THE FORGE FIRE

The Newsletter of the Indiana Blacksmithing Association, Inc.

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

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

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

**If you would like an IBA membership application form,
please contact Farrel Wells, Membership Secretary
(765) 768-6235.**
BULK LOTS ARE AVAILABLE TO DEMONSTRATORS,
SHOPS, SHOWS AND OTHERS WILLING TO MAKE THEM AVAILABLE.
WE APPRECIATE YOUR HELP.

More nearby resources and organizations for blacksmiths:

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

IBA MEETING SCHEDULE	
Check the latest *Forge Fire* for monthly **IBA** revisions.	
July 16 2022	**COVERED BRIDGE BLACKSMITH GUILD**
Aug 12-13 2022	**SUTTON-TEROCK REGIONAL CONFERENCE**
Aug 20 2022	**SNAKE ROAD FORGE**
Sept 30-Oct 1	**BUNKUM VALLEY REGIONAL CONFERENCE**

Editors Message

Correction: The fall regional conference hosted by Bunkum Valley Metalsmiths will be held on **September 30 and October 1.** The announced date in the June Forge Fire was off by a week.

Indiana State Fair: Bill Corey is coordinating the IBA representation at the State Fair. If you are interested in demonstrating contact Bill at (317) 919-1047 or email at bc65925@yahoo.com.

This year's fair runs July 29—August 21. The fair is closed on Mondays and Tuesdays.

I believe previous rules apply regarding selling of wares: Anyone wishing to sell items at the fair must obtain a permit from the Fair Board.

Porter County Fair: Snake Road Forge is looking for demonstrators to support the Porter County Fair, July 21 – 30. This is a very large fair with about 150000 attendance. If you are interested in demonstrat-ing, contact Rod Marvel at (219) 241-0628

IBA Hammer Ins: We have scheduled state hammer ins for July (Covered Bridge) and August (Snake Road). The June hammer in at Jennings County had a low turn out with only local satellite group members attending. Hopefully we will see bigger turn outs for the remaining hammer ins.

Fred Oden and Sutton Terock
PRESENTS 2022 BLACKSMITH CONFERENCE
13 Aug at Fulton County museum, 37 E 375 N. Rochester Ind
Museum 574-223-4436, Mark Blosser 574-217-1276
12 Aug friday setup,13 Aug conference Saturday 9am-5pm
Food close and on site, Lunch and Dinner Saturday by museum
Iron in the Hat for IBA ,bring donations for auction
    Membership renewals, DEMONSTRATING
Robert Wolfe - Colonial Crafts
Omar Hershberger- Animals an Creatures
BEN Ganshorn- TBA
Mark Blosser- Induction Forge practicle applications

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

Dates to Remember

August 12/13
Regional Conference at Sutton-Terock

Sept 30—Oct 1
Regional Conference at Bunkum Valley

IBA Satellite Groups and News

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

2) **Jennings County Historical Society Blacksmith Shop**
   Meet: 2nd Saturday at 9 AM
   Contact: Ray Sease (812) 522-7722

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

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

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

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

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

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

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

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

11) **Covered Bridge Blacksmith Guild**
    Meet: 1st Saturday
    Contact: John Bennett (812) 877-7274
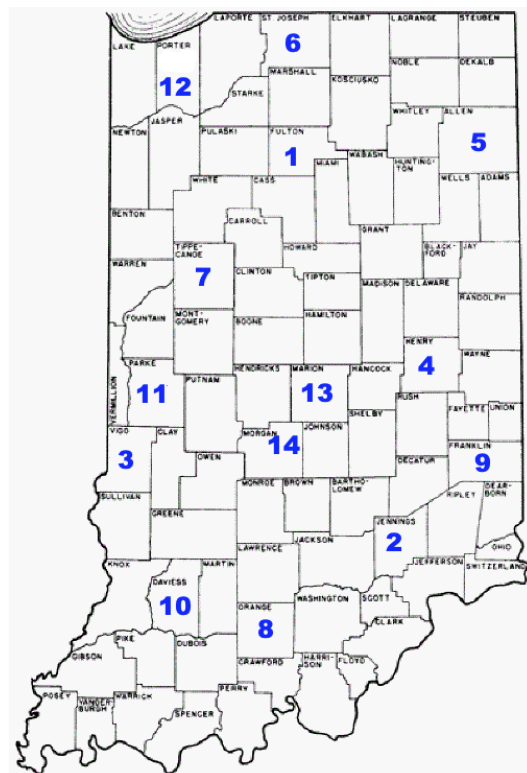
12) **Snake Road Forge**
    Meet: 1st Saturday
    Contact: Rod Marvel (219) 241-0628

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

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

Bunkum Valley Metalsmiths

The Bunkum Valley Metalsmiths met Saturday, July 2nd with about 25 in attendance. It was definitely a hot day which slowed down the metal bending. Plenty of food, iron in the hat and lots of idea exchanging. Our next meeting is Saturday August 6 if you are in the area please stop by.

Mark your calendars for the annual White River Valley Antique Show beginning Thursday September 8th and running through September 11th. More details are available on the website at https://wrvaa.org
Please plan to visit our blacksmith shop where demonstrations will be happening. It is always a great show and so much to see and do.

We will be hosting the Southern Blacksmithing Conference beginning Friday evening September 30 and the next day, Saturday October 1st. We will be providing more details as we work them out. Everyone is welcome to come and enjoy.

IBA Satellite Groups and News (continued)

Jennings County Historical Society Blacksmith Shop

The Jennings County Blacksmiths met on the 11th of June with Kevin Welsh leading the demos. Kevin started by making ringers for the triangles. Dave Good was testing the hardening ability of some steel he wished to make a tool of to be used under the power hammer. Bill Newman made a ladies hair pick from a piece of copper. Keven continued to make triangle ringers while Dave made a pair of calla lilies. We had 14 to sign in. Hope to se you July9th. Bring lots of iron in the hat and, you know the rest.   Paul Bray

August Hammer In will be hosted by Dave McNulty:
         7620N CR 400W, Scipio, IN 47273,
         ph: 812-592-0102

Meteorite Mashers

Hot today and a smaller gathering. Had to relocate from Jason Bowman's shop to Jeff Reinhardt's shop due to unforeseen circumstances.

Had 2 beginners come today, Jeff Reinhardt started the beginner's class and when Mike mills arrived he took over. Mike had to leave early so Jeff took back over. Both beginners left with a finished item and were quite happy. Stuart Mullins came from Ky and as usual took lots of photo's, not yet seen by this writer. Next meeting will be at Jason Bowman's shop in Elizabeth In.

February 2022   *Pittsburgh Area Artist – Blacksmiths Association*

It's a Better Fit By Glenn Horr
-A little tip for small rods in a large stand tubes. Allows a three point contact. Use what ever angle fits your stand or make an angle. Cut the angle and bend tabs so it will stay in the tube. See photos below.
FYI: If you are using square tubing, weld your threaded nut on the corner so you get the same three point contact. I find it holds better.

Spreading Flat Stock & Setting Down My 75% Worth.
Mark Aspery, Springville

Utterly preposterous, barely defensible, but at times, quite a handy thing to know.

With my disclaimers appearing above, let me add that this somewhat predicable result is within my sphere of operating experience only, and may not fit all situations.

As they say " Your mileage may vary depending on the driver and driving conditions."

Spreading

Empirically, I generally attain 75% of the width of material that theory says I should yield when spreading flat bar with the peen and setting down material with the face of the hammer.

Initially, let me first describe some of my results for you, so that you can get a feel for the expected outcomes, and then let me try to describe how I see the application(s) for a smith.

"75% of the theoretical outcome" – what does that mean? Take a length of 1-inch wide by ¼-inch thick material, I'll describe the bar another way…a stack of material comprising of four pieces, each 1-inch wide by 1⁄16th –inch thick.

If I were to lay this stack of material side-by-side, width-ways, math states that I should get a result 4- inches wide by 1⁄16th -inch thick. Theoretically, when spreading the 1-inch by ¼-inch bar with the peen, I should attain a result that is 4-inches wide and 1⁄16th -inch thick. I don't.

I yield a result of about 3-inches wide by 1⁄16th inch thick. A result of approximately 75% of what could be mathematically or theoretically predicted.

I have found that this result is somewhat predictable across a range of stock in my sphere of operating experience, that is, the typical stock that I work with, my fuel source, the shape and size of my cross peen, speed/force of my swing and the heat of the bar.
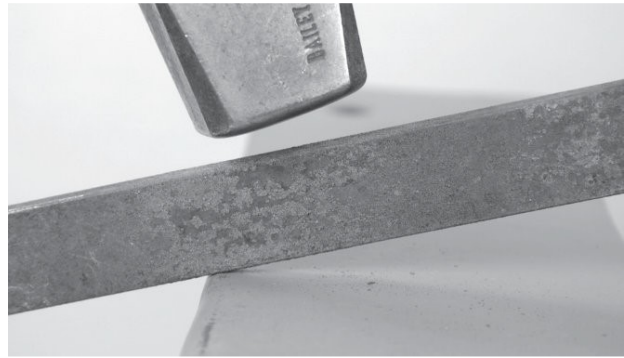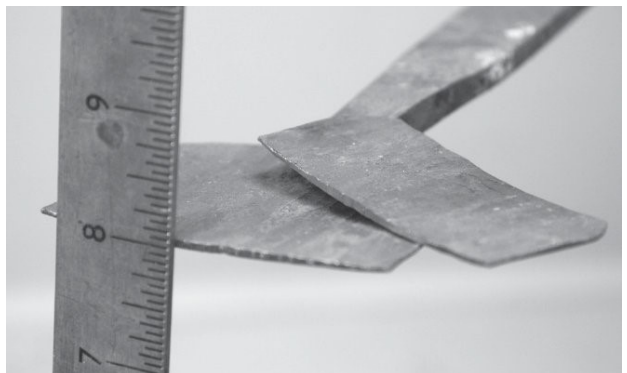

Necking in at the edge of the anvil with the hammer prior to spreading the material
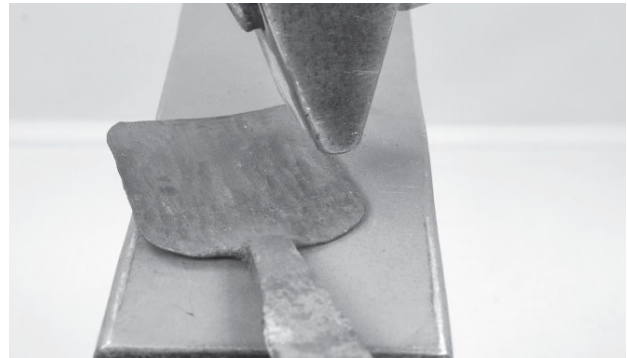
Spreading the 1-inch thick by 1/4 inch wide bar

My result on spreading the 1-inch thick by 1/4 inch wide bar

The spread bar cut to show the thickness of the material

75% Worth

If you are making a water leaf and creating the leaf by spreading the scroll stock, the 75% result will let you know how wide the leaf will be - and if it will match your intended outcome.

Working with scroll material that is ¾-inch wide by ¼-inch thick, the math states that I should yield a leaf 3-inches wide by $1/16^{th}$-inch thick on spreading. I don't, I yield about 2¼-inches in width by $1/16^{th}$-inch in thickness, again 75% of what could be mathematically predicted.

The missing 25% is lost to both scale and elongation of the stock.

There are times when knowing that the bar will stretch 25% is a useful thing to know. An easy enough calculation if the sides of the bar are parallel, while some mathematical gymnastics are required for a taper.

Also, knowing what the outcome will be allows me to forge with a certain conviction, not having to pause and check my work.

A water leaf blank from the scroll stock 3/4-inch wide by 1/4-inch thick to be folded back and welded to the scroll

The water leaf and tip the scroll applied to the remainder of the scroll stock

Judging the 1⁄16-inch Thickness While Spreading

Firstly let's take a look at punching through a bar of steel. I don't care if you are using a slot punch or a round punch, so long as the punch has a flat working end and will yield a slug.

Punch until you feel and hear the anvil, turn the bar over and clean the slug. What thickness is the slug? Mine are generally 1⁄16-inch thick.

The punch is considerable smaller in area than my cross peen, and I'm giving it a good whack with my hammer to get through the bar. But still, the feel of the punch changed considerably when it got to within 1⁄16-inch of the anvil.

So to summarize, a tool with a small contact area that was given a descent whack with the hammer didn't push all the way through the bar.

When spreading with my hammer I am waiting for the hammer to give me the same sort of feel as the punch, a brighter bounce back or return of a downward blow and the sound of the anvil. Both of these things tell me that I am at the 1⁄16-inch thickness of material.

Experience must play a part in this observation - did you just re-heat the bar, or, is the stock really too cold to forge successfully.

Setting Down

Changing both material and hammer face gives another example. Making a jaw for an open jaw set of tongs out of square material. I set the square material down on the nearside, rounded, edge of the anvil until I get half the parent stock thickness.

Taking a length of ¾-inch square bar, my go-to stock for general tongs, this means setting the bar down to a thickness of 3/8-inch.

75% Worth

Theory states that the ¾-inch square bar, when set down to half its thickness should yield a bar that is 1½-inches wide.

My bar, when set down with the flat face of my hammer on the rounded, nearside, edge of the anvil, achieves a width of 1 1/8-inch when forged down to 3/8-inch thick. Yielding approximately 75% of the mathematically predicted 1½-inch wide result.

This works well for me when tong-making, as I can set the bar down to 1 1/8-inch wide without continually checking on the stock thickness.

One more example, and then I'll move on to the application as I see it.

Setting a 3:1 (width to thickness) ratio flat bar down on edge on the face of the anvil. I'm using a length of ¾-inch wide by ¼-inch thick bar.

3:1 is a limiting ratio for the smith – not to say that you shouldn't use other ratios of bars, you can, but if you intend to forge it by setting-down it on edge, drawing down on edge, or upsetting the material, then a ratio of 3:1 has some advantages that you don't get with higher-ratio, bars. I digress...

Setting the ¾-inch by ¼-inch bar down, on edge, to a square sectioned bar (when dressed) I get 3/8-inch square bar. Math states that I should get near to a 7/16-inch square bar – with the 3/8-inch square being about 75% of the predicted yield.

### Combining Both Disciplines

Using ¾-inch diameter bar as a starting stock, I want to set the material down to make a bar 1-inch wide by ¼-inch thick. A ¾-inch diameter bar has an area of: A=Pi x r2 = 0.44184 sq-inches, 75% of which is 0.33138 sq-inches.

My 1-inch wide by ¼-inch thick desired outcome flat bar has an area of 0.25000 sq-inches, allowing me some room to tidy up the forging on the sides, to get sharp, square corners. So, I am within scope of getting what I need from my starting stock, without having to draw down or upset the bar.
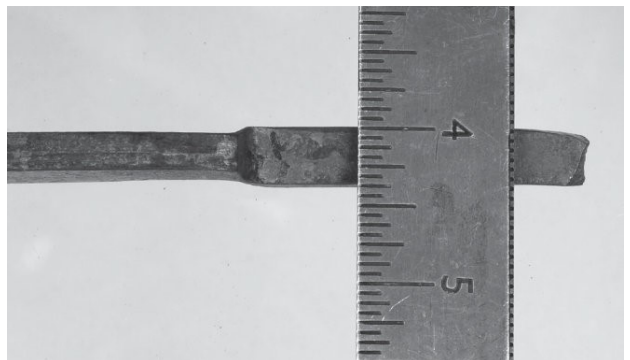

A 3/4" square bar to be used to make a pair of tongs, about to be set down to half its thickness
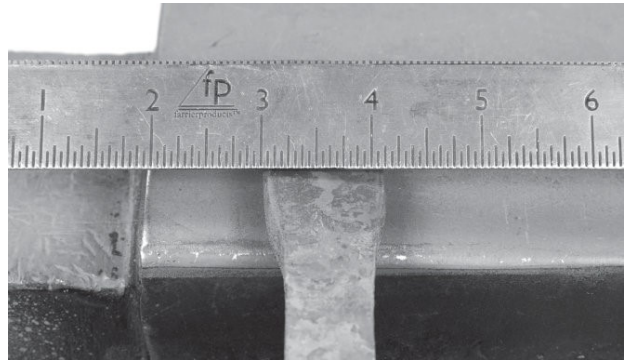
The result of setting the bar down to half its thickness on the face of the anvil using the flat face of my hammer

A 3/4-inch wide by 1/4-inch thick bar (3:1 ratio) set down on edge on the face of the anvil

When dressed (and that obviously changes the cross section somewhat) I yield a ⅜-inch square bar

75% Worth

After isolating material for a decorative element, I need to spread the remaining material to create a tapered socket for the wooden handle

The wooden handle is made from 1-inch diameter material, and will need material a little over 3-inches in width (depending on thickness), to make a socket that will accommodate the handle at it's largest point tapering to be able to create a 3/8-inch diameter nearest to the chisel.

The material will stretch along the centerline of the bar by something akin to 25%.

Math and the real-world can sometimes bump heads, and this is one such case. I know that I don't want to fuller down to my finished dimension, allowing room for a little cleanup later.

I intend to fuller in and then create a taper about 20% shorter than I need to allow for stretch when spreading.

Working backwards, the socket needed will be a heavy 3/32-inch thick. At the widest point of the socket, the ID will be such to allow a 1-inch round handle to fit. But, we also know that we need to allow for the neutral axis of the bend, so in reality, the circumference will be:

Pi × 1 3/32 inch = 3.437-inches (≈3 7/16-inch)

That is a flat measurement, I'm going to multiply it by 3/32" (thickness) to calculate the area.

3.338" × 0.0938 = 0.3223 square inches

Wood chisel roughed out, ready for the socket to be turned and finish bench-work

But that's finished, ie 75%, with no allowance for losing the 25% to scale and stretch. I need to 100% to get my starting stock.

0.3223" ÷ 75 × 100 = 0.4297 square inches

Now I need to find the round bar that this equals:

Area of a circle is: π × r2

If I divide by Pi, I'll be left with the r2, which I can then find the square root for.

0.4299 ÷ π = 0.1368

Now finding the square root will give me the radius needed.

√0.1368 = 0.3699" radius or rounding up to 3/8-inch radius

Checking my math, I'm going to find 75% of the area of a ¾-inch diameter bar

A = 3.142 × 0.375 ×0.375 = 0.4418-sq inches

Divide by 100 gives me 1% and then multiply by 75, gives me 75% = 0.3313-square inches - just a little over the 0.3223 sq inches I need.

I know that I'll need a little more than that for cleanup - call it 7/8-inch diameter bar I want a 3½-inch long socket - I know that my taper will lengthen by 25% as I spread the bar, so I'm going to opt for a 2¾-inch (plus) long taper, going from ½-inch diameter up to 7/8-inch.

If I was doing a one off, I'd probably forgo the math and wing it. But if I was making a few chisels, I might be inclined to "crunch the numbers" ahead of starting.

Choosing the Right Starting Stock

Knowing how stock moves – while spreading in this case – enables the smith to choose the most appropriate starting stock for a given project.
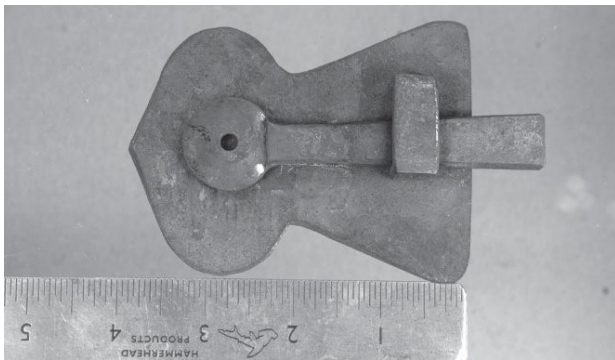
Suppose that your starting stock fits most of the project, but you need a little variation in size somewhere along the bar, needing to either upset or draw-down the bar in a specific area. Knowing that you'll yield 75% can help you calculate the amount of upset or the drawing-down.
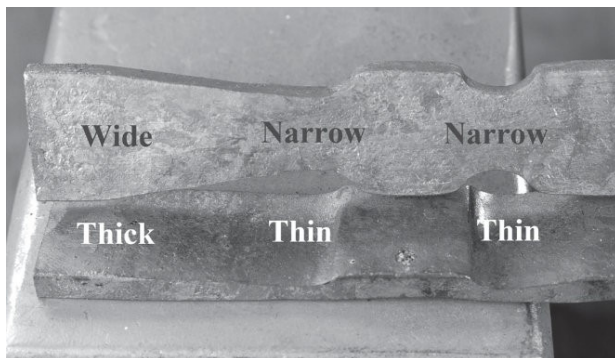
75% Worth

Backing Plate for a Latch

I like to use a backing plate for my Suffolk latches. I know the travel of the latch-bar to clear the keeper, and I know the dimensions of the staple that will constrain the latch-bar's travel on the backing plate.

I know the width of the lock (or latch) style of the door to which the plate will be fitted, and so I have the parameters of the dimensions of the lock - given my design.
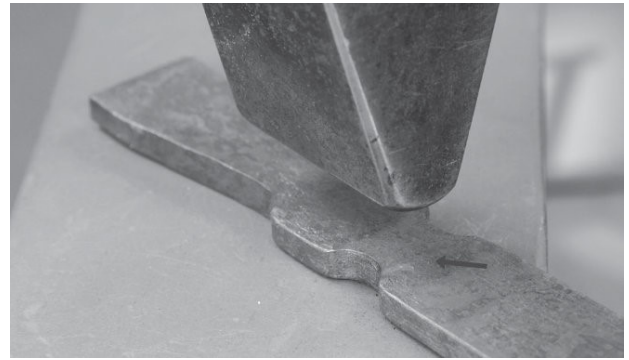

The side fullered material does not allow for clearance of the peen when spreading

The backing plate for my Suffolk latch

The set-downs on the face of the material allow clearance for the peen when spreading

Wide   Narrow   Narrow

Thick   Thin   Thin

Both methods have isolated the appropriate material in the correct places

Set down the material and create a taper towards the end of the bar. Leave the last ¼-inch of the end unforged

This 7-page article is reprinted from the May/June 2022 edition of California Blacksmith Online the online news-letter of the California Blacksmith Association

Set down the material on the other side of the pillow

75% Worth

The plate is 3-inches wide at the jam side of the style, and the latch style is 4-inches in width.

My client wants a design that reflects a popular 16th and 17th century design; the Russian Kokoshnik or Moroccan flare, giving a keel shape to the domed end of the plate at the panel or rail side of the door style.

I want the plate to feature the texture of spread material, so that foregoes the option of cutting the design out from sheet steel.

To forge this style of plate requires that the starting material is first broken into isolated areas and then manipulated to achieve the desired outcome with the minimum of follow-up bench-work.

I can isolate either on the side of the flat bar, or on the face. My preference is to isolate on the face of the bar in this instance.

Pillow isolated by fullering into the sides of the bar

Tapering the stock towards the end of the bar. Leave the last ¼-inch of the end unforged

To create a predicable outcome, keep the hammer parallel to the centerline of the stock when spreading

To isolate the material is to either set down or fuller the material in such a way as to leave a block of material isolated from the remainder of the bar.

The question is, "how much do you set down or fuller in to the material to leave you with the correct amount of material for future forging operations, and how much material do you leave isolated?"

Enter the 75/25% observation.

I can calculate the stretch in both directions giving me the "set up" of my starting stock.

Firstly, lets take a look at the two options available to me in this case, set down on the face or fuller-in from the side. Both methods will isolate the required material for the design.

My preference is to set down the material on the face (over a round edge to eliminate cold shuts).

The depressions created in the face of the stock give clearance for the corners of the peen of my hammer while spreading, something that I don't get when the stock is fullered on the side and uniform in thickness.

As the plate is tapered, so my initial set-up of the stock must be tapered, but shorter by 25%.

I want round corners at the front of the plate, so I leave a little un-forged material in front of the tapered stock.

75% Worth

As you can see from the accompanying photographs, both methods allow for the stock to be tapered from the isolated pillow of material.

The trick here is to spread equally. After creating a valley in the center of the stock, I like to move the material away from me first as that's my weak side, and then move the material towards me, my stronger side.

I know what I should get from my 75% observations, so its easy to see that I have more work to do here
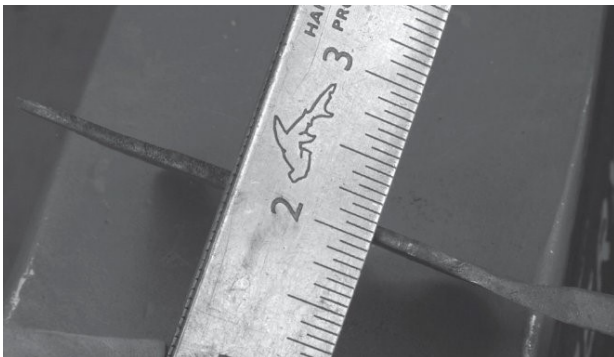
*More material yet to be spread to achieve my 1⁄16-inch thickness*

Do a little on the weak side, and then catch up on the strong - a little more on the weak etc..

Keep the hammer parallel to the centerline of the stock, as that keeps the distribution equal.

I hope that you find this 75/25% useful in your forgings. I usually don't bother with the intricate math unless forced to, but I do factor in a gain in length and a limited yield in spreading as I work on a project.

Spread the material away from you first
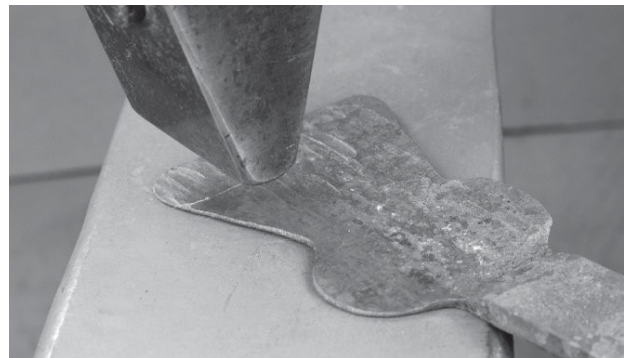
Then play catch-up, by spreading the material towards yourself

To finish, I believe that the largest advantage of this knowledge is that it helps me to forge with more confidence - "I can get after it!"

Less checking the work, or getting out my rule, and more getting on with the job.

Certainly this won't fit all circumstances, but it does hit a few.

I think the important thing to remember when changing the cross section of bar is that you will always lose something to scale and lengthening along the centerline, you're not going to keep 100% of the stock in place.

Your results may differ from mine, but you should be able to find a repeatable constant there somewhere, and finding it will help your work and efficiency.

If you find other constants as you are playing with this, give me a call. I'd love some input or another angle to this idea.

First Class Mail

July 16 Hammer In
Covered Bridge Blacksmith Guild

Parke County 4-H Fairgrounds, 1472 N US-Hwy 41, Rockville IN 47872

Driving Directions: The fairgrounds are located on US-41 about 1 mile north of US-36

Please bring a dish to share.

August 20 Hammer In
Snake Road Forge

38N 600W, Valparaiso, IN 46385

Directions: I-65 exit 249 (Crowne Point East 109th Ave). East 109th Ave becomes CR 100S. After about 7 miles turn left on CR 600W. Drive about 1.4 miles, shop is on the left.

Note: This part of Indiana is in Central time zone.

Forge Master: Rod Marvel   ph: (219) 241-0628