



A Bench Built to Last

This workbench has a wide top and a sturdy base that provides solid footing and plenty of storage space

BY DICK McDONOUGH

If this workbench played football, I'm certain it would be a lineman. Because, like the guards and tackles found on the gridiron, my bench is big and solid. And I wouldn't have it any other way.

Most of my work involves the fabrication of large case goods—entertainment centers, bookcases and other types of storage furniture. And although much of the machine work gets done using a tablesaw and router, I still do a good deal of work at the bench. So when it was time to replace my older, smallish and somewhat rickety workbench, I opted to make a new one with all the bells and whistles. The bench would provide plenty of size and sturdiness. Sturdiness is the operative word here. Indeed, no matter how aggressive I get with a saw, a handplane or a mallet and chisel, the bench doesn't wobble. The result is a workbench that has just about everything I need.

The supersized top is another important feature. With about 22 sq. ft. of surface area, the top is great for supporting long boards and wide sheet goods. Two end vises, a front vise and a shoulder vise, along with a small army of benchdog holes, make it easy to secure almost any size stock to the bench.

My bench is considered left-handed, based on the location of the shoulder vise. If you prefer a right-handed bench, just build the shoulder vise on the right side.

The base creates a sturdy foundation

The bench owes much of its sturdiness to the design of the base. Yet its construction is pretty straightforward. It has just five main parts: three support frames and a pair of boxes. Screwing the frames and boxes together creates a single, rock-solid unit that can accept almost any kind of top. And the two boxes provide a ton of space for adding cabinets or drawers.

The center and right-side support frames are identical. But to provide additional support for the shoulder vise, the left-side support frame is longer and has an extra leg. I added seven heavy-duty levelers—one under each leg of the support frame.

To simplify the construction of the base, I made both plywood boxes the same size. They fit snugly between the top rail and the foot of the frames, which adds rigidity to the base.

If you include drawers in one of the boxes, as I did, cut the dados for the drawer-support cleats, then glue the cleats into the dados before the box is assembled.

Once the support frames and boxes were put together, I was able to assemble the base without much fuss. The boxes butt against the legs, with the bottom of the boxes simply resting on the narrow lip along the length of the foot. Attaching the boxes to the frames was a matter of driving five wood screws through the inside of the box and into each of the legs.

Once the base was built, I moved it to its final location. Next I leveled the top surface using winding sticks and the seven levelers. Then I was ready to build the top right on the base.

The top is flat and durable

The top has three main parts. There's a center section made from veneered particleboard. Attached to the center section are two

A variety of vises and ample storage



Shoulder vise adds clamping options. The lack of a vise screw between the jaw surfaces makes the shoulder vise (above) especially handy when a board must be clamped vertically.



Front vise is nice. Used in conjunction with round benchdogs, the front vise (left) lets the author work comfortably from the end of the bench.



Drawers galore. The shallow top drawer provides a perfect place for the author to store his favorite chisels.

6-in.-wide edgings—one in front, the other in back—and both made from glued-up solid maple.

Start with the center section—To help keep costs under control, I face-glued three pieces of particleboard together—a $\frac{5}{8}$ -in.-thick piece sandwiched between two $\frac{3}{4}$ -in.-thick pieces.

First, I joined one of the $\frac{3}{4}$ -in.-thick pieces to the $\frac{5}{8}$ -in.-thick piece, making sure all of the edges were flush. Then, I used a $\frac{5}{8}$ -in.-dia. core-box bit to cut three $\frac{5}{8}$ -in.-deep grooves across the underside of the $\frac{5}{8}$ -in.-thick particleboard. When the remaining piece of particleboard was added, the groove produced a $\frac{5}{8}$ -in. semicircular hole, which accommodated a threaded rod that helps secure the solid-maple edgings.

A workbench top gets a lot of wear and tear, so I used a $\frac{3}{16}$ -in.-thick veneer on top. And to make sure any movement stresses would be equal, I also veneered the bottom.

To make the veneer, I resaw maple to about a $\frac{5}{16}$ -in. thickness on the bandsaw. I used a thickness planer to bring the material to final thickness. Then I jointed one edge of each piece of veneer and ripped the other edge parallel on the tablesaw.

At this point, the veneer was ready to be applied to the particleboard. But faced with having to veneer such a large surface with thick veneer and without a lot of clamps, I used a somewhat unusual gluing-and-clamping technique (see p. 41).

Wide edgings accept benchdogs—The wide edgings that run along the front and back of the bench are made of solid maple. That way the benchdogs have plenty of support when in use.

I routed the dados that create the openings for the rectangular-shaped benchdogs before the pieces were glued together.

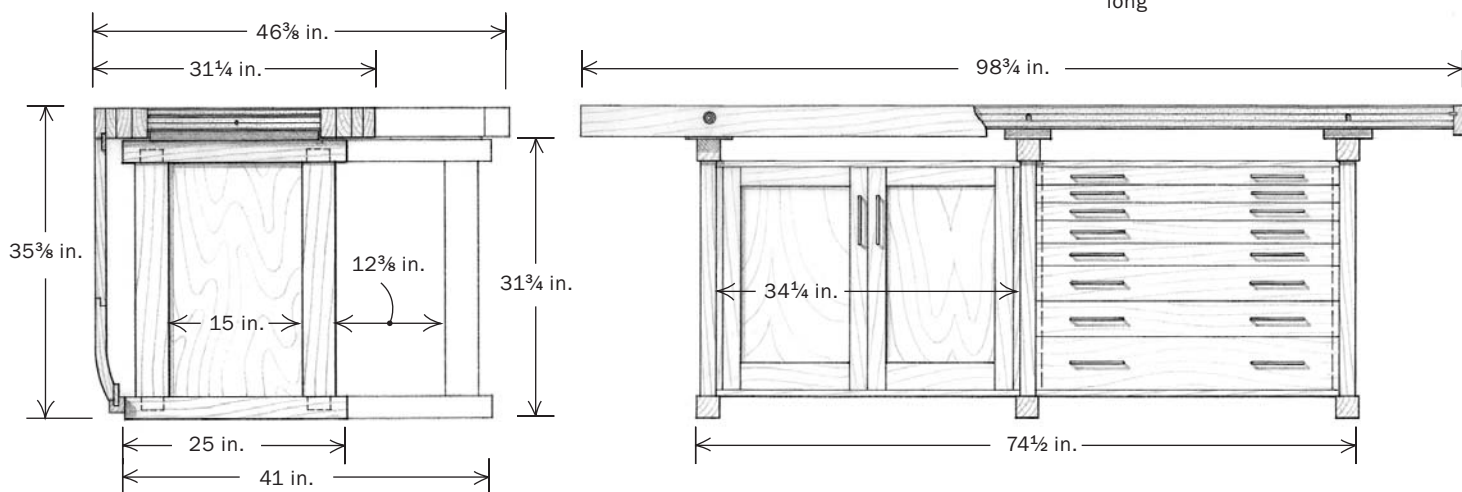
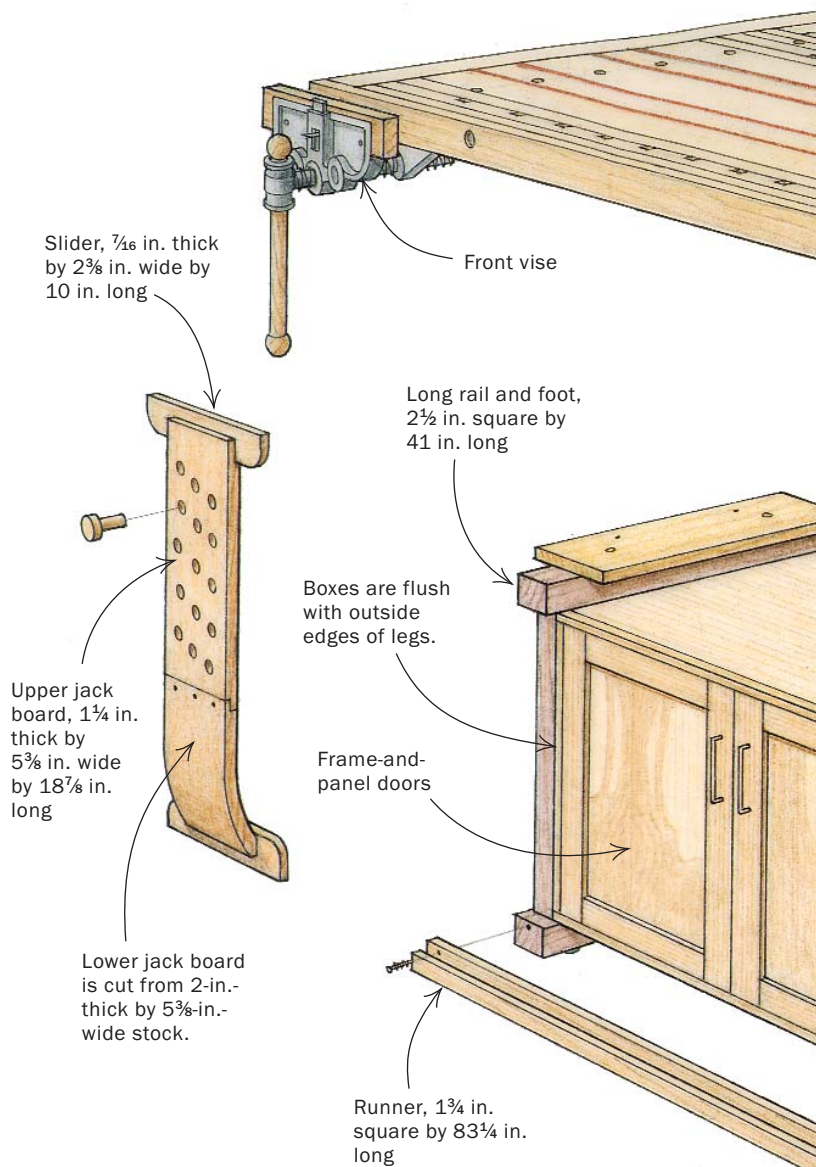
I also wanted benchdogs to work with the front vise. But it was going to be a hassle to chop out all of those square mortises with a chisel. Plus, the particleboard wouldn't hold up well when the dogs got squeezed. So I opted to use round benchdogs. That way I simply had to bore a hole to accept it. And to reinforce the particleboard, I glued a short length of $\frac{3}{4}$ -in. copper water pipe into the hole.

Three lengths of $\frac{1}{2}$ -in.-dia. threaded rod, with a washer and nut on each end, secure the wide, solid-maple edgings to the veneered center section. The rods extend through the "holes" in the particleboard and into through-holes in the edgings.

To drill the through-holes, I first cut each piece of edging to

A massive top on a sturdy modular base

To help keep costs under control, the top is a hybrid, a mix of solid maple, thick veneer and particleboard. The base construction is surprisingly simple—a pair of plywood boxes sandwiched between three frames—yet the single unit that results is as solid as a '72 Buick.

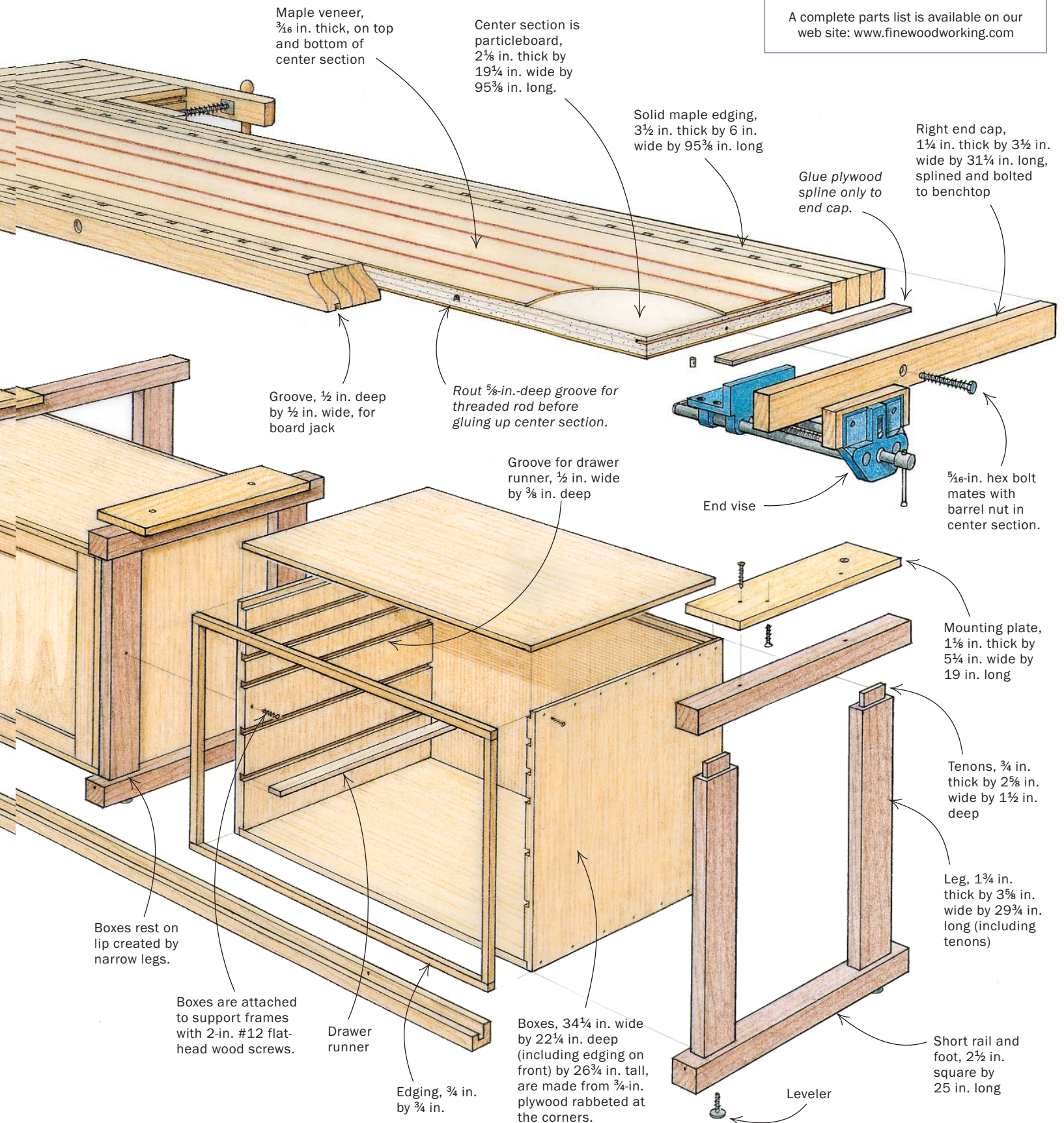


SOURCE OF SUPPLY

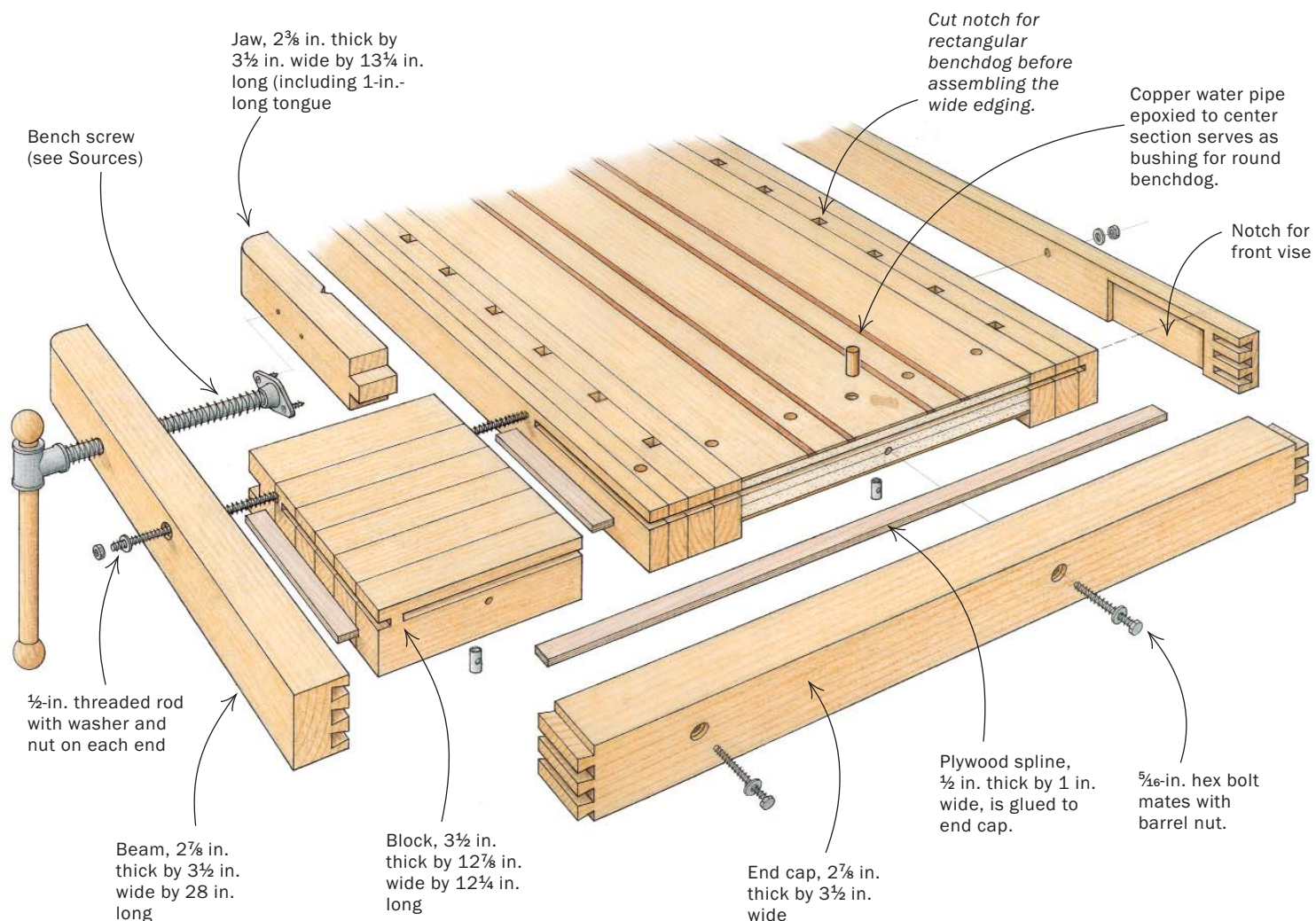
WOODCRAFT (800-225-1153)

Vises, vise hardware and benchdogs

A complete parts list is available on our web site: www.finewoodworking.com



Shoulder vise and end cap



final length. Then to mark the location of the holes in the edgings, I clamped one piece to the center section. I made a center-point marker by driving a finish nail in the end of a long, $\frac{1}{2}$ -in.-dia. dowel. The nail must be centered in the end. I ran the dowel through the holes in the particleboard and used the nail to mark the center point of the hole in the edging. Once all of the points were marked, I drilled all of the holes through each piece of edging.

The threaded rod closest to the left end is longer than the other two rods because it extends all the way through the shoulder-vise parts. I used the same technique to mark the center points on the shoulder-vise parts.

I then face-glued the edgings and glued and clamped them to the front and back of the bench.

The space under the bench is put to use—Those big boxes in the base provide plenty of storage space. I placed eight drawers in the right-hand box. Plus, to take advantage of the space between the top of the box and the underside of the benchtop, I added a shallow through-drawer that extends from front to back, with a face on each end of the drawer, so it can be accessed from both sides of the workbench.

The left-hand box holds the parts of a project I'm building. The box includes a hinged shelf that pivots up and out of the way when it's not needed. The frame-and-panel doors keep dust from filling up the box.

Board jacks support long stock—The board jacks (one in front and one in back) are handy additions to the bench. When a board is clamped in the front, or shoulder, vise, the jack holds up the unsupported end. To accommodate boards of varying length, the jack is able to slide along the full length of the bench.

Power strips bring the juice—Because my bench is several feet from a wall, I added power strips along the front and back edges, making it easier to use power tools at the bench.

The bench has been serving me well for several years now. During that time, it has picked up plenty of scratches and dents, but it's as solid as ever. And I expect it's going to stay that way for many years to come. □

Dick McDonough lives in Flint, Mich., where he's a full-time finish carpenter and part-time woodworking teacher.

GLUING THICK VENEER TO A LARGE SURFACE

Large surfaces, like the top of my bench, are a challenge to veneer because it's difficult to get good clamping pressure over the entire surface. I have enough clamps for most jobs but nowhere near the number I'd need for my jumbo-sized benchtop. And new clamps don't come cheap.

The answer proved to be a set of 10 shop-made clamping cauls. And because I was able to use mostly scrapwood, the total cost was under \$12—less than I'd pay for a single commercial clamp.

It's easy to make these clamps. The top "jaw" is a 24-in. length of 4 $\frac{3}{4}$ -in.-wide medium-density fiberboard (MDF) screwed to a 24-in.-long 2x3. The bottom jaw is a 24-in.-long 2x4. To prevent the MDF surfaces from ending up glued to the veneer, add a healthy coat of paste wax to each one. The ends of the jaws accept a 9-in.-long, $\frac{3}{8}$ -in.-dia. threaded rod that is fitted with a washer and nut on both ends.

To begin veneering, spread a generous coat of yellow glue on the mating surfaces of the veneer and particleboard. A short painter's roller allows you to spread the glue easily and quickly. When working with a large surface area, it's important to have a good assembly game-plan worked out because yellow glue can start to tack up in less than 10 minutes. You need to get the glue down and the clamps tightened up without delay.

Place the veneer glue-side down on the particleboard. Butt the pieces together, but don't add glue to the edges or worry about a perfect joint quite yet. Let the veneer overhang the particleboard all around.

Then start clamping down the veneer. To help avoid lengthwise buckling, tighten the clamps at one end and work toward the other.

Both the top and bottom surfaces of the particleboard must be veneered; if only the top is veneered, it can create uneven stresses that can cause the top to cup.

Once both sides have been veneered, true up the edge joints with a router equipped with a $\frac{3}{16}$ -in.-dia. straight bit. Use a long piece of stock as a straightedge and rout a $\frac{3}{16}$ -in.-deep groove centered along the entire length of each joint line. Then use the clamping cauls to glue $\frac{3}{16}$ -in.-wide by $\frac{3}{16}$ -in.-thick inlays into the grooves. This technique results in near-perfect edge joints.



Clamp the veneer to the particleboard with clamping cauls. No need to have a small fortune in clamps to do this glue-up. Shopmade clamping cauls get the job done for pennies.

INLAYS CONCEAL IMPERFECT VENEER JOINTS



Rout the joint. To clean up any gaps, a router and edge guide are used to cut a shallow groove centered on the long joint.



Add the inlay. Thin strips of cherry fill in the grooves, producing tight joint lines along the full length of the bench.