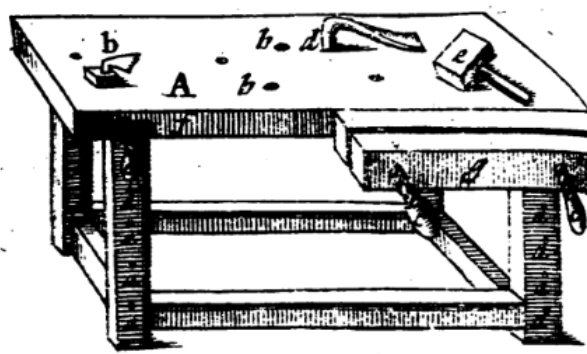


Moxon Twin-Screw Vise Design Considerations



Moxon Vises are double-screw work-holding fixtures that have been in use in furniture shops for some 400 years. They were first described and illustrated by Joseph Moxon in his 17th century book, *The Art of Joinery*. A dual-screw Moxon Vise is an incredibly versatile workbench accessory that is simple to build with the right hardware. It can stabilize wide and narrow boards with incredible force while various joinery, shaping or carving operations are performed. It is the perfect accessory when hand cutting tenons or dovetails. It raises the workpiece to a more comfortable and ergonomic height. It is highly portable and can be quickly mounted anywhere on a bench or table, and when not in use, easily stowed away on a shelf or hung on a wall.

This Moxon Vise hardware kit is quite economical, yet contains high-quality 3/4-10 threaded rods, nuts, washers and cast handles/knobs. This hardware kit contains everything needed (minus the wood) to make a fully functional Moxon vise. You can make it as wide and as tall as you desire and from your choice of wood. By design, this kit does not include plans or measured drawings as numerous possibilities for customization exist. We leave the details for you to decide. Below are various design considerations allowing you to individualize your Moxon vise to suit your personal needs.



Size Considerations

A Moxon vise contains just 2 wood parts: a rear fixed jaw and a front movable jaw. The rear jaw should be at least 1-1/2" thick (thicker is better). Ideally, the front movable jaw should also be at least 1-1/2" thick, but a thinner 3/4" jaw will work for narrower vises.



1-3/4" Thick Front Jaw



3/4" Thick Front Jaw

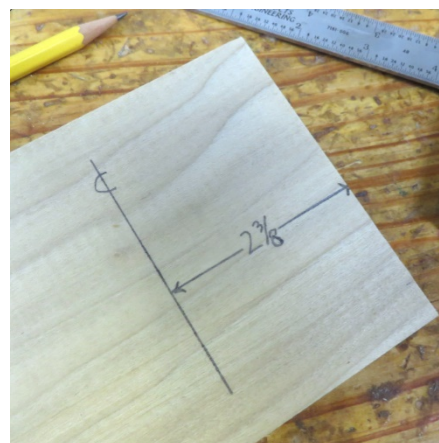
Using 8" long threaded rods with 1-1/2" thick wood will allow a maximum jaw opening of just over 3", which is plenty wide for most work. Any clear, straight-grain wood can be used. A 2x8 section of Southern Yellow Pine from the Home Center would make a fine and inexpensive vise. The jaw height should be at least 4" but not more than 6". Keep in mind, the jaw height is the distance your workbench working height will increase. If you have a tall bench or are short in stature, jaws closer to 4" high might be more appropriate. For taller folks or those with shorter benches, 6" jaws might be best. To work out the front jaw width determine the widest board you plan to work and add 5-1/2". This allows the inside edge of the threaded rods to be inset 2-3/4" from each side. Add 6" to the front jaw width to size the rear jaw. This extra 6" provides two 3" clamping extensions used to secure the vise to your bench. For most folks a front jaw that's 23-1/2" wide, which allows 18" between rods, is plenty wide. Keep in mind that making the vise wider or taller will increase its overall size and weight, making it more difficult to move and store.

Parallel Front Jaw Option

The front jaw can be made to glide in and out while remaining parallel to the rear jaw. This jaw style will only clamp parallel workpieces. This is accomplished by drilling 3/4" holes through both jaws. Mark out the two holes in the vertical center of each jaw. On the front jaw, measure 2-3/8" in from each end and mark your holes. On the rear jaw, mark 3" in from each end. Using double stick tape attach the front jaw to the rear jaw on your layout lines. To ensure perfect alignment drill the 3/4" holes through both jaws at the same time.



**3/4" ID x 1" OD
Steel Bushings**



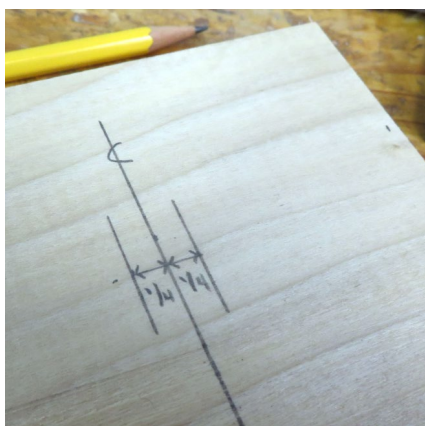
Using a drill press with a fence is highly recommended. The holes in the front jaw can be left bare or enlarged to accept steel bushings. Steel bushings will allow the jaw to slide with ease and will prevent wear to the

wood jaw holes. To enlarge the 3/4" holes, plunge a 3/4" bit in an already drilled hole with the drill press off. Now clamp the piece to your drill press table. Change Forstner bits to the outside dimension of your bushing and drill an enlarged hole around the smaller hole. Repeat for the other side.

Tilting Front Jaw Option



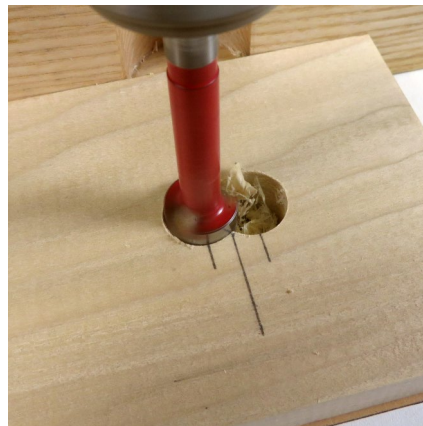
A pivoting front jaw with elongated slots is indicated if you plan to clamp odd shaped or tapered parts. Layout elongated slots by making marks 2-3/8" in from each end in the vertical center of the front jaw as outlined above. Transfer these marks to the rear jaw. On the front jaw measure 1/4" to each side of your mark.



Layout



Drill 1st Hole Drill



Drill 2nd hole

On your marks, drill the two overlapping holes using a 3/4" Forstner bit. Note: this will not work with any other style of bit and using a drill press with a fence is highly recommended. Clean out the waste between holes using the spinning bit to create one elongated slot. Chisel or file away any residual waste. This 1-1/4" slot will allow the jaw to tilt approximately 6 degrees. Finally, drill the 3/4" holes through the rear jaw using the marks you transferred

earlier. Spherical or pivoting washers can be used to allow the front jaw to tilt and prevent the knobs from marring the front jaw.



3/4" ID Spherical Washer Set

More Front Jaw Considerations

The top of the front jaw can be beveled to make it easier to saw pins in half-blind dovetails without the dovetail saw hitting the jaw. The front jaw can be lined with adhesive-backed cork or leather to increase its gripping power and prevent marring of your work.



Beveled Front Jaw

Installing a Support Shelf on Rear Jaw



A shelf can be added behind the rear jaw to support and clamp larger pieces.



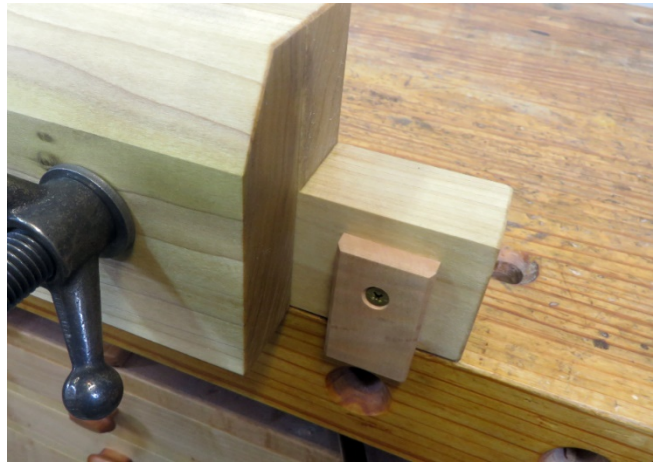
If this shelf is wider than a few inches, a 90-degree support bracket may need to be added to prevent the vise from tipping backwards. Some have made an entire bench-on-bench Moxon vise or mini workbench with an extended bench top behind the vise jaws. These vises sit on top of an existing bench and provide numerous work holding possibilities For a Bench-on-Bench example see: <https://www.youtube.com/watch?v=pMpqhpgxzPE>

Options for Securing to Your Bench

The vise needs to be securely fastened to your bench. Bar clamps can hold the rear jaw to the edge of your bench via the dual 3" clamping extensions. Your clamps will now rise above the top of the jaws that could potentially interfere with your work. An option is to drill 1-3/8" holes in the extensions to accept clamps. Another option is to cut tabs in the rear jaw to create clamping surfaces.



1-1/4" Clamping Hole



Clamping Tab

The above two methods keep clamps well below the top of the jaw and out of your way. Clamping tabs can be created either by cutting notches in the rear jaw or by gluing up the rear jaw from several pieces. A 1-1/2" square clamping caul can also be screwed or glued to the back of the rear jaw where holdfasts or clamps can be used to secure the vise.



Clamping Caul

To align the vise to the edge of your bench, the front jaw can be made to extend 1/8"-1/4" lower than the rear jaw. Having this lip will only allow the vise to be used on the edge of your bench. Installing a set of pivoting tabs on the rear jaw aids in quickly flushing the vise to the edge of your bench and allows the vise to be used elsewhere when the tabs are pivoted up and out of the way.

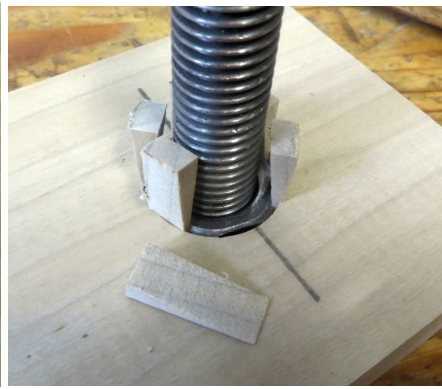


Inlaying the Nuts in the Rear Jaw

The rear jaw should already have hole marks that were transferred when laying out the front jaw. Using a Forstner bit in the drill press drill 1" holes in the front side of the rear jaw slightly deeper than the height of a nut. Finish drilling through each jaw using a 3/4" Forstner bit. Screw a nut on a threaded rod and drop in each hole. Draw or scribe around the perimeter of each nut and clean up the six corners to your lines with a 3/8" chisel until each nut fits snugly and is seated below the surface. You could also drill 1-1/4" holes, drop in a rod and nut assembly and drive and glue wedges (3/8" x 1" wedges cut at 6 degree) in the six voids around the nut. Trim the excess with a flush cut saw.



Inlaid Nut



Fill Voids with Wedges



Wedged Nut

Finishing

Apply your favorite finish. Boiled linseed oil, wipe on poly, shellac or tung oil are all good choices. To maximize gripping power do not finish the inside of the jaws.

Installing the Hardware

All metal components come from the factory coated with light oil to inhibit rust. This can be removed with rubbing or denatured alcohol. Screw a nut on each threaded rod and insert a rod in each hole in the rear jaw. Place a washer and nut on the back and tighten. You can adjust the projection of the rods from the jaw by adjusting these 2 nuts. Slide the front jaw in place. Place a washer and knob/handle on each rod and tighten. The knobs/handles will spin freely for effortless in/out adjustment. Plane both jaws so they are flush with one another.



How to Use:

Align the vise to the edge of your bench. Secure to your bench with clamps or holdfasts. Open the front jaw far enough to accept your workpiece. Insert your workpiece between the jaws and push the front jaw snugly against your work. Tighten one knob/handle until it contacts the jaw. Now tighten the other. Very minimal knob/handle pressure will hold boards with enormous force. To reposition your work, loosen one knob, move your work and retighten the knob/handle.

Caring for Your Vise:

For a more traditional look and feel, all metal parts are made from untreated steel that can develop rust under the right conditions. If you live in a humid area or your shop does not have climate control, an appropriate rust inhibitor will need to be applied. Sta-Bil Rust Stopper or any furniture paste wax are proven to prevent corrosion. You could also coat all metal surfaces with a thin coat of shellac or lacquer. Clean and lightly wax or oil your threads regularly to keep the knobs moving freely.