

A Cabinetmaker's Workbench

By Louis Armstrong

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When trying to plane some parts using my old workbench, I found that the bench and everything on it was moving rather alarmingly, I decided that I wanted a better bench. My old one was built several years ago and used primarily for various mechanical projects. The top was not flat and had quite a bit of oil soaked into it. I did a lot of reading and Internet browsing on the subject. I determined that I wanted something along the line of a traditional cabinetmakers bench, but was not going to be a stickler for historical accuracy. A major problem arose when I started pricing the materials to do the job. The break came when I spotted an advertisement on craigslist.com for maple beams; some used butcher block, and a maple slab.

I initially thought that I could use the three 4"x8"x12' beams advertised to build a 6' top and the legs. When examining the material, I found that they were laminated out of 1 by material. I didn't want to find out that they were not completely solid. However, the section of "butcher block" was a top from what, I will guess, was a school shop bench. It had a number of dings, stains, and small cuts in it, but seemed to be fairly flat and solid. It was 63" long, 24" wide, and 1-3/4" thick glued from 1-5/8" maple strips. The 1-1/2" thick maple slab was 50" long by nearly 24" wide with some water damage at the ends. It was glued up from 6" wide strips. I purchased the two items for \$50 total. I thought that this would be most of what I needed to make the top for a moderately sized bench. This turned out to be true as the only other wood purchased for the top was 6' of maple 1x4 and 5' of maple 1x6. I also thought that by adding a solid core door under the top that I would add some weight and potentially some stability to the bench, so I bought a used door for \$10 from the Restore.

Then the fun began. I started by planing some of the worst dings out of the top and smoothing the rest with my trusty #6 Stanley with the top resting on sawhorses. There were a number of staple legs in it that I had to drive deeper with a nail set because I couldn't pull them. A significant quantity of sweat and some sore muscles later, it was starting to look pretty good. I trimmed the ends with a 7-1/4" circular saw with a guide clamped to the top. Somewhere along the line I decided that I



would use a purchased tail vise screw rather than making a wooden screw. The cost wasn't that much different between the screw assembly and a threading box and tap. The only critical dimensions in the design were those dictated by the Veritas™ tail vise screw that I purchased from Lee Valley. I lucked out that they had a special for free shipping the week that I placed the order. I also ordered a front vise mechanism from Grizzly. I decided that the best way for me to attach the end caps was to use paired bolts into dowel nuts, one into the maple top and one into the solid core door. This would hold everything together but allow a slight bit of motion if needed for differential expansion. I looked at all of the local suppliers that I knew about for dowel nuts with limited success. I wanted them longer than 3/4" for the base structure and for attaching the end caps into the door. I finally located 5/16" dowel nuts 1-3/16" long at Woodpeckers.com.



I built the tail vise based on the design used by Jeff Greef in his traditional workbench design that is posted on his website (www.jeffgreefwoodworking.com/pnc/ShopProj/TradBnch/index.html). It is a box design that transfers the forces from the tailpiece to the jaw through the top and bottom covers as well as the outer face. This design also minimizes the depth behind the vise, allowing legs to be closer to the end and front of the bench.

I modified the design slightly to allow for a row of dog holes near the outside edge rather than just one on the screw centerline. In order to allow for a little adjustability and to simplify construction, I attached the guide bar to the movable jaw and tailpiece with bolts and dowel nuts rather than with through mortises and tenons as shown in his drawings.



I doubled the end cap stock (I was using the 1-1/2" material) to give better support to the nut for the end vise and made the fixed jaw portion to fit this and the rest of the top. The dog holes are rectangular with a 2° tilt toward the tail vise opening. I cut them on the table saw with a dado blade. Since my dado blade is less than perfect, I had to pare them with a chisel to clean them up. The covers on the tail vise had to have matching holes to the grooves in the front edge. I made the dogs themselves later from oak with maple springs.



Once I had the top complete with both vises mounted, I determined the largest size that the base could be without interfering with anything. I then measured the Douglas fir material that had been taking up space in my garage for years. The design that met both requirements and appeared to lend itself to maximum rigidity turned out to be only 48" long by 21" front to back.

This seemed to be too narrow to me, so I incorporated sled type feet to make the effective width match the width of the top. The legs are 4" square and incorporate laminated mortices for the stretchers and tenons into the feet. The stretchers on the ends and front are 1-1/2" by 8" with tenons into the legs. The two rear stretchers are 1-1/2" by 4". The whole thing is bolted together using 5/16" bolts and dowel nuts that can be easily tightened if it ever becomes necessary. The concrete floor in my shop is not quite level, so I made levelers for the feet. The top is fastened the base to with lag screws through cleats glued and bolted to the front and rear stretchers.



Just for grins, I installed oak dowels through the box joints on the tail vise and through the front of the bench. At this point I applied a coat of Danish oil to the bottom components to seal them and was ready to turn the bench over. This was no trivial task, but my wife and I managed to tilt it off of the sawhorses and onto its feet. I did a little more planing and put a couple of coats of Danish oil on the top. I also glued some leather to the tail vise faces and turned handles for the vises from oak with end caps from mahogany.

I knew that this bench was fairly heavy, but was surprised when it weighed in at just over 275 lbs. I can't put enough force on a plane to move it and I doubt that anything else I will do will make it move or shake.



I still ended up spending more to build the bench than I wanted to, but I ended up with a workbench that will be a tool for projects for the rest of my woodworking career. I definitely will not have any hesitation to use it for whatever needs to be done and won't worry about putting the first ding in it - it is pre-dinged. If I hadn't been able to find and reuse the majority of the material, I probably would not have even started the project.

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