

Convertible Clamping Workstation

Assembly table keeps clamps close at hand, adjusts to different heights and tasks



BY GARY B. FOSTER

After working for months on my knees building a large bookcase, I decided I needed a low table in my shop for assembling large projects. Although my newly built shop is spacious at 1,040 sq. ft., I didn't want to take up room with a low table that would find only part-time use. It needed to do more. So I designed a workstation that also fulfilled a number of other shop needs, including a place to store my clamps, and a level surface to support long clamps when gluing up cumbersome furniture parts such as tabletops and frame-and-panel doors. The workstation is built in two sections and

can be reconfigured to accommodate its various uses.

A twist on the torsion box

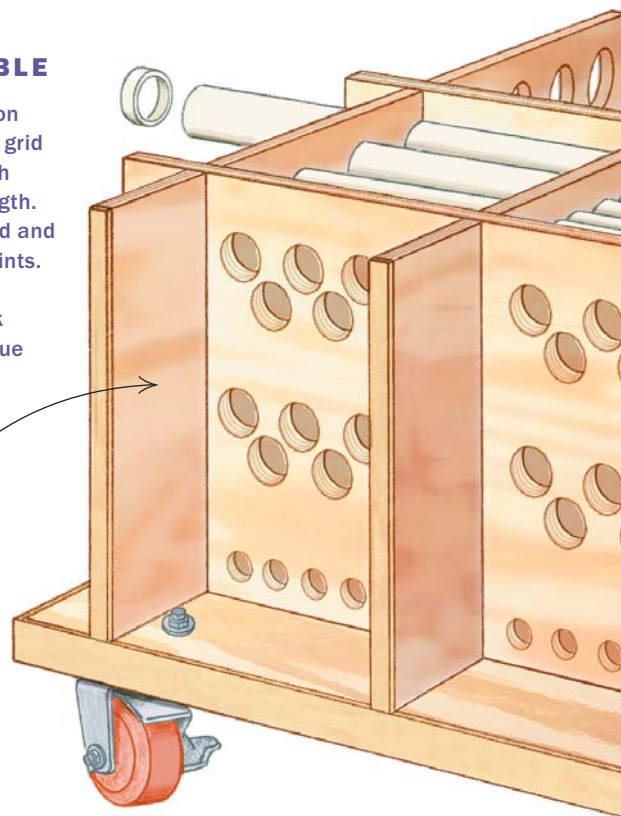
The lower portion of the workstation consists of five plywood panels running widthwise and three panels running lengthwise (see the drawing at right). The panels are sandwiched between a top and base of $\frac{3}{4}$ -in.-thick plywood. Built into the lower torsion box is a web of PVC pipes that hold clamps up to 6 ft. long.

Build it from the bottom up—Begin by cutting the crosslap joints in the plywood

LOWER SECTION: MOBILE ASSEMBLY TABLE

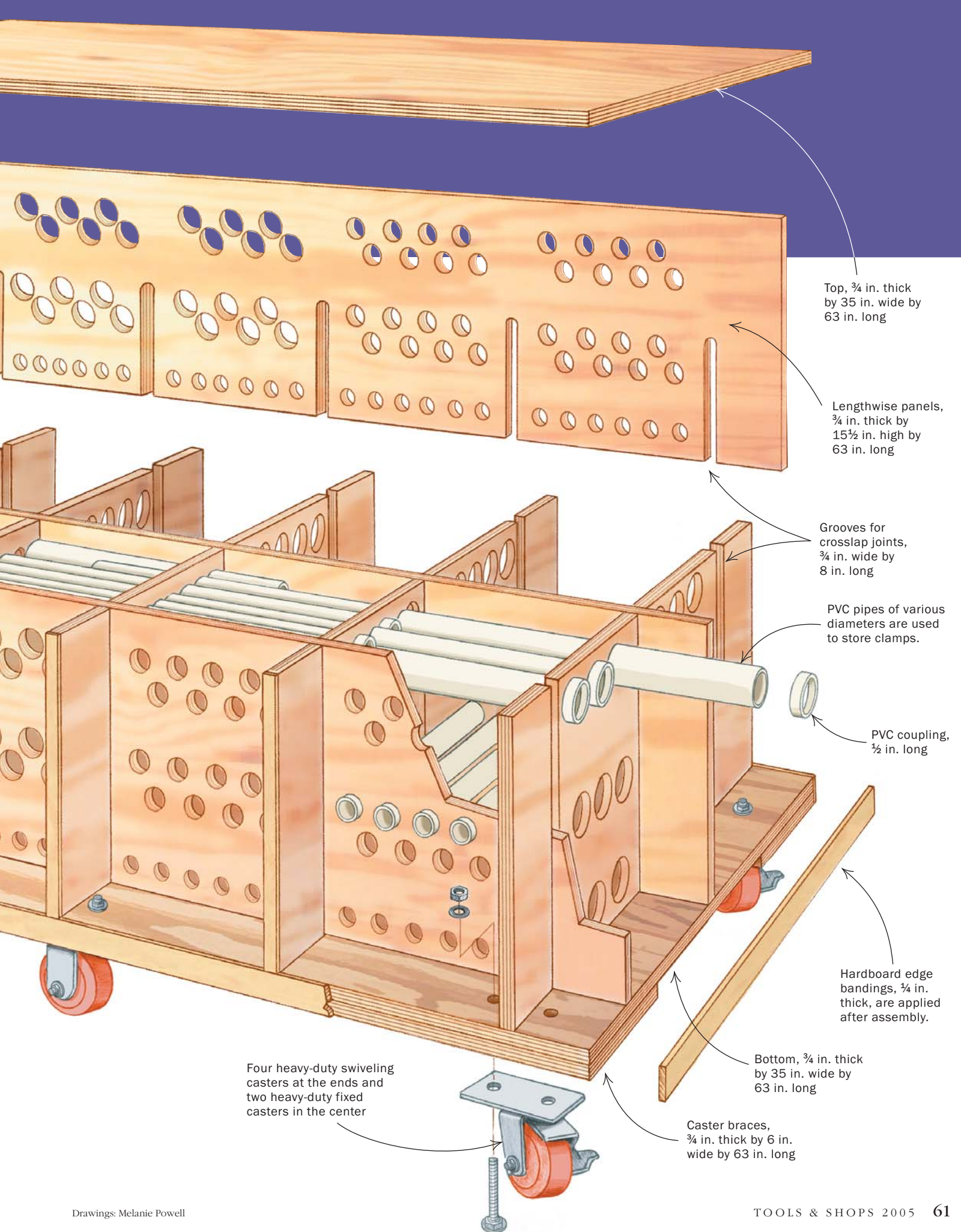
The lower portion of the workstation is a tall torsion box consisting of a grid with five panels spanning the width and three panels spanning the length. The $\frac{3}{4}$ -in.-thick panels stand on end and cross one another with crosslap joints. The grid is sandwiched between a top and a base made of $\frac{3}{4}$ -in.-thick plywood, which is attached with glue and $2\frac{1}{2}$ -in.-long drywall screws.

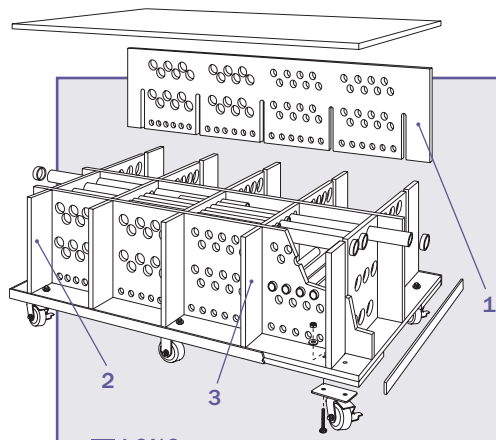
Widthwise panels,
 $\frac{3}{4}$ in. thick by
15½ in. high by
35 in. long



panels with a $\frac{3}{4}$ -in. plywood router bit. This specialty bit, available from most home centers or catalog retailers, is slightly undersize to account for the actual thickness of plywood. Using this bit will make the crosslap joints fit tightly.

Next, plan and lay out the PVC pipes. I chose to use several different-diameter pipes to hold the assortment of clamps I own. Those spanning the width can be accessed from either side of the table, while

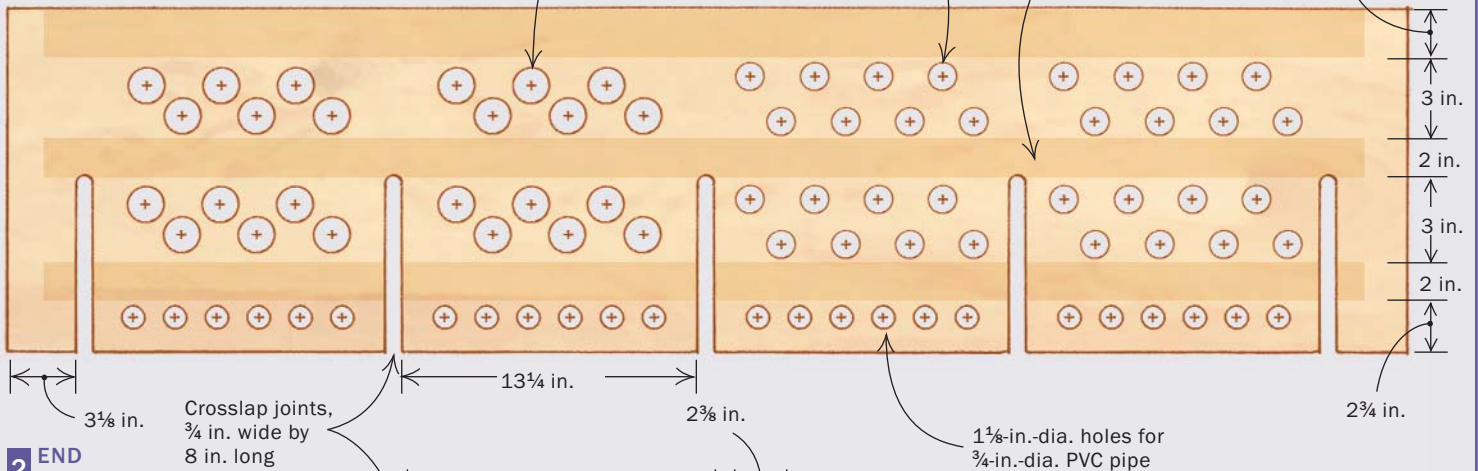




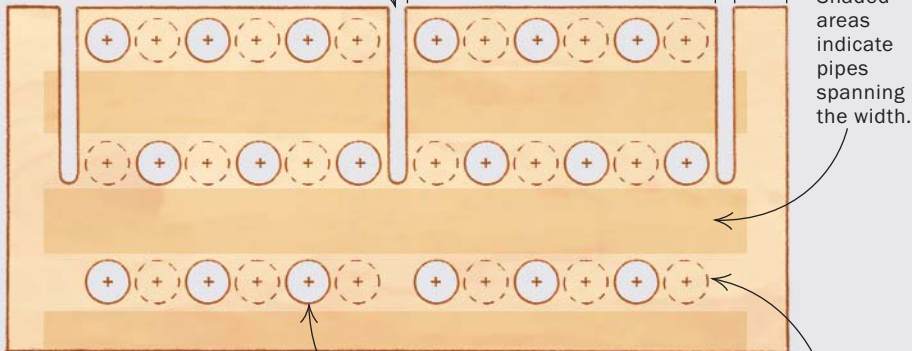
HOLE LAYOUT FOR PLYWOOD PANELS

PVC pipes, with diameters based on the size of the clamps they will hold, are fed through holes drilled in the plywood panels. Lay out the pipes so that those spanning the width of the table don't interfere with those running lengthwise. Prepare templates to cut matching hole patterns on each plywood panel. The end panels are mirror images of each other and are laid out with the same template. The center panels combine the layouts of the two end panels.

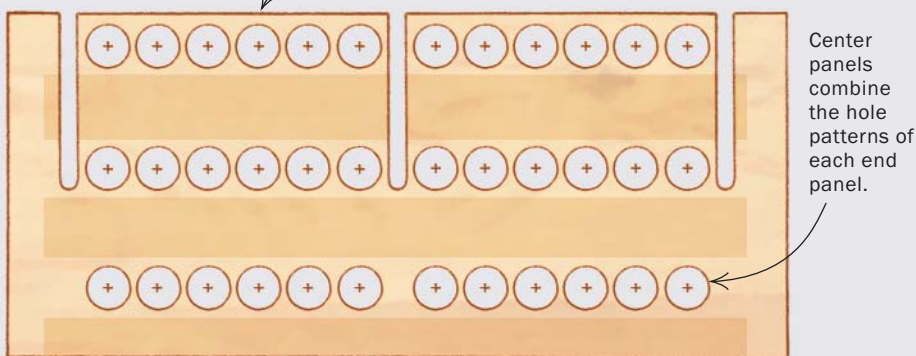
1 LONG PANELS



2 END PANELS



3 CENTER PANELS



Prepare templates for matching holes. Transfer the center points from a paper template to a 1/4-in.-thick plywood template. Use the template to lay out each section on the final panels.

those running the length can be accessed only from one end. This setup maximized the number of long clamps I could store.

The pipes extend through the torsion box's interior grid, and holes must be drilled in each plywood panel in the same location so that the pipes can feed through properly. I created a template to locate and drill pilot holes in each of the interior panels, and then bored each hole with an appropriately sized hole saw.

After the plywood panels have been prepared, begin assembling the torsion box. It must be constructed on a flat surface and upside down. Fit together the plywood grid and attach the bottom with glue and 2½-in.-long drywall screws.

While the box is upside down, attach six heavy-duty casters with carriage bolts. I added a plywood brace between the bottom panel and the casters to provide extra strength for carrying the weight of the table as it's rolled around the shop. I used 6-in. casters rated at 700 lb., purchased from an industrial-supply store. The four corner casters swivel, and the two center casters are fixed, making the workstation easy to move around the shop.

Plumb the table for clamp storage—

Flip over the torsion box to install the piping and the top. The lowest row of piping comes first as you work your way up the table. To prevent the pipes from slipping out of the holes in the grid, use ½-in.-long rings cut from PVC couplings. The couplings are sold in plumbing-supply stores and are easily cut. I used a bandsaw, holding the couplings with locking pliers to keep them straight.

Cut the pipes that span the width of the table 1 in. longer than the width of the torsion box. Glue a ring over one end of the PVC pipe and feed it through the plywood grid. The pipe should extend ½ in. from the other side of the table. Place a ring over that end.

The pipes running lengthwise should be cut roughly 12 in. short of the opposite end panel. Feed one end of the pipe through the table, cap it with a ring, then cap off the other end.

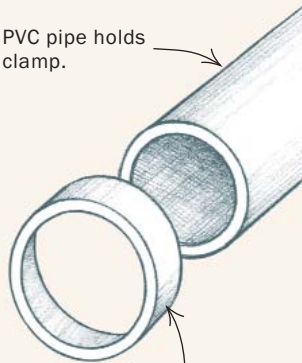
Clamp table makes glue-up easy

The upper section of the table stacks on top of the lower section and is designed to support clamps when assembling furniture parts. Like the lower section, the upper

PVC-PIPE GRID KEEPS CLAMPS FROM GETTING TANGLED

MAKE CLAMP HOLDERS OUT OF PVC PIPE AND PVC COUPLINGS

PVC pipe holds clamp.



½-in.-long slice of PVC coupling serves as a cap to hold pipe in place.



Install the pipes. Use PVC glue to attach the rings to the pipes. Work from the lowest row to the top.

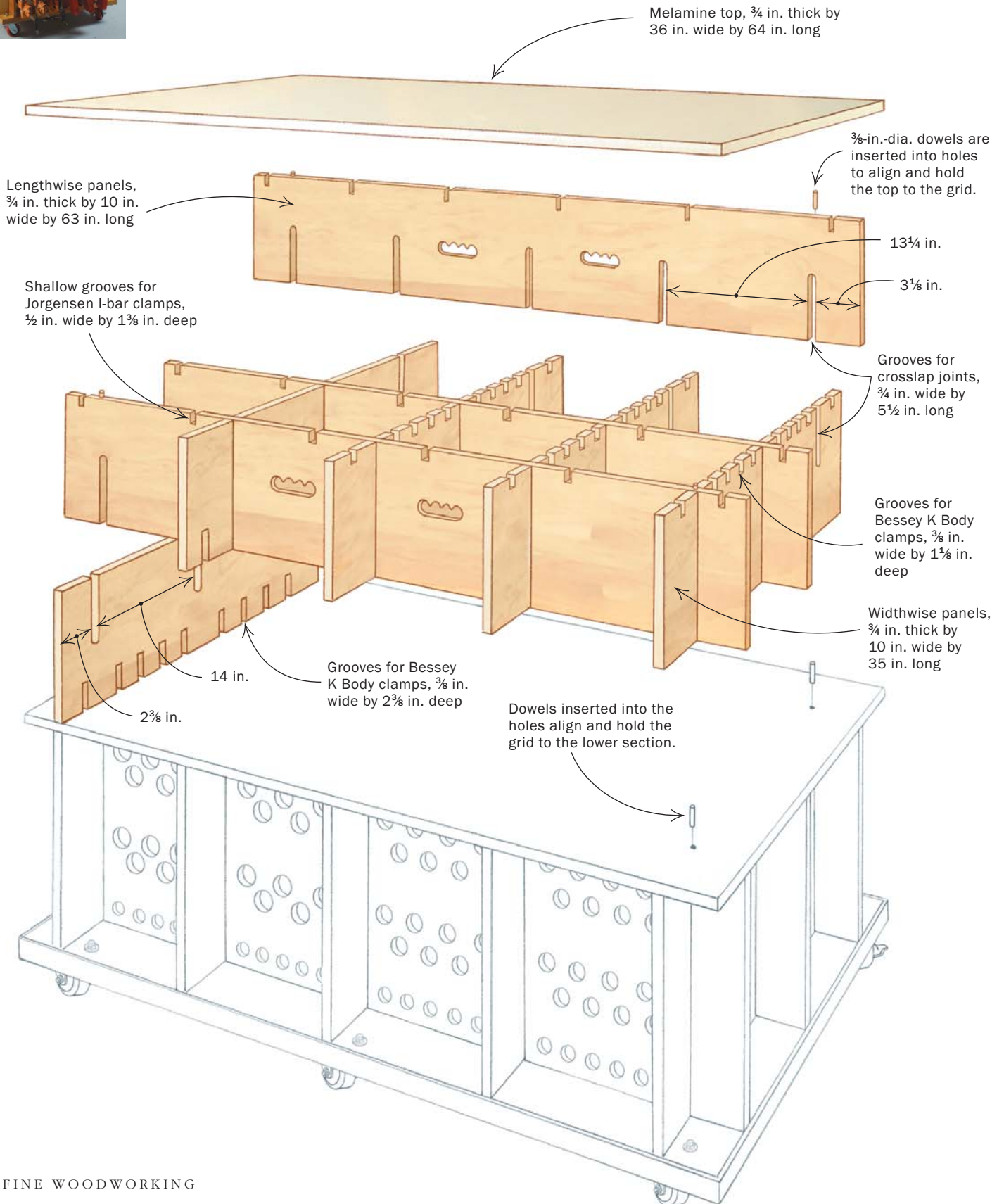


Space-saving clamp storage. Offset the holes for the PVC pipes to maximize storage space. If clamps interfere with each other, you can insert some from the other side.



UPPER SECTION: KNOCKDOWN TABLE DOUBLES AS CLAMPING GRID

The upper section of the workstation is a torsion box consisting of tall plywood panels connected by crosslap joints. The panels are not glued together, so they can be reconfigured for different clamping arrangements. Grooves in the top edges of the panels support clamps during glue-up. In one configuration, grooves in the lengthwise panels are twice as deep as those in the widthwise panels. This allows clamps to be arranged front to back and side to side without interference. With the top panel in place, the workstation can be used as a large worksurface.



one is constructed as a tall torsion box with panels that lock together with crosslap joints. However, this torsion box is not glued, so it can be reconfigured to hold clamps in different arrangements. Use a standard $\frac{3}{4}$ -in. straight router bit when cutting the crosslap joints so that the plywood panels have wiggle room for assembly and disassembly. While most of the table is finished with oil-based polyurethane, these boards should be finished with a water-based polyurethane and waxed regularly to keep them from sticking.

To secure the upper section to the bottom, install $\frac{3}{8}$ -in. wood dowels in each corner of the upper torsion box and drill matching holes in the top surface of the lower table assembly (see the drawing on the facing page).

Grooves hold clamps level—On the top edge of the plywood panels, grooves cut at regular intervals are sized to hold clamps. My table holds Bessey K Body clamps and Jorgensen I-bar clamps. However, grooves can be cut for clamps from any manufacturer. Size them so that the width of the groove is equal to the width of the clamp, and the height of the groove is $\frac{1}{8}$ -in. shallower than the height of the clamp. As a result, the clamp will sit proud by $\frac{1}{8}$ in. and keep a workpiece out of contact with the table during glue-up.

Gluing up some furniture parts, such as frame-and-panel doors, requires clamping in two directions to apply pressure on four edges. To accommodate two-directional clamping, cut grooves in the widthwise panels twice as deep as those in the lengthwise panels. This way, the clamps won't contact each other when they cross.

Top off the table with melamine

The upper section also can be used as a worksurface by laying a sheet of $\frac{3}{4}$ -in.-thick melamine on top of the plywood grid. With the top on, the table is level with my workbench and tablesaw, so it is useful as an infeed or outfeed support.

Again, install four wood dowels on the underside of the top sheet. Matching holes are drilled into the top edge of the upper torsion box and keep the worksurface locked in position. □

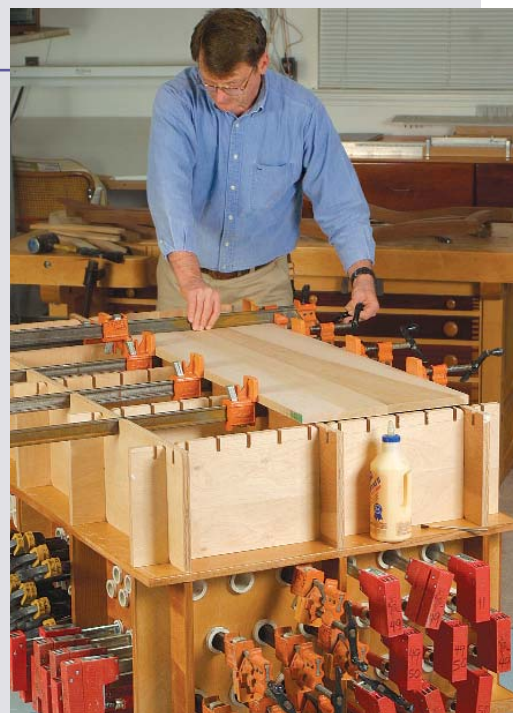
Gary B. Foster works wood at his home in Folsom, Calif.

RECONFIGURE THE GRID FOR DIFFERENT GLUING TASKS

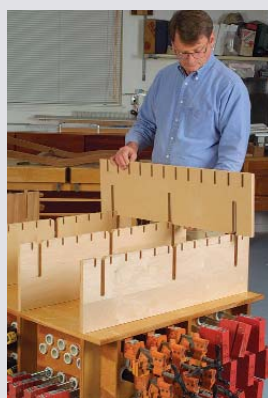
SETUP FOR LARGE PANELS



Crosslap joints make for easy assembly and disassembly of plywood grid. Bar clamps rest in grooves cut into the top edges of the plywood grid. The bars extend $\frac{1}{8}$ in. above the plywood edge to provide clearance during glue-up.



SETUP FOR PANEL DOORS



Reconfigure the grid for two-directional clamping. Grooves of various depths, cut into the five short plywood panels, allow the grid to be arranged so that clamps situated front to back can sit below those running side to side.

