

The Anvil's Horn

A Publication of the Arizona Artist Blacksmith Association

Issue No. 184 January 2017



*Winner of the bottle opener contest at the AABA Annual Banquet and Auction by Dan Jennings. His entry was inspired by Brian Brazeal's one-heat horse head.
November 12, 2016*

President's Message

Our annual gathering and auction at Sahuaro Ranch was a wonderful gathering of fellow blacksmiths. The talent displayed in the items folks brought was very impressive. I especially liked the various bottle openers that were on display. We are quite the creative bunch. It was great to see all the different ways people went about creating such a simple object. Keep up the great work!

The new year is upon us. I wish everyone happy holidays and a very productive and fun 2017.

Happy Hammering

Paul Dief

**Your dues for 2017 are due.
The AABA secretary has mailed the 2017 invoices.
Please send your membership renewals.**

The Editor's Notes

I get calls to artists from around Tucson. I need other members to keep an eye out for calls from other places in the state.

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Demonstration: Saturday, January 21, 2017

Ira Wiesenfeld's Circle of Iron Forge

1801 W. Overton Rd.
Tucson, AZ

Demonstrator: Rich Greenwood

Rich was on the series premier of History Channel's "Forged in Fire". He was also on the most recent season's episode for fan favorites. Rich will be demonstrating a "San Mai" style kitchen knife. San Mai is taking two, or sometimes more pieces, of steel and forge welding them together. Usually a harder steel is used as an inner core with a soft outer jacket to make a knife blade. Rich will explain the whole process and reasons for doing this, and then he will demonstrate it. You won't want to miss this!



- Registration begins at 8:00 AM, the demonstration starts at 9:00 AM.
- Registration fee:
 - \$15 for members
 - \$20 for non-members,
 - Free for first timers (Non-members who haven't attended an AABA event before or who have attended only AABA open forges).
- Potluck lunch at noon on Saturday.
- Tailgating is encouraged. Tailgaters, please consider donating to Iron in the Hat.
- Free horseshoes, RR spikes, cable, etc. from Ira's scrapyard. Ira will have other stuff for sale.
- Smiths can forge after the demo on Saturday and on Sunday. Bring hand tools.
- Ira will have a BBQ and campfire Friday and Saturday nights. Bring meat and potluck dishes in a cooler.
- Camping and lodging will be available all weekend at Ira's. Camp out, sleep on the floor, sleep in the treehouse. Call him at 520-780-9076 to make arrangements.
- Bring things for Iron-In-the-Hat and Show-and-Tell.
 - Don't forget to put your name on anything you bring for Show-and-Tell.

Remember Iron in the Hat

Thanks to all of you who have participated in Iron in the Hat. By purchasing tickets and donating items, you help support AABA events and projects. Items for donation can be a tool, piece of art, something you made specifically for iron in the hat, something you don't need in your shop, a great book, a t-shirt, a hat ... something an AABA member would enjoy.

Directions to Circle of Iron Forge

1801 W Overton Rd., Tucson, AZ

From Tucson

- River Rd. to La Cañada

From outside of Tucson

- I-10 to Ina Rd. (Exit 248)
- East on Ina to La Cañada

- North on La Cañada to Overton /Hardy
- West on Overton, down the hill and around the curve.
- South on Verch (watch for on-coming traffic).
- Turn right into the first driveway.

Our January Demonstrator: Rich Greenwood

My dad says I have always been good with my hands. From the time I was about four years old I could be found by his side “fixing” what needed to be fixed, be it the house or the car. By age six I was disassembling lawn mowers, radios or cars—I didn’t start learning to reassemble until I was about ten.

I have never been one for the traditional means of learning. I have always been better at the hands on approach, and the same holds true for knife making. Sometime back in 2013 a good friend of mine asked me for some help heat treating a Wakazashi blade. That day I went home and started collecting and researching the tools of the trade. Shortly after, I had built my own forge, procured an anvil, and bought a set of hammers that I still prefer using today.

With the help of my good friend and mentor Goya Kenny I have made my way to learning the ins and outs of this trade I have come to love. As far as personal mottos go mine seems to be, “I never make a mistake, I either succeed or learn!”

Please enjoy my knives and if you see something you can’t live without.... Let me know, I’d love to make one for you!

Rich teaches knife making at Pima Community College and runs his knife business Pokabu Forge. You can see more of his work at www.pokabuforge.wordpress.com.



Coming Attractions

March 2017

Jake Janes, one of the featured demonstrators at the ABANA 2016 Conference, will be giving a three-day workshop at Grizzly Iron in Phoenix. See some of Jake's work at www.jakejames.ca. The regular March demo on Saturday, March 18, 2017, will be a one-day window (at regular prices) on that three-day workshop for people who are not signed up for the whole workshop. Workshop details are being developed. Watch for more information in upcoming issues of the *Anvil's Horn*.

Upcoming Classes

Douglas Pryor Chasing & Repoussé Workshop

February 18 - 20 2017, 9am - 5pm, Saturday, Sunday, and Monday

Hessen Iron Works
3230 S. Dodge Blvd.
Tucson, AZ

For more details:

www.facebook.com/events/1154629574651944/ or email Steve at hesseniron@gmail.com

AABA Annual Auction and Banquet 2016

Bill Ganoe

Photos by Wally Warnke unless otherwise noted

The 2016 AABA banquet and auction was held at Sahuaro Ranch in Glendale on Saturday November 12. Again this year Jason LaBrash organized the event with great food, member recognition, and a lively auction of pieces donated by members. The money from the auction benefits the Reed Carlock Scholarship fund for blacksmith education.

The day got off to a start with a short business meeting presided over by AABA President Paul Diefenderfer. Results of the election for officers and board members for 2017 were announced. The new line-up appears on page 2 of this issue.

After the business meeting, trophies were awarded for the best auction contributions. The award of the Bill Callaway Award for Outstanding Member Contributions was delayed until the January 2017

meeting in Tucson. After the awards were announced, the AABA auction was conducted by auctioneer Craig Riggle. The banquet was delayed until after the auction because of equipment problems with the grills cooking the steaks, chicken, and veggie burgers.

In addition to the auction items donated by members, we had items donated by Doug Thompson and John Winer who demonstrated at our meetings this year. We want to thank the people and businesses that donated door prizes: Finishes, coatings, and patinas by Sculpt Nouveau; a gift certificate for an order for a touch mark stamp by Superior Steel Stamp Co.; a blacksmith mug by Amy Pieh; earrings by Sarah Harms; and prints of blacksmithing scenes (owned, but not painted) by Peter Sevin.



*Len Ledet presented prizes for the most grandchildren to Ron Kinyon and Martha Callaway.
(photo by Bill Ganoe)*



Trophies for the 2016 winners



*"Grizz" LaBrash with new granddaughter, Claire, and her mother, Amber LaBrash.
(photo by Bill Ganoe)*



*Ron Kinyon
Winner of the Advanced class award
and the People's Choice award.*

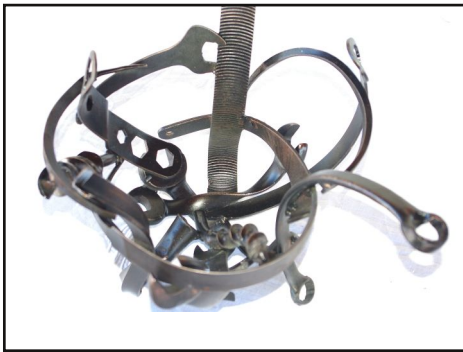


*Steve Miller
Winner of the Intermediate
class award.*



*Dan Kallberg
Winner of the Novice class
award.*

AABA Annual Auction and Banquet 2016 (cont.)



*Ira Wiesenfeld
Found-object bottle opener*



*Peter Sevin
Lamp*



*Bill Morris
Napkin holders
(photo by Bill Ganoe)*



*Mo Hamburger
Flower
(photo by Bill Ganoe)*



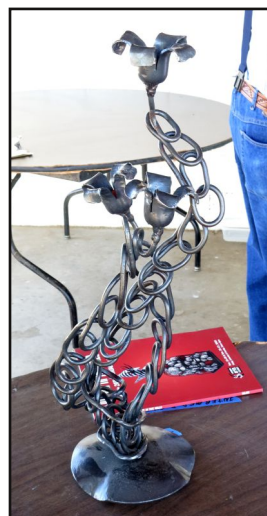
Horse shoe pumpkin



*Roger Jonasson
Hand*



*Len Ledet
Candle holder
(photo by Bill Ganoe)*



*David Bridenbaugh
Lamp
(photo by Bill Ganoe)*



*Charles Brown
Trammel hook --
continuously adjustable*

AABA Annual Auction and Banquet 2016 (cont.)



*Sarah Harms
Photo printed on metal*



*Roger LaBrash
Branding iron bottle opener*



*Wally Warnke
Pot holder rack*



Bottle openers by various contributors



*Open Forge
December 3, 2016
Sam Rivera's shop, Tucson
(photos by Bill Ganoë and Vivvayna Nightshade)*

Blacksmithing Videos: Some of My Favorites

Dan Jennings

I feel a little guilty winning the bottle opener competition with Brian Bazeal's One Heat Horse Head. If you want to make one here's the video: <http://www.youtube.com/watch?v=5aO6BPD5-1E>
Hint: to do it in one heat you need a heavy hammer. I think he uses a 4 pounder. Brian has several other great videos.

Mark Aspery has a ton of videos and I think they are all very good. If you search for him on You Tube you will come up with something you're interested in.

If you are into armor or metal shaping Winter Tree Crafts has a great video:

<http://www.youtube.com/watch?v=Hi3LOkO5kAg>

For the knife makers, Walter Sorrells has over 150 professional quality videos covering all aspects of knife making, handles, sheaths, Damascus and even a few on selecting appropriate steels.

Rory May, aka Dirty Smith, has 52 videos. The topics include basic and advanced techniques and projects. He usually throws in some humor which I find helps me remember the point he's making.

Technicus Joe has 170 videos. I have students watch his video Forge Welding with sand as flux.

<http://www.youtube.com/watch?v=R9wL2M153HY>

DF Forge has several good videos. This video on forge welding shows how to get real strength from a forge weld: <https://www.youtube.com/watch?v=fyjbN0hWRY>.

He has a few about making tools from scrap steel that I recommend to students (because he agrees with me) .

Chandler Dickenson is another blacksmith with a lot of videos. Sometimes I think he provides tips on what not to do. Often enlightening, always fun.

If you are into the historical aspect of blacksmithing here are links to chainmaking in the early 1900's.

<http://www.youtube.com/watch?v=nLIbObCltfQ>

http://www.youtube.com/watch?v=k_LA_R4ifYk

<http://www.youtube.com/watch?v=zRPos5uyy0A>

I get a kick out of this 1930's film showing building of a locomotive in Britain.

<http://www.youtube.com/watch?v=aHIEudnoRYU>

AABA Library News

David Bridenbaugh

We acquired a few more books at the September demonstration for our library. This library is a benefit of membership and I encourage everyone to peruse the books at the demonstrations and check one out. They are a great source of inspiration, ideas and techniques.

Marc Larsen donated a generous portion of his own library of blacksmith and knife making books. He donated The Skills Of A Blacksmith, volume 1 and volume 2, by Mark Aspery, Art of the Knife by Joe Kertzman, Knifemaking With Bob Loveless by Durwood Hollis, Backyard Blacksmith by Lorelie Sims, The Complete Bladesmith by Jim Hrisoulas, A Blacksmiths Craft, The Legacy of Francis Whitaker by George Dixon and Damascus Steel by Manfred Sachse.

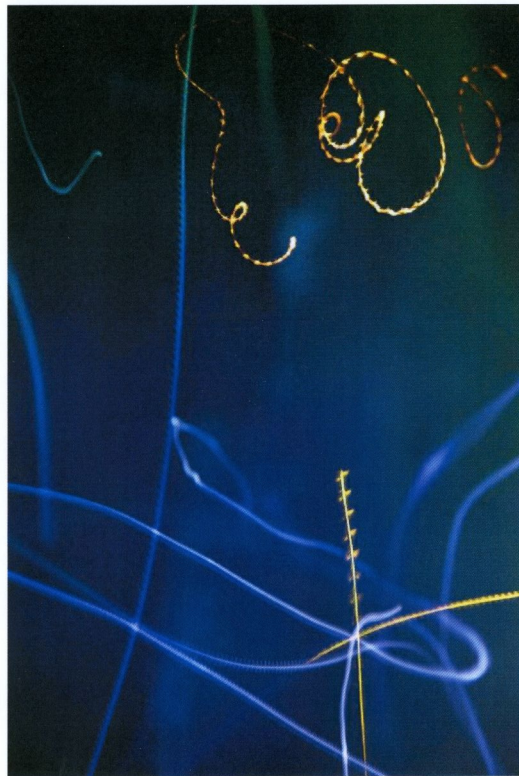
Richard Rozinski donated Ironwork Today, volume 4. His Nebula sculpture of neon and stainless steel appears in the book. Rodger and Jason LaBrash have an impressive entry gate with an organic theme. Clark Martinek shared photographs of his Bilancio and Sevin's Sail sculptures.

Kay Kofford donated Industrial Fluid Power volumes 1 and 2. These are textbooks providing "a broad overview of fluid power, covering principles, major components and circuitry". These could be useful to anyone interested in a hydraulic press or air hammer.

Call to Artists



Call to Artists!



DAY FOR NIGHT

Entry Deadline: Wednesday, January 11, 2017

Exhibition Dates: February 16 - April 19, 2017
Opening Reception: Thursday, February 16, 5:30 - 8:00 p.m.

In the Sonoran Desert the transition of day into night and back again is an ever-changing display that exhibits the subtle and dramatic effects of light and darkness. Beaming sunrises and burning sunsets signal the sequence of the diurnal, the crepuscular, and the nocturnal. The cycle of each day affects

not only the colors of the earth and the sky but also the movements and lives of the plants and the creatures that inhabit them.

Light and darkness stir the senses, evoking mood and activating nature.

Artists are asked to explore the diurnal, crepuscular, and nocturnal worlds of the Sonoran Desert. The many colors, moods, shapes, patterns, plants, creatures and stories they find will be fascinating. The possibilities are endless. Artists from the region are invited to submit 2-dimensional or 3-dimensional works in any media for consideration in this juried exhibition.

The deadline for entries is January 11, 2017.

Please view the "call for entries" prospectus for more information about the exhibition and feel free to share this with artists who may be interested

[click here for the full prospectus: DAY FOR NIGHT](#)

Please contact us if you have any questions
 520 - 742 - 6455 Karen Hayes (x 217) and James Schaub (x 218)

The exhibitions at Tohono Chul connect to the park's mission to enrich people's lives by connecting them with the wonders of nature, art and culture in the Sonoran Desert region and inspiring wise stewardship of the natural world. Tohono Chul seeks to be an indispensable resource for helping people learn about, celebrate and conserve our region's natural, cultural and artistic heritage.

image:
 Robert Renfrow . from the series MOTHS . photograph



Tohono Chul Park, 7366 N Paseo del Norte, Tucson, AZ 85704

Calendar 2016 - 2017

January 7, 2017	Open Forge	Sam Rivera's Shop	Tucson
January 7, 2017	Open Forge	Sahuaro Ranch	Glendale
January 14, 2017	Open Forge	Desert Rat Forge	Cave Creek
January 21, 2017	Demo - Rich Greenwood	Circle of Iron Forge	Tucson
February 4, 2017	Open Forge	TBA	Tucson
February 11, 2017	Open Forge	Desert Rat Forge	Cave Creek

Classes at Pieh Tool Beginning/Intermediate Blacksmithing Classes with Gordon Williams.

Gordon has moved to Utah. No new classes are scheduled at this time. Call 928-554-0700 or browse to www.piehtoolco.com for scheduling updates.

Sahuaro Ranch in Glendale

There will be an open forge on Saturday, January 7, 2017 from 8 to noon. Questions? Call Ronald Wicklund at 623-776-5684.

More things, such as open forges and demonstrations for school children, are being planned at Sahuaro Ranch. Watch for more details and announcements.

Ride Sharing

Interested in sharing a ride to a far off blacksmithing event to save on expenses or wear and tear on the old truck? Or would you like some company going to an AABA event just up the road? AABA VP Steve Miller is organizing a ride sharing exchange for AABA members. Email your requests or suggestions to stevemiller.az@cox.net

Deadline for the March 2017 issue

January 31 is the deadline submitting photos and articles for the January issue of the Anvil's Horn.

Send articles, pictures, etc. by email to:

editor@azblacksmiths.org

or by regular mail to:

Bill Ganoe, PO Box 40233, Tucson, AZ 85717

Welcome New Members

R. Evan David
Austin Sandoval
Anthony Belli

Scottsdale, AZ
Camp Verde, AZ
Prescott, AZ

MCC Blacksmithing & Welding

The Mesa Community College blacksmithing program is an excellent deal - over 60 hours of instruction including material and propane! Saturday (Jaime Escobedo instructor) and evening classes (Dan Jennings instructor) are available. Blacksmithing is WLD 103.

TIG, MIG, Arc, Gas, and Art classes are all available, as is certification in any of those welding methods at Mesa Community College, Southern and Dobson in Mesa.

Classes fill up early. For more information go to: www.mesacc.edu

If you try to register for any Welding Department classes on line, and you find all the classes are closed (full). Contact me (Dan Jennings) at danshammer@cox.net with the class number (time and days) of the class you'd like to take - I'll get an override number so you can sign up.

Submit Your Touchmark

Submit a JPEG of your touchmark(s) to Steve Miller, stevemiller.az@gmail.com, so it can be included in our AABA touchmark registry which will appear on our website soon.

AABA Website: www.azblacksmiths.org

Open Shop: Tucson

Sam Rivera will be hosting an open forge on Saturday, January 7, 2017, from 9 to noon. His shop is at 675 W. Helen St., Suite 1C, Tucson.

Take Speedway to Main Ave. Turn north on Main, then turn west on Helen. Helen is the first street north of Speedway. Call him at 520-591-4700 if you have trouble finding the shop.

Open Shop: Grizzly Iron

Don't have a power hammer? Use one at Grizzly Iron, 1329 W. Lincoln St., Phoenix, 5 PM to 8 PM every Wednesday. \$20 each night. Call Roger "Grizz" LaBrash at 602-716-9660 to sign up.

If You Are Attending An Open Shop...

You might not be aware but this, but these events are not funded by the AABA. They are hosted by our members for all of our benefit. So if you participate in forging, welding, use shop materials, or accidentally damaged something. Please offer to donate to help out or help with the cost of replacing a item. Thank you! From all of your open forge hosts. **You will need to wear safety glasses. Hearing protection is recommended.**

Open Shop: Desert Rat Forge (Phoenix area)

Paul Diefenderfer will host an open forge on Saturday, January 14, 2017, from 9 am to noon, followed by lunch (You gotta' buy your own.) at the world famous Big Earl's Greasy Eats in Cave Creek. Desert Rat Forge is at: 40218 N. 78th St. Cave Creek. 602-509-1543 or dief@phoenixrockgym.com

Directions: From the center of Cave Creek (the 4-way stop at Cave Creek Rd & School House Rd.) head north on School House 1.5 miles to Highland Rd. (If you get to the 4-way stop at Fleming Springs you have gone a tad too far.) Turn right (east) on Highland. After about 1 mile the pavement ends. Keep going on the gravel road until the pavement starts up again. Turn right through the stone walls down a paved driveway. You are there!

(Dief will be working some temporary jobs in Florida on and off for the next few months. This will involve travel on Sundays, so he has rescheduled the next several open shops on Saturdays.)

AABA Membership

Benefits for members include:

Member discounts at vendors around the state: See page 18 of this issue for more details.

Reduced registration fees at demonstrations and workshops

A one year subscription to the bi-monthly newsletter, *The Anvil's Horn*

Connection to members throughout the state who can answer questions and give advice

Free classified ads in the *Anvil's Horn* and on the AABA web site.

eMail notices when event details change or new events are scheduled on short notice.

AABA New Member and Membership Renewal Form

Name _____

Address _____

City _____ State _____ Zip _____

Phone _____ Email _____

Professional blacksmith _____ Hobbyist _____ Farrier _____ Blade smith _____

Your main blacksmithing interest _____

Occupation or skill _____

Please check one:

Regular membership (\$35) _____

Family membership (\$40) _____

Mail to: Terry Porter
2310 E. Melrose St.
Gilbert, AZ 85297

Make Check Payable to AABA

Rebuilding the Little Giant Power Hammer

Steve Miller

(Photos by Steve Miller)

As part of the AABA Reed Carlock Scholarship program this article is my return to AABA members after receiving a scholarship to attend the Little Giant workshop. This is a summary of my experience. The full version is available on the AABA website.

Parts Identification

There are two basic styles of Little Giant Hammers. Old Style and New Style. The pictures within are of an old style hammer as that is what was used in the workshop.

Pre-purchase Inspection

This inspection can be done without dismantling the hammer with the exception of removing the dies, which is considered a normal operational step. The idea is to look for excessively worn and loose parts, which may be a point of negotiation in the purchase price.

Inspect the frame for cracks or a broken casting. The frame is the only part that cannot be replaced. Lift up on the crankplate to test the play in the Babbitt bearings on the crankshaft. Look for shims between the bearing saddles and caps. If shimmed, some of the shim can be removed to snug up the fit. Check the pitman for looseness. It needs to move freely, but you don't want a sloppy fit. If excessive, it may need the sleeve bearing replaced. Check the toggle arms and toggle links for cracks and excessive wear. A good indication of proper maintenance is to look in the oil holes to see if they are clear or plugged. If plugged, oil cannot lubricate the joint and there may be excessive wear. Check the ram and ram guides. Worn or maladjusted ram guides will be a sloppy fit on the mating frame surfaces. The ram guides may just need proper adjustment also. Some filing can be done on the ram guides and they are easily replaced if needed. Look at the ram head for tight fitting die keys. Does the die key make full contact with the die and ram head? A short die key or wrong taper will put a concentrated force in only the contact spots and risk cracking the ram head dovetail joint or cell block on the lower die. Check the cell



*Fig. 1
Tiny model of a 25#
Little Giant.*

block for cracks and the dovetail joints for excessive wear, pitting, and chipped edges. The dovetail joint can be filed and shimmed for useful service. The shifting fork and collar should be easily operated by the foot tread. Check for excessive wear on the clutch Babbitt bearing. It too is a long term maintenance item and requires machining for concentricity and fit. If you don't have access to a lathe, Little Giant provides this service. See the contacts section at the end of this article for information.

Cleanup

The condition of the hammer and where it has been stored will dictate how much cleanup is necessary. By the nature of the hammer design it will accumulate grease, oil, and, if used in a dusty environment, dirt. The accumulation over the years can become difficult to remove. So, some "removers" can be quite helpful. However, resist the temptation to use power tools. The hammer was originally painted with lead paint and the use of power tools will fill the air with lead paint particles. It is best to wear a respirator for this operation. A simple lead test kit purchased at your local home center will tell you if you're dealing with leaded paint or not. Be sure to test several places. Only one portion of my hammer tested positive for lead and the paint was very smeary and difficult to remove. I ended up painting over it. Diesel fuel works well for those parts that can be removed and soaked to remove old dried up grease and oil. A wire brush and hand scraper can help loosen stubborn areas.

Teardown

The tear down is done from top to bottom so that as pieces are removed there is better access to the pieces below. Before starting make sure all electrical power is disconnected from the motor. Start with removing the drive belt (new style only), motor, clutch spring, linkage and shifting fork. Place a wood block under the top die to keep it from falling in the next step. Next release the tension spring by loosening the tension adjusting screw until there is no compression on the spring (old style). Disconnect the toggle links at the toggle arms. Remove the crosshead bolt and the crosshead/toggle arm assemble can be removed. Remove the upper die key

> Continued on page 13.

Rebuilding the Little Giant Power Hammer (Cont.)

and die. Loosen and carefully remove the ram guides and ram. Remove the lower die key and die. Remove the foot tread.

Main Bearings

With the crankshaft removed, inspect the Babbitt bearings (saddles and caps) for cracks and wear. If replacing the Babbitt, heat directly with an



Fig. 2
Filing saddles
flat.

oxy/acetylene torch with a rosebud tip. Catch the old Babbitt in a heavy ladle made for pouring molten metal. It can be reused. Do the same for the bearing caps.

Babbitt comes in several grades.

Use the softest, least expensive Babbitt you can find. It will be about 70% lead.

The high speed Babbitt is too hard for this purpose. Do not use lead

weights.

File the tops of the bearing saddle surfaces flat to prevent twisting the caps as they are tightened. True up the ends also. See below. Do the same to the bearing caps. Check the angle between the bearing saddles and ram face. It should be 90 deg.



Fig. 3
Melting old Babbitt



Fig. 4
Mandrel fitted less
brass shims.

A Babbitt mandrel the same size as the shaft is required to pour the Babbitt. Round tubing works the best so the inside can be preheated prior to the pouring process. New brass spacers will be required if the hammer did not have them when the old Babbitt was melted out.

The spacer thickness should be half the distance of remaining space from the mandrel to the bearing cap with 3/16" to 1/8" shim between the saddle and cap. See Figure 4.

Preparing the lower bearings - four bearing collars made of steel with a set screw that fit the mandrel are used to secure the mandrel against the bearing journals and allow it to be rotated if needed. Place the mandrel with spacers in the lower bearing saddles. Install the collars with a "rope" of Babbitt on the outside corner of each collar as shown and push the

Babbitt into the crack but not into the bearing cavity. There are also Babbitt replacement damming compounds that can be found online. Dam up the bolt holes also to save cleanup later.

Heat the Babbitt in a crucible on a propane stove as near as possible to the pour area. While the crucible is heating up, preheat the ladle and mandrel to 300 deg. F using a rosebud tip on an oxy/acetylene torch. Start heating the frame then the mandrel including the inside of the mandrel.

Add two sugar cubes worth of beeswax as a flux. Test the heat of the Babbitt with a wooden paint stick; when burnt it is ready to pour. Set up a solid platform so that you can stand on it and look down on the pour. You want to be above the pour to see well, but keep away from the vapors. When the Babbitt is ready, scrape any impurities away with the ladle and fill it with clean Babbitt. Carefully navigate to the pour platform and make a continuous pour. When it just begins to overflow, stop pouring. Melt in the corners using a rosebud torch. Pour the second lower bearing. Let cool a few minutes, and then remove the Babbittite.

Use a sharp chisel to remove the large pieces of excess Babbitt and file flat. Cut off the excess in the front and back with a hacksaw. File flat. Wipe the inside edges of the Babbittite to remove burrs and chamfer the inside corners.



Fig. 5
Mandrel with bearing collars
and Babbittite installed ready
for the Babbitt pour.



Fig. 6
Pouring the Babbitt.

Redo the Babbittite on the mandrel collars and lay in the mandrel. Install shims, and fill holes at shims with Babbittite. Bolt on bearing caps and seal metal shims with Babbittite. Repeat

Babbitt pour procedure for the bearing caps. When Babbitt fills the well, stop pouring. Let cool and drill



Fig. 7
New Babbitt poured

> Continued on page 14.

Rebuilding the Little Giant Power Hammer (Cont.)

out excess Babbitt. Remove the bearing caps and drill out the oil hole. A half round file with no teeth is an ideal scraper for the oil hole. No string or blackening is required before pouring the Babbitt as has been recommended in the past.



*Fig. 8
Cleaning up the overflow.*

Clutch Bearing

The clutch pulley and spider must be as concentric as possible. If needed, it can be repoured. A tapered mandrel is needed to make this pour and then trued up on a lathe. The hammer we rebuilt in the class did not need to be repoured, so this step was not performed. However, we were walked through the steps. Basically, position the clutch on the floor with a solid plate as a stop. Insert the appropriate sized mandrel and make as concentric as possible. After the Babbitt is poured and cooled use a lathe to true up the bearing for a good fit.

The clutch collar is a broken fit. It is cast as a single piece then broken at the joint. If not already done, drill and tap the clutch pin for a grease zirk.

Unless the spider and flywheel are in need of repair do not remove them. If needed, the trick is to press them slightly further onto the shaft to release the key then press them off. Never hammer on the end of the shaft to drive it out. This will upset the shaft making it difficult if not impossible to remove and possibly damaging the flywheel.

The pitman pin is peened on the back end. It is not designed to be removed. If damaged cut off and press thru. Replace with a new part.

It is best to start from the bottom and work your way up so that parts above are not in your way. The exception is the foot tread to keep it out of your way until it is needed.

Use Prussian Blue by Permatex or similar product for fitting the die keys. Check for distributed contact across the dovetail. The key can be heated for carbon build up for more friction if needed. Smooth out the dovetail with an angle grinder as needed. Shims can be added under the dies if badly pitted. For dies that squirt out the top, undercut the dovetail for a better fit.

Hammers with no SOW block have a normal

taper of 1/8" per foot. Models with a SOW block have a taper of 1/4" per foot.

The original dies are W1 or W2. New dies are made of 4140. As the dies wear they become shorter; and shorter dies cause erratic operation. For a 25# hammer the upper and lower dies should be spaced 3/4 to 7/8" apart. A 50# hammer spacing is 1-1/8 to 1-1/4".

On the old style hammer clean up the V-groove with a scotch bright pad on a right-angle die grinder. If the guides are worn out, then can be replaced with brass angle and are available from Little Giant. The ram on the 50# old style hammer needs to be trimmed if not already done to keep it from hitting the flywheel. Check for alignment and clearance prior to trimming, then trim up to 1/2" from the top of the 50# ram.

Clutch Fork

Wear in the clutch fork can wear out the clutch collar. Weld or braze as necessary. The pivot hole is usually misplaced. Weld shut and relocate.

Toggle Arms

The holes in the toggle arms need to be parallel. To repair, tack weld to a piece of channel or bar to clamp in mill vise and bore out as necessary.



*Fig. 9
Upper and lower
dies installed.*

Crosshead

Check for proper spacing. The pitman should fit into the crosshead easily. The original bushing is brass. The flathead bolt used to tighten the crosshead to the pitman on the old style 25# hammer is a 1/2-12 TPI. The 1/2-12 thread is a British Standard Whitworth (BSW) thread, while the standard in this country for a 1/2" bolt is 13 TPI. If either is damaged replace both. I'm not sure how it got on a Little Giant power hammer. Perhaps some old timers will have this knowledge locked away and be willing to share.

The grease zirk on the crosshead should not go all the way in. Contact with the pitman would cause wear and be potentially more difficult to get the grease in.

> Continued on page 15

Rebuilding the Little Giant Power Hammer (Cont.)

Upper Die

Typically, the top die key enters from the left side of the hammer and is on the back side of the die. However, I had to put the top key on the front side of the die to clear the right side ram guide on my hammer. The bottom key goes in from the right and on the back side. I had to put it mine in the front to match the top die and keep the top and bottom dies aligned.

Clutch Pads/Blocks

The old style clutch pads are belting material. Chisel off rivets to remove. Clean up the pad area. Replace with high density power transmission belting, which is available at Little Giant. Use various thicknesses of gasket material to determine the shim thickness necessary for good engagement. The pads should fit snugly with some remaining engagement space, which will be taken up as the pads wear. Glue on shims and pads. Trim off excess with a sharp knife. Drill holes for brass countersunk screws and secure with nuts and lock washers.

Chamfer the clutch pad edges with a scotch bright pad on a die grinder. Pads must be oiled for use. Chainsaw bar oil works the best. It sticks to the pads longer.

Old Style Ram

The old style ram is reversible. Decide on the best fit. Shims of gasket material can be placed under the ram guide as needed. Little Giant carries the recommended material. The ram guide will tolerate some bending for fine adjustment with a 2 pound or so “tweaker”.

Main Shaft

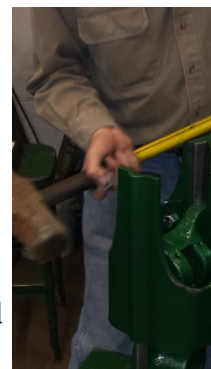
On old style hammers put the drive belt on the main shaft now. Otherwise, you’ll be taking it apart to get the belt between the bearing saddles. The new style hammers don’t have this problem. Oil and grease the shaft. Shim for a slight drag. Tighten down the bearing caps. Cover the oil reservoirs to keep the shop dust out. A piece of scotch bright works well.



*Fig. 10
Gluing on the clutch lining.*

Clutch fork and linkage

The clutch fork pivot is typically “walled out”, a technical term I learned while there. Weld the hole shut and grind flat. With the clutch fork fully engaged and the clutch held back, punch a hole in the fork through the frame. This saves time in locating the hole. Drill the hole and assemble. Attach the return spring.



*Fig. 11
Tweaking the old style ram guide.*

Pitman and Toggle arms

Dry fit and check the pitman and toggle arms for free movement and no binding. Install the pitman crosshead, T-bolts, toggle links, and spring. Tighten the spring for slight downward angle. Adjust the die height for $\frac{3}{4}$ to $\frac{7}{8}$ ” space with the ram at its lowest point.

Motor

Install the motor and adjust the spring tension for reliable operation.

Assembly – New Style

Repeat as in the old style, but adjust the spring as follows, but first a note on disassembly. Releasing the spring tension for disassembly is most easily done with the aid of a bar clamp across the toggle arms at the toggle links. When connecting the toggle links, if they are off by more than a half the hole diameter, the spring is too long and needs to be cut or ground down.

Use the bar clamp to tension the spring for reassembly. There are three adjusting bolts that hold the ram guides to the frame. The frame should be less than $\frac{1}{8}$ ” wider than the ram.

Position the ram with some margin on each side of the frame. Install the guides and through bolts using the heavy washers and nuts. Keep the guides tight against the ram. With the through bolts as far forward as possible, tighten the set screws. Torque the through bolts to 30 in-lbs. The ram should be tight. The instructor said this part is a bit unconventional, but is the best and fastest method to get proper adjustment that he has found. Tap the set screws firmly with a hammer into the through bolts. This will provide a bit of clearance and the ram will

> Continued on pag 16.

Rebuilding the Little Giant Power Hammer (Cont.)

be loose. Continue tapping until the ram moves freely in the ram guides. Re-torque the through bolts to 70-80 ft-lbs. Tap back of ram guides as needed for clearance.

Check the lettering on the flywheel. It can interfere with the ram. File down or grind as needed.

Mounting

Use conveyor belting between the hammer and the floor. Horse stall pad is too soft.

Transportation

There are two methods depending on the equipment you have. One is to lay the hammer down on its side using old tires for cushion and support. This will work well if moving to a nearby shop or even across town. If shipping across country after purchase or for machining at Little Giant, the other method is to mount it upright. This method has a tendency to twist in transit. The following approach will keep twisting to a minimum. Build a pallet of 4x4s with two rails 4' long and parallel to each other with three cross pieces (two ends and a middle) spaced to allow forklift access. Cover with two

layers of ½" plywood. Screw all pieces together well. Using 3/16" link chain and 3/16 carriage bolts chain down the hammer to the pallet. Wrap the chain around the "C" Frame and bolt to the pallet. Contact Freightquote.com for the best price on shipping.

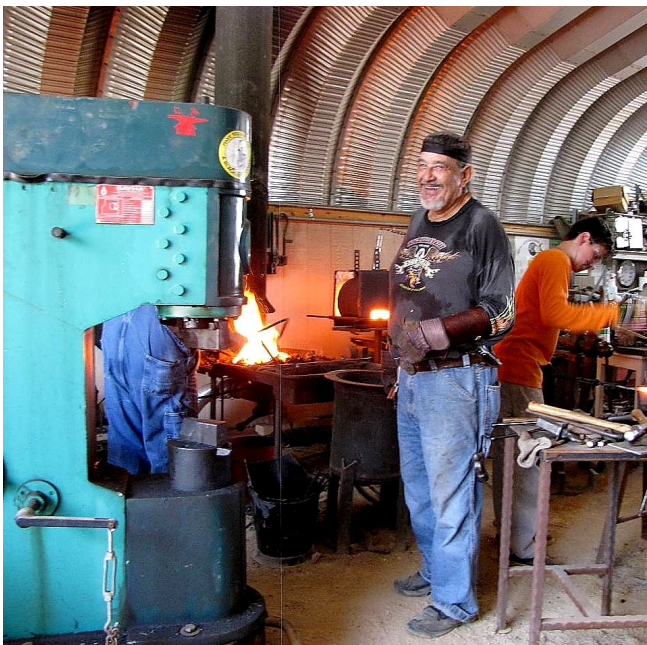
Foundation

The concrete base should be the same weight as the hammer. For the 25# hammer this is 1000 lbs and for the 50# hammer is 1800 lbs.

The anchor bolts should be sleeved in pipe for flexibility. Use different length bolts for easier alignment. Put expansion joint between the old and new concrete if setting in an existing pad to reduce noise transimission.

Contacts

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Nebraska City, NE 68410
Phone: 402-873-6603
Email: lgiant@windstream.net
Webpage: www.littlegianthammer.com



*Open Forge
Harold Hilborn's shop, Tucson
October 1, 2016
(photos by Vivyanyna Nightshade)*

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1) IMS has space for member metal work to be put on display in a glass case and on top of the cut metal rack inside the store. Contact Steve Miller, stevemiller.az@cox.net, to get your items on display. These items may be for show only or they may be offered for sale. Artists are responsible for any financial exchange. IMS will make a nice card to identify the piece, the artist, and the cost.

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For membership information or address change, contact: Terry Porter, 2310 E. Melrose St., Gilbert, AZ 85297, 480-988-2070, trp555@prodigy.net

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The AABA secretary has mailed the 2017 invoices.
Please send your membership renewals.**



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