

A Different Kind of Screw Vise, version 3

By R. G. Sparber

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This vise clamps screws for safer handling during grinding. To clamp the screw, back out the bolt, slide the screw into the side slot, and tighten the bolt. The smooth, round body makes it easy to turn the vise and grind a bevel on the end of the screw.



Previously I was faced with trying to hold the screw with pliers and then smoothly turn it to grind a bevel. Using my fingers may have given me better control but one slip and I could be hurt.

This particular design handles #8 screws. I made a second one that holds #6 screws. The design can be scaled up to handle larger screws. If you find a

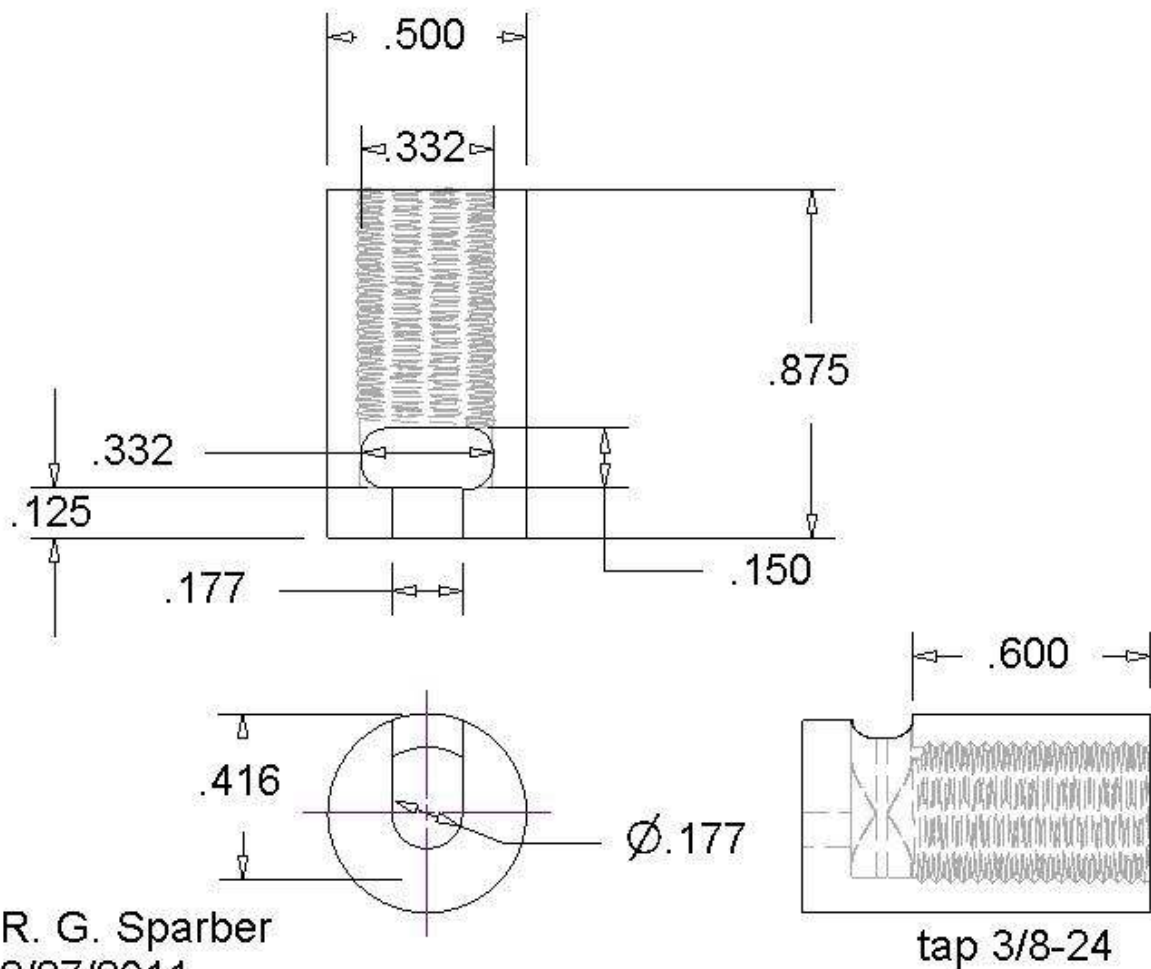
smaller diameter end mill, you can scale the design down too. Alternatively, you can chain drill and file the resized 0.177" gap shown below.

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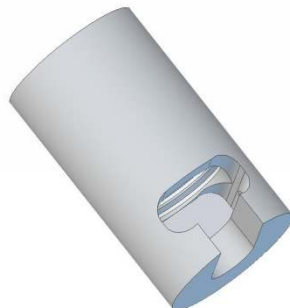
Plans

Although this head can hold both #6 and #8 screws, I chose to make a second head that was a closer fit for #6 screws.

#6 and 8 Screw Vise Head



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Shop Procedure

I did most of my prototyping on the computer using Alibre, a Computer Aided Design program.



My first step was to turn down some 5/8" diameter aluminum rod to an OD of 0.500".



I then center drilled, followed with a Q drill to a depth of 0.6", and ran through with a 3/8 - 24 tap.

Next, I used a #16 drill through the part.



The stock was removed from the lathe and cut off on my horizontal bandsaw.

I then put the part back into the lathe and faced the rough end.

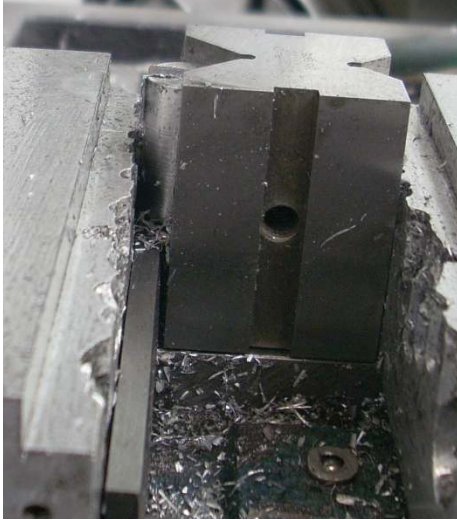


I used my caliper to determine how much more metal to remove and then trimmed to the final length.

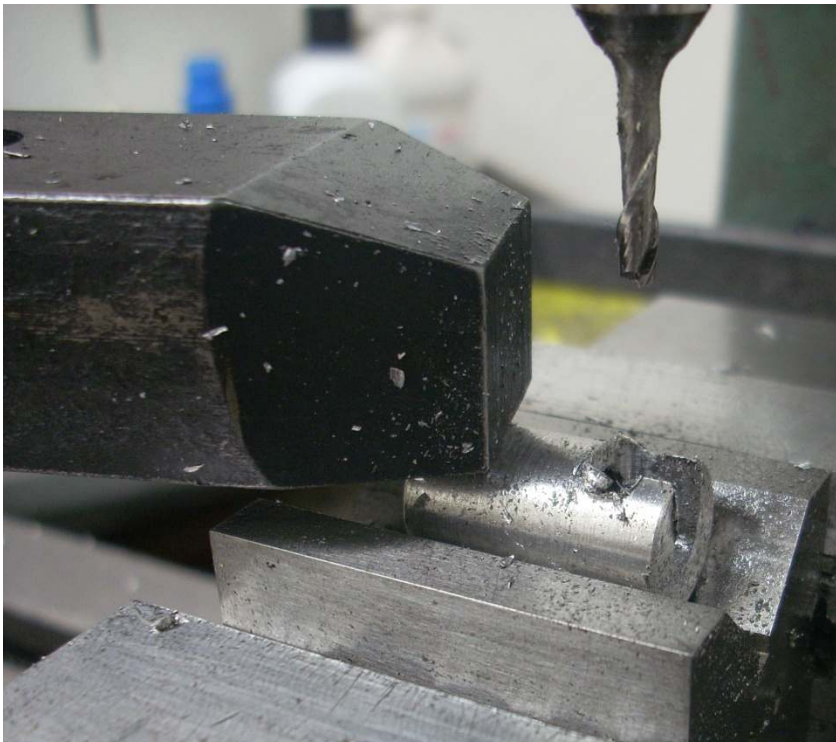
My next stop was the mill.



I used a V block to help clamp the part with the small hole end facing up. My 0.1" diameter end mill was centered in the hole by eye and my Digital Read Out zeroed in the X and Y direction. I lowered the end mill until it touched the part and zeroed the Z axis.



Here is a side view after the end slot was cut. Because of the small diameter of my end mill, I took a series of light cuts and hand fed the motion. It is all too easy to snap off such a thin end mill.



I milled the side slot using the same end mill.



Here is the finished vise with a #8 screw in place. The 3/8 – 24 bolt that makes up the handle has a slight cup in the end which helps to align and hold the screw head.

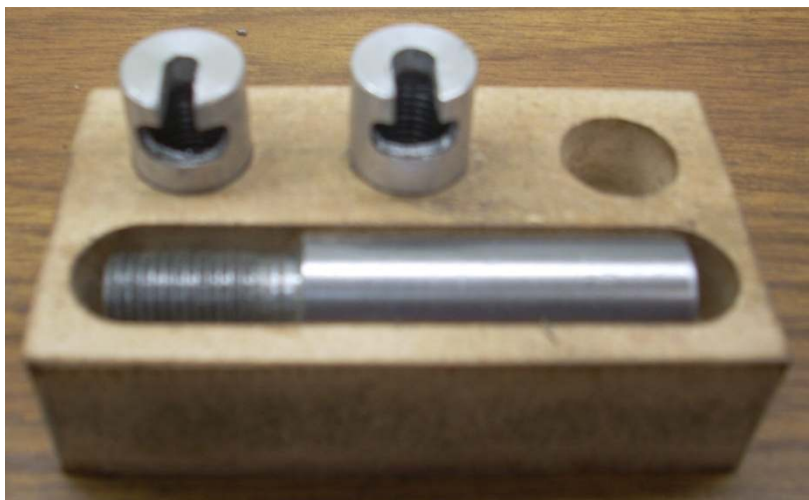
You can see the nice even bevel on the end of the screw. Of particular note is the lack of blood covering the threads. 😊

A Few Improvements



The first improvement I made was to turn a piece of 1/2" CRS with a 3/4" long section of 3/8 – 24 thread.

In this way the handle is the same diameter as the head. That should make it easier to rotate while it rests on the grinder's table.



The second improvement was to mill a block of 5/8" thick MDF to hold my new tool. I plan to make one more head so left a hole for it. This head may be for #4 screws or for #10 screws. If I decide to make a #4 holder, I will forgo the side slot and just have a center

hole. The tool will have to be dismantled; a screw dropped in the hole, and then reassembled. I don't have a mill thin enough to cut the side slot.

Acknowledgement

I received invaluable editorial help from William Abernathy.

What's Next?

I welcome your questions and comments. They will improve on what I have presented here. All of us are smarter than any one of us.

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