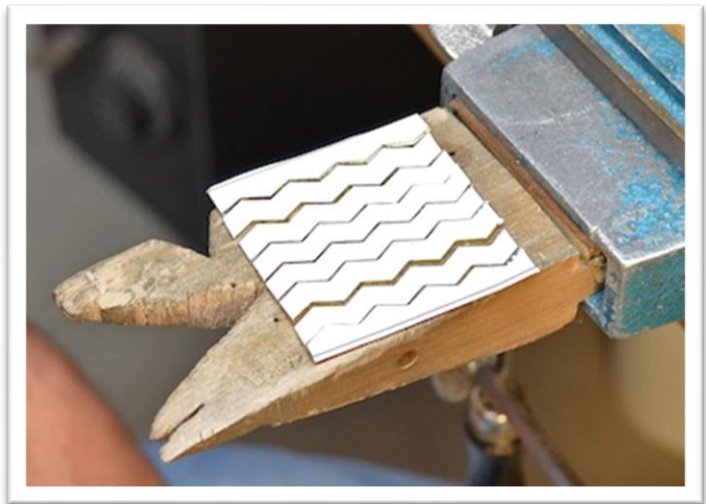


Jewelry Fabrication 1, Lesson 2: Sawing and Drilling

By John Sartin

As mentioned in the first lesson, the jeweler's saw is one of the most important tools on the jeweler's bench and learning to use it proficiently is paramount to successfully fabricating jewelry. This is one skill that will be used on every piece of jewelry that you make.



The same rings true with drilling holes. If you are piercing a design, setting stones, riveting on a bail, soldering hollow shapes together...the list goes on. Chances are you will be drilling holes.

This lesson will teach you the proper use of these items along with some tips to make things a little easier.

This lesson will also have a video component. Yes, I've gone Hollywood or at least my version of it. Many of the steps will have a link to a video if I think the technique is better demonstrated and easier to learn through a short video instead of a static image.

Also, additional detailed information about sawing and drilling can be found in my book, *The Complete Photo Guide to Making Metal Jewelry*.

Safety Tips to Follow

Always wear safety glasses

Always be mentally present and know where
your hands and fingers are at all times

Always secure loose hair and clothing

Materials List

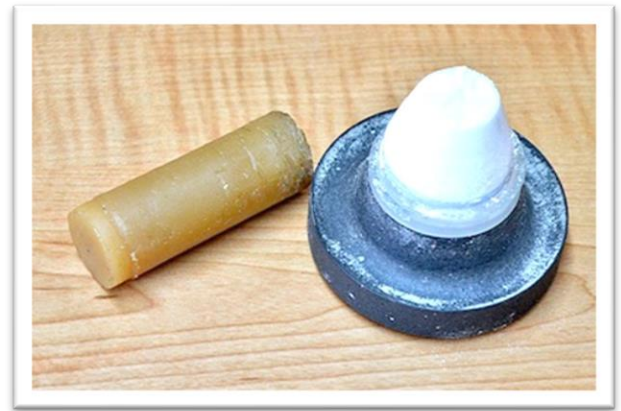
- 18 pieces of 22 gauge yellow brass 2" x 2" each (you can ask your supplier to cut it to size it will most likely come in a 6" x 12" sheet)
- Glue stick or rubber cement

Tool List – Don't forget Safety Glasses!

- Jeweler's saw
- #5/0 saw blades, at least a 2 dozen
- Bench pin
- Center punch
- Small ball peen hammer
- Flex shaft or rotary tool (Dremel style)
- #55 drill bits
- Beeswax or Bur-Life®

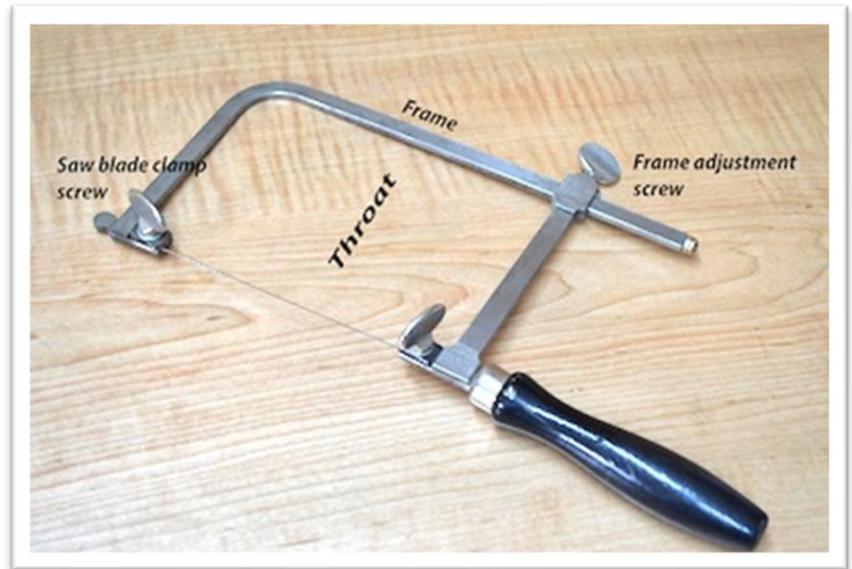
Lubricant

Something that will make sawing and drilling easier is some type of lubricant. Traditionally beeswax is the preferred choice and many still like to use this for sawing and drilling. However if too much is used it can clog the teeth of a saw and reduce it's sawing efficiency. There are also other lubricants made especially for sawing, like Bur-Life®. This lubricant will not clog your saw or other tools if used properly.



The Anatomy of a Jeweler's Saw Frame

- 1) Handle
- 2) Throat: Saw frames come in a number of throat sizes; a saw with a 3.5" throat will work for most designs.
- 3) Frame
- 4) Frame slide adjustment screw
- 5) Saw blade clamping screw



Installing the Saw Blade

<http://vimeo.com/johnsartin/installingasawblade>

There are a number of ways to accomplish this task, but the one I learned when I first began fabricating jewelry is the one I still use.

1. First, you will need to adjust the frame for the length of saw blade. This will most likely be the first and last time you will have to do this step because most jeweler's saw blades are the same length.

Ensure the teeth of the saw blade are pointing down towards the handle and away from the frame. Then open the top blade clamp and insert the tip of the blade, pushing it up until it stops. Make sure the blade is parallel to the saw frame and tighten the clamp screw.

2. Loosen the saw frame adjustment screw and slide the saw frame apart or together until the free end of the blade is approximately $\frac{3}{8}$ th of an inch away from the bottom of the blade clamp and tighten the frame adjustment screw.
3. Set the tip of the saw frame or the top of the saw frame against the edge of a table or bench. Place the handle of the saw frame against the tip of your sternum. Using your body weight press against the saw frame, this will slightly flex the frame closed. Insert the loose end of the blade into the bottom clamp and tighten the clamp screw. Take pressure off the frame and test the blade by plucking it with your fingernail. The blade should give a ping.

Note: To remove a blade from the saw frame reverse the above steps. Sudden release of the saw blade clamp without relieving tension on the frame will cause the blade to break: which could send pieces flying through the air.

Sawing

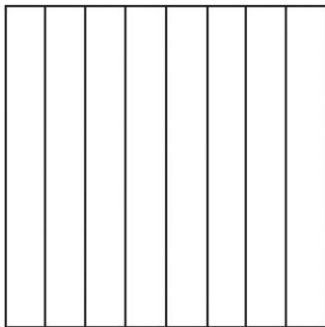
Step 1

Begin by printing out the attached PDF sheet of designs, cutting out each 2" x 2" square and adhering them to the pieces of 2" x 2" sheets of 22 gauge brass using rubber cement or a glue stick. Set them aside and let them dry thoroughly.

Note: You will break blades, it is all part of learning how to use the saw.

Step 2: <http://vimeo.com/johnsartin/sawingstraightlines>

Lubricate your saw blade by lightly drawing the side of the saw blade across your chosen lubricant. You don't need much.

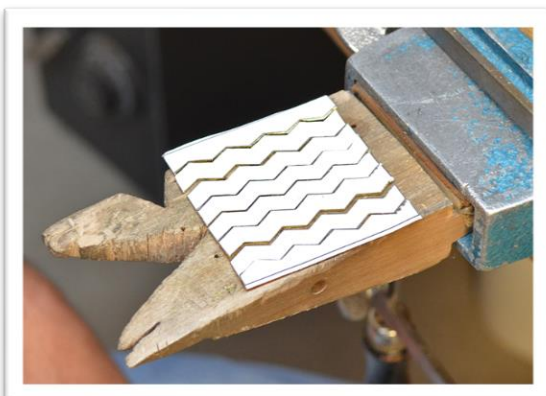
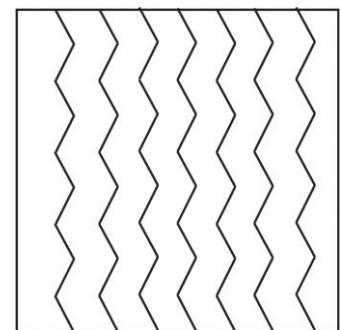


Start with the straight lines. Set the metal sheet on the bench pin and pinch the design to the pin using the fingers of your non-dominant hand, ensuring that the first line is slightly off of the side of the pin. Place the saw blade on the first line, at a slight angle, and push on the back of the saw blade with your thumb and pull the saw down. This will help to keep the blade on the line while you start the cut.

Begin moving the saw up and down until you have created a cut about 1/4" long. Rotate the saw so that the blade is almost straight up and down. Cut slowly moving the saw up and down using the majority of the length of the toothed section of the blade. Slow rhythmic strokes, with slight forward pressure. Let the saw blade do the work.

Step 3: <http://vimeo.com/johnsartin/sawingthezigzag>

Next is the zig zag design. Start sawing as before, but make sure that by the time you reach the corner the saw blade forms a 90° right angle with the metal sheet. Entering the corner you will need to take short strokes instead of long strokes. You will need to turn the work piece and not the saw. Turning the saw into the corner will bind the blade and cause it to break. Once you are on the straightaway you can take longer strokes.



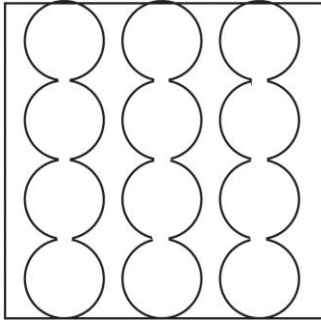
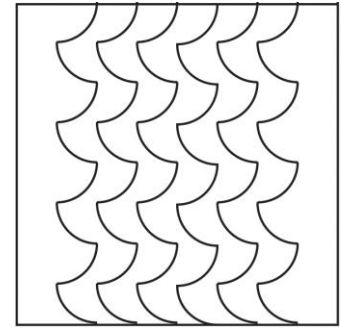
Step 4

Continue until you have eight zig zaggy strips.

Now sit back, take a break and pat yourself on the back. It is a good idea to lay the pieces out in the order that they were sawn this way you can see your progress in the accuracy of your cuts.

Step 5: <http://vimeo.com/johnsartin/sawingawavepattern>

Next start on the wave pattern. This pattern is composed of inside and outside curves. It will require you to turn the metal constantly, first in one direction, then in the opposite. Keep your blade at a right angle to the metal and work slowly.

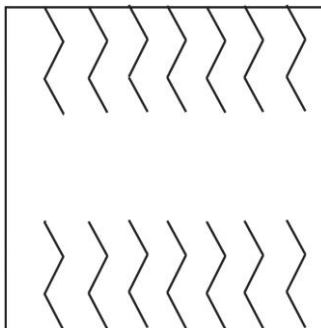
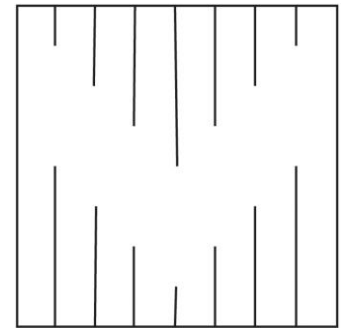


Step 6: <http://vimeo.com/johnsartin/sawingconnectedcircles>

The next pattern to tackle is the connected circles. The tricky part with this is the transition between the circles.

Step 7: <http://vimeo.com/johnsartin/backingout>

The next design is the straight lines that don't connect. With this exercise you will need to saw to the end of the line then back the blade out. To back the blade out you will need to use the same sawing motion you did to make the cuts. Don't cheat by un-threading the saw blade.

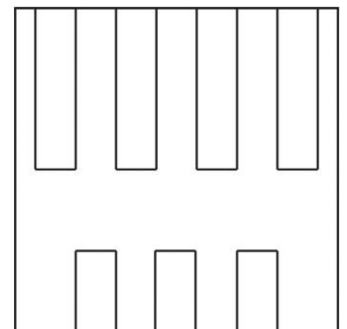


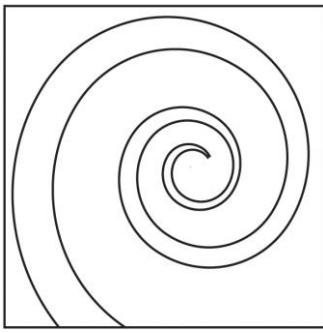
Step 8

Same exercise as step 8 just with the zig zag pattern and a little more difficulty.

Step 9: <http://vimeo.com/johnsartin/sawing90corners>

Here you will be cutting out the rectangles—90° corners—which will require that you saw a complete right angle. Remember all of the nuances of the process. Saw straight up and down, slow, rhythmic strokes using the full length of the toothed area of the saw blade, letting the saw do the work. Then using shorter quicker strokes as you reach the corner and turning the piece not the blade. You will need to stop forward motion completely, and slowly nibble away at the corner as you are slowly turning the metal.





Step 10—The grand finale!

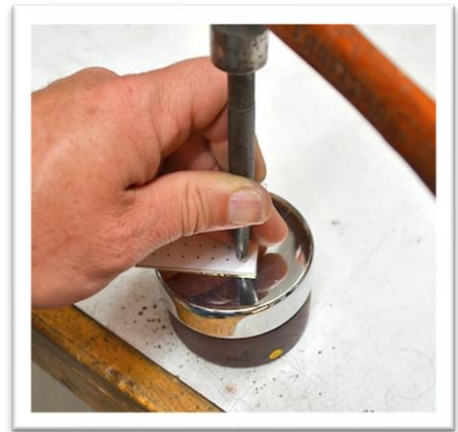
Saw out this spiral with only one saw blade. If you break a blade, start with a fresh piece of metal and a new pattern.

These are all great exercises and they address any sawing situation you might find yourself in. If you become fluent in sawing all of the designs in this lesson you will be able to saw any design quickly, efficiently and with minimal blade loss.

Drilling

Step 1

The first thing to do is prepare the piece of metal by adhering the dot pattern design to the metal sheet as you did with the sawing designs. Using a center punch and a ball peen hammer, punch each dot by centering the punch on the dot and giving the punch a little tap, which will cause a small depression in the metal. This depression will give the drill bit a guide to start the hole without moving about.



Step 2

Insert a #55 drill bit in your rotary tool or flex shaft per the manufacturer's instructions.



Step 3: <http://vimeo.com/johnsartin/drilling>

Drilling is not hard. The main thing to remember is to keep your drill bit straight up and down, forming a right angle with the metal's surface. And keep the drill bit turning all the way through the metal and back out. Stopping the drill bit while it is in the metal might cause it to bind. Tilting the bit while it is in the hole will cause it to break, and a tip of a broken bit is virtually impossible to remove without causing other damage to the piece. Take your time be mindful, and most of all, practice.