New Jersey Blacksmiths Association

N.J.B.A. Newsletter

NJBA Volume 20, Issue 3 02/28/17
http://www.njblacksmiths.org

Upcoming Events

Get you calendars out and mark these events down. Please bookmark our web site and check for updated meet information. Remember most of our meets have an "Iron in the Hat" drawing, so be sure to bring something.

Date TBD MAST Event. The Marine Academy of Science and Technology (Fort Hancock, Sandy Hook) has asked NJBA to hold an open forge meet for their high school junior class of 70 students. (8 AM to 2:30 PM on a **weekday**, probably before the end of April.) This is not a meet open to NJBA members generally, but **we are soliciting additional blacksmiths to assist.** Contact NJBA Director Bruce Freeman for further information.

Sat., Apr. 22 Blade-Making Demonstration and Workshop. 10 AM to 4 PM at Marshall's Farm. **Workshop fee: $100 plus $25 for materials**, due on registration. No charge to attend the demonstration, including the Iron-in-the-Hat drawing and tailgate sale. See details later in this newsletter.

Sat., May 6 Greater Newark Museum Mini Maker Faire. Any NJBA member who wishes to demonstrate should contact Bruce Freeman for details -- as soon as possible, as last minute additions to the crew will not be possible. See details later in this newsletter.

Sun., May 7 Peters Valley Open House. 11 AM to 4 PM, at the Peters Valley School of Craft, Layton, NJ. Tailgate sales welcome. See details later in this newsletter.

Sat., May 20 "Forged in Fire" Blacksmithing Demonstration at the historic Joseph Turner house, Hampton (Hunterdon Co.), NJ. See details later in this newsletter.

Sun., May 21 Walnford Day. Bruce Freeman will demonstrate blacksmithing for the public in Historic Walnford Park, **62 Walnford Road, Upper Freehold, NJ.** See details later in this newsletter.

Sat. May 27 Damascus Workshop. 10 AM to 4 PM at Marshall's Farm. **Workshop fee: $100 plus $25 for materials**, due on registration. See details later in this newsletter. Tailgate sales welcome.

Sat., June 3 NJBA (Bring-Your-Own) Picnic and Open Forge Meet. Rain or shine, at Marshall's Farm. No admission charge. New nonmembers may participate in the open forge meet (but must join before participating in any additional hands-on events). See details later in this newsletter.

Autumn? Anvil-Repair Workshop. NJBA is considering holding another anvil-repair workshop. Probably cost: $125 per anvil (for basic edge and gouge repairs only),

Your renewal was due by September of 2016. ***If you have not renewed, this is probably your last newsletter!***

The New NJBA Web Site!

The NJBA Web Site is:

`http://www.njblacksmiths.org`

The Newsletter is at:

`http://njblacksmiths.org/archive/index.htm`

or use the link on the NJBA web site for the newsletter.

Official NJBA Address
NJBA, P.O. Box 224
Farmingdale, NJ 07727-9998

We like to thank those who joined NJBA as Business Members ($40 dues):

Marshall Bienstock

Bruce Hay

NJBA Board of Directors

List not available online

An NJBA Insurance Crisis

Last September, NJBA paid its full year's insurance premium of $255. A few weeks later we received a bill for an *additional* $3500, with the warning that our insurance would be cancelled if it weren't paid by the end of the month! Since this sum exceeded the funds in our treasury, we did not pay it, but contacted our agent. By December the carrier had indeed cancelled our insurance coverage and NJBA filed a complaint with the NJ Dept. of Banking and Insurance. Since it was apparent that the matter was not going to be resolved quickly, the NJBA Board suspended all membership activities of NJBA indefinitely.

Subsequently, the insurance carrier corrected its its misclassification of NJBA and lowered the premium to about $650 or so (in addition to the $255 we already paid), but with the *proviso* that we would no longer be able to obtain certificates of insurance for venues like the Red Mill, Middlesex Co. Fair, and others.

At this juncture, NJBA Director Eric Von Arx found a better insurance policy for $653, and got Board approval of the change in carriers. The Board then voted to resume activities effective. Considerable thanks is due Eric for his efforts, including his paying the premium by credit card and letting NJBA pay him back.

The December vote to suspend activities *also* suspended admitting minors to any hands-on activities, including open forge meets, due to potential liability. For the moment, the Board has not reversed this decision and is considering the issue further.

A Timely Donation from the Suhakas

At the last NJBA Board meeting, Ben and Ceil Suhaka presented NJBA with a $200 donation toward the cost of NJBA's new insurance premium. They were thanked and applauded by the Board.

Open Forge Meets

Members are welcome to attend our open forge meets. Nonmembers are invited to try your hands one time. NJBA requires you to join before continuing. The application form is on the last page of this newsletter.

Monday Night Open Forge, Howell, NJ

Marshall Bienstock hosts an open forge meet every Monday evening at 7 PM, except major holidays. (Please call ahead on holidays to make sure: 732-221-3015.)

Sunday Open Forge, Smithtown, LI, NY

From the beginning of November through the end of April, Ron Grabowski will open his forge to NJBA members. 110 Burlington Blvd., Smithtown. Please call ahead to confirm and get directions: 631-265-1564. Ronsforge @aol.com

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Blade-Making Demonstration & Workshop

On Saturday, Apr. 22, professional swordsmith and NJBA Director Mark Morrow will demonstrate the forging of a small blade in a demonstration open to the public. This demonstration will be followed immediately by a workshop in which he will coach participants through the making their own blades. The event will run from 10 AM to 4 PM at Marshall's Farm, 663 Casino Dr., Howell, NJ. The fee for participating in the workshop is $100 plus $25 for materials, and is due on registration (not later than your arrival at the event). Space in the workshop is limited. Contact Mark to register for (and to secure your space) in the workshop. Like all hands-on events, this workshop is open only to NJBA members, but nonmembers may join when registering by paying the $20 membership dues. Admission to the demonstration (no hands-on) is free, but

please bring a contribution to the Iron-in-the-Hat drawing. Tailgate sales welcome.

Greater Newark Mini Maker Faire

On Saturday, May 6, NJBA Director Billy Barret will be demonstrating blacksmithing at the Maker Faire to be held at the Newark Museum (where there's a "Sketch in Iron" by Samuel Yellin). NJBA has demonstrated at this event the past two years. The event runs from 11 AM to 5 PM (with set-up before 10:30). Any NJBA member who wishes to demonstrate should contact Bruce Freeman for details -- as a form must be filled out and submitted to the Museum in advance, making last minute additions to the crew impossible.

The Maker Faire is "A mix-up of science fair, farmer's fair, interactive show-and-tell, ... tech gurus, crafters, educators, tinkerers, hobbyists, engineers, science clubs, authors, artists, students, and start-ups. ... hands-on activities, learning opportunities and the chance for visitors to learn new skills such as glass work, sewing, rocket building and welding."

See www.newarkmuseum.org/greater-newark-mini-maker-faire , or www.newarkpulse.com/events/event/114649 for further information on tickets, directions, parking., etc.

Peters Valley Open House & Studio Tours

On Sunday May 7, 11 AM to 4 PM, the Peters Valley School of Craft (19 Kuhn Road, Layton (Sussex Co.), NJ; PetersValley.org) will hold an open house with studio tours. NJBA Director Billy Barrett will be there, demonstrating blacksmithing. Jake Brown, Blacksmithing Artist Fellow, invites experienced blacksmiths from NJBA to demonstrate the craft to the public. The event is free.

Tailgaters are welcome, but (1) you must call Jacob Brown before the event (at 773-428-5253, so he can plan for the parking), and (2) you must be set up before 9 AM the day of the event. (If he doesn't pick up, just leave a name and number, and a message that you want to tailgate at the open house event.) Tailgate sales will be between the blacksmith shop and the red barn just beyond the it, in the small turnaround / parking lot. (Lat. 41.1934266, Long. -74.8524469) Only those tailgating or demonstrating in the blacksmith shop will be allowed to park in this area.

Lindsay Gates, Development Director, tells us that this event is one of the primary ways that Peters Valley gets the public excited about coming to take workshops and to learn more about blacksmithing and other art forms. Demonstrators will be working in all of the PV studios, and a shuttle bus will tour you about. Visitors can watch artists forge metal, weave cloth, turn wood, carve sculptures, create jewelry, etc.; tour our current gallery exhibition; purchase the works of over 200 American artists; and view photos and literature about the history of the area. There will be live music and great food available throughout the day from Green Valley Farms. PV loves dogs but cannot allow them on the campus during these events. For further information, contact Lindsay Gates at 973-948-5200 or craftfair@petersvalley.org.

"Forged in Fire" Blacksmithing Demo

On May 20th (rain date May 27) the Union Forge Heritage Association will hold its first event of the season, "Forged in Fire," from noon to 5 PM at the Joseph Turner house, 117 Van Syckels Road, Hampton (Hunterdon Co.), NJ. The event features forging demonstrations by the NJBA, lectures, demonstrations of antique firearms, tours of the Turner House museum, and displays of colonial ingots from the Iron Works. The event and parking is free. (Suggested donation: $7).

NJBA members who are interested in participating in the blacksmithing demonstration

should contact NJBA Director Ryan Amos.

According to Michael Gronsky, Jr., President of the UFHA, the Union Iron Works is the oldest continually operating foundry in U.S. history and the country's second oldest business, and 2017 marks its 275th anniversary. The Union Forge Heritage Association (UFHA) is marking this milestone with a year-long calendar of events revolving around this important company. Visit the UFHA wesite, UnionForgeHeritage.org, for their calendar of 2017 events.

Walnford Day

Sunday, May 21 is Walnford day at Historic Walnford Park, 62 Walnford Road, Upper Freehold, NJ. This is always a nice day. The mill and the historic home will be open for tours, and there will be various crafts demonstrations, many of them hands on. (Blacksmithing is hands-on only for NJBA volunteer demonstrators.) NJBA Director Bruce Freeman will bring one or two forging stations (depending upon whether anyone else plans to demonstrate). He'll be setting up around 10 AM (for a demonstration running from 11 AM to 5 PM) and would welcome assistance or other demonstrators. Contact Bruce if you'd like to help demonstrate, or just stop by the park and visit.

Damascus Workshop

Saturday May 27, professional swordsmith and NJBA Director Mark Morrow will teach the making of a billet of Damascus steel at a workshop to be held 10 AM to 4 PM at Marshall's Farm, 663 Casino Dr., Howell, NJ. The fee for the workshop is $100 plus $25 for materials, and is due on registration (not later than your arrival at the event). Space in the workshop is limited. Contact Mark to register for (and secure your space in) the workshop. Like all hands-on events, this workshop is open only to NJBA members, but nonmembers may join when registering by paying the $20 membership dues. Tailgate sales welcome.

NJBA BYO Picnic and Open Forge Meet

Saturday, June 3, from 10 AM—4 PM, NJBA will hold an open forge meet and (bring your own) picnic at Marshall's Farm, 663 Casino Dr., Howell, NJ. We will set up our lightweight forging stations and you can try out your hand at light forging. If you are a novice blacksmith, there should be plenty of more experienced hands around to give you pointers. In case you are a woodworking blacksmith, one of our members plans to forge a traditional European-style woodworker's holdfast for a bench and perhaps an English-style holdfast and a traditional style bench dog. This event is on, rain or shine (we have canopies).

NJBA will provide drinks, paper plates, utensils, etc., for the picnic; attendees must bring their own food. If you don't care to bring a picnic lunch, you may get lunch "to go" from one of the local establishments. Families are welcome, but children must be supervised at all times by an adult. (Since there are deer in the area, the use of tick repellant may be advisable.) Please bring an item for the Iron-in-the-Hat drawing, and feel free to bring stuff to tailgate. Contact NJBA Director Bruce Freeman for further details.

Report on the Princeton Open Forge Meet

by Bruce Freeman

On Oct. 8, I loaded 2 complete forging stations into my Nissan pickup truck and headed for Princeton. I had weighed most of the equipment, and when I estimated the total I was bringing, it came to half a ton. This was good because that happens to be the load capacity of my pickup. (It also explained why my truck behaved poorly last season when I loaded up with 3 complete forges ...)

I arrived at Bowen Hall, Princeton University, at 10 AM and found Doug Learn and his

son Calum already there and largely set up. There were a few folks around, so I enlisted some of them to help set up the three canopies and the rest of the equipment. NJBA member Tony Fresolone arrived during this time and we fired up the two forges. By the 11 AM, the official start time, we had three forges up and ready to work. Billy Barrett, who had been delayed in traffic, arrived about then and set up.

I lost count of the number of students who tried their hands at forging, but it was a good number and the event was very well received.

We started breaking down the fires at 4 PM and by 5 PM, the site was cleared and my truck was loaded and ready to go. This is noteworthy: It took one hour to set up and one hour to break down -- much faster than we ever managed with the old, heavy equipment.

Report on the Vise Stand Workshop,
by Bruce Freeman

On November 5, I arrived at Marshall Bienstock's shop early to help do some tidying of his shop. We cleaned off the table (made of a door and two sawhorses) apparently for the first time in a year or more, for, lo and behold, we found the two books that had been donated to NJBA and we had thought missing all that time! Soon folks started arriving to help with the workshop, and they helped with the tidying.

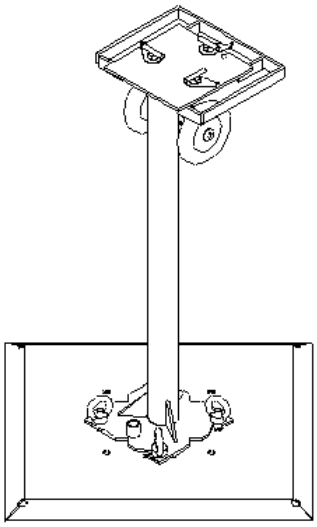
I set up my drawings and flowcharts and started getting folks busy with the several tasks . In short order we had Julie LaChance, Ryan Amos, Bob Bozzay, Bill Lodato, Al Mottram, Ron Jani, and Bob Crowder helping out.

Marshall fired up the Ironworker for shearing small stock and punching three different plates for each vise stand. Jennie and Ryan assisted Marshall until I got them working on the tables and bottom plates for the post assembly - drilling scribing, and saw-cutting notches. Bill is a weldor, so he headed up our welding efforts: tool bars and wing bolts.

Bob B. and Al notched the corners of the base plates. Then Marshall set up the brake and Ron and Al did the bending. I aligned the corners and checked that the base plates sat flat on a flat floor.

I believe it was Bob B., Bob C., Al, and Ron who took on the job of bolting the reinforcement plates to the underside of the base plates. Here we hit a snag when it seemed the five critical holes would not always line up. Marshall put a reamer on a drill and reamed out the holes, improving the situation greatly, but some hand work was needed after the workshop, as I'd probably made the tolerances too tight.

Next the bases went to a welding station where the several struts were added. Bill headed up this effort. After a while he got Ryan do-



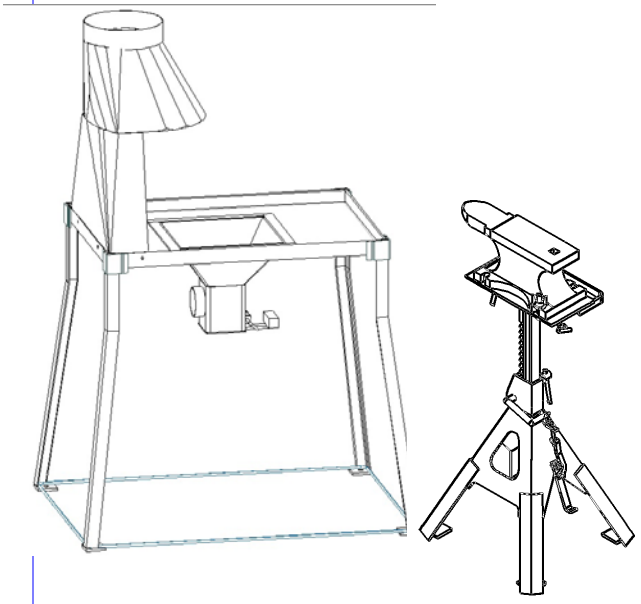
ing welding, and then started Jennie at a second welding station. In the late afternoon, Marshall set up a third welding station and started work welding the posts to the post-bottom plates.

I lost track of what each person was working on otherwise, but every time there was a task

to do, there was a person ready to do it. At the end of the day, Dave Megill pitched in to finish up the welding on the last base.

Hence, we finished up all five bases, all five posts and all five tables (except for some minor parts), but fully finished only one vise stand.

Since the workshop, Marshall and I have worked to finish the remaining vise stands. Four vise stands, including the prototype, are now finished and ready to use, and we're working on the other two, which are largely complete.



NJBA's Lightweight Forging Stations

The following equipment is ready to use:

· Six forges including firepots, hoods, and flues
- Three hand-crank blowers for forges
- Six anvils & stands
- Four vise stands
- One toolbox of hand and fire tools
- A few canvas sacks with plastic bags of coal
- Several tin tubs for use as slack tubs

One forging station, including a canopy, coal, hand tools and fire tools, weighs about 500 lb total.

Equipment Needed, and Progress … by Bruce Freeman

NJBA really needs to inventory its tools, but the following is a brief description of what we have and need. If you have tools you'd like to donate to our six toolboxes, please contact any NJBA Director

Tool Boxes. We have at least four boxes, but need to fill them with hand tools (hammers, tongs, etc). These should be run-of-the-mill tools, not expensive ones. Although a good stock of equipment may be desirable, we must not make these boxes too heavy to lift easily.

Hammers. NJBA has a decent stock of hammers, but with six toolboxes, we may need more.

Tongs. Poz tongs are most generally useful, and we have only a few. Horseshoer's tongs and others are also useful. Vise Grip™ pliers can sometimes be used when nothing else works. Tongs should be less than 18" long, to fit in the tool boxes.

Hardies. We need more cut-off hardies. (with 7/8" square stems). Ryan Amos has begun making more from a truck axle. Other hardy tools might also be useful.

Fire Tools. We need to assemble about 3 more sets of fire tools and distribute these amongst the six forge stations.

Blowers. Blowers are the current bottleneck to completing the six forging stations. If you know of a lightweight hand-crank forge blower we can procure, please let me know. I have tested one lightweight hand-crank blower that I have, but its performance wasn't stellar. I also adapted an electric "bounce house" blower to drive a forge, but it's too powerful. The ash door had to be opened an inch to gain adequate control of the blast, lest it blow the fire out of the firepot.

Incidentals. A few more stakes from 3/8" re-bar for the vise stands and the blower stands.

Controlled Hand Forging Lesson 13

Cutting a Bar

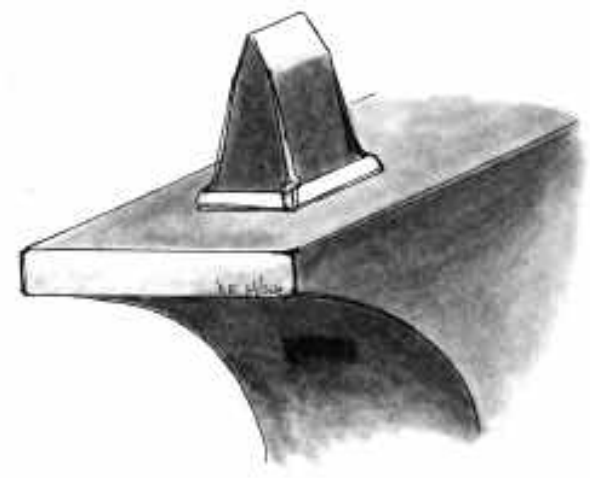
by Dan Nauman
Illustrations by Doug Wilson
Lesson #13

Definition: Cutting a hot bar using the hot-cut hardy.

Note: A hot-cut hardy has a cutting edge of about 25 to 30 degrees. A cold-cut hardy has a cutting edge of about 60 degrees.

Intent: To learn to cut through a round, square, or rectangular bar using the hot-cut hardy on the anvil, making a clean and even cut, with the resulting burr located in the center of the cross-section of the bar. With the burr in the center of the bar, it will make life easier for following forging operations such as upsetting the end of the newly cut bar.

It must be said here that this method is not necessary for all cutting applications. A bar can be cut faster (and easier) by driving the bar down into the hardy from one side. This procedure will leave a burr on one side of the bar, and will also create an angled edge on the end.



A hardy with the cutting edge parallel with the anvil's edge.

This edge may be desirable in some circumstances, i.e., starting a taper on the end of the bar, or an intentionally angled end of the bar to form a scarf.

Tools: Anvil; hot-cut hardy; hammer; soapstone or chalk.

Material: 1/2" square x 12" mild steel.

Forging Dynamics: The angle of the cutting edge of the hardy is important when cutting hot metal. With the narrower cutting edge of the hot-cut hardy at 25 to 30 degrees, the material being cut will not only distort less, but the act of cutting will be more rapid. The wider 60-degree cutting edge of a cold-cut hardy will tend to distort the material, i.e., creating a wide v-notch, and also potentially reducing the cross-section of the bar from the additional hammer blows necessary to drive the bar through a thick wedge.

Step One

Measure 2" from the end of the bar and mark that distance with soapstone on the bar. Place the cold bar on top of the hot-cut hardy edge, with the 2" mark directly above the cutting edge. Turn the bar up onto its corner. With your hammer, strike the bar down onto the hardy, hard enough to make a good nick. This nick will be used to indicate where the bar will be cut when hot. (For alternative marking methods, see "Notes" at the end of this lesson.)

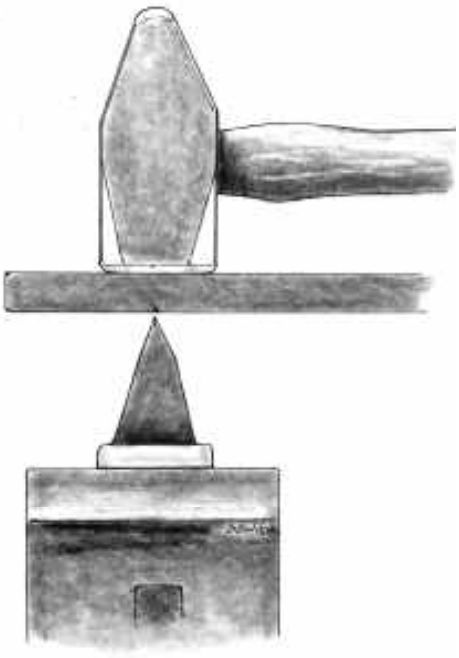
Caution: Nicking the corner of a bar on a hot-cut hardy as in the manner of Step One could damage your hardy's cutting edge if you are using cold-rolled steel. Cold-rolled steel (as milled) is harder than hot-rolled steel of the same type. Once heated, or normalized, the cold-rolled steel's properties match that of hot-rolled steel.

Also, this method is never a good idea if forging high-carbon steel. Review the alterna-

tive marking methods at the end of this lesson, and use good judgment.

Step Two

Heat the area to be cut to a yellow heat. Place the bar on the hardy, and move the bar back and forth to find the nick. Turn the bar onto its flat side (side "A") and hit a solid blow.



The hammer correctly placed over the bar and hardy

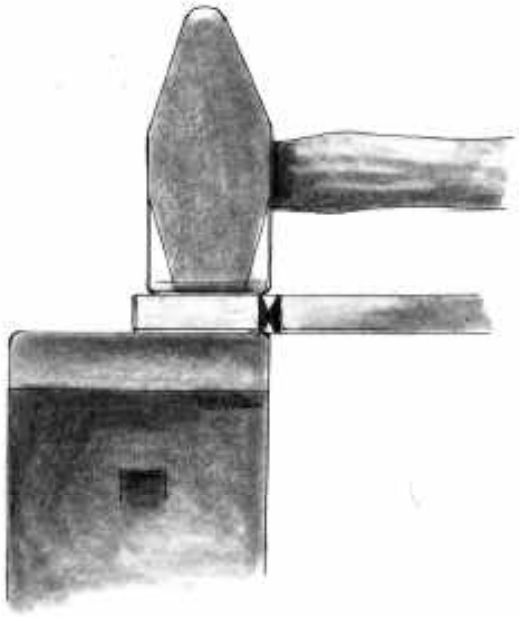
Note: Keep the bar parallel to the face of the anvil, and 90 degrees to the hardy, at all times during this process.

Turn the bar 45 degrees (right or left), and strike again lightly to mark the corner. Continue to turn the bar in the same direction to mark the next face with a sharp blow.

Reversing the direction you have previously turned the bar, turn the bar back to side "A," and then turn 45 degrees and lightly nick the corner. Proceed in the same direction to the next face, and mark this face with a sharp blow.

Next, turn the bar 90 degrees to the fourth face. Look down at the bar from a bird's eye view, and you should be able to line up the nicks on the bar with the cutting edge of the hardy. Once you have lined up the nicks, proceed to strike the bar solidly.

Continue rotating the bar to each face, and continue cutting into the bar. Cut until the thickness of the area uncut is roughly 1/8". *Note:* Do not cut the bar all the way through… as you may sever the bar, and you may damage your hammer as well as the hardy. Severing the bar could also send the very hot, cut-end of the bar sailing across your shop.



Weighting one end of the bar with the hammer to twist the bar.

Step 3

There are several methods to break off the end of the bar. You may:

A.) Hold the short end of the bar with tongs or hammer and bend up and down or twist until the end breaks off.

B.) Shear the end of the bar by lining the cut up with the far edge of the anvil and strike down on the protruding end with your hammer.

C.) Quench the area cut with water. This will mildly harden the bar so that the bar can be

snapped off easily.

Targets:

–You should be able to cut the bar in one heat.
–The cut should be even. No "corkscrewing" or misalignment of cuts.
–The bar should remain straight. –The burr left on the end of the bar should be centered in the cross-section of the bar.

Notes: Some alternatives to nicking the bar on the hardy to mark where the bar is to be cut:

A.) For shorter cuts, you can draw a line on the face of the anvil. The line should indicate the length of bar you wish to cut. Measure from the near side edge of the anvil with chalk, soapstone, or for longer lasting lines, a felt-tip pen. Place the end of the bar even with the chalk line. Use the edge of your hammer face to indicate the line to be cut by lining it up with the edge of the anvil (with the hammer on top of the bar). Now carefully bring the bar and hammer to the hardy. Line the hammer edge up with the cutting edge of the hardy. Apply some downward pressure so the bar does not slide off the mark. Strike solidly and proceed as indicated in the lesson.

Alternate method of holding the short end with tongs to twist the bar.

B.) Some smiths prefer to use a center punch, and others a chisel to mark where bar is to be cut. If using a center punch, make sure the punch mark is deep enough so that you can see it when you bring the glowing bar out from the fire.

C.) For marking cold-rolled or high-carbon steels, use soapstone to mark the cut, then take an initial low heat (bright red). The soapstone mark should still be easily seen at this temperature. Nick the bar, (with a hardy, chisel, or center punch) then reheat to make the final cut as outlined in this lesson.

Controlled Hand Forging Lesson 14

Bending

Text and Photos by Dan Nauman

Lesson #14- Forging a 90-degree corner

Definition: Altering the centerline of a bar.

Intent: To learn how to forge a sharp 90-degree corner while maintaining the parent stock dimensions throughout the bend, and have the resulting two legs measure to a predetermined length.

Tools: Anvil, 16- to 20-ounce cross-peen hammer, center punch, steel square.

Material: 1/2" square x 20" mild steel.

Step One

Note: When producing a bend of this nature you will lose some length, equal to half of the parent stock thickness, on both legs.

Also, when figuring how much metal will be needed for this bend in a project, remember that your measurements should be taken from the center (or mean line) of the bar on your layout, and not from the inside or outside corners.

Our target length for the short leg that will be formed is 3 3/4", and a target length of 15 3/4" for the long leg. With that in mind, measure 4" from the end of the bar, and mark with the center punch.

Step Two

Heat the bar to bright yellow, with the center punch mark centered in the heat.

Note: A short heat for this step will reduce the work in succeeding heats. The length of the heat when initially pulled from the fire will be too long. If this heat is not minimized, the resulting bend will require more effort to achieve your goal.

The bright yellow heat will give you some time to quench the bar. Using a dipping can, quench the bar (with water) down to 1/2" on either side of the center punch mark so that the heated area is confined to about 1 1/2"… ideal for this initial bend.

After you have minimized the heat, make sure the center punch mark is visible on the side of the bar, and position the bar so that the center punch mark is over a 1/8" radius on the far edge of the anvil. Proceed to bend the bar over the edge of the anvil by striking the end of the bar down. Bend the bar so that it is at about a 100-degree angle. (See photo #1)

Notes- Do not use a sharp corner of the anvil or the vise to make the initial bend. This can lead to galling on the inside corner which may lead to forming a shut (overlap) during subsequent steps. A shut in steel can form into a crack, weakening the piece. A shut in wrought iron will cause the leg to fall off.

Our goal is to teach you to make this bend with a minimum of tools. However, some smiths prefer to use the vise to perform a controlled, gentle bend in Step Two (avoiding a gall), and then use it for a brace (or back-up) in succeeding steps. While this practice is not necessarily wrong, it must be noted that it takes precious time to place the piece in the vise. Also, the vise acts as a heat sink, robbing precious heat from the metal. These facts combined reduce your window of time to forge the corner.

Forging dynamics: From bending, the inside corner has now increased in cross-section from compression, and the outside corner has decreased in cross-section from stretching. This excess material on the inside corner can be moved to help replace the loss of material on the outside corner. The next step will help accomplish this task.

1. After the initial bend, the angle should be approximately 100 degrees, as shown here.

2. Position the hammer as shown when cross-peening the corner. Be mindful that you do not reduce the cross-section smaller than that of the parent stock.

3. Stand at the heel of the anvil to forge this form.

4. Vertical blow– note the position of the hammer and the short leg.

Step Three

In the same heat from step two, lay the bar on its side on the anvil so both legs are resting on the face. Using the cross peen of the hammer, carefully forge down the excess material on the inside corner back down to 1/2". The peen should strike the bend, perpendicular to the 50-degree mean angle, so that the metal pushes to the outside corner. The legs themselves will help prevent the metal from flowing into the inside corner. (See photo #2)

Step Four

Heat the bend to bright yellow. Quench the bar to concentrate the heat to 1/2" on each side of the bend.

Note: Your stance at the anvil is important for this step. It will be easier for you to swing the hammer if you position yourself with your shoulders square to the heel of the anvil. (See photo #3)

Place the short leg ten degrees to the right of vertical (ten degrees to the left if you are left handed), with the end down on the face of the anvil. Strike the bar five or six times with hard blows. The blows should be focused so that the hammer face is in the same plane with the long leg, and slightly to the inside of the axis of the short leg. (See photo #4)

In the same heat, position the bar ten degrees to the left (or ten degrees to the right if you are left handed), and redirect your blows with the hammer's face in the same plane as the short leg, and just below the axis of the long leg. (See photo #5)

Proceed to strike the bar with seven to nine blows.

Alternate back and forth from the short leg to the long leg until the metal reaches a dull orange color. Maintain an angle of about 100 degrees. Count your blows as explained above.

Forging dynamics: The reason you strike more blows horizontally is that your hand is not as solid a brace as the anvil is for the vertical blows, thereby requiring more blows to accomplish the same task of moving material

5.Horizontal blow-Note the position of the hammer and the short leg.

towards the corner. Also, using a lighter hammer such as a 16- to 20-ounce hammer minimizes the possibility of forcing too much material to the inside corner of the bend (which could happen when using heavier hammers).

The force delivered by a lighter hammer is expended on the surface of the bar. (See photo #6 of 1.8# hammer vs.1# hammer.)

Step Five

Your work thus far has also increased the cross-section of the bar at the inside corner. As you did in step three, use the peen to simultaneously reduce the cross-section, and push the excess material to the outside corner. Smooth with the face of the hammer. Be careful, as you do not want to reduce the corner to less than the parent stock size.

Step Six

Repeat steps four and five until the outside corner is visibly sharp (no greater than a 1/32" to 1/64" radius).

6. Use a smaller hammer to do this operation. The hammer on the left is a one-pound hammer– a good hammer weight for the task. The hammer on the right is a 1.8 pound hammer which is too heavy for this form.

7. When trueing the angle to 90 degrees, keep the short leg away from the anvil as shown here. Doing so will keep you from reducing the cross-section of the bar beneath the parent stock size.

Note: If the legs begin to bend during any part of these procedures, straighten them at once or the energy from your blows will do more to continue bending the legs, rather than forging the corner.

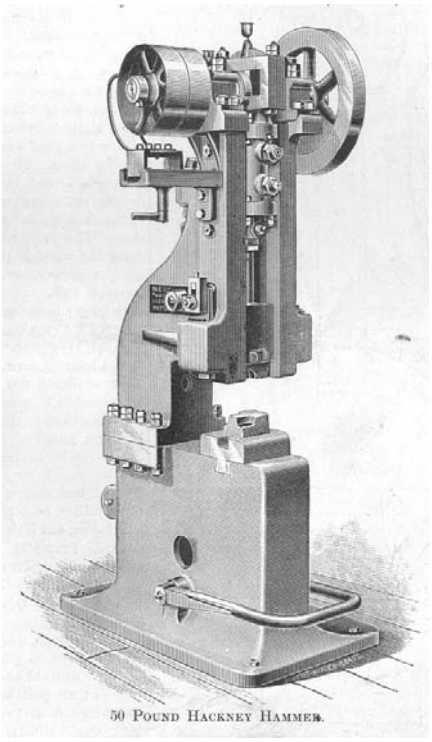
Step Seven

Heat the corner to bright yellow. Quench as in step four. Lay the long leg on top of the anvil. The short leg should point down off the anvil, with the inside corner away from the side of the anvil. With light blows striking horizontally towards the short leg, close the angle of the corner to 90 degrees (See photo #7). The legs can be straightened by lightly tapping on the anvil in any orientation that suits the task. Use the steel square to check your progress. (See photo #8.)

Note: Resist forging down on the bar on the corner of the anvil to achieve the 90-degree bend, or to straighten the legs. What you are trying to do at this point is to bend the bar to 90 degrees, not forge the bar to 90 degrees. Forging down on the legs to achieve the bend will reduce the cross-section of the legs near the corner.

Targets: -The short leg is 3 3/4" long, and the long leg is 15 3/4" long, plus or minus 1/16".
-Both legs lie in the same plane. No twists or bends.
-The stock size remains 1/2" throughout the forging.
-The corner is 90 degrees, with a radius of 1/64" to 1/32" for an outside corner.
- The legs are straight, and do not slope down to the corner.
-The surface of the faces are smooth.
-With practice, the corner should be forged in five to six heats.
-There is no shunt (overlap) on the inside corner.

8. Check your work with a square. Note that the legs are square, but there is a gap near the corner of the long leg, which should be corrected.



REDUCING THE SIZE OF A HOLE

by: Tommy Ward

Here are a couple of tricks for reducing the size of a drilled or punched hole that is found to be slightly larger than desired.

One method is to find a ball bearing with a diameter larger than the hole and drive it against the opening with a hammer to push the metal around the lip into the hole. This technique can be done cold, but may require heating the piece to a forging temperature if more material is to be moved or if the work is particularly hard. Repeat the process on the reverse side.

Another approach is to heat the area around the hole to a bright red and then carefully quench the "bottom" side of the work (the hole should be perpendicular to the water) while leaving the "top" part outside of the water. The submerged area will cool rapidly and shrink somewhat, but the portion of the metal remaining outside of the water will be drawn in more as it slowly air-cools - resulting in the "top" half of the hole being reduced in size. Reheat the piece and repeat the process on the opposite side. I have found it easier to hold the work pre-cisely half-submerged by bending up some coat hanger supports that span my slack tub. Make a couple of dry runs to get things adjusted, and then quenching will be a simple matter of lay-ing the heated material on the hangers that have been preadjusted for the correct depth. If you're really curious about how the shrinkage of the metal can be influenced, play around with the leaving the piece in the water until it cools to room temperature, or taking it out of the wa-ter and allowing it to air-cool after the initial quench.

Both of these techniques work better, of course, on thicker pieces of metal, and with a little practice can reduce the size of a hole by a surprising amount.

Reprinted from January 2017 edition of "The Upset", newsletter of the Mississippi Forge Council

A Better Way To Cool Tools

By Randy Stoltz

Both paraffin wax and beeswax have an excellent ability to absorb and store heat. Additionally both of these substances do not have a melting point, they have a melting range (i.e. they slowly liquefy over a range of temperatures not a single point like water). This makes wax a great medium for cooling punches, chisels, drifts, and other tools used to work hot steel as it will cool and lubricate the tool without the risk of hardening it.

I have used a mixture of paraffin wax, beeswax, and powdered graphite to cool my punches and other tools for some time now and have had very good results. You can use all paraffin or all beeswax but I used a 50 - 50 mix since the paraffin is harder than the beeswax (and I had I several pounds of it sitting around). I added the powdered graphite to improve the lubricating properties of the mixture. Graphite is a high pressure high temperature lubricant often used on dies or presses. It works very well on drifts to keep them from sticking. You can also use molybdenum disulfide powder for extreme lubricating applications but it usually costs a lot more.

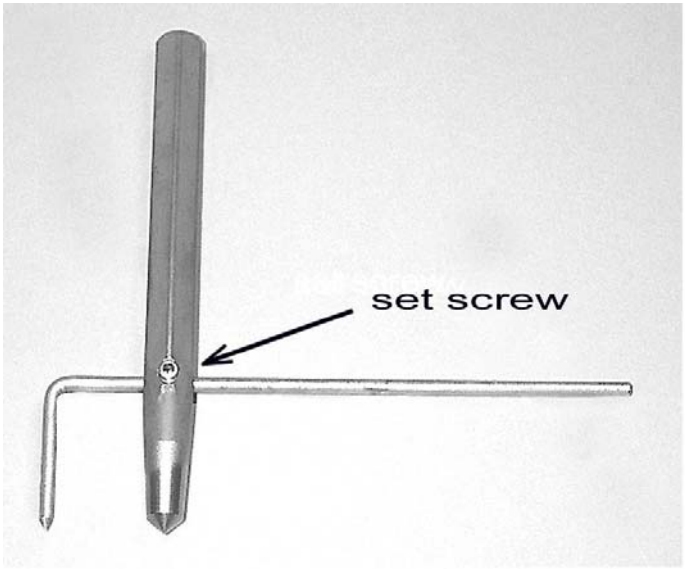
To make the mixture, I add one tube of the powdered graphite (.21 oz / 6 grams) to 2 cups of melted wax and pour it into a metal cup. Note that wax expands 5-10 percent when heated so leave some room in the cup. Here is some additional technical information. Paraffin wax is part of a family of hydrocarbon compounds known as alkanes with the general formula of nH2n+2 that are solid at room temperature. Paraffin that is liquid at room temperature is known as mineral oil. Beeswax is not a single compound but is a mixture of several compounds with the base compound very similar to paraffin. Both paraffin and beeswax are solid at room temperature and have a flashpoint of 400° F. The melting range of paraffin wax varies with the exact compound but can be classified as: low (125° F - 135° F), medium (135° F - 145° F), And high (150° F - 165° F). Beeswax has a melting range of 144° F - 147° F.

Reprinted from The Anvil's Horn, January 2011.

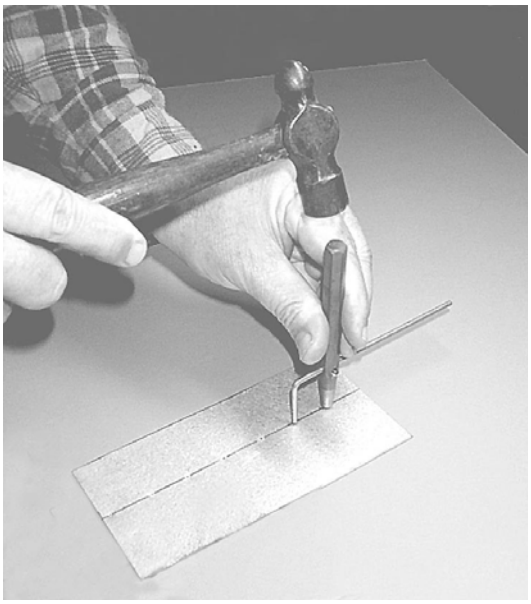
A SELF-MEASURING CENTER PUNCH

by Tommy Ward

From time to time I've had to drill a succession of equally and accurately spaced holes. Although laying out the hole spacing can be done fairly quickly using a transfer compass, the positioning of the compass points, scribe marks, and ultimately the point of the center punch itself, each present the opportunity for a slight error (particularly with my aging eyesight). Over a series of holes these small individual errors can "stack up" and result in a significant overall change in dimension. The solution to the problem is a "self-measuring" center punch. This little trick is neither new nor original, and is one I first recall having seen many years ago in an old metal trades manual.



A standard center punch can easily be fashioned into a self-measuring type by drilling a perpendicular hole thru its shank to receive a lateral locating rod. A point is sharpened on one end of a small diameter rod (I used 9/32" piano wire) and the sharpened end is bent ninety degrees to form the locating "leg". Cross-drill and tap the punch shank to accept a setscrew which will be used to lock the adjustment of the locating leg. Although punches are generally regarded as being a fairly tough steel, I had no trouble drilling a pilot hole through mine with an 1/8" dia. TiN coated bit running at 1500 RPM and using a coolant. The dimensions of things are not critical, but care should be taken to insure that the lengths from the cross arm to the tips of the punch and locating leg are identical.



To use the device, set the desired distance between the tip of the punch and the locating leg, lay out a longitudinal reference line on the work, and punch the location of the first hole. Then place the point of the locating leg in the first mark and punch a second mark on the reference line. This sequence continues for the remainder of the layout as the locating point is placed in each successive punch mark, a new mark is punched on the reference line, and the process is repeated as needed.

Reprinted from January 2017 edition of "The Upset", newsletter of the Mississippi Forge Council and the Indiana Blacksmithing Association, the Forge Fire

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Northeast Blacksmiths holds its meets twice a year at the Ashokan Field Campus in New York State.

The Ashokan campus is located in Olivebridge, N.Y., several miles west of Kingston, N.Y. The meets are held around the first weekend in May and in the first weekend in October every year. The main demonstration is in the blacksmith shop and there is a "Hands On" workshop for beginners. A different demonstrator is brought in for each meet. Food and bunkhouse style lodging are provided as part of the cost of the weekend long meet.

Contact : Tim Neu to register for hammer-ins or subscribe to the newsletter;
Tim Neu,
511 Beaverkill Rd.,
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