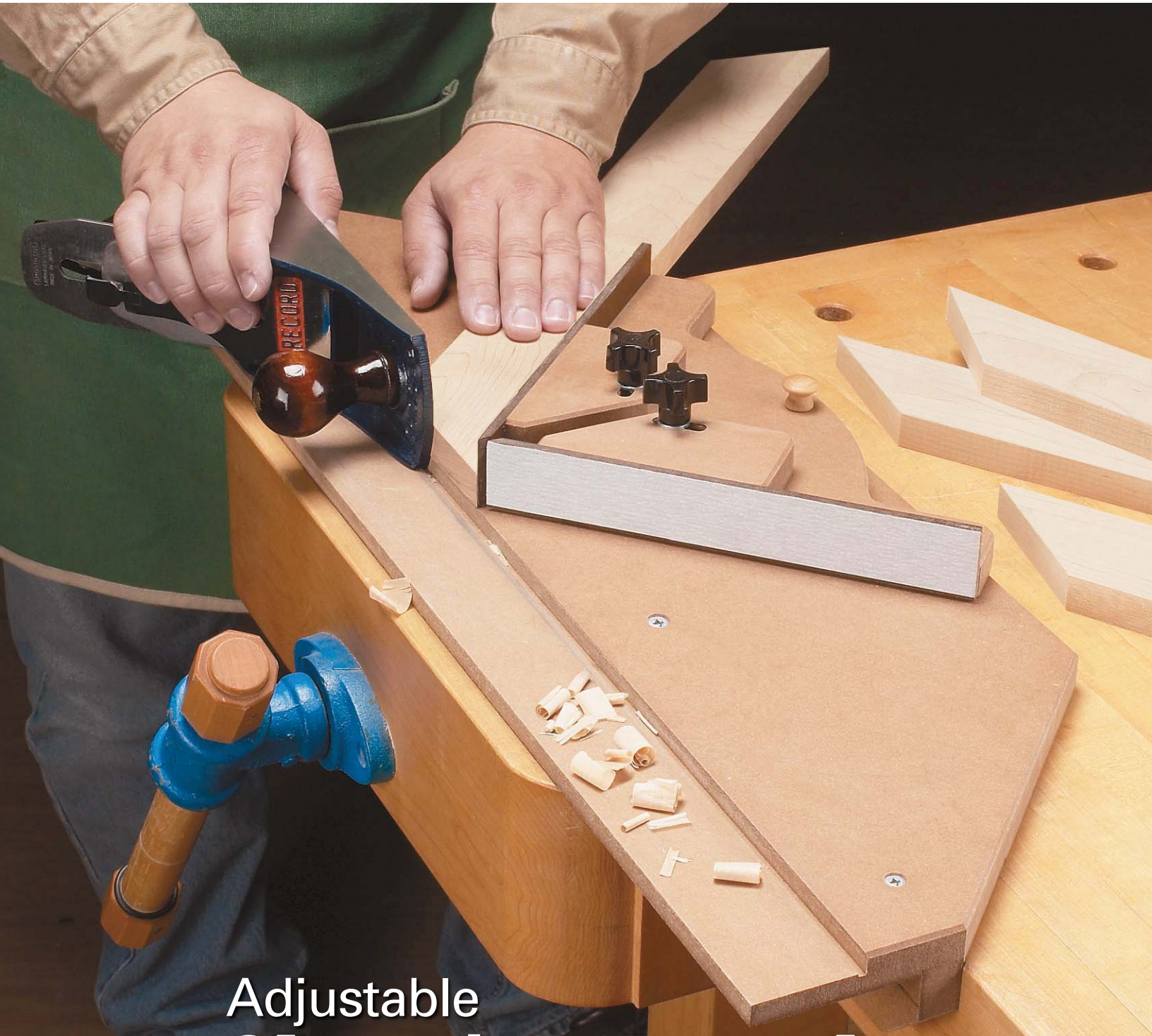


Adjustable Shooting Board

A cat's whisker. That's the difference between a perfect-fitting miter and one that "almost" fits. But trying to shave such a small amount off the end of a workpiece with a table saw or compound miter saw is almost impossible. For a delicate procedure like this, a sharp hand plane works much better. The trouble is that it's difficult to hold the workpiece at an exact angle while planing the end. That's where a shooting board comes in.

A shooting board not only helps to steady the workpiece, it guides the plane at the same time. So you can take a paper-thin shaving off the end of a workpiece.

Most shooting boards are little more than a narrow, rabbeted board with a fixed block of wood to act as a stop. This shooting board is different in a couple of ways.

First, it has a pivoting stop block with automatic settings at 45° and 90°. But you can also adjust the stop block to any angle in between. Plus, the shooting board has sliding fences that can be adjusted to completely back up the workpiece and prevent tearout.

To help set up and use your shooting board, we've included a separate article that begins on page 16. It features some tips on getting the best results.

Base

There's not much to the base of the shooting board. It's just a piece of medium-density fiberboard (MDF) with a cleat for clamping the jig in a bench vise. But the base serves an important purpose. A rabbet along the edge of the base guides the plane in a straight path as it trims the workpiece.

The *base (A)* starts out as a rectangular blank. To make it a little lighter and easier to handle, I trimmed off the back corners of the base, as shown in Figure 1 at right. Then I proceeded to cut the rabbet for the plane.

As you can see in Figure 2, cutting the rabbet is a two-step process. First, a kerf is cut in the base two inches from the edge (Figure 2a). Then the workpiece is placed on edge, and the rest of the waste is cut away (Figure 2b).

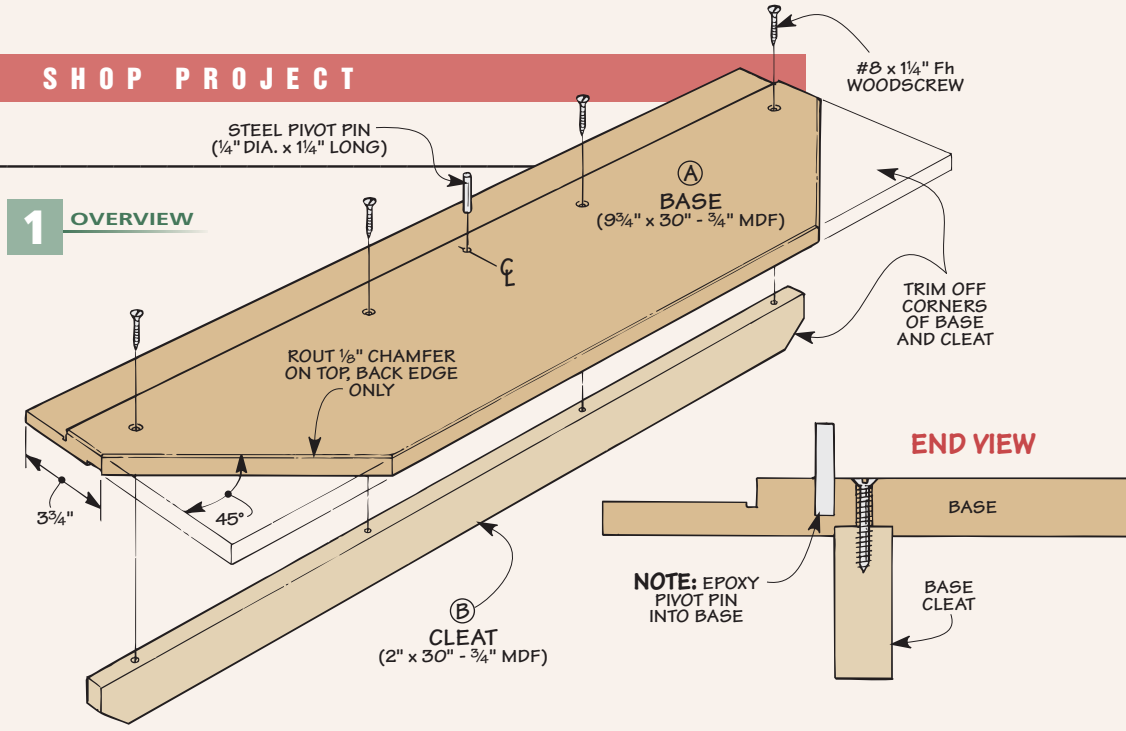
Drill Hole – Once the rabbet is cut, the next step is to drill a hole in the base for a pivot pin that will be added later. I did this on the drill press, like you see in Figure 3.

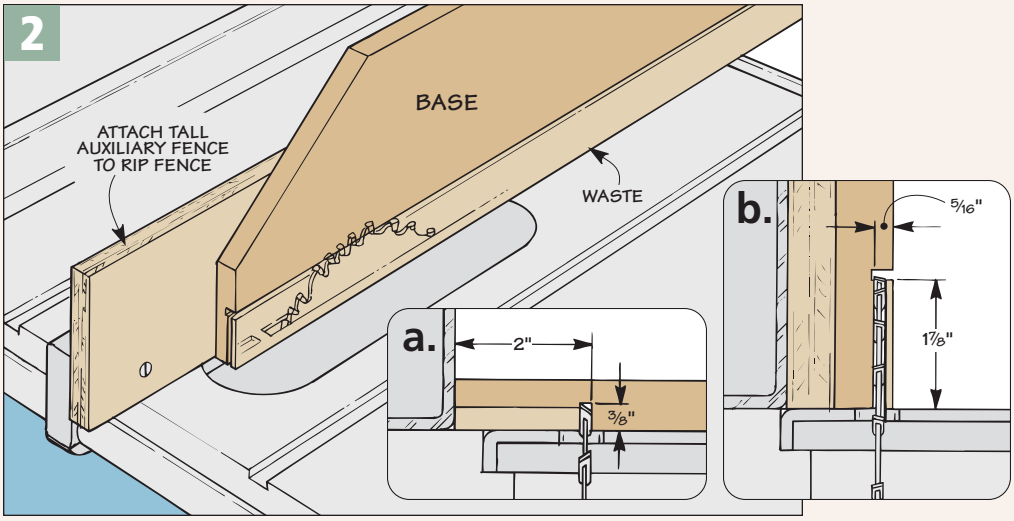
Cut Groove – Before you can add the cleat, you need to cut a groove in the bottom of the base. This groove will hold the cleat and keep it aligned during assembly. In Figure 4, you can see how I cut the groove on the table saw with a dado blade.

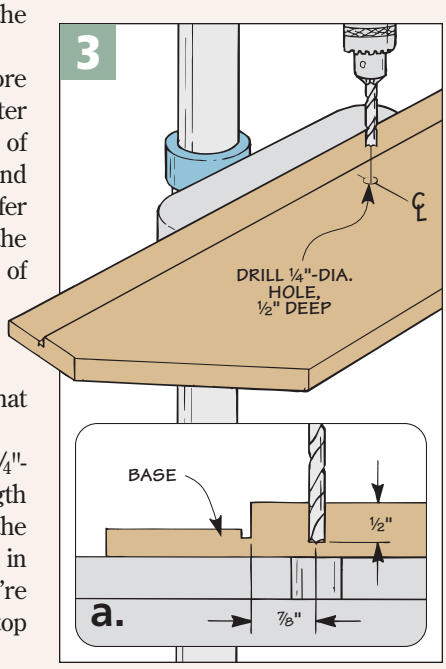
Cleat – The cleat is nothing more than a narrow strip of MDF. After knocking off the sharp corners of the *cleat (B)*, it can be glued and screwed to the base. Then a chamfer is routed around the edges of the base. (Note: The rabbeted edge of the base is *not* chamfered.)

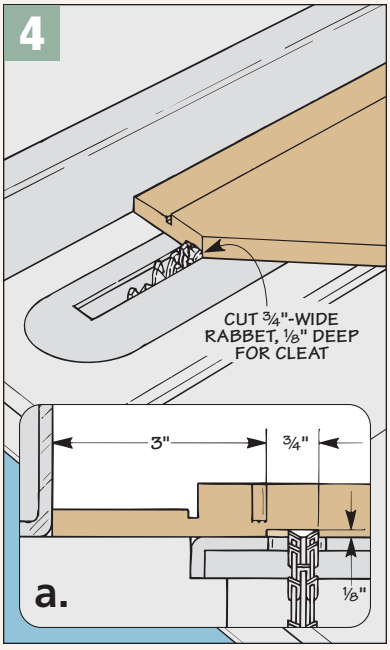
Pivot Pin – The last step to complete the base is to add a pivot pin for the adjustable stop that will be added later.

The pivot pin is just a piece of ¼"-dia. steel rod. It gets cut to length (1¼") and is then epoxied into the hole that was drilled in the base in Figure 3. Once this is done, you're ready to start working on the stop and fences of the shooting board.









Stop and Fences

The rabbet cut in the base of the shooting board guides the hand plane. But in order to hold the workpiece in place you need a stop block. On most shooting boards, this stop is just a block of wood that is glued or screwed to the base. But the stop on *this* shooting board is designed to pivot so it can be set up for miters of any angle.

The *stop block (C)* starts off as a square blank cut from MDF. It's important to make sure this blank is cut square so that you have a true, 90° corner.

Before cutting the blank to shape, I laid out and drilled all the holes. First, a couple of ¼"-dia. holes for the pivot pin and locking pin are drilled, as you see in Figure 6. Then you can drill the holes for a pair of T-nuts. These holes are counterbored so the T-nuts will be flush with the bottom of the stop block when they are installed (Fig. 6b). These T-nuts will be used to hold the sliding fences that are added later.

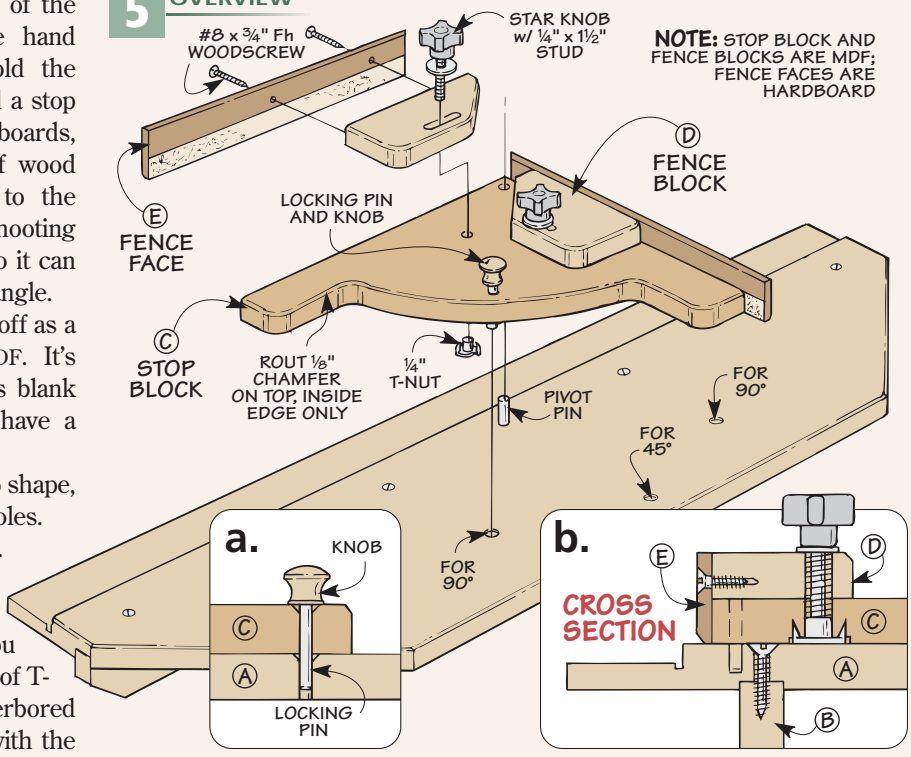
After installing the T-nuts, the stop block can be cut to shape. I laid out the profile on the blank and then cut it to shape on a band saw, see Stop Block Detail below. But if you don't have a band saw, you could use a jig saw. After cutting the block to shape, the edges are sanded to remove any saw marks. And the top, inside edge is chamfered (Figure 6).

Sliding Fences – In order to back up your workpiece when "shooting" a miter, a pair of sliding fences are attached to the stop. These fences can be adjusted in or out to provide maximum support for your workpiece.

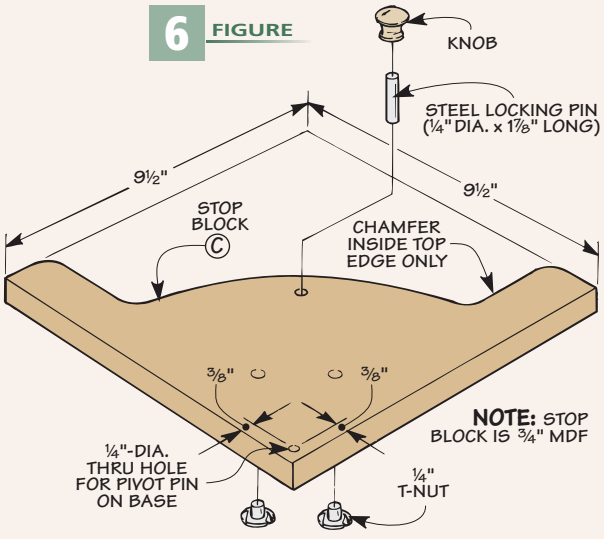
Each fence is made up of a fence block and a fence face (Figure 7). The *fence blocks (D)* are cut to shape from ¾" MDF. After the edges are sanded smooth, a slot is cut in each block for a knob with a threaded stud. I made these slots by drilling a couple of holes to establish the ends of the slot then cutting out the waste in between with a jig saw.

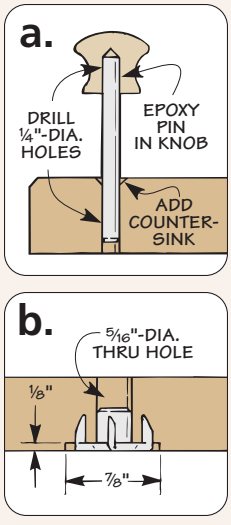
After the slots are cut, you can chamfer the top edges of each block. Just don't chamfer the front (long) edge. This edge is left square since the fence face will be added to it later. Also, when you are chamfering the

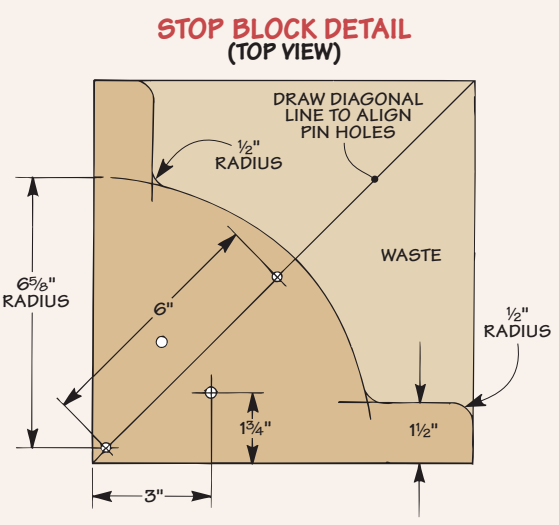
5 OVERVIEW



6 FIGURE







edges, keep in mind that you will need a left-hand fence block and a right-hand fence block.

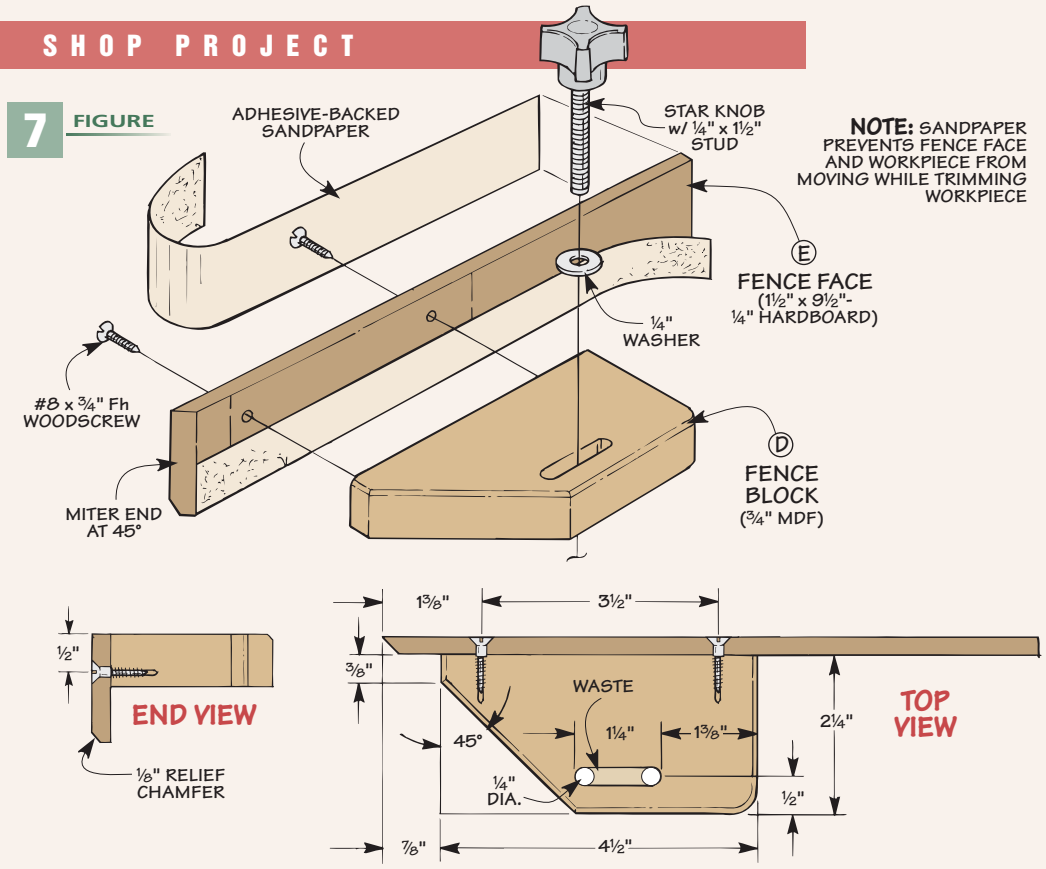
Fence Faces – The *fence faces (E)* are just narrow strips of ¼" hardboard, mitered on one end. Each fence face is chamfered slightly on the bottom edge to create a relief. After the fence faces are made, they get screwed to the fence blocks. I didn't use any glue here so that I could replace the faces later if they get chewed up.

Fence Hardware – The sliding fences are mounted to the stop block with star knobs and washers. The knobs have threaded studs that screw into the T-nuts mounted in the stop (Figures 5b and 7).

Once the fences are added to the stop, the next step is to drill a few holes in the base of the shooting board for a locking pin. This will allow you to automatically position the stop at 45° or 90°.

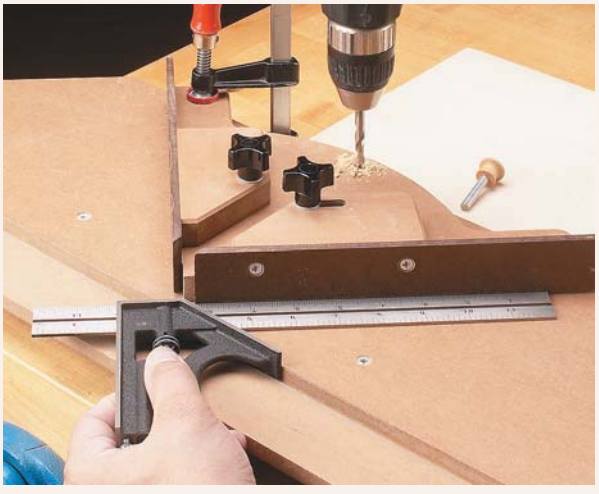
It's important that the holes for the locking pin are drilled accurately. To do this, I placed the stop over the pivot pin in the base of the shooting board. Then I used a combination square to set the stop at a 45° angle to the rabbeted edge of the base, as you see in Step 1 below. With the stop clamped securely in place, I drilled a ¼"-dia. hole in the base, using the hole in the stop as a guide.

7 FIGURE

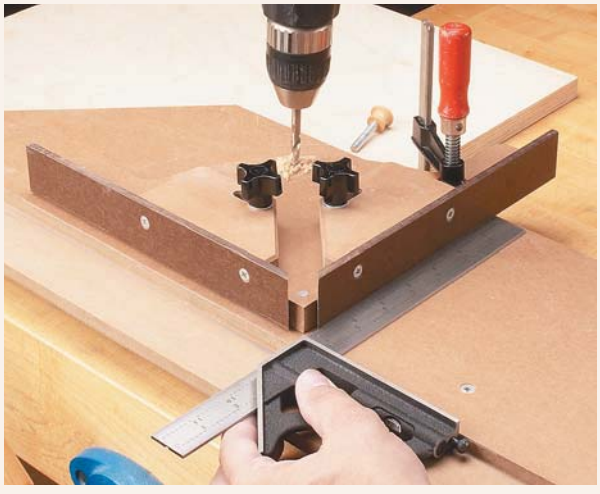


To drill the second hole, I repositioned the stop at 90°, see Step 2 below. Then I swung the stop around so the opposite fence was perpendicular to the edge and drilled a third hole. After all three holes are drilled, you can pivot the stop out of the way and countersink the holes in the base. This will make it easier for the locking pin to slip into each hole when you are using the shooting board.

Locking Pin – Like the pivot pin, the locking pin is also cut from a piece of ¼"-dia. steel rod. But a wood knob is epoxied to the end of the locking pin to make it easier to remove (Figure 6a). Finally, I added some adhesive-backed sandpaper to both sides of the fence faces (Figure 7). For more information on setting up and using the shooting board, see the article on page 16.



1 *To drill the holes in the base for the locking pin, use a square to position the stop block. With the stop block clamped in place, drill a hole in the base, using the hole in the stop block as a guide.*



2 *To drill the two holes for the right angle settings, reposition the stop so it is square to the front edge. Countersink the holes after drilling them to make it easier to insert the locking pin.*