



# SOFA SOUNDS

**SOFA**  
SOUTHERN OHIO FORGE & ANVIL

FEBRUARY/MARCH 1991

Artist-Blacksmiths Association of North America

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Ken Scharabok (513-258-1389)

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**MARK YOUR CALENDAR:** Unless otherwise noted, all meetings will be held at the Studebaker Frontier Homestead on Rt. 202, about 4 miles north of I-70 near Tipp City. Please don't park on the grass or block access to the production buildings. Donations of items to the newsletter support raffle are always welcome. Please bring your work or tooling for display. The public and guests are welcome. Finger food and cold drinks provided on a break-even donation plate basis. The forges at the homestead are available before and after meetings for individual projects.

FEBRUARY 2nd, 1 PM

Demonstration by Chuck Sigler and Bill Vatter on tool making.

MARCH 2nd, 1 PM

Demonstration by Ham Hammond on lost wax casting.

APRIL 6th, 1 PM

Demonstration by Doug Fink. Doug would like to know what you would like to have demonstrated. He has done demonstrations on forging pipe and tubing and horseheads in the past.

MAY 4th, 1 PM

Demonstration by Scott Murray on kitchen hardware.

JUNE 1st, 1 PM

Annual workshop to make hardy tools or hand-tools out of jackhammer bits.

JULY 6th, 1 PM

Demonstrator needed.

AUGUST 3rd, 1 PM

Demonstrator needed.

SEPTEMBER 28th & 29th

1991 Quad-State Round-Up.

## INTERNATIONAL MUSEUM OF BLACKSMITHING:

Construction is underway for this museum in Nashville, TN. It is being build, and will be run, as a non-profit trust, by Lee Nehrt, a retired professor, who is the son of a blacksmith - the last of eleven generations of blacksmiths.

## Chapter of ABANA

The museum will have five exhibits showing the evolution of blacksmith "shops" from the beginning of the iron age to the 20th Century. It will have exhibits of items made by blacksmiths, in different parts of the world, over the past 2,500 years. It will also have a museum shop to sell items made by blacksmiths or related to blacksmithing. This will be the only museum of its type in the world and should be a unique contribution to our craft. Nashville has about two million visitors per year, so it should have good visibility.

Mr. Nehrt would like to hear from any blacksmiths who would be interested in working with him to: a) make items to be sold in the shop, such as candlesticks, shoe scrapers, door knockers, skillets, spoons, book ends, etc.; b) make replicas of ancient items to be part of the exhibits; and c) make donations to the museum of existing blacksmithing tools, equipment, and objects made by blacksmiths. For such items, a tax-deductible valuation contribution certificate would be issued and a sign would specify who contributed the item.

Any interested smiths should write to: Lee Nehrt, Director, International Museum of Blacksmithing, 550 Birdie Galyan Road, Bloomington, IN 47408.

(Since the museum will be going back 2,500 years, maybe Ham Hammond will donate the bronze spearhead he has which is stamped "15 BC". - ed).

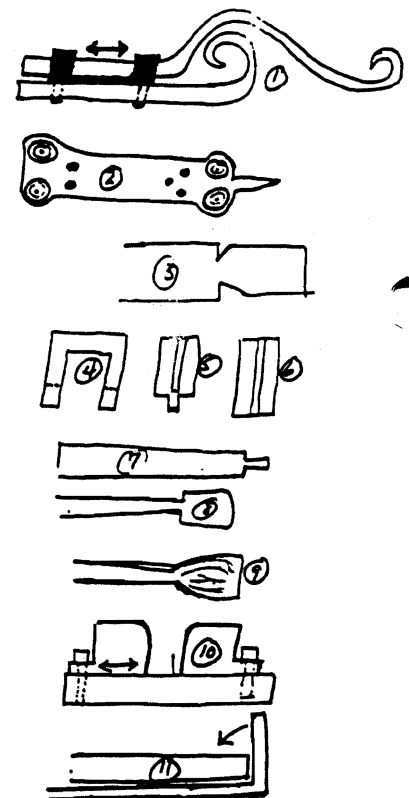
#### DECEMBER MEETING:

At the December meeting, Ron Van Vickle and Ron Thompson demonstrated a throw bolt for a door. It was patterned after one in Ted Tucker's book, "Practical Projects for the Blacksmith", unfortunately now out of print.

As can be seen in illustration #1 (yes, the rumor is true, I flunked fingerpainting in Kindergarten), the bolt will slide forward until it hits the end staple and will only backwards until it hits the rattail on the bottom plate.

The stock used was 1/4"x1 1/4" for the bottom plate, 1/2" square for the bolt and 3/8" x 3/16" for the staples. A smaller bolt might use 3/8" square for the bolt and 1/4" x 1" for the bottom plate.

They started by putting a rattail on the end of the flat stock using the edge of the anvil and a hot set. However, they ended up with a crack in the base of the tail probably from a coldshut during the fullering process. This could have been avoided by either using a handheld side-cut or hacksaw to make grooves such as indicated in I-3. Once the tail was completed a ballpeen hammer was used to put in four depressions which are both decorative and will provide a countersink for screw heads. They started with a smaller ballpeen and then finished with a larger one. Four holes for the staple legs were measured and drilled and a fifth hole drilled to receive the end of a spring. The inside area of the staples was the thickness of the bolt (1/2") plus 1/16" for the spring. The staple legs were cut with a hacksaw with the leg length the thickness of the bottom plate plus just enough to peen over. One sample bolt had a decorative groove fullered on the top and sides (see I-4, 5 and 6). To make the staples they had made a bottom tool (I-10) but found it too difficult to keep the sliding side in place. They resorted to simply putting a square corner on the staple stock, holding it with a piece of 1/2" flat stock and then bringing over the top leg as indicated (I-11).



The spring was a piece of old hacksaw blade with the teeth ground off. It was heated to red, the catch tooth bent over, a bow put in the blade, heated back to red and then quenched in used motor oil, flaming three times (put in fire to flame, quench, put in fire, etc.) as this seems to increase the spring action.

The last piece needed was the bolt. One end was fullered leaving about 3/4" of stock. The piece was then tapered for about 6" and the end piece fullered into a fishtail end and curled for the finger hold area. (Note: if you size this to your finger size, allow it to cool first). Slightly taper the end of the bolt.

When all the pieces were ready the entire bolt was assembled by putting in the spring (which extends to the front staple to keep it in place), the bolt and then the two staples. Filing was done as needed to fit the square staple legs into the round holes and the inside top of the staples and corners of the bolt as needed for smooth action. The fit should be loose enough for it to slide easily but snug enough to where it cannot be vibrated loose if used at the top of the door or to slide down if used on the bottom.

A testimonial to their work is that Emmert asked them afterwards about making two for the new doors he wants to put on the shop building.

To show you how easy it is to make these, Fred Caylor said his neighbor's dog wandered into his shop, Fred accidentally dropped a piece of hot iron on its tail and the dog make a bolt for the door.

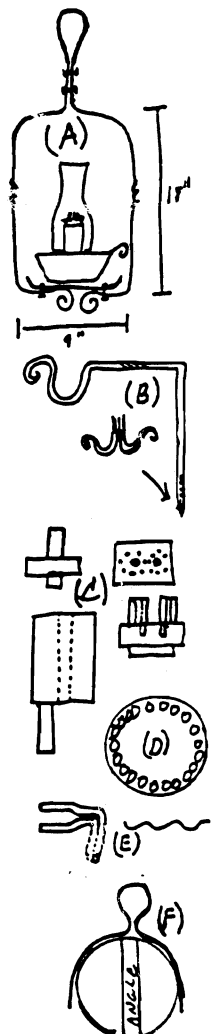
#### JANUARY 5, 1991 MEETING:

For the demonstration at this meeting Bob Cruikshank made a hanger for a kerocene Hurricane Lamp his daughter received for Christmas. The hanger and wall bracket are shown at A & B. The hanger was made from a piece of 3/16"x1/2" stock about 60" long, folded in the middle and an area under the eye double riveted. The wall bracket was made out of 3/16". It was designed to have a leaf at the hook end, but when that broke off, the design changed.

The scrolls under the hanger were made by a nifty little bending device. The base was a piece of 1/2" thick stock about 3"x5" with a piece welded on the bottom for it to be held in a vise. Two stems were placed in the plate. To fit over these round stock about 1 1/4" thick (and about 2" long) was drilled through (to fit over the stem) and then a leg put on one side as indicated in C. The legs fit into holes drilled around the center stem. I should note the center hole was not drilled in the exact center. Thus, when move around to the various holes, the distance between the two hubs changed to allow different thickness of stock to be bent. The display competition at the 1991 Quad-State will be tooling such as this, and I hope it gets entered.

For the pan on which the lamp sits, Bob used a piece of thin metal in about a 8" diameter circle. To crimp the edges, the used a spreading fixture made to fit the hardy hole. The fixture was about 3/8" stock bent in half and then bent at a 90° angle. The legs were spread 1/2" apart. Bob laid the edge of the plate over the spread area and then creased it with a ballpeen hammer to produce the crimped edge consistently around the plant. (See D & E).

To even out the upper sholders, Bob used a piece of about 7" pipe section which had been welded onto a piece of angle iron. The angle iron leg served to hold the jig in the vise. This area was heated, held with a pair of visegrips on both sides and then formed around the sides.



Kidding about the tools he uses to make old-time hardware, Bob said the mark on them "Made in Taiwan" was incorrect. The tools were made by his Uncle Taiwan so it should really say "Made by Taiwan". He also had an Uncle Vise Grips. Ron Thompson also let it be know his favorite uncle was "Uncle Stanley".

#### Editor's Corner:

OK guys, go to your VCR library and look between "Debbie Does Quad-State" and "Fancies of a Blacksmith" to see if you have any of the SOF&A VCR tapes. These are loaned out with the understand they will either be brought to the next meeting or mailed back to Ron Van Vickle prior to the next meeting so they can be loaned out again. We are missing the bulk of the tapes which have either been loaned to or donated to SOF&A. Giving the choice between trying to maintain an elaborate tape tracking system or discontinuing this service to our members, we just might choose the later. Come on guys, how about cooperating by returning the tapes when you promised to. Enough said!

I have been remiss in not including the ABANA President's message in the newsletter due to limited spaces versus a lot of material I'd like to include. As a catch-up from recent ABANA President's messages:

- ABANA is in a stable position with a firm grip on finances.

- At the suggestion of a member the board recently discussed reducing the number of board member (currently 15) and electing board members by geographic region. After much discussion, it was determined the number of board members is appropriate for the variety of things the board is trying to accomplish (reducing the number of board members would merely increase the workload on fewer people - not a good situation for a volunteer organization) and any ABANA member can run for the board. The board has been, and is now, fairly well distributed geographically. The board is sensitive to the cost of periodic board meetings.

- ABANA has been unable to come to terms for 1991 with the editor of The Anvil's Ring. Thus, they will be seeking a new editor. They are striving to produce the next few issues internally until a new editor is found. (Editor's note: Since I didn't even make the final cut last time, I am not planning to resubmit my application).

Back when I was Secretary/Treasurer, Newsletter Editor and Label Preparer, you could renew the day before the newsletter was mailed and not miss an issue. However, this is now split between three people; myself, Ron Van Vickle and Dick Franklin. Due to the time lapses between us, unless you renew fairly quickly after receiving your renewal notice, you may well miss the next issue. It would really help us if you would renew promptly after receiving your renewal notice and would also consider multi-year membership. Consider sending in \$20 for a four-year membership versus \$5.00 for one year - if nothing else it will save you over 75¢ in postage and us a lot of hassle.

A special thanks goes out to Denny Bishoff and Owen Vance for taping the meetings and bring coffee during the winter months, respectively. This is really appreciated but sometimes we neglect to say thank you as often as we should - thanks guys! Also thank you goes out to the monthly demonstrators - note that about 30 people braved icy roads on January 5th to attend - to me one heck of a sign the demonstrators and SOF&A are doing something right.

Note the the 1991 Quad-State is scheduled for September 28th & 29th. We have identified what we think will be a bang-up list of demonstrators and have sent out invitations to them - I'll let you know as our program firms up. This year's

Saturday evening program will be a competition between chapters to make chainlinks with prizes awarded based on quantity, quality and a weld-strength test. We need a SOF&A team! The display competition will be tooling to make a job easier. I have noted some beginning blacksmiths come up with really neat tooling - perhaps because they see what needs to be done and do it without prejudices.

Please take a minute to review your mailing label for the correct address (news-letter exchange addresses also). If a correction is needed, please provide it to Dick Franklin, 7158 Klyemore Dr., Dayton, OH 45424. The Post Office is becoming increasingly sensitive to having the correct address provided to them.

Several years ago the chapter established The Emmert Studebaker Award to recognize significant contributions for an extended period to the chapter. Your editor won the first award presented in 1989 and Larry Wood won it in 1990. The 1991 winners were determined to be Dick Franklin and Larry Gindlesperger (separate awards). Congratulations guys! Presentation will be at the 1991 Quad-State.



11 different iron "Tavern Puzzles" are available from Tucker-Jones House, P.O. Box 231, E. Setauket, NY 11733-0231. Cost is \$12 each plus S&H. Brochure on request.

Hand stamps (touchmarks) are available from Centaur Forge (P.O. Box 340, Burlington, WI 53105); Henry A. Evers Corp. (72 Oxford St., Providence, RI 02905) and Harper Mfg. Stamp and Die (3050 Westwood Dr., Las Vegas, NV 89109. Send design for price quote.

FOR SALE: Johnson gas forge, coal forge and large anvil. \$600 takes all. Contact Harold Hessler - 616-342-9474 (Mich.).

Jim Crean, a professional photographer from Hansburg, NY is interested in compiling a photo essay book on "The Blacksmiths of North America: A Vanishing Breed". He is looking for any size shop. If you are interested in being included in this work, please contact him at 716-649-0735 (4876 Big Tree Rd., Hamburg, NY 14075). Personally, I think he need to select a more appropriate title.

- The Texas Refinery Corp., a well-respected manufacturer of protective coating products, is looking for a manufacturers representative in the Dayton area. They prefer older workers and, in fact, over 50 of their area reps. are in their 80s and 90s. Contact Jerry Hopkins, P.O. Box 163589, Fort Worth, TX 76161-9972.

The Lockdown Securities, Inc. sells a bender with will handle up to 5/16"x2" and 5/8" round or square for \$369.00 postpaid. Included are 8 dies. Request brochure from them at 505-388-5067.

Interested in learning how to tie brooms for your fireplace sets? The Brukner Nature Center (5995 Horseshoe Bend Rd., Troy - 513-698-6793) has periodic broom-making classes. Cost is \$5.00 for a two-hour session.

FOR SALE: Champion blowers and firepots, send SASE for list and price to Steve Battaini, 212 Bradburg Ct., Redwood, CA 94061 - 415-363-2288.

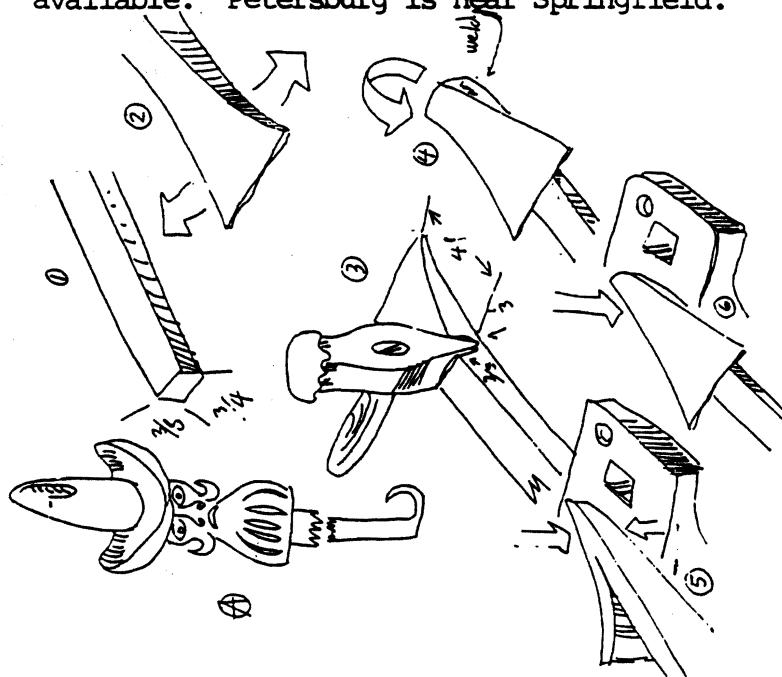
Didydium safety glasses, \$25.00 postpaid, Steve Feinstein, 106 River Heights Dr., Columbia, TN 37013 - 615-381-4663.

If you are restoring a wagon and need a replacement axle, one source is Emanuel Yoder, Farmerstown Axle Mfg. Co., Route 1, Box 90, Baltic, OH 43804. Send SASE for price list.

(From the newsletter of the Michigan Artist-blacksmith Ass'n)

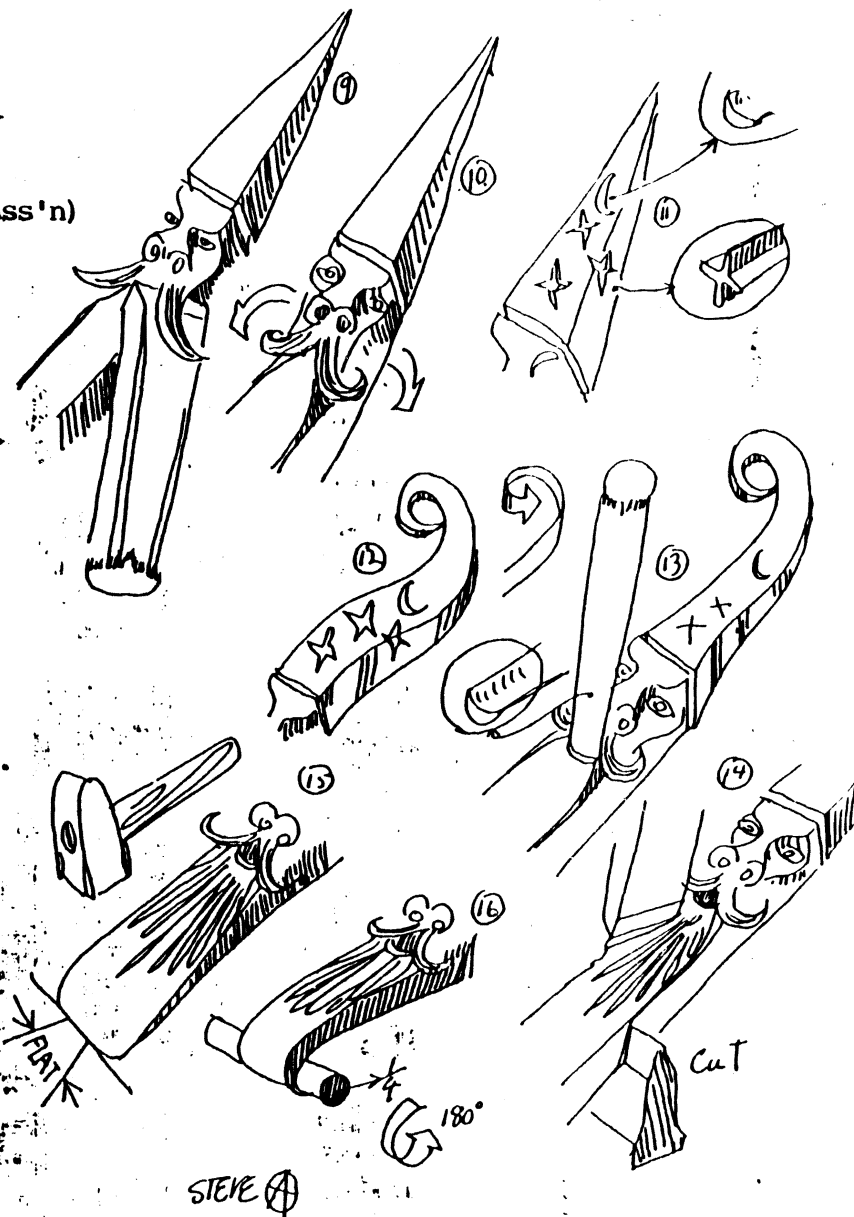
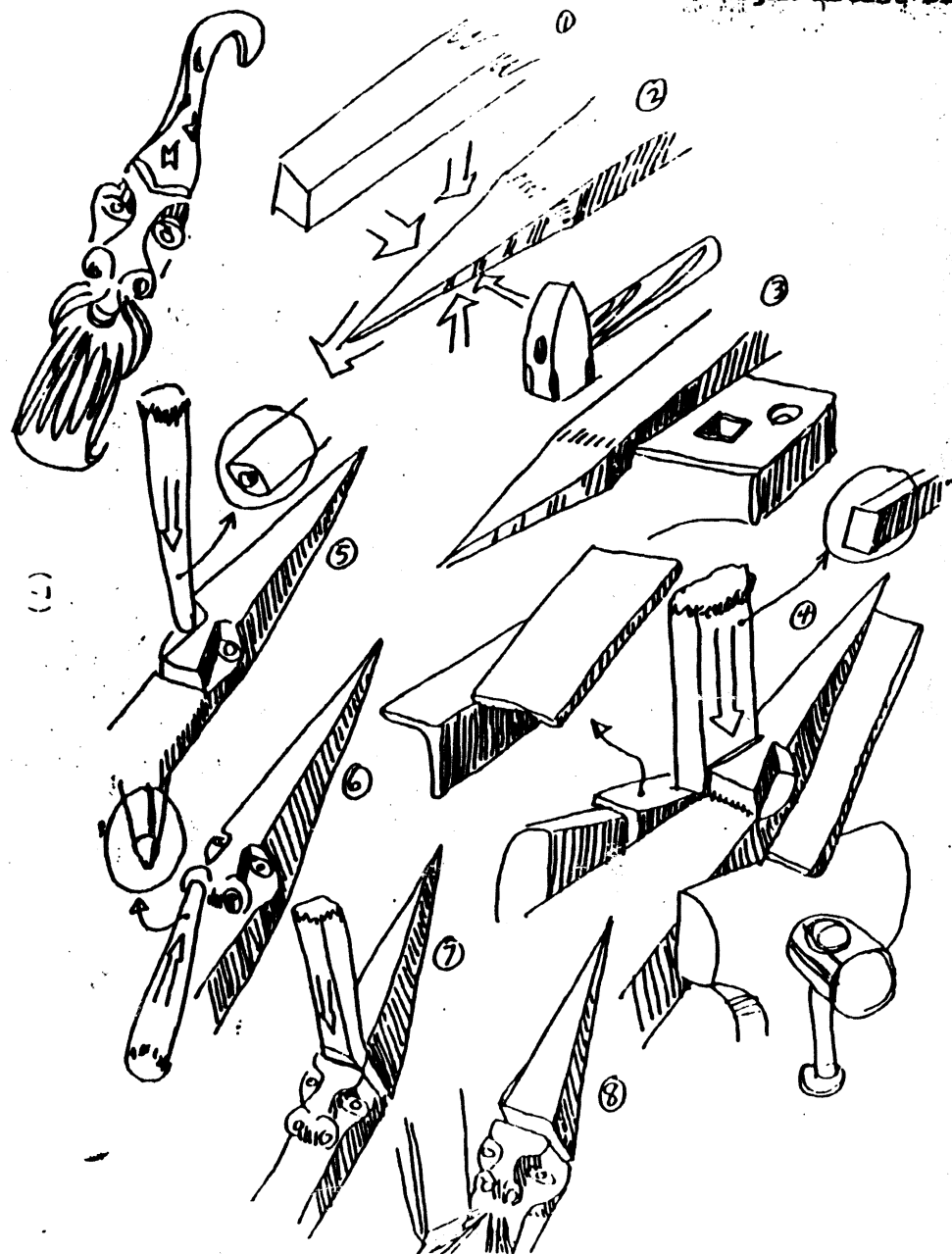
Steak Turner  
demonstrated at the April 8th  
meeting at Ken Nankel's in  
Cannonsburg - Bob Becker demon-

LATE NOTE: Jim Batson is the demonstrator at the 1991 Hammer-in at the Lincoln's New Salem State Historic Site. He will demo his style of people heads on April 6th and bladesmithing on April 7th. For further information contact Jim Patton, RR #1, Box 244-A, Petersburg, IL 62675 - 217-632-7611. Camping sites available. Petersburg is near Springfield.



# Ron's Bottle opener

(From the newsletter of the  
Michigan Artist-Blacksmith Ass'n)



Ron's demo from the Feb. 1990  
meeting - Sketches by  
Stephen Alling



(8)

## HINTS TO BLACKSMITHS AND HORSE-SHOERS

- Don't burn the shoe on.
- Don't rasp under the clinchers.
- Don't rasp on the outer side of the wall more than is absolutely necessary.
- Don't rasp or file the clinch heads.
- Don't make the shoes too short. Don't make high calks. Don't pare the frog.
- Don't cut down the bars. Don't load the horse down with iron.
- Don't lose your temper. Don't hit the horse with the hammer.
- Don't run down your competitor. Don't continually tell how smart you are.
- Don't smoke while shoeing. Don't imbibe in the shop. Don't run outdoors while sweaty. Don't know it all. Always be punctual in attendance to your business. Allow your customers to know something. No man is such a great fool but that something can be learned of him.
- Be always polite. Keep posted on everything belonging to your trade. Read much. Drink little. Take a bath once a week. Dress well. This done, the craft will be elevated, and the man respected.

(From: "The American Blacksmith", 1916)

**HANDS-ON POWERHAMMER WORKSHOP.** Clifton Ralph will hold two consecutive one-week, hands-on, power-hammer classes at Bill Manly's shop near Kingston, TN. \$200 per class, bunkhouse camping available. Classes are March 25-29 and April 1-5. Contact Clifton at 4041 47th St., Gary, IN 46408 - 214-980-4437.

## OWED TO A BLACK SMITH

Beneath the spreading maple tree  
The local Idiot stands  
With propane forge and homemade air hammer  
and burns upon his hands.



He heats and beats the metal  
you can hear the anvil ring  
All the folks that know him  
Know he is a real Ding -A- ling

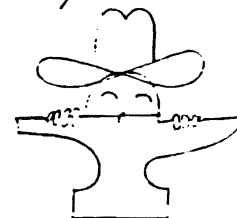


He hammers and he hammers as  
He stands so tall  
He beats and he forges  
Oh No! This piece is still too small!



Now I'm the local Idiot  
you heard about at the start  
If you get a laugh out of this  
I have done my part!

*Monty Manly*





## USING MILD STEEL FOR DIES: (Ron Thompson)

My career has been spent as a foundry metallurgist and foundry/weld shop manager. As a result, I am a kind of resident metallurgist for the SOF&A Chapter and am frequently asked various metallurgy and hardening questions by chapter members. I have learned a great deal about metallurgy as it relates to blacksmithing as a result.

My first real contact with using a lye solution as a quenching media was at the 1990 Northwest Ohio Blacksmiths Spring Conference while watching Joe Bonifas' demonstration. Joe stated he was using a lye quench to make dies for his large Chambersburg hammer from mild steel with excellent results. Joe had learned of this technique from Russ Swider at the 1989 Quad-State Blacksmithing Round-Up and felt it produced a very effective powerhammer die.

Joe stated that Russ' method was to heat the mild steel die to 1400°F and then quench it in a solution of one pound of lye in a gallon of water. Later I learned Russ had also specified the lye quench needed to be no higher than room temperature, thus either only a single quench could be done or a large amount of lye quench solution was required.

When asked by a SOF&A member how it worked, quite frankly I didn't have the foggiest idea and was skeptical. I knew lye is basically sodium hydroxide (NaOH) and hardening usually involves quenching steel containing about 30 points of carbon to obtain a suitably hardened structure - mild steel is generally accepted to be a steel with a carbon content below 30 points (0.30 percent carbon). I could not imagine lye was adding anything to the steel to give it increased hardening tendencies such as a case hardening effect using a nitriding powder. On the other hand, I did not think there was enough carbon in the mild steel to be effectively hardened by itself without the lye contributing something, so I was puzzled.

The inkling of how things may work started with the aspect the lye quench lost its hardening ability if the quench solution was above room temperature when the item was quenched. To Hans Peot, who is highly experienced in practical metallurgy from his Air Force engineering experience, this suggested the lye was producing a super-quenching effect at lower quenching solution temperatures. I agreed but was at a loss as to how it could produce hardening above a water quench without more carbon or a nitriding agent being introduced.

As an experiment a fellow SOF&A member, Brian Thompson, gave me several mild steel samples consisting of a control (non-heated) piece and four heated to 1400°F and then air cooled, quenched in oil, quenched in water or quenched in a 10 percent lye solution. Analysis by our lab showed he had pulled a piece of cold rolled, resulfurized steel out of the scrap bin and it contained just 0.08 percent carbon (8 points). This steel also contains a high manganese content (1.75 percent) to tie up the sulfur and is frequently used for machining since the sulfur reduces the chip size. A lab test as to the Rockwell Hardness (Rc) of each sample piece is contained in Table 1, along with the results of the similar process preformed by me on pieces of documented hot rolled (HR) 1020 (17 points carbon). Note the cold rolled started out as Rc 12 (due to the cold rolling process and high manganese content) but the heating actually resulted in a severe loss of Rc with air or oil quenching. As expected, air quenching had no effect on the hot rolled since the process by itself results in an air quench. I was frankly surprised Rc 36 could be obtained from mild steel with just 17 points of carbon.

Table 2 also shows the results of two further experiments.

Photomicrographs on the structure of the test pieces showed a conversion by the water quench to ferrite grains with some globules of manganese sulfides and areas of pearlite and martensite, with the least ferrite in the lye quench. The HR 1020 showed almost complete transformation to martensite on quenching either with water or lye, but the water quench shows maybe five to ten percent more ferrite than the lye quench, signifying the lye quench was deeper. Apparently this is from a faster quench as suspected although the five to ten percent difference in ferrite levels did not significantly affect hardening. This is probably because maximum hardness was reached with a water quench so the effect of a super quenchant added no hardness. Keep in mind this was a sample of one, so the results should be noted as such.

TABLE 1:

Type of Quench	Resulfurized 8 Points Carbon Hardness in Rc	Hot Rolled AISI 1020 Hardness in Rc
Control (not heated)	12	1
Air	-3	1
Oil	5	12
Water at room temp.	18	36
10% lye at room temp.	23	36
Water quench - propane tempered to peacock	18	
Water quench - oven tempered to dark straw		36

TABLE 2:

Tempering Temperatures °F	Rockwell Rockwell C (Rc)
None	67-68
300	65
400	62
500	60
600	56
700	51
800	46
900	41
1000	36
1100	32

TABLE 3: (Quenched at 1328 - 1022°F)

Quenching Media:	Cooling Rate Relative to Water at 65°F
Aqueous solution 10% NaOH	2.06
Aqueous solution 10% H <sub>2</sub> SO <sub>4</sub>	1.22
Water at 32°F	1.06
Water at 65°F	1.00
Mercury	0.78
Water at 77°F	0.72
Oil (Rapeseed)	0.30
Water at 122°F	0.17
Water at 212°F	0.044
Liquid air	0.039
Air	0.028

TABLE 4: (Quenched under 1500°F)

Quenching Media	Cooling Rate Relative To Water at 75°F
Brine (10%)	1.81
Tap water	1.00
Guld Super-Quench	0.38
Slow oil	0.17
10% soluble oil, 90% water	0.17
Still air	0.024

Martensite is a very hard, brittle, crystalline structure of iron carbide produced when hot steel is suddenly chilled in a cold solution. Tempering, as is done with tool steels, reduces the stress levels in the martensite and thus lowers the brittleness. Both procedures used showed no change in Rc levels. The oven tempering was at 500°F for one hour.

Since mild steel isn't normally tempered, I could'n find any tempering information on it among my references. I did find the information in Table 2 in the "Peninsular Tool Steel Catalog" for AISI W2 (90 points carbon). Steel with a lower carbon content should respond similarly after being quenched in a super quench solution, possibly losing its hardness faster.

It should be noted 8 points and 17 points carbon mild steel was used in these experiments. The Rc obtained by using ASTM A36 should be even higher as the carbon in it runs from 26 points for stock 3/4" or less in thickness to 29 points for stock over 4" in thickness according to the "Wabash-Lagrange Steel Supply Catalog".

On the impact of the temperature of the solution I dug out my college text "Physical Metallurgy for Engineers" by Clark and Varney and found the information in Table 2. As can be seen from the table, the lye quench was just over twice as effective as the water quench at 65°F. However, this does not mean you can expect twice the hardness. It is possible to reach maximum hardness with just a water quench.

One would expect a fall off in hardness similar to water for water-based quenchants as the quenching solution temperature rises. Be sure to note it does not take much of a rise in quenching solution temperature to severely reduce the effectiveness of the quenchant.

While impressed with the above information, I also know lye is a very caustic and thus very dangerous chemical. It is difficult to store and dispose of and any lye solution in the eyes by accident could result in permanent loss of vision very quickly. Steam from the quenching procedure can also burn the lungs if inhaled.

A co-worker, and graduate metallurgist, loaned me his college text "Introduction to Physical Metallurgy" by Avner. While not mentioning lye, it shows a ten percent solution of salt is 1.82 times as effective as water as a quenching media at 75°F - see Table 4. Extrapolation to the data in Clark and Varney's text, which showed a drop in hardness from 65°F to 77°F for water, indicates the salt water quench to be nearly as effective as the lye quench (1.82 versus 2.06). at the least, and perhaps as good without the associated danger of dealing with a hazardous chemical solution.

With the data I have been able to obtain there does not appear to be a question lye quenching is superior to water quenching for dies, possibly by removing the scale and shortening the vapor stage of quenching in some way. However, there appears to be another method close, if not equal, to it - quenching in a ten percent salt solution at lower solution temperatures.

If you are going to try to make durable dies out of mild steel I recommend:

1. Make sure you know the carbon and alloy content of the mild steel you are using. Use HR 1020 as a minimum, perhaps A36 due to its higher initial carbon content.
2. Heat the area to be hardened (instead of the entire die) to a bright cherry or even yellow to make sure you are getting the maximum hardness available restricted to the working area as much as possible. The Iron Carbon Diagram suggests a higher pre-quench temperature for lower carbon content, although in a discussion with Robb Gunter he said higher initial die temperatures have given inconsistent results.
3. Rather than lye, quench the dies in a chilled solution of one pound common salt to one gallon of water. This should give essentially the same results via a far safer process.
4. Temper the die at 500°F to 600°F for one hour in your pre-heated kitchen oven. This will help reduce the brittleness in the die caused by the martensite. A mild steel die will lose hardness very easily if overheated compared to a carbon or alloy steel die. Keep this in mind if you are planning to use the die for production work.
5. Don't expect consistent results or even consistency within the particular die. Mild steel isn't meant to be used for its hardenability regardless of how effective the quenching agent.
6. Consider using a case hardening powder instead if depth of hardness isn't a critical factor. It can be purchased at your local welding supply house and isn't difficult to use.

I understand Robb Gunter is working with metallurgists at the Sandia National Lab and further information on the exact effect of lye quenching on mild steel may come from there.

(Ron Thompson works for a foundry in Sidney, Ohio)

#### References:

"Physical Metallurgy for Engineers" by Clark and Varney, D. Van Nostrand Co., 1962 edition.

"Introduction to Physical Metallurgy" by Sidney Avner, McGraw Hill, Inc., 1974 edition.

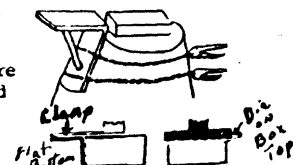
#### SHOP TIPS & TECHNIQUES (Continued from page 12):

- **DECORATIVE LEAF FROM FLAT STOCK:** Material: 3/16"x1/2". Point the end, 7/8" from end make notches with 1/4" spring fuller. 3/8" from first notch, make a 2nd. Flatten end into leaf shape using a bottom swedge with groove for leaf vein. Cut off 5/8" from 2nd notch and finish other end the same way. Cup all leaves on an indented cupping tool held in the vise. (From a demonstration by Bob Becker as written up in the newsletter of the Upper Mid-West Blacksmiths Ass'n).

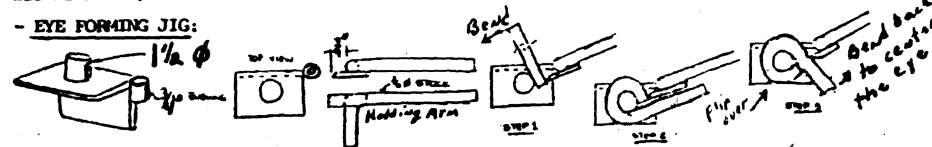


- **ADJUSTABLE HEIGHT POST VISE:** To make an adjustable height post vise, for say a school, attach a post vise to an old telescoping trailer leg and mount it securely in the floor. (By Michael Yinhar from the newsletter of the North Carolina Chapter of AANA).

- **POWER HAMMER DIE HOLDER:** To clamp various dies to the bottom die of his power hammer, Glenn Horr made a table extension which is attached to the bottom stand with the top aligned with the top of the hammer's bottom die. The dies are then welded to a short length of bar which is in turn clamped to the table by two or more ordinary #10 vise grip pliers. (By Paul Lacy from the newsletter of the Appalachian Blacksmiths Ass'n). (Two other method would be, if your die is high enough, to mount the table directly on the side of the die as shown, or to mount the die like a box lid over the bottom die. - ed.)



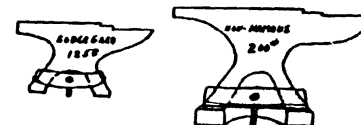
#### - EYE FORMING JIG:



- We recently received a job to make 1,000 hooks to carry castings on a conveyor, so we made a die to make 1 1/2" I.D. eyes in the 5/8", B620 round stock. What we came up with was a forming die made from 3"x3"x3/8" angle, 4" wide with a piece of round stock of the inside diameter of the eye required welded on the angle iron at a space far enough away from your holding arm to be able to hold the largest diameter of rod you expect to bend. Grind a slight taper to the top of this center piece to facilitate removing part. To hold the piece which is being bent just bend a piece of 3/4" round at 90° and weld 3/4"x1/2"x2" stock on the bar at the 90° bend. Grind or cut a slight taper on the end to give it some bite. Weld a 3/4" I.D. bushing at top and down leg of the angle iron so the hold down piece can't wiggle. (By Jim Auer and Merle Ballard from the newsletter of the Northwest Ohio Blacksmiths). (A typed note on the illustration indicated, "If the center post were made smaller and bushings made to fit over it, any size I.D. bend could be made". It should also be noted that the holding arm shown will only hold about 5/8" stock. To make this holding arm versatile you can weld a clip as indicated to a piece of 3/4" I.D. pipe and then slide the pipe over the 3/4" 90° as far forward as needed. - ed.)

- **HOT CUT:** Regular or sidecut hot cuts can be made by cutting and shaping an appropriate size piece of leaf spring, welding it to a suitable collar using the appropriate welding rod, and then welding a piece of box tubing the size of your hardy hole to the bottom of the collar. (By Ron Porter from the newsletter of the Indiana Blacksmith Assoc.)

- **SINGING AND DANCING ANVILS:** I have yet to attend a blacksmithing conference where all of the anvils were toned down and none danced on the block or, if tied to it, on the floor. Personally, I think a smith is letting the cheese slip off his cracker if he thinks an anvil must ring or allows it to. The same applies if he chases a loose anvil while attempting to do skilled work. As to the loud ringing, I have a 125 lb and 200 lb anvil which took opera lessons. I tried the unsafe procedure of a punch in the pritchel hole and contemplated gluing a piece of belt under the heels of both when Tom Brandt of Fishers, IN told me to "tie it down". I've seen chains, draw bolts and a variety of complex solutions. For the 200 lb anvil I hot punched two pieces of 1/2" x 1 1/2" x 9" for a 1/2" x 6" lag screw, laid them across the feet on both sides of the anvil, located and bore a 3/8" hole in the stump about 30° from vertical or commensurate with the angle of the bar as it lays on the anvil feet. Be sure to grease the threads for ease of tightening. Ring is reduced to about one half and the anvil will stay put. In the bottom of the stump on concrete or fill dirt around the edge on a dirt floor, I reamed about 1" of wood in the center of the bottom of the stump for a dirt floor leaving a 2" wide rim to settle into the dirt. On the 125 lb anvil, I used the center sections of two flat car springs with a center hole large enough for a 3/8" x 5" lag screw. To retain the spring tension, cut the spring to length with a chop saw or cutting torch - not the forge and hot hardie. If you have neither, use a metal cutting blade in your electric handsaw or grind a groove one half way through and snap off in a vise. If anyone has a simpler solution, please share it. (By Bernie Cler).



Hans Peot reports that Patterson Iron on East First Street has been taken over by Franklin Steel and they now have a good supply of good scrap steel on hand at all times. The supply changes frequently.

FOR SALE: 300 lb anvil in excellent condition. Asking \$300. Contact Bill MacLeod, 667-6392, Tipp City.

WANTED: Craftsman sought for established blacksmith shop. Salary negotiable. Send letter of introduction to Leaning Oak Forge, Harmony Rt., Box 5, Spencer, WV 25276.

The 10th New York - International Art Competition is offering \$30,000 in prizes and New York gallery exhibition for winners. One category is metalwork. For further information contact them at International Art Horizons, P.O. Box 1533, Ridgewood, NJ 07450 - 201-487-7277.

The Arrowhead For Boys Camp is looking for a blacksmithing to teach June 4 - August 22 at their camp in Tuxedo, NC. Have a shop and would pay room board, laundry and a salary. I overheard someone at Quad-State 90 saying they had done this last summer and really enjoyed the experience. Contact them at P.O. Box 97, Tuxedo, NC 28784 - 704-692-8362.

Photos of the works submitted for the gallery at the 1990 national conference are available from ABANA. For additional information provide a SASE to the editor.

Arrowmont School of Arts and Crafts (P.O. Box 567, Gatlinburg, TN 37738) is calling for submissions for a national juried exhibition titled "From All Directions". For further information provide a SASE to the editor.

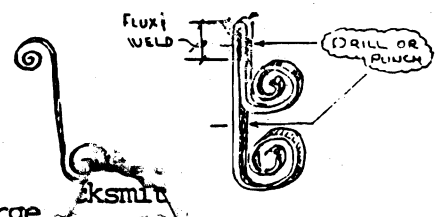
The Bear Mountain Outdoor School (Hightown, VA 24444 - 703-468-2700) will hold a one-week introduction to blacksmithing course taught by Charles McRaven, author of "Country Blacksmithing" on May 12-17, 1991. For further information contact the school.

Some of the tools used in automobile restoration also have application to blacksmithing. For a free catalog of automobile restoration tools call The Eastwood Company at 800-345-1178 (580 Lancaster Ave., Box 296, Malvern, PA 19355).

**SHOP TIPS & TECHNIQUES:** The following were, for the most part, paraphrased from other ABANA Chapter or affiliated group newsletters. While the information presented herein, and elsewhere in this newsletter, is believed to be accurate, neither SOF&A nor ABANA assume any responsibility for the accuracy, fitness, proper design, safety or safe use of any information, technique, material, tool design, use, etc.  
**USE IS SOLELY AT THE USER'S OWN RISK!**

- **REMOVING ZINC PLATING:** Galvanized (zinc plated) hardware should never be forged since the fumes from burning zinc are highly poisonous. To remove the zinc plating, put the item(s) in Muriatic Acid (used to clean masonry and available in hardware stores) for about ten second. Use a very small amount of acid and handle the object(s) with plastic or wooden tongs. Rinse pieces in water, then heat to dull red to oxidize them to black. ALWAYS HANDLE ACIDS PROPERLY AND WORK IN A WELL VENTILATED AREA. (By Brad Silberberg from the newsletter of the Blacksmiths' Guild of the Potomac).

- **WALL HOOK:** Cut a length of 1/2" x 1/8" flat M.S. 20" will yield an average sized wall hook. Forge a scroll at each end as shown; note that the lower end has a more open, larger diameter scroll. Take an orange head, bend as shown, flux and prepare to weld. Drill or punch two holes for screws. Finish to suit (i.e., paint, wire brush, etc.). Forge actual diameters on the scrolls to your taste - experiment! (By Joe Farina from the newsletter of the Florida Artist-Blacksmith Ass'n).

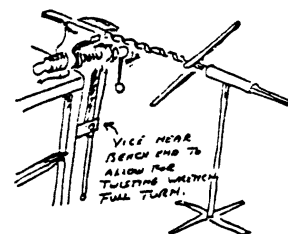


- FORGE WELDING A-36: Forge welding A-36 can be difficult. To do so, heat stock to a bright cherry red, flux with borax, then return to fire. Heat again to bright cherry red, flux with E-Z Weld or the like, return to fire and bring it up to welding heat and weld. (From demonstration by Fred Caylor as reported by Mark Wein in the newsletter of the North Carolina Chapter of ABANA).

- TIPS FROM THE NEWSLETTER OF THE BLACKSMITHS' ASS'N OF WESTERN AUSTRALIA: 1. 7. ANVIL BLOCKS: In a situation where different people work on an anvil, cement angle iron pieces into the floor at the anvil base. It can then be raised to the appropriate height by placing boards under the anvil block.

2. ANVIL TWIST HOLDER: To keep long twists straight, hold one end like that as illustrated.

3. DESIGN TRANSFERRING: To transfer a design from paper to a layout table, rub the back of the paper with chalk, lay paper down on table and trace. Results - perfect drawing without ruining original. (By Malcolm Paine as observed in the shop of Francis Whitaker at the Colorado Rocky Mountain School, Carbondale, CO.) (A problem with the anvil block holder illustrated as that the site of the anvil would be permanent. It looks like the same effect could be achieved by putting a metal plate under the anvil block and welding the angle irons to that plate. - ed).



- ON OILING MACHINERY: Many times when you have a lot of machinery, you hear the statement, "Oil is cheaper than new equipment". I found out the other day by accident, that in certain cases, too much lubrication can actually cause problems. What happened was I was reading an operations manual for a milling machine. In the directions I read you should make sure the oil was at a certain level and no higher because if there was too much oil in the reservoir, it would tend to foam up, causing the mechanism to over-heat! I guess it helps to read the manuals once in a while!!! (By Mike Shaffer from the newsletter of the Tullie Smith House B-G.)

### ABANA Membership Application

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 Mail application to: **ABANA, P.O. Box 1181, Nashville, IN 47448** Phone 812-988-6919  
 Dues Distribution: 1 Year Subscription to Anvils Ring: 68.5% \$24.00, Adm. Offices & ABANA projects: 31.5% \$11.00

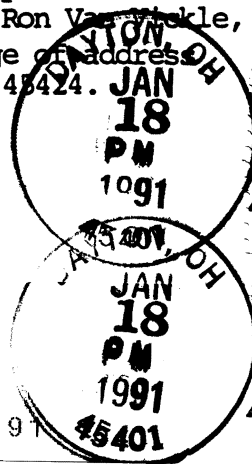
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