

Router Bit Vise

by Loring Chien, Feb 15, 2016

A problem one often has with router bits is that they need some service or attention. The carbide flutes can be honed with an diamond abrasive, some stacked elements need to be disassembled and rearranged, and router bits with bearings need to have bearings changed or serviced. Often the flutes are very sharp and the shanks are very smooth. It is difficult to grab the shank with an ordinary vise as the contact area is small and it rolls in the vise. A pair of pliers is bad because it can damage the precision shank making it not fit or be off-center. Holding by hand is extremely dangerous because one slip can slice your hand on the razor sharp flutes.

My idea is to make a specialized router bit vise. There are ones available for around \$99 that fit one size shank. However mine can be made with a drill and a piece of scrap wood and about 30 minute of work.

The base is a 1-1/2" by 5" x 3/4" piece of wood, I used a leftover piece of pine whitewood from the box stores, but any hardwood scrap will do, as well. You will also need two each 1/4-20 x 2" carriage bolt, 1/4" flat washer and 1/4-20 wing nuts for much less than \$1. Two 3/4"-long 1/4" wood dowels are needed, either cut from a stick or from a doweling kit.

There are a number of holes to drill in the top and long edge. A hand drill might give acceptable results but this is an excellent use for a drill press and brad point bits set. The 1/8 and 3/8" holes in the top provide a fulcrum for the wood to flex and a stop for the slots. The 1/2 and 3/4 holes are for the router bit shanks.

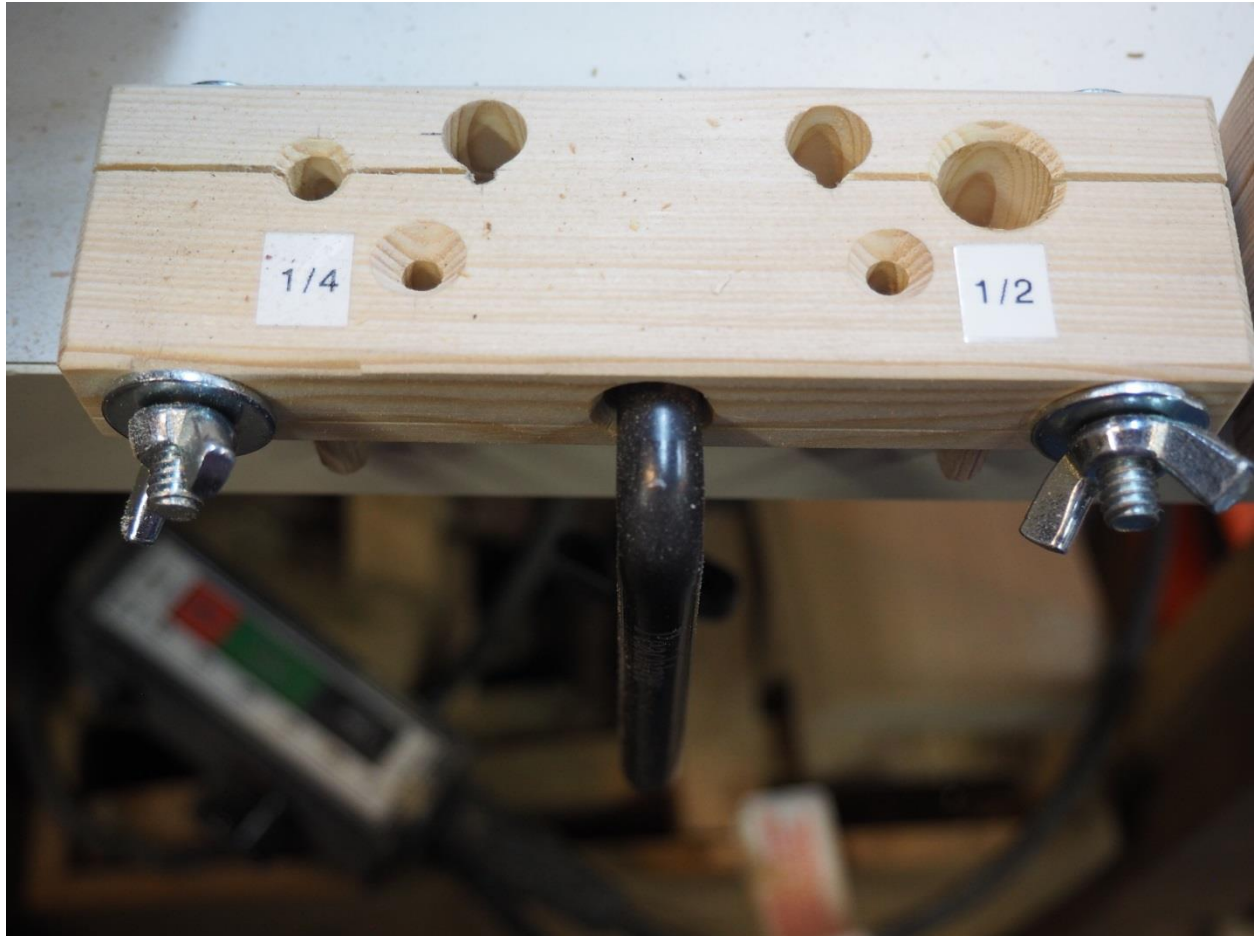
There are two 1/4" holes in the long edge and the 7/16" hole.

There a few more holes in the top and bottom for optional mounting, I'll describe later.

Since the holes are all in a few lines, a drill press equipped with a fence will make drilling the holes quick and accurate.

The following picture shows the vise fully drilled and using a fence clamp to hold it in place. I like fence clamps because they do not extend above the top of the vise. However, a conventional clamp will work equally well. I do recommend it, but if you do not use the fence clamp you may omit the 7/16" hole for it.

I have two mounting options. Option 1 is to put a pair of 1/4" dowels in the 3/8" deep 1/4" holes in the bottom of the vise as indicated in the detail drawing. These dowels will butt to the table top and prevent rotation of the vise during use. Or, the dowels can be clamped into a larger table mounted vise to hold the bit vise. Option 2 is to put a pair of countersunk holes in the top and use them to screw the vise to a table using flat head wood screws or to use flat head bolts to screw to threaded inserts installed in the table. You can put both or none.



Construction:

- Drill and countersink the holes in the edge first.
- Drill and countersink the holes in the top next. Drill the 1/8" holes first and then the 3/8" holes next which will overlap the 1/8" holes. The two mounting holes are optional.
- If needed, drill the holes in the bottom for the two dowels.
- Use a bandsaw or handsaw to cut the two slot that intersect the 1/4" hole and the left 1/8" hole and then the other slot that connects the 1/2" hole and the right side 1/8" hole. My bandsaw left a kerf of about 0.020" but anything large to about .050" is OK.
- Install the two carriage bolts from the back side into the 1/4" holes, the square on the bolt should be forced into the hole to provide a non-rotating fit, when the wing nut is tightened. Thread the washers and the wing nuts onto the end of the bolts protruding out the front of the vise

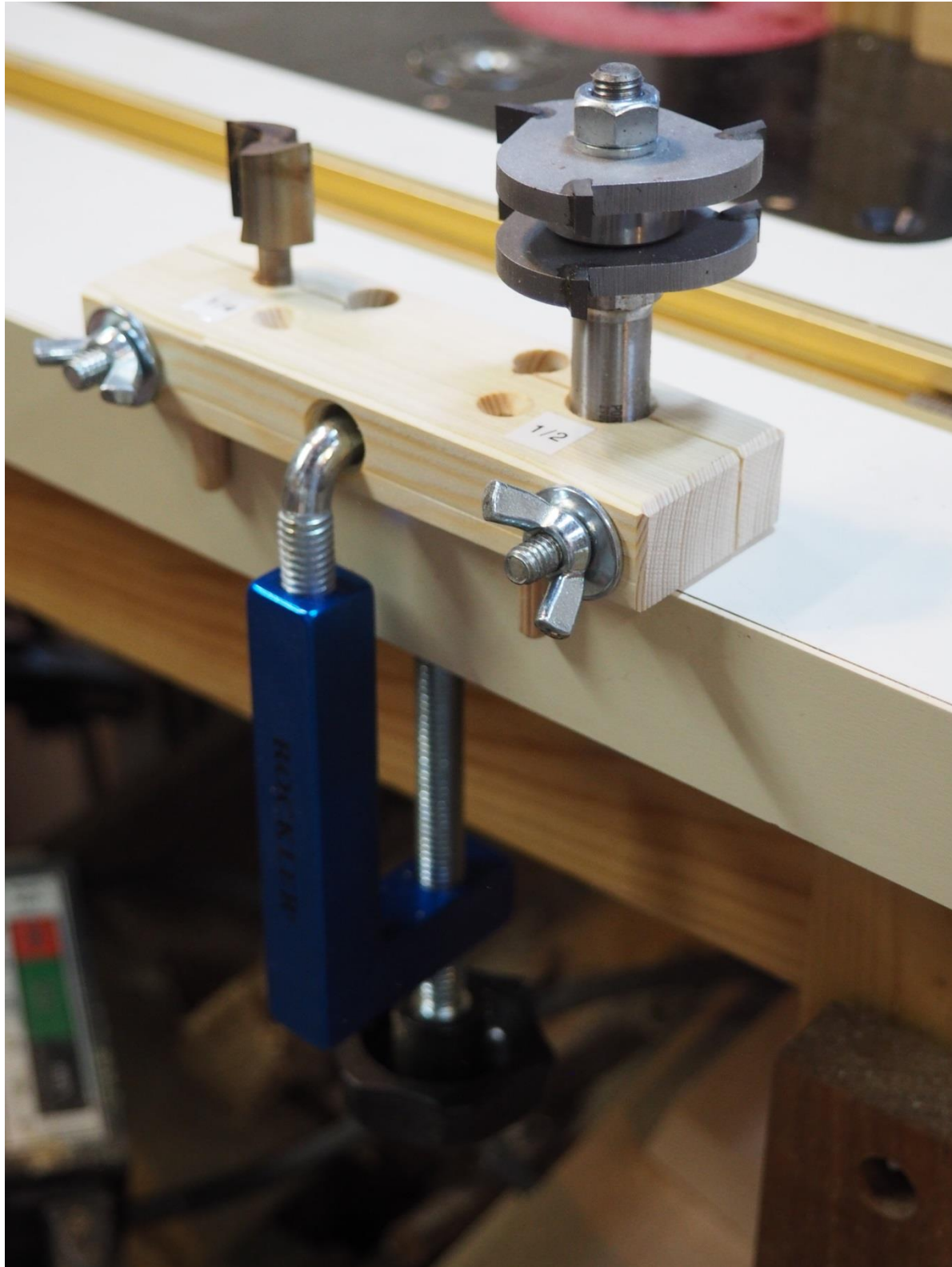
Additional hints:

- If the vise can't be tightened enough to hold the bits securely, enlarge the bandsaw kerfs some
- If the router bit shanks don't slide smoothly into the provided holes, use regular 118° pointed drill bits to ream out the holes, closing the gap ever so slightly with the wingnut until you get a sliding fit to your satisfaction.

Here's a photo of the vise in action. Clamp the vise to a table edge with the dowels flat against the table edge. Put the $\frac{1}{4}$ " shank bits into the left-most hole, or the $\frac{1}{2}$ " shank bits into the right-most hole.: Tighten the nearest wing nut to tighten the hole around the bit shank. Perform actions like honing the flutes, removing the nut holding a stack together (shown) or remove the screw retaining guide bearings for cleaning or repair.



Using fence clamp mounting:



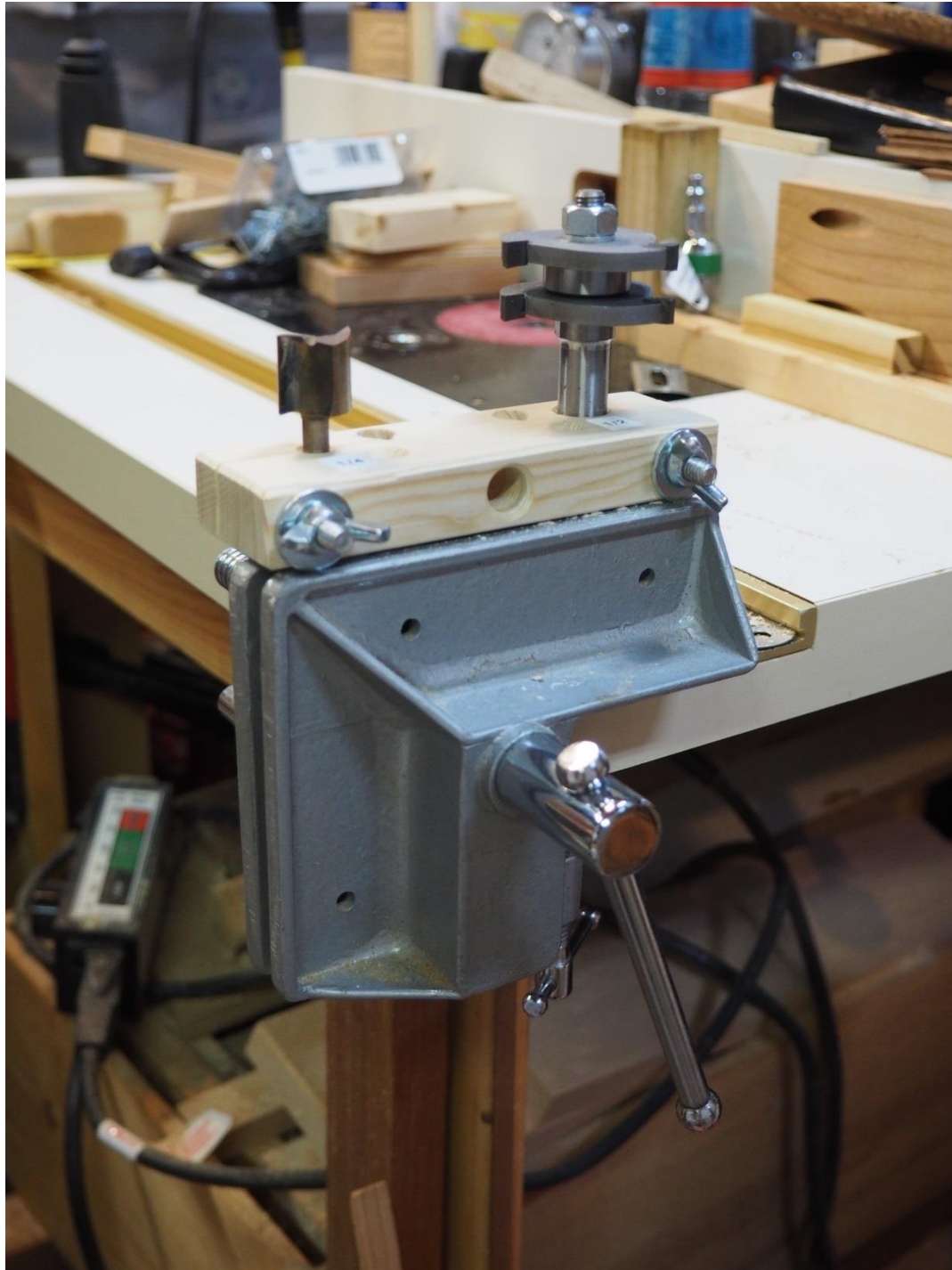
Using F-clamp mounting



Side view:



Mounting in table vise:



Recap: Router Bit Vise:

- User Safety
- No more damaged bits from improper clamping
- Convenience

- Compact
- Works well
- Inexpensive - Made from shop scraps and a couple of bolts.
- Made in 30 minutes or less