

# N.J.B.A. Newsletter

NJBA Volume 21, Issue 4      4 May, 2018

## Upcoming Events

Many of our meets feature an "Iron in the Hat" drawing (fund raiser), so be sure to bring a contribution. Tailgate sales are permitted at many of our events. See p. 2 for Directors' contact information.

### Sun., May 20, Walnford Day

NJBA will demonstrate blacksmithing to the public. Members are welcome to participate. Contact NJBA Director Bruce Freeman for info.

### Sat., May 26. Advanced Damascus Workshop

See announcement on this page.

### ~~Sat., June 9. Anvil Repair Workshop~~

*This workshop has been cancelled due to lack of sufficient preregistrations.*

### Sat., July 7. Princeton U. Open Forge Meet

Princeton U. will be hosting a summer open-forge meet for students. *Volunteers are solicited to help. Contact NJBA Director Ryan Amos if you would like to assist.*

### Mon.-Sun., Aug. 6-12. Middlesex Co. Fair

NJBA has been again invited to demonstrate at the fair. *Volunteers will be needed to demonstrate to the public from 5-9 PM all seven days. Contact NJBA Director Damian Toryak if you'd like to participate.* General questions should be directed to NJBA Director Bruce Freeman.

### August 19, Red Mill Picnic and Tailgate Sale

Mark your calendar.

### Sat., Sep. 15. Days of the Past Engine Show

Former NJBA Director John Choborda has been demonstrating at this show for a dozen years or so. He will be there with his blacksmithing trailer on Sat., Sep. 15. Others are welcome to join him.

### Sat., Sep. ? (TBD) Picnic & Open Forge Meet

The 2017 event was in June and was rained out. After some discussion, this year's even was moved to September, but the date is yet to be set.

### Autumn Workshops (Dates TBD)

Professional swordsmith and knifemaker Mark Morrow plans to hold three workshops this coming autumn, a **tong-making workshop**, a **trade-axe-making workshop**, and a **steel-smelting workshop**. Watch for additional information.

*It is time to renew your membership and vote for the nominees to the NJBA Board of Directors.*

*See the ballot and renewal form later on the last page of this issue.*

## REGISTER NOW!

### Advanced Damascus Workshop, May 26.

This workshop will be more advanced than previous Damascus workshops. The fee for this workshop is \$150, plus a \$50 material fee due when registering & reserving your place in the workshop.

The workshop is limited to 6 participants. Your \$20 membership dues are payable at workshop, if you haven't already paid them. Contact NJBA Director Mark Morrow (at swordsmith2001@verizon.net or 732-458-5823) for further information. and to register. Tailgate sales welcome.

*Note: Tasks performed at these workshops are limited to the projects being taught, and no other.*

# **New Jersey Blacksmiths Newsletter**

## **NJBA Board of Directors**

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### **Damian Toryak**

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damiantoryak@yahoo.com

We like to thank those who joined NJBA as  
Business Members:

**Marshall Bienstock**

**Eric Cuper**



## **ABANA CONFERENCES -- 2008 & 2010**

**Wed., Jun 27 – Sat., 30 Jun, 2018.** ABANA 2018 Conference Meadow Event Park Richmond, Virginia. Visit ABANA.org for further information.

**Summer, 2020.** ABANA 2020 Conference. To be held near Saratoga Springs, NY. At this past Ashokan meet, Bruce volunteered the loan of our lightweight forges. For information or to volunteer for this event, contact Rand Condell at the Adirondack Folk School, 518-696-2400, P.O. Box 2, Lake Luzerne, NY 12846

# **New Jersey Blacksmiths Newsletter**

## **Official NJBA Address**

**NJBA, P.O. Box 224**

**Farmingdale, NJ 07727-9998**

## **NJBA's Website:**

<http://www.njblacksmiths.org>

## **NJBA's Facebook Page:**

<https://www.facebook.com/njblacksmiths/>

## **NJBA's Private Yahoo Group...**

Send an email to [crankybellows@gmail.com](mailto:crankybellows@gmail.com), including your name e-mail address, and an invitation will be sent to you.

## **NJBA's IForgeIron subforum:**

Scroll down at

<https://www.iforgeiron.com/>.

## **NJBA Newsletter:**

[njblacksmiths.org/archive/index.htm](http://njblacksmiths.org/archive/index.htm)

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

## **Participation in Hands-On Events**

Participation in NJBA-sponsored hands-on events is limited to adults (i.e., 18 years or older).

This rule was effected as of December 2016, when NJBA was having problems with its insurance coverage (which has since replaced).

This policy applies to workshops, open forge meets, demonstrations, etc.

This policy *does not* apply to open forge meets and similar events that are sponsored by youth-oriented organizations such as scouts or schools with the aid of NJBA equipment and members.

## **New NJBA T-Shirts Now Available**

We have recently received our new NJBA T-shirts. These navy blue heavy-duty pocket T's bear the anvil logo (below left) on the pocket and the vise logo (below right) on the back.

Prices are \$20 for sizes M, L & XL, or \$25 for sizes 2XL & 3XL.

NJBA Sweatshirts are still available at \$25 each for all sizes.

These T-shirts and sweatshirts may be purchased at the above prices at our Monday evening open forge meet at Marshall's Farm, and we expect to have them available as well at our upcoming workshops and meets.

If you wish to order them by mail, a postage and handling charge of \$10 for one sweatshirt or up to two T-shirts. For further information, contact NJBA Director Bruce Freeman.

## **Open Forge Meets**

Anyone 18 years or older is welcome to try their hand one time at our open forge meets. NJBA members may participate any time the forge is open. (The application form is on the last page of this newsletter.)

### **Monday Night Open Forge, Howell, NJ**

NJBA Director Marshall Bienstock hosts an open forge meet every Monday evening at 7 PM, except major holidays. (Please call ahead on holidays to make sure the forge will be open.)

### **Sunday Open Forge, Smithtown, LI, NY**

**From the beginning of November through the end of April**, Ron Grabowski will open his forge in Smithtown, LI, NY, to NJBA members. Please call ahead to confirm and get directions: 631-265-1564. [Ronsforge@aol.com](mailto:Ronsforge@aol.com)

# **New Jersey Blacksmiths Newsletter**

## **Volunteers Needed**

NJBA is a volunteer-run organization. To continue to function and to deliver the benefits you have become used to, we need members to step up to help out. Mostly, the help we need is in demonstrating to the public and in running meetings or workshops.

If a member becomes a regular, reliable contributor, we may elect him to the NJBA Board of Directors so that he will have a voice in the operation of the organization. (See "NJBA Bylaws" at [njblacksmiths.org](http://njblacksmiths.org).)

### **We are currently soliciting volunteers to help at these upcoming events:**

- **Sat., July 7. Princeton U. Open Forge Meet**

A number of volunteers are needed to man the coal forges (keeping the fires burning) and to provide elementary instruction to novices. Contact NJBA Director Ryan Amos ([rbanos@princeton.edu](mailto:rbanos@princeton.edu)) for information or to volunteer.

- **Mon.-Sun., Aug. 6-12. Middlesex Co. Fair**

Several volunteers will be needed to demonstrate blacksmithing to the public from 5-9 PM all seven days. Contact NJBA Director Damian Toryak ([damiantoryak@yahoo.com](mailto:damiantoryak@yahoo.com)) if you'd like to participate.

If you would like to put yourself on a list of members to be contacted when we need assistance, please complete and return the volunteer form (and ballot and membership renewal) on last page of this newsletter.)

## **Lawrence Fogg**

Longtime NJBA member, Larry Fogg, passed away at home this past April at the age of 75.

Larry resided in Readington Township for over 45 years. For most of that time he was a member of the Readington Volunteer Fire Company.

Throughout his life, Larry enjoyed a variety of interests and hobbies: biking, bird watching, blacksmithing, car rallies, dog training, fishing, gardening, hunting, kayaking, photography, volleyball, wine-tasting and sailing.

He also enjoyed summers at the Jersey shore at family homes in Sands Point Harbor and Lavallette, where a favorite activity was attending The Pinelands Cultural Society's Albert Music Hall.

Larry is survived by his daughters Krystal Carr (Jens) and Autumn Hobbs (Graham), six grandchildren (William, Wyatt, Everette, Sylvi, Austin and Garrett) and his long-time companion, Mary Neary.

*(Obituary derived from Legacy.com)*


## **NJBlacksmiths.org is Now Secure**

by Ryan Amos

In recent years an important web protocol, HTTPS, has been gathering increasing attention. HTTPS protects users and websites against attackers spying on or modifying their communication. Projects like HTTPS Everywhere and Let's Encrypt, as well as Chrome, Firefox, and other browsers' HTTP warnings have pushed for every website to move to HTTPS.

To keep up, we've adopted HTTPS on NJBlacksmiths.org. From now on, when you visit

our website, you should see the green lock symbol. If you don't see that lock, on our site or any other, don't trust the site. Don't enter any passwords, payment details, or click on any links that might ask for your personal information.

 **Secure** | <https://www.njblacksmiths.org>

This change means that when you open our website, you know what you're reading is what we sent you, and no one has spied on it. This also opens the door for us to have user interactions that require more trust; for example, we're considering adding online membership renewal.

## Forging Tongs- Part One

### Lesson 22A- Forging the Jaws

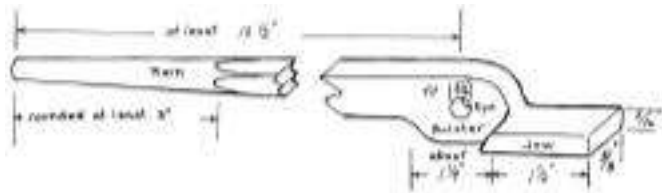
Text By Jay Close

Photos by Jane Guilden and Jay Close

Drawings by Tom Latané

*Introduction:* There are many tong forms serving myriad functions, and there are diverse approaches to this common tool. Some smiths collect tongs in profusion; others get by with a small number. Some like alloy steel for tongs; others find mild steel adequate. The tongs discussed here are basic, forged from mild steel and, except for those used in punching, these tongs can be made without the use of tongs.

*Intent:* The lesson is designed to familiarize the learner with the basics of tong forging. The student will practice basic forging operations including drawing down, hot punching, drifting, shouldering, rounding, cutting and upsetting. These operations come together forging a set of flat jaw tongs using 5/8 inch square bar and drawing down the reins. Drawing 1 illustrates one side of the tongs discussed here. Dimensions and the terms used for the major parts of the tongs are included.



*Drawing 1.*

*Material:* 5/8 inch square mild steel at least 24 inches long.

5/16 inch round mild steel for the rivet.

*Tools:* Basic forging tools including a hot punch and drift to make a 5/16 inch diameter hole; a post vise will be useful but is not a necessity; layout tools including a rule, dividers and center-punch.

*Procedural Overview:* Each half of the tong is forged identically; there is no left and right jaw.

To create the jaws and pivot bolster, three, one - sided shoulders are forged on the rounded edges of the anvil. Become confident with these three shoulders, their order and where on the anvil they are forged before proceeding. There is no time to puzzle over where to hit. Rehearse these shoulders in the workshop between your ears.

Photos 1 through 5 show the shoulders that start the tongs. You will review these photos later in the lesson too.

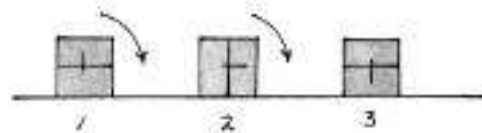
*Hint:* For a learner without an experienced coach, it may be wise to go through the procedure with an appropriately sized "bar" of

modeling clay.

**Shoulder One**— made on the near rounded edge of the anvil.

Step in the bar about one half of its thickness the full amount of the stock lying on the anvil. Address sideways spread keeping the jaw the same width as the parent bar. (Photos 1 and 2).

**Shoulder Two**— made on the far rounded edge of the anvil after tumbling or rotating the bar 90 degrees to the left. That is rotate



*Drawing 2- Tumbling a bar around its long axis, as viewed from the free end of the bar. The rotation would be to the smith's left.*

the bar around its long axis so the adjacent face of the bar is positioned uppermost. Drawing 2 illustrates the idea.

This shoulder comes at the base of the first one. Many smiths will also slightly angle the bar at about 30 degrees off perpendicular to the axis of the anvil. Here you want sideways spread. Again, reduce the bar thickness by about half. See Photos 3, 4 and 5.

**Shoulder Three**— also made on the far rounded edge of the anvil after another left hand turn or tumble of 90 degrees. Photo 6.

This shoulder defines the pivot bolster and the start of the reins.

After the jaws are forged and the pivot bolster defined, a pivot hole is hot punched and drifted.

The reins are drawn out using the anvil horn and the reins are smoothed on the anvil face.

The two tong halves are riveted together. Once assembled, they are sized to fit a specific bar thickness.

*Note:* directions assume a right handed smith forging tongs used principally in the left hand. Tongs for a left handed smith that will be held primarily in the right hand are sometimes made with 90 degree tumbling to the right. The slight offset in the handles to the left or to the right seem to better conform to the anatomy of the left or right hand. Many smiths do not bother with the distinction or bend the reins in vertical alignment creating a neutral grip

**Step One** (layout):

Cut a length of 5/8 inch square mild steel a minimum of 24 inches long. This will provide sufficient length to forge both halves of the tongs without use of tongs.

Put two centerpunch marks (or some other permanent layout mark) on the bar. The first should be 5 and 1/2 inches from the end of the bar and the second should be 11 inches from the end.



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See Photo 7 for the layout. These marks indicate the material for each tong half.

A layout easily seen when the bar is at heat can be made by placing a deep centerpunch mark very near the edge of the bar. If the mark is near enough to the edge, the steel bulges out from the bar looking like the bulging eye of a frog. Prominent "frog's eye" layout marks save precious time lost searching for more subtle indicators.

## **Step Two** (first shoulder):

The student should review previous lessons on shouldering at the near and far edges of the anvil using half faced hammer blows.

Heat the end of the bar to a yellow and place 1 inch of it on the anvil face at the near rounded edge of the anvil. Hold it horizontal and perpendicular to the edge of the anvil as in Photo 8.

*Hint:* if you need, place a chalk or soap stone mark on the anvil so you can readily repeat the over lap. With practice such an aid will not be necessary.

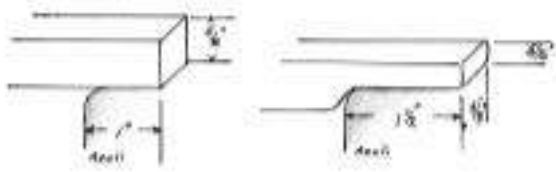
With half face hammer blows sink a vertical shoulder reducing



*Photos 1 and 2.*

the thickness of the bar by about half all the way to the end of the bar. You want a parallel sided extension that will become the tong jaw.

Eliminate sideways spread, keeping the bar 5/8 inch wide as you forge. See Photos 1 and 2.



*Drawing 3- The first shoulder, made on the near edge of the anvil, to form the jaw.*

The higher the heat and the harder you hit the more readily this shoulder will develop.

Drawing 3 shows the needed result with approximate dimensions.

Target: This shoulder is readily forged in one heat. With practice you may be able to forge more than one shoulder on the same



*Photos 3 and 4.*



*Photos 5.*

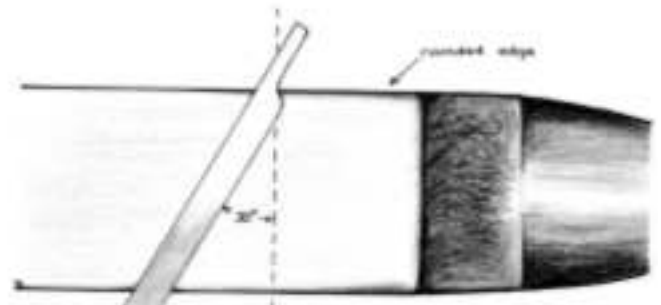
heat, but it is critical to set shoulders at the highest possible temperature. Do not extend a heat attempting to do more than the temperature allows.

As the bar drops to orange temperature, get it back in the fire.

## **Step Three** (second shoulder):

The second shoulder is made by tumbling or rotating the bar 90 degrees to the left and repositioning it on the anvil. See Photos 3, 4 and 5.

Place all of the drawn down portion of the first shoulder extend-



*Drawing 4- The second shoulder, made on the far edge of the anvil, to form the bolster. The 30-degree angle forms a slightly stronger transition between the jaw and bolster..*



*Photos 6 and 7.*

ing off the far side of the anvil so the base of the shoulder aligns with the far rounded edge. Keep the bar flat on the anvil face. Drawing 4 shows the positioning of the bar for the second shoulder. Note that the bar is swung about 30 degrees to the left. This makes the joint a bit more refined. It is permissible to simply hold the bar straight across the anvil.

At a yellow heat, hit flat, half-faced hammer blows.

Thin the bar to about half of its starting thickness and create symmetrical sideways spread. You ought to be able to get 1 inch of spread and about 5/16 inch thickness. Photo 5 shows the result.

Work this reduced thickness down the length of the bar for about 2 inches. This gives a head start in drawing the reins. See Photo 6.



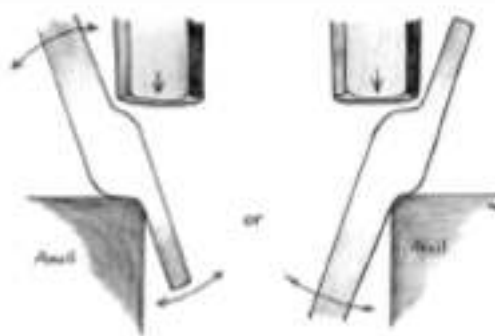
*Photos 9 and 10.*

*Forging dynamics*— because this spreading and shouldering is accomplished entirely from one side of the bar, the spread in cross section can be expected to be slightly wider on the top than the bottom. This is evidence of the differential impact of the hammer blow as opposed to the anvil on the hot bar. The harder you hit and the hotter the temperature, the less this asymmetry develops.

#### **Step Four** (third shoulder):

The third shoulder requires another tumble of the bar 90 degrees to the left. This orients the flat you made in Step Three vertically.

If you spread the bar to one inch in width when making the second shoulder, you now want to place that same amount of the spread bar extending off the anvil. Compare Photo 9 and Photo



*Drawing 5- Dressing the shoulders, which defines the bolster.*



*Photos 11 and 12.*

10. These photos show use of dividers to compare dimensions for explanatory purposes; in forging make this an eye judgement.

At a yellow heat, hit hard, half face blows to forge the third shoulder. Be sure you are using the rounded edge of the anvil. See Photo 11.

Control the bar dimensions. Define the pivot bolster and begin to draw the start of the reins. At this point retain the 5/8 inch width of the bar but reduce the thickness to match that of the bolster.

Your results should look like Photo 12.

Hint: After the third shoulder is established use the horn of the anvil as much as possible to do all subsequent drawing out of the reins. The rounded form will greatly enhance the stretching effect of your hammer blows and speed the work significantly.

You can refine the bolster shape by working it on the anvil as shown in Drawing 5. You can even selectively cool one edge to retain its form while the opposite side is altered. You want a symmetrical “football” or lozenge shape to the bolster area.

Often the transitions between the first shoulder and the second when forged on the rounded edges of the anvil will develop a “web.” The transitions will not be crisp and angular, but will flow into each other reflecting the curve of the anvil edge. Attempting to forge this web away will often result in a cold shut, so it is preferable to leave it for now and do a bit of file clean up as necessary prior to final assembly.

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*Photos 13 and 14.*

## **Step Five (punching):**

Review previous lessons on punches and hot punching.

The most efficient forging procedure is one in which each section is completed before moving to the next. This avoids reheating areas that have been left incomplete after they are cool.

While some smiths will reheat and punch the pivot hole after the rest of the tongs are done, efficiency dictates that now is the time to punch the pivot hole. With care drawing the reins, there



## **Demonstrators Needed**

**East Jersey Olde Towne** in Piscataway NJ is looking for blacksmiths to demonstrate to school groups and the public weekdays and weekends starting in the spring 2018 and through the fall. The Historic Village is open 8:30 till 4:00 PM and is located in Johnson's Park across River Road from Rutgers's Stadium.

Anyone who is interested can contact Matthew Stroh at EJOT [732.745.3030](tel:732.745.3030) Ext 304. More information can be found at <http://www.middlesexcountynj.gov/Government/Departments/BDE/Pages/East-Jersey-Olde-Towne-Village.aspx>

Bob Bozzay ([robert.bozzay@gmail.com](mailto:robert.bozzay@gmail.com)) currently works there two days a week. He can provide additional information.

should be little or no distortion of a hole punched at this stage.

Punch the center of the bolster using a hot punch about 1/4-inch diameter on the end.

Remember to start punching from the outside of the joint with the jaw off the anvil at the far rounded edge. See Photo 13. When you flip the work 180 degrees to complete the hole and then move to the pritchel hole or punching block to free the slug or "biscuit," the flat outside of the joint will lie flat on the anvil face. See Photo 14.

Drift the hole to 5/16 inch diameter.

## **Target:**

Punch and drift the hole in a single heat. The hole should be centered in the mass of the pivot bolster.

This lesson is concluded in the next issue with Controlled Hand Forging Lesson 22B, "Drawing The Reins."

*Acknowledgments: Photos by the author and by Jane Gulden. Thanks to the American College of the Building Arts ([www.buildingartscollege.us](http://www.buildingartscollege.us)) for encouragement writing this lesson.*

## **Champion Contractors' Forge**





## Forging Tongs- Part Two

### Lesson 22B- Drawing the Reins, Assembly and Adjustment

Text By Jay Close

Photos by Jane Guilden and Jay Close

Drawings by Tom Latané

#### Lesson 22B- Drawing the Reins, Assembly, and Adjustment

##### Step Six (drawing the reins):

There will be about 2 inches or 2 and half inches of unworked bar left before the layout mark you made in Step One. Photo 15 shows the bar, the forged jaw and pivot bolster with punched hole along with the unworked bar left to form the reins.

Ideally, the jaw and pivot bolster are in their final form and there should be little reason to reheat them. Efficient forging technique dictates that the reins be drawn out sequentially working



Photo 15.

from the bolster to your cut-off mark, finishing each section before moving to the next.

We are forging tongs without using tongs so heat transfer to the holding hand may be an issue. A longer starting

bar can overcome this, but too long a bar can be awkward. A gloved hand is an option, but this too has drawbacks (see note below regarding the gloved hand). Regular cooling of the bar in the slack tub is also a useful strategy.

Another technique that can be used is to forge a "heat stop." When an abrupt change in the bar mass exists and the heat is transferring from the smaller mass to the larger, the heat transfer will be dramatically slowed at the juncture of the two masses. We can use this to good effect in forging these tongs.

Take a yellow heat on the area near the layout mark. Set the bar on the near rounded edge of the anvil with the layout mark about 1/2 inch from that edge. See Drawing 6. Keep the work as horizontal as possible. Forge a shoulder here on two adjacent flats of the bar.

Hit the bar with half faced hammer blows driving it into the rounded corner of the anvil. Rotate the bar 90 degrees— left or right, it does not matter— and forge in a shoulder adjacent to the first. Work back and forth between the two shoulders using the "hit turn, hit turn" rhythm you learned when drawing a taper.

Work these two shoulders until the bar is reduced to about half of its original dimension or 5/16 inch square at the shoulder. Photo 16 shows the result.



Drawing 6.

**Target:** Take no more than two heats to reduce the bar to 5/16" square at the shoulder.

You have dramatically

reduced the bar mass at the adjacent shoulders. This should help reduce heat transfer to your holding hand.



Photo 16.

You have also established a target dimension on the small end of the reins. With the pivot bolster forged to final form and the small end

target dimension established, the drawing down of the reins becomes a matter of working the mass in the middle into final form.

Move to the horn and draw the rein striving for an even taper in width from the bolster at about 5/8 inch wide to the adjacent shoulders at about 5/16 inch wide. Retain the bar thickness of about 5/16 inch from the bolster to the shoulders.

Use the horn to accomplish 90% of the mass reduction and then move to the anvil face to refine the shape and surfaces. Even using the horn to best effect expect to take several heats to draw down the mass of the rein. (Photo 17)

Once the mass in the middle of the rein is reduced over the horn and the rein has begun to stretch, you should re-establish the linear and sequential approach to drawing down: work a short section complete in each heat; rough it on the horn and finish on the anvil face; work down the length of the rein finishing the area near the "heat stop" last. Compare Photos 17 and 18.

Photo 19 shows the reins drawn and the shape refined.

At the end of your heat cut the bar free on the hot hardy (Photo 20).

The shape is shown in Photo 21 compared to a completed forging.



Photos 17 and 18.

ing.

##### Step Seven (finishing the reins):

The tong blank should be at least 12 inches overall. With care this is enough length to hold the jaw in the hand while finishing. The faster you work the less heat transfer there will be, but if the jaw gets uncomfortable to hold, cool it in the slack tub.

As the bar heats in the forge, keeping a sopping wet rag on the end you want to hold is another strategy to help maintain a bar cool to the touch.

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*Photos 19, 20, and 21.*

*Hint:* As a point of preference many smiths work with a gloved left hand which allows them to hold a workpiece that might otherwise be too hot to handle. The drawback to this practice is that it can instill the habit of grabbing a bar without first testing for radiant heat. Tongs are designed for holding hot bar. Otherwise, keep the bar cool to the touch.

With a yellow heat on the end of the bar, draw the remainder of the 5/8-inch square stock. Continue the taper from the bolster to the end.

To keep a cold shut from developing, your first hammer blows on each shoulder should hit at an angle. This pushes the upper edge of the shoulder forward toward the end of the rein. Photo 22 shows the shoulders being struck this way.

*Note (forging dynamic):* The forged material will move in the path of least resistance. When striking straight down on a corner, the path of least resistance is into the open air. The corner flows out. If that corner is the top of a shoulder being forged flat, the outward flow can result in a cold shut as illustrated in Drawing 7. Avoid this by first hitting the corner at an angle.



*Photo 22.*

Forge the end of the rein to 5/16 inch square using the horn to accomplish most of the forging (Photo 23).

Round the square section end of the rein. It should look like Photo 24 with at least 3 inches of the rein rounded in section for a comfortable grip. See previous lessons on the proper rounding technique.

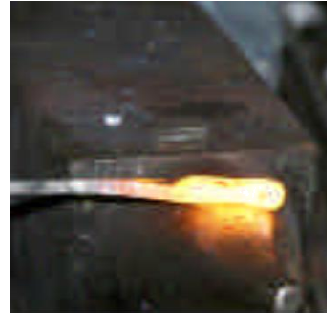
The tong blank should look like Photo 25 and measure

at least 12 to 13 inches from the center of the pivot hole to end of the rein.

If needed, adjust the jaw on the anvil so that it is parallel to the rein. We will alter that in fitting to a specific bar thickness, but parallel is a good place to start. Drawing 8.

## Step Eight (the other half):

If you began with a 5/8-inch square bar 24 inches long, 18 1/2 inches of it remains after cutting away the first tong half. Keeping the held end cool, repeat the above eight steps forging the second half of the tongs.



*Photos 23 and 24.*

## Step Nine (assembly):

Match the tong halves for length of the reins measuring from the center of the pivot hole. Match for the width and thickness of the jaw. It may require reheating one or both of these tong halves to make needed adjustments. Once assembled, changes are awkward.



*Photo 25.*

ward.

Assure yourself that the halves accurately mate with the punched holes aligned. Sometimes the bottom of the shoulder at the base of the jaw needs to be filed so the halves lie flat to each other. This is the “web” mentioned in Step Four. Photo 26 shows the problem area corrected.



*Drawing 8.*

Use a convenient length of 5/16 inch diameter bar for the rivet. It should be an easy sliding fit in the two pivot holes. If not, slightly forge the rivet stock smaller in diameter or open the pivot holes by re-drifting (they may have distorted in completing the jaw blank) or by filing with a round file.

At light orange heat cut a ring around the bar on the hot hardy 1

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and 1/4 inches from the end so that it is almost cut through. See Photo 27. A set of dividers with this distance between the points makes a useful reference. This length of stock will allow a bit more than the equivalent of one diameter length of the stock to extend on either side of the join. Reference Drawing 9. Keeping the rivet stock attached to the end of the bar provides a handle for the next heat.

Take a light orange to yellow heat on the rivet. Holding the tong halves in their proper orientation, insert the rivet and twist off the excess stock setting it aside.

Work quickly with the peen of your forging hammer to spread the rivet on one end. Flip the assembly to address the other end



Photo 26.

in the same way. Keep the tongs properly aligned and the inside surfaces of the pivot bolsters in contact.

Make sure that the amount of rivet on either side of the joint is approximately equal. Make needed corrections by placing the short side into a thick bolster block or into the pritchel hole and tapping the long side down to match. See Drawing 10.



Photo 27.

Switch to the face of the hammer and flip the tong again. Forge down the edges of the peened end. Angle your hammer to make a short pyramid shape like Photo 28 on one

side then flip to develop it on the other end.

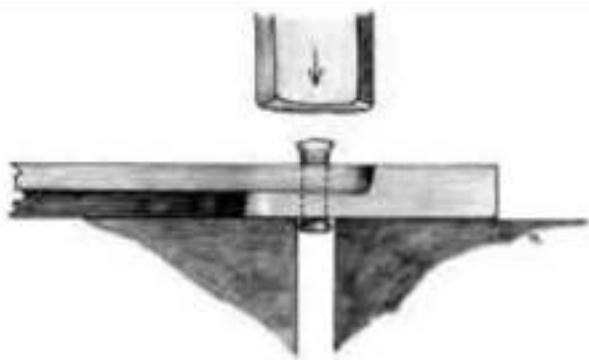
Turning back to the initial end (which will have lost its peak) work around the circumference of the head forging the edges down. Repeat on the other side.

You can continue to work opposite ends of the rivet this way as long as there is visible heat in the material. Once that visible heat has been lost, stop forging. The steel will be most prone to cracking at this temperature.

Photo 29 shows the assembled tongs.



Drawing 9.



Drawing 10.

Hint: If the rivet is not sufficiently headed on this one heat, you can work the head once it has cooled to room temperature. If you feel it necessary to take an additional heat to finish, do so with the following caution: heating in the forge it will be impossible to heat the rivet without also heating and softening the bolster around it. In re-heading, if you hit straight down on the rivet you will upset it through its entire length. It will quickly shorten as the hole surrounding it will widen to accommodate the rivet's increased girth. Worked to an extreme, you can forge the rivet flush with an ever expanding bolster and no rivet head. Consequently, when taking a second heading heat, only work the edges of the rivet head, angling your hammer and drawing the edges down to the bolster surface.

Note: Some smiths use a round faced hammer for heading rivets in this way or a ball peen. Both can be effective, but the job can



Photos 28 and 29.

be accomplished well with the regular cross peen forging hammer too.

**Step Ten (freeing the jaws):**

Likely you have riveted the tongs tightly together so they will not move. Free the jaws by putting the pivot area of the tongs in the forge fire and heating to a bright red or orange heat. Pull them from the fire and work the reins open and closed through their full range of movement. Keep moving them as the tongs cool to well below red.

Make sure the tongs do not distort while doing this.

Hold the tongs horizontally as if gripping a bar. The tongs should fall open when the fingers release the bottom rein. There should be no sticking or tight spots. If this is not the case, they



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may need another round of heating and working.

## **Step Eleven** (adjustment):

These tongs can be sized to hold anything from sheet to a bar about 1/2 inch thick. Above 1/2 inch thick usually requires a slightly different set up for the jaws.

We will size these tong to hold 1/4 inch thick flat bar.

Select a short piece of 1/4 inch thick scrap bar as the "sizer." Three or 4 inches long is plenty.

Heat the jaws of the tongs to an orange heat and grab the sizer bar in the tongs. There ought to be enough grabbing effect even with the heated jaws to accomplish this.

Place the jaws on the anvil and forge them to fit with careful hammer blows. Work both jaws equally so they are pushed into full length contact with the sizer bar.

If a post vise is available, it can be used to squeeze the jaws to the sizing bar. Photo 30.

Photo 31 show fitted tong jaws with each jaw making full con-tact with the bar.

In a similar fashion, the reins can be adjusted to a comfortable hand hold. Small adjustments can easily be done cold on the anvil. Greater change is best done at heat.

This is mostly a matter of changing the angle the reins make where they intersect the pivot bolster. Small changes there will cause significant changes in distance between the two reins where they are held.

A red heat on the area where the reins meet the bolster is usually sufficient, but creativity is often call for holding the assembled tongs on the anvil to effect the needed alteration.

If you have adjusted the reins on the anvil you will probably also need to recheck their fit to the sizer bar.

A post vise can ease the task of rein adjustment. Heat the reins where they meet the bolster and then put the sizer bar in place. Hold the jaws and sizer bar in the vise as illustrated in Photo 30 and manually adjust the reins for comfort and symmetry.

## **Targets:**

It is most important that the two halves of the tongs match. The measurements shown in Drawing 1 are a good guide. Following the method outlined you ought to match the dimensions of one tong half to the other to within plus or minus 1/8 of an inch in linear dimensions. Widths and thicknesses can be forged to within plus or minus 1/16 inch.

Plan on a heat each for the three shoulders needed for the jaws



*Photos 30 and 31.*

and pivot bolster.

Use one heat to punch and drift the pivot hole. That hole should be centered in the area of the pivot bolster.

Drawing down the reins may take several heats. From the point that the bolster is punched and drifted, use no more than ten heats to produce a ready-to-assemble tong half.

The tongs should tightly grip the bar they were sized to fit, in this case 1/4-inch-thick flat bar. Hold the "sizer" bar in the tongs and the free hand should not be able to easily dislodge the bar from the tong grip.

The joint should work freely without sticking. With the tongs horizontal, as if holding a bar, the bottom rein should fall completely open without sticking when it is released by the fingers.

The reins should be a comfortable distance apart when holding the appropriate dimension bar stock.

The reins should be symmetrical, virtual duplicates of each other.

## **Further Steps:**

Now that you can make tongs, having tongs opens up two more effective approaches to their forging.

1. The first alternative is to proceed as outlined above through Step Five (punching of the pivot hole). At that point cut the forging free at the layout mark. Then use tongs to hold the jaw while the rein is drawn down. Try to organize your forging in a sequential manner. Heat a small section to yellow and draw it on the horn of the anvil. Finish the shape on the anvil face to final dimension then move to the next section.

2. The second alternative forge welds round stock onto the jaw blank using a drop tong scarf weld. This, of course, saves the effort of drawing down the reins. Review the prior lessons on welding.

Less than 3 inches of the 5/8 inch square stock will be needed for each jaw. About 9 inches of round stock 3/8 inch in diameter is about right for each rein.

After forging the third shoulder and drawing a bit of the transition to the reins, leave the bar about \_ inch square on the end and forge a scarf. Note that the scarf must be oriented so that the jaw blank will lie on the anvil face for the weld.

Upset the round stock (the vise and a light hammer is useful for this) and forge it to about \_ inch square on the upset end and provide it with a scarf.

The drop tong weld proceeds in the normal fashion. After the two parts are joined, forge the area at the weld into a smooth transition from rectangular section to round section. Finally punch and drift the pivot hole.

A refinement of the welding procedure is to weld one jaw section to a round about 18 inches long, enough for two reins. Then weld the second jaw to the other end of the round and cut the two halves free before assembly.

*Acknowledgments:* Photos by the author and by Jane Gulden. Thanks to the American College of the Building Arts ([www.buildingartscollege.us](http://www.buildingartscollege.us)) for encouragement writing this les-son.

# New Jersey Blacksmiths Newsletter

**PABA Membership Application**  
2018 (Jan. 1 - Dec. 31) \$25

Name \_\_\_\_\_

Address \_\_\_\_\_

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Telephone # \_\_\_\_\_

E-mail \_\_\_\_\_

Do you have any particular skills (welder, accountant, carpenter, doctor) that may be helpful to the group or membership? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Please circle your skill level...

Beginner Intermediate Advanced Professional

*Note - Membership is per household.*

Make Checks payable to PABA.  
Send completed application and \$25 (one year) to: PABA Treasurer - Barbara Plant  
207 Lexington Road, Schwenksville, PA 19473

**PABA USE** Cash \_\_\_\_\_ Check # \_\_\_\_\_

New Member \$25 \_\_\_\_\_ Renewal \$25 \_\_\_\_\_

New Member after June - June-Dec. price \$10 \_\_\_\_\_

## Northeast Blacksmiths Association

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.,

Olivebridge, N.Y. 12461

For more information check the web site;

**[www.northeastblacksmiths.org](http://www.northeastblacksmiths.org)**

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New Jersey Blacksmith Association  
90 William Avenue  
Staten Island, New York, 10308  
Attn: Larry Brown, Editor

## NJBA Membership Renewal, Ballot, and Volunteers' List

*(Please check your mailing label for the year your membership expires. If 2018 or less, your dues are due immediately, and must be paid for your vote to count. If 2019 or greater, you may vote without making any additional payment.)*

Mail completed renewal form and ballot, along with check for dues, to:  
**NJBA Election, P.O. Box 224, Farmingdale, NJ 07727-9998**

Name \_\_\_\_\_

Address \_\_\_\_\_

City, State, Zip \_\_\_\_\_

Phone Numbers: Day \_\_\_\_\_ Eve. \_\_\_\_\_ Cell \_\_\_\_\_

Email address \_\_\_\_\_

**My check is enclosed:**      ☐ \$20 (regular membership dues), or  
   ☐ \$40 (business membership dues)

### Ballot

To vote for a nominee, please check the box next to his name.

☐ **Check here** to vote for ALL nominees.

Nominee	Nominee	Nominee
<input type="checkbox"/> Ryan Amos	<input type="checkbox"/> Dave Ennis	<input type="checkbox"/> Mark Morrow
<input type="checkbox"/> Billy Barrett	<input type="checkbox"/> Bruce Freeman	<input type="checkbox"/> Al Mottram
<input type="checkbox"/> Marshall Bienstock	<input type="checkbox"/> Tony Fresolone	<input type="checkbox"/> Bruce Ringier
<input type="checkbox"/> Larry Brown	<input type="checkbox"/> Ron Jani	<input type="checkbox"/> Ben Suhaka
<input type="checkbox"/> Eric Cuper	<input type="checkbox"/> Tom Majewski	<input type="checkbox"/> Damian Toryak

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### NJBA Volunteers List

"Please put my name on the list of potential volunteers:" (Circle all that apply.)

<b>Availability:</b>	Saturdays	Sundays	Weekdays
<b>Interests:</b>	Demonstrating	Coaching Novices	Assisting at Workshops
<b>Experience:</b>	Novice	Intermediate	Experienced Professional