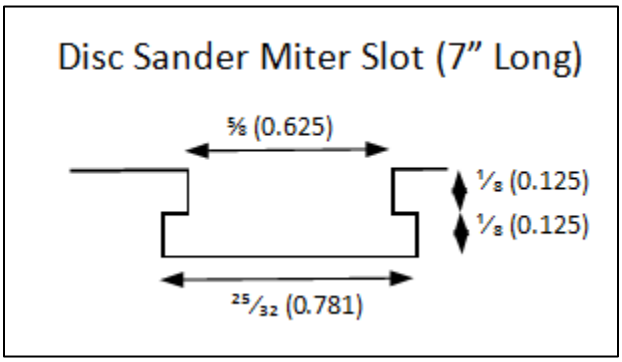
Custom Blank Squaring Jig for 6-Inch Disc Sander

Author: David Lange aka: egnald - August 8, 2023

This is the process I used to build a custom Blank Squaring Jig that would fit on my Craftsman 6 inch Disc / 4 x 32 inch Belt Sander. Although not all Disc Sanders are the same, the general information provided in this guide may help you make a custom jig that will work with your equipment.

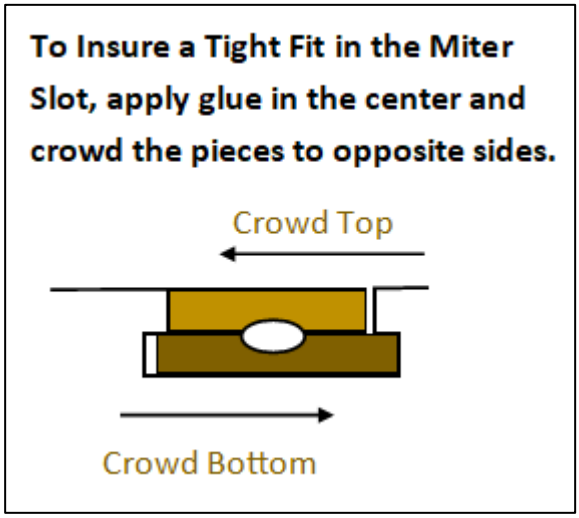
Make a Runner that will fit in the Miter Slot on the Sander

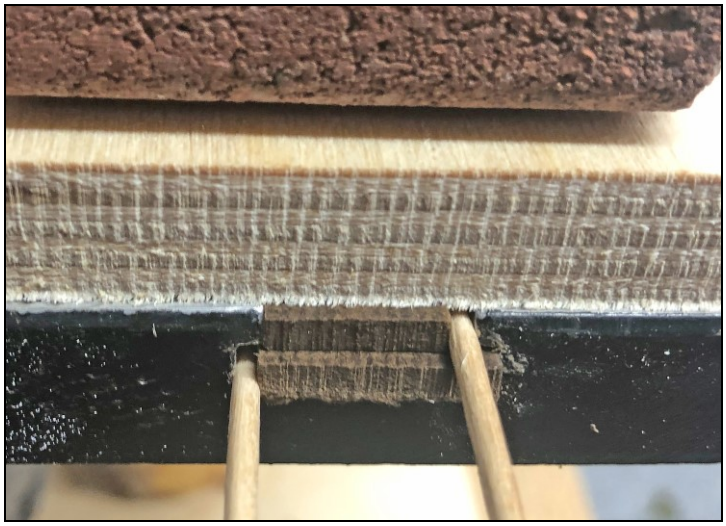
The first thing I did was to measure the Miter Slot on my sander. It happens to be an inverted "T" type of miter slot. Fortunately, both the top and bottom halves of the slot were ⅛ (1/8) inches tall so I could use a common ⅛ (1/8) inch thick piece of hardboard to make the runner.



So, with my bandsaw I cut two strips of ⅛ (1/8) inch thick hardboard to the approximate dimensions for my miter slot, one to match the width of the bottom of the slot and one to match the width of the top half of the slot. I made both pieces 7 inches long to match the length of the table on the sander. I sanded the pieces to get rid of the rough edges left by sawing and to insure that they would slide easily in their respective slots.

I placed the bottom piece in the slot and crowded it to one side by using a couple of toothpicks as wedges. I ran a thin bead of glue down the middle of the strip then I carefully placed the remaining strip on top and crowded it to the opposite side of the slot with toothpicks. I placed a piece of scrap wood on top of the strip and applied weight using a brick while the glue was drying. This can be seen in the following diagram and photo.





After the glue was dry, I used the sander to put a bevel on both sides of the Runner to help lead it in to the Miter Slot.

Attach the Runner to a Sled Base

I cut out a piece of ½ (1/2) inch Baltic Birch plywood to 6 inches by 8 inches to function as the base for my sled. Then I inserted the Runner into the Miter Slot and applied a bead of glue down the middle of the Runner. The plywood base was placed on top with a 1/16 (1/16) inch gap between the sled base and the surface of the sanding disc. I centered the plywood left-to-right and used a couple of pieces of craft sticks (Popsicle sticks) to space it back from the sanding disc to provide the gap. Then I weighted down the plywood with a brick to apply pressure while the glue was drying.

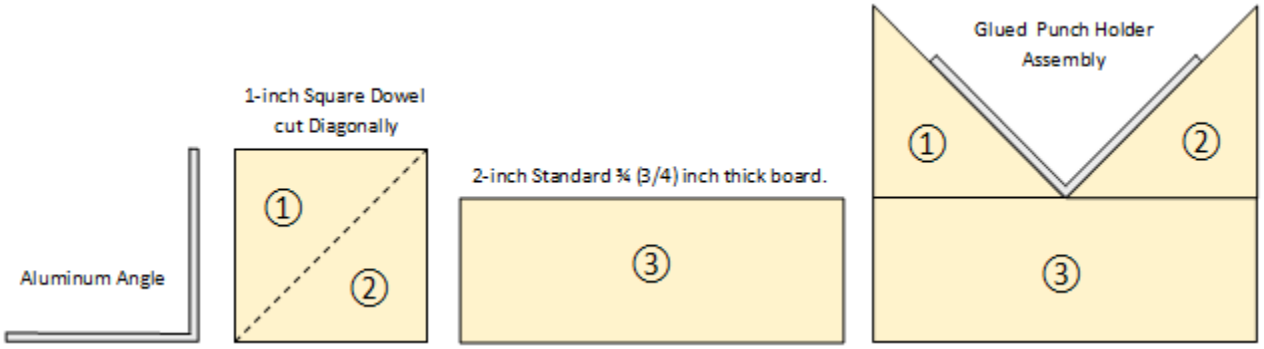
After the glue was dry, I removed the sled with the runner attached and applied a thin coat of wax to both the bottom of the sled and to the runner to both protect them and to make them slide more easily.

Build and Assemble the Punch Holder

Materials needed for the Punch Holder:

- one 2-½ (2-1/2) inch piece of angle aluminum
- one 2-½ (2-1/2) inch long piece of 1 inch square wooden dowel (cut diagonally)
- one 2-½ (2-1/2) inch long by 2 inch wide piece of ¾ (3/4) inch stock

I cut a 2-½ (2-1/2) inch piece of 1 inch angle aluminum to act as a "V" notch to hold and align the punch. I made a support for the aluminum angle by cutting a 2-½ (2-1/2) inch piece of 1 inch square dowel in half on the diagonal and a 2-½ (2-1/2) inch long by 2 inch wide piece of standard of ¾ (3/4) inch stock to provide additional support. The pieces were assembled and glued together using epoxy according to the following diagrams.



To provide improved access, I trimmed off the top of the Punch Holder to be flush with the Aluminum. To keep the center of the "V" notch in the Punch Holder a full 1 inch above the sled base, the bottom of the Punch holder, I did not trim the bottom. This permits the sled to work with blanks that are up to 1 inch square.

Positioning the Punch Holder on the sled base when gluing it on is critical to insure that the punches will be square with the base and square with the face of the disc on the sander. The precision here directly translates into how square the end of your blanks will be in reference to their tubes.

I clamped a small punch securely in the "V" notch of the Punch Holder assembly and used a square (a small machinist's square) to position the assembly so that the punch was square to the face of the sanding disc in both the horizontal axis and the vertical axis. Since the Miter Slot Table is square with the sanding disc, shimming the Punch Holder assembly to make it square was not necessary before I glued it down.

Build and Assemble the Punch Clamp

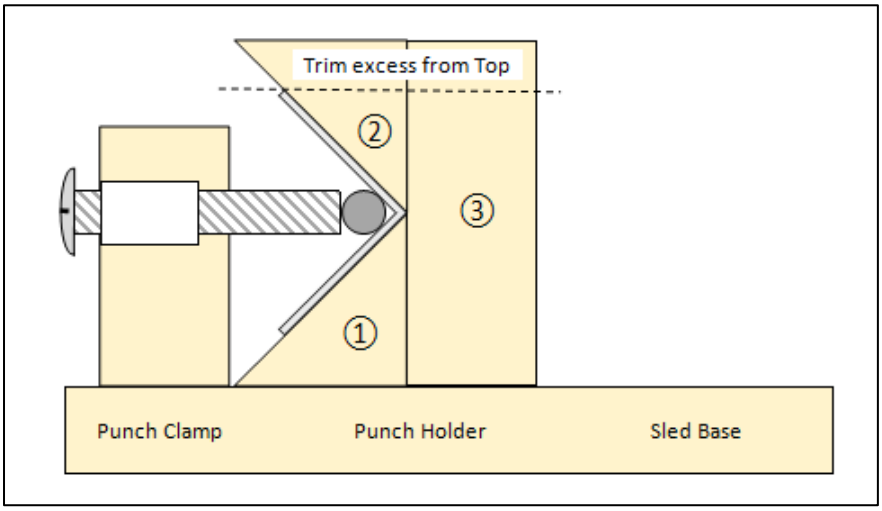
Materials needed for the Punch Clamp:

- one 2-½ (2-1/2) inch long by 1-½ (1-1/2) inch wide piece of ¾ (3/4) inch stock
- two ¼-20 (quarter-20) threaded insert for wood
- two ¼-20 (quarter-20) threaded machine screw 1-½ (1-1/2) inches long
- two ¼ (1/4) inch washers (optional)
- two ¼ (1/4) inch shelf pin rubber end caps (optional)

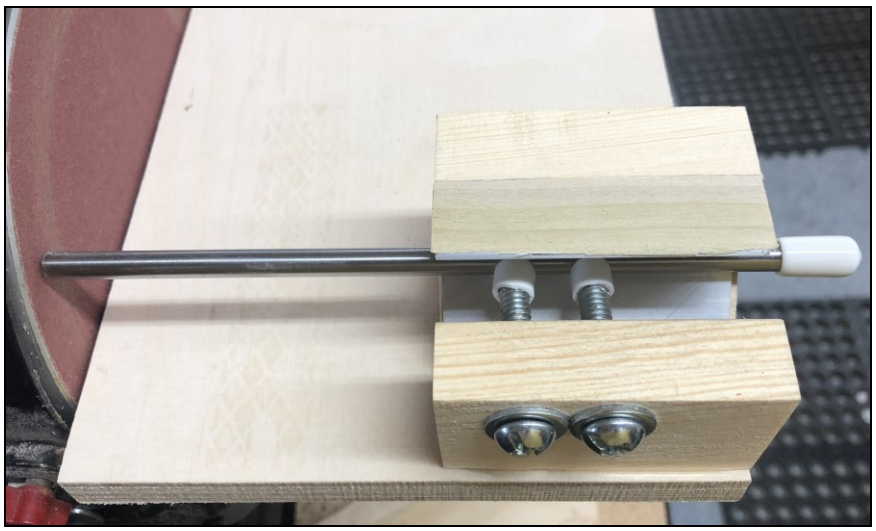
I cut a 2-½ (2-1/2) inch long by 1-½ (1-1/2) inch wide piece of standard of ¾ (3/4) inch stock as the base for the Punch Clamp Block. An 11/32 (11/32) hole was drilled in the front center of the block one inch from the bottom. A second hole was drilled on the sanding disc side also at 1 inch to accommodate clamping for shorter punches. (The exact size of these holes may need to be adjusted to best fit the threaded inserts you have).

After initially installing the threaded inserts in the holes, I removed them and added a drop of glue, then re-installed them. I threaded the machine screws with washers through the inserts and covered the end with ¼ (1/4) inch shelf pin rubber end caps to provide a little cushion and to prevent marring the punches.

After the glue on the Punch Holder had dried, I glued down the Punch Clamp Block. The position of the Punch Clamp Block is not as critical when it is glued down as the Clamp Holder is what determines the squareness of the Punch when it is installed. The Clamp Block merely holds the Punch securely in place.

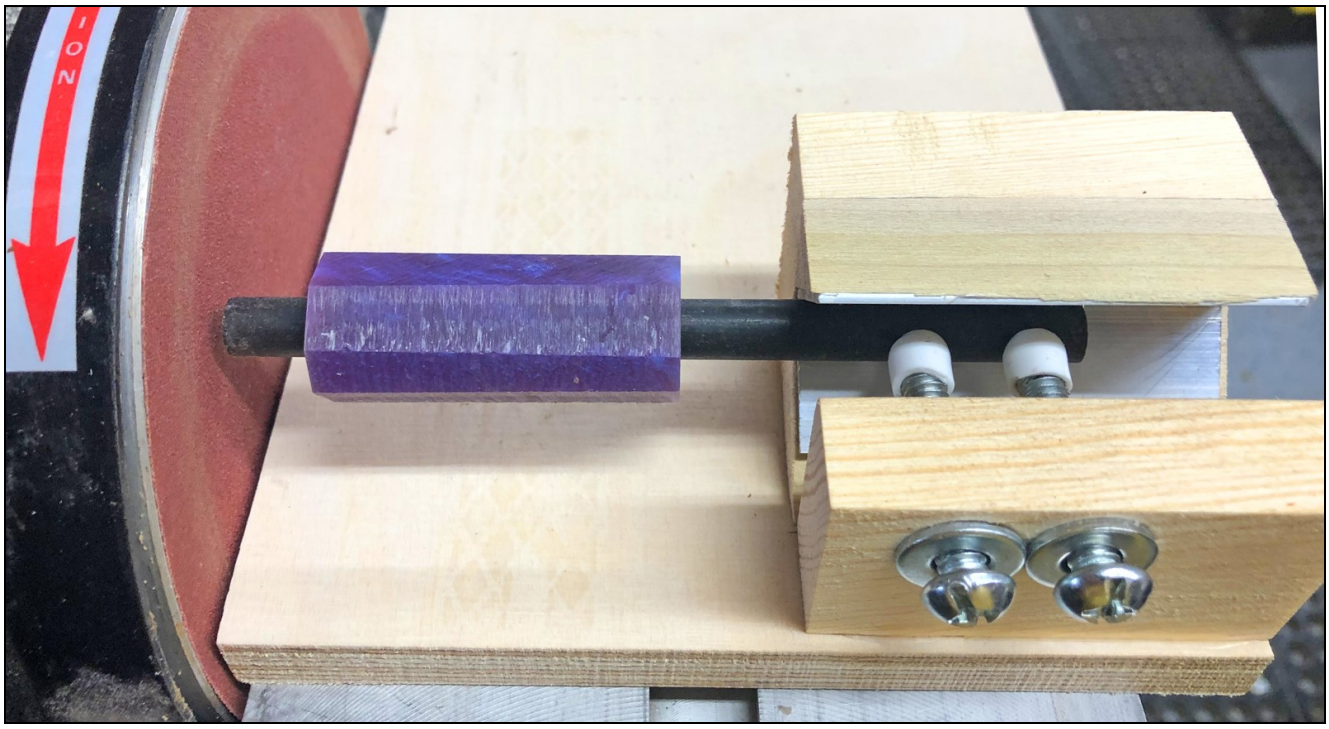


After the Punch Holder and Punch Clamp were securely glued to the Sled Base, I inverted the base and drilled 4 countersunk holes and installed four #6 screws from the bottom side up into the Clamp and Punch Holder to give them a little added strength. Pictures of the completed jig follow:

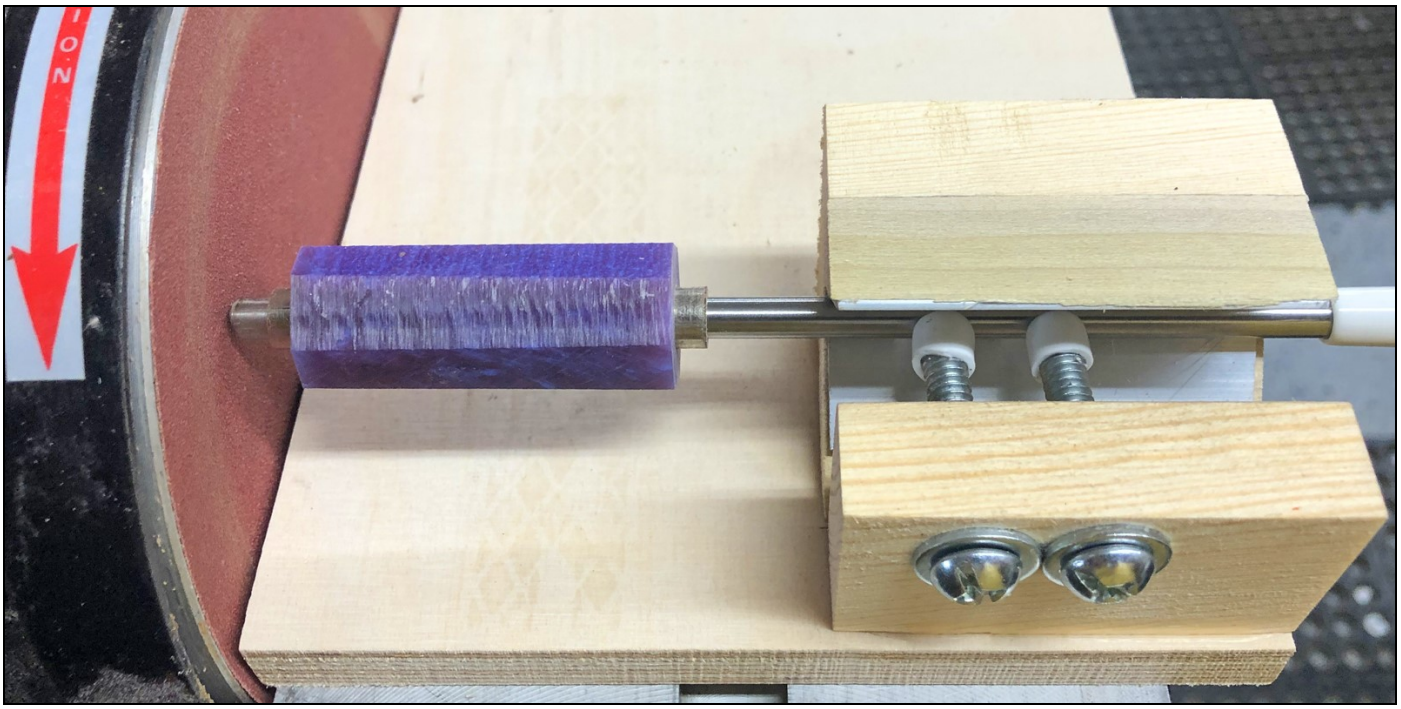


To use the Jig for Squaring Blanks to the Tube

There are two ways that the jig can be put to use. It was designed to be used by clamping a transfer punch (or disassembly punch) in the jig. The punch is chosen empirically and should be the largest punch that will fit through the tube without binding.



Since I already have a set of sleeve bushings (barrel trimmer bushings) for most of the tube sizes, I clamped in a piece of 7mm mandrel and use my sleeves for the various tube sizes. (It is much quicker to change sleeves than to change out the punch).



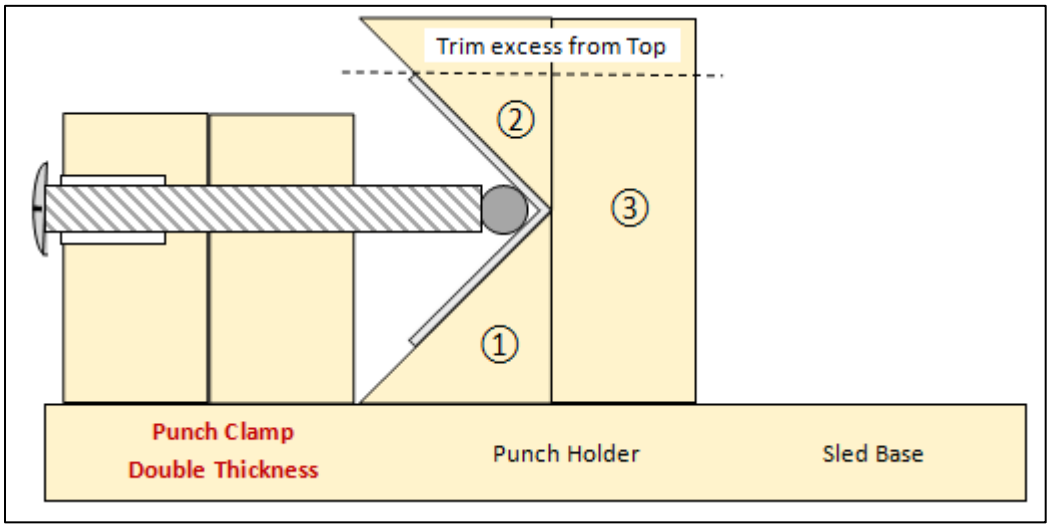
Note: The standard 7mm mandrel shaft, the Berea “A” mandrel, is specified at 0.247 +0, -0.002 inches in diameter. “D” Drill Rod is held to a very tight tolerance and is 0.246 inches in diameter. The “D” size works very well for all sleeve bushings; however, some particularly stubborn 7mm tubes can be too tight. In this case, I replace the drill rod with a piece of “C” Drill Rod which is only 0.004 inches smaller but it accommodates the 7mm tubes perfectly.

I turn the blank as I gently press it against the sanding disc. I also move the sled in and out to help prevent the sanding disc from loading up in one spot.

Revisions and Improvements to Consider

Reinforce Punch Clamp block for More Rigidity

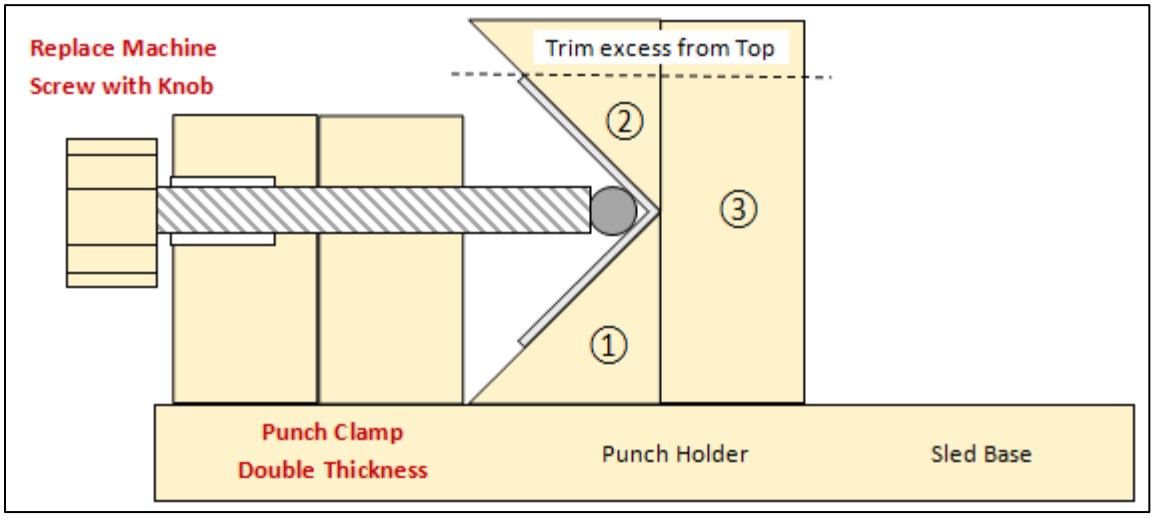
Although it is glued down and is reinforced with screws from the bottom, the single piece of ¾ (3/4) inch material still flexes slightly when the machine screw is tightened down. I should have doubled the thickness of the 2-½ (2-1/2) inch long by 1-½ (1-1/2) inch wide piece of ¾ (3/4) by building two of them and gluing them together.



Replace Machine Screws with a Knob

I have found that a single Machine Screw is sufficient to position and hold the punch in the aluminum angle of the Punch Holder. Instead of using a screwdriver every time the punch needs to be changed, I replaced the Machine Screws with a single Knob and a ¼-20 (quarter-20) threaded stud. This can be made either by drilling a through hole in the knob and gluing in a standard Machine Screw or by drilling a blind hole in the knob and gluing in a piece of threaded rod.

Although I only use one knob, I still use both of the holes and threaded inserts in the Clamp. When the Punch is not long enough to reach the center hole, I move the knob to the hole closer to the sanding disc.



For my knob, I turned a piece of poplar into a ⅞ (7/8) inch diameter knob and drilled a blind ¼ (1/4) inch hole in one end. Then I epoxied a piece of ¼-20 (quarter-20) threaded rod into the hole and added a couple of washers. (I have found that I am less likely to overtighten and flex the clamp using the knob instead of a screwdriver).