

BOARD OF DIRECTORS

Gary Phillips '18 President:
14800 N SR 167 N
Albany, IN 47320
(765) 789-8316
behere@netdirect.net

Steve King '18
1155 S. Paoli Unionville Rd
Paoli, IN 47454
(812) 797-0059
kingknives@live.com

Bill Conyers '19 Vice Pres
50964 Lilac Rd,
South Bend, IN
(574) 277-8729
billconyerssr@yahoo.com

Bill Newman '19
4655 Williams Rd
Martinsville, IN 46151
(317) 690-2455
ruralsmiths1@yahoo.com

Dominick Andrisani '16
3608 Capilano Drive
West Lafayette, IN 47906-8869
(765) 463-4975
andrisan@purdue.edu

Ted Stout '16
8525 W 700 S
West Point, IN 47992-9258
(765) 572-2467
stout8525@tds.net

James Johnston '17
Education Chairman:
806 Twyckingham Lane
Kokomo, IN 46901-1885
(765) 452-8165
kokomoblacksmith@comcast.net

Keith Hicks '17 Secretary:
5184 State Road 252
Brookville, IN 47012
(765) 914-6584
keithhicks2011@gmail.com

Librarian:
Larry Rosenthaler
8715 E. 375 N
Churubusco, IN 46723-9501
260-693-3267
lrosenthaler@gmail.com

Editor:
Bill Kendrick
1280 N 900 W
Seymour, IN 47274
(812) 445-3009
bill.d.kendrick@cummins.com

Treasurer and membership secretary:
Farrel Wells
8235 E 499 S
Dunkirk, IN 47336-8807
(765) 768-6235
fwells@frontier.com

Awards Chairman:
Charlie Helton
2703 South Water Plant Road
Westport, IN 47283
(812) 591-3119
heltoncs@frontier.com

December 2015

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.

The Indiana Blacksmithing Association, Inc., its staff, officers, directors, members, and hosts and the *Forge Fire*, specifically disclaim any responsibility or liability for damages or injuries as a result of any construction, design, use, manufacture or other activity undertaken as a result of the use, or application of, information contained in any articles in the *Forge Fire*. The Indiana Blacksmithing Association, Inc. And the *Forge Fire* assumes no responsibility or liability for the accuracy, fitness, proper design, safety, or safe use of any information contained in the *Forge Fire*.

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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.

Dec 12 2015 **DON REITZEL SHOP STILESVILLE**

Jan 16 2016 **TBD**

Feb 20 2016 **KEN DETTMER'S SHOP COLUMBUS**

Mar 19 2016 **TBD**

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Passing of Lonnie Salmon

It is with great sadness that we report the passing of IBA member and Bunkum Valley Metalsmiths member Lonnie Salmon. He passed away unexpectedly on October 30, 2015. He was a great guy who always had a smile on his face, was generous with his time and always willing to help anyone out. He will be greatly missed by our group.

Jim Malone, Forgemaster

Bunkum Valley Metalsmiths

Zile Estate Auction

The family of the late John and Arthenia Zile would like to announce the upcoming estate sale of their parent's belongings. The sale will be held Saturday, Jan. 9 starting at 10 a.m. at the Sulphur Springs Community Building in Sulphur Springs, IN, along U.S. 36 just west of Ind. 3. The facility is located one block off of U.S. 36 immediately north of the fire station. The auction will be conducted by Walther & Hawkins Auctioneers.

Included in the sale will be several blacksmithing tools as well as much art pottery, antique glass and china, books and other antiques and collectibles. Among the blacksmithing tools will be Fulton anvil (app. 120 lb.), Sanderson Sheffield anvil, Kohlswa Swedish anvil, 107 lb Mouse Hole anvil, 285 lb Mouse Hole anvil, 124 lb Peter Wright anvil, non-legible "N.Y." anvil (app. 140 lb), portable forge with blower (Dad used this for public demonstrations), customized leg vise with table (also used for demonstrations), Buffalo forge/blower/hood unit, nice Whitney Jensen shear, Badger State Machine Co. shear, two large leg vises, tongs, top and bottom swages, app. 70 feet of wrought iron fence made by the Muncie Arch and Iron Works, Muncie, IN, a large lathe, and other misc. tools.

A complete sale listing and pictures soon will be posted at www.waltherandhawkins.com and www.auctionzip.com.

The family would also like to thank the many wonderful blacksmithing-community friends of John and Arthenia who have been so supportive and helpful during the past few years. A special thanks goes out to each member of the Fall Creek Blacksmith satellite group, Jim Johnston, Alvin Cave, Brad Marcum and others, who all have helped preserve and spread dad's enthusiasm for the art and history of blacksmithing. We (and he would have been too) are so humbled and honored to be able to be associated with such a wonderful group of individuals.

Dates to Remember

- Dec 12 Hammer In at Don Reitzel's Shop
- Feb 20, 2016 Hammer In at Ken Dettmer's Shop

IBA Satellite Groups and News

Sutton-Terock Memorial Blacksmith Shop

Meet: 2nd Saturday at 9 AM
 Contacts: Fred Oden (574) 223-3508
 Dennis Todd (574) 542-4886

Wabash Valley Blacksmith Shop

Meet: 2nd Saturday at 9 AM
 Contacts: Doug Moreland (217) 284-3457
 Max Hoopengarner (812) 249-8303

Maumee Valley Blacksmiths

Meet: 2nd and 4th Saturday
 Contact: Clint Casey (260) 627-6270
 John Schamber (260) 579-7303

Rocky Forge Blacksmith Guild

Meet: 2nd Saturday at 9 AM
 Contacts: Ted Stout (765) 572-2467

Whitewater Valley Blacksmiths

Meet: 2nd Saturday
 Contact: Keith Hicks (765) 914-6584

Bunkum Valley Metalsmiths

Meet: 1st Saturday
 Contacts: Jim Malone (812) 725-3311
 Terry Byers (812) 275-7150
 Kathy Malone (812) 725-3310

Satellite 13

Meet: 4th Saturday
 Contact: Bill Newman (317) 690-2455

The Southern Indiana Meteorite Mashers

Our November meeting was the Saturday after Thanksgiving as is tradition, it was the Smoked Turkey Hammer-in. Held at Jeff Reinhardt's shop, he hickory smokes a turkey for the entree and all really step up the food. In fact we sorta ran out of space to lay out the food so we just had to start eating quick. The shop was full and got to 83F before we slowed down the wood stove. Although it rained all day we were warm and dry and held iron in the hat in a lean-to next to the shop so dry

there as well. Many items were demoed, but I could not keep up with all that was shown. Steve King demoed a Bull dog face hanger. Jeff reforged an engineers hammer to a diagonal peen. Pete Riddle finally attended another hammer-in after taking time to build a house and made horse shop curtain hold backs.

Billy Merrit attended and announced his retirement from being our forge master due to health. He nominated Mike Mills as Forgemaster and Steve King seconded the nomination. There were no other candidates nominated so a vote was held and Mike was elected Forgemaster.

Next meeting is December 26th at Dave Kunkler's shop in Branchville.

Jennings County Historical Society Blacksmith Shop

Meet: 2nd Saturday at 9 AM
 Contact: Ray Sease (812) 522-7722

Fall Creek Blacksmith Shop

Meet: 4th Saturday at 9 AM
 Contacts: John Zile: (765) 533-4153
 Larry Singer (765) 643-5953
 Farrel Wells (765) 768-6235

St. Joe Valley Forgers

Meet: 4th Saturday at 9 AM
 Contacts: Bill Conyers (574) 277-8729
 John Latowski (574) 344-1730

The Southern Indiana Meteorite Mashers

Contacts: Billy Merritt (812) 338-2876
 Steve King (812) 797-0059
 Jeff Reinhardt 812-949-7163

One-Armed Blacksmith's Shop

Meet: 1st Saturday
 Contact: Tim Metz (812) 447-2606

"Doc" Ramseyer Blacksmith Shop

Location: 6032W 550N, Sharpsville, IN 46060
 Meet: 3rd Sunday at 2 PM
 Contacts: Mike Kelley
 Charles Gruell (765) 513-5390



IBA Satellite Groups and News (continued)

Bunkum Valley Metalsmiths

The Bunkum Valley Metalsmiths held a meeting On December 5, 2015 . We had around 40 people in attendance. Kathy Malone made beaver roast . Everyone loved it. Thanks to all for the dishes and desserts. We have a great group.



Jennie donated some little anvils for the iron in the hat drawing. Thanks very much.. They were so cute.



We learned how to make a knot with metal.. Which was really amazing to me.



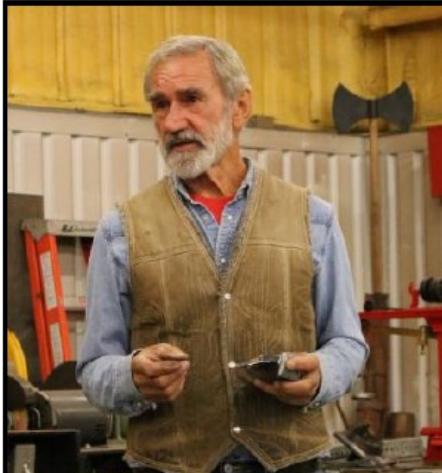
Gary was working on a leaf...his first one



Aaron taught Megan how to make a heart .
We all had a lot of fun. Can't wait till the next meeting.

Editors Note:

This article reprinted from the December edition of the Saltfork Crafts-men Artist-Blacksmith Association newsletter



Pattern Welding Demo

By Gerald Brostek

October 31, 2015

Story By Russell Bartling

Overview

In October, Gerald Brostek demonstrated his methods for pattern welding steel at the Route 66 Blacksmith Museum in Elk City for about 20 Saltfork members and guests.

Gerald started with a lecture outlining the basic concepts and materials used and differences between his artwork and knife making. Gerald started his experience with pattern welding in the mid 60's with his friend Bob Patrick. He made his first piece by welding O1 steel to wrought iron.



Fig. 1: Gerald's first attempt at pattern welding from 1968. Wrought Iron and O1 steel.

In those days he used strong nitric acid but now just uses warm vinegar to etch for the pattern. He said in the beginning, there was a lot of trial and error with a LOT of error. Now there is much more information available and many people constantly developing and sharing new innovative twists on the techniques.

Gerald pointed out that "pattern welded" is the correct term for what he does rather than "Damascus." Damascus is often used to describe pattern welded steel but true Damascus is a very special form of steel created in a complicated crucible process (also called "Wootz" steel.) Pattern welding involves forge welding layers of different steels into a billet with the intent of obtaining contrasting patterns when the billet is etched later.

The metals he uses for pattern welding are more for art and are selected for dramatic colors and high contrast in the layers rather than for actual use as edged tools. As such, the combinations of metals for artwork would not necessarily be the best choices for fully functional edge tools. Gerald also likes to get big, bold stripes rather than using more layers which would be more typical in knife making.



Fig. 2: A single bit axe by Gerald. Note the wide bands and dramatic contrast of layer colors.

Gerald uses a container method for forge welding where the stock is enclosed in a sacrificial "box" to control oxidation (more on this method later.)

The metals used must be forge weld compatible. Knife makers might use 1095 and 15N20 as they are compatible for welding, show a good pattern and have decent edge characteristics. (15N20 is 15% Nickel and 20% Magnesium.) Gerald usually adds pure Nickel to get even more contrast. Sometimes he uses 1084.

Pure Nickel has gotten pretty expensive. A 36" length of 1 1/2" x 1/8" pure Nickel bar can run about \$75. Gerald has started using Nickel 200 which is a much thinner sheet to control cost. Pure Nickel will not weld together well so it should never be together when layers are laid out.

Metals are also available in powder form and in varying degrees of fineness. (Some of the finer powders list the grain sizes in microns!) The powders are especially good for filling odd shaped voids when using the container method that Gerald uses. If metal powder is



Fig. 3: A sample of some metals available including powder form.

used, it is very important to tap the box while packing to ensure no voids are left in the layer material. Steel shot can also be used in combination with the powders to fill voids and create interesting patterns.

Gerald gets the dramatic colors by tempering the finished piece. Nickel always shows a sil-

ver where 1095 shows blues and purple colors. The Manganese in 1084 steel makes its colors darker where 1095 tends to be lighter.

To put the overall process into perspective, Gerald said that, generally, preparation takes an hour or two, welding takes only seconds, and finishing takes many hours.

The Demo

In his demo, Gerald used alternating strips of pure Nickel sandwiched between 1095 with 15N20 on either side of the 1095. The pattern repeated to fill a sacrificial box made from 1-1/2" thin walled square tubing. The box starts with one end welded with a square piece of mild steel. The other end will be welded on after packing. The layer strips were approximately 1-1/2" wide by 2" long and around 20 gage thick.

Since the layer material is contained in the box, no flux is used. The intent of the box is to serve the same main function of flux which is to keep oxygen away from the material to be welded. This minimizes any scale formation which would prevent the weld from taking



Fig. 4: Gerald packing strips into the box.

place.

For preparation, the strips must be very clean. Gerald scrubs them in the kitchen sink to remove as much of the oils and dirt as possible from the surfaces. It is good practice to hold the strips by the edges after they are clean to

avoid depositing more contaminants from the skin onto the mating surfaces.

When packing the box, it helps to place layers of paper on each outer surface to help prevent the box from forge welding to the layer material. Since initial welding is only done from the flat sides of the layer material, only they need the paper applied. "Smoking" up the inside of the box with black carbon from an Oxy-Acetylene torch also works to keep the box from welding to the layers.

After packing, the other end is welded onto the box to complete the enclosure. Gerald likes to have a very small hole drilled in one end of the box and place a small amount of lighter fluid in the box before closing it up. The concept here is that, once heated to welding temperature, the lighter fluid will burn off any remaining oxygen in the container.

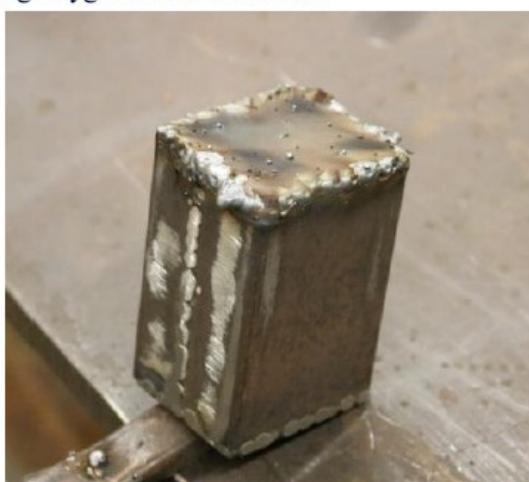


Fig. 5: The completed box with the ends welded and ready to go to the forge.

The completed box is placed in the forge (in this case a propane forge) and slowly brought up to welding heat. Gerald brought the box up to a good yellow heat for his demo but he said if powders are used, the welding heat should be higher (a high yellow.)

Using tongs carefully placed to be out of the way, Gerald quickly moved the heated box from the forge to the 100 Lb Little Giant power hammer and in three quick hits, it was welded. With a 50 Lb hammer or better that is all that is needed. If welding is done with the hand hammer, it may take several hits and even may require more than one heat.



Fig. 6: Gerald forge welding the billet. Three quick hits with the 100 Lb Little Giant.

After the forge weld, Gerald said that the box should not be quenched but allowed to cool slowly.



Fig. 7: The forge welded box cooling slowly in a cold coal forge. Note the small hole in the box.

After cooling, the box can be chiseled off to reveal the billet.

With the newly exposed billet free of the box, the first operation needs to be grinding the edges to be flush with each other. It is common for the edges to be slightly offset from each other which causes a potential for splitting the welds or causing cold shuts and weak spots to form during further forging. Once these edges are smoothed, the billet can be forged to whatever shape is required for the desired project.



Fig. 8: Chiseling the box off to reveal the newly welded billet.



Fig. 10: A Tomahawk by Gerald. This one has 1084 welded in for the cutting edge.



Fig. 9: The newly welded billet. Note the uneven edges which must be ground before forging.

Once the final shape is forged and drifted, it is ground as needed. For small pieces, Gerald uses a Harbor Freight Magnet to hold the steel better and avoid burning his hands. When the piece is ready for final finishing, it is hardened and then finely polished. The polishing must be done to completion now before getting the final colors by tempering. There will be no opportunity to further polish without destroying the colors. If etching is desired to emphasize the layers, Gerald recommends white vinegar or apple cider vinegar over nitric acid. It must be warm to hot but will work just as well and is much easier to use.

The dramatic colors are achieved by tempering in the kitchen oven between 360 to 550 degrees. For this operation, experience is hard to beat since the colors will continue to run even after the piece is removed due to residual heat. A little trial and error on test pieces may be necessary to get a feel for timing and the specifics for a particular oven or piece.

It is important to hang the piece from wire in the oven or the oven rack will introduce stripes on the colors. It may only take around ten minutes for the colors to get close to the desired finish so this is a process that needs full attention. Water quenching to arrest the heat and stop the colors running does not work and will only wipe out the colors.

For his axes, Gerald likes to use Bois d'Arc

Finishing

If the billet is twisted before forging, the finished piece will usually show more layers.

Gerald likes to make axes out of his pattern welded billets. It usually takes a 6" length of 1 1/4" square billet for his axes. After forging to shape, he anneals the axe head in ashes to get it as soft as possible. To create the eye, he drills two holes 1" apart with a new drill bit. A new drill bit is used to minimize the chance of drilling off center. Then he uses a slitting chisel to open the eye using the holes as a guide and follows that with the appropriate drifts.

handles (Osage Orange.) When he first started using them, he tried to find the elusive perfect pieces with no worm holes. Now he actually prefers the imperfections and uses them to accent the handles by filling with turquoise.

To do turquoise inlays, he puts the stones in a plastic bag and breaks them up with a hammer. The small pieces are then put into the worm

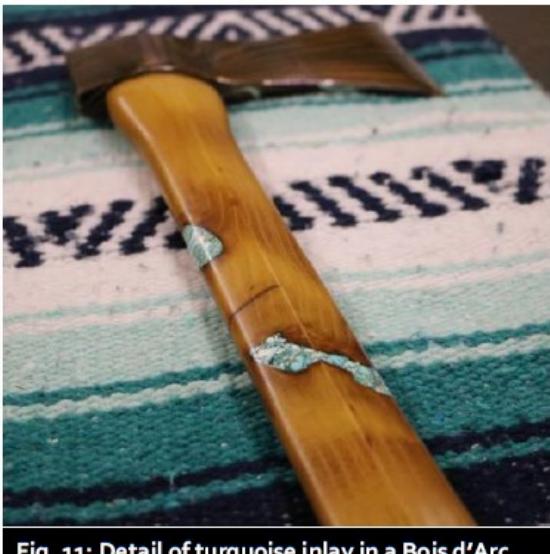


Fig. 11: Detail of turquoise inlay in a Bois d'Arc handle.

holes with clear superglue, mounded up and allowed to dry overnight. After belt grinding, the process is repeated with smaller pieces as needed until it is filled completely then it is given a final polish.



Fig. 12: A square billet made with scraps of old billet, metal powder, and steel shot.

Gerald said he never throws billet scraps and cut off pieces away as they can be re-used to make some really interesting patterns.

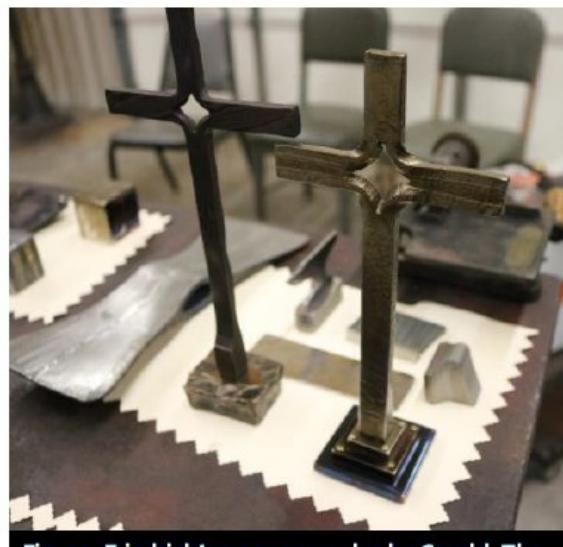


Fig. 13: Friedrich's cross examples by Gerald. The detail in these crosses is really amazing.

Gerald also had some striking examples of what he does with the pattern welded billets other than axes. He had two amazing Friedrich's split crosses mounted on bases that accented the colors and contrasts of the cross layers. The detail in the crosses doesn't come through very well in the photos and is really much better seen in person. The multi-colored base was made by tempering the different base pieces separately and then riveting together.



Fig. 14: This pattern welded billet anvil with tool steel face is about 1 1/2" tall.

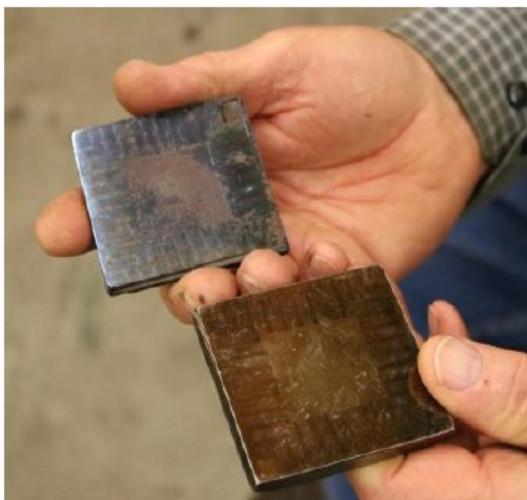


Fig. 15: Cut off box ends showing an example of a different pattern by packing layers perpendicular to each other.



Fig. 18: Harbor Freight magnet Gerald recommends for grinding small parts.



Fig. 16: Another view of the crosses with some billet pieces and a roughed out double bit axe.



Fig. 17: A raw axe-sized billet showing layers with no heating for color.

Gerald said that metals for pattern welding can be obtained from a variety of sources. He usually obtains his metals from any of the following:

Jantz Supply
309 W Main
Davis, OK 73030
www.knifemaking.com
580-369-5503
1-800-351-8900

McMaster-Carr
www.mcmaster.com

Online Metals
www.onlinemetals.com

Kelly Cupples (Powdered Metals)
PO Box 3153
Union Gap, WA 98903
octihunter@charter.net
509-949-5231

Our Librarian, Doug Redden, captured video of the entire lecture and demo. If you were not able to attend or would just like to get a copy of the video, contact Doug to request a copy.

Thanks to Gerald Brostek for putting on a great demo!

- Editor

Power Hammer Rebuilding Class: March 11-13, 2016

LEARN HOW TO MAKE YOUR LITTLE GIANT POWER HAMMER WORK HARDER THAN EVER!

Please join us for the 23rd annual Little Giant Rebuilding Seminar! Although we did pass ownership of Little Giant to our machinist Roger Rice in 2013, Sid Suedmeier will continue teaching the rebuilding class at his shop at 420 4th Corso in Nebraska City.

We carry on the tradition of our good friend Fred Caylor of teaching how to make Little Giants run well and hit hard.

The 2 ½ day class is a hands-on format. You will help transform a 25 LB Little Giant hammer from functional but sloppy condition into a well tuned, quiet, hard working hammer. Sid Suedmeier, former owner of Little Giant, will share all his knowledge and experience gained from working with Fred and from 24 years of repairing and rebuilding Little Giants.

An old style 25 LB Little Giant will be rebuilt during the class, and a new style machine will be on hand to demonstrate proper assembly and adjustment of both styles.

The class is held in Sid's shop in historical Nebraska City, Nebraska. The city has a wide variety of cafes, outlets (including Pendleton Woolen Mills), antique and gift shops, orchards, wineries and museums.

IF YOU HAVE A LITTLE GIANT, THIS CLASS IS FOR YOU!

No experience is required to attend this class. Past classes have been comprised of students, retirees, artists, welders, doctors, farriers ...anyone who wants to learn will benefit from this class. We approach the rebuilding process using tools that can be found in the average home workshop.

If you are in the market to buy a power hammer, this class will make you an educated shopper. If you already own a Little Giant, or any other brand of power hammer, this class will teach you how to get the best performance possible.

The class costs \$95, refundable up to 7 days prior to the class; advance registration is required. We limit each class to 25 participants. The classes start at 9 AM sharp on Friday, and usually end by Saturday evening. The schedule runs Sunday until noon in case we encounter any exceptional problems in rebuilding, and to answer remaining questions.

When we receive your registration, we will send you a city map, along with travel and hotel information. Airports are located in Omaha (45 miles north), Lincoln (50 miles west) and Kansas City (125 miles south).

Please call or email if you have any questions, or prefer to register by phone. You can reach us at 402.873.6605 or SidsShop@windstream.net.

Suedmeier Enterprises, 420 4th Corso, Nebraska City, NE 68410.

An added bonus this year will be a discounted price on the Little Giant Rebuilding DVD set that we had filmed several years ago. Regular price is \$95; it will be offered to class members for \$50. One set per class member.



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Farrel Wells *Membership Secretary*
8235 E 499 S
Dunkirk, IN 47336-8807

First Class Mail

Address Correction Requested
If Undeliverable return to
sender

December 12 Hammer In

Don Reitzel's Shop, 4113 W County Road 900 S, Stilesville, IN 46180

Directions: Take I-70 west of Indianapolis to exit 59 (SR 39). North on SR 39 for 1 mile. Turn left on County Road 900. Shop is about 6 miles on left.