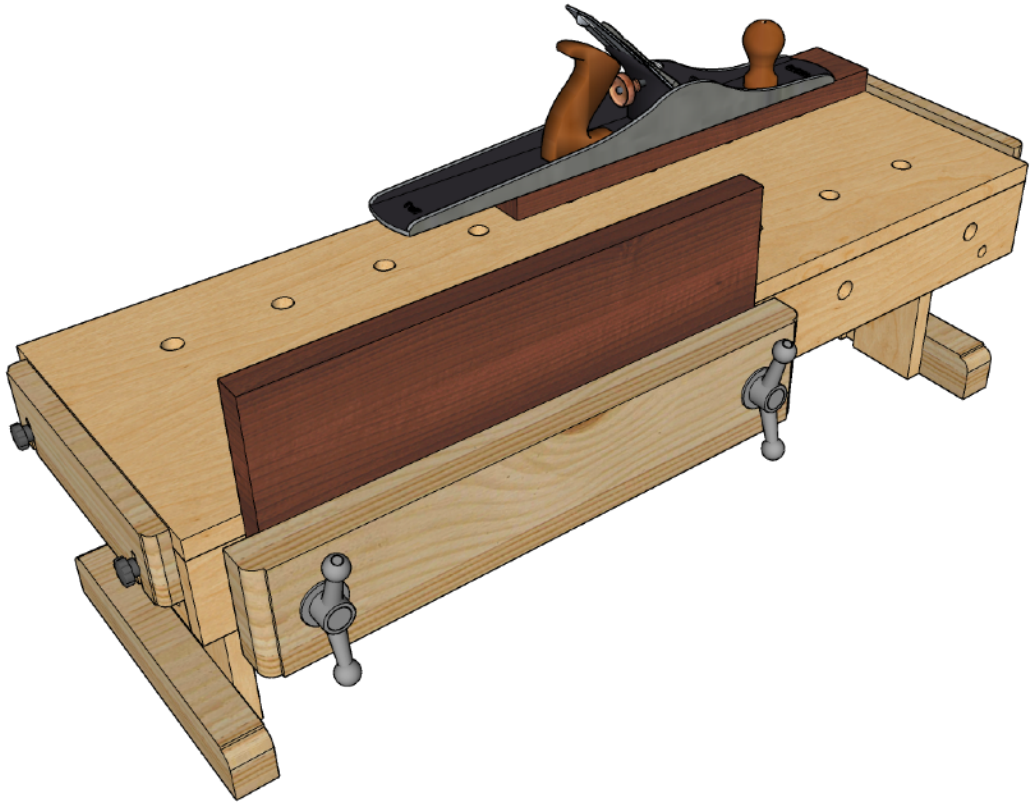
Portable Knock-Down Workbench



Doc. Revision 20240315

Introduction

This Portable Knock-Down Workbench is the perfect workshop accessory for anyone seeking an economical and easy-to-build workbench with all the work holding capabilities of a much larger bench. Constructed as a torsion box, it requires just a 1/2 sheet of plywood, a piece of 1-½” stock for a vise chop, and a hardware kit that includes everything needed to make the twin-screw vise. It is simple and quick to construct and can be built in a few afternoons using basic woodworking tools. Highly portable, it can be quickly attached to numerous surfaces via a few track clamps and easily stowed away when not in use. The dog holes on the top and sides, plane stops, and twin- screw vise give this bench all the workholding capacities of any traditional bench. The bench alone is 4” thick, with the possibility of adding additional height risers to bring your work to a more comfortable and ergonomic height.

Many Twin Screw Moxon Vise installations have both screws attached to the rear jaw, held secure by four nuts, with two mortised in the rear jaw flush with the front surface. This design leaves both screws protruding from the front jaw, potentially interfering with the user. Our improved Moxon Vise Hardware Kit addresses this issue by embedding threads in the rear jaw, allowing both rods to pass through the back jaw as the front jaw is opened and closed, leaving the front of the vise unobstructed. Additionally, the screws ride in steel bushings, reducing friction.

The improved Moxon Vise Hardware kit includes 3/4-10 threaded rods, nuts, washers, bushings, and cast knobs—everything needed (excluding wood) to create a fully functional Moxon Twin Screw Vise. The plan provides measured drawings and comprehensive step-by-step instructions for the construction process, but customization options abound. You can tailor it to your preferred width, height, and wood choice, offering a multitude of possibilities for individualization. The details are left for you to decide.

Cut list & Supplies

Make sure to read through this build guide **BEFORE** cutting any wood. Familiarize yourself with the tools, techniques, and your approach to building this project.

Item	Quantity	Sizes needed	Material
Top	1 per workbench	12” x 36”	3/4” plywood
End Rail Blanks	4 per workbench	4” X 11”	3/4” plywood
Rear Long Rail	1 per workbench	3 1/4” x 36”	3/4” plywood
Front Long Rail	1 per workbench	4” x 36”	3/4” plywood
Front Rail Support	1 per workbench	4” x 20”	3/4” plywood
Square Nut Brackets	2 per workbench	2 1/2” x 2 1/2”	1 1/2” Hardwood
Vise Jaw	1 per workbench	4” x 20 1/2”	1 1/2” Hardwood
Plane Stops	2 per workbench	2 5/6” x 10 1/2”	3/4” Hardwood
Risers	2 per workbench-Optional	7” x your choice	3/4” plywood
Riser Support Feet	2 per workbench-Optional	2” x 1 1/2”	1 1/2” Hardwood
Stretcher	1 per workbench-Optional	4 3/4” x 34”-Approx.	3/4” plywood
2 1/2” carriage bolts	8		
¼-20 Knurled Knobs	4		

You will need about a half sheet of ¾” plywood, about 2 feet of a 2x6, and 2 feet of a 1x4.

The wood you choose for the Hardwood is up to you. The Jaw and Plane Stops should to be smooth and perfectly flat.

All of the Workbench hardware can be purchased from Taylor Toolworks:

Twin Screw Vise Hardware Kit (10” long x ¾” diameter threaded rod, square nuts, washers, cast knobs and bushings)

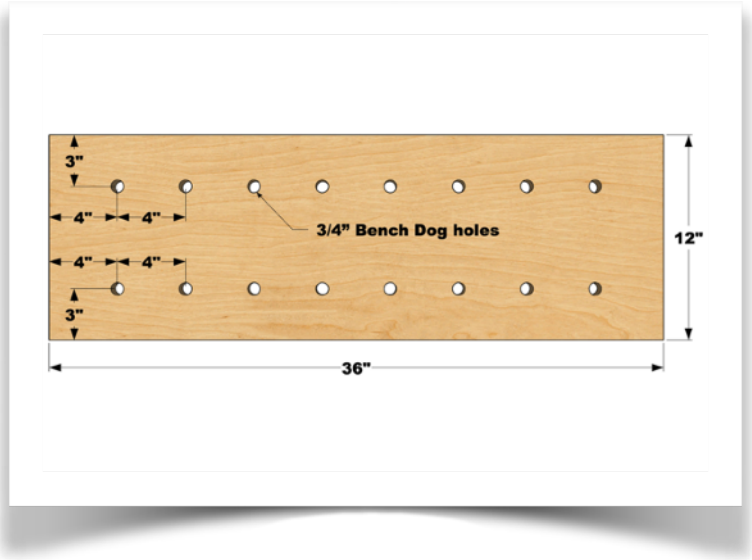
Blackened Steel ¼-20 Knurled Knobs

Vertical Workbench Clamps

Adjustable Bench Dogs

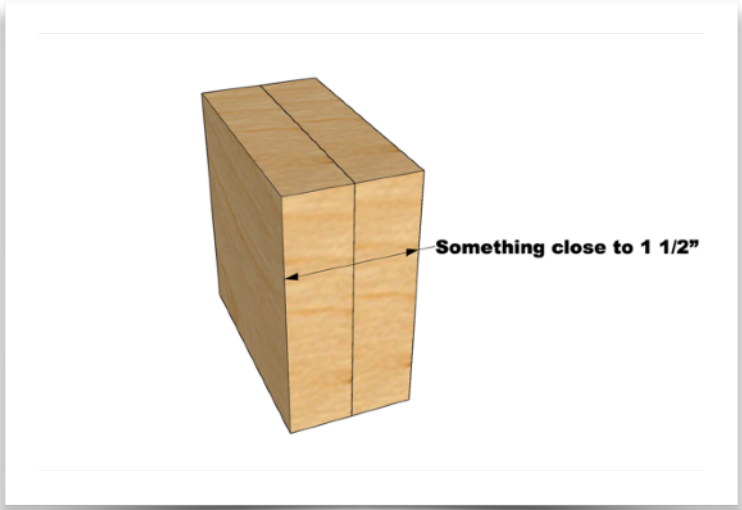
Brass Bench Dogs

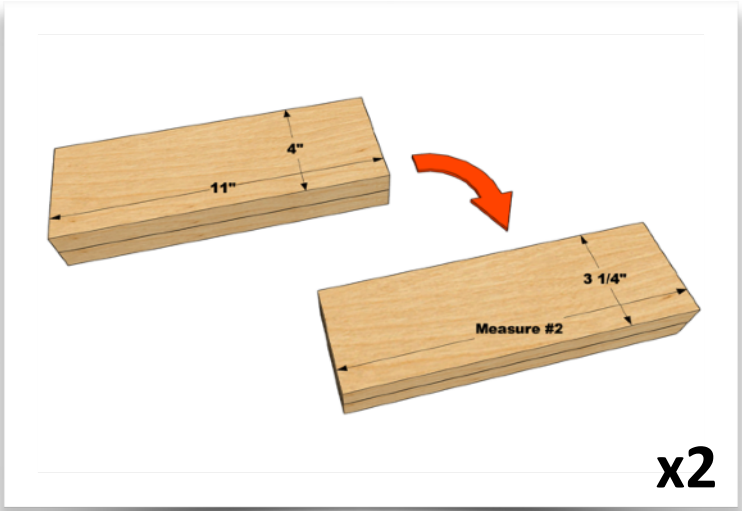
Workbench Top



- Cut one piece 12” x 36” of 3/4” plywood for the Top.
- Mark locations of the bench dog holes 3” from each long side, and 4” apart as shown.
- Drill the bench dog holes with a 3/4” forstner bit.

Workbench End Rails





Since 3/4" plywood is not exactly 3/4" thick, we need to do some precise measuring.

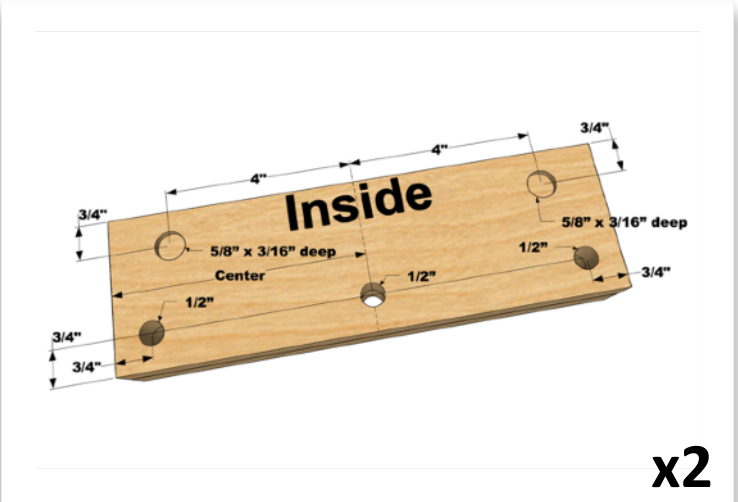
- Measure the total thickness of two pieces of the 3/4" plywood you are using. Note this here:
  Measurement #1: _____

  Subtract this measurement from 12" and note that here:
  Measurement #2: _____

Make two of these:

- Cut two pieces 4" x 11" of 3/4" plywood.
- Glue two pieces together to form a doubled thick End Rail.
- Once glue dries, trim these to their final dimensions of 3 1/4" x Measurement #2 above.

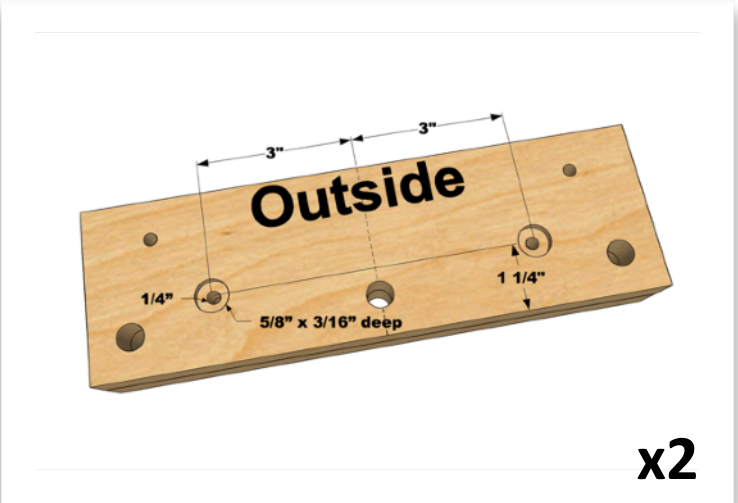
Workbench End Rails (continued)



On the front (inside) face of both End Rails, drill the following holes with forstner bits and using a drill press or a drill guide. These holes need to be perpendicular and straight.

- Mark a vertical line exactly in the center of the End Rails.
- For the Plane Stop mounting holes, measure down $^{3}/_{4}$" from the top edge and 4" to the left and right of the center line. Drill two $^{5}/_{8}$" holes about $^{3}/_{16}$" deep.
- In the dead center of these $^{5}/_{8}$" holes, drill $^{1}/_{4}$" holes all the way through.
- For the track saw clamp holes, mark a horizontal line $^{3}/_{4}$" from the bottom edge. On this line, mark $^{3}/_{4}$" from each end, and at the center line. Drill $^{1}/_{2}$" holes at these three locations.

Workbench End Rails (continued)

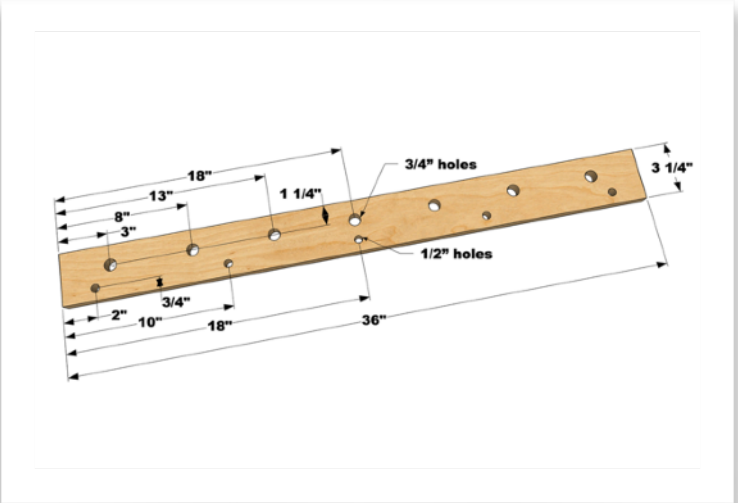


Flip the End Rails over and drill these additional holes in both:

- Mark a vertical line exactly in the center of the End Rails.
- For the Riser mounting holes, measure down 1 1/4" from the top edge and 3 " to the left and right of the center line.
- Drill two 5/8" holes about 3/16" deep.
- In the dead center of these 5/8" holes, drill 1/4" holes all the way through.

The two completed End Rails should look like what is shown here.

Workbench Rear Rail

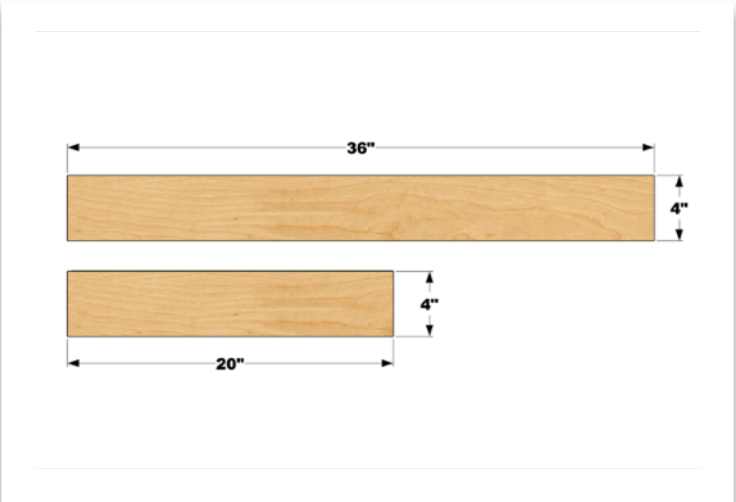


- Cut one piece 3 1/4" x 36" of 3/4" plywood for the Rear Rail.

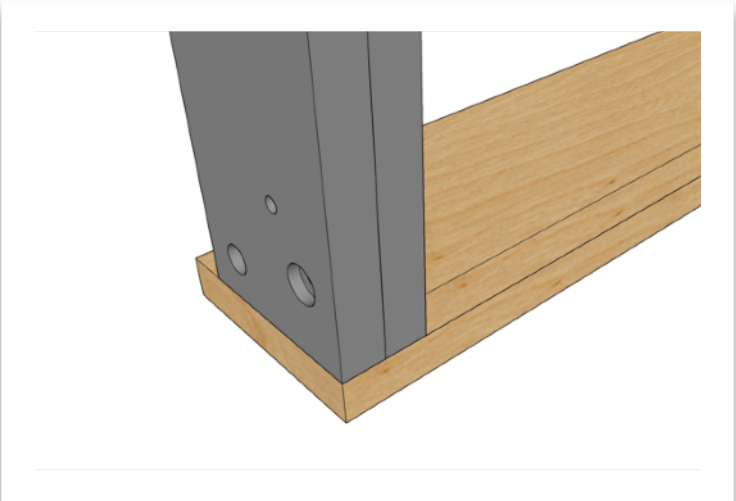
Note: The lefthand and righthand measurements are exactly the same.

- Mark locations of the bench dog holes 1 1/4" from the top edge, starting 3" from each end, and 5" apart as shown.
- Drill the seven bench dog holes with a 3/4" forstner bit.
- Mark locations of the track saw clamp holes 3/4" from the bottom edge, starting 2" from each end, and 8" apart as shown.
- Drill the five track saw clamp holes with a 1/2" brad-point bit.

Workbench Front Rail

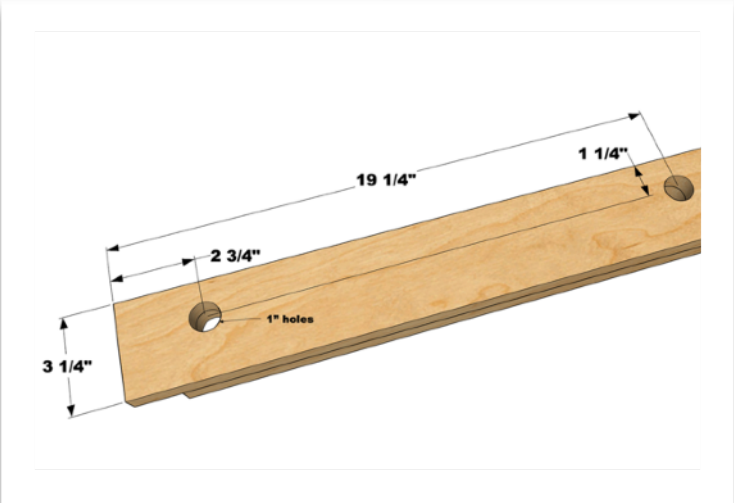


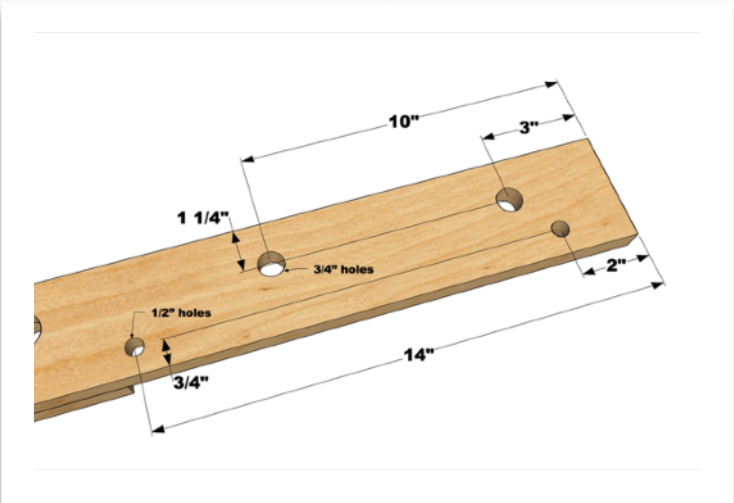
- Cut one piece 4” x 36” of 3/4” plywood for the Front Rail.
- Cut one piece 4” x 20” of 3/4” plywood for the Front Rail Support.



- Using one of the End Rails as a spacer, set it on top of the Front Rail, flush with one end.
- Glue the Front Rail Support to the Front Rail as shown. *Make sure not to glue the End Rail to these pieces.*
- Once the glue has dried completely, trim the Front Rail assembly to its final width of 3 1/4”.

Workbench Front Rail (continued)

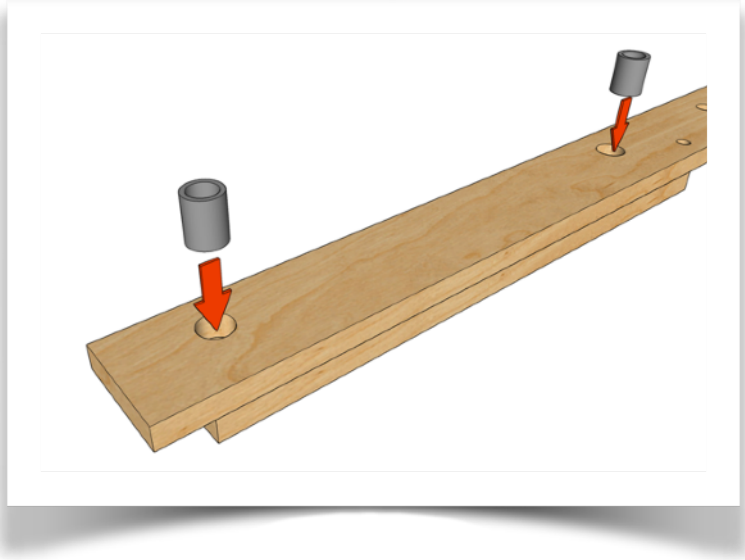




Flip The Front Rail over so the Front Rail Support is on the bottom. Drill all holes with forstner bits using a drill press or a drill guide. These holes need to be perpendicular and straight.

- On the left end of the Front Rail, mark and drill 1” holes for the vise threaded rods 1 1/4” from the top edge and 2 3/4” and 19 1/4“ from the left end.
- On the right of the Front Rail, mark and drill 3/4” holes for the bench dogs 1 1/4” from the top edge and 3” and 10” from the right end.
- Also on the right of the Front Rail, mark and drill 1/2” holes for the track saw clamps 3/4” from the bottom edge and 2” and 14” from the right end.

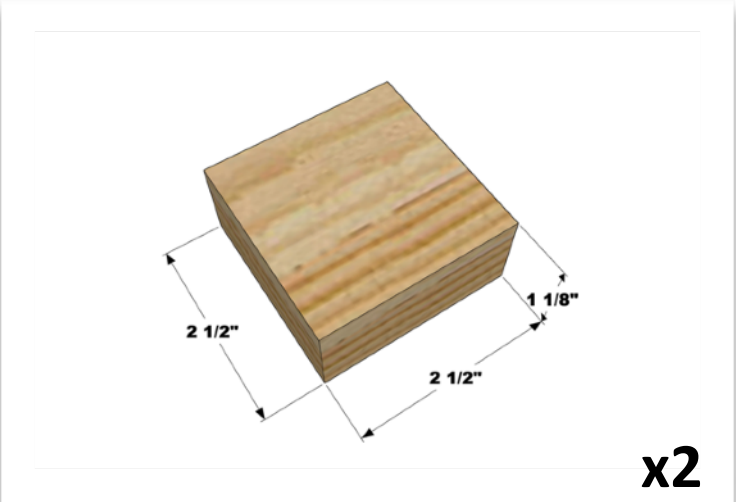
Workbench Front Rail (continued)



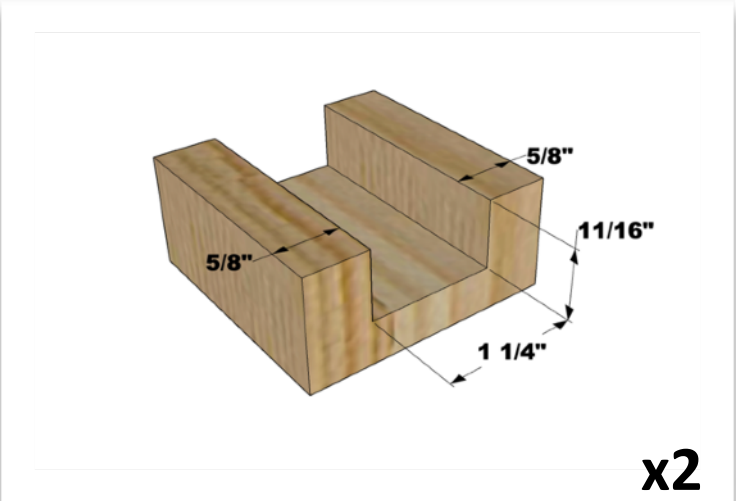
- Drive the 1” Steel Bushings into the 1” holes you drilled in Front Rail. Use a rubber or dead blow mallet to prevent damage to the bushings.

  Make sure the end of the Steel Bushings are flush or slightly below the surface of the Front Rail.

Square Nut Brackets

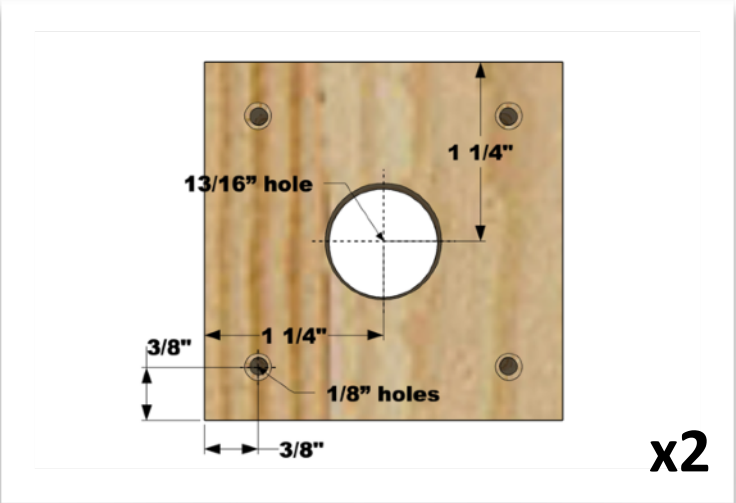


- Cut two pieces 2 $^{1}/_{2}$” x 2 $^{1}/_{2}$” and 1 $^{1}/_{8}$” thick from the hardwood of choice for the Square Nut Brackets.

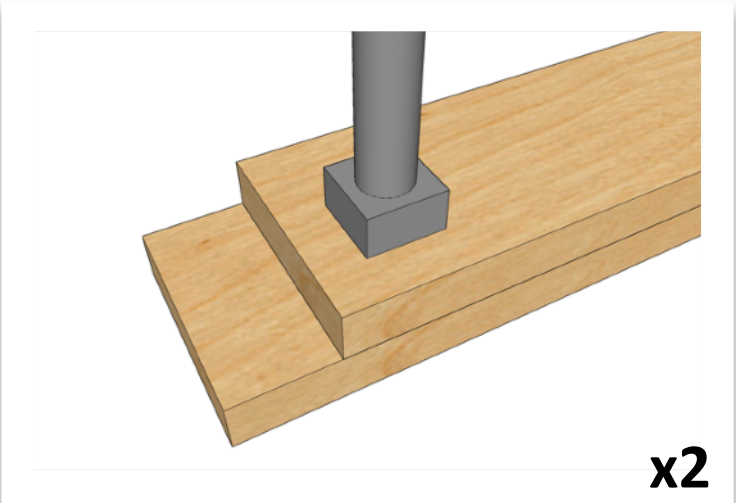


- Cut a 1 $^{1}/_{4}$” groove, $^{11}/_{16}$” deep in the center of these pieces. Pay attention to the grain direction as shown.

Square Nut Brackets (continued)

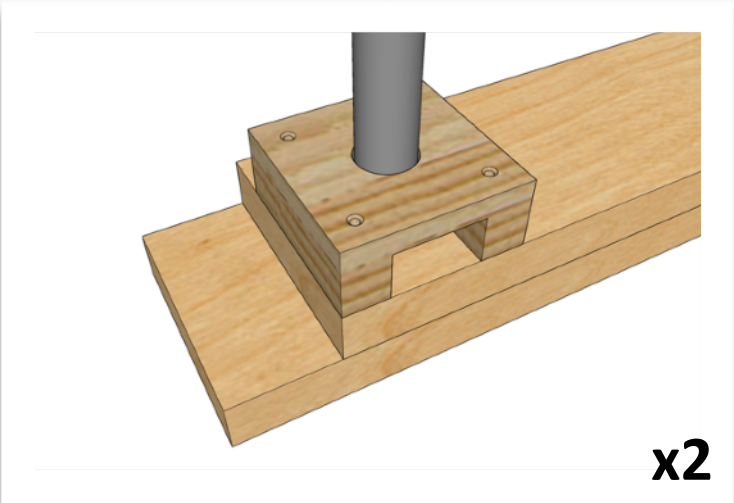


- On the opposite side of the Square Nut Brackets, drill four small holes near the corners with countersinks to allow the screw heads to sit flush with the surface.
- Drill a $^{13}/_{16}$" hole directly in the center of each of the Square Nut Brackets. Do not chamfer this hole.



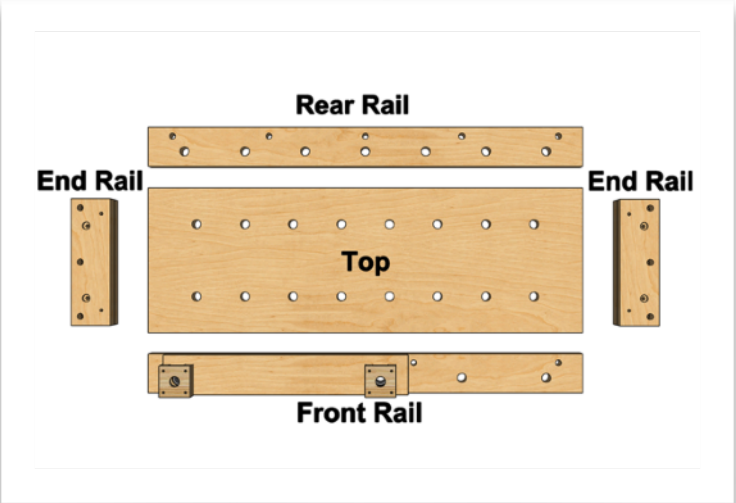
- From the Hardware Kit, screw the Square Nuts onto the Threaded Bars about 1 $^{1}/_{2}$" from one end.
- Place the Front Rail, face down, and place the Threaded bars into both bushings in the Front Rail Support.

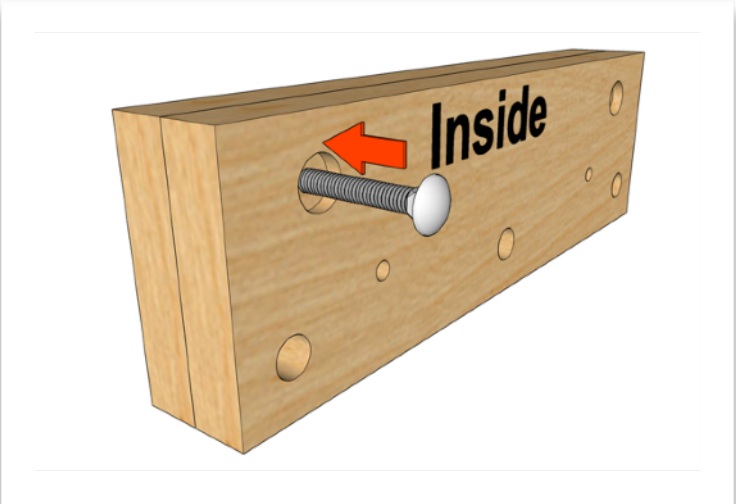
Square Nut Brackets (continued)



- Put a small bead of glue on the underside of both sides of the Square Nut Brackets as shown.
- Carefully place the Square Nut Brackets over the Threaded Rods and Square Nuts as shown. Center the hole in the brackets over the Threaded Rods to ensure the Threaded Rods will not rub against the inside of the hole when turned. Flush the brackets to the edges of the Front Rail Support. Make sure the Square Nuts are free to move just a tiny bit within the slots. Apply moderate downward pressure on the bracket for a few seconds until it is held in place by suction and then let dry for at least two hours. After the glue has dried, drive four 2” screws through the Square Nut Brackets into the back side of the Front Rail Support.

Assemble the Workbench





- Gather all of the parts you've made so far. This is how they will be assembled to make the Workbench top. Take your time here laying out the glue up as it would be very easy to get parts lined up wrong and then glue them up in an incorrect orientation. All the track saw clamp holes should be facing the same direction.
- Take one of the 2 1/2" carriage bolts and drive into this hole on the inside face of one of the End Rails.

  This is done now because when you attach this piece to the Front Rail, the Square Nut Bracket will block this hole and make putting this bolt in place impossible after assembly.

Assemble the Workbench (continued)

- Glue all the parts together as shown. The End rails go on the inside of the Front and Rear Rails.

Make sure the Outside face of the End Rails is perfectly flush with the ends of the rails.

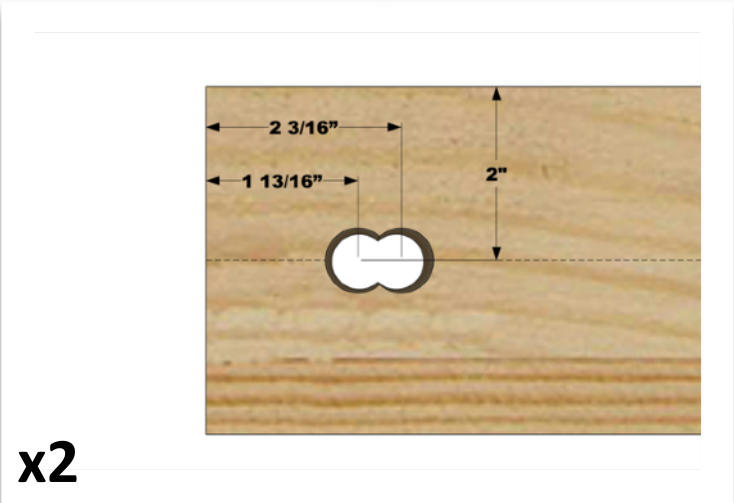
Also make sure the assembled frame is square by measuring corner to corner.

Clamp the pieces together and use brad nails and/or screws to fasten everything together.

- Once the glue for the Frame has dried, add the top with glue and brads and/or countersunk screws.

Vise Jaw

- Cut one piece 4 ” x 20 $^{1}/_{2}$” of 1 $^{1}/_{2}$” thick hardwood for the Vise Jaw.



- Make marks to drill two overlapping $^{3}/_{4}$” holes, $^{3}/_{8}$” apart on both ends of the Vise Jaw: the first is 1 $^{13}/_{16}$” and the second is 2 $^{3}/_{16}$” from each end, both 2” from the top as shown here.
- Using a drill press, drill two $^{3}/_{4}$” holes at these marks.

Vise Jaw (continued)

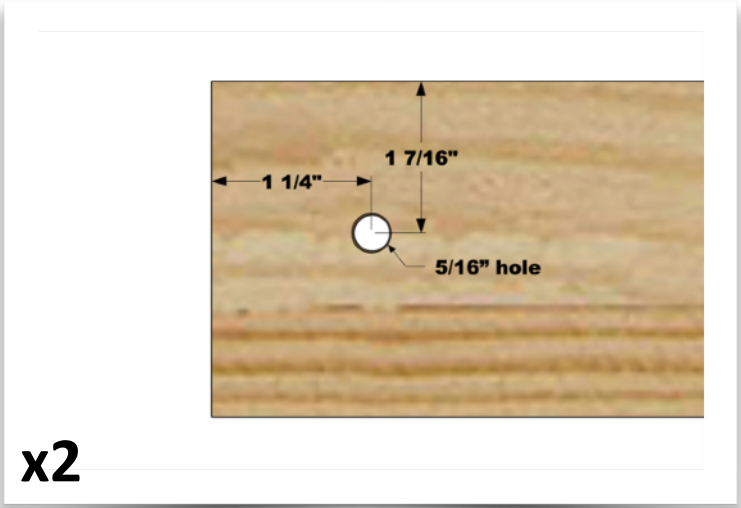
- Chisel or file away the intersection of the two 3/4” holes smooth to remove the “widow’s peak” as shown.

Note: This will create elongated slots that will allow the Vise Jaw to pivot and clamp tapered parts.

- Using a router with a 1/2” round over bit, create a decorative edge to the Vise Jaw. If you do not have a router or round over bit, you can chamfer the ends of the View Jaw on the table saw.

Plane Stops

- Cut two pieces 2 $^{5}/_{8}$” x 10 $^{1}/_{2}$” of $^{3}/_{4}$” thick hardwood for the Plane Stops.



- Make marks to drill two $^{5}/_{16}$” holes at both ends of the Plane Stops at 1 $^{1}/_{4}$” from the end and 1 $^{7}/_{16}$” from top edge as shown here.

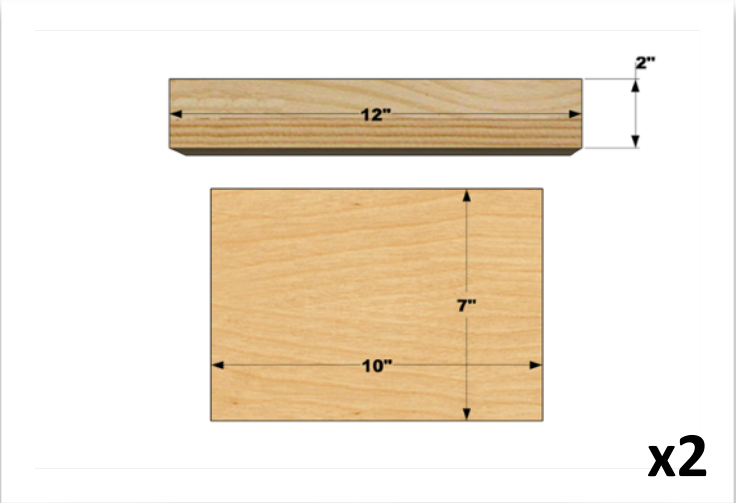
Plane Stops (continued)

- Using a tablesaw, bandsaw or a jigsaw, extend the $^{5}/_{16}$” holes into slots down to the bottom edge of the Plane Stops.

  Make sure these slots are straight and parallel to the ends of the Plane Stops.

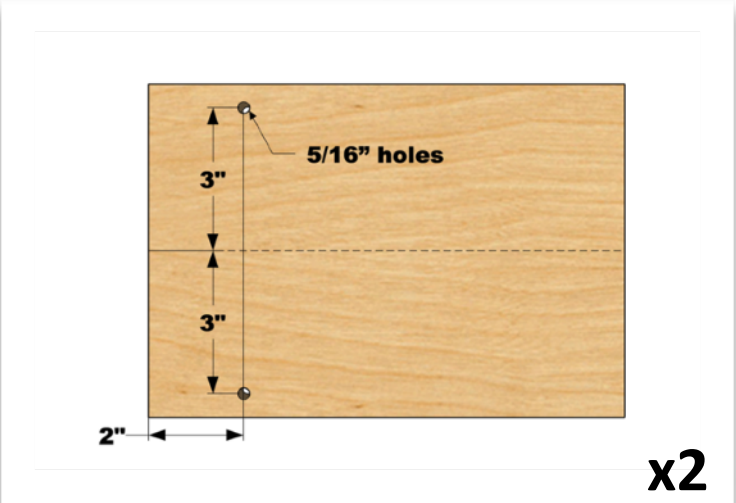
- Using a router with a small $^{1}/_{4}$” or $^{5}/_{16}$” round over bit, create a decorative edge to the Plane Stops. If you do not have a router or round over bit, you can chamfer the ends on the table saw.

Risers



- Cut two pieces 7” x 10” of $^{3}/_{4}$” plywood for the Riser Legs.
- Also cut two pieces 12” x 2” of 1 $^{1}/_{2}$” thick hardwood for the Riser Feet.

Note: The 10” measurement for the Riser Legs can be adjusted to your needs and can be anything from about 6” to 12”.



- Mark a horizontal line exactly in the center of the Riser Legs.
- For the Riser mounting holes, measure over 2” from the left edge and 3” above and below the center line.
- Drill two $^{5}/_{16}$” holes at these two locations.

Risers (continued)

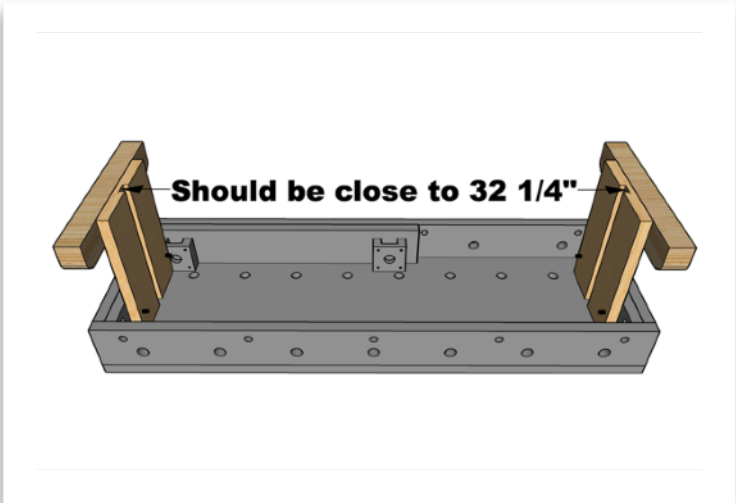
- Using a router or dado stack in your table saw, cut a 3/4" dado down the exact center of both of the Riser Legs

.

- Using a router with a 1/2" round over bit, create a decorative edge on the Riser Feet. If you do not have a router or round over bit, you can chamfer the ends using the table saw.

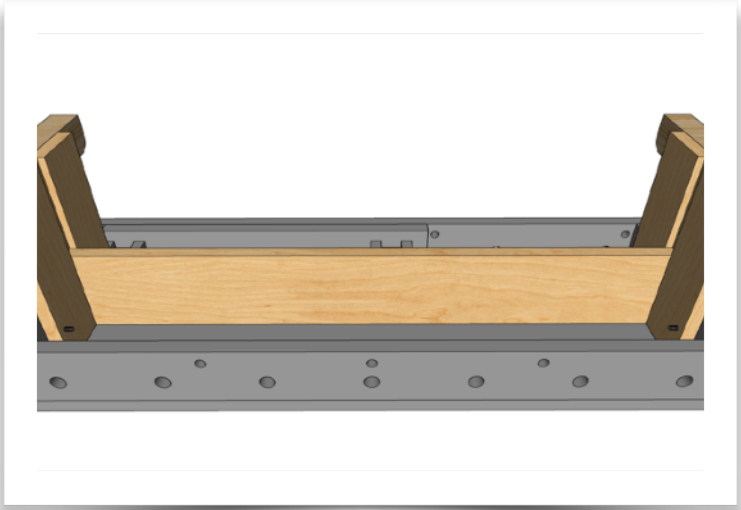
Risers (continued)

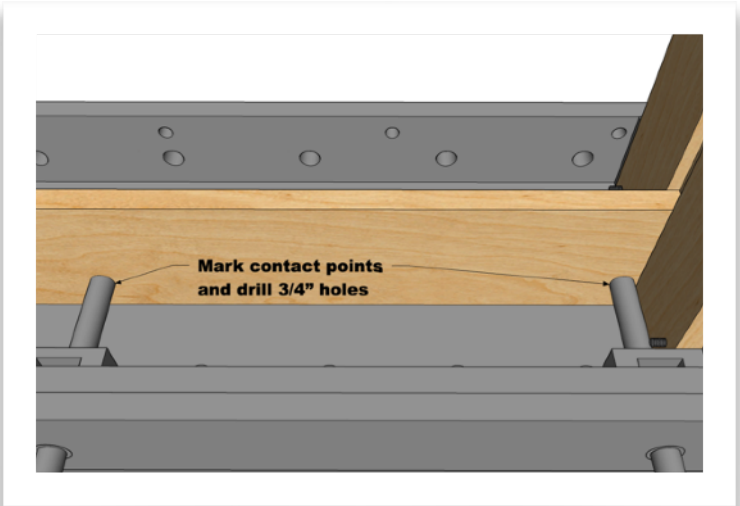
- With glue and brad nails and/or screws, attach the Riser Legs to the Riser Feet as shown. Make sure the Riser Legs are centered on the Riser Feet.



- Attach the Risers to the Workbench using the 2 1/2" carriage bolts, driven through the End Rails and the 5/16" holes in the Riser Legs. Secure with nuts and washers.
- Measure the distance between the dados in the two Risers to get a measurement for a Stretcher to help stabilize the Workbench.

Risers (continued)





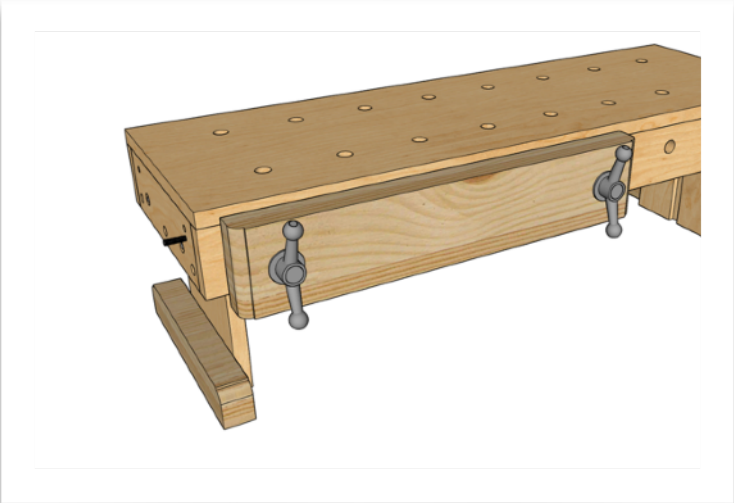
- Cut one piece of 3/4" plywood that is 4 3/4" wide and a little longer than the measurement you took in the previous step for the Riser Stretcher.
- Test fit the Stretcher between the Riser Legs and trim it until it fits snug, but not too tight.

You will need to drill 1" holes in the Stretcher to allow the threaded rods to pass through.

- Place the square nuts into the Square Nut Brackets, and screw the threaded rods in enough to touch the Stretcher. Mark the locations and then drill the 1" holes in those locations on the Stretcher.

Final Assembly

- Place the Vise Jaw onto the threaded rods as shown.



- Place the Washers onto the threaded rods.
- Thread the Knobs from the Hardware Kit onto the end of the threaded rods. Use permanent thread locker to keep the knobs from coming off.

Final Assembly (continued)

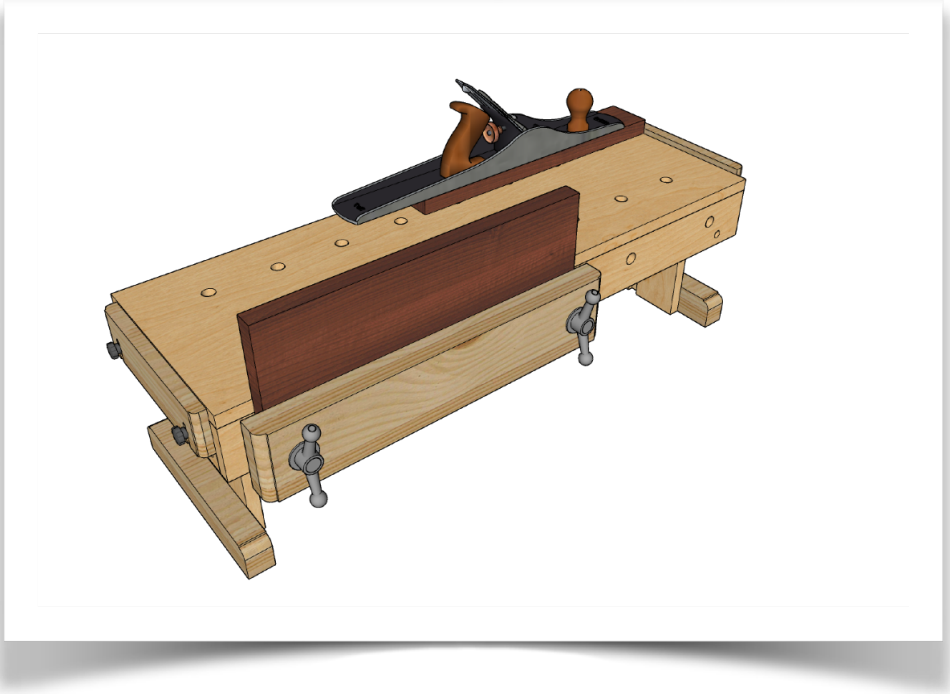
You will be attaching the Plane Stops to both ends of the Workbench.

- Drive the three remaining carriage bolts through the End Rails.
- Place the Plane Stops onto the carriage bolts as shown.
- Trim the Plane Stops so they are just below the surface of the top when fully lowered.
- Thread the 1/4-20 knurled knobs onto the ends of the carriage bolts.
- Loosen and tighten these knobs to raise and lower the Plane Stops on the Workbench.

Countersink and add 1 1/2" long screws 1/2" below the bottom of the End Rails to secure both ends of the Stretcher in place.

Finished!

And with that, you are finished!



If you have any questions, please reach out via email at support@taytools.com

These plans were created for Taylor Toolworks by:

H2 Wood Shop

Instagram

Facebook

plans@h2woodshop.com

Doc. Revision 20240315