

Robust Bench

A traditional workbench made cheap and easy



This attractive and sturdy woodworker's bench is built with materials from a home center, and employs simple joinery.

by Vern Grassel

tall because that is a comfortable working height for me, but you can adjust the leg lengths to suit your needs. You might consider making the height the same as or slightly lower than your table saw so the bench can act as an outfeed or side table.

This wouldn't be a woodworker's bench without vises. We chose a Veritas Twin Screw end vise and a Jorgensen woodworker's vise (see SOURCES ONLINE). Add bench dog holes to further expand your vise's capacity and to hold work steady on the top.

Additional features include a tool tray to keep small tools and hardware within reach but off of the work surface. A shelf between the legs provides a

A woodworker's bench isn't just a work surface; it's a tool — maybe the hardest-working tool in any shop. Hardwood construction and elaborate joinery typically make these benches expensive, but you can build a lower-cost bench that works just as well as high-priced versions.

By stripping away unnecessary design details, I created a woodworker's bench that performs all of the functions of a traditional bench, but mine is made of less expensive materials and takes less time to build. Standard 3/4-in. lumber and simple joinery keep the cost down and make this an attractive project for woodworkers with limited tools. Stack-laminating the base-frame mortise-and-tenon joints makes the joinery process quick and easy without sacrificing strength. Woodworkers of

all skill levels can confidently build this rock-solid bench.

The design

You can build this bench out of almost any wood. It's best to use a hardwood such as maple for the top, but the base can be made from any solid stock — I chose pine. To minimize wood movement and achieve a consistent appearance, select boards with a straight grain pattern and similar color. I bought all of the materials (see Shopping List, p. 15) at a local home center.

The bench's footprint is 28 x 60 in., making it small enough to fit in almost any shop but large enough for most woodworking tasks. You can place it against a wall or in the center of the room, and it's easy to disassemble for moving or storage. I made mine 38 in.

place to put glue bottles, boxes of screws and nails, and a removable lower shelf is designed to hold toolboxes and cases.

The base and shelves

I achieved the look and strength of thick base stock by face gluing 1x stock to make the 1-1/2- and 3-in.-thick legs, feet, top rail and stretchers.

Start the assembly with the legs. Center the two outer leg pieces over both sides of the two inner leg pieces to form the 3-in. tenons at each end of the leg. Glue and clamp the parts together. After the glue has cured, remove the excess glue with a scraper or chisel.

The stretchers and legs are assembled with a dovetail halving joint (see drawing detail, p. 14). I used a band saw to cut the dovetailed ends of the outer stretcher parts, but a jigsaw or handsaw will also

PHOTOS BY MARK MACEON; PRODUCTION ASSISTANCE FROM PATRICK GIBSON

WORKBENCH

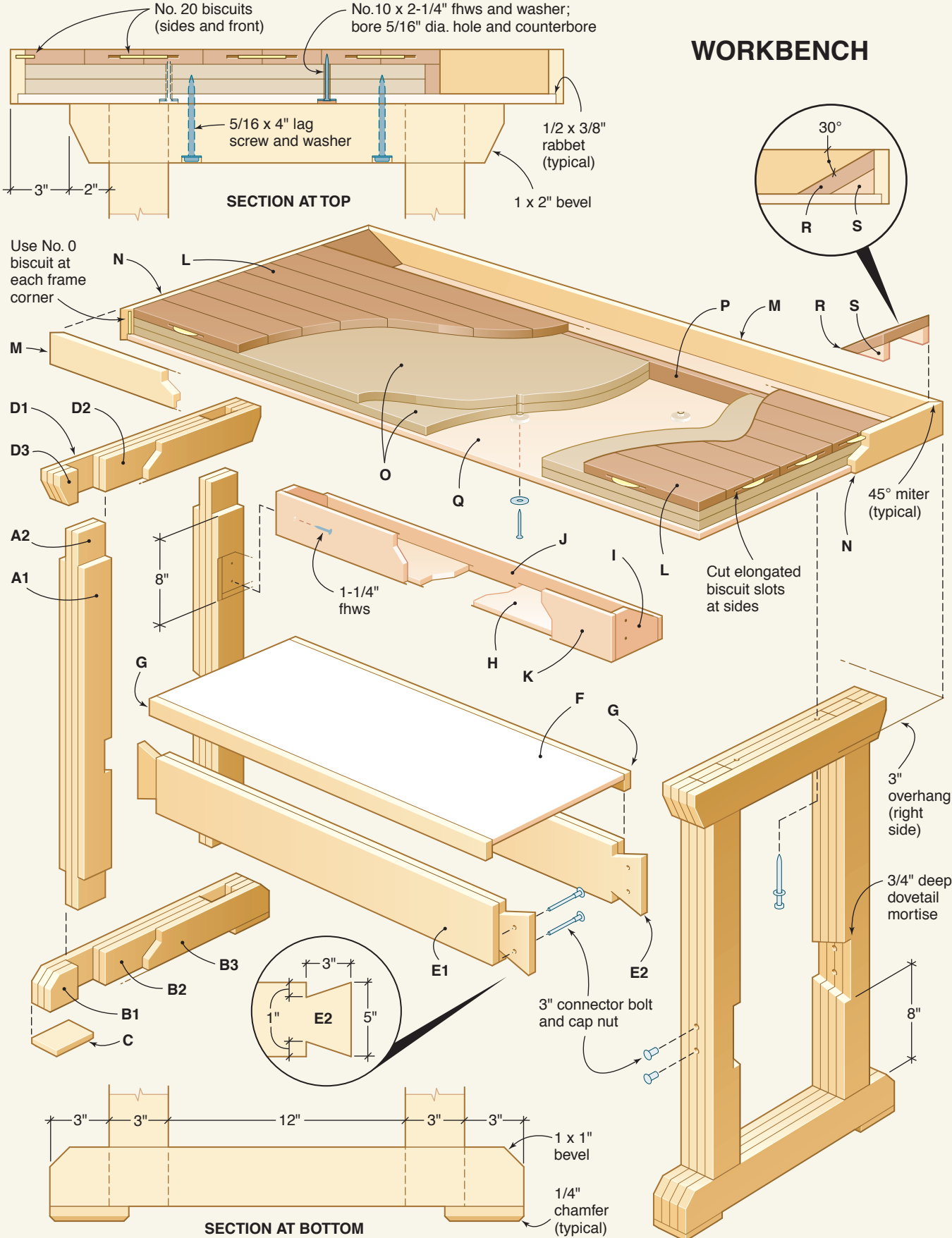


ILLUSTRATION BY GABRIEL GRAPHICS

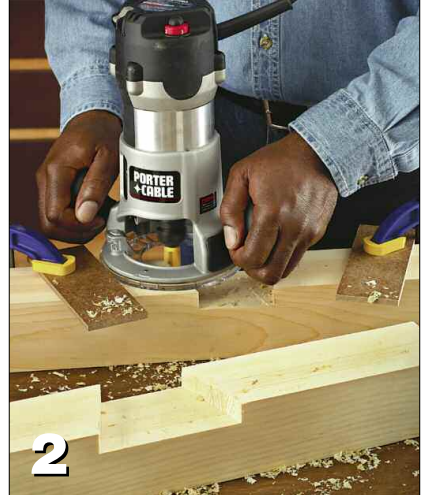


1

Glue the stretcher parts together, lining up the ends of the inner stretcher with the dovetail shoulders that you cut on the outer stretcher. Spread a thin layer of glue on one face, and use a damp cloth to wet the mating face.

work. Glue the stretcher parts together (photo 1, above).

After the glue has cured, hold the stretchers against the legs as a template for you to mark the dovetail profile on the leg. Use a router to remove the material between the layout marks to a depth of 3/4 in. (photo 2).



2

Cut dovetail mortises in the legs. Clamp straightedges to the leg, and remove 3/4 in. of material in three passes.

Now assemble the foot parts around the bottom leg tenons (photo 3, p. 16). Do the same with the top rail parts and the upper leg tenons. Measure the leg assembly diagonally from corner to corner to ensure it is square. Then use the router to cut a 1/4-in. chamfer on four edges of each foot pad, and attach the

pads to the bottoms of the feet.

Finish the base assembly by fastening the legs to the stretchers with 3-in. connector bolts (photo 4). Do not apply glue to this connection if you plan to disassemble the workbench in the future.

I used Baltic birch plywood for both shelves. One 5 x 5-ft. piece (a typical size for this type of plywood) is all you need. If it's not available in your area, you can substitute 1/2-in. AC-grade plywood. Fasten the upper shelf between the legs with screws, and rest the lower shelf on the stretchers.

The top

A stable, flat work surface is essential for any bench. Traditional woodworking benches feature thick, solid tops, often made from 2- to 3-in.-thick quartersawn maple. I used 3/4-in.-thick maple for the top surface and two layers of 3/4-in. MDF as a substrate. The maple provides a hard work surface that can be sanded

MATERIALS AND CUTTING LIST

KEY	NO.	DESCRIPTION	SIZE
BASE			
A1	8	Outer leg, pine	3/4 x 3 x 28-1/2 in.
A2	8	Inner leg, pine	3/4 x 3 x 34-1/2 in.
B1	4	Outer foot, pine	3/4 x 3 x 24 in.
B2	4	Center inner foot, pine	3/4 x 3 x 12 in.
B3	8	End inner foot, pine	3/4 x 3 x 3 in.
C	4	Foot pads, pine	3/4 x 3 x 4 in.
D1	4	Outer top rail, pine	3/4 x 3 x 22 in.
D2	4	Center inner top rail, pine	3/4 x 3 x 12 in.
D3	8	End inner top rail, pine	3/4 x 3 x 2 in.
E1	2	Outer stretcher, pine	3/4 x 5 x 43 in.
E2	2	Inner stretcher, pine	3/4 x 5 x 37 in.
SHELVES			
F	1	Lower shelf, Baltic birch plywood	1/2 x 15-1/8 x 37 in.
G	2	Lower shelf edging, pine	3/4 x 1-1/2 x 37 in.
H	1	Upper shelf bottom, Baltic birch plywood	1/2 x 5 x 36 in.
I	2	Upper shelf sides, Baltic birch plywood	1/2 x 4 x 5 in.
J	1	Upper shelf front, Baltic birch plywood	1/2 x 2 x 37 in.
K	1	Upper shelf back, Baltic birch plywood	1/2 x 4 x 37 in.
TOP			
L	7	Top, maple	3/4 x 3 x 59 in.*
M	1	Top frame front and back, maple	3/4 x 2-3/4 x 60 in.**
N	2	Top frame sides, maple	3/4 x 2-3/4 x 28 in.**
O	2	Substrate, MDF	3/4 x 20-1/4 x 58-1/2 in.
P	3	Top inside frame, maple	3/4 x 1-1/2 x 58-1/2 in.
Q	1	Top/bottom, Baltic birch plywood	1/2 x 27-1/4 x 59-1/4 in.
R	5	Tool tray ramps, maple	3/4 x 5-1/2 x 4-3/8 in.
S	6	Ramp cleats, Baltic birch plywood	1/2 x 1-3/8 x 2-1/4 in.

* Finished panel is 21 x 58-1/2 in.

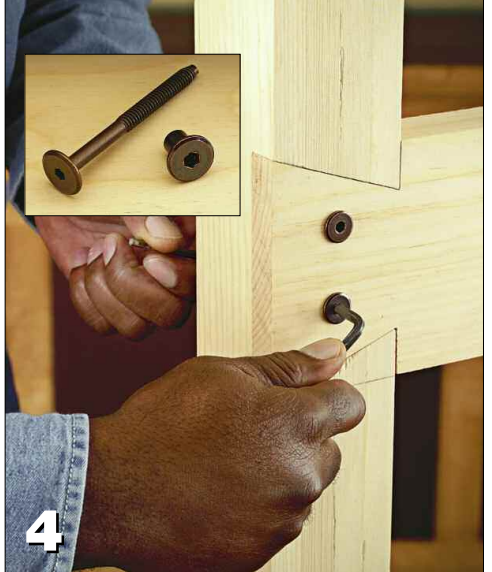
** Length is from longest point to longest point.

SHOPPING LIST

- 1x4 x 8-ft. pine boards (10)
- 1x6 x 8-ft. pine boards (2)
- 1x2 x 8-ft. pine board (1)
- 1x4 x 8-ft. maple boards (10)
- 3/4-in. x 4x8 MDF (1)
- 1/2-in. x 5x5 Baltic birch plywood (1)
- 1-1/4-in. brads or staples
- No. 20 biscuits
- 3-in. connector bolts and caps
- 1-5/8-in. flathead wood screws and finish washers
- 5/16 x 4-in. lag screws and washers
- No. 10 x 2-in. screws and washers
- Wood glue
- Tung oil



3 Carefully line up the laminations when gluing the feet and top rails to the legs. Glue and staple one piece in place at a time, and then clamp the entire assembly.



4 Fasten the leg assemblies and stretchers together with connector bolts (see inset). Use glue to reinforce this joint if you don't plan to disassemble the bench.



5 Cut three No. 20 biscuit slots in the side frames (see drawing for details), and then cut three overlapping biscuit slots to form elongated slots in the maple top side edges.

or planed when it becomes worn, and the MDF provides a stable and hefty backing. The bottom of the top is a 1/2-in. piece of birch plywood that also acts as the tray bottom.

The top assembly is designed to keep the maple top flat and still allow wood movement. The top is glued only to the MDF along the front edge of the bench, which keeps the front edge flush. Biscuits are glued in the top and are not glued in the elongated slots in the side frames. And, the center and back edge of the top are held in place by screws driven through oversize screw holes in the MDF.

Carefully select surfaced maple that is straight and has smooth edges. Cut No. 20 biscuit slots on the edges of the top panel pieces; then glue up the panel. When the glue has cured, plane,

scrape or sand the top flat and trim the ends to final size.

Before cutting the frame pieces to their final lengths, use a table saw or

router to cut 1/2-in.-wide x 3/8-in.-deep rabbets along the bottom edge of each frame piece. Then miter the pieces to final length and cut slots for No. 0 biscuits in each miter.

Next, line up and cut No. 20 biscuit slots in the front and side top frame and front edge of the top. Then cut elongated slots in the side edges of the maple top (photo 5).

I found it easiest to assemble the top upside down. Spread glue on the first few inches along the front edge of the maple top. Then place one of the MDF pieces on the top, keeping it flush against the front. Now spread glue over the exposed MDF surface, wet the face of the second sheet of MDF and place



Secure your work

A variety of bench dogs and hold downs are available to keep your work in place (see SOURCES ONLINE). Bench dogs are inserted in the bench holes, extending the vise capacity to handle longer workpieces. Hold downs are friction-fit in the bench holes and tapped tightly into place to hold work down on the bench top. VG

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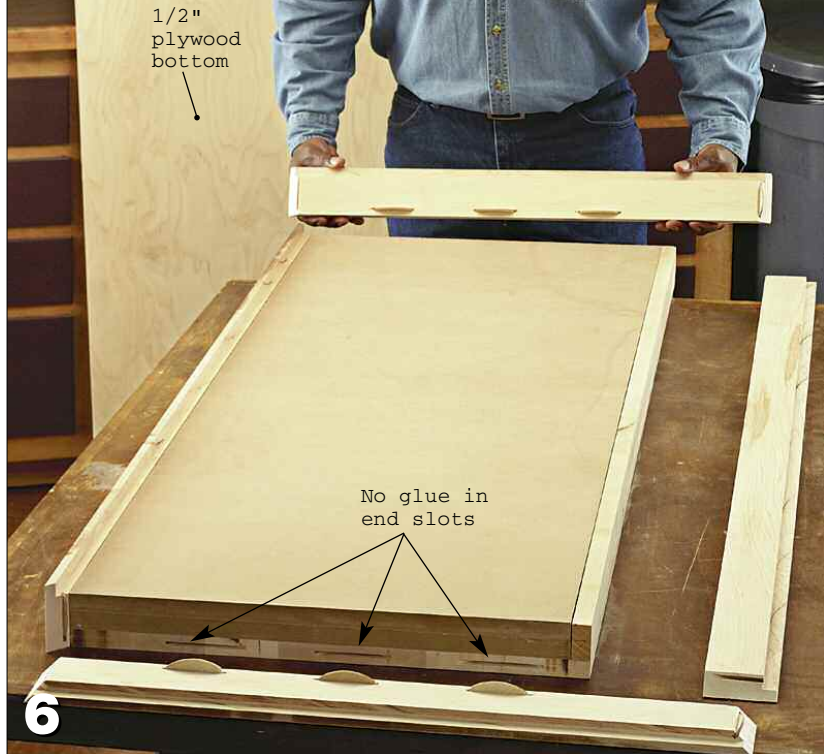
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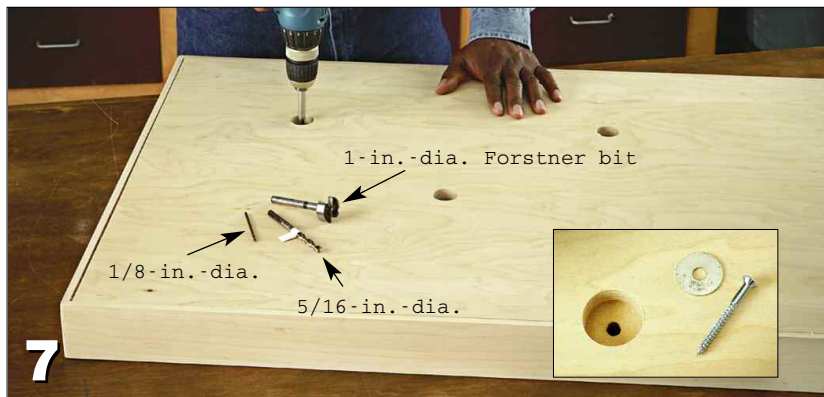


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Glue the front and inner frame pieces to the top assembly. Apply glue only to the miters of the side frame pieces.



Three bits are used to create the countersink and pilot holes in the top assembly. First, bore the countersink with a 1-in.-dia. Forstner bit. Next, bore the oversize pilot hole with a 5/16-in.-dia. bit. Finally, bore a 1/2-in.-deep pilot hole in the maple top with a 1/8-in.-dia. bit.

the second MDF piece on top. Clamp the three pieces, using cauls to distribute pressure over the entire surface.

While the panel assembly is curing, glue biscuits into the side frames. Gluing these biscuits in advance will prevent them from accidentally adhering to the maple top during the final assembly.

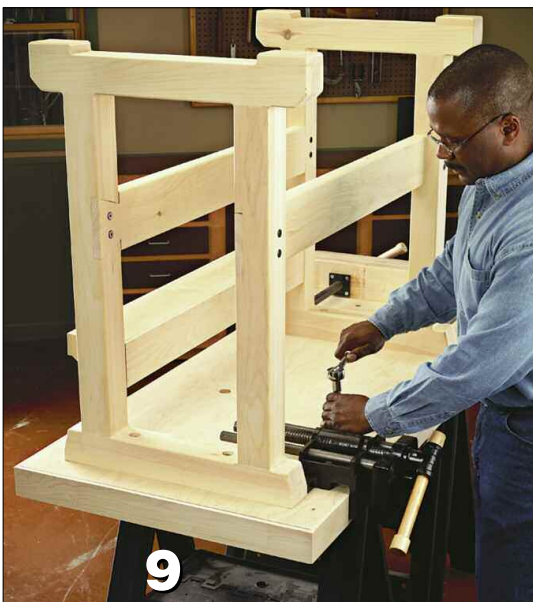
Finally, attach the frame parts to the top assembly (photo 6) and then spread a layer of glue over the bottom MDF

surface and in the rabbets, and position the 1/2-in. plywood bottom. Clamp the top assembly together. When the glue has cured, remove the clamps and drill six countersink and pilot holes through the top assembly. Stop the pilot holes before you bore into the maple top. Secure the top with No. 10 x 2-in. screws and washers centered in the oversize holes (photo 7).

Small ramps in each end of the tool tray make cleaning it easier. Bevel cut



Use a scrap board as a carrier to safely cut the steep 30-degree ramp angles on a table saw. Cut the 60-degree bevel on the other end using a compound miter saw.



Fasten the vises to the underside of the bench with lag screws. Use shims to position the top of the vises flush with the top of the bench.

the 30- and 60-degree ends in each tool tray ramp (photo 8). Attach the cleats and ramps; then you're ready to mount the top to the base.

Attach the top with two countersunk 5/16- x 4-in. lag bolts and washers through each top rail/leg assembly. If you intend to leave the bench permanently assembled, apply glue between the top and base.

Finishing touches

Apply a few coats of tung oil to the bench and it's ready to use as is, but adding a couple of vises greatly increases its utility (photo 9).

Mounting the vises can be a project in itself. For example, the hefty Twin Screw end vise we chose required very precise hardware positioning. For specific instructions, refer to the vise's installation manual.

The final step is to drill 3/4-in.-dia. bench dog holes in line with the each vise. Space the holes apart half the distance of the vise's total capacity.

Now you're ready to put the bench to work on your next project.

Club member Vern Grassel designs and builds furniture in Elk River, Minnesota



SOURCES ONLINE

For online information, go to www.HandymanClub.com and click on SOURCES ONLINE.

Adjustable Clamp Co. (Jorgensen Woodworker's Vise, model 40000) (312) 666-0640

Lee Valley & Veritas (bench dogs, hold downs and Twin Screw vise, model 05G12.21) 800-871-8158

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