Volume 25 Issue 10 November 2011

FORGE

Dedicated to the revival of the "King of Crafts"

Vancouver Island Blacksmiths

www.vibladesmiths.com

COMING EVENTS

November 27 2011…….meeting at Luxton
No meeting December
January 29 2012……..Annual general meeting

Index

Executive Report……..…...2
Drill bits……...3-6
Snowflake…….7-8
Candle holder……..9
Membership……..…….10

Lights! Hammer! Action!

Well, that's almost how it goes in Hollywood. That is how it will go in our new well lighted shop. Neil has made the final arrangements for the new shop lighting to be installed, sometime in the near future (perhaps by the time you are reading this it will have been done). With your newly enhanced ability to see …there is now no excuse for not restocking our sales tables with hand-forged objects'd art in profusion.

Speaking of lights, our new 8 foot fluorescent tubes draw about 0.9 amp/hr. each. An 8 foot section of our old lights (2X 4Ft tubes) drew 1.4 amp/hr. That, in addition to having the modern electronic ballasts with 5 times as many lumens per watt, means the new lights work a lot better than the old. Actually, many of the old tubes we had in the shop didn't work at all, so were actually quite cheap to run… but had a really bad lumen per watt output. Looking at it another way, it could be said that they might have had an infinite lumen per watt output. What happens when you divide zero by zero?

Another very interesting, and recent development about light was just announced by scientists at CERN, working at the Large Hadron Collider under parts of France and Switzerland. They found that neutrinos shot from their particle accelerator were travelling faster than the speed of light. Albert Einstein said that was impossible…completely impossible by anything anywhere in the universe… and Albert was usually right about these kind of things.
I am not really suggesting that changing the lights in our shop has fundamentally altered the physics of the universe…but is does seem a strange coincidence don't you think? Makes you wonder what would happen if we cleaned the place up a bit.

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Publishing Info: "Forge" is published monthly by and for members of the Vancouver Island Blacksmith Assoc. General Correspondence for VIBA: 1040 Marwood Ave, Victoria, BC, V9C 3C4. (or directly to appropriate executive member) Permission granted for reproduction of any part of "Forge" provided credit is given to the original source, and the item is not marked 'copyright' or specifically stated to be for the sole use of "Forge". Unless otherwise stated, the editors are the authors of all material. Disclaimer Notice: "Forge" makes every effort to ensure accuracy of the information contained therein, but the executive officers & general membership of the Vancouver Island Blacksmith Association including the editors, specifically disclaim any responsibility or liability for damages or injuries as a result of any construction design, use or application of information contained in this newsletter. The use of any information is solely at the user's own risk.

Submissions & Contributions

Submissions to "Forge" can be made at any monthly meeting or by snail mail to:

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Secretary's Report

By: Charlie Low

Viba Oct 29, '11

Show and Tell: Charlie L, Dennis and Ted brought in the slabs of damascus we made at Dennis' shop over the last 2 Saturdays- they are 1095 and L6 in the W pattern, heated in the propane forge, pressed in the hydraulic press to weld, cut almost through into 3 sections, folded and re-welded, with this repeated twice more, to make a total of 27 layers, then cut at a 30 degree angle, with each nugget rotated (the Ferry Flip) so that the section that had been inside was turned to the outside, then the 7 to 10 rhomboid bits re-welded into a solid billet. The whole thing was then forged down to knife-blank size under the power hammer. Dennis ground them smooth on the surface grinder and etched them to display the pattern, and if I say so myself, they are beautiful.

Keith brought in a copy of Tin Can Projects and Art Metal Work, originally printed in 1936, and now available from Lee Valley. On a very quick inspection, it appeared to have quite a lot of interesting ideas.

Norm told us that Princess Auto is coming to town Nov 15. There was speculation that during the opening week or so, there would be bargains to be had.

The minutes were accepted as printed in last month's newsletter.

Business: Dennis brought in a copy of an email from Neil. He has an electrician friend, who had a look at the shop. He will do the lights, bring the place up to code, deal with the permitting and generally look after our electrical problems. The consensus was "Good!"

The gate will proceed- Neil will look after getting the drawings for the footings and supports, and early in the new year, there will be a work party to install them. There will be some work making them pretty too.

New members: Rod and his father, Fred Edwards were at themeeting. Rod has done some blacksmithing, and Fred is a farrier..

Andrew brought back the anvil he borrowed for the summer, and volunteered to make some stuff for the club by way of repayment. We said, "Come to a production day", which will probably happen in April.

And with that, we adjourned.

Sharpen Your Drill Bits

Robert Dixon Gumm

Have you ever had that urge to save yourself a fistful of dollars by grinding your drill bits to perfection? Have you ever felt really foolish when you thought you could save yourself a ton of money by grinding your bits? Have you ever snuck out of your house in the middle of the night to bury something you've destroyed? Welcome to the world of D-I-Y bit grinding.

We know that, "to err is human, to forgive, divine," but forgiving oneself for injury to tools always seems a bit harder than forgiving oneself for erring in the course of human relations. This is probably the reason why so many do-it-yourselfers' would rather throw a party for that jerk down the street or welcome the in-laws with wide open arms than take on the task of sharpening their drill bits.

Before going any farther, I must confess to being a seeker of truth and knowledge. I would like to find some knowledge to fix that load of bum bits in my shop. And to my own self I would like to be true – they're duds because I screwed them up. In this effort, I have turned to the internet (not always a reliable source) for information, and have turned up some things that seem to make light out of the mess I've made. Not that all of them can be repaired. I'll just have to dream of new uses for them, or kick them under the floorboards.

You'll Need:

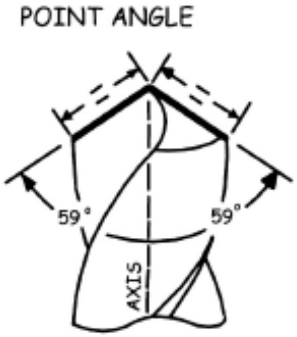
Probably the most indispensable weapon in the blacksmith's arsenal is the bench grinder. For those living in the twenty-first century, they're easy to find, easy to use, and above all else, fairly inexpensive. For you "pioneering" sort of smiths, it's still not too hard to find a grinder that can be driven by a drive belt (waterwheel or steam engine are optional). If you're really rustic, you can use a treadle-powered grindstone. Along with the bench grinder, you'll need to have at least one grinding wheel that has a flat grinding surface. If you don't, you'll need to buy one. Since safety is always the first step in any project, make certain that you have suitable eye-protection available and that you actually wear it!

If you feel "skittish" about doctoring your bits, it's not too late to jump ship. You can purchase a drill doctor, or if you know someone who has one, you can ask to borrow it. Even better, you can ask them to sharpen your bits in exchange for something (money always works, as do coal and good steel). There are sharpening shops and hardware stores out there that can do the job. You may even come across a Black & Decker self-contained bit sharpener in your tail-gating. I have one. I think their toasters work better.

When/What to Sharpen:

There are a number of reasons why drill bits become dull. Frequent use, improper drill speeds, and drilling at an angle can cause bits to become dull quickly. Failing to remove the bit from the hole occasionally to remove dust and fragments can also be problematic. Leaving drill bits loose instead of storing them in a protective container can also lead to damage. The best advice is to keep drill bits from becoming dull instead of waiting until they need intensive sharpening.

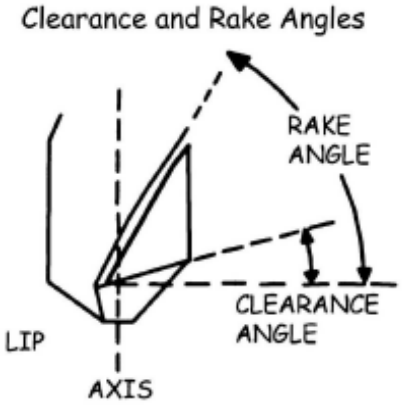
Logically, drill bits are sharpened when they become dull. The telltale signs of a dull bit are a lack of cutting progress, the need for higher than normal pressure, excessive heat, smoking, and squealing. Counter-intuitively, bits that are sharp may need to be re-ground. The bits that we purchase over the counter have cutting surfaces that are configured for general-purpose work. But we use our bits on different materials, and in order to get the best results for drilling wood, steel, rubber, plastic, or other materials, we may need to do some regrinding.



Terms:

Looking at a new drill bit, you'll notice that the angles of the top edges form to the vertical axis. Each face is 59 degrees, with an included angle of 118 degrees. This is the P*oint Angle* of the drill bit. (left)

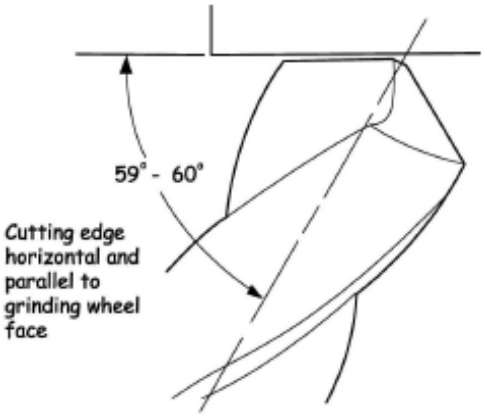
If you rotate the drill bit you will notice the ramp behind one of the two cutting lips. With the drill bit held vertically, the edge of the ramp forms an angle with the long axis of 12-15 degrees. This is the *Clearance Angle*. (right)



Sharpening

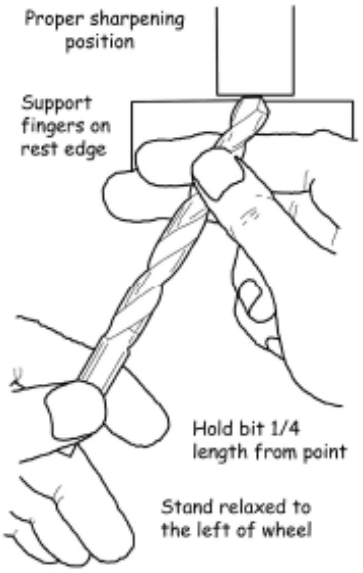
Once again, the first step in grinding drill bits is safety. Make sure that you have proper illumination, safety glasses, corrective lenses, and a fine grit wheel with a flat face.

Keeping in mind that it is always wise to know where you're going before you try to get there, sharpening a drill requires that you have a clear understanding of what you are going to do.

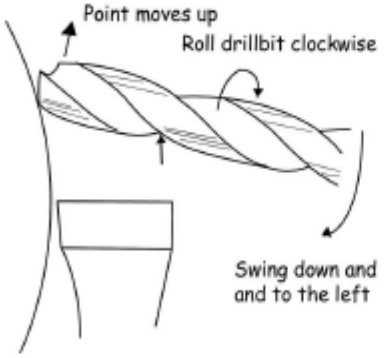


The first step in sharpening a drill bit is to grind the point angle. Stand slightly to the left of the grinding wheel with your feet apart. Next, hold the bit about a quarter of the way along from the point, using your thumb and forefinger. You should have the tool rest properly positioned before you begin. If so, rest your fingers on the tool rest. Use the other hand to hold the drill at its shank.

Now hold the bit so that it is horizontal but approaches the grinding wheel at an angle of approximately 60 degrees. Next, rotate the bit so that the cutting edge is parallel and close to the wheel. You can now move the bit forward and grind the point.

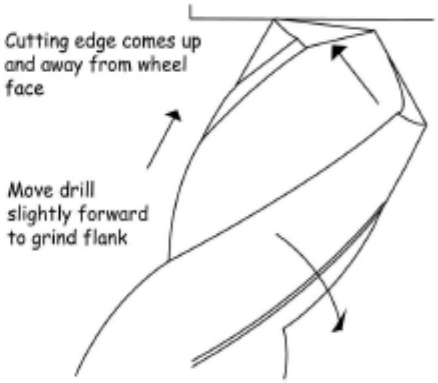


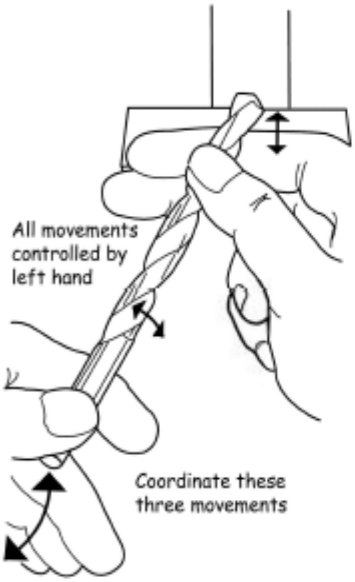
The next step is to grind the lip *clearance*. Using your left hand, swing the shank downwards and to the left. Be very careful not to make exaggerated movements! Your hand motion should be very slight. Remember to support your right hand on the tool rest. As you move your left hand, use your right hand to roll the bit clockwise about a quarter-turn while moving the bit forward against the grinding wheel.



If you feel nervous or apprehensive when you first start, you can practice these motions using the edge of your bench as a simulated grinder. Air guitar meets bit sharpening.

Be sure to work through these sequence of motions: left hand down and leftwards, right hand fingers rotate drill clockwise, both hands move drill forwards. Watch the cutting edge and you'll see that as you do this, it moves forward and away from the grinding wheel. However, if you rotate the drill too far, or your left hand is not moving towards the left, the opposite side cutting lip will come into contact with the grinding stone, thereby producing undesired results.





When the point angle and lip clearance have been ground for one face, do the other. Make sure that the point angle is symmetrical and centered.

It is important that you use only the slightest pressure when grinding your bits. Also, be sure to pause frequently so that the airstream will cool the bit. Always keep your bits cool.

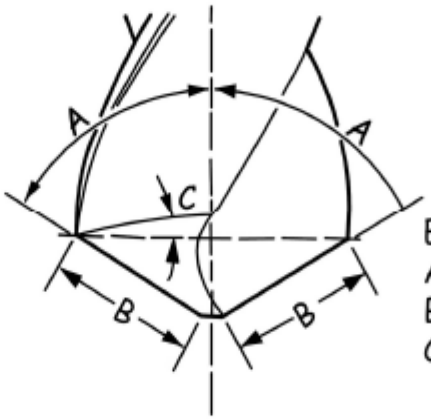
How'd It Go?

If you're a novice bit sharpener (if you're reading this article, you probably are), don't try to sharpen a bunch of bits. Sharpen one bit, and then give it a test run on a piece of scrap metal. If it doesn't work very well, don't despair. Beginner's luck is uncommon when sharpening drill bits. Take a close look at the hole you've drilled, and carefully examine your bit.

Here are a few things to look out for:

A properly sharpened drill bit should have equal cutting angles, equal length cutting edges, and equal angle lip clearances.

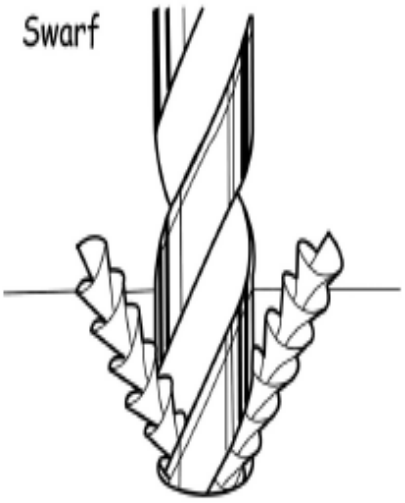
When drilling through your scrap metal, the bit shouldn't squeal or stick, and it shouldn't need excessive pressure. The swarf should be continuous and produced in two lines. And the bit should be a tight fit when you put it back in the hole.



Equal
A. Cutting angles
B. Cutting edges
C. Lip clearances

What do you do if you run into problems? Identify the problem, determine the cause, and regrind. If your swarf is uneven or the drill point wobbles and the press shakes, it can be caused by unequal cutting lip length, unequal cutting lip angles, or an off-center point angle. If there is squealing or you need to use excessive pressure, the cutting edges may be dull or the lip clearance insufficient behind one lip.

In conclusion, there are three maxims that we can reflect upon. First, practice makes perfect. Add to this a lot of patience goes a short way. Second, you can learn to tune a piano, but you cannot learn to tune a fish. And finally, you can sharpen drill bits, but you cannot sharpen a dull mind.

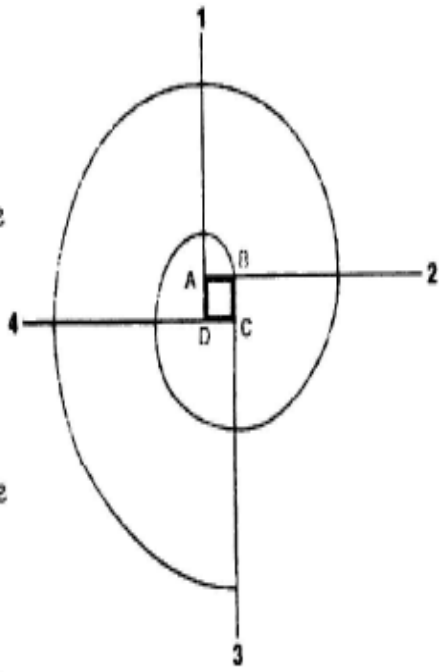


Two evenly shaped chips

How To Draw a Scroll

Dick Fackler

The scroll, or involute, as used in ornamental ironwork, is most easily drawn by making a square, A,B,C,D. Extend the sides to 1,2,3,4. Using the corners of the squares as centers, draw 90 degree arcs. The first radius is equal to the length of one side of the square. The radius of each successive arc is the distance from the next corner of the square to the terminating point of the previous arc. You can vary the size of the scroll by changing the dimensions of the square.



Start by putting the center of your compass at corner A. Using A-B as your radius, draw a 89 degree arc from B to line 1. Move your compass center to corner D. Enlarge the radius to the terminating point of your first arc and draw another 90 degree arc from that point to line 4. Continue drawing your scroll until you have the size scroll you need. Each time you draw an arc, enlarge it by the length of one side of your square. This will give you a proportioned scroll that is pleasing to the eye.

3D Snowflake

Michael Wollowski

In this article, you will find constructions notes for a three dimensional snowflake. Don Neuenschwander showed me one that Ken Dettmer made based on Don's specifications. Don himself saw someone up north make one of these.

The snowflake is made from a 3" piece of ¾" square stock. It needs to be cut it several ways. To start, make two 1 ¾" cuts along one side, splitting the side three ways. From the opposite end, make two cuts that are ¾" long, again splitting the side three ways. You will be left with ½" in the center that is not cut. The cut layout is shown on the left side in figure 1 below.

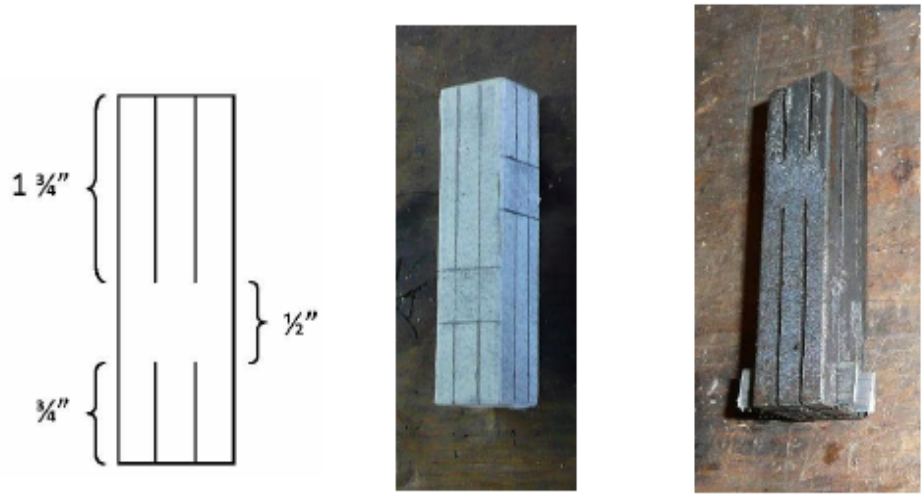


Figure 1: Cut layout (left), blank with marked cuts (center), cut blank with spacers (right)

Turn the bar 90 degrees and make the same cuts except from opposite ends. I like to put masking tape on the steel and draw my lines on it. The marked up blank can be seen in the center of figure 1. I insert some old saw blade pieces in the short cuts of one end. This is the end that gets to be put in the vise first. By placing the spacers in the cut, it is easier to open them up later on. The sawn blank, prepared for heating is shown on the right in figure 1.

In order to get the three dimensions, the primary bends are along the long cuts. When bending this piece, it is advisable to use tongs and a vise rather than a hammer and anvil, as the folds will be rather delicate and can easily be bent beyond repair.

To begin, heat up the bar and place the end with the saw blades in the vise so that the saw blades are parallel to the jaws. You need to place the bar in the vise so that the long cuts are about ¼" proud of the top of the vise. This ensures that there is space for the jaws of your tongs. Bend down the outer two long sides. Before bending the long sides, it helps to open them up with a chisel first and then use flat tongs to grab a side and bend it out. You may have to perform a sequence of grabbing part of the side, bending it, grabbing some more, straightening it with the tongs and bending it. See about producing a nice bend, not too tight and not too wide. The picture on left side in figure 2 gives you a sense of the radius of the bend as well as how much the long cuts have to be proud of the top of the vise. If the arms are not straight, a chisel can be used to pry them off the vise jaws.

Figure 2: Blank after first set of bends, notice the spacers (left), finished snowflake (right)

Next, put a little bit of heat in the end that contains the saw blades and knock them out. Heat up the bar and cool down the center of the piece. Use a chisel to open up the long ends that are to be bent next. Put the piece back into the forge and heat it up. Now comes the hard part. The entire snowflake will be orange hot and any attempt to cool parts of it invariably cools down other parts that should not be cooled. Furthermore, any bending you do, will upset other parts of the piece. When opening up one of the hands, you will bend the snowflake out of shape, just ensure that when you bend the other hand, you bend it back into shape. You may consider using several heats to open up the two long hands.

The four bent arms should be in one plane. You may consider placing the piece in the hardy hole, placing a piece of pipe over the hands that need to be aligned and gently tapping on it. Notice that the sum of the two hands that have not been bent remains 3" long, yet the sum of the bent hands making up either of the two other dimensions are about 3 ½" long. This is due to the fact that the outside hands are ¼" off the center of the bar. The unequal length cannot be helped except for cutting ¼" of the ends of each of the bent hands and then deepening the cuts by ¼". You may consider hanging the snowflake so that the bent hands are vertical.

You are now left with having to bend the outside fingers made by the ¾" cuts. If you split open the fingers with a chisel, you need to cool down the center of the snowflake as the hammer blows will compress the delicate bends at the center of the snowflake. You want to use some fairly narrow tongs to open up the fingers to about a 45 degree angle. Here again, consider using a process of repeatedly grabbing, bending, re-grabbing, straightening and bending. Notice that fingers of neighboring hands will end up parallel to each other.

I finished my snowflake by immersing it in vinegar overnight, brushing off the scale using a brush and water and polishing it with an angle grinder and the Dremel tool

Reprinted from *The Forge Fire* Dec 2009
Indiana Blacksmith Association

Holiday Candle Holder

Step 1 - Using a 1/4" x 1" piece, forge a 4" section square and taper at both ends of square section.

Step 2 - Draw out the handle end thinner and wider to form a slightly pointed shape. Forge the handle shaping concave, lengthwise.

Step 3 - Twist the square section evenly, leaving the handle and the bulk of the bar in one plane.

Step 4 - Cut a two inch split in the other end. Spread wider and thinner with the cross peen. Leave the peen marks showing to give it character.

Step 5 - Spread the feet and curve the whole piece as shown. The handle will curve back under with the concave side underneath.

Step 6 - Forge the pin from a 1/4" round rod and put a 3/16" tenon on the end, about 1/2" long. At this small size, it is just about as easy to file it to a tenon.

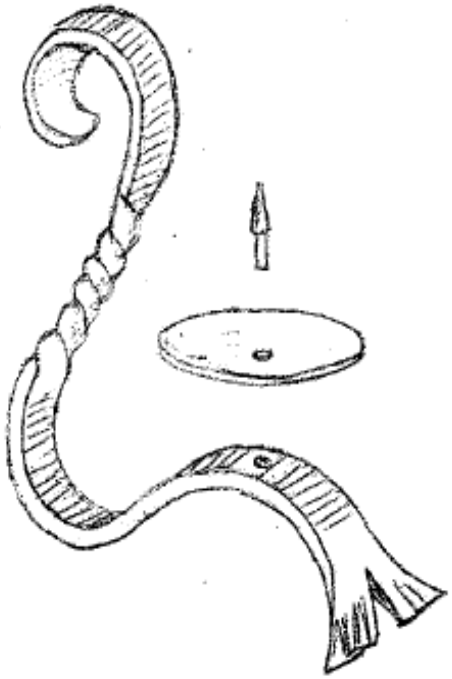
Step 7 - Cut a 4" circle from 1/8" plate and drill a 3/16" hole in the center.

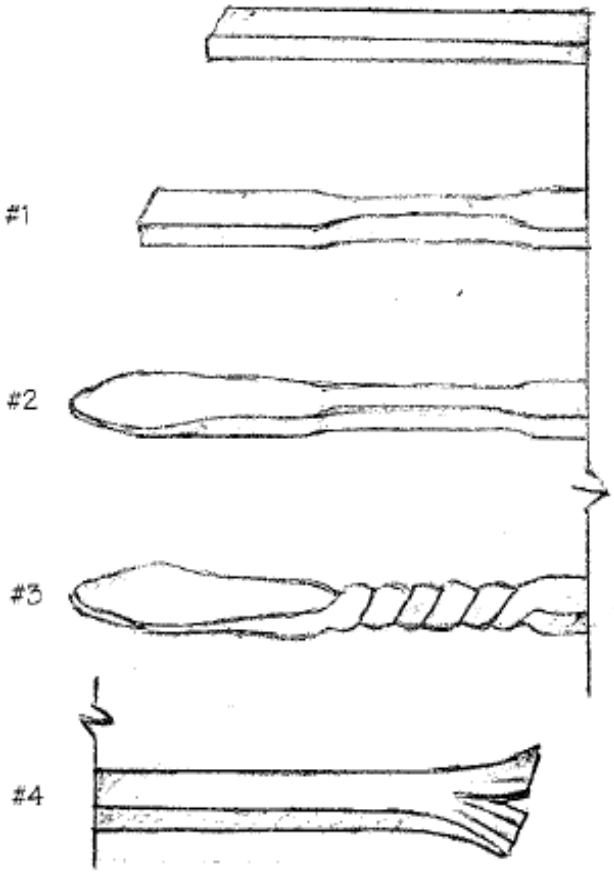
Step 8 - Upset the edge of the plate to add a little depth to the wax tray. This can be done over the end of a piece of 3" pipe. Turn up the edge just enough to look nice.

Step 9 - Center the plate on the legs and mark the spot for the hole and drill to receive the tenon. It is easier to get the tray level after the legs are curved and the tray upset and drilled.

Step 10 - Rivet the bottom of the pin in the holes to attach the tray.

Step 11 - Finish by sanding lightly and applying floor wax or some other clear finish.





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