

Brass Stretcher Brightens



a Bench

Strong, classic form
with a metallic twist

BY MICHAEL ROBBINS



This bench came into being in two stages. It existed as a top and four legs for a year or so, moved from here to there around the shop, all the while unfinished and collecting dust. I knew the bench needed something. With its knife-edge seat and splayed turned legs, it had the classic proportions and simplicity of a Shaker bench, but it lacked a voice of originality.

At the time I had recently built a chair with a steam-bent crest rail, and that curve seemed to bring the chair together in a way that seldom happens with squares and angles. So I began a quest for a curve that would tie the bench's form together. I had some flat bar steel leaning in the corner of the shop, and I began playing with that. After kinking a few pieces, I figured out how to bend the steel to a smooth arch, one with enough tension built in to provide structure while achieving the visual flow I'd been

Create the seat



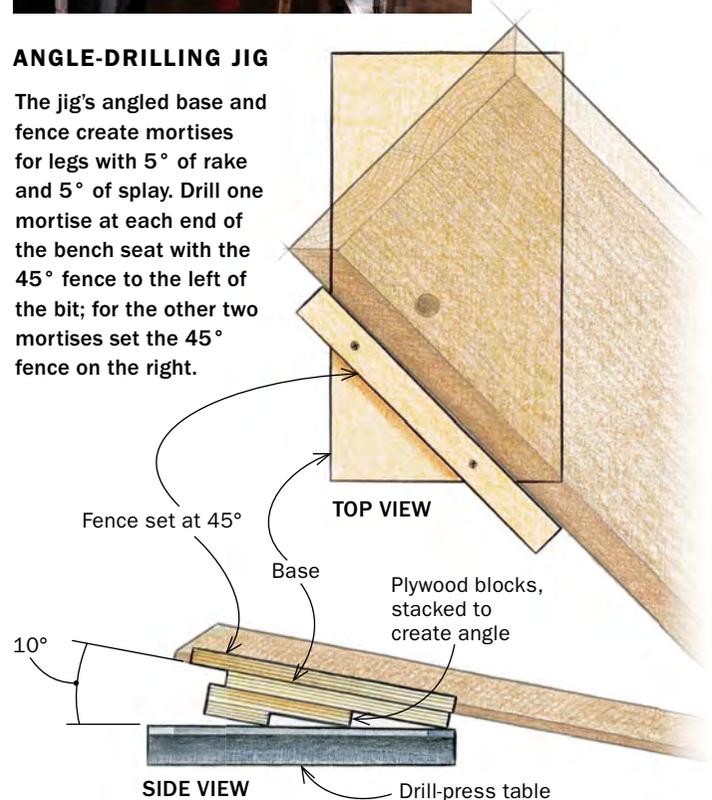
Bevel the blank. Robbins cuts the seat's wide underbevel on the tablesaw, leaving a narrow flat band above the bevel.



Jig directs the drilling. To drill angled mortises for the legs, Robbins built a jig for the drill press. It is ramped at 10° and has a fence set at 45°.

ANGLE-DRILLING JIG

The jig's angled base and fence create mortises for legs with 5° of rake and 5° of splay. Drill one mortise at each end of the bench seat with the 45° fence to the left of the bit; for the other two mortises set the 45° fence on the right.

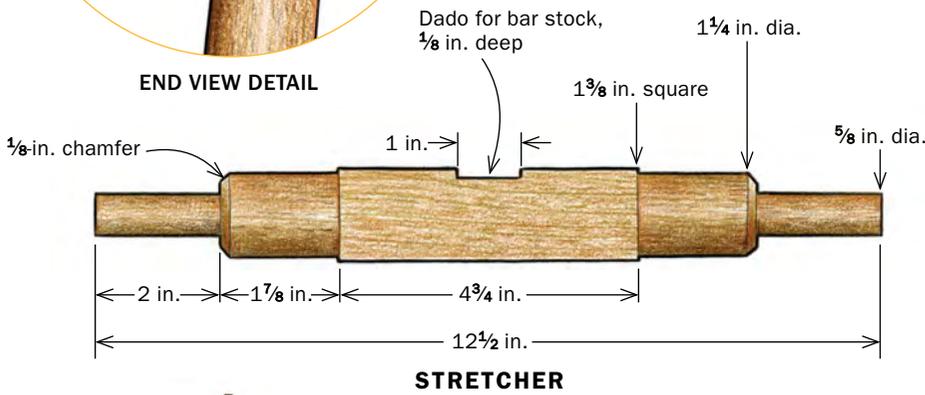
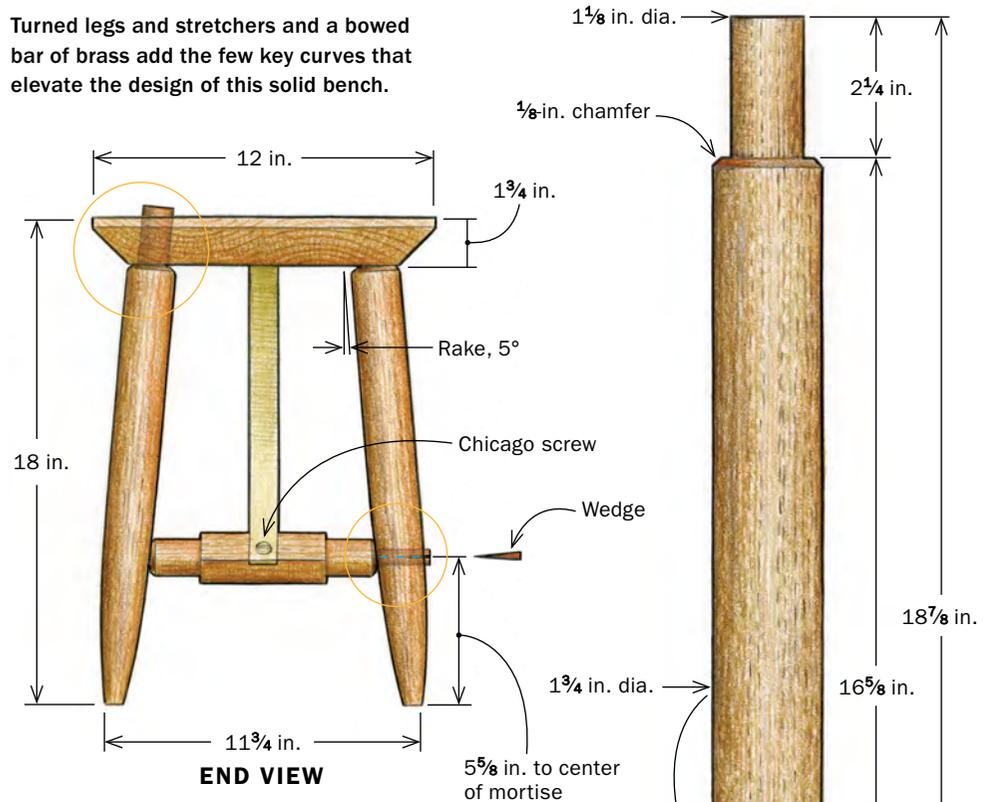
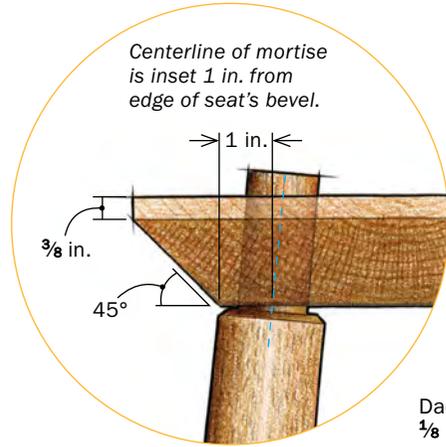


Finished at the bench. After drilling nearly through at the drill press, Robbins finishes the mortises with a hand drill. A backing block prevents blowout.

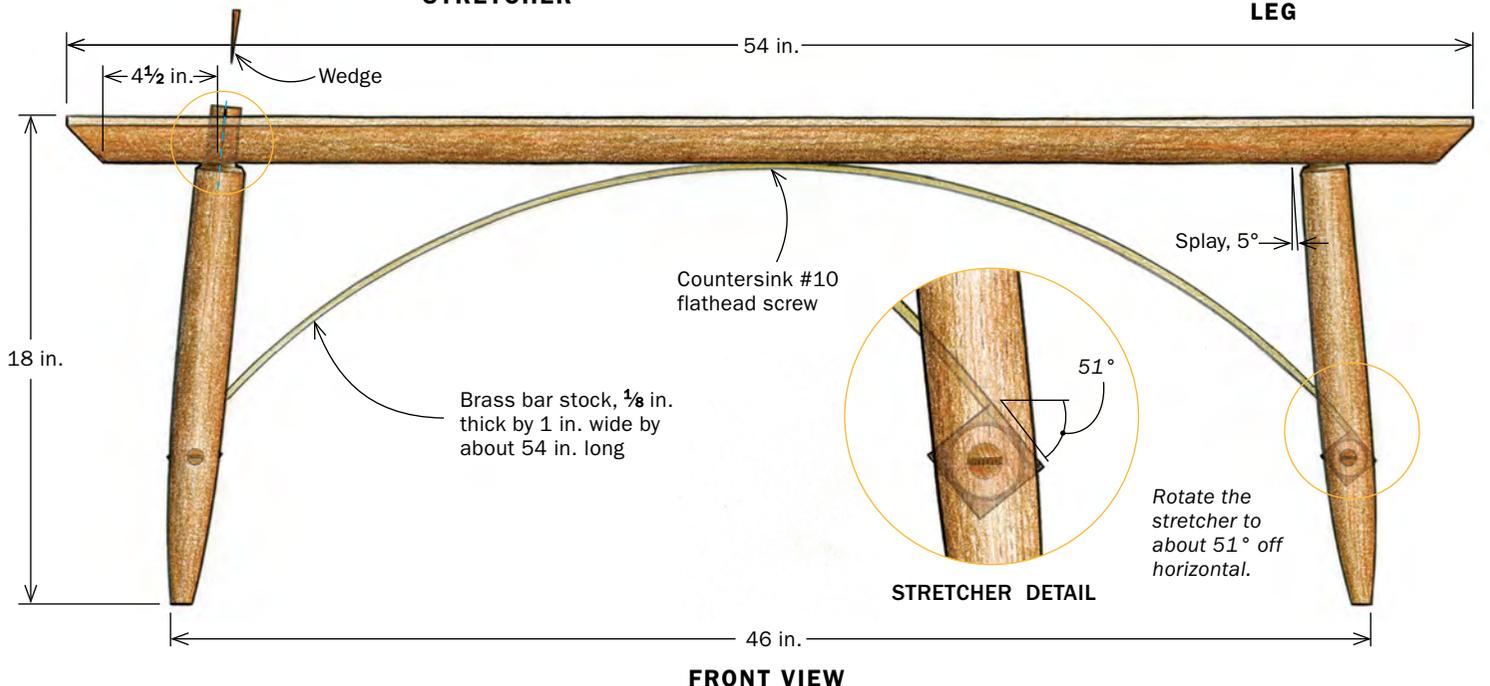
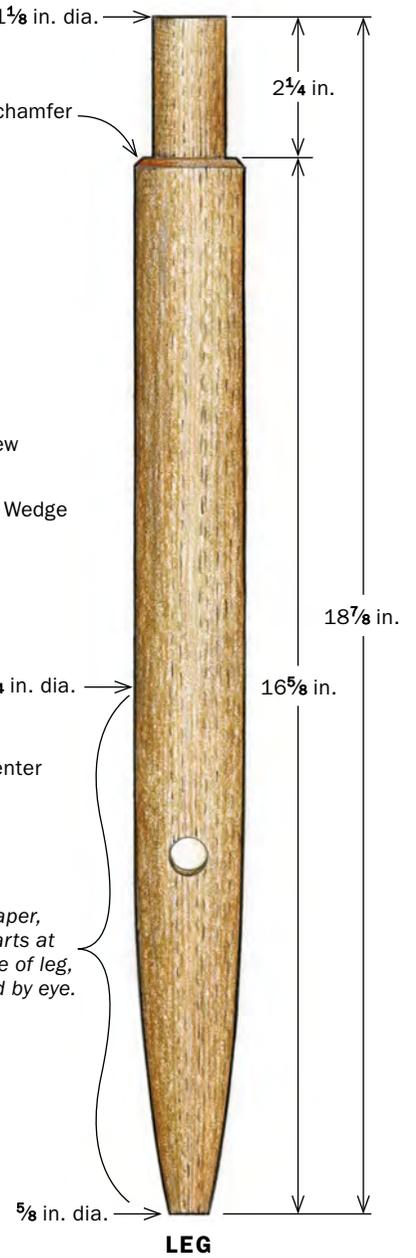
BRASS AND WALNUT BENCH



Turned legs and stretchers and a bowed bar of brass add the few key curves that elevate the design of this solid bench.



Curved taper, which starts at centerline of leg, is shaped by eye.



Shape the legs



Turn the torpedoes. After turning the leg blank to a cylinder, Robbins uses a skew chisel and wrench to size the tenon. Having turned the curved taper (right) by eye with a roughing gouge and a skew, he measures and marks for the stretcher mortise.



Make way for the wedge. At the bandsaw, with the leg clamped and cradled in a V-notched scrap for stability, Robbins kerfs the tenons to accept wedges.



Drill for the stretchers. To cut the angled mortises for the stretcher tenons, Robbins sets his drill-press table to 10°. With the leg resting in a V-notch cradle, he drills nearly all the way through.

seeking to resolve the design. I've gone on to build several dozen benches of this design, and now I typically use brass for the arch.

Start at the seat

I begin the bench by gluing up the seat. I use 8/4 hardwood stock—walnut, in this case—and mill it down to 1¾ in. thick. After gluing it up, I cut the seat to size and then bevel all four edges at a 45° angle, leaving a 3/8-in.-wide flat at the top of the edge. Once the edges are shaped, I'm ready to drill holes to accept the legs.

I drill the holes so the legs will have both rake and splay angles of 5°. A shopmade angle jig that I clamp to the drill-press table makes cutting these holes straightforward. Using a 1½-in.-dia. Forstner bit and setting a depth stop, I drill the holes with the seat facedown. I drill to just shy of going through the seat. When I've drilled all four holes, I take the seat to the bench and use a hand drill to finish the holes. A backing block clamped in place prevents blowout when the bit comes through.



Calling in backup. Robbins uses a hand drill to finish the through-mortises, preventing blowout with a coved backing block. To make the block, he drills a series of large holes in a scrap and rips it down the middle on the bandsaw.

Make the stretchers



A notch for the brass. Using a dado blade and a stop, Robbins cuts the centered dado for the brass bar in two passes.



Dimensioning by dowel. To get a precise shoulder-to-shoulder measurement for the stretcher blank, Robbins dry-fits the legs and marks a dowel rod threaded through the stretcher mortises.

Turn the legs and drill the angled mortises

I mill the leg blanks a little over $1\frac{3}{4}$ in. square by $18\frac{7}{8}$ in. long. This length includes $2\frac{1}{4}$ -in.-long tenons that will protrude about $\frac{1}{2}$ in. through the seat at assembly. I turn the legs to a taper and turn a tenon at the top. Then, to set the location of the mortises for the stretcher tenons, I measure from the foot and, with the lathe spinning, make a clean pencil line around the circumference of the leg. Next I use the bandsaw to cut kerfs in the tenons to accept wedges. Then it's off to the drill press. I set the drill-press table to a 10° angle and use a V-shaped cradle to hold the leg. I drill these mortises using a $\frac{5}{8}$ -in.-dia. Forstner bit.

I use the wedge kerf for orientation when drilling these stretcher mortises. I remove the blade from a combination square and tap it into the kerf, then place a magnetic torpedo level on the blade to find plumb. This ensures that the wedges will line up and create a clean detail when seen from the top. As with the seat, I drill the holes just short of through at the drill press, and then finish them at the bench with a handheld drill and a sacrificial backing block, this one with a radius to fit the leg.

Lay out and turn the stretchers

To ascertain the length of the stretchers, I dry-fit the legs into the seat. I thread a length of dowel rod through the stretcher mortises



Tape trick. Robbins wraps the blanks with blue tape to ensure he'll get a clean transition between the square and cylindrical sections of the stretcher when he turns them on the lathe.

Bend the brass



Dry-assemble the bench to fit the brass. With a vise clamped to his drill press, Robbins drills a hole with a twist bit at the centerpoint of the brass bar. He also cuts a countersink, then drives the screw by hand.



Careful on the curve. With the bar fixed at the middle, Robbins brings each end down gingerly to the stretcher (above), being sure the curves are symmetrical. He then clamps the ends in place and marks them for length (right). He notes the rotation angle of the stretcher using a digital gauge.

and mark the distance between the legs, then add 4 in. to account for the two 2-in. tenons. After cutting the 1 $\frac{3}{8}$ -in.-square stretcher blanks to that length, I cut a dado across one side of each blank to accept the arched brass bar stock. I turn the stretchers next, using blue tape to ensure a clean transition from the square center section to the cylinders on either side.

Two-stage assembly

Once the stretchers are turned, I dry-assemble the bench and install the brass. For a 54-in. bench, I start with a 60 in. length of $\frac{1}{8}$ -in. by 1-in. C360 brass bar (from onlinemetals.com). At the centerpoint of the bar I mark, drill, and countersink for a #10 flat-head screw. I drive that screw with the bench upside down and the brass flat on the underside of the seat. Then I turn the bench right side up and slowly bring one end of the bar down to the





Bring the bench together



At glue-up, drive the legs home and synchronize the stretchers. After fitting the legs to the stretchers, drive the legs into the seat. Robbins uses a digital angle gauge to be certain both stretchers are rotated to the correct position (right).

Wedge work. As soon as all the joints are home and the stretchers are properly rotated, Robbins knocks in the tenon wedges on the legs and stretchers.



Flushing. A flexible Japanese flush-cutting saw makes quick work of cutting off the tenons just proud of the surface. Robbins follows up with a chisel to flush them off cleanly.



Last bit with brass



Quick cleaning. Rubbing with a Scotch Brite metal finishing pad makes the brass gleam.



Tighten the screws. After driving the center screw (above), Robbins installs the knock-down fittings through the stretchers (below). Rubber gloves keep him from smudging the brass.

dado in the stretcher. I exert some pressure inward toward the pinned center as I bend, which allows the brass to form a nice curve and creates some structural tension.

I move back and forth between the two stretchers, getting a feel for the natural curve of the brass, adjusting the rotation of the stretchers, and making sure the brass overhangs both ends equally. I'm shooting for a pleasing, symmetrical arch with a fair amount of tension. It takes practice to find a happy medium; if you're not careful you may go too far in one direction or the other and create a kink or a wonky angle.

Once I have this dialed in, I clamp the brass in place on the stretcher. I set a digital angle gauge on the top of the seat, zeroing it out. I then put the gauge on the flat of each stretcher and rotate the stretchers until their angles match. When they do, I mark the brass for length and mark the ends of the stretcher tenons for wedge kerfs. Then I disassemble the piece and cut the brass to length. At each end of the brass bar I drill a $\frac{1}{4}$ -in.-dia. hole to accept knock-down fittings. I use brass-plated Chicago screws (chicagoscrews.com). I also cut kerfs for the stretcher wedges at this point, and then sand and polish all the parts.

Now I start the glue-up. I fit the stretcher tenons into the legs, then apply glue to the leg tenons and knock them home with a dead-blow mallet. I use the digital gauge again to set the rotation angle for the stretchers, and then drive wedges into the stretcher and leg tenons. Once the glue has cured, I trim the through-tenons and finish-sand the whole piece.

I usually apply an oil finish at this point. Then, last but not least, I dry-polish the brass to an even shine with metal-finishing Scotch Brite and screw it in place, giving the bench that nice visual flow I was seeking. □

Michael Robbins builds furniture in a former garment factory in Philmont, N.Y., and has a storefront showroom in nearby Germantown.

