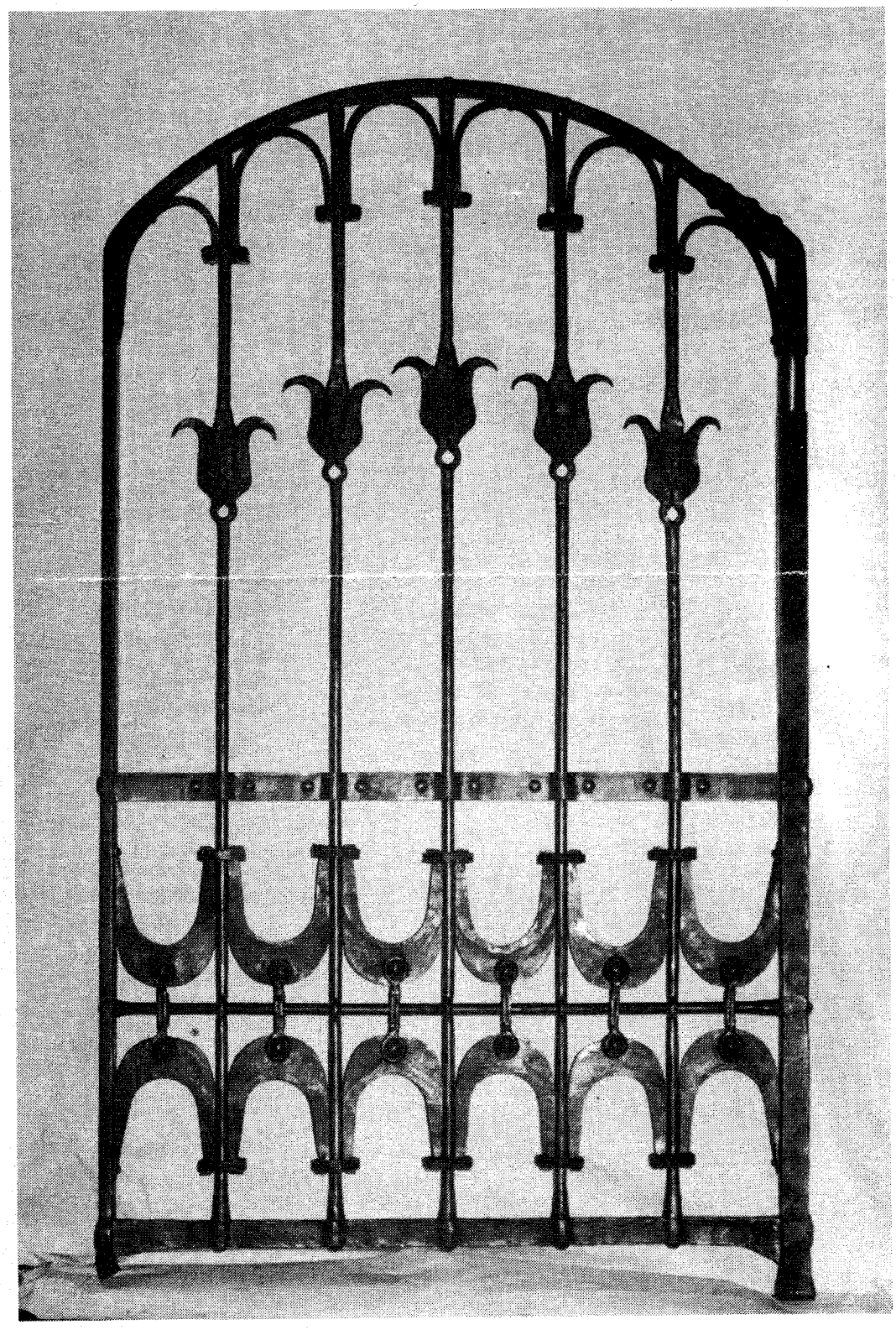
NWBA Hot Iron News

By Corky Storer

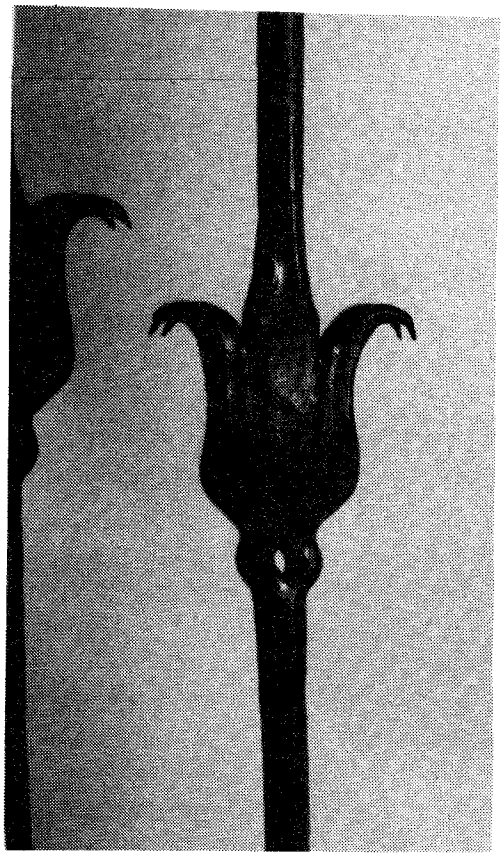


MARCH, 1985

1985 has had a spectacular beginning for the N.W.B.A.; January in Eugene, Oregon at Dave Thompson's shop an open forge and workshop was held under the direction of Bernard Herr. The festivities began with the open forge on Sunday. The attendance was great, the weather was crisp and clear. Dave's shop has a spacious work area - a very welcome ingredient for this sort of gathering. The regulars were out in force, along with a good many new faces, bright with enthusiasm and interest in the activities.

Bernard began the morning with several large forgings taking the shape of a dramatic flower, the components were placed together just so and then pollenated with an electric stinger to hold them securely in place. In the afternoon, we caught our first glimpse of the gate planned for the workshop yet to come. A thumbnail sketch of the proposed gate. one of the tulips that would so handsomely fill the upper third of the gate was forged by Bernard out of 1/2 x 2 1/2. Starting with stock that large for the tulip, and being able to efficiently draw down to smaller size sets ones mind to whirling with possible motifs. Dave's shop having several power hammers with dies progressing from radical drawing to flat finishing, makes it all seem logical.
There was an extensive gallery of work done by many of the smiths in attendance. Many sculptures, fire tools, and a glistening collection of forged knives displayed by several bladesmiths; also, some very intriguing antique forgings from someone's collection - a few which appeared to be good candidates for "does anyone know what they used this for?". These are all fun things to add to a gallery - a nice blending of the old and the new. Sunday was great, lots of interest, good conversation; all around a good exchange. The evening ended with some great slides of Europe; Bill Martines - just recently back from what proved to be a fantastic trip over much of Europe - the slides were beautiful. France, Spain, Italy, and Greece were artfully covered. Bill is well versed in much of the background of the places and things he showed us in his slides. Architecture, art work and even some iron work Bill had pictured ranged from the times of Greek and Romans to present day. The slide show was so extensive it continued two more evenings of our week together and thoroughly was enjoyed by all of us - Thanks Bill!

Monday morning began with a full scale drawing of the proposed gate. Necessary steel sizes and lengths recorded into a material list and we began. The various components delegated to teams and briskly we set to our tasks. One of the excitements of the project was much of the joinery to be used in

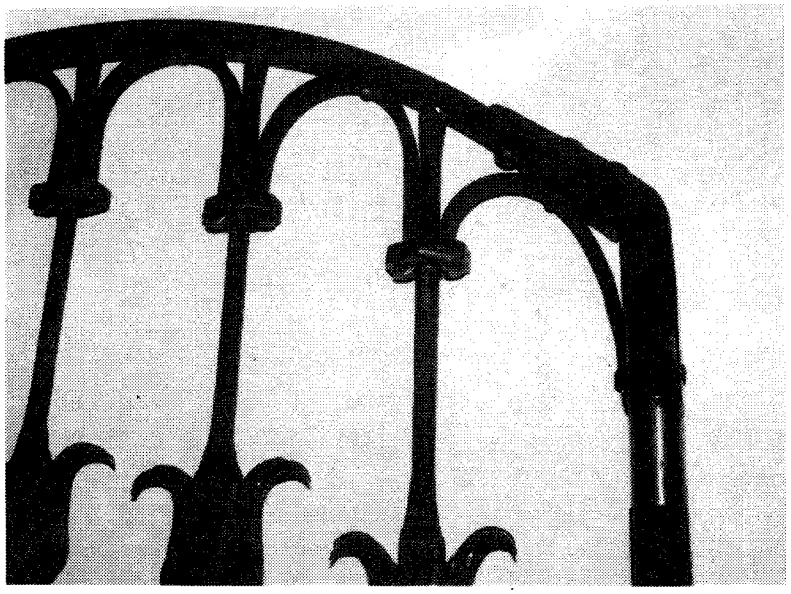


Detail of tulip motif.

this gate was brand new to all of us, for instance the collars 15 in all were pieces of 1/2 x 1 1/2, 2 1/2 inches long, a center opening split and then forged to a diamond shape. The opening in the diamond, forged to accept the 5/8 round, also afforded room to allow the stepped down half-round ends of the large U shapes and dainty arches up top to be slipped in along side the 5/8 round and peaned over to form a sound union.

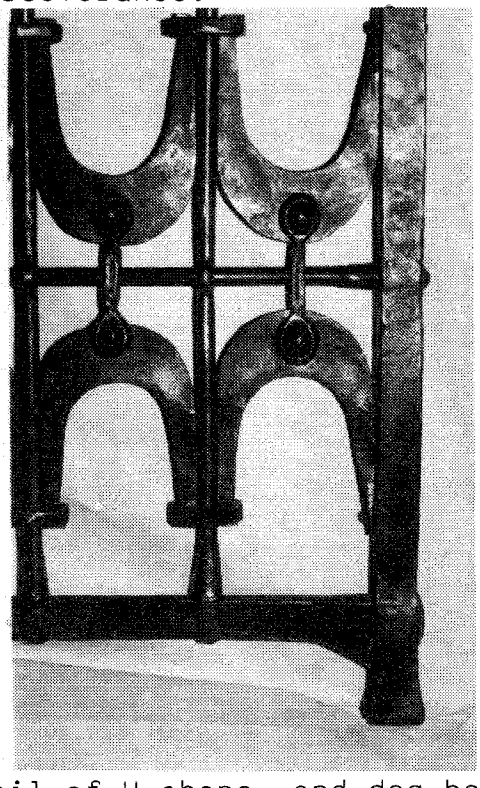
The connection bridging the U shapes received the nickname "dog bones". Thad Adams, Bill Martines, and Erick Zinner began to forge the dog bones, reluctantly at first, however, after a couple of tests, they really weren't that tough, their forging pace quickened and they seemed to have a bunch of fun doing it. The dog bones, as we called them, are a slick technique of joining those large U shapes and the 5/8 round bar that ran between them.

The tulip motif was forged from 1/2 x 2 1/2, a hot cut used to cut deeply into the 1/2 inch side to bring out the top of the tulip, the edge of a set hammer was used to define the center of the flower. The pleasant hour glass shape at the bottom of the flower was achieved by fullering with a one inch fuller on the anvil. The length of 5/8 round coming out of the top of the flower was drawn from the 1/2 x 2 1/2, the lower length also came from the 1/2 x 2 1/2, however, only for about 4 to 5 inches, then it was upset scarfed and forge welded to a 5/8 round bar by Bernard and myself, working from two forges. We would bring our halves to a common anvil between us and forge weld the two halves striking together. To reach a welding temperature simutaneously by coordinating the heat proved to be most fun. The pierced hole Bernard added just below the flower I felt, was a nice design touch. The frame has some



Detail of collars and arches.

very pleasant weight variations which add a great deal to its beauty. Jerry Culberson, Daryle Neslon, Terry Carson, and Tim Prusak were all involved in its construction. The journal was painstakingly hand done using cold chisel, files and finally emmery paper, finished to a degree of excellence by Erick Zinner. When Erick was finished, a lathe would be hard pressed to true it up at all, quite a display of patience and perseverance.



Detail of U shape and dog bones.

The crew, top left to right, Daryle Nelson, Thad Adams, Terry Carson, Corky Storer; Front row left to right, Jerry Culberson, Bernard Herr, Tim Prusak, Russell Jaqua, John Burks, Erick Zinner, Dave Thompson, Bill Martines not pictured.

Erick regularly works with Dave Thompson so his knowledge of the shop and his willingness to perform the many go-for duties made him indispensable.

Russell Jaqua and Dave Thompson forged the U shapes from 1/2 x 1 1/2. Dave has a great Boudry power hammer with some drawing dies that get right to it. There were a dozen of these U shapes each to be forged to its specific shape including the ends, shaped half-round in a swedge, enabling the diamond collars to be slipped into place and held there by the excess half-round end, peaned over at 90 degrees.

John Burks was a late arrival, seems he got crossways with one of those gently hand fed, pet broncs; liked to nearly ruin his left knee. John is a horseshoer, you see. He just finished the class at Frank Turley's. John said he took it just to have some basic knowledge of forgings so he could make some hardware for a log cabin he hopes to build. However, a short time into the class he began to get the bug. While in Santa Fe he got to meet Tom Joyce - Tom only lives a few miles from Frank's school. After seeing the work that Tom was doing and what was possible at Franks', he is well on his way to being an incurable blacksmith.

As you can see from my pictures of the gate and crew, we had

a bunch of fun and learned lots. Next time make it your turn to get involved in a workshop like this, you won't believe the strides possible in this sort of class. All you have to do is just do it. The atmosphere is always friendly and you always have something to offer and to learn, so come and join the fun, its great to see new faces and learn new things about something you enjoy. Hope to see you at the next one.

As I said 1985 has started out great with the gate workshop in Eugene. At this time we also have planned, the first weekend in May, Mark Solomon will have an open forge, he promises to have his 1,000 pound hammer in full operation. Mark has a great shop - there will be lots to see - there is a renaissance street fair in town all that weekend, it is always a great party besides! Also in May on the 18th, Ike Bay will have his annual pig feed. The setting of this majestic farm with wide open spaces is a great place to gather for roast pig and conversation. The chain forged by so many last year was an unequalled success, really a super group project. Some folks who had never got into a forge turned out forge welded links of a chain which grew to over 10 feet when all was said and done. Along with some frustration and singed finger tips, alot of fun was had. We will be looking forward to what they come up with this year!

Shaping up to be the event of the year is the Western States Conference to be held at Mount Hood's Timberline Lodge on Friday, Saturday and Sunday - Labor Day weekend in September. The N.W.B.A. is the hosting organization this year. There will be a great medley of demonstrators - our beloved home town boy, Russell Maugans, who is a friend of Timberline, and responsible for some beautiful iron work on site in the lodge. Richard Pozniak of Chicago will be there. I witnessed his demo at the National, he is witty, very informative, and very good at what he does. He is employed as a fulltime blacksmith for the railroad. At the National he had some slick sample boards showing step by step some of Yellin's and Kuhn's forged elements. Jim Wallace and Jeffery Funk will also be on hand.

The Mount Hood Lodge is such a great facility, there is actually still downhill skiing with a lift available, ski rentals, swimming, pool, sauna, guided tours of the lodge and of the mountain. They have four places to eat, a snack bar, a sandwich bar with beer, restaurant, and in the summer, a fulltime barbeque. For those who wish, there are four places to purchase adult beverages.

They say "there is nothing like it in the world. The all Oregon effort is under the W.P.A., making use of local rock and timber and emphasizing Indian and environmental themes. Timberline Lodge is itself a work of art, housing smaller works of art, as well as a monument to a unique moment in history."

There will be an iron work show one week before the conference and also an impromptu iron work show, details to follow, so stay tuned, we will keep you informed of necessary details to participate.

HAPPY FORGING!

Corky

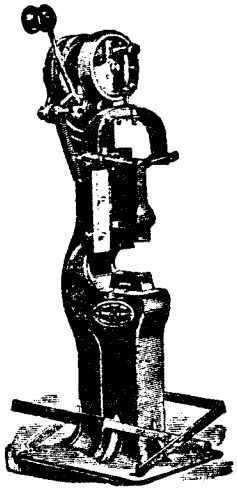
For Sale - Wanted - Swap Column

FOR SALE

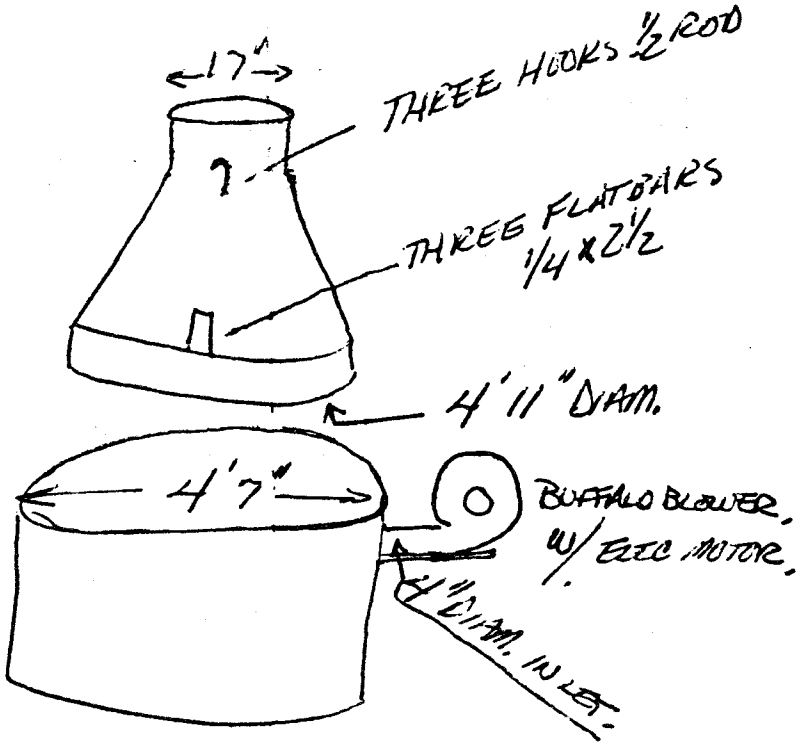
MANDRELS. Long taper, highly smooth surface and very hard steel. Taper goes from 7/8 to 1 3/8 inch over 14 inches, ending with an additional 2 inches of round shank, threaded metric. Shank will slip into 1 inch tube for hardie hole or you can fit by other ways.

Immediate delivery at $30.00 each ($25.00 for shorter ones), UPS or PP included. Send check payable to John Dittmeier, 6 W. Mt. Vernon Street, Smyrna, Delaware 19977

FOR SALE: Champion, walking beam, spring bow, head hammer, 25 lbs. quick change lever for changes in length of hammer stroke. Easy adjustable head heigth. Sow block holds 3x6 die. Head holds 2 1/2x4 die. Slip belt line shaft clutch with 1 1/2 H.P. - 115-230 volt 1 phase motor. $900.00
Contact Nahum Hersom
Golden Pheasant Art-Metal
3011 Innis St.
Boise, Idaho 83703



FOR SALE: Forge with blower and hood. Hand tools for power hammer work.
Contact: Gregory Luark
P.O. Box 449
Montesano, WA 98563
Phone: 249-3844 or
Home 249- 5506



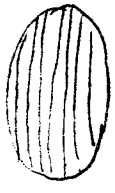
Hammer Handles

Hammer handles become loose over time mainly by the shrinking and swelling of the wood caused by changes in humidity or by poor fitting in the first place. Here are a few tips on setting handles that will last for years.

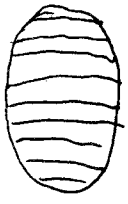
A. Wood Selection

Handle wood should be tough, springy and fairly hard. I've found three that fit the bill. They are white ash, hickory and purpleheart. The latter is a tropical hardwood and is excellent. The wood should be air dried,(Kiln drying tends to produce a softer, weaker wood) and the grain in the handle should run parellel to the direction of the swing as in the figure.

Good



Not Good



An excellent souree for ash and hickory is store bought sledge handles.

I've found the best length for a hammer handle is about the length from your wrist to your elbow, holding the head in your hand. To get the best spring from a handle it should be somewhat narrower towards the head. The gripping part should be as small as is comfortable and usable. Oversize handles tend to form large callouses and or blisters. Experiment with sections such as elipses and octagons.

Make the fit of the handle to the eye a little oversize and taper the eye fit into the rest of the handle, don't step it. When your fit is pretty close, bake the handle in the oven at 150°F for 24 hours or put it real close to your wood stove for a day or so. Then, while the handle is still warm, drive it into the eye. You will be surprised at how much it has shrunk in the oven. Wedge with the wood wedge and the steel wedge. Then pour cyanoacrylate glue (crazy glue) or a drying oil (such as boiled linseed oil) over the endgrain of the handle exposed thru the eye of the hammer. Let the oil or glue harden and you are ready to go to work. Assuming the eye of your hammer is properly shaped, (smaller in the center than the outside) the handle should last for many years to come.

PHIL BALDWIN

I BUILT A KNIFE HEAT TREATING OVEN USING A 3000 WATT (220 VOLT) ELEMENT FROM AN OLD CLOTHES DRIER. LEAVE THE CERAMIC INSULATORS ON THE ELEMENT WHEN REMOVING ELEMENT FROM DRIER ELEMENT ASSEMBLY. THE CERAMIC INSULATORS WORK FINE FOR A TIE POINT TO HOLD ELEMENT IN BRICK GROOVES. FOR LONGER ELEMENT LIFE A SUITABLE DIODE CAN BE INSERTED IN THE LINE. THIS GIVES YOU HALF WATTAGE AND LONGER ELEMENT LIFE. MY OVEN CHAMBER IS ABOUT 8" X 4" X 14" (DEEP).

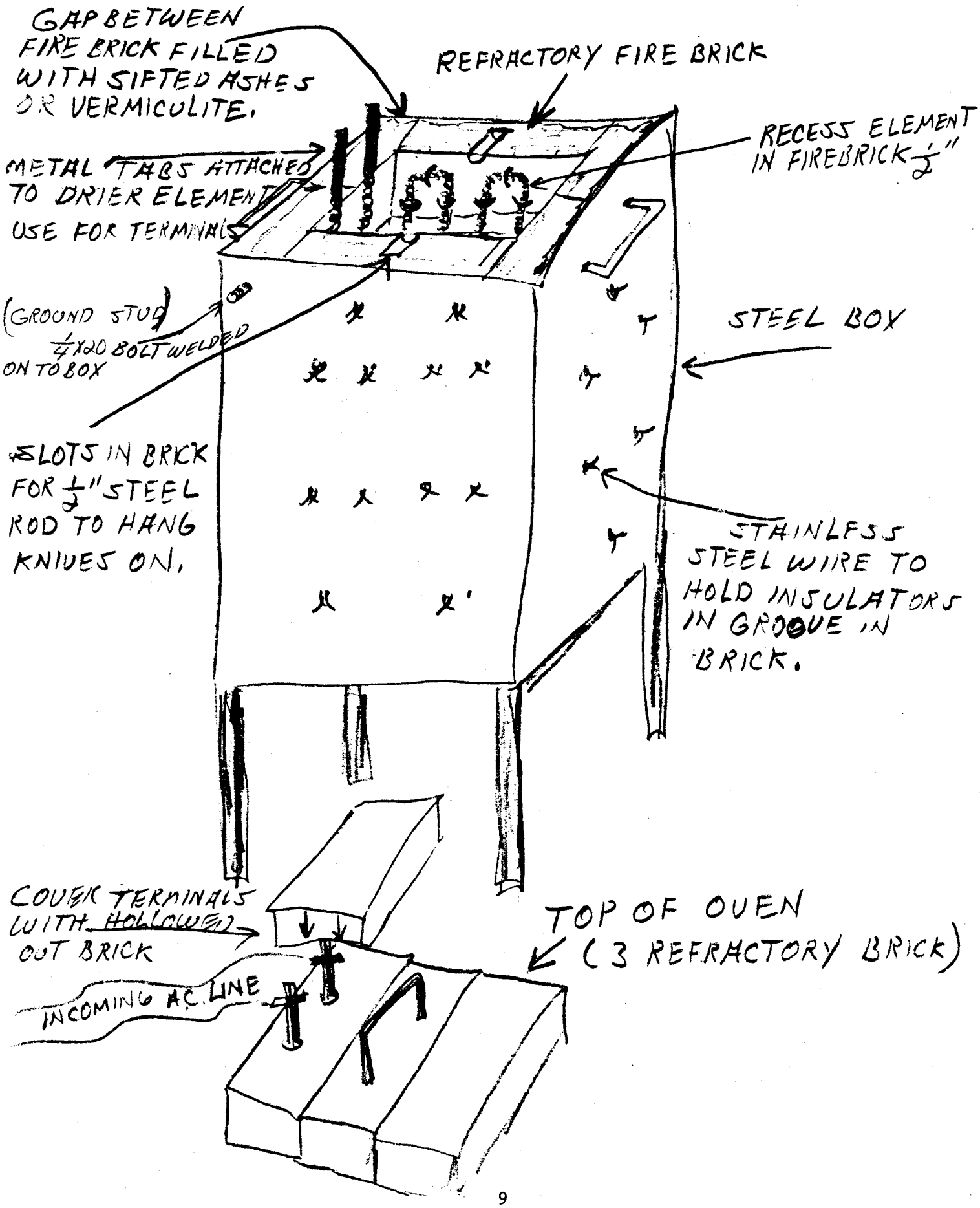
BOEING SALVAGE IN KENT VALLEY WAS THE SOURCE FOR MY BRICK, PYROMETER AND DIODE.

BE SURE TO GROUND THE STEEL BOX AND CHECK FOR SHORTS WITH A OHMMETER. BEFOR TURNING ON THE JUICE.

I HEAT TREAT FOR WHATEVER ROCKWELL HARDNESS I'M AFTER WITH THIS OVEN THEN TEMPER THE BLADE SPINE IN THE TRADITIONAL OXIDIZING COLOR METHOD FOR A SPRINGY BACK.

Glen Chapman

KNIFE HEAT TREATING OVEN



GRIZZLY FORGE
Charles Bear
4042 Bones Road
Sebastopol, California 95472

WHY FORGE?

Charles Bear

Even for the ornamental blacksmith the question "Why Forge?" is not always easily answered. The same question for the toolsmith or bladesmith is almost never easily answered. And when an answer is attempted it leads right into a metallurgical quagmire that most smiths refuse to tread. But unless one forges only as a decorative function, entrance into the metallurgical quagmire is a necessity.

Nothing is so blinding as our own illusions, and nothing is so enlightening as dispelling our own illusions. Even if disillusionment is painful, illusions are even more painful. The question "Why Forge?" can only be answered by confronting our own illusions about ourselves as blacksmiths, and the illusions we have concerning our tools: steel, fire, hammer, anvil and water.

In this article I'll focus primarily on steel, and since I am a cutler I'll keep the discussion directed to knives. What follows, however, applies to all smithing of tools (an item of both beauty and function).

Let's start by recognizing three general approaches to smithing, approaches for which conception and execution, or praxis, may be briefly described as follows:

1) One praxis in forging a blade is that we forge to shape the steel into a blade -- much as a decorative smith forges a flower, i.e., forging is the forming of shape.

2) Another praxis would be the forging of a blade to thermomechanically treat the steel. When this is the praxis, it is held that shaping may be carried on as a machinist would do it.

3) The third praxis is that the blade must be in harmony. That is, shape and thermomechanical treatment must be unified into one harmonious process. We cannot separate the process into discrete aspects. All must flow together.

The first and second praxis mentioned above seem prevalent. The third praxis is difficult to carry out, but to properly harmonize your self with the self of the steel and to release the quality that steel has within itself, you must forge the blade to shape while at the same time thermomechanically treating the steel. Many of us as smiths seem to separate that which cannot be separated. Some of us emphasize one side of the process over the other. But to harmonize and blend energy into the steel, both shaping and thermomechanical treatment must be one simultaneous process.

Bladesmithing has a telos (end or completion) that guides us as we forge. We cannot forge without this telos clearly in mind. The bladesmith's telos is controlled by his vision and his steel. The smith must never force but must instead harmonize and blend with his steel. Disharmonies are corruptions and lead to weaknesses that the smith forges into the steel. For example, by trying to work at too high a temperature or by working too fast we may disrupt our harmony with the steel, thereby creating weakness as opposed to strength. Steel that is forged in harmony generates a blade that has great internal integrity. I believe that the highest expression of harmony and internal integrity that smithing has to offer us as an example is the Japanese sword smithed in its traditional way.

In addition to our vision, a bladesmith's (toolsmith) telos includes (but is not limited to):

1) Homogeneous dispersion of carbides
2) Fine grain structure
3) Fiber and blade shape conformity
4) Sound solid state welds (forge welds)

Now I'll examine the necessity of this telos.

1. Homogeneity of Steel.

All tool steel we buy and use today started from a molten state. Atoms in the molten state do not have a fixed arrangement, they move in random continuous motion. As the steel cools it begins to solidify, meaning an arrangement of the atoms is starting to take place and crystals are being formed. Crystallization of molten steel in a mold starts at right angles to the mold's walls. The freedom for crystalline growth is limited except towards the interior of the ingot. The grains that form are called dendritic crystals -- a very weak structure.

The center of the crystals are richer in higher melting point steel (low carbon steel) and the outside is richer in lower melting point steel (higher carbon steel). On the crystalline level (microscopic) this is called coring. On the macro level segregation occurs. In segregation, the center part of the ingot (slowly cooled part) is richer in carbon, phosphorous and other elements. The first part of the ingot to solidify is low in carbon and other elements. Cast steel (the way all commercial steels start) are cored and segregated.

Segregation cannot be removed by heat tratement alone, but must be mechanically worked. In fact, it must be forged; rolling only elongates the segregation. Coring and segregation are highest in the high alloy steels.

Because coring and segregation disrupt the internal integrity of the steel, a great disharmony is created. Steel that is out of harmony with itself is weak steel. Strength abounds in homogeneous, even structures, not in uneven, non-homogeneous ones. (This statement does not apply to the tempering process.)

2. Fine Grain Structure.

The quality of a forging can be judged by its grain structure. For best results the grain size should be a minimum for a given hardness. By proper forging the grain size can be refined. If forging is stopped above the lowest temperature or recrystallization, marked grain growth may occur. In other words, you must forge through the recrystallization temperature in order to fully refine the grain of the steel you are working. To make this decision, you must know your steel's individual personality.

Some steel responds well to what is called cold working, i.e., forging at temperatures below the recrystallization temperature. Others do not. In order to help understand the particular steel I am working with I use its Time Temperature Transformation diagram (TTT). The TTT is a useful guide for forging and heat treatment of your steel.

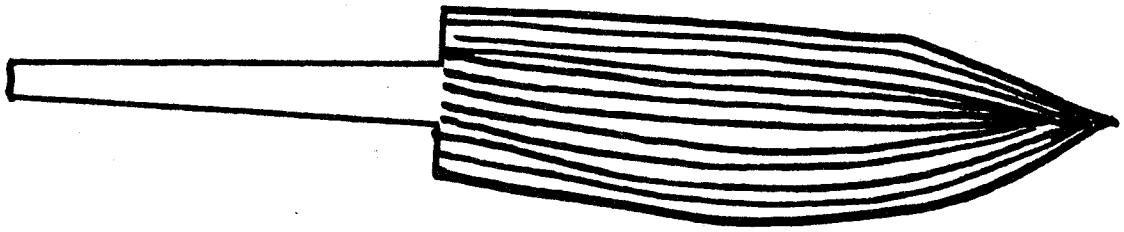
Working steel in its most plastic state (i.e., "where the steel moves the easiest") is not conducive to fine grained steels. Fine grain is the health of the steel -- make your steel as healthy as you possibly can.

3. Directional Properties.

Flow lines or fiber in steel is the result of rolling or forging. The dendrites are elongated in the direction of the rolling or forging. Fine fiber and fine grain structure go hand in hand. The contour of the fiber should reflect the shape of the blade. Fiber should run perpendicular to the point of pressure or impact and parallel to the direction of pull or tension. If this is so, the blade's ability to withstand shock is greatly increased.

Stock Removal. All fiber runs parallel.

Bear
4.



Forge to Shape. Fiber contour follows shape of blade.

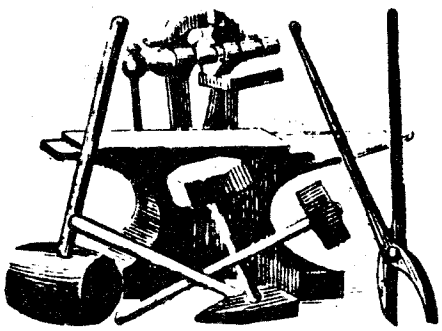
The ability to withstand impact is what we mean by a stell being tough. Thus if flow of fiber and shape of the blade harmonize we have a tougher blade.

4. Solid State Welds (Forge Welds).

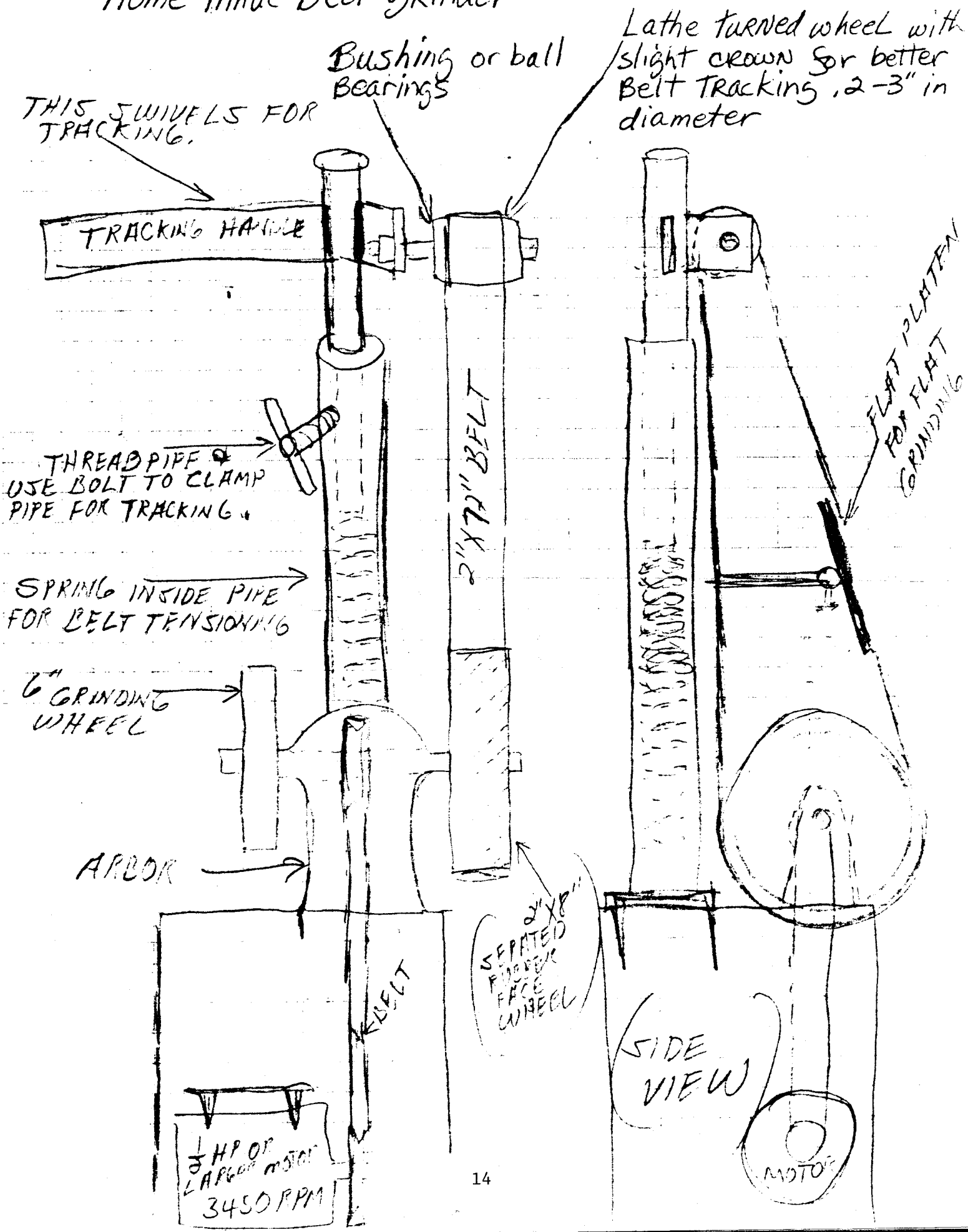
There is plenty of evidence to show that fine grained steel forge welds easier and that the welds hold more securely. Thus we are led back to harmonious forging praxis. Too high a heat for too long a time leads to a weak steel and weak welds.

Back to "Why Forge?"

Forging is a process of harmonizing -- with our selves and with the steel. Steel can be seen as an organic material, not a fixed or permanently formed thing. Viewed in this way, it is something with which you may have an animate relationship. That is, the forging process changes not only the steel, but also the smith. We don't forge just to produce the blade, but in an effort to bring into harmony our own energy and the energy in the steel. When we are in harmony our forging is in harmony.



Home Made Belt Grinder



THIS DRAWING IS CLOSE TO BEING REPRESENTATIVE OF THE KNIFE GRINDER I MADE. I USED PIPE FOR CONSTRUCTION BECAUSE IT WAS AVAILABLE. ANGLE IRON OR SQUARE TUBING COULD BE USED EQUALLY WELL. OTHER TENSIONING DEVICES CAN BE IMPROVISED. I FOUND A SLIGHT CROWN ON THE TENSIONING WHEEL PROVIDED POSITIVE TRACKING. A SERRATED RUBBER WHEEL PROVIDES THE BEST GRINDING SURFACE.

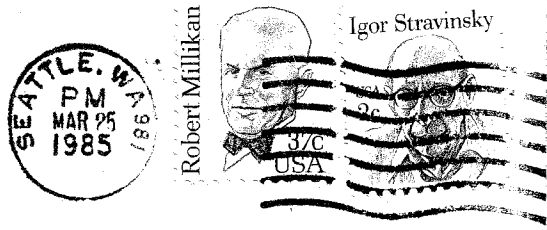
GENE CHAPMAN

P.S. I AM NOT AN ARTIST OR TECHNICAL WRITER SO IF YOU HAVE ANY QUESTIONS GIVE ME A CALL.

* * *

And he sang, "Hurrah for my handiwork!"
And the red sparks lit the air;
Not alone for the blade was the bright steel made,
And he fashioned his first plough-share.

Charles Mackay:Tubal Cain



Northwest Blacksmith's Association
P.O. Box 81041 • Seattle, WA 98108