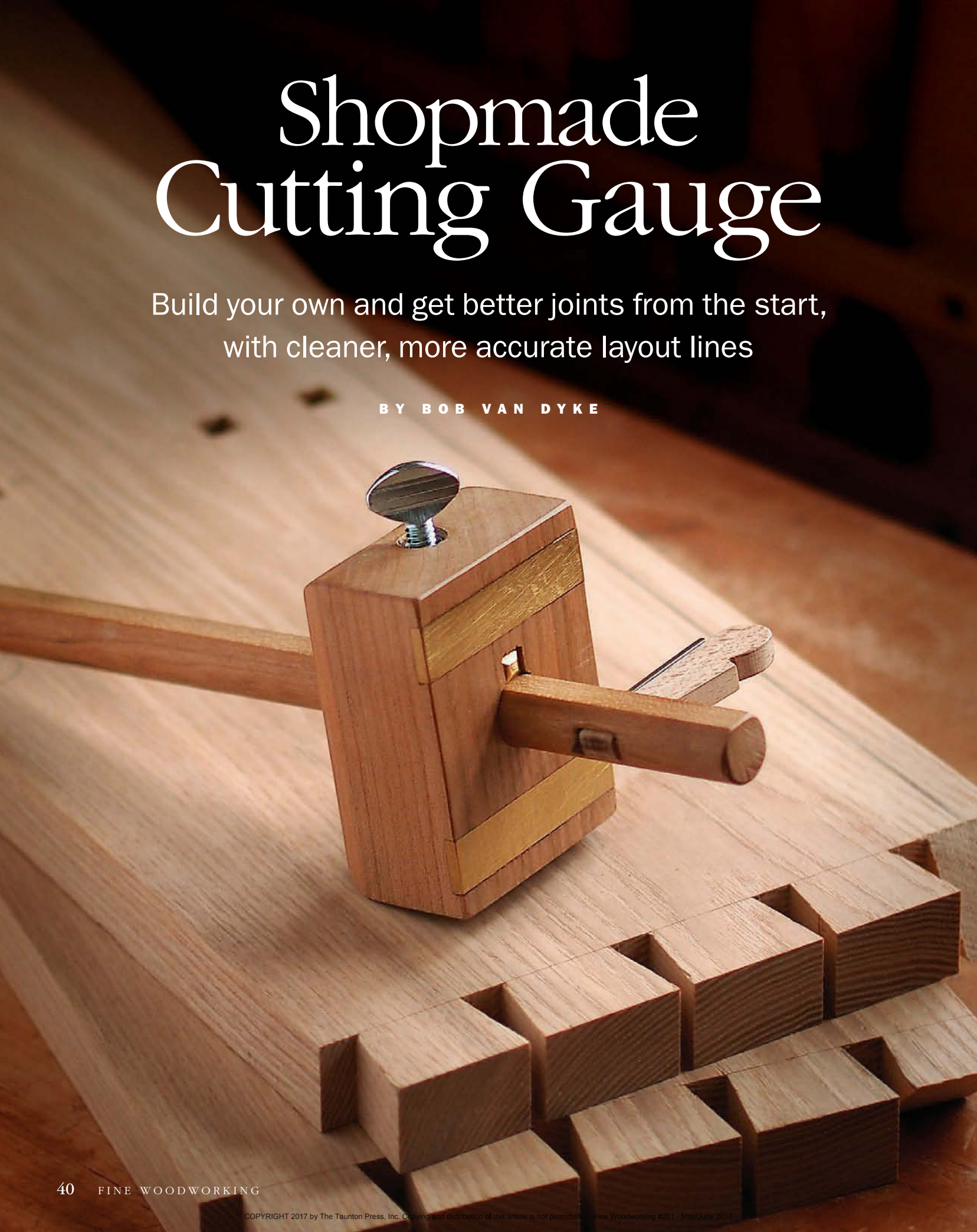
Shopmade Cutting Gauge

Build your own and get better joints from the start, with cleaner, more accurate layout lines

BY BOB VAN DYKE



COPYRIGHT 2017 by The Taunton Press, Inc. Copying and distribution of this article is not permitted. Fine Woodworking #261 - May/June 2017

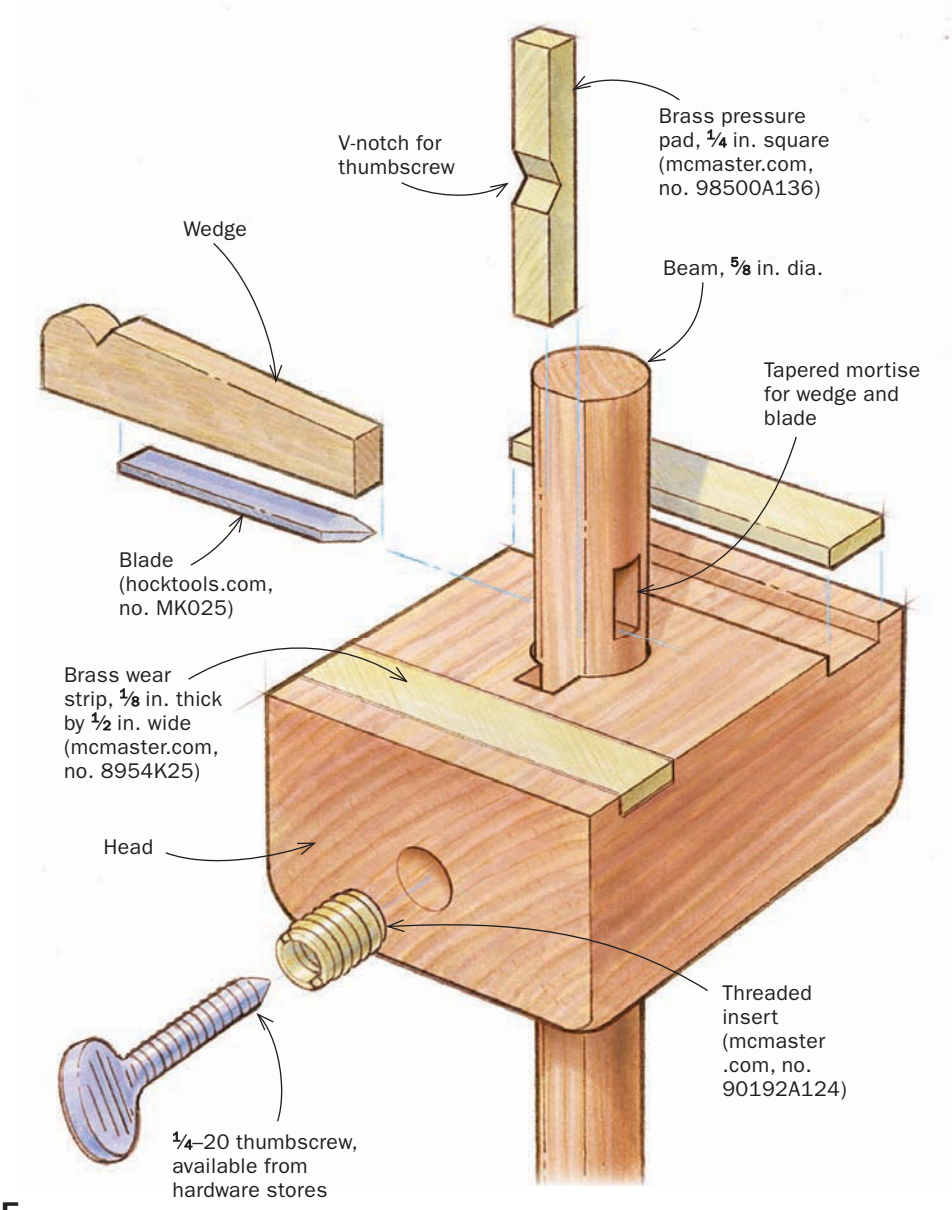
Accurate joinery is a matter of cutting to a line but not beyond it. So it's necessary to begin with precise layout. One of the best tools for this is a cutting gauge. This precision tool severs the fibers on the surface of the board, creating a clean, deep, and well-defined layout line that is easy to see.

The design I prefer is one by my friend Will Neptune, who made his while a student at North Bennet Street School in Boston. It has a good single-bevel knife for a blade, a large and comfortable fence, and a round beam. The round beam has several benefits. First, it's easy to see where you are starting and stopping the cut, and the mortise in the gauge's head is drilled rather than chopped, simplifying construction.

Make and mortise the head

Mill a block of hardwood—cherry, tiger maple, and walnut are good choices—to the head's final dimensions. Mill a setup piece to the same dimensions to help dial in machine settings.

It is important to follow this drilling and mortising sequence: Drill a hole to receive the threaded insert. This should be in the exact center of the end of the head blank and about halfway down. Lay out a ⅝-in.-dia. circle on the face, and then a ¼-in.-square mortise tangent to the circle. I cut the mortise with a hollow-chisel mortiser. I



A BETTER MARKING GAUGE

Design has distinct advantages. *Brass wear strips ensure that this gauge will last for years, while the screw and pressure pad lock the beam securely in the mortise so that it doesn't move during use. The round beam lets you see exactly where the point of the blade is, allowing you to start and stop a cut with great precision.*

Single-bevel blade is more accurate. *The blade in this gauge cuts a deeper, cleaner, more precise line than either the pin of a traditional marking gauge or the round cutter of a wheel gauge. Orient the bevel toward the gauge's head so that it pulls the gauge tight to the workpiece as it cuts.*

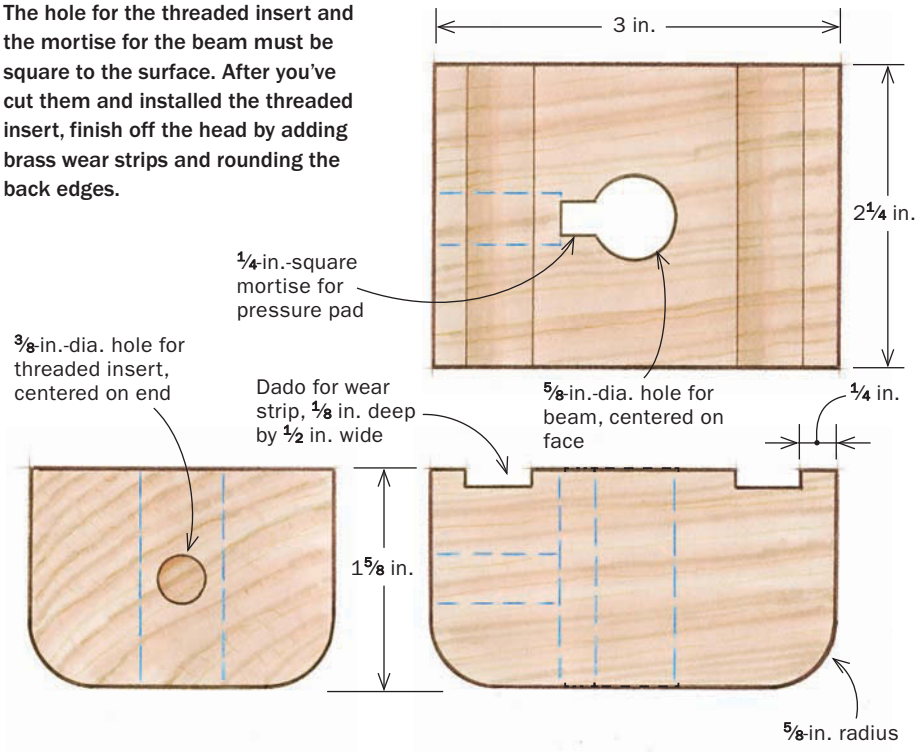
Drawings: Dan Thornton

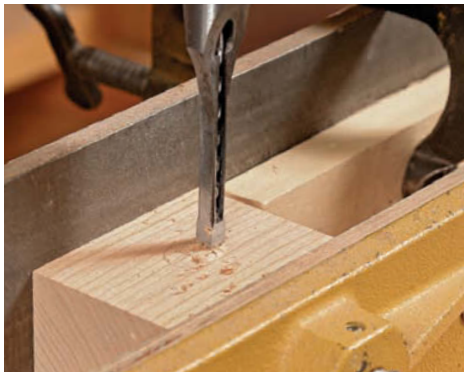
COPYRIGHT 2017 by The Taunton Press, Inc. Copying and distribution of this article is not permitted. Fine Woodworking #261 - May/June 2017

MAKE THE HEAD FIRST

Drill for the threaded insert. *Centered in one end, the hole extends halfway through the head. To steady the head during drilling, Van Dyke presses it into the corner of a right-angle fence.*

The hole for the threaded insert and the mortise for the beam must be square to the surface. After you've cut them and installed the threaded insert, finish off the head by adding brass wear strips and rounding the back edges.





Mortise for the pressure pad. *To cut the square mortise, go halfway through from one face, flip the head over, and finish the cut. A stop block ensures perfect alignment.*

A hole for the beam. *Again using the L-shaped fence to steady the head, drill completely through from one side, using a piece of MDF beneath to prevent blowout.*

Seat the insert beneath the surface. *To ensure that it ends up square to the surface, Van Dyke uses an unplugged drill press to begin threading the insert. The head is held steady in the jaws of a hand screw (right). Then he puts the driver into a ratchet to recess the insert (far right).*

cut in halfway from both faces, using a stop clamped to the fence to locate the head accurately. Back at the drill press, drill the hole for the beam. Make sure to back up the piece with a fresh piece of plywood or MDF to prevent blowout as the bit exits the hole. For safety and accuracy, use a right-angle fence to support the head.

Install the threaded insert now. I use an unplugged drill press to ensure that it goes in straight. Insert the driver bit and turn the chuck by hand while keeping downward pressure on the drill-press handles. I finish recessing the insert with a ratchet (see bottom photos, left).

Now rout the dadoes for the brass wear strips. Make them shallow enough that the strips sit just proud of the surface. Because these dadoes are routed across the grain, knife the edges of the cuts before running them on the router table. Back up the block so it does not blow out as the bit exits the cut. Glue the brass wear strips into the head with epoxy. After the glue dries, sand the strips flush and remove any squeeze-out. Finally, round over the back side of the head.

Round beam makes gauge user-friendly

The gauge's beam begins its life as a ⅝-in.-dia. dowel. Dowels can be incon-

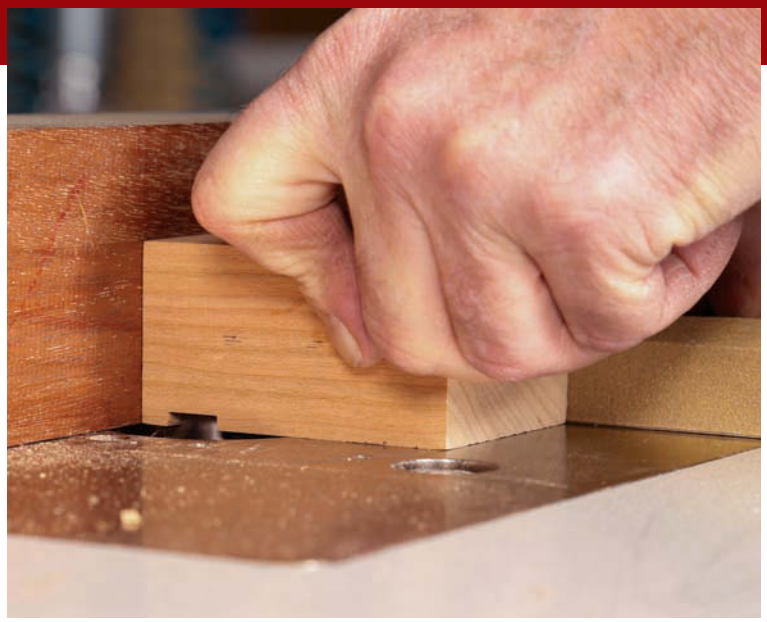
Photos: Matt Kenney

COPYRIGHT 2017 by The Taunton Press, Inc. Copying and distribution of this article is not permitted. Fine Woodworking #261 - May/June 2017

sistent in diameter, so I knock the dowel through a dowel plate, and sand and scrape it to get a tight fit that still slides smoothly.

Clamp the dowel in a bench vise and plane a flat on one side. The flat should be the same width as the brass key stock you'll use later for the pressure pad.

Now cut the mortise for the blade and wedge. The front end of the mortise is angled about 8°. The back end is perpendicular. I cut the mortise with a hollow-chisel mortiser, holding the dowel in a jig



Rout dadoes for the wear strips. *These should be a bit shallower than the brass strips are thick. Use a fresh backer block to prevent blowout and to steady the small block.*

Epoxy for the brass. *Spread a thick layer over the bottom and walls of the dado before setting the brass wear strip into it.*

Use a jig to press them in. *Dowels, cut in half and glued to a block of hardwood, direct pressure over the strips. Let the glue dry before leveling the strips.*

Sand to level the strips. *Start with coarse paper and work up 220 grit. Work on a flat surface, like a piece of ¼-in.-thick glass, or the table of a jointer or tablesaw.*

(see drawing, p. 44). To make the square end of the mortise the dowel is held in the jig with a wedge underneath. This ensures that the beam is parallel to the mortiser's work table. Remove the wedge to cut the angled front end of the mortise.

To lock the beam in the head and allow for precise adjustments, a thumbscrew presses on a pressure pad made from brass key stock. When tightened, this pad will press against the flat planed into the beam. File a V-shaped groove into the middle of the brass pad, and then grind a matching point into the end of the thumbscrew. The groove and matching point hold the pad in place when the screw is loosened.

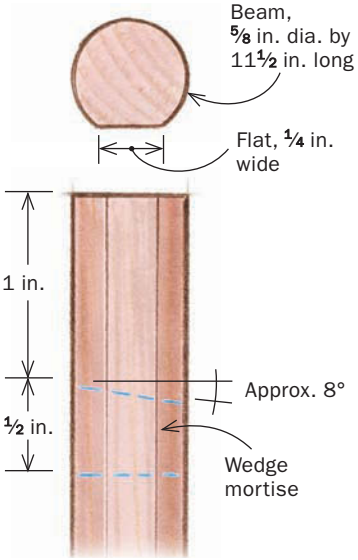
Now turn your attention to the wedge and cutter. Make the wedge from a tight-grained hardwood. The blank should slide freely in the mortise, and its angle should

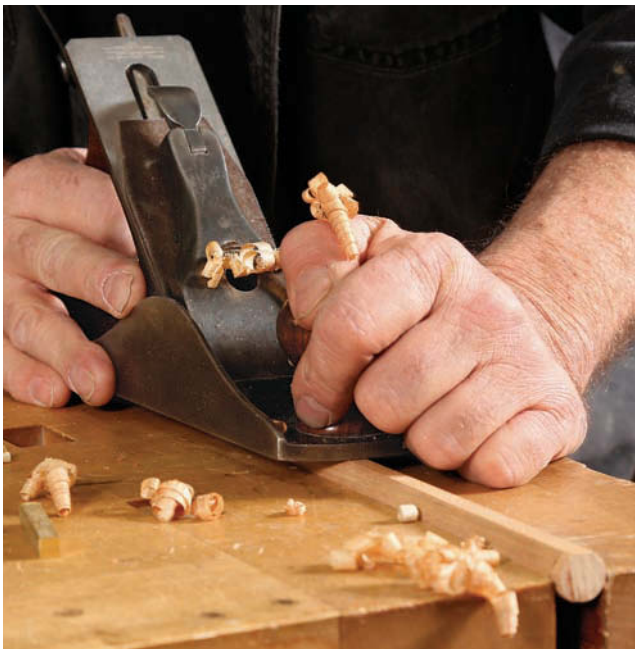
Round over the back edges. *Van Dyke uses a ⅝-in.-radius roundover bit and guides the workpiece past the bit using a backer board. Shaping can also be done with hand tools. The key is to make the head comfortable to hold.*

COPYRIGHT 2017 by The Taunton Press, Inc. Copying and distribution of this article is not permitted. Fine Woodworking #261 - May/June 2017

MORTISE THE BEAM AND FIT THE WEDGE

The exact angle used for the mortise and wedge isn't critical, but it should be the same for both.

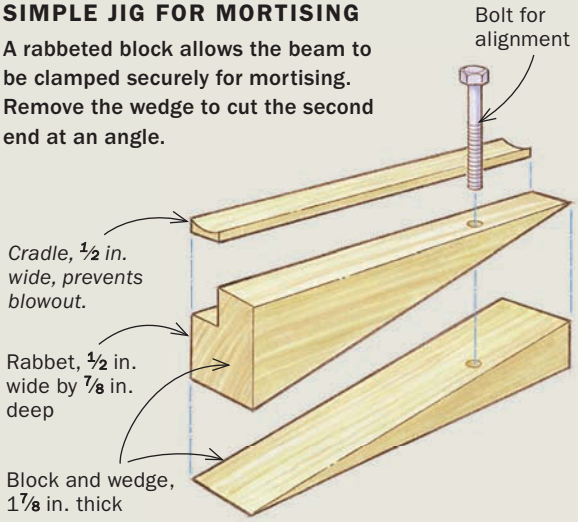


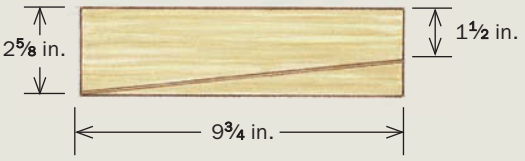


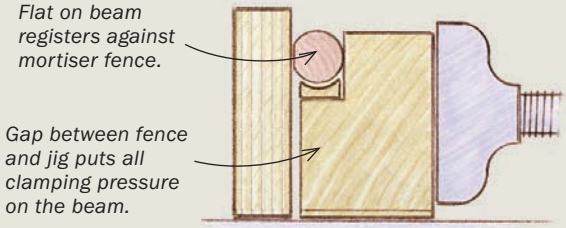
Flatten one side. *Clamp the beam in a bench vise and carefully plane a flat into it (left). Stop when the flat is as wide as the brass pressure pad (above).*

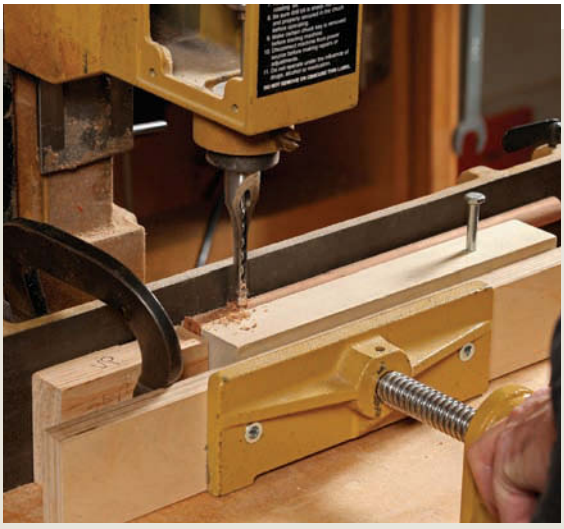
SIMPLE JIG FOR MORTISING

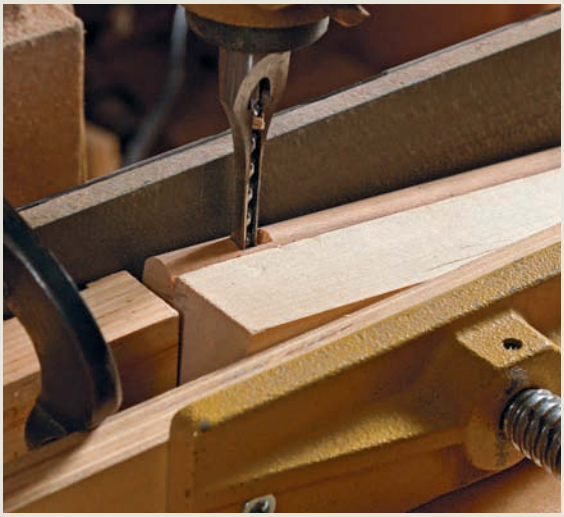
A rabbeted block allows the beam to be clamped securely for mortising. Remove the wedge to cut the second end at an angle.

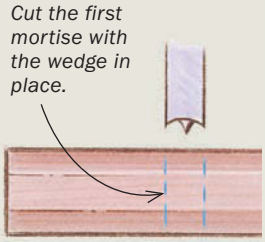




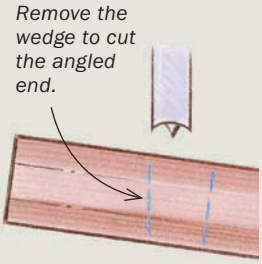




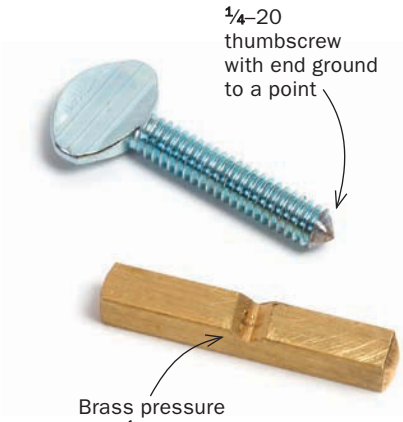


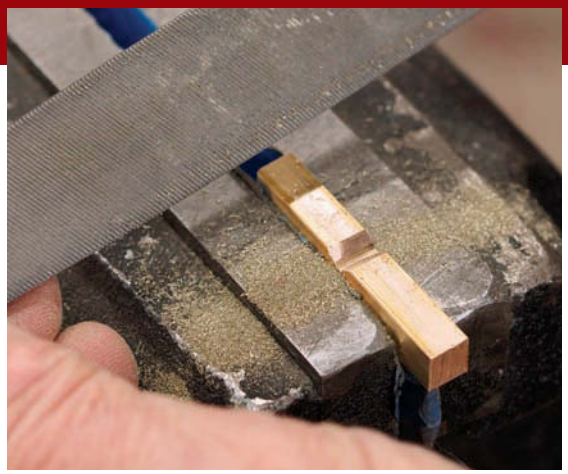


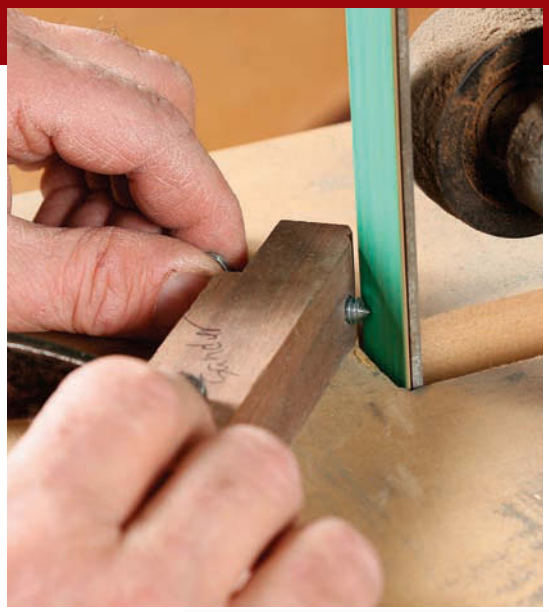
Cut the wedge mortise in two steps. *Begin with the end closest to the head, which is cut with the beam parallel to the mortiser's bed (top). Remove the wedge to cut the opposite end of the mortise at an angle to match the wedge that secures the blade in the mortise (bottom).*



COPYRIGHT 2017 by The Taunton Press, Inc. Copying and distribution of this article is not permitted. Fine Woodworking #261 - May/June 2017



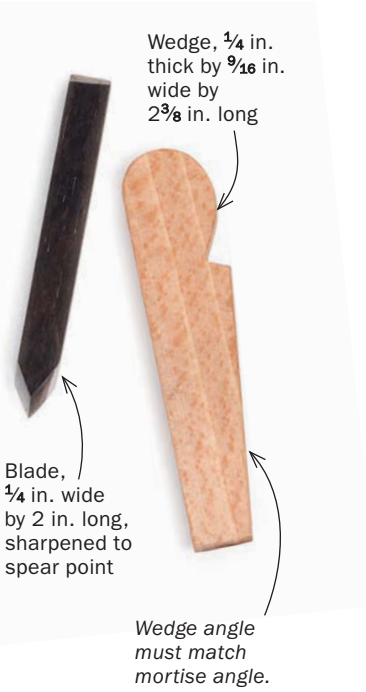




Notch the pressure pad and grind the thumbscrew to fit. *File a V-notch in the brass bar stock (above). Then use a guide block to grind the thumbscrew (right). Angled 45° to the sanding belt, it helps create a point that fits into the V-notch.*

The blade is easy. *Van Dyke uses a ¼-in. marking knife from Hock Tools for the gauge's blade, cutting off the first 2 in. at the grinder.*

Make the wedge. *A simple jig, which holds the blank at the correct angle, ensures that the wedge has the same angle as the mortise in the beam.*



match the mortise's angle. You can use the wedge from the mortising jig to get this angle.

The gauge needs a good blade, and the best I have found begins life as a Hock Tools ¼-in. marking knife. I cut about 2 in. off the end, and grind that to a shallow spear-point profile. Put the blade in the beam with the bevel facing toward the head and the tip protruding about ⅛ in. Lock it in place with the wedge. The bottom end of the wedge probably will stick out too far. Trace around the wedge, pull it out, and cut it down.

After one or two coats of wax, the gauge is ready for use. Always hold the gauge with your hand wrapped around the head and never around the beam. □

Bob Van Dyke is the founder and director of the Connecticut Valley School of Woodworking in Manchester, Conn.

Online Extra

To see Van Dyke sharpen a marking gauge and get perfect scribe lines every time, go to **FineWoodworking.com/261**.

Trim for clearance. *Scribe around the wedge, and then cut it so that it's just proud of the beam. This leaves enough sticking out for you to press the wedge out of the mortise and pull the blade out for sharpening.*

COPYRIGHT 2017 by The Taunton Press, Inc. Copying and distribution of this article is not permitted. Fine Woodworking #261 - May/June 2017