

Jim Thvedt Builds a Renaissance Handplane

From Sharp & to the Point

#4-2018

Jim Thvedt builds Renaissance period clavichords, forerunners of the modern piano. For those who are unfamiliar, the clavichord was in regular use from about 1400 (although the earliest surviving clavichord only dates from the 1540s) to 1800, with a strong revival during the 20th century. The clavichord is distinguished from the early piano by its more delicate sound, and is played today by devotees of Renaissance, Baroque and, Classical music, and is the subject of ongoing discussion and analysis by music historians. Jim is one of these clavichord enthusiasts, and happens to be a Hock Tools customer for almost 30 years.



Assorted Replica Medieval-Renaissance Era Handtools by Jim Thvedt to use in making Medieval-Renaissance Era Clavichords.

At one clavichord conference in Italy, Jim spoke on a replica medieval clavichord and was countered by another scholar for using modern tools to build replica instruments. Although he had used only hand tools, some were modern forms, and Jim decided to take up the gauntlet and run with it.

Here, Jim generously explains step-by-step, concession-by-concession, photo-by-photo how he went about building one replica Renaissance wooden handplane. Jim used the simple alloy found in Hock Tools 01 plane irons for the business end of this plane.

So, please set yourself up with your favorite beverage, and sink into this longer-than-usual newsletter article. It is the story of one woodworker's pilgrimage to the Renaissance and back. Jim Thvedt's self-told tale of precision and practicality while working in a contemporary shop with available woods displays a cascade of decisions, as well as a respect for the shoulders woodworkers stand on today. Inside, you will find numerous photos that demonstrate a deeply engrossing project. I think you will agree that Jim's is a story of an absorbing and singular effort.

— Linda at Hock Tools



Construction of Noah's Ark, 2nd half of 16th C., Jacopo da Ponte (1510-1592). Note handplanes in lower left foreground.

The Italian Renaissance plane is one of history's more interesting iterations of the woodworking handplane. It appears to have been used neither as – in the modern sense – a pure Western-style push plane, nor was it pulled as are Eastern planes. Of course, both Eastern and Western types of planes lend themselves to being used in various ways, but the Italian Renaissance plane was designed to be pushed with one hand and pulled with the other.



Noah's Sacrifice, Jacopo da Ponte, 1574.



Detail from *Construction of Noah's Ark*, Jacopo da Ponte, use of a handplane.

In use, although the motion is somewhat different from using a modern Western plane--one is pulling with one's primary hand, rather than pushing--I find that the motion quickly becomes natural.—JT

We are fortunate that among other images, two very good depictions of the Italian Renaissance plane in use appear in two different paintings by the long-lived Jacopo da Ponte. The *Construction of Noah's Ark*, left, and *Noah's Sacrifice*, both readily viewed online.



Detail of mid-foreground, *Noah's Sacrifice*, Jacopo da Ponte, two handplanes.



Detail of left foreground, *Construction of Noah's Ark*, Jacopo da Ponte, two handplanes.

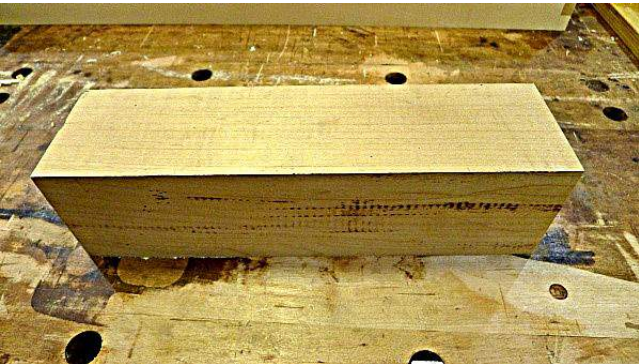
And, even though a frame saw, hammers, auger, adze, dividers, and hatchets were more clearly depicted in *Noah's Sacrifice* the handplanes in da Ponte's *Construction of Noah's Ark* were more helpful to me as they are very clear in depiction and use.

I was particularly interested in the plane shown in use in *Construction*. If you look closely at the foreground of both pictures, there are planes on the ground. At first, one wonders how well these planes were cared for, strewn about as they are. However, these are Renaissance paintings where da Ponte tells his story through the composition. These carpenters work hurriedly as clouds gather in the background. As he chronicles tools of the age, da Ponte has us – his viewers - seeing what Noah knows, that time for the flood is close at hand.

For me, da Ponte's depiction of carelessly kept Renaissance era woodworking handtools was useful historical insight, and a lucky find.

I decided to make a smoother-sized plane, around 10 inches long, fitted with one of Hock Tools 1 ½" Kenov-style irons. I chose to not include a cap iron because they were not used in early planes.

I also decided to use the "Krenov," or "sandwich," method to make the plane. This is not an authentic 16th century technique, of course, yet is a quick way to build a plane, using regular shop tools: the reader might avail him or herself of the convenience offered by Hock Tools kits, which come complete with a blade and pre-cut sides, etc. (As a matter of fact, I recommend prospective wooden handplane builders begin with a Hock Tools Krenov-Style Wooden Handplane Kit, and to read *Making & Mastering Wood Planes* by David Finck, as well as *The Fine Art of Cabinetmaking* by James Krenov's. All are exceptional sources for finding out more about building "sandwich" wooden planes).



The maple block cut to 12 inches with one side cleaned up.

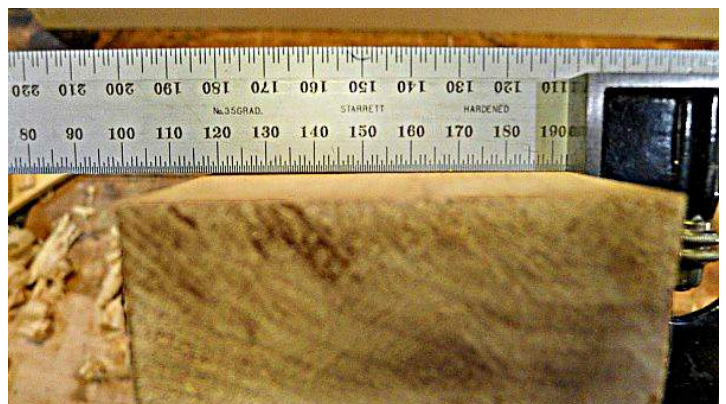
dressing one face first, then working off that face.

Once it was square, I used the 1 ½ inch iron I'd purchased to determine how much should be sliced off each side to make the "sandwich." The cheek pieces should be about ½" thick on each side, and the 3" stock left plenty of extra thickness here.

Viewing the endgrain, my stock had growth rings running squarely to the sides. Although it is traditional to orient the growth rings parallel to the sole, David Finck asserts that he finds no difference in the resulting plane no matter how one orients the

A nice 3"x3" maple turning-block had been sitting around for several years; it was quite dry and well acclimated to my shop. I cut off a 12" piece. Except for a short piece of dowel and a sole insert, the entire plane would come from this block of maple.

The piece needed squaring, and I began by



Squaring, working off the first face.

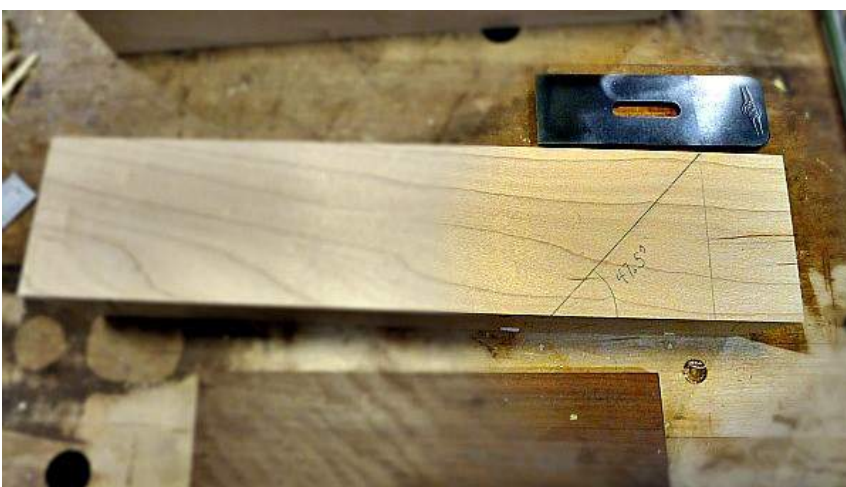
grain. However, my experience with a favorite smoother – a beech coffin smoother - told me differently. It has growth rings parallel to the sole. During winter, with my furnace going constantly in the cold Minnesota winter, that smoother was not useable because the body shrank to a point where the iron no longer fit. Thank goodness, I had removed the iron so that the cheeks did not crack! Considering that potential disaster, I decided for this replica plane that I would go with my gut feeling and orient the grain vertically to the sole, hoping to minimize shrinkage on the horizontal axis.

However, I do think it valuable to orient the horizontal grain for the length of the plane so that it works with the direction being planed, by the same principle of “planing uphill” with the grain.

With layout, there were several considerations. First, since this was to be a smoother, I decided to make the bed angle at 47.5 degrees. Historical planes generally exhibit bed angles like modern bevel-down bench planes. One can't really tell the bed angles in the da Ponte painting, but I felt that the slightly-steep angle would help in the layout, while being within what we know about the original planes. Also, with this plane, the iron is located near the heel of the plane, and the handle is at the toe. As seen in da Ponte's *Construction of Noah's Ark*, the heel is a semicircle, so the iron needed to be



Front of the plane-to-be is on the left. The blank plane body, with the sides sawn and the central piece a fat 1/16" thicker than the iron is wide.



Markings on the right help you see where the back of the throat will be. Also, please note the grain orientation and the darker piece of wood at the bottom of the picture, which will become an insert in the sole.

located so that there is some gluing surface for the cheeks, and so that the semicircle would not cut into the rear corners of the throat.

I also decided to put an insert in the sole (see bottom of photo to left) — almost certainly inauthentic — although I also think we would agree not affecting the use of the plane. I had a piece of some very hard Australian wood that was about 6 mm thick; hard and stable, perfect for the insert. As with the insert itself, Australi-

an woods could not be authentic, as the first known landing in Australia by Europeans was by Dutch navigator Willem Janszoon in 1606! I chose practicality in this case, since the presence of an insert does not affect how the plane is used.

I then squared off the insert using a shooting board, and fit the insert into a shallow mortise in the center piece, leaving a fair distance in front of the mouth, and such that it extends behind the mouth. This was done to fit the piece of wood I happened to have, rather than to some measurement.

Then, after gluing the insert into the center piece, I trimmed and planed it so that the center piece of the “sandwich” was ready for subsequent steps.



Squaring off the sole insert with a shooting board.



Fitting the insert into a shallow mortise in the center piece.



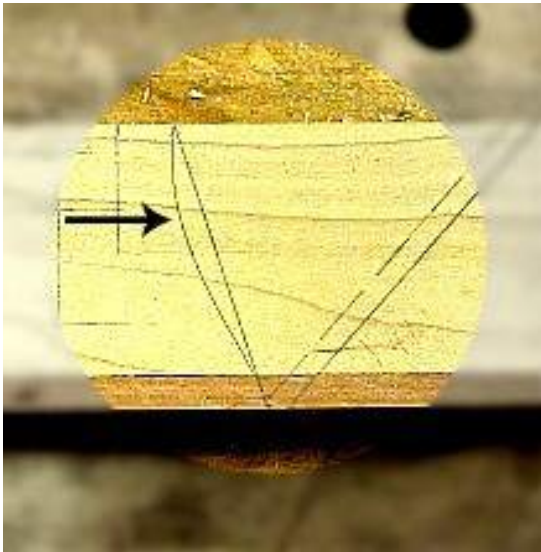
The center piece is glued and clamped together. Once set, it will be trimmed and planed.



The sole insert glued into the center piece, trimmed and planed and ready for subsequent steps.

One reason I liked the plane in use in the da Ponte painting was that it appeared that the front handle is narrower than the full width of the plane. Therefore, it could be made from the center piece of “the sandwich,” and the side pieces could form the overall width of the main part of the body, at the front of the plane.

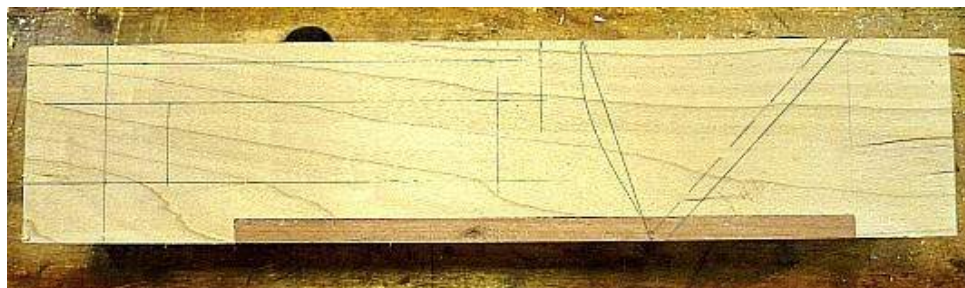
I laid out the plane on the center piece, starting with the marks I'd already made to place the iron. I marked the iron ($3/16$ ") so that the placement of the throat opening could be fixed. At this point, the throat opening is marked so that the iron will not come through: the fine adjustment of the throat would occur after the plane is assembled, permitting the throat to be finished more accurately. This approach offers a side benefit, as well: the iron will not drop through the plane during the various steps, such as when it comes to fitting the wedge. Until the final adjustment of the mouth, the iron will first meet the front of the throat opening, about $1/16$ " above the sole.



A curved line drawn on the blank indicates front of the mouth, with clearance for shavings.

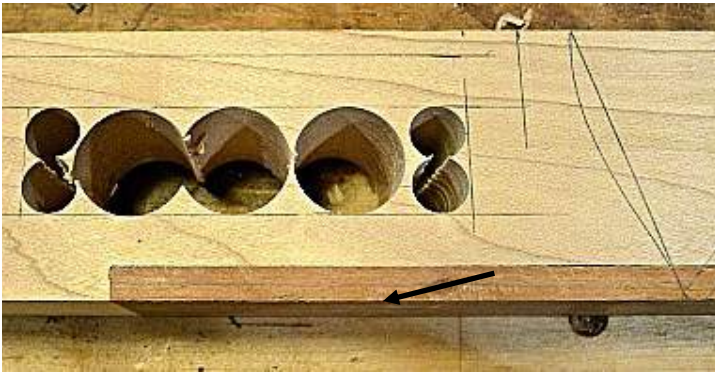
If you will recall, the bed is at 47.5° . The angle in the front of the block is 70° , which is steeper than recommended by David Finck, who recommends 62° ; (Krenov recommended 75°). Finck's recommendation envisions clearance for shavings and space to use one's fingers to clear the throat. I used a steeper angle because I wanted some wood between the

throat and the handle for extra strength and stability. I felt a steeper angle would be acceptable because, with no cap iron, there is a little more clearance in the throat.

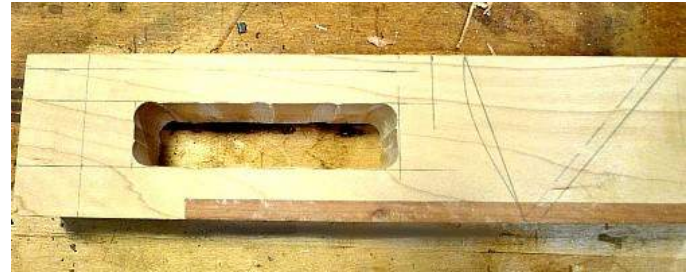


Layout of the throat and handle on the center piece.

Nevertheless, to give a little more clearance for shavings, I marked the center of the throat with a curve.



I used Forstner bits, so the handle would have nicely radiused corners, and another to drill out most of the waste—definitely not an authentic 15th century planemaking technique!



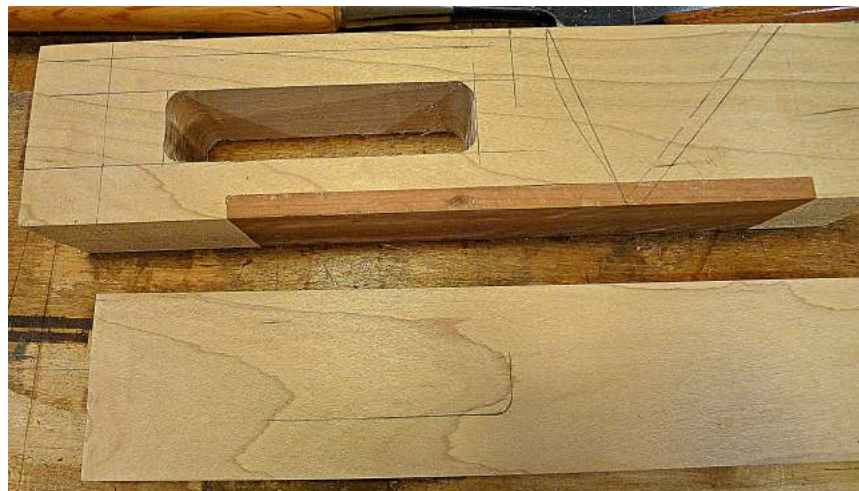
The rest of the waste was chiseled out.



I used a paring chisel to clean everything up.

The handle was also laid out on the center piece. The next step was to rough out the handle, which was accomplished prior to cutting the center block into pieces, and gluing on the sides in order that the work could be done more efficiently.

Then, the side pieces were marked from the center block to locate the cutting lines.



The side pieces were cut so that the handle would be formed by the center piece, and the width of the rest of the plane would be formed by the full sandwich. At that point, it was time to prepare the center piece and sides for gluing:



Once cut, the side looked as it does to the left.

I cut the center piece in the front and back, creating the throat; and then I set the throat piece aside to make the wedge with it later. To move things along, I accomplished this task with a scroll saw. If you do this, be sure to use a sharp, new blade! Of course, a bandsaw works well, too.



The center piece has been cut, and the throat piece set aside to make the wedge.

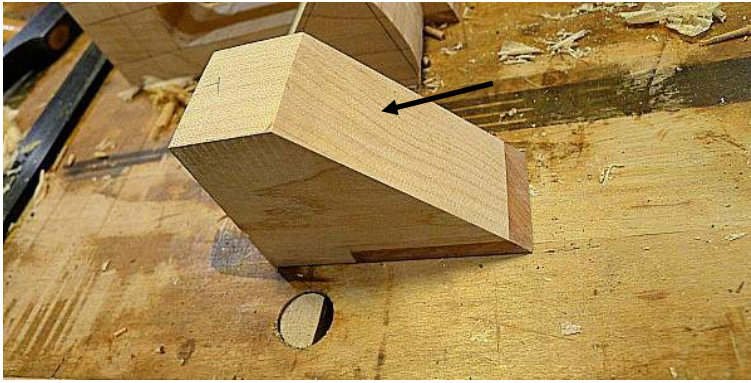
To allow the iron to sit square and flat, it was important that the ramp was square. Otherwise, the iron could not bed correctly.

I flattened the ramp with a block plane fitted with a very sharp iron (for sharpening I highly recommend Ron's book *[The Perfect Edge: The Ultimate Guide to Sharpening for Woodworkers](#)*) set to take very light cuts on the semi-end grain of the ramp. To get



the ramp square and flat, I made careful iterations with a machinist's square, marking out-of-square or high points with a pencil, which I then planed off, repeating until the ramp was acceptably square and flat.

The ramp presents an angle that planes more like end grain than side grain. That is why a low-angle, bevel-up plane works well for this step. I am fond my Veritas block plane, pictured here.



Back piece with flattened ramp.

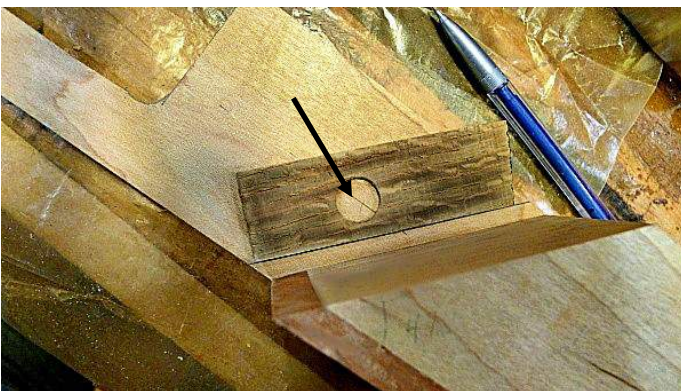
Now, with its flattened ramp, the back piece was square on all faces. And, it was finally time to begin assembling the plane.

The usual technique for ensuring accurate glue-up (used by Hock Tools wooden plane kits, for example) is to drill the assembly with guide holes and use index pins during gluing. With the oddly-shaped side pieces, this didn't seem practical, so I just clamped the center pieces to my workbench, and then glued the side pieces to that.

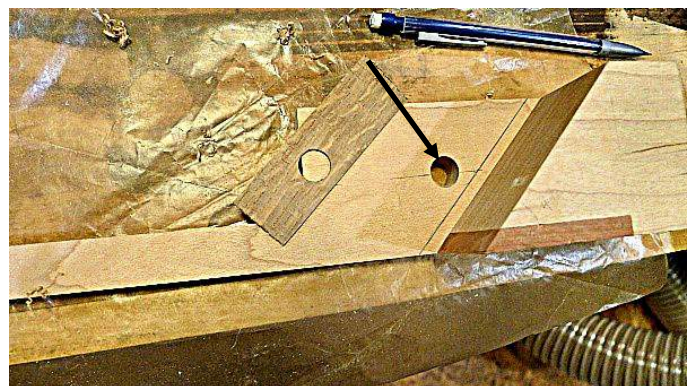


I clamped the ramp section to my workbench, then glued one side and then the other to the body of the plane.

With one side piece glued on to the center, using a piece of scrap wood, I located the hole for the cross piece. I drew a line on the sidepiece to represent the thickness of the iron, and a line parallel to the bottom at 1 1/4" height, and then placed the guide with the edge on the line, centered on the 1 1/4" line, to locate the hole for the dowel.



The hole in this guide is 3/16" from the edge.



I drilled a 1/2" hole for the cross piece.

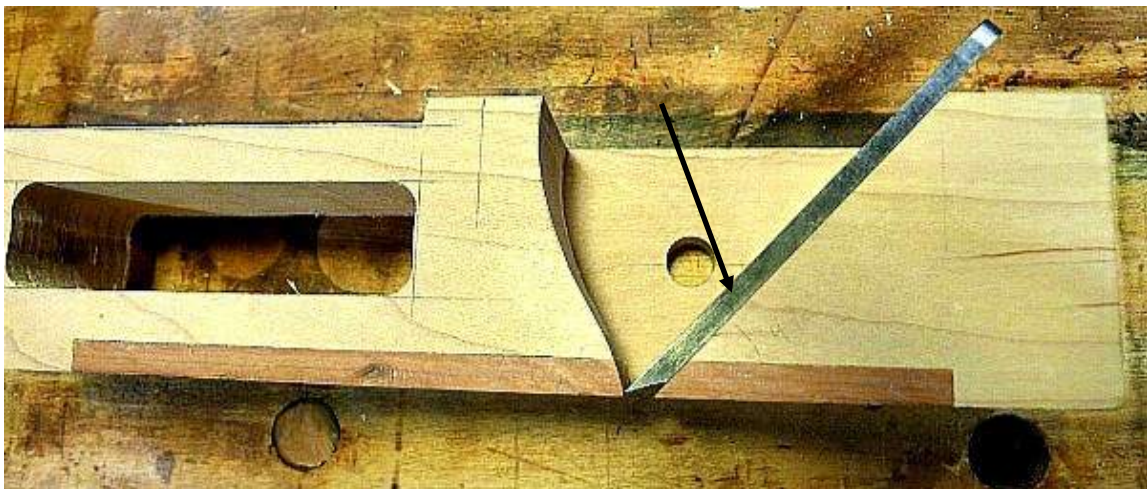
Things begin to move rather quickly from here on out....



If you recall, the center piece was cut so that the iron would not quite clear the mouth.

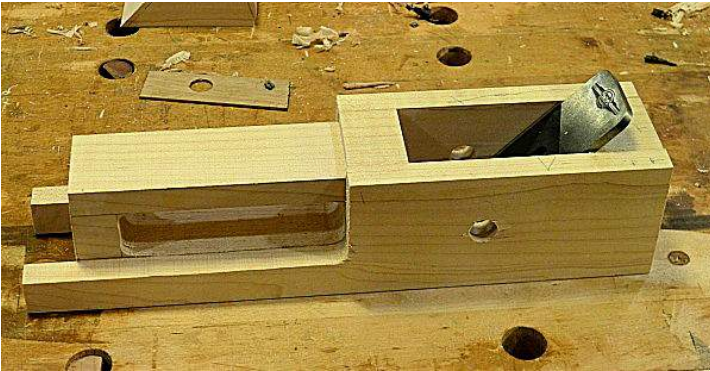


The front-center piece is glued and clamped.



With blade in for reference, the assembly waits for me to glue up the second side.

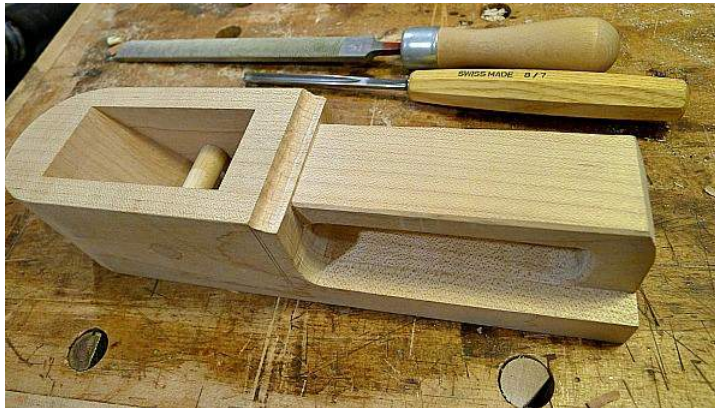
At last, the plane's shape begins to show a hint of things to come!



A rough assembly, again with blade for reference.



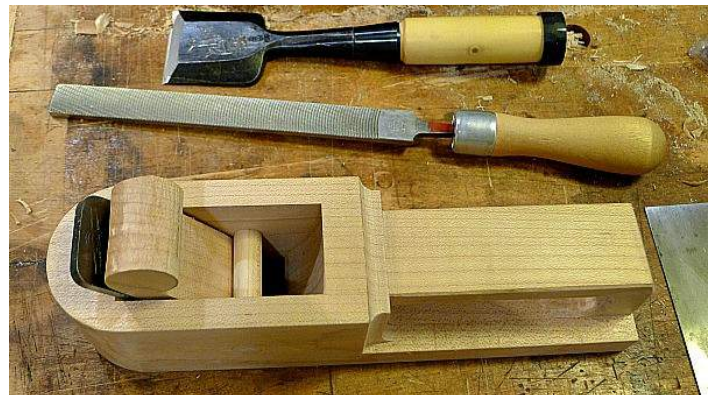
I accomplished this initial shaping on the bandsaw.



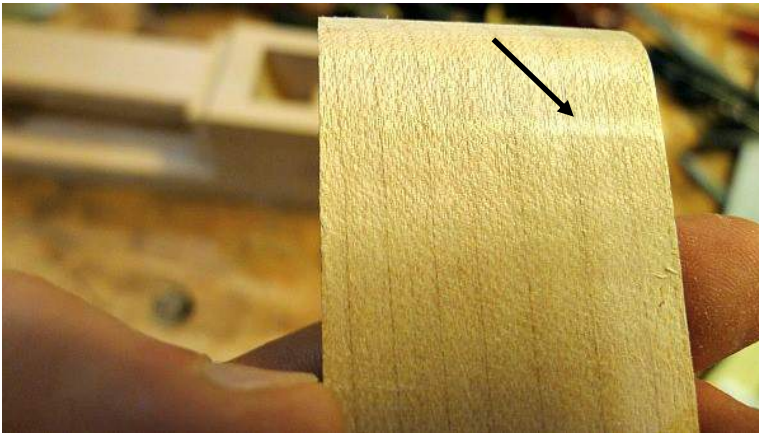
Yet more shaping of the body with a wood file and gouge, shown above plane. The cross piece is now glued in.



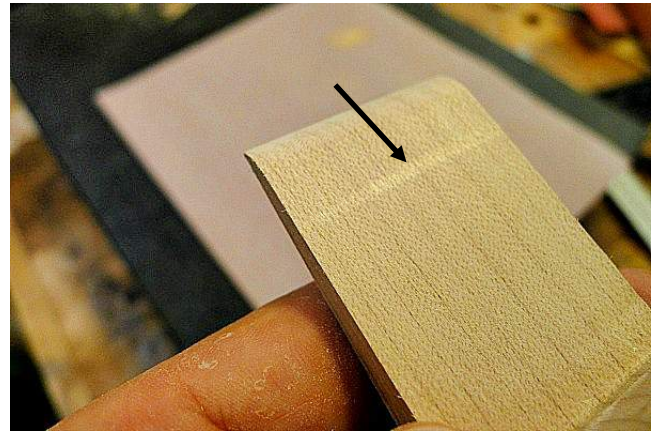
The wedge was made from the piece cut out for the throat of the plane.



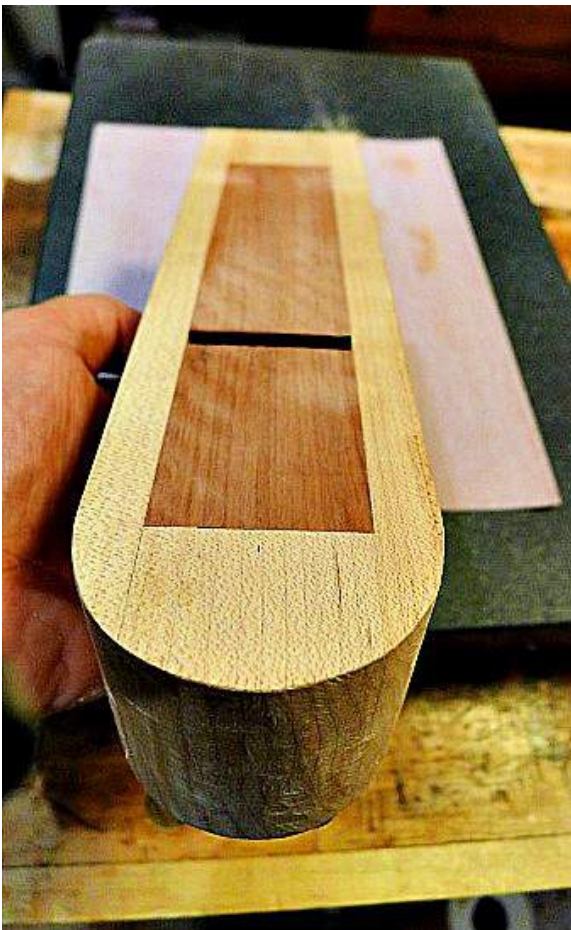
Plane and wedge almost complete. Just a bit of fitting and fine-tuning left to do.



You can see above that the right side of the wedge was burnished by the cross piece more than the left side was.



With a bit of light scraping on the right side, I fit the wedge, again with the iron, into the plane to check the fit. I repeated this until the burnishing caused by the cross piece became even across the entire width of the wedge.



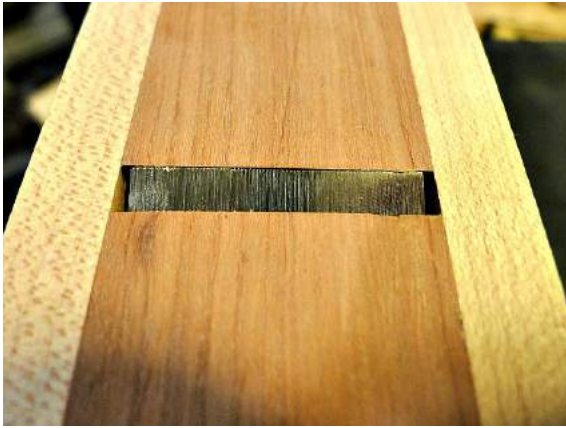
The 150-grit sandpaper worked great, and the sanding pattern is even. The plane is nearly ready for making shavings.

It was now time to flatten the bottom of the plane. To ensure that the bottom was flat and the iron well seated, I installed the iron along with the wedge, so the plane was under the same stress as when it would be in use. Next, using a piece of 150 grit sandpaper on a granite surface plate, and being careful not to rock the plane, I simply pushed the plane back and forth until the entire bottom indicated an even sanding pattern.

There are several reasons while building to keep the mouth of the plane too narrow for the iron to fall through. First, during fitting, it helps that the iron cannot fall through the plane body and hit something— not good for the iron, not good for the floor, and not good for the toes; second, it helps prevent sanding the iron as you flatten the bottom of the plane; and third, it allows you to open the mouth after the bottom is flattened, preventing further unwanted opening that might occur during flattening.

My recommendations at this juncture for other woodworkers are to use a file to open the mouth, proceed slowly and carefully, with frequent stops to

test your progress. Because it has safe edges, consider using a file intended for sharpening auger bits.



You can see that I left more space on each side of the iron than I intended — these things happen, and it can make setting the iron a bit trickier. However, in my experience more space on either side still allows the iron to do its job. Of course, I would rather a tighter fit, but because the plane's use has not been materially affected, I am not much bothered much by this turn of events.



At this point, the plane pulled a nice, fine shaving. But, I wanted this plane to pull a heavier shaving, and opened the mouth ever so slightly more. I also finished the plane with a walnut oil, and waxed the sole.

The Bedrock 604 above is 9-1/2" long x 2-3/8" wide. At 10 1/4" the Renaissance plane is slightly longer than the Bedrock and wider, 2-9/16".

The iron is narrower, too, — 1 1/2" as opposed to a 2" wide blade in the 604.



I tried to go back in time to the Renaissance, and to recreate a tool that a woodworker would have used at that time. The plane does not look like a modern plane; and yet, it is highly functional. Plus, it was a fun project!

And now, for those brave souls whom I thank for reading thus far, here is a photo of a clavichord reproduction. It is more-or-less contemporaneous with the plane described in this article, because this clavichord is based on a 15th Century fresco in a cathedral in Naples, so it is within a few decades of da Ponte's *Construction of Noah's Ark*.



A clavichord based on a fresco by the painter Perinetto, a replica late Medieval—early Renaissance era clavichord by Jim Thvedt.

— Jim Thvedt



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