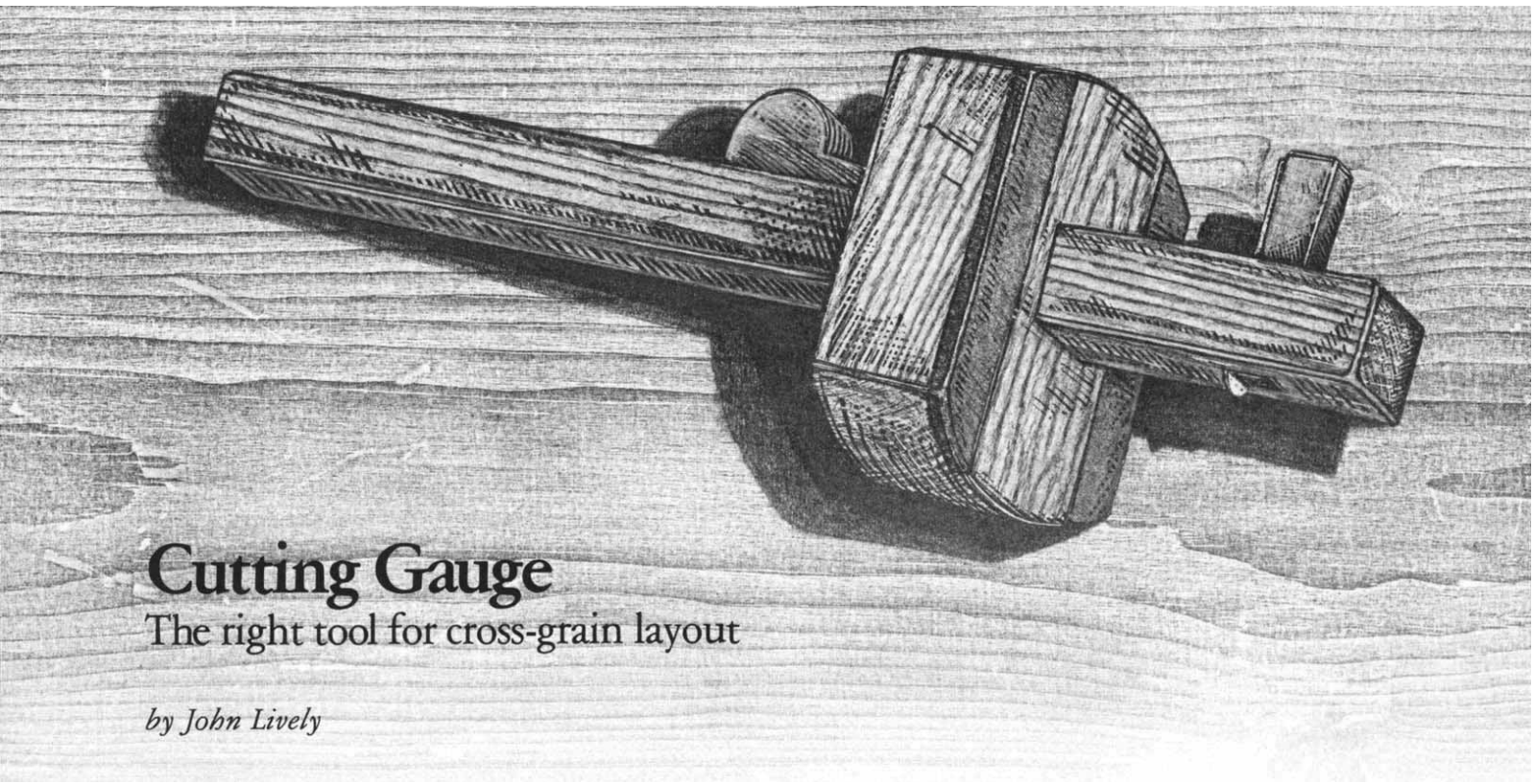


Cutting Gauge

The right tool for cross-grain layout

by John Lively

Nothing quite beats the cutting gauge for scoring across the grain. For striking dovetail baselines and shoulder lines for tenons, dadoes and rabbets, it's an especially accurate and handy tool. It can also be used to eliminate splintering when crosscutting by scoring the wood prior to sawing, though this requires an initial crosscut to within an inch or so of the final length to give the gauge an. edge to ride against.

Unlike the ordinary marking gauge whose steel scribing pin is designed to mark along the grain, the cutting gauge is equipped with a cutting spur, which when properly ground and honed, severs cross-grain fibers cleanly. Used across the grain, the marking gauge can tear the wood and produce a ragged line, but the cutting gauge incises a neat, clearly visible cut, just the right thing to accept the edge of a sharp chisel when paring away the last bit of end-grain tissue.

The only commercially available cutting gauge on the American market is made by Marples (England) and is sold by most mail-order tool suppliers for about $14. Usually made from beech, the fence has two brass wear strips let into its face, and is bored and tapped to receive a plastic thumbscrew which tightens against the stock and locks the fence in place at any distance from the spur. The Marples cutting spur is ground to a spear point and beveled on both skewed faces and is flat on the back. The spur is held firmly in the stock by a brass wedge. If you buy one of these or already have one, you'll get it to work better by regrinding the spur to a round-nose profile as described below.

Instead of buying a cutting gauge you might want to make one. Start by selecting and dimensioning the material for the fence and stock. A stable, relatively dense hardwood like maple or cherry will do. Though the pieces themselves are small, it's best to cut the blanks large enough to machine them. The fence blank should be planed to a finished thickness of 1 1/16 in., ripped to a final width of 2 3/16 in., but leave the block about 14 in. long for now. Thickness the blank for the stock (bar) to 3/4 in. square, cut it to its finished length of 7 1/2 in. or 8 in. and put it aside.

Now pencil the outline of the fence in the middle of the blank. The fence is about 2 3/4 in. long (its length really depends on what size most comfortably fits your hand), and it is radiused top and bottom. Orient the layout so the grain runs vertically, from one rounded end to the other. To mortise the fence to receive the stock, locate the center of the fence and construct a 3/4-in. square about it, knifing-in the lines on both faces so that you have two squares directly opposite one another. Next bore a 5/8-in. hole through the block, centering the bit in the square. Enlarge and square up the hole, finally paring from knife line to knife line on all four sides of the mortise. The stock should slide freely through the mortise, but with no wobble side to side or up and down.

Fence and stock are locked together by a wedge, which requires tapering the top of the mortise at about 10°. Find the angle with a sliding bevel, and knife a line on the inside of the fence the proper distance above the top of the mortise. The tapered slot for the wedge is 5/8 in. wide; this will leave a 1/16-in. wide untapered shoulder on either side of the mortise. These keep the stock from flopping up and down when the wedge is removed. Pare down the end grain with a 5/8-in. chisel to form the slot, taking care to stop the taper just short of breaking through at the other end. Cut the wedge to fit the angle of the slot, but make it about 1/16 in. narrower than the slot is wide. The lateral play here, along with the prominent hump on the rear of the wedge, lets you wiggle the wedge side to side when you want to remove it.

Cut a 1/2-in. wide by 1/8-in. deep rabbet down both sides of the block on the face side (opposite the wedge side). These receive wear strips which you can make from a dense tropical wood like lignum vitae, ebony or rosewood. Finally, bandsaw the fence from the blank and epoxy the wear strips in place. When the glue has cured, sand the strips flush with the face, and smooth the rounded top and bottom edges.

Grind the cutting spur from a length of old hacksaw blade. It is 5/16 in. wide and 1 1/2 in. long. You ought not break it off until you've ground and honed the edge. The business end is first rounded and then beveled to a sharpening angle of about 20°. The rounded edge keeps the tool from digging in

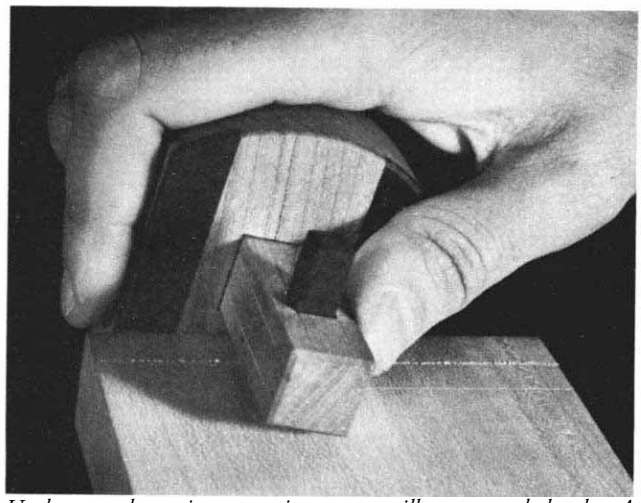
and dragging. Back off the unbeveled side on a stone, hone the bevel, then back it off again. Soften the upper edge with a file after snapping it off.

Cut the mortise for the spur and its retaining wedge about ½ in. from the end of the stock. Proceed as you did when mortising the fence, only taper the outside wall the full width of the mortise; lastly, fashion the wedge from the same tropical wood you used for the wear strips.

Traditionally used, the cutting gauge (and the marking gauge for that matter) is pushed into the work rather than pulled. This requires adopting a special grip to get consistent, accurate results. As shown in the photo at right, the index finger wraps around the top of the fence, while the thumb, positioned against the stock directly above the cutter, powers the tool. If you try to push the tool by its fence, it's liable to get slightly askew and bind against the wood. Trying to cut the full depth in the first pass can also cause the cutter to bind, drag and even wander; so first make a light pass. Having easily cut a shallow groove straight and true, you can make a second pass to final depth without risk of binding or wandering, because the scoring spur cannot deviate from the groove it cut first, and half the work is already done.

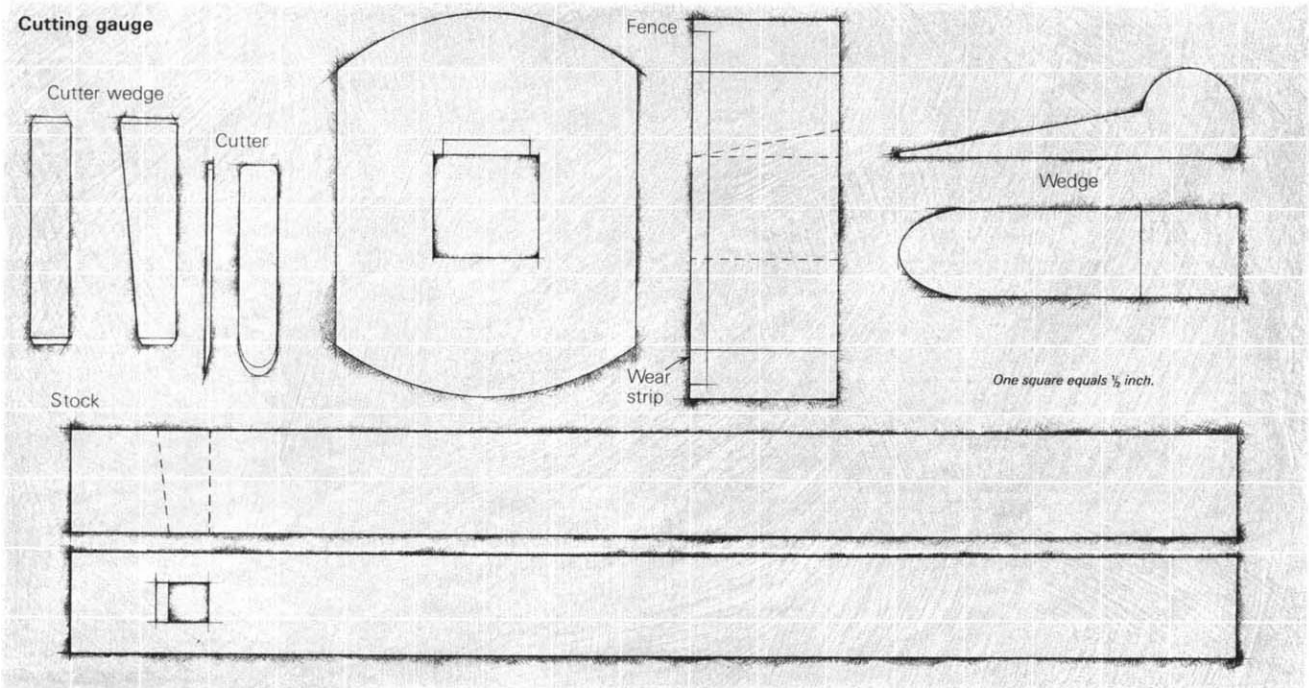
The orientation of the cutter is important, and can be different, depending on whether you are left or right-handed. If the toe of the spur is inclined toward the fence even slightly, you'll have a hard time getting a straight cut because the spur will want to push the fence away from the edge as you move the tool along. If the heel of the spur is angled toward the fence, it will wedge the fence against the edge during the cut, tight enough to cause binding if the angle is too great. Ideally the cutter should heel-in toward the fence one degree or less; this combines ease of operation with a slight wedging action, which means that you don't have to jam the fence against the edge of the board with barbaric force. Shave small amounts of end-grain tissue off the rear wall of the mortise in the stock until you get the right degree of skew.

For most woodworking operations, the bevel of the spur should face the fence, a condition that means that the beveled side of the scored groove is in the waste and that the groove wall on the other side is perfectly vertical to the face of the board. This vertical wall is plainly visible (the end-grain has been burnished by the spur), and it makes the task of end-grain paring *(FWW* #27, March '81, p. 72) considerably easier. You've already got a ledge about 1/32 in. wide on either side of the board to position the edge of your chisel for the final, leveling shave.



Used across the grain, a cutting gauge will score wood cleanly. A marking gauge has torn the wood fibers and left a ragged mark.

The cutting gauge is more than a marking tool. Its spur actually cuts the visible shoulder line of the joint it's laying out. The careful chiseling you do between the scored lines, the nice end-grain surface you leave behind, gets covered up when the joint goes together. But the clean, straight line you scored with the cutting gauge is what you see and feel once the shoulder is pulled up tight. In laying out a joint with a cutting gauge, you make the final cut first. □



Illustrations: E. Marino III