53. Brass brush/steel brush | Diana Davis |

Remember, if you have tools for the toolbox they need to be gotten to Mandell Greteman. His contact information is in the Board of Directors section in the front of the newsletter.

Inside Dimensions of tool box: 25 1/2 x 7 1/4

Forge Welding

By Dan Nauman

Illustrations by Tom Latané

Photos by Dan Nauman

Lesson Number 10- Forge Welding

Definition:

Fusing two or more bars together by bringing them to a high heat in a forge, and applying pressure to the area being fused by hammer blows.

Lesson: Upsetting, scarfing (see *Definitions, below), and forge welding the ends of two bars of equal size together to make one bar.

Intent: The smith will learn the technique of welding two bars of equal size together, accurately maintaining the original stock size and shape after welding.

Materials: Two 15" bars of 1/2" square mild steel.

Tools needed: Basic tools include standard cross peen hammer and anvil. Flux (see *Definitions, below), either borax or EZ Weld. Calipers and a square can be used to evaluate your work.

Method:

Forge welding is used in several circumstances: to produce a smooth transition of adjoining elements; to secure several elements into a bundle (i.e. leaves, grapes, acorns, basket twist); to join a bundle to another element; to close the ends of a single bar shaped in a ring, oval, or rectangular shape (as in a frame); to join mild steel to high carbon steel (as in an ax bit); or to laminate several bars together to form a billet (as in Damascus laminate).



A forge welded sample from Cyril Colnik

Definitions:

1.) **Scarf** (scarfing): Preparation or preparing a portion, often the end of a bar for welding by tapering to a thin edge which can be blended into the mating material.

2.) **Flux:** The product applied to the areas to be fused to reduce oxidation, and lower the melting temperature of the scale. (Examples: borax, EZ weld, etc.)

3.) **Clinker:** The hard, gritty, often glassy mass that congeals in the bottom of the fire-pit.

4.) **Coke:** Soft coal that has had the bulk of its impurities burned out. Coke's appearance is puffy. As good quality soft coal burns, it expands and congeals to the neighboring coal nugget forming a larger mass. Almost entirely carbon in its makeup.

Note: Just as there are different approaches to other aspects of forging, the same is true for forge welding. It cannot be said that any one way is best, as there are many experienced smiths who produce consistently sound welds in a different manner than explained here. Different scarf forms, different fluxes, and several other aspects of forge welding can be learned and utilized. To introduce these differences in this lesson would prove confusing to the student. Thus, this lesson will concentrate on the method taught to me in the 1970's. Differences aside, the fundamentals usually prove to be similar or identical.

In all cases, a high heat is needed at the point of fusion to successfully weld the bars together. The color of the bars should be yellow to yellow/white when removed from the fire. The only exception to this would be when welding high carbon steel to mild steel. A lower heat of orange/yellow should be the highest heat applied so as not to burn the carbon out of the carbon steel.

The gray scale that forms on a bar when heated is the enemy of the forge weld. The bars will not fuse properly when scale is present. Scale forms on the outside of the bar in the presence of oxygen. Flux forms a barrier around the areas to be fused, protecting it from oxidation. It is applied to the bars at an orange heat. Flux is not glue, or a bonding agent, rather it lowers the melting temperature of this scale, and prevents more scale from forming while heating in the fire. Some smiths theorize that to

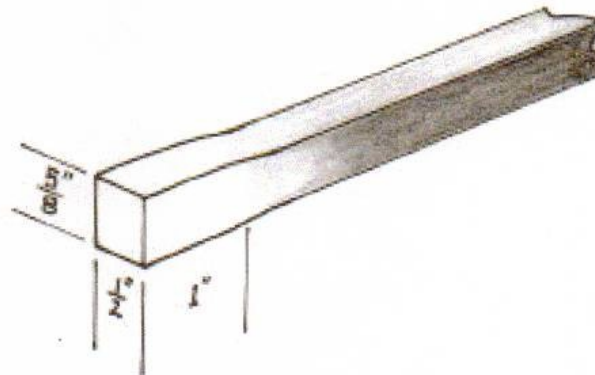


Figure 1: Upset end preparation

ome degree flux also raises the burning temperature of the metal.

Another important aspect of welding is to be absolutely sure you have a "clean," domed fire. A clean fire is free of a clinker in the fire-pit, and has no fresh coal burning in the center of the fire. A good welding fire also has an abundance of coke domed and banked in the fire-pit. Should the fire "hollow out" while heating the bars, only coke should be added to the fire to replenish the fuel. Fresh coal cools the fire, and also introduces impurities naturally found in coal. These impurities are largely burned out as the coal becomes coke.

When taking a welding heat, a good deep fire with the bar in the center of the fire under a good two or so inches of coke will reduce (but not eliminate) the amount of scale which forms on the bar during heating.

Step One—Preparing the scarf:

Taking a short high (yellow) heat on the last 1" of the bar. Then upset about 1" of the end of the bar so that the bar measures at least 9/16" square. (See previous lesson Number 7) Next, forge one dimension back to 1/2" producing a cross section measuring 1/2" x 5/8".

Step Two:

Take another yellow heat on the end of the bar, again on the last 1" of the bar, place the end of the bar (with the 5/8" sides vertical) squarely on the anvil's face with the end of the bar 1/4" from the inside edge of the anvil. The edge of the anvil should be somewhat sharp for this step. Hitting straight down with the hammer's face halfway above the anvil face and halfway beyond the anvil face (Figure 2, photo), reduce the cross section to about 1/2 the thickness of the material, in this case to 5/16".

Tip: In order to create a clean shoulder in this operation, put a slight downward pressure on the bar so the bar stays where you put it. Then after the first or second blow add a slight forward pressure to keep the bar from "stepping" off the anvil.

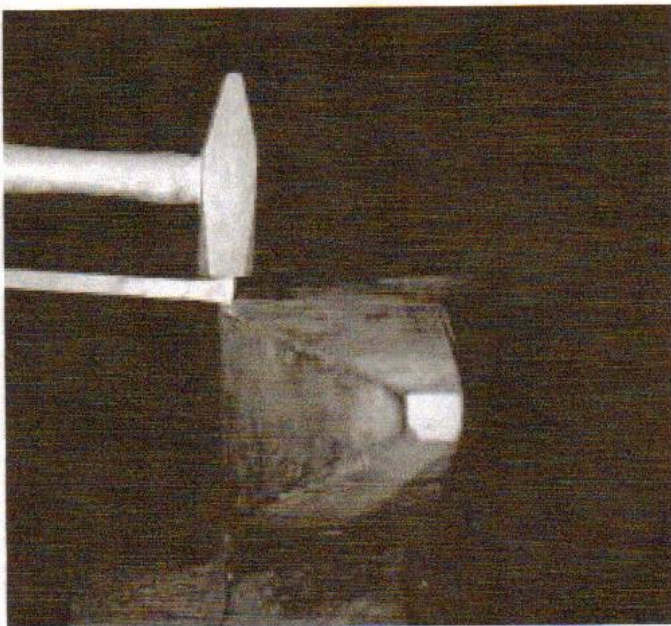


Figure 2: A half-face blow

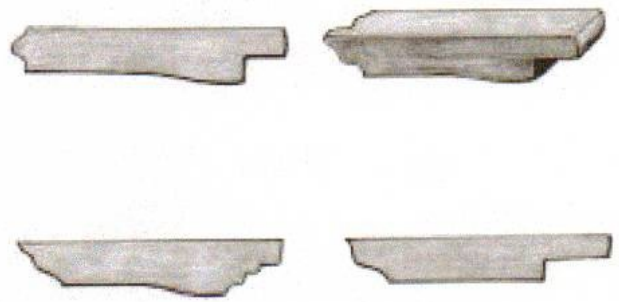


Figure 3: Above, correct. Below, incorrect. Left—initial shoulder backed off anvil too soon. Right—no upset remains for scarf to be laid upon during weld.

Step Three:

The forging dynamics of the material will cause the area of the bar on top of the anvil to slightly spread wider than desired. In the same heat from step two, turn the bar 90 degrees, and forge this area back down to 1/2" in thickness.

Step Four:

Take another yellow heat on the last inch of the bar. Place the shoulder produced on a sharp edge of the anvil, pressing the shoulder squarely against the side of the anvil. The hand the bar is holding should be lowered slightly so the face of the scarf is off the anvil face. (Figure 4, photo). Move the hand holding the bar to the left of square, and take a blow. Moving the bar back and forth at a 90 degree angle (right to left), and using each step produced by the previous blow to brace against the side of the anvil, slowly step the bar off the anvil. (Figure 5, photos). In this same process, the profile of the bar should be drawn out to a flat point. (Figure 6, photo). If done correctly, the face of the scarf should have steps as shown in the figure 7 below. When the scarf



Figure 4

CONTROLLED HAND FORGING

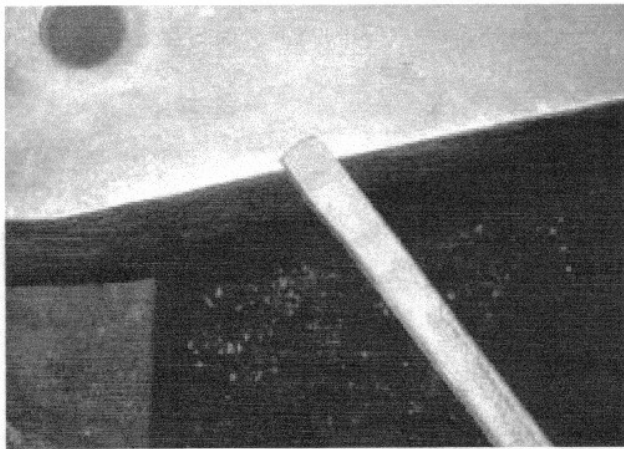


Figure 5

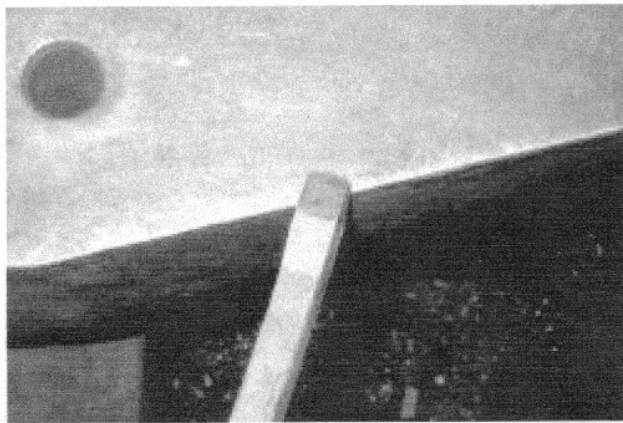


Figure 6

is drawn out, forge a slight curve at the end of the scarf. (Figure 7) You should be able to do all of step four in one heat.

Notes on scarves:

The reason for the curve at the end of the scarf is simple. The anvil acts as a heat sink when hot metal is applied to it. If the end of the scarf is not off the anvil when welding, it might cool too rapidly, and the weld will not be properly fused in this area. The curve keeps the thin edge of the scarf off the anvil before the first blow, retaining the heat longer to produce a sound weld.

The thin tapered edge of the scarf is formed to produce a smooth weld joint. A scarf with a thick edge will produce a weld with a very visible seam (Drawing, figure 8).

Step Five:

Repeat steps One through Four on the second bar.

Step Six: Fluxing the scarves.

SAFETY! - Some fluxes may emit noxious fumes when heated. Make sure your forge and building are vented properly.

Reduce the air blast in the fire if you have an electric blower. If you are manually applying the air blast, reduce the force of the blast to more of a whisper. This will reduce the chances of burn-

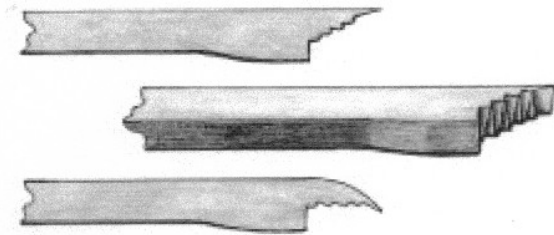


Figure 7: Top- shouldered and stepped scarf. Bottom- Curved tip. Shoulder prevents scarf from overlapping beyond upset area when scarfs are quickly placed together.

ing the scarves while fluxing by reducing the available oxygen in the fire.

Making sure you have a clean and deep fire, place the scarves into the center of the fire, face up. If the bars are not covered with coke, cover them. When the bars reach a bright orange, with the bars remaining in the fire, take your fire rake make a hole in the fire over the scarves so flux may be sprinkled on the face of the scarves. With a small spoon with a long handle (so you do not burn your hand), apply enough flux with to cover the scarf, as well as beyond the scarf where the other scarf will join. (Figure 9, drawing). Cover the bars once again with coke. When you are finished fluxing the scarves, position them so they are facing down in the fire.

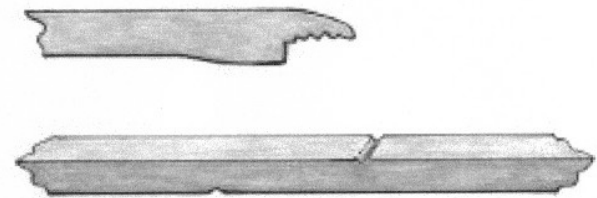


Figure 8: Blunt scarf makes seam difficult to blend

Notes:

One of the biggest mistakes beginners make in welding is not applying the flux back far enough on the bar where the bars will be fused.

Some smiths prefer to flux all sides of the scarves, while others simply apply flux to the scarf faces. The theory behind fluxing all sides of the bar is to insure that all surfaces are free from scale, as well as to increase the burning temperature of the bar. The bar can and will burn if allowed to get to a full sparkling white heat, at which point the flux will also burn off. The bars likely will not weld at this high temperature. Also, the molecular structure of the material will break down, creating a weaker joint, and often an unsightly weld.

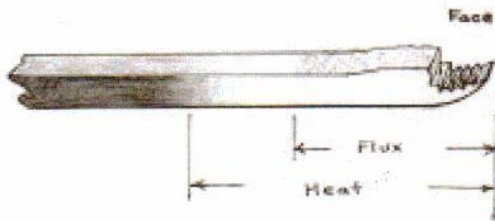


Figure 9: Fluxed face heated from below.

If you choose to flux all sides of the scarves, turn the bar 90 degrees only after you are certain the flux has adhered to the scarf surface. You will know when this happens, as the flux will be the same color as the bar. If one bar gets hotter than the other, move it to the side of the fire where the fire is cooler, or reduce the air blast further.

Fluxing the scarves in the fire keeps them hot, and reduces the amount of scale formed, therefore shortening the time it takes to produce the weld. Removing the bars from the fire to flux the scarves is not necessarily wrong, as many smiths prefer this procedure, and do so successfully. Sometimes, fluxing in the fire is virtually impossible (i.e. welding a wagon wheel tire.) In these cases, removing the bar from the fire is necessary.

Always keep coke on top of the bars when not in the act of fluxing.

Tip: Rub soapstone or chalk on the face side of the bar to indicate direction of the scarf face when pulling the bars from the fire.

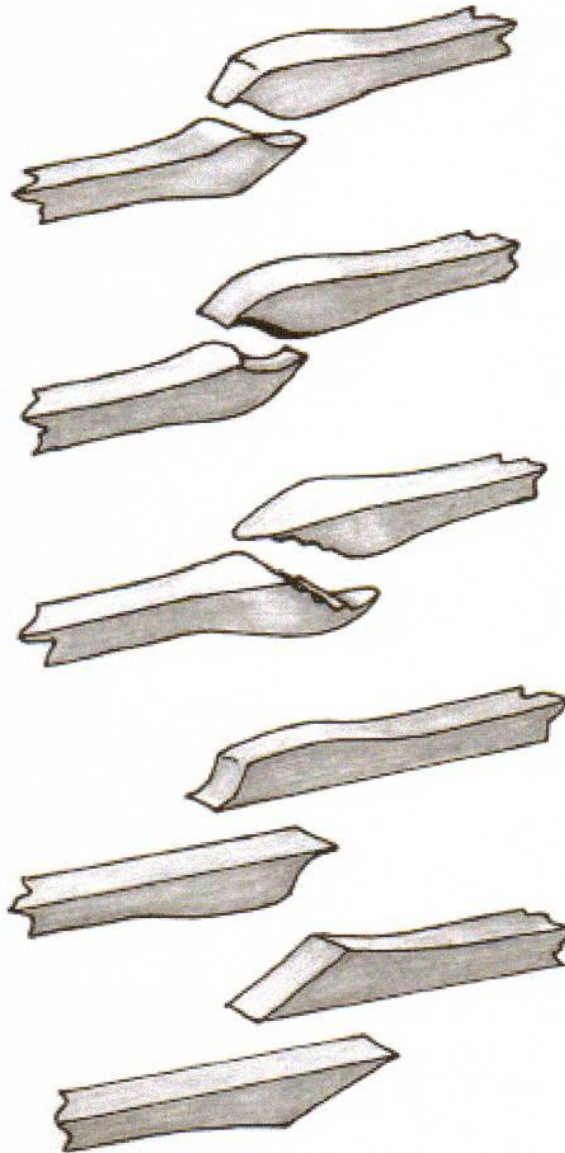
Step Seven: Welding the bars

Have your hammer at the anvil in a position to grab it quickly. The scarves are at a welding heat when they are at a yellow-white appearance in color (Often referred to as a "welding heat.") Make sure the scarves are heated well beyond the shoulder where the mating bar will join. Some smiths wait to see just a few sparks coming from the fire, indicating the piece is just starting to burn. This is not necessary, and can lead to burning the tips off of the scarves.

Tip: If you are not sure if the pieces are at a welding heat, gently



Figure 10



Some other forms of bar end scarfs. The 90° shoulder on the scarf described in the text will aid in quick alignment of bars to be welded, preventing overlap beyond upset material.

touch the pieces together in the fire. If they want to stick, almost like a magnet, they are probably ready to weld. With experience, this touching in the fire will not be necessary.

SAFETY: When welding, molten sparks fly from the bars which can burn others, as well as you. Alert others in the area when performing a weld, and make sure other items in the shop that are flammable are protected from the sparks. Some smiths wear a protective leather apron when welding to prevent their clothes from burning. You and anyone else present should be wearing eye protection with side shields at all times. After welding, be aware of the possibility of fire caused from stray sparks in the surrounding area i.e. shop rags, charcoal, dry wood, etc. These items and others ignite easily from molten metal

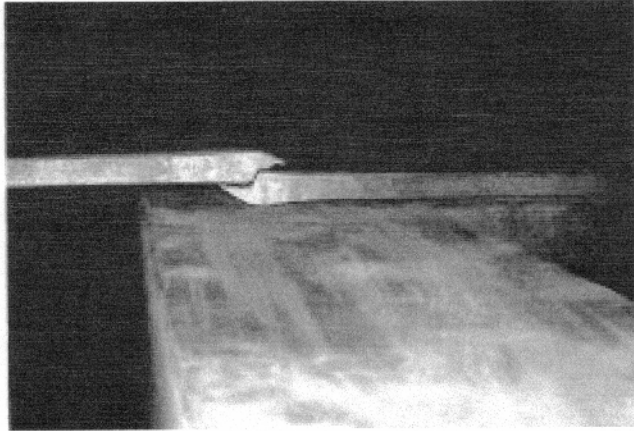


Figure 11

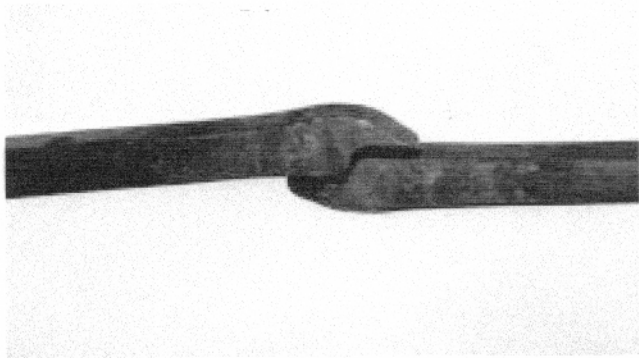


Figure 12

and flux spattered from the forge welding process.

Bring the pieces out of the fire, rotating one piece 180 degrees so that the scarf is facing up. Place the bar with the face up on the center of the face of the anvil, coming in from the far side of the anvil. (This bar should be in your hammer hand.) Place the other bar on the near edge of the anvil, with the scarf off the face, pointing up at about a 45 degree angle. (Figure 10, photo). In a hinging fashion, lower the scarf down onto the opposing scarf, keeping contact with the edge of the anvil to control the accuracy of the placement of the scarf (Figure 11, photo) and press down on the opposing scarf. The heels of the scarves should be placed together as shown. (Figure 12, photo). Press down hard enough so you can release the bar in your hammer hand.

Release the bar in your hammer hand, grab the hammer, and strike firmly in the center of the joint. Forge the entire joint rapidly with six or seven blows. Make sure you forge the thin tip of the scarf as it will cool rapidly. Next, flip the now welded bar 180 degrees to forge the opposite side. Hit six or seven blows on the entire joint and then turn the bar 90 degrees and repeat five or six more blows on the joint. Flip the bar 180 degrees and hit the joint once again five or six blows. Repeat as necessary, never forging colder than a medium orange heat.

Note: Dark spots on the joint indicate cooling of the material and will not weld there. This may be caused by too low of a

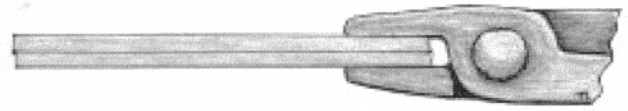


Figure 13: Bars for practice weld— no alignment of scarfs.

heat, or inadequate fluxing. These areas must be fluxed again, returned to a welding heat, and forged to fuse the joint.

While welding, keep in mind that you do not want to forge the cross section of the joint down beyond the parent stock size. Also, be careful not to forge beyond the joint as this will reduce the cross section of the bar beyond the parent stock size.

With a properly executed weld there will not be any "dark spots" or evidence of a scarf. If there is evidence that the weld is not complete, flux the open seams of the joint, and take another welding heat. Remove the bar from the fire, and forge down carefully, so as not to greatly reduce the cross section of the bar beyond the parent stock size.

Note: Timing is important. If you take too much time getting the pieces from the fire to the anvil, you may lose too much heat to weld the bars together. To increase your proficiency, you may want to take a few "practice runs" by removing the bars while cold from the fire pit positioning them on the anvil as described in Step Seven. Do this until you are comfortable with the procedure. You will then be able to release the bar from your hammer hand and grasp the hammer without the bar falling to the ground.

Tips

-Some fluxes, such as EZ Weld brand, are very aggressive and may adhere to the metal after the weld has been completed. To remove it, take another welding heat, remove the bar from the fire, and scrub vigorously with a stiff wire brush. Flux is harder than a file, so do not try to file the flux off, as it can ruin your file.

-A lighter hammer of 1 1/2 to 2 pounds may work better than a larger hammer. With a lighter hammer, the hammer can be swung faster, and more accurately. Also, the chance of forging

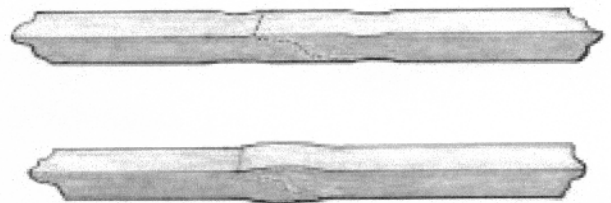


Figure 14: Top— thin areas due to loss of material from burning, too little upset, or over-hammering, must be upset. Bottom— remaining bulge must be drawn down to dimension.

down beyond parent stock size is reduced with a smaller hammer, as you will not have the heavier force of the larger hammer.

-You may want to first practice a more simple weld to get used to the properties of forge welding. The faggot weld is a simple, crude weld which has no end preparation (no scarves.) Try bending a 3/16" x 3/4" piece in half and weld the last 3/4" of the end of the bars together. (Figure 13, drawing). Be extra careful when performing this type of weld, because the larger surface area causes more molten flux and sparks to fly from the joint.

Step Eight: Refining the weld (If necessary)

If the cross section of the joint is still larger than the parent stock size, place the bar back in the fire and bring the joint to a welding heat. Remove the bar from the fire, and carefully forge the joint back down to the parent stock size.

Potential problems and solutions:

If the weld is properly executed, the joint is invisible, the bar has no bulges or "necked in" spots, and has sharp 90 degree corners. (Figure 14, See drawing of bulge and necked in spots). To refine the bulge, proceed as described in Step Eight.

If the bar is necked in it will be more difficult to fix. The portion of the bar where it is necked in is taken to a welding heat, and then upset (refer to Lesson Seven) back to the parent stock size. A poorly executed weld will begin to come apart or fail entirely in the upsetting process.

If a parallelogram was formed at the joint, first upset the joint, then take another heat and forge down the acute angles slightly. (As explained in Lesson One.) Then carefully reduce to the parent stock size.

Targets.

- The scarf is produced in one heat.
- The weld is completed in one to two heats, and the joint returned to the parent stock size.
- The joint is to be square in section with sharp corners, no necked in areas, and no bulges. You can check your accuracy with a pair of calipers. Check for squareness with a steel square.
- The welded bar is to be straight, have no twist, be free of flux residue and the bar should have no visual evidence of a seam.



More examples of forge welding from Cyril Colnik

Teaching Tapes

NC Tool

2013 Meeting schedule

SE Region (1st Sat)

Jan..open
 Feb..Eddie Horton
 March..Bill Phillips
 April.. **Open**
 May..Eddie Horton

June..open
 July..open
 Aug..Eddie Horton
 Sept. **Open**
 Oct. **Open**
 Nov. Bill Phillips
 Dec. **Open**

NE Region (2nd Sat)

Jan..open
 Feb..Bill Kendall
 March..Doug Redden
 April..Ed McCormach
 May..Omar Reed/Gerald
 Brostek

June..Mike Krudoski
 July..Chuck Waite
 Aug. **open**
 Sept. James Maybery
 Oct. Ed McCormack
 Nov. **open**
 Dec. **open**

SC Region (3rd Sat)

Jan. Gerald Franklin
 Feb..Byron Doner
 March..Bob McKelvin
 April..State picnic
 May..Heather Morefield

June..Larry Mills
 July.. Bill Davis
 Aug..Richard Simpson
 Sept. Jim Dyer
 Oct. SCABA Conference
 Nov. Bob McKelvin
 Dec. Ricky Vardell

NW Region (4th Sat)

Jan..open
 Feb..Bob Kennemar
 March..Bob Rea
 April.. Don Garner-
 May..Gary seigris

June..Mandell Greteman
 July..Roy Bell
 Aug. Cheryl Overstreet
 Sept. Dorvan Ivey
 Oct. Don Garner
 Nov. Mandell Greteman
 Dec. **open**

Saltfork Craftsman Regional Meeting Hosting Form

Region _____ SE _____ NE _____ S/C _____ NW

Date: Month _____ day _____ [correct Saturday for region selected above]

Name _____

Address _____

Phone/email _____

Trade item _____

Lunch provided _____ yes _____ no

Directions or provide a map to the meeting location along with this form.

****All meeting are scheduled on a first come basis. Completely filled out form MUST be received by editor no later than the 23rd of the month TWO months PRIOR to the meeting month.**

Completed forms can be mailed or emailed.

You will receive a conformation by email or postcard.

A form must be filled out for each meeting.

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NW Region coal pile is located in Douglas, OK. If you make arrangements well in advance, Tom Nelson can load your truck or trailer with his skid steer loader for a fee of \$10 to be paid directly to Tom. Tom has moved his skid steer and must now haul the loader to the coal pile to load you out, hence the \$10 charge. You may opt to load your own coal without using Tom's loader. The coal can be weighed out at the Douglas Coop Elevator scales. Contact Tom Nelson (580-862-7691) to make arrangements to pick up a load. Do not call Tom after 9 PM!! Bring your own containers and shovels. Payment for the coal (\$.07 per pound) should be made directly to the Saltfork Treasurer.

NE Region coal location: Charlie McGee has coal to sell. He lives in the Skiatook, Oklahoma area. His contact information is:

littleironworks@gmail.com or (home) 918-245-7279 or (cell) 918-639-8779



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