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THE FORGE FIRE

The Newsletter of the Indiana Blacksmithing Association, Inc.

An Affiliate Of The Artists-Blacksmiths' Association of North America, Inc.

IBA is a Not For Profit Indiana Corporation recognized by the IRS under section 501(c)(3)

9:30 AM is the regular meeting time for IBA Hammer-Ins
with beginner training available at 9:00 AM.
PLEASE MAKE SURE TO ASK FOR HELP!

**If you would like an IBA membership application form,
please contact Farrel Wells, Membership Secretary
(765) 768-6235.**

BULK LOTS ARE AVAILABLE TO DEMONSTRATORS,
SHOPS, SHOWS AND OTHERS WILLING TO MAKE THEM AVAILABLE.
WE APPRECIATE YOUR HELP.

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

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More nearby resources and organizations for blacksmiths:

Rural Smiths of Mid-America:
Meetings are on the first Saturday of each month
Call Ron Gill
317-374-8323 for details

IBA MEETING SCHEDULE

Check the latest <i>Forge Fire</i> for monthly IBA revisions.	
Sept 15 2018	TBD
Oct 20 2018	JENNINGS COUNTY BLACKSMITHS VERNON, IN
Nov 17 2018	TBD
Dec 8 2018	DON REITZEL'S SHOP (2ND SATURDAY)

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Dates to Remember

September 20-23
Quad State (SOFA)

October 20 Hammer In at Vernon,
IN



Bill with the 2018 Fair Queen

The 2018 Quad State event at SOFA is September 20-23. Official events are Sept 21-23, with set up beginning on the 20th. For more details check out their website: <https://sofablacksmiths.org/event/quadstate-2018/>

For those of you who do not follow the IBA Facebook page, Jeff Reinhardt has posted a number of informative articles based on his training and experience in industry. Pages 6-7 contain the article Jeff wrote on proper lubrication for hand crank blowers. I can attest to making the mistake of using "gear oil" in a blower many years ago. It did not take me very much time on a 40 degree day to understand the oil was not right for the job.

Editors Message

Congratulations to Bill Newman for organizing another banner year at the Indiana State Fair. Everyone I have spoken had a good time. I know Bill Newman is planning to retire next year. I have also heard reports that he plans to relocate out of state after retirement. If you might be interested in coordinating the IBA demonstrations at the Indiana State Fair, I would recommend contacting Bill or any other board member.

The October IBA hammer in will be hosted by the Jennings County Blacksmiths. This will be first state hammer in since the shop was expanded. Lunch will be a pitch in.



SEPTEMBER 21, 22, & 23, 2018

**Brotherhood of Friendly Hammermen,
forging large split cross**
Friday Night Forging Demo

Lisa Geersten - Contemporary
Seattle, Washington

Jim Rodebaugh - Bladesmithing
Carpenter, Wyoming

Allan Kress - Traditional & Tooling
Cullman, Alabama

Richard Sullivan - Gunsmithing
Colonial Williamsburg, Columbian, Ohio

Atticus McFadden-Keesling - Animal Forms
Pontiac, Michigan

Hands on Instructions
Christopher Daniel - Blue Hell Studio
Cincinnati, Ohio

IBA website: www.indianablacksmithing.org **IBA Facebook page:** www.facebook.com/groups/IndianaBlacksmithingAssociation/

IBA Satellite Groups and News

1) Sutton-Terock Memorial Blacksmith Shop

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

3) Wabash Valley Blacksmith Shop

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

5) Maumee Valley Blacksmiths

Meet: 2nd Saturday
 Contacts: Clint Casey (260) 627-6270
 Mark Thomas (260) 758 2332

7) Rocky Forge Blacksmith Guild

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

9) Whitewater Valley Blacksmiths

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

11) Bunkum Valley Metalsmiths

Meet: 1st Saturday
 Contacts: Jim Malone (812) 725-3311
 Terry Byers (812) 275-7150
 Carol Baker (317) 809-0314

13) Satellite 13

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

2) Jennings County Historical Society Blacksmith Shop

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

4) Fall Creek Blacksmith Shop

Meet: 4th Saturday at 9 AM
 Contacts: Gary Phillips (260) 251-4670
 Dave Kline (765) 620-9351

6) St. Joe Valley Forgers

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

8) Meteorite Mashers

Contacts: Mike Mills (812) 633-4273
 Steve King (812) 797-0059
 Jeff Reinhardt 812-949-7163

10) One-Armed Blacksmith Shop

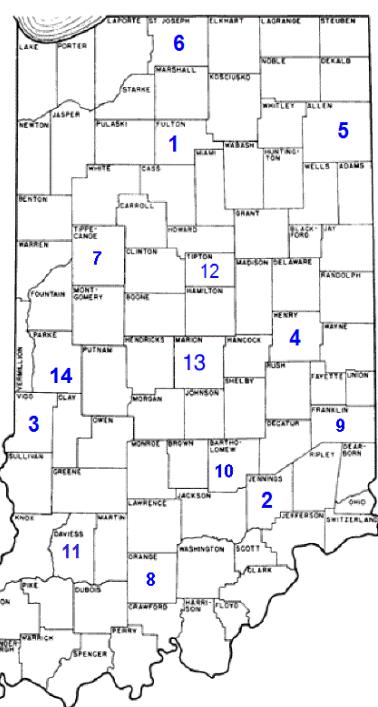
Meet: 1st Saturday
 Contact: Tim Metz (812) 447-2606

12) "Doc" Ramseyer Blacksmith Shop

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

14) Covered Bridge Blacksmith Guild

Meet: 1st Saturday
 Contact: John Bennett (812) 877-7274



Jennings County Historical Society Blacksmith shop

The Jennings County Historical Society Blacksmiths was greeted by Kenny Dettmer and his trailer with a 50# power hammer! This hammer is an IBA hammer from the One Armed Blacksmith shop started by Tim Metz. Most of the meeting consisted of moving and setting of the hammer. Dave Good worked on the small hammer, making an ax drift. After some complications, work had to be suspended. We had a good turnout and Iron in the hat.

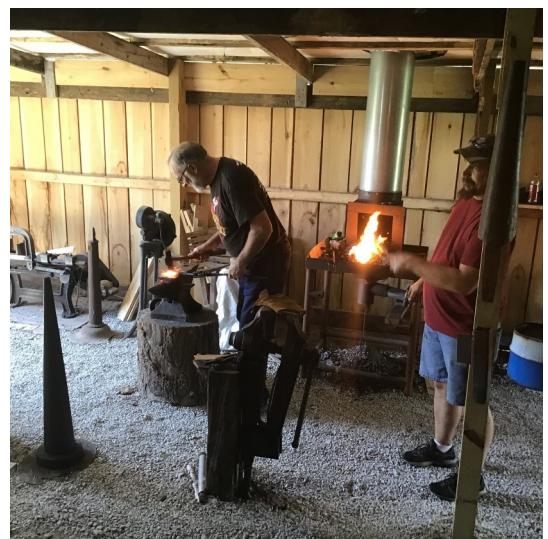
Paul Bray

IBA Satellite Groups and News (continued)

Bunkum Valley Metalsmiths



The Bunkum Valley Metalsmiths met Saturday September 1st. We had a great good group of 20+ men, women and kids. We loaded up for the White River Valley Antique Show that is starting this Thursday and running through Sunday. The Blacksmith shop will be open everyday with demos being shared. Jim Ray and Kathy Malone will be singing on Friday evening with their band the Bunkum Valley Boys around 7:45pm. This is a free concert with admission to the Fair Grounds \$5 each. [White River Valley Antique Association](#)



IBA Satellite Groups and News (continued)

Meteorite Mashers

The Meteorite Mashers met at Dave Kunkler's shop in Branchville this month. Had lots of new folks and Donna Kunkler took the photos. I and Butch Sparks were quite late to the meeting due to a roadside emergency with Butch's vehicle. It got fixed and we did make it just to late for me to write much about the goings on. Our Sept Meeting will be in the shade of the horn of an Anvilstream trailer at Troy Ohio during Quad State. The meteorite mashers sub group the BFH are making a large split cross for the Friday night demo at Quad State. Don't miss it.



The October meeting has not yet been set.



The November meeting will be the now infamous Smoked Turkey Hammer-in at Jeff Reinhardt's shop in Floyd's Knobs on the Saturday after Thanksgiving.



Lubrication for Hand Crank Blowers

Jeff Reinhardt

I know that many are building up their equipment and generally getting started out. I see lots of misinformation on the lubrication of hand crank blowers. My background in machines and especially old machine is quite long. I have worked in factories since the 70's and most had at least some equipment from as far back as 1880. This old equipment was kept running in production over those many decades of very hard service by proper lubrication. When the designer started the plan for a machine, the speeds of the shafts gears and so forth are known to him, and he would pick the bearing-lubrication-load-speed as a system. The speed and load of the shaft, and the type of bearing calls the lube. When the design calls for oil, usually in small equipment "Oil holes" were designed in to allow dripping a drop or two of oil from time to time to keep the shaft floating on the oil. More advanced systems used a felt in the hole to keep out dirt and hold oil in a sort of reservoir. Then came oil cups that had a flip lid and a felt to hold more oil and then drip oilers, and if the machine was run many hours and had many oil points a oiler system like a Manzel pump multi-oiler was used. The point is that grease is not mentioned in any place in the above. Grease is used in low speed heavy loaded bearings. If you use grease in the higher speed roller bearings for instance it will churn and overheat.

In these little hand crank blowers oil was and is the lube of choice. These depend on the oil creeping into the bearings and also to be brought up from a small puddle in the bottom of the case by the turning gears to lube the gear faces and to run down and do that creep into the bearings thing. If you are tired of oil dripping from these little jewels remember that most were designed to do just that as they are "Total loss" lube systems. That is the point as the oil goes in, and washes out any dirt and wear metal OUT. If you grease pack these boxes, the grease is soon packed into the box and none is on the gears and none is creeping into the bearing and soon you have a destroyed gearbox.

I have repaired a fair number of totally stuck blowers that required disassembly and digging the grease and rust and general coal dust etc out and once clean return to oiled service.

Many ask about what oil. I always recommend ATF. Automatic Transmission oil closely matches the viscosity of the oil intended by the designers as it is a fairly low viscosity. It has the lowest pour point of any common available oil and has the anti-wear additive that is needed for long gear and plain bearing life. Many recommend gear oils at up to 90wt. These are very good oils in a gearbox with low speed worm gears but are not good in a hand crank blower for several reasons. One the cold viscosity is so high that it will make turning the blower very hard in a cold shop. Also the viscosity does not allow the oil to creep into the bearings as the blower turns, and the tacky nature does not cling and drip the same defeating the pick up oil in the puddle and carry it to the top and drain down scheme.

Here are a couple of photos of a simple gear box on a Cannady Otto blower that was brought back from stuck solid to smooth and easy running.



Case opened and full of hard grease water from condensation



Note the grease packed into the nooks and crannies but not on the gears or shafts.



The hardened sticky grease and dirt from inside the gear case

We have only a limited number of these no longer made jewels, and we need to treat them well so our grand kids have something to use.

Mystery Steel Processing and Testing

Marc Banks

Editors Note: This article was posted in an on-line blacksmithing forum. It is re-published with the author's permission.

Here is my process for using and recycling steel that had a previous application in life.

First off, remove all fasteners, bolts, spacers, etc and get everything knocked apart. With leaf springs it might be easier to maneuver them around if you cut them in half after you get the individual leaves apart, use an angle grinder or whatever you are comfortable with.

Next give them a good lick with a wire brush to knock off most of the grit and grime you can before annealing. Then build a decent size wood fire and toss them in, leave them in until the fire dies out. For me this is usually a late afternoon or early evening start and I dig the steel out in the morning.

Wire brush again, if the steel has formed scale that prevents you getting a good inspection for cracks soak it in vinegar for 3-4 hours and wire brush again.

Now if it is free from cracks and it was a spring, it was probably an oil quench steel. That isn't

always the case 100% of the time though. Cut three small strips off the spring and draw them out to a uniform thickness, I usually will do about 1/4" to 1/8" thick by 6" long so it's easy to work with. Take each up to non-magnetic/critical temperature, hold there for about 5 min, then quench one in veg oil or similar, one in water, and air cool the last. After quenching, clamp each of your pieces in a vise and use a wrench to snap them in half, take note of how difficult each one was to break and compare the 'grain' structure of the metal. The test piece that has the finest grain structure is the one that was quenched correctly.

Now if you are really feeling curious, you can nail down one more characteristic of your steel. This one isn't really going to help you a lot, but it might be useful. Take one of your test pieces and grind it down to shiny clean metal, then do the same with a chunk of plain 'ole mild steel. Sit them side by side and spray them with salt water, you can dunk them if you don't have a spray bottle handy.

If they rust at the same rate, then you're likely dealing with a 10xx series. If they don't, then there are likely other alloying elements in your mystery steel.

So now you have a ballpark idea of what you're working with, what's next? Let's define some things before we get too far in the weeds.

It's important to be aware that steel is not just one element with a few other bits poked into it like a granola bar. It's more like a cake or a brownie depending on how the heat treatment has been done. You need to understand how to get it all to be uniform, otherwise you end up with some bits being more brittle or softer than others and that means it's more prone to break.

Steel is made of two primary things at its most basic, Iron and Carbon. The two elements interact and bond together in different shapes that make steel harder or softer. When you add in other elements to the mix like chromium, manganese, copper, nickel, etc. it changes how all the elements in the mix 'hook on' to one another. While those other alloying elements can dramatically change the nature of the metal, it's still the carbon and iron that do most of the bonding.

Normalizing is essentially a hard factory reset for an alloy steel. The material is taken up to its critical point and held there long enough for the atoms in the alloy to let go of each other somewhat and just hang on to the ones that they are most attracted to. This means that you get an extremely fine and uniform grain structure throughout the steel. It also means that when you do the rest of the heat treatment, you won't have hard and soft spots. The general process is pretty simple, the steel is taken up to the hardening temperature (just a pinch beyond non-magnetic) and held there until the temperature is constant throughout, 15 minutes per inch of thickness is my rule of thumb, and allowed to cool in air, a moderately slow rate I think, to allow that fine uniform mix of elements in the alloy, aka grain or microstructure.

If you're recycling steel from something else, like springs and such, normalizing is critical before and after forging. Not doing so will frequently lead to unexpected and undesirable issues in whatever you're making.

Annealing relieves internal stresses in the material from either intentional or unintentional cold working of the metal. Essentially you take the steel up to a temperature below it's critical temperature where you'd need it for hardening or normalizing and let it cool slowly, this varies a bit depending on

the steel alloy being cooled since there are some steel alloys that harden in air, those you would have to cool at an even slower rate.

The terms annealing and normalizing do have an ounce of confusion between them, and don't by any stretch, call on me as an expert. My understanding is that Normalizing is going to reset the grain structure of the steel, and annealing will generally get things softer and relieve stresses, largely, without meddling with the microstructure of the steel.

Quenching is done when the steel is evenly heated to a little beyond the temperature a magnet will attract it, commonly known as the critical temperature, then inserted into the quenchant like oil, water, brine, air, or whatever. This cools the steel at a uniform and predictable rate, hardening the steel. If the correct quench medium was used, it will be as hard as it can be, but brittle as all get out, frequently it's referred to as "glass hard" at this point. Usually I'll use an old file to make sure that it won't bite into the material at this point to make sure it hardened up well.

Tempering is the next step, you're heating the steel just enough to slightly soften it. There is a tradeoff though, higher temperature tempers rob the steel of that hardness. There is no avoiding this trade off, harder steel holds a keener edge, but is far more fragile. For most common steels used in knives get tempered between 300F to 550F and allowed to slowly cool in the tempering oven or in air. Don't quench it again if you can help it.

Depending on the steel and the intended use, the temperature you temper will vary depending on the final hardness you want, many of the more common steels will be very brittle at around 60 to 70 hardness RC if all has gone well.

Straight razors, for example, are usually tempered to something around 300F-350F in order to be very hard and hold a fine edge, approximately 58-60 RC.

Skinning knives are often tempered for hardness around the 54-56 RC range, 400F-500F, as they see more aggressive use that is more likely to damage the cutting edge.

Blades made to be struck and beaten on, pried with etc, will often be tempered for a hardness around 48-52 RC range, 500F-650F.

All those numbers vary based on the steel/alloy being used. There are many other variables to the process depending on what you're using and what you're doing.

On a final note, motor oil is a terrible quenchant and it has NOTHING to do with toxic smoke. It's all about the rate of cooling. When you quench a blade, you are trying to get the right mix of pearlite, martensite, and other crystalline structures to form in the steel to give you the most hardness.

Motor oil doesn't do that, it's WAY too slow (we're measuring the rate of cooling in 1/100ths of a second here at least).

Vegetable, canola, and peanut oil, however, are much faster quenches and better able to cool most 10xx, 51xx, 41xx, and many other steels much closer to their ideal rate. They match commercial quenchants like Parks closely too. That is why they are the preferred.

You Can Handle This Candle!

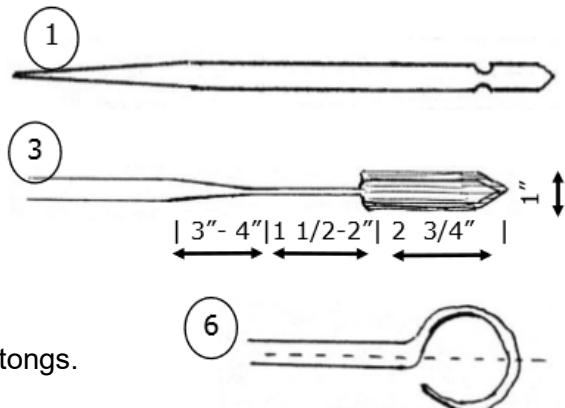
by Don Pfaff

This article reprinted from Pittsburgh Area Artist—
Blacksmith Association newsletter, July 2018 edition

Materials: Stock size— 1/4" X 1/2" X 20" to 24"

Directions:

1. Forge a 9" long taper one end and short taper on other end
2. Fuller in 2 3/4" from short taper
3. Round up stock 1 1/2"-2" from fuller toward long taper.
4. Taper stock 3"-4" to meet rounded stock.
5. Cross pein to about 1" wide
6. Roll candle cup to 3/4" I.D.
7. Align center of short shaft to center of candle cup.
8. Lock vertical in vise and bend cup into position using scroll tongs.
9. Forge scroll at long taper.
10. Bend to 900 and adjust.
11. Hot wax finish.



Not Out of Your Sights.....Really!

Stuart Hill of Velarde, New Mexico would be first to say, you can create this candlestick too! He is a firm believer in "breaking down" an object to its simple elements and build from there. This candlestick can be made from materials bought at your local Lowes, you just have to make them into shape! "If you know how to make scrolls, pein a fish tail, draw tapers, add texture...you are there! Then add a little stove polish (from Lowes) and you got it!" Stuart says students are often locked in on "what they are shown" not what it

can be, such as a simple "S" hook is the first part of a scroll...just "break it down", you too can create beautiful items just by taking small steps!

If you can taper a point, fuller, roll and scroll, you can make this candlestick. Once you feel comfortable with Don Pfaff's design, give Stuart Hill's project a try or a variation. Just use what you learned from making the above!!!

Melting Point of Metals

This chart is reprinted from the Foundry Manual, Department of the Navy, Bureau of Ships, Washington 25, DC (1958), Chapter 1, Page 9.

The entire manual may be viewed at the Historical Naval Ships Association website:

<http://www.hnsa.org/resources/manuals-documents/single-topic/foundry-manual/>

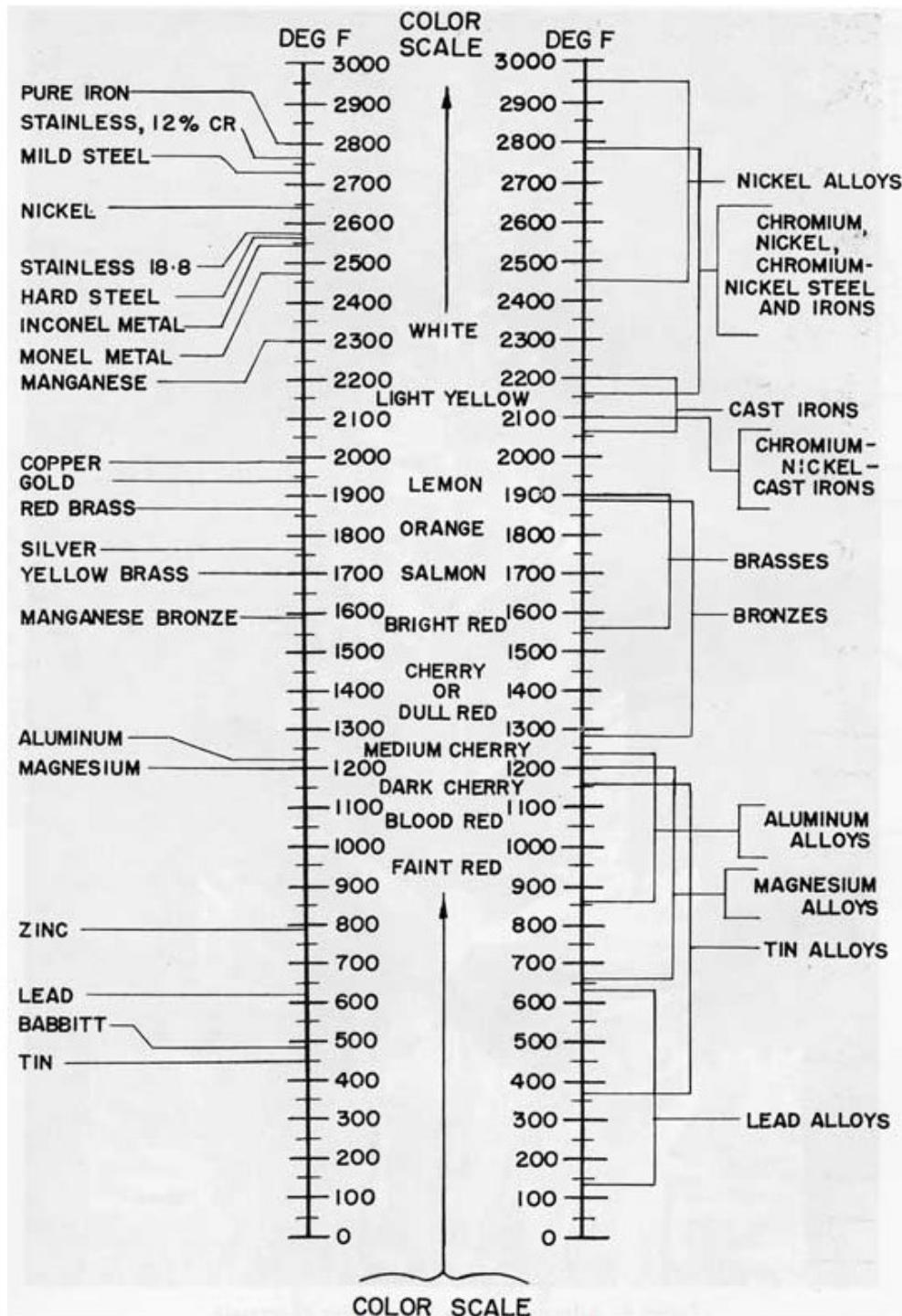


Figure 5. Melting points of metals and alloys.



The FORGE FIRE
Newsletter of the
Indiana Blacksmithing Association, Inc.

Farrel Wells *Membership Secretary*
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Dunkirk, IN 47336-8807

First Class Mail

Address Correction Requested
If Undeliverable return to
sender

October 20 Hammer In

Jennings County Historical Society Blacksmith Shop Vernon, IN

Directions: Take State Road 3 to Vernon, IN. Turn onto North Pike St at Court House. Go one block. Blacksmith shop is on the right after the historical society building.

Pitch in lunch.