



SOFA SOUNDS

SOFA
SOUTHERN OHIO FORGE & ANVIL

Artist-Blacksmiths Association of North America

OCTOBER/NOVEMBER 1989

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NEWSLETTER EDITOR:

Bud Rupe (299-3378 after 4pm)
*ABANA Board Member

MARK YOUR CALENDARS: 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 for 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 to be provided on a break-even donation plate basis. The forges at the homestead are available before or after meetings for individual projects.

October 7th, 1 pm BUSINESS MEETING followed by a demonstration by Larry Wood and Hans Peot, on the making of a Vise Jaw and one leg of a Post Vise. OPEN FORGES BEFORE AND AFTER THE MEETING.

November 4th, 1 pm BUSINESS MEETING followed by a demonstration by Ken Scharabok and Hans Peot. They will give a once in a life time demo on the complete making of a wrought iron body steel faced Peen hammer head.

THANKS:

SOFA would like to give its thanks to all the people who made this year's Quad-State Blacksmithing Round-Up a great success. It takes a lot of hard work and we would like to give special thanks to those who made it possible. Emmert Studebaker, for his continued patronage and the use of his one of a kind facility, and Ken Scharabok for his fine organizational skills as Chairperson. Also, thanks are in order to the folks one and all who braved the weather to help set-up and who had it in their hearts to stick around after the event to help clean up. We had some exceptional demonstrators who put their hearts into their work. After all, without these fine craftsmen/artists there would have been nothing to see at the round-up. And finally, a thank you to those who provided services and who drove from near and far to take part in the brotherhood of the forge at our yearly fall get together.

Note from the Editor:

Thanks to Ken Scharabok for providing the following information dealing with the August 5th demonstration and related materials while I was on vacation.

BUD RUPE

Chapter of ABANA

- At the August 5th business meeting, Hans Peot told of his trying to use wrought iron from an old bridge. He noted his band saw wouldn't cut it since the silicate in the metal kept clogging the teeth and it didn't oxy/ace cut well either. He tried drawing out pieces both with and against the grain and kept getting cracks. He noted this was apparently single refined wrought iron versus double refined. If anyone knows how to work wrought iron, Hans would like you to contact him. Hans was interested in trying to work wrought iron into his Damascus-pattern billets, but has given up on the idea for now. In reading other chapter newsletters, I noted some knifemakers use wrought iron from old wagon wheel rims; apparently it doesn't need to be preforged to shape.

Hans also displayed a hot cut hardy he made on the advice of Jay Reakirk. He shaped and ground a piece of truck spring for the cutting blade and then welded that onto a piece of square stock to fit his hardy hole. Hans said it makes a super hardy with little work.

The newsletter support raffle brought in \$52.25. Spencer Combs won sheets of sandpaper donated by Dave Clouse; Art Holz won RR spikes and Larry Gindlesperger, Ken Scharabok and Steve McNew won short lengths of 4140 steel donated by Jim Leistner; Jeff Morrison, John Jacobs and Jim Leistner won bags of nuts and bolts donated by Monty Thompson; Doug Fink won two handles donated by Joe Abele; Bill Heileman won a powerhammer swage donated by Ken Scharabok, Bill Baillif won a nylon hammer donated by Doug Fink; Joe Abele won one of Hans Peot's hot cut hardys; Hans Peot won a sewing machine motor, Jim Leistner won a brass pump and Ham Hammond won a bag of apples all donated by Emmert Studebaker and Jim Leistner won the end of raffle odds and ends pile.

Following the business meeting Ham Hammond gave a dandy presentation on the basics of welding. Ham was a career boiler maker and has burned a few pounds of rod in his time. Rather than repeat fundamentals found in several welding handbooks, just the highlights and asides from his presentation are given:

- An excellent welding reference is Hobart's "Pocket Welding Guide". While at one time it was small enough to fit into a shirt pocket, it is now about the size of a paperback book. This, and other reference material, can be ordered directly from Hobart. Write to them at Hobart Square, Troy, OH 45373 - 513-339-6000 and ask for publication DM-601, "Hobart Welding Training Aids". They also carry a number of publications from the American Welding Society. You can also pick up miscellaneous information on welding (e.g., rod requirements and performance) for free at welding supply houses.

- Prior to the atomic bomb, an arc welding arc was the highest known temperature achievable - about 10,000°F. The arc emits a high level of ultraviolet light and can cause severe sunburns in very short order.

- A critical consideration is the number on a rod (e.g., 6010) since it tells you the tensile strength (first two numbers in thousands of pounds), what positions the rod is best suited for (the third position) and current requirements (the last number). Most welding guides will decode this number for you.

Ham told the story of going to one welding job and being shown a brand new machine which they said was defective since they couldn't weld standard 6010 rods with it. Ham immediately notice it wasn't intended to provide the DC 6010 rods need to work properly and by using 6011 rods showed them how to properly use the machine.

- Penetration of welds is the name of the game. Unless the rods get a good bite, the welding will not hold under any stress.

- If your ground is farther away than the length of your grounding wire, you can extend the ground with any direct metal to metal contact. Ham noted on some jobs then wired lengths of rebar end to end to extend the ground.

- Duty cycle on a welding machine means the time out of a ten minute period the machine can be run constantly. 20% duty cycle is OK for most home application, 50% is OK for production welding since about half the time is spent putting in new rods.

- Welding was discovered by accident when someone noticed a shorted wire caused metal to fuze. The first rods were lengths of bare metal rods. However, even a good welder could only get about 50% good welds with them, meaning excessive grinding out for rewelding. When someone figured out oxygen was causing the problem, the first fluxes used were coating of organic materials, and later iron powder coatings. When someone also noted hydrogen was causing a problem also, heilarc welding was developed using helilum and later argon gasses. Emmert Studebaker noted he once tried to use powdered welding rod flux as a forge welding flux and it didn't work at all.

- Ham read a portion of Hobart's "Pocket Welding Guide" to emphasize the five critical elements of good arc welding are the correct rod size for the job, the correct current, the correct voltage (amps), the travel speed and the angle of the rod. Like forge welding a good blacksmith can cut corners, but violating the rules gets most people in trouble (i.e., bad welds).

- If you are having trouble seeing your weld being made, try using 'cheater' lenses available at welding supply outlets. They are magnifying lenses determined by your age not eyesight. Welding lenses come in different shades, most commonly used for arc welding is #10, however some people may weld better with #9 or #11. Generally, the larger the rod diameter, the darker the lens needed.

- The time and effort you spend preparing the material to be welded (e.g., clamping and aligning) is as important as, if not more important than, welding techniques. Chipping, grinding and wire brushing is critical to multi-pass welding.

- When using oxy/ace. set-ups, NEVER, NEVER, NEVER use any oil on the fitting. Using acetylene above 15 pounds pressure can cause the acetylene tank to turn into a rather large and deadly bomb by allowing packing material to be vented, leaving an extremely dangerous void within the tank. Ham said when he use to teach welding he would pass around a photo of a garage completely leveled by an explosion to illustrate this point.

- Eventhough they are built rugged, treat oxygen bottles with a great deal of respect. If punctured or the fitting broken off, they can expel more pressure than the thrust of rockets used during WW-II.

- If you don't use oxy/ace. on a regular basis, always go over instructional material before use and follow what it says. Oxy/ace. welding is far more deadly than arc, MIG (wire feed) or TIG (inert gas) welding

- The following safety procedures are off the front of my Miller arc welding machine (and also emphasized by Ham):

-- Protect yourself and others. Read and understand the instruction manual for the equipment you are operating.

-- Electric shock can kill. Ham noted it is far less likely to get badly shocked while welding than it is by trying to get into a welding machine while it is plugged in.

-- Arc rays can burn eyes and skin. Noise can damage hearing. Wear correct eye, ear and body protection. Emmert pointed out you can get sunburned on the back of your neck from rays bouncing off of a white ceiling. Ham always makes of practice of loudly saying "WATCH YOUR EYES" whenever he strikes a weld if anyone is nearby.

-- Fumes and gasses can seriously harm your health. Ventilate to keep from breathing fumes and gasses. If ventilation is not adequate, use approved breathing apparatus. Ham noted many welding flux fumes contain arsenic, among other goodies.

-- Hot metal, splatter and slag can cause fires and burns. Allow equipment and work to cool before handling.

-- Magnetic fields from high current can affect pacemaker operation. Wearers should consult with their doctors before going near arc welding, gouging or spot welding operations.

At the meeting Emmert ask that those who buy coal from him do so before the regularly scheduled meetings unless it is an emergency situation (you run out on a rush order). Thus, please plan your use accordingly.

EYE PROTECTION FOR THE WELDER

All craftsmen must worry about flying sparks, chips and dirt; and sometimes, radiation. The problem is aggravated further by trying to find something that provides reasonable protection, while being comfortable, and that does not interfere with seeing fine details. The situation gets more difficult for welders who also must protect their eyes from intense radiation.

Ye Editor recommends that blacksmiths who wear glasses talk to their local welding supplier about "Cheaters". These are **supplementary** lenses that slip inside the welding helmet behind the colored filter. The cheaters work like your bifocal lenses, and bring the weld into sharp focus. You wear your regular glasses with the helmet, as usual. I have been so pleased with the close-up lens that I bought an extra arc bonnet, fitted it with a Shade 5 filter, and another Magnalens to bring this comfort and convenience to acetylene welding. The supplementary lenses cost 6 or 7 dollars each, and are available in several strengths, or diopters.

TEN COMMANDMENTS OF WELDING:

This section is from the Modern Blacksmith as reprinted by the newsletter of the California Blacksmith Ass'n. While most blacksmiths today seem to only do occasional welds, the information seems appropriate. The reprint was titled "Church Column" by Rev. John J. Davis.

"Malcolm Muggeridge once said, "Someday, a lot of people are going to be surprised to find out that God is interested in something besides religion,". I agree with that. I consider the church and its activity a recovery and training center for the business of life. As I reflect upon that, I have seen the ten commandments revised and rephrased and parody written. One such writing dealt with the Ten Commandments of Welding...please note that they are not "suggestions" ...a lesson often emphasized.

1. Thou shalt not weld on an unpurged tank, for the noise will be very loud when the tank explodes and thy friends will console thy widow in ways generally unacceptable unto thee.
2. Thou shalt secure thy tanks, lest one fall on thy foot and transform thee into less than a graceful dancer when called upon by thy wife or other female friend.
3. Thou shalt clean thy work carefully, lest thee gaze upon thy work falling apart as it passeth out of sight.
4. Thou shalt place thy work in jigs, or other holding fixtures for thy eye is a poor instrument for the measurement of angles and great will be the wrath of thy leader as thou art doing the task a second time.
5. Thou shalt not weld near batteries, compressed gasses, or flammable materials lest a spark from thy labors create a fire which would cause thee to continue thy chosen profession in an open field or other such drafty place.
6. Thou shalt take great care of thy tools and equipment, lest thy friend who is in charge of such things smites thee about thy head and shoulders for being a wasteral and a knave.
7. Thou shalt not preform thy art without proper ventilation, for the smell of toxic gases produced by the heating of primers, and painted or plated surfaces is worse than a bad cigar and will remain with thee until the end of thy days.
8. Thou shalt not weld without goggles, not shall thou allow others to gaze upon thy labors, lest thy employment, or the employment of others be changed to sitting on cold and rainy streets while selling pencils.
9. Thou shalt wear sturdy gloves, for burns upon thy hands are a source of great pain when thou art attempting to raise thy bowling average.
10. Thou shalt ground thy work, for thou art a poor conductor of electricity and the shock which thou shalt receive shall ruin thy plans for the weekend.

REGISTRY OF BLACKSMITH TOUCHMARKS

This registry, although not an original idea, was developed and recorded by Mike Shaffer beginning in 1988 and has been constantly updated as new information has been made available. Duplication and/or republication of any or all of this information is invited by any not for profit organization.

Mike Shaffer Publisher

TOUCHMARK (TRADE MARK, LOGO)

JUD NELSON
SUGAR VALLEY GA.

SHS



MWS

D/W

RG



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G.B. HERR
•GBH•

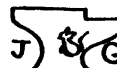


MB

TF
TRANSIT LINE
FORGE



MP



MOUSE HOLE ANVIL
BLACKSMITH SHOP

R



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ABANA

Artist-Blacksmiths' Association of North America



P.O. Box 1181, Nashville, Indiana 47448
Executive Secretary, Janelle Gilbert

Office Hours: 7:30-11:30am & 1:30-4:30pm
Phone: (812) 988-6919

PRESIDENT'S MESSAGE September 1989

Dear Friends,

ABANA is offering a fund-raising project for the chapters who wish to take advantage of it. There is a limited number of baseball caps at \$2.00 ea. and engineer caps at \$4.00 ea. in lots of 12 (any combination). Both caps have the 1988 ABANA conference logo on a sewn patch. These patches could be replaced with your local chapter logo if desired. Please take advantage of this money making project while the supply lasts. Send an additional \$2.00 for shipping for each order of twelve.

We are a little behind in our printing and shipping of the forge plans. Those of you who have mailed in your request should be receiving your blueprints within the next 7 - 10 days. Anyone putting in a new order must be sure to add \$2 for shipping in addition to the price of \$15 for ABANA members or \$20 for non-members. It was found that we could reduce the size of the blueprint itself and bind it in a booklet with instructions for the same price so it can be taken to the shop layout table as a complete text. It was felt, as we got into the printing, that this would preserve both the plans and text in its entirety, allowing ease of filing and safe keeping in your blacksmith library.

As I look ahead to the British-Artist Blacksmiths Association (BABA) Conference at Cardiff, Wales in two weeks, I find that I cannot keep from reflecting upon my roots in blacksmithing. From the first time that I picked up a hammer, ABANA was there. ABANA was there for me when there wasn't anything else. In ABANA I found a link with honesty, value, worth, sharing and growing together in both my business and in my personal life. Through the years I have been intimately involved in its growth; watched the good times and the bad times; and like a marriage I stuck with it and believed in it. I did that because of all of you, the members; my friends, my inspiration, my drive; and because I found that it made me happy, peaceful, satisfied, and complete. From the beginning you have accepted and respected me and I have done the same with you. This common bond that we share in the iron is one of my most precious possessions. To be allowed the privilege of representing you on the board all of these years and of being entrusted with your confidence now is truly profound.

As I ready for Cardiff, I see my trip as a great responsibility. I proudly and humbly have been allowed the privilege of representing not only myself, but all of you as members; men, women, beginners, professionals, hobbyists, all of us as a team --together as your President, the spokesman of the membership of the greatest blacksmithing organization in the world.

I hope each and every one of you will some day enjoy a similar circumstance. It is my personal goal to help ABANA reach a point in the future where every member will have an equal opportunity for such an experience.

Sincerely,

Dorothy Stiegler
ABANA President

DES/jrg

ABANA

Artist-Blacksmiths' Association of North America



P.O. Box 1181, Nashville, Indiana 47448
Executive Secretary, Janelle Gilbert

Office Hours: 7:30-11:30am & 1:30-4:30pm
Phone: (812) 988-6919

PRESIDENT'S MESSAGE October 1989

Dear Friends,

I'm pleased with the return of the board of directors ballots and by-laws change. I wish I could give you the results, but the ballots are still being processed. I will notify the candidates on September 29th and I will update the membership in the next chapter mailing and Anvil's Ring Fall issue (due out in December).

We still have some of the engineer and baseball caps left from our 1988 ABANA Conference to be used for chapter fund-raising. These caps have an '88 conference logo patch which can be replaced with your individual chapter logo. Baseball caps are \$2.00 each and engineer caps are \$4.00 each. Be sure to order in lots of twelve and add \$2.00 for shipping of each lot order (any combination).

The gas forge plans are going like hotcakes and if you wish to get in on the first printing, be sure to contact the ABANA Office as soon as possible. Member price is \$15.00 and non-member price is \$20 with an additional \$2.00 for shipping on any order.

The British Artist-Blacksmiths Association (BABA) is to be commended for the excellent conference held at Cardiff Wales in September. It was an international event in every sense of the word --from the conference booklets given to each delegate upon arrival, to the food and conference site. Can you think of a better place to have a blacksmith conference than at a 900 year old castle? I understand they were building onto the thing when Columbus discovered America! How's that for an antique? It was wonderful meeting old and new friends and it was obvious to everyone in attendance that they were getting their money's worth.

The demonstrations and the lectures were each 2 hours long with 30 minute breaks. No two events were scheduled at the same time and you came away knowing that you had the opportunity to attend everything you chose. I am unsure if this schedule would work for the ABANA conference as we have more than twice the delegates in attendance; food for thought, however.

The BABA conference was sponsored by Allied Steel so the funding was substantial compared to the ABANA conference budget. The large amount of money available certainly showed itself but the incredible organization was what pulled it all together. In my opinion we who attended were certainly treated to the event of the decade. Good job BABA!

The ABANA board is preparing for the annual budget meeting in Tipp City, Ohio coming up the second week in November. If you have anything that you would like discussed at the meeting, please inform someone on the ABANA board very soon.

Warm regards,

Dorothy Stiegler
ABANA President

DES/jrg

National Ornamental Metal Museum

FOR
IMMEDIATE
RELEASE

FOR
IMMEDIATE
RELEASE

RELEASE FOR PUBLIC INFORMATION

September 8, 1989

"REPAIR DAYS WEEKEND"

on the grounds and in the Smithy at the
NATIONAL ORNAMENTAL METAL MUSEUM

374 West California Avenue

Saturday and Sunday, October 14 & 15, 1989
*10:00 A.M. - 5:00 P.M. Daily

The public is invited to bring any object made of metal for repair by members of the Museum staff and craftsmen volunteers who come to Memphis at their own expense to offer their services. ALL PROCEEDS BENEFIT THE MUSEUM'S GENERAL OPERATING FUND. Services include:

soldering
retinning copperware
blacksmithing

welding
dent removal
sharpening

Admission to the grounds is free and visitors are invited to observe and ask questions as their pieces are repaired. Admission to the Museum will be waived for those holding repair receipts.

Helen Shirk, Professor of Art at San Diego State University, will serve as this year's "master smith". An exhibition of her work will be on view in the galleries of the Museum.

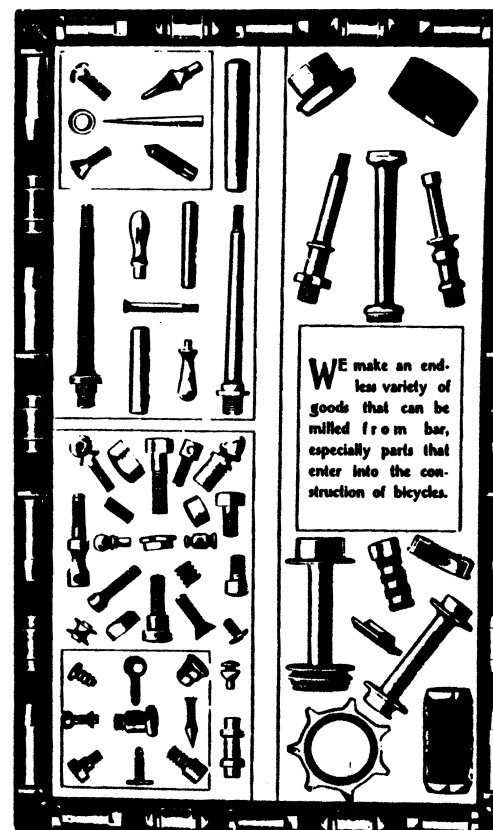
*To insure that all work taken in can be serviced during the two day event, no new repairs will be accepted after 3:00 P.M. on Sunday, October 15. All objects brought in during the weekend should be picked up before 5:00. The Museum is not responsible for objects which have not been claimed when the gates close on Sunday.

First floor galleries, giftstore, the grounds and smithy are accessible to the handicapped.

CONTACT: ELEANOR CAREY DOWNES
(901)774-6380

KILL DATE: OCTOBER 15, 1989

THE MAKING OF LITTLE THINGS



Some of the "little things" made by Western Automatic before the turn of the century.

In 1895 the Industrial Edition of the *Lorain County Reporter* printed an article entitled "The Western Automatic Machine Screw Co., one of the Largest Manufacturers in their Line in the Country . . . Its History a Record of Prosperity and Advancement."

The introductory paragraphs of this 3-page article offered its readers an explanation as to how such a large concern could be devoted entirely to the production of "little things." The article began . . .

"It's the little things that give perfection to the world of invention, that give life and being and motion to huge machines, intricate productions of mechanical genius and make possible of attainment the thousands of inventions that the brain of man yearly calls into activity! It's the little things that produce great results, create innovations, and supplant the cruder methods of producing the necessities of man."

"The Western Automatic Machine Screw Company of this city is one of the institutions of the country whose energy is exclusively devoted to the making of little things for the use of manufacturers and the retail hardware trade. The inconceivable number of little things that enter into the construction of the big things are made by this concern, and cover a range of subjects embracing the important small parts of instruments of precision, such as printing presses, engines, electric appliances, watches, clocks, musical instruments, optical work, guns, pistols, sewing machines, locks, shears, bicycles, machine shop supplies, and all the finer classes of small hardware made from iron, steel, or brass."

"With such an institution devoted entirely to the manufacture of screws and kindred goods, the ordinary man is forced to exclaim, 'Where do they all go to?'"

(Published in the Industrial Edition of the *Lorain County Reporter* in 1895)

(From the newsletter of the Western Canadian Blacksmiths Guild)

PROPANE FORGE

by
John Smith

Last year I built a propane forge the same as Jeffrey Funk (see the March, 1988 issue of *The Rivet*), with a steel arched top lined with Kao-wool, firebrick base and sides, and two burners coming in through the top. I built this forge for one purpose -- taking 36 inch long heats -- for making the bases of my fireplace toolsets in one heat. It does a wonderful job and has already paid for itself several times over. It has two drawbacks: It takes quite a while to heat up, and it uses a lot of propane.

For 95% of the forge work we do, a 9" or 10" heat is enough. So I built a small forge of firebricks, with a single burner coming in the side, and this was quick and fairly efficient, but did not give an even heat. A lot of efficiency is lost when the flame hits a brick wall a few inches away; in fact the brick area opposite the burner was black, even when the rest of the inside of the forge was bright orange.

I attended Northwest Blacksmith Association meeting in the fall where Darryl Nelson of Fire Mountain Forge had a new type of propane forge, which reached welding heat in about 5 minutes from light up, and ran on hardly any propane. It was cylindrical -- a piece of 10" pipe -- lined with 1" thick Kao-wool. The burner came in horizontally near the top, creating a circular, swirling flame, giving a very efficient and even heat. I knew I had to have one!

There was, however, one thing that really bothered me about Darryl's forge, and that was the exposed Kao-wool, with the burner aimed right at it. (In Jeff Funk's forge the burners are aimed away from the Kao-wool.) Kao-wool is extremely irritating to the throat, and when I have handled it without a mask I have experienced a very irritated throat and tight breathing, similar to breathing galvanizing fumes, for several hours.

The brand name that is easily available here is "Inswool," from A. P. Green Refractories, and on the box it says to avoid breathing without a mask when handling as it gives "temporary" lung irritation. When Kao-wool is exposed inside a forge, with the burner flame blowing on it and the steel that is heating up bound to touch it at times, it seemed to me that this must cause particles to become airborne.

One of the reasons for giving up coal is to avoid the harmful airborne coal dust and ash -- and I see no point in trading one health hazard for another if it is possible to avoid both. So I built a round forge using a castable refractory material instead of Kao-wool. It doesn't heat up as quickly, but once hot runs at a nice forging temperature at about 1/2 to 1 psi of propane pressure. At increased pressure it reaches forge welding temperature easily.

The castable refractory material I used is from A. P. Green and is called CA2004. There are several different mixes available, ranging from \$25 to \$70 per 25 Kg bag. CA 2004 is about \$35, and so far is working fine. You just add water and mix it up like concrete. After it has cured for 24 hours it is important to dry it out thoroughly before lighting it as trapped moisture can turn to steam and explode it. I set mine on top of our woodstove for a week. The stove was alight continuously and it dried the forge nicely, although there was some steam created during the initial firing. It was heated slowly and we took several hours before we got the inside to glow. I did this outside, partly in case it did explode, but also because the steam coming off didn't smell very nice.

Everything went fine, and the next day we brought it inside and started using it. Initially I had a piece of 1 1/2" pipe with no concentric pipes added.....

.....and it really roared very unpleasantly. When I added the two extra pieces of pipe (see plans) it quieted right down. Thanks, Jeff, for this important detail. Also, without the extra pipes in the burner, it was a bit temperamental, and until it warmed up it would occasionally blow itself out. Now the flame pattern is much better and it is not as touchy with the air/gas ratio. A big improvement. The heat throughout the forge is really even.

I built my forge specifically for it to be used by two people at once -- one working at each end -- so I just have loose firebricks stacked up to close off the ends, with an adjustable opening to put the steel in. It is important to use high-temperature firebricks. I used "Prairie" from A. P. Green. (Regular fireplace firebricks fall apart when they get red hot, as they do on

the side facing the inside of the forge.) My forge is 14" long and the burner is in the center. It could be scaled up or down to suit individual requirements, and one end or both could be made from the same castable mix, with a slot for work to go in, and another slot through the back for heating the middle of a long bar. I used what I had, but did follow A. P. Green's recommendation of making the lining 3" thick.

A CAUTIONARY NOTE: Propane gives off carbon monoxide which can be deadly. Do not operate a propane forge in a closed shop unless it is properly vented, and even then a supply of fresh replacement air is necessary.

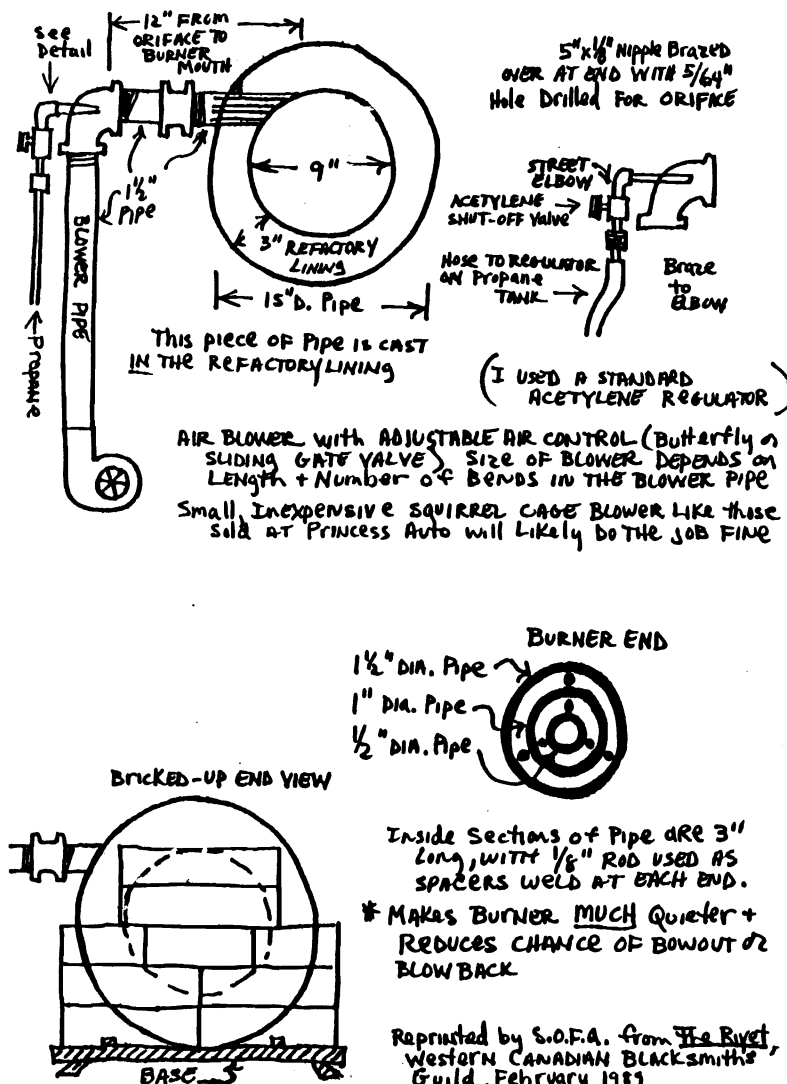
Medical books say carbon monoxide is harmful at a concentration of 100 ppm, which isn't very much.

I haven't used my coal forge since the blower burned out in November, and you know, I don't miss it. Using propane is so darned simple.

(Ed. note: John says that a 100 lb bottle of propane lasts him about 35 hours and that the cost of running the forge is around 70 cents per hour.)



Note: Hans Peot has obtained excellent results from simply lining the inside of a 10" diameter pipe with Dura-wool (available in 1", 1 1/2" & 2" wide blankets from Plibrico Sales & Service, Division of Frank W. Schaefer, Inc., 1500 Humphrey Ave, Dayton (Off Linden near Color Tile). Hans' gas forge is about 18" long closed at both ends with firebricks.



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