

## Roy's Saw

When you walk in the front door of Roy Underhill's Woodright's School and look to your left in the window hanging above Roy's stuffed chicken is a large frame saw. Now the chicken is an interesting object and makes one wonder why someone would have a chicken stuffed, and furthermore why it is at a woodworking school (I should have quizzed Roy; I guess the deeper more important questions will have to wait until later).



I did ask about the saw though. Roy bought it from a tool collector some years back and believes it to be of continental European origin. He also said this one was intended to be a rip saw for general use, not for sawing veneer.





The saw is not a decoration piece but sees regular use at the school. The cross pieces at either end are made from oak, the long stretchers are made of a very light in weight mystery wood we could not identify.



The hardware is blacksmith made and blade or web is 38in long by 1 1/2in tall and .030in thick. Originally it was sharpened with 2 tpi (teeth per inch) rip teeth but at some point had been refiled to 4 tpi.



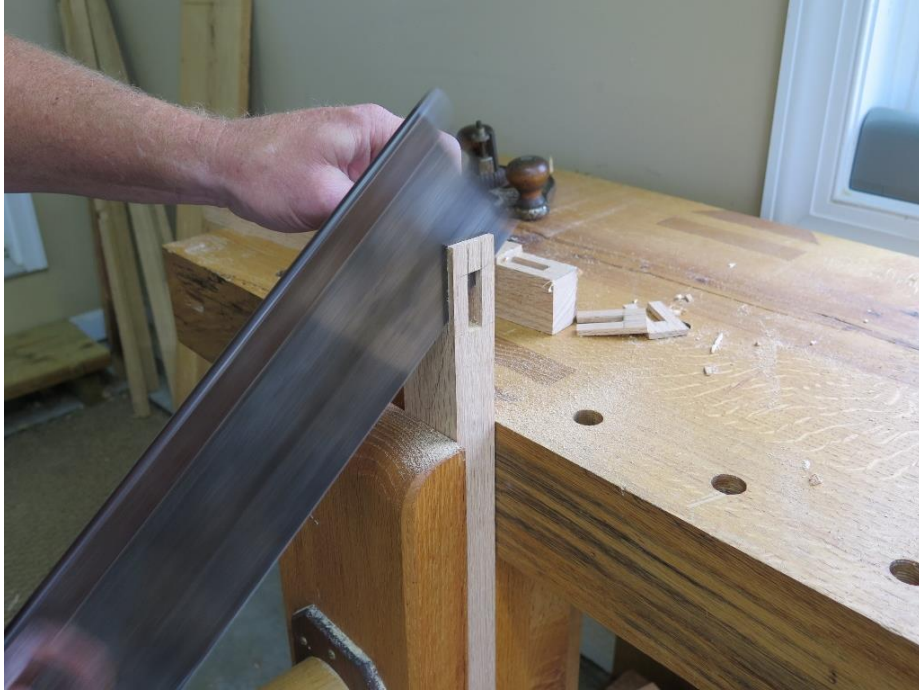
My version of the saw is an almost exact copy of the original except for a couple of small details that I will note along the way.

I started with the cross pieces for either end these are 2in by 1 1/4in by 17 3/4in long red oak. You may want to cut these a bit long and then cut them to final length after the mortises are cut; this would help prevent a blowout. I did not think about that and had to use a clamp to support the ends while mortising.



Lay out the two ends together that way you can be sure everything will line up. The stretcher mortises are 1 5/8in. long and 5/8in. in from the ends. While you are laying out go ahead and locate the center and knife it in as well. Using a mortise gauge with the pins set to my 3/8in. mortise chisel I laid out the width of the mortises.





Then chop out the mortise halfway from one side and halfway from the other. The original saw had a 1/4in. shoulder cut on the inside of the end pieces where the stretchers meet them. I really do not know there is a need for these and they could be omitted, since the original had them I cut them on this one.



Using a gauge set to  $\frac{1}{4}$ in. I laid the shoulder out and the sawed away the waste. To make sure the bottoms were flat I used a router plane to level up any imperfections. The outsides of the end bars have a taper cut in them. To lay this out measure over from the center line  $1\frac{1}{2}$ in. and pencil a line around. On either end measure down about  $\frac{3}{8}$ in. or so from the outside then mark a line connecting the two.





There is not much wood here to remove, I used a jack plane to hog off most of the waste and then a couple of licks with the jointer to clean it up.



To finish the end pieces up I used a Stanley 65 spoke shave to cut the chamfers on the edges of the inside and outsides. I also continued the chamfers around the ends with a chisel and rasp the original saw was cut off square on the ends.



The long stretchers are 1in. thick by  $1\frac{3}{4}$  wide by  $43\frac{1}{4}$ in. long; I used poplar for these. I laid the two stretchers out as a pair to assure alignment of the tenon shoulders.





The tenons are  $\frac{3}{8}$ in by  $1\frac{3}{4}$ in. long and  $1\frac{3}{8}$ in. wide offset to the inside of the frame.



The shoulders need to be cut as accurately as possible to keep the ends square and straight in the frame. The chamfers on the stretchers were made by using the jack plane and just eyeballed them.



With the frame assembled it is time for some hardware. You can buy the web and mounting hardware from Blackburn tools, and probably other suppliers as well. Me being me the glutton for punishment I am, made my own. The tensioner is made from 1 1/4in by 1/8in. bar stock. The inside of the tensioner needs to be as wide as the end bars of the frame is thick so it slide over the ends.



I used a 1 1/4in. diameter bar that was handy as a mandrel to bend the hoop of the tensioner around. This thickness stock needs to be heated to at least a red heat to get a nice even bend. The next piece is a small 1 1/4 in. wide by about 1 5/8 long by 3/16 thick piece of metal. I ground and filed this leaving to small round tenons on each side, being sure there was 1 1/4 in. between the shoulders.



Next, I drilled a 1/2in. hole dead center.





I then welded a 1/2in. square nut to the center of this piece over the hole and ground and filed the nut to a pyramid shape.





With the nut complete I drilled the holes in the hoop for the four little tenons and installed the nut assembly to the hoop.



Using a ball peen hammer to rivet the tenons to the hoop locking the two together.



I used a hacksaw to cut the slot in the hoop for the web to slide into. The tensioning bolt is just a 1/2in. bolt with the head cut off, the shank heated and hammered flat.





I shaped it roughly round by grinding and filing. Last part of the tensioner to make was a 3/4in. square piece of metal with a countersink bored in it, this sets in a small mortise in the center of the end bar and keeps the tensioning bolt from digging into the wood.

The bail that attaches the opposite end of the blade to the frame is a piece of 1/4in. rod bent around to fit over the cross piece with the ends welded together. You can bend this cold, but heat helps tremendously. Last, I used a small piece of sheet metal bent around the 1/4in rod to bolt the blade to the bail. Roy's saw this piece was riveted to the web, on this one I used two 3/16in. machine screws with square nuts to make it easier to change to different webs if the need ever arose.



The blade or web is made from .030in. 1095 spring steel I ordered from McMaster-Carr. The blade is 1 1/2in. wide 38in long filed 2 tpi. You don't need your glasses on to see these teeth!

The web is a bit of work to make. After laying out the teeth I used a pneumatic cut off tool to roughly shape the teeth and then finished up with a file (I still murdered three files in the process). The web is mounted to the tensioner end with a single 1/4in. rod thru the hoop and two 3/16in. machine screws with square nuts on the bail end.





After assembly, tension the web check the frame for twist. There will probably be a bit one way or the other. As long as the web is true it is not an issue. To check the web clamp the saw on one side, then you can use a couple of scrap pieces of wood as winding sticks to sight across. If it is out of alignment you can bend the bail a bit in the direction it needs to go to straighten it up.





I have almost no experience with frame saws. I have read negative and positive comments about them from others who have made and used them. So far I have been impressed with the saws performance. From what I have been told these saws can be used pushing or pulling, I seem to have more control pushing. When pulling the saw cuts much faster but is also harder for me to keep it on the line. I was a little worried about the coarseness of the tooth pattern but it really works well and is quite manageable...and fast!





Roy giving the new saw a test run, Emalyn giving advice!

Best!

Will Myers

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