WOODWORKER'S JOURNAL downloadable plans:
"America's leading woodworking authority"™

Precision Crosscutting Jig

In this plan you will be getting:

- Step by Step construction instruction.
- A complete bill of materials.
- Exploded view and elevation drawings.
- How-to photos with instructive captions.
- Tips to help you complete the project and become a better woodworker.

Published in Woodworker's Journal "Woodworking Secrets: Essential Methods and Projects for Fine-Tuning Your Shop Skills"

Get Adobe Reader To download these plans, you will need **Adobe Reader** installed on your computer. If you want to get a free copy, you can get it at: **Adobe Reader**.

Having trouble downloading the plans?

- If you're using Microsoft Internet Explorer, right click on the download link and select "Save Target As" to download to your local drive.
- If you're using Netscape, right click on the download link and select "Save Link As" to download to your local drive.

$7.95

WJ093

Precision Crosscutting Jig

Spend a day or two making this classic workshop project and the results will improve your woodworking accuracy for years to come. The sled makes it easier to perform crosscuts on long or heavy stock and panel material. Our design also includes a mitering fence for dead-on angle cuts and a micro-adjustable stop block.

Woodworking is an exercise in precision. A fine joint that crisply mates two pieces of wood into a single, strong unit depends on a craftsman's ability to make the cuts accurately. It's possible to carry this to ridiculous limits (as when people talk about tolerances in thousandths of an inch), but in woodworking, differences under 1/64" are generally acceptable. Trimming a board to the correct length with square ends lays the foundation for all subsequent layout and joint-cutting steps. It's essential, therefore, to make these first cuts as perfect as possible, and there's no better tool for getting this done than a crosscutting jig for your table saw.

While 90° cuts are the first priority of a crosscutting jig, it's a bonus if it handles miters as well. Our crosscutting jig has a mitering accessory for cuts from 0° to 65°, with positive stops at 22½° and 45°.

This jig works great for trimming all kinds of panels, including the raised-panel shown here.

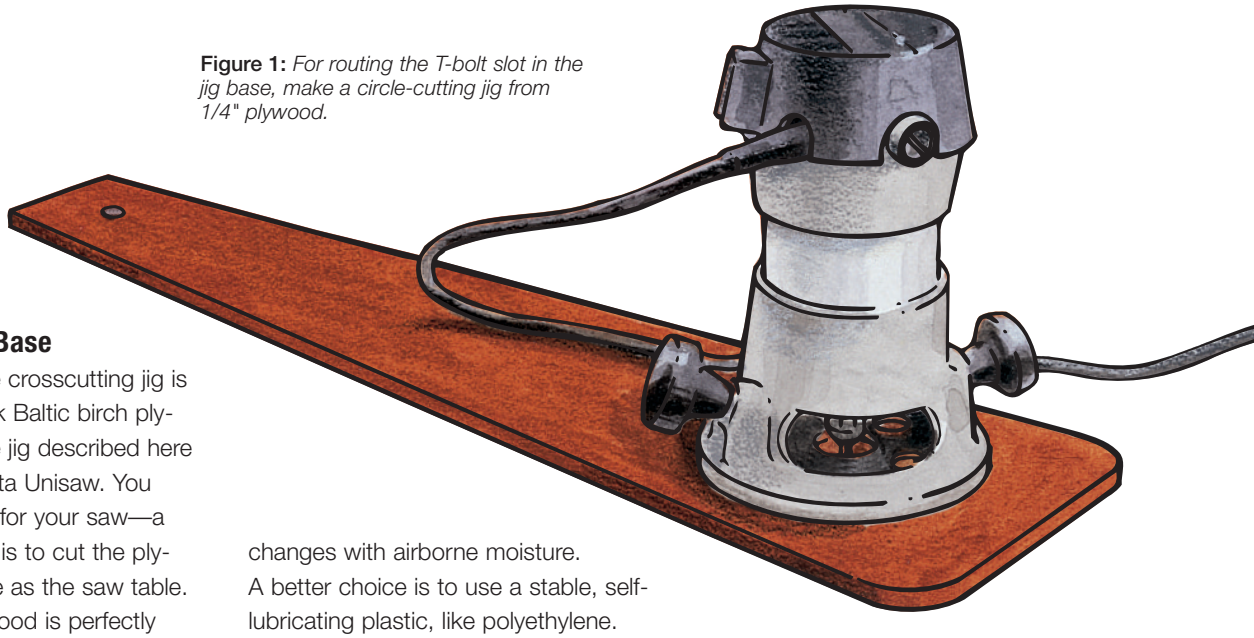


Figure 1: *For routing the T-bolt slot in the jig base, make a circle-cutting jig from 1/4" plywood.*

Building the Jig Base

The core of the crosscutting jig is a piece of 1/2"-thick Baltic birch plywood (piece 1). The jig described here was made for a Delta Unisaw. You should size your jig for your saw—a good rule of thumb is to cut the plywood the same size as the saw table. Make sure the plywood is perfectly flat, then cover both faces with plastic laminate (pieces 2) for a durable, long-lasting surface. Choose a light color that allows you to see any pencil marks drawn on the jig.

Trim the laminate with a flush-cutting router bit, then lay out the entry holes and the pivot hole for the miter fence accessory (see the *Jig Base Elevation Drawing* on page 37). Use a drill press and a 3/4" Forstner bit to bore 3/8"-deep entry holes for the T-bolt slot, then flip the panel over to drill a 1/4"-deep counterbore at the pivot hole location. Now switch to a 5/16" bit to complete the pivot hole.

Cutting the curved T-bolt slot in the base requires a simple circle-routing jig (see *Figure 1*). Make the jig and attach it to your plunge router. Chuck a 3/8" straight bit in the collet and align the pivot hole in the jig with the pivot hole in the crosscutting jig base. Press a 5/16" bolt through the holes and adjust the bit so it touches the bottom of the entry holes. Now rout a slot to connect the two entry holes, then switch to your T-slot cutter, adjust its cutting depth, and complete the slot.

The runners (pieces 3) must fit the miter gauge slots in your saw table yet not be so tight that the jig binds. Using wood runners is common, but wood changes with airborne moisture. A better choice is to use a stable, self-lubricating plastic, like polyethylene.

To install the runners, first cut shallow dadoes in the underside of the base so they're laid out just like the miter gauge slots in your saw table. Clamp the jig base squarely on your saw table and mark the miter gauge slots, then measure the width of your slots and install a dado blade of matching size. Now set your rip fence to align each set of marks with the blade and cut 1/16"-deep dadoes. These cuts must be as accurate as possible to keep the jig runners from binding.

Rip your plastic stock to the exact width of your dadoes, then place the two runners in the dadoes and drill 5/32" countersunk pilot holes. Use #8-3/4" screws (pieces 4) to secure the runners. Test the jig base on the table saw and, if the runners bind in the slots, use a cabinet scraper to shave them until they operate smoothly.

Installing the Fences

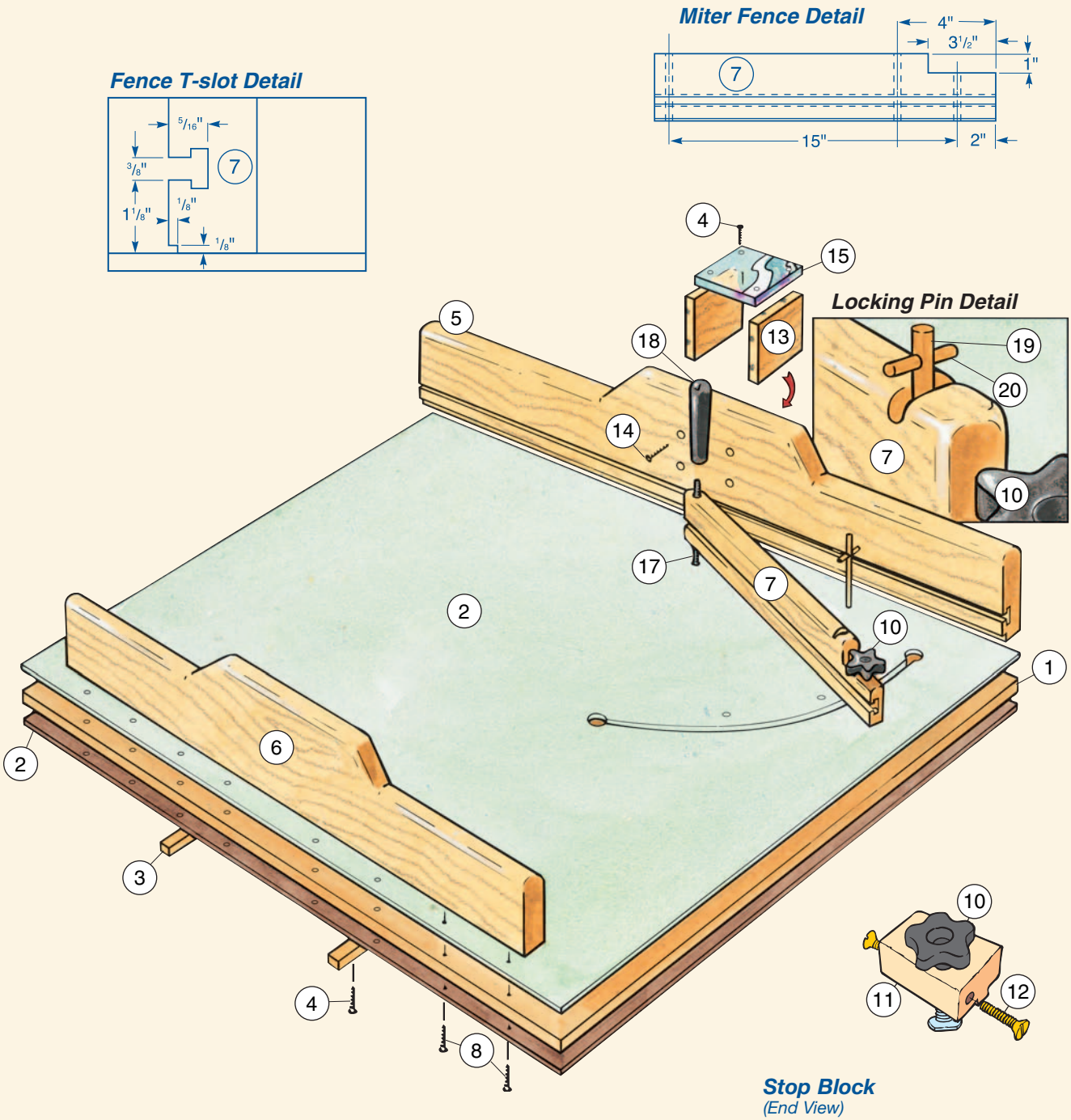
Now that the jig base is constructed, build the three fences (pieces 5, 6 and 7). Cut your stock to size and shape following the *Material List* and *Elevation Drawings* on the next two pages, then set the rear fence aside so you can rout T-bolt slots in the front fence and miter fence for mounting the stop block.

QuickTip

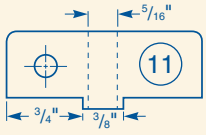
Both Sides Covered

Professional cabinetbuilders laminate both faces of a countertop to keep the assembly as stable as possible. If the top face alone were laminated, ambient humidity might enter the porous face on the underside, and that inequality is an invitation to warping. Some of the core products the pros use in cabinet shops even come from the factory with a plastic coating already applied to the underside so the shop doesn't have to spend time laminating the underside.

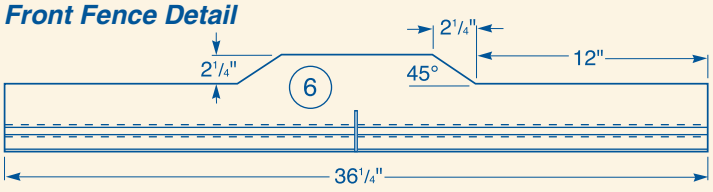
Jig Exploded View



Stop Block
(End View)



Front Fence Detail

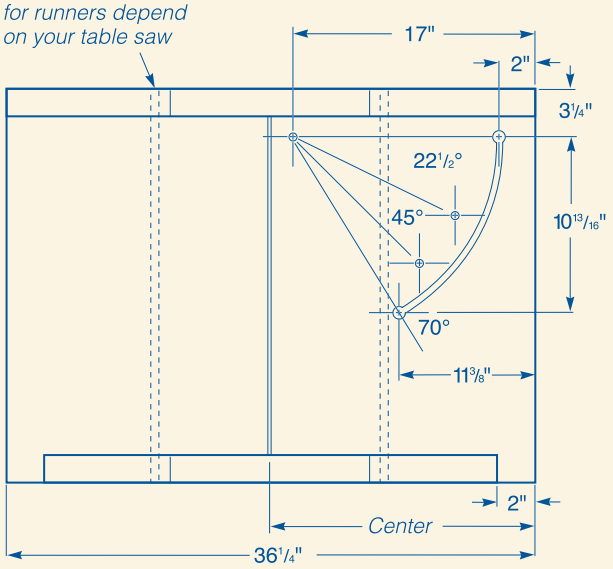


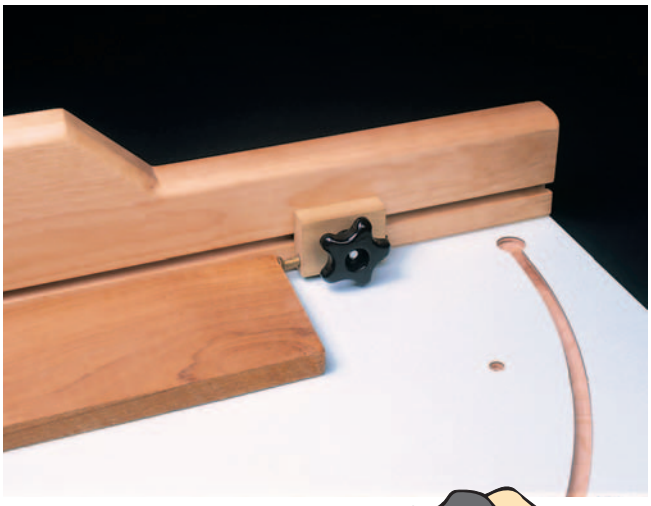
MATERIAL LIST

		T x W x L
1	Plywood Core (1)	1/2" x 27" x 36¼"
2	Plastic Laminate (2)	1/16" x 27" x 36¼"
3	Runners (2)	3/8" x 3/4" x 27"
4	Flathead Screws (16)	#8 - 3/4"
5	Front Fence (1)	1½" x 5⅝" x 36¼"
6	Rear Fence (1)	1 1/16" x 5⅝" x 32¼"
7	Miter Fence (1)	1 1/16" x 3½" x 17¾"
8	Flathead Screws (16)	#8 - 1½"
9	Short T-bolts (2)	5/16" x 1¾"-18
10	Hold-down Knobs (3)	5/16"-18
11	Wood Block (1)	3/4" x 1¾" x 5"
12	Micro-adjust Bolts (2)	1/4" x 1½" - 20
13	Guard Walls (2)	3/4" x 4" x 4"
14	Flathead Screws (4)	#8 - 2½"
15	Plastic Shield (1)	1/4" x 4" x 4"
16	Long T-bolt (1)	5/16" x 3½"
17	Carriage Bolt (1)	5/16" x 4" - 18
18	Post Handle (1)	5/16" - 18
19	Locking Pin (1)	3/8" x 5"
20	Cross Dowel (1)	1/8" x 1"
21	Wood Block (1)	3/4" x 2" x 2"
22	Toggle Clamp (1)	Right-angle Type

Jig Base Elevation

Exact dado locations for runners depend on your table saw





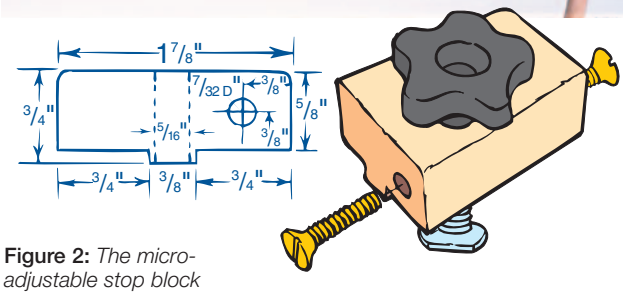


Figure 2: *The micro-adjustable stop block brings great precision to your jig, especially when cutting many pieces to the same length.*

For each slot, make your first pass with a 3/8" straight bit routing 5/16" deep, then follow with the T-slot cutter routing to the same depth. After routing the slots, rip a 1/8" x 1/8" rabbet along the bottom inside edge of both fences for dust relief. Next, drill the three holes in the miter fence for the hold-down bolts and pin lock, and pass the fence over the table saw blade to cut a 3/8"-deep kerf at the pin hole lock location (see *Miter Fence Detail* on the previous page). Finally, rout the top edges of all three fences as well as the pivot hole end of the miter fence, with a 1/2" roundover bit.

Installing the back fence to the base isn't that critical, but mounting the front fence requires great care to ensure the accuracy of your crosscutting jig. Clamp the back fence so it's aligned with the edge of the base and drill countersunk pilot holes to secure the assembly with #8-1½" screws (pieces 8). Clamp the front fence to the base and drill one counter-sunk pilot hole to secure the right end of the fence (leave the left end free for now).

The micro-adjustable stop block (pieces 9, 10, 11 and 12) is really great for accurately setting repeat crosscuts (see *Figure 2*), but it also comes in handy for precisely setting the front fence. Make the jig and slip it into the T-slot in the jig base, then use a framing square to adjust the fence square to the blade. Now slide the stop block up to the fence and tighten the hold-down knob. Clamp the fence to the stop block (see *Figure 3*) and make your first pass completely through the crosscutting jig.

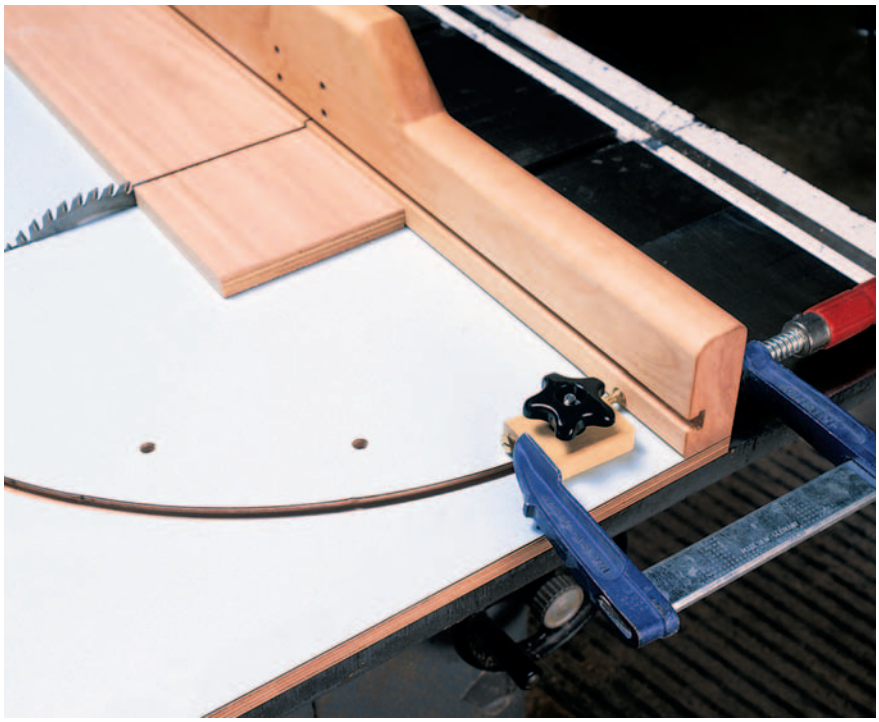


Figure 3: *When you're ready to install the front fence, use your new stop block and a clamp for making fine adjustments to get perfect 90° cuts.*

Test the accuracy of the front fence by crosscutting a scrap piece that has perfectly parallel edges. After cutting the scrap, flip one piece over and slide the freshly cut ends of the two pieces together, holding both pieces firmly against the jig fence. If the ends don't match perfectly, loosen the clamp to turn the micro-adjustment bolt a tiny bit, then reclamp the fence and cut another piece of scrap material. Continue this process until the cut ends match perfectly, at which point you can drill countersunk pilot holes and screw the front fence in place.

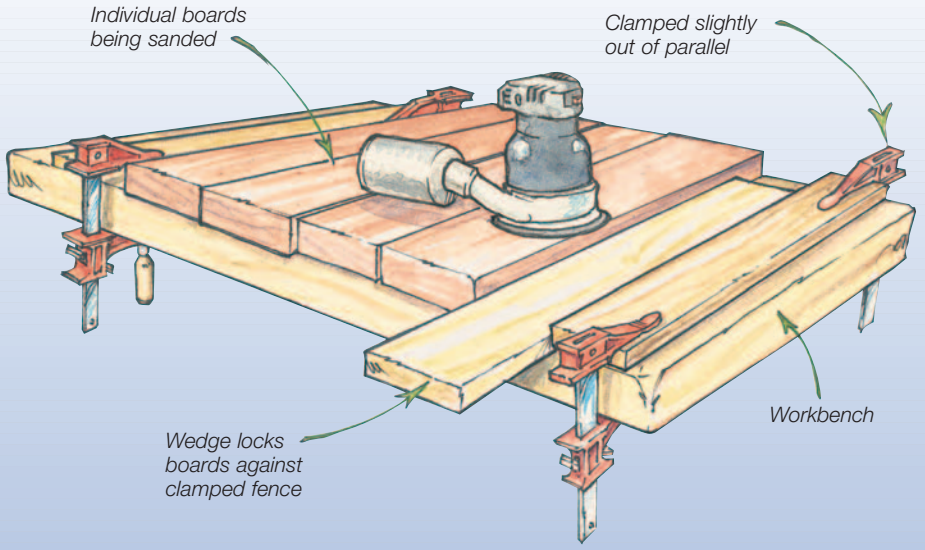
Completing the Jig Accessories

The guard on the front fence helps protect you as the jig passes beyond the blade. Cut the material and clamp the walls (pieces 13) to the front fence 1¼" from the blade kerf, then drill 5/32"

QuickTip

Sanding Jig for Multiple Boards

When you need to sand several boards of the same size, clamp two fences to your bench, leaving one at a very slight angle to the other. Then load up the boards and wedge them in place with a piece of scrap. It makes for quick board changes, which is great on big jobs. Just make sure the fences and wedge are thinner than the boards being sanded.



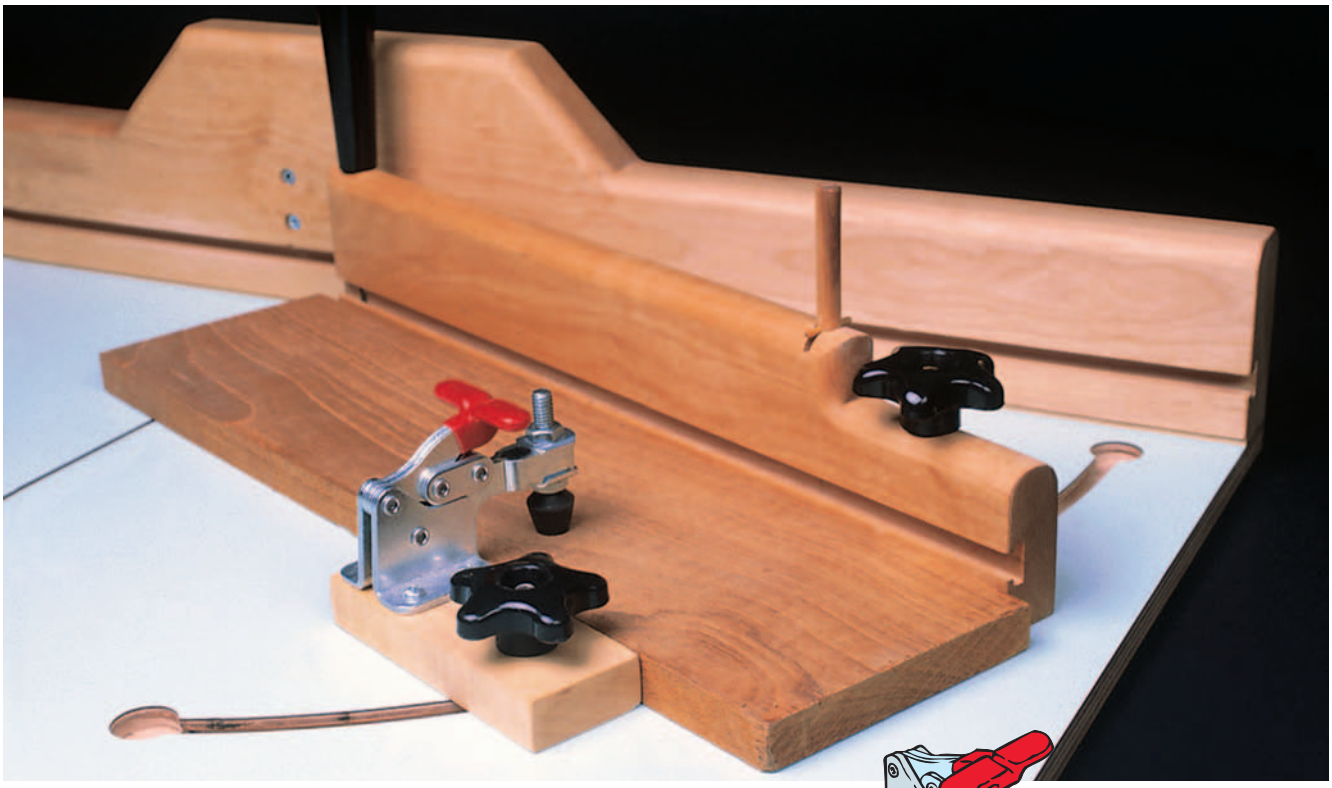
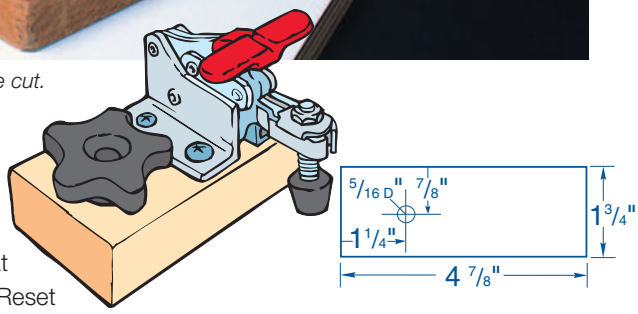


Figure 4: *While mitering, boards sometimes creep along the fence and spoil the cut. Using the hold-down jig solves the problem entirely.*



counterbored pilot holes. Secure the walls with long screws (pieces 14), and complete the guard by drilling pilot holes and screwing down the plastic shield (pieces 4 and 15).

Now install the miter fence to the base with a long T-bolt (piece 16) and a carriage bolt (piece 17). Slip the miter fence onto the bolts and spin on the hold-down knob and post handle (pieces 10 and 18).

Setting the miter fence lock positions at 22½° and 45° requires the help of an artist's adjustable triangle (available at art supply stores). First set the triangle to 45° and slip it between the front fence and the miter fence. When you have the angle dead-on, slip a 3/8" brad-point bit in the miter fence pin lock hole and use a hammer to tap it lightly against the laminate. Next, move the miter fence out of the way and drill a 3/8"-deep hole at the mark with the 3/8" bit. Reset the triangle to 22½° and follow the same procedure for marking and drilling this hole.

Make a locking pin (pieces 19 and 20) by cross drilling a 3/8" dowel with a 1/8" bit (see *Locking Pin Detail*, page 36), then glue a short piece of 1/8" dowel in the pin. Sand the pin so it slips through the hole. When you insert the pin and align the cross dowel with the saw kerf you cut earlier, the pin will reach into the locking holes in the base.

To use the stop block you've already made, slide it into a fence slot and use a tape measure to set it a particular distance from the saw kerf. If the length is off, just give the stop block bolt a turn and make another cut.

The hold down jig (pieces 9, 10, 21 and 22) is designed to lock a workpiece onto the jig base during a cut. It's especially effective at preventing creep while mitering. Make the jig shown in *Figure 4*, above, and install it in the T-bolt slot in the jig base. Adjust the toggle clamp to work on 3/4"-thick stock, since that's probably what you'll cut most often. If you frequently cut thicker stock, you may want to make a second hold-down jig suited for this material.

Now that the crosscut box is complete, oil all the wood parts to keep them free of glue and dirt. Or apply a clear hard finish of your choice for even greater durability.