



Perfect miters—Guided by Ed Speas' shooting board (left), a Lie-Nielsen #9 miter-plane easily shaves a 45° miter on molding. The fence is reversible, so the fixture can handle left- and right-hand cuts.

Fixture doubles as a bench hook (below). To convert the shooting board to a bench hook for 90° sawing, the author simply removed the miterfence (here resting in the bench trough).

Shooting Board Aims for Accuracy

*Multi-task fixture guides saws
and planes for perfect joints*

by Ed Speas



Fitting miters has been every woodworker's problem at one time or another. Whether you are making a picture frame or joining molding, if your angle of cut or your piece lengths are not perfect, you have to repeatedly shave a smidgen to get a tight joint. Although a chopsaw or a tablesaw can save time and effort, it may not be the best choice for extremely clean and accurate cuts. If you use a handsaw, it tends to wander if not precisely guided. And even then, I don't know too many folks who can really get consistent forty-fives with a hand miter box alone. Trimming 90° cuts can also be a problem. A sawblade, hand or power, rarely leaves a smooth enough surface. If you sand the end grain, again, you risk introducing error.

You can eliminate these difficulties by using a simple fixture called a shooting board. When guided by a shooting board, a plane with a razor-sharp edge, set to take a light cut, can accurately slice off wispy thin shavings, as shown in the photo at left above. And the end grain will be left with the smoothest surface possible. To use one of these fixtures, first place a workpiece against the fence, and lay a handplane on its side with the sole against the edge of the base. Butt the work up to the plane sole, and then push the plane by the work in several passes.

The shooting board I use is an adaptation of an old bench hook, or sawing board. I made this combination bench hook/shooting

board so it would either hold stock while sawing (see the photo at right on the facing page) or precisely plane the ends of stock. One of the fixture's unusual features is its removable 45° fence, which makes it both a miter and a right-angle shooting board. The fence is reversible as well, so I can pare miters from the left or the right side, a great advantage when I need to work each half of a joint in molded work.

Making the fixture

My shooting board consists of a rectangular base and fence, a triangular miter fence and a hook strip, which serves as a bench stop and a clamping cleat. I made all of the parts out of medium-density fiberboard (MDF). To get the 1-in. thickness I wanted, I first laminated two pieces of ½-in. MDF, about 9 in. by 25 in. Next I cut out pieces in the sizes shown in the drawing at right, making sure all the corners were exactly square and the 45° angles were dead accurate, not just close.

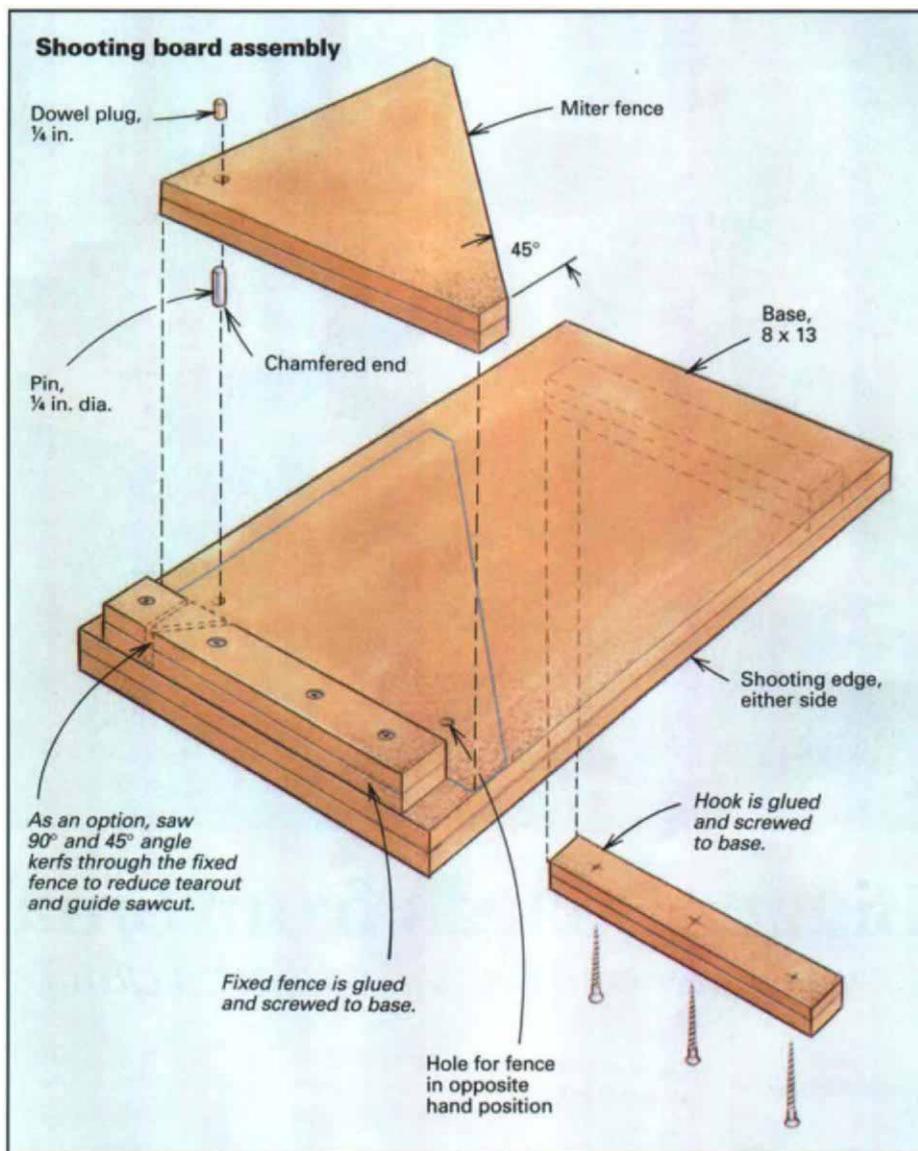
When assembling the shooting board, I was concerned about how much pounding the fixed fence would take. That's why I both glued and screwed it to the base. I attached the hook the same way. First I drilled and countersunk the screw holes. Next I aligned each piece with a square and glued and clamped it to the base. Then I fastened each in place with bugle-head drywall screws.

The removable miter fence registers against the fixed fence and is held down by a snug-fitting pin. I used a ¼-in. bolt with the head cut off for the pin. As an alternate, a hardwood dowel would work, but I suspect over time the pin would become loose. Because the location of the pin and the size of its holes are critical, I bored the holes with my drill press. First I drilled a ¼-in. pin hole through the miter fence in the location shown in the drawing. Next I clamped the fence to the base in its right-hand position, so I could drill through the pin hole into the base. I flipped the miter fence and did the same thing to make the hole for the left-hand position. I chamfered the end of the pin and then tried its fit in the base holes.

Using cyanoacrylate glue, I secured the pin in the fence hole, letting the chamfered end hang out about ½ in. on the underside of the fence. For aesthetic reasons, I plugged the top ¼ in. of the fence hole with a dowel. With the shooting board together, I clamped it in my bench vise. Then I laid my plane on its side and took a shaving off the shooting edge, both sides. Because a standard plane iron does not go all the way across the sole, the iron leaves a rabbet along the base. This is necessary for proper registration of the plane. After dusting the fixture off, I finished the whole thing with oil. After it was dry, I waxed the shooting board to keep it slick and clean.

Shooting square cuts and miters

To use the shooting board, clamp its hook in an end vise to keep the fixture stable. Make sure your bench is dead flat, or lay down



a flat auxiliary table before clamping the fixture. While steadying the workpiece, hold the plane with a firm grip, and keep it tight against the edge of the shooting board as you take multiple passes. Use the largest bench plane you have. A Stanley #7 or #8 jointer plane works best, but a #5 jack plane will also do, as long as it has a sharp iron, squarely set, and its sole is true and square to the plane's body. Even better, you can use a miter plane, which resembles an oversized block plane and is specifically meant for shooting (see the photo at left on the facing page).

When shooting the end grain of a right angle cut, it's a good idea to knife an edge line around the board, which will prevent tearout, and then plane to the line. When shooting 45° angles, tearout is rarely a problem. In this mitering mode, the shooting board can trim tiny amounts (see the photo at left on the facing page). This is crucial when fitting a lipping around a veneered panel, for example, where the length of the lipping from inside miter to inside miter has to be exactly the length of the panel. Because the fence pin serves as a pivot point, you can adjust the angle of cut slightly to bisect a corner that's not quite square. Just insert a paper shim where needed between the fences. I have a stack of old business cards that work great for this.

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