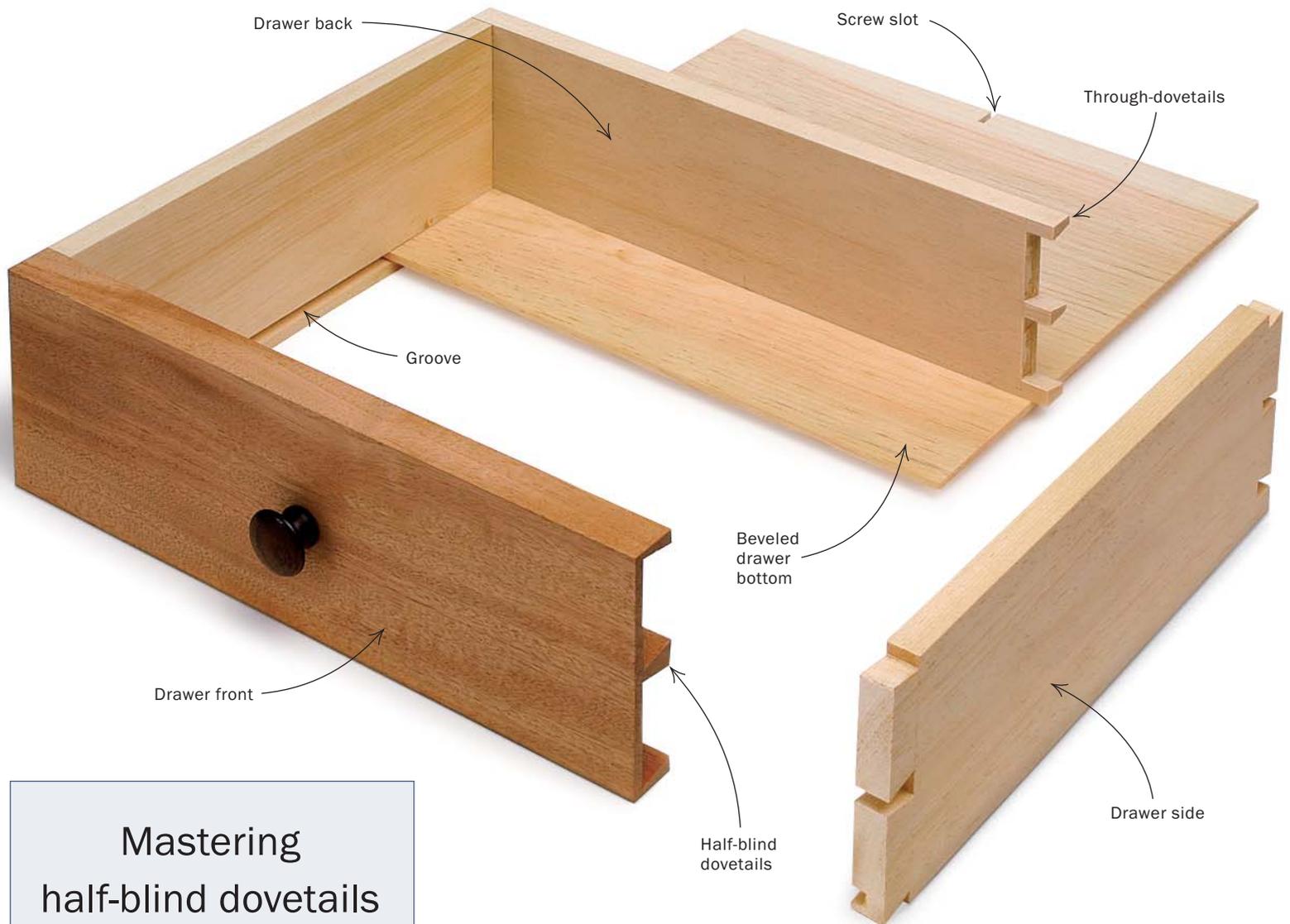


Making Traditional Dovetailed Drawers



Mastering half-blind dovetails is the key to building reliable drawers

BY JANET A. COLLINS

The dovetailed drawer has long been the hallmark of quality, handcrafted furniture. And for good reason: A dovetailed drawer is both beautiful to look at and strong enough to last 200 years. But dovetailing a drawer is not the daunting task you might think—all it requires is a little know-how and practice. No matter what size drawer you're building or what piece of furniture it's going in, the techniques are the same. If you can

build a drawer for a simple Shaker table, you can build a dozen of them for an 18th-century highboy.

The key to building a drawer is learning to cut dovetails. A traditional dovetailed drawer combines both half-blind and through-dovetails. Because you want to see dovetails only on the drawer sides, use half-blind dovetails at the front of the drawer. Through-dovetails are used to connect the back to the sides. In this article I'll

walk you through cutting half-blind and through-dovetails, especially as they concern building drawers. I'll focus mainly on cutting half-blind dovetails, because once you learn to cut those, through-dovetails become a piece of cake.

I recently taught a workshop on cutting half-blind and through-dovetails. At the end of the three-day class, students not only knew how to lay out and cut these two joints, but they also knew how to build a traditional dovetailed drawer. The first order of business is to tune up your tools: two chisels, a dovetail saw and a marking gauge. Using properly tuned tools makes your woodworking life much easier.

As you're working, remember to cut pins on the drawer front and back, and tails on the drawer sides. Dovetails go together and come apart only one way, and this orientation works with the movement of the drawer being opened—you won't loosen the joint as you open and close the drawer.

Build drawers to fit the case

Before you start building drawers, your table or case piece should be constructed and glued up, and the drawer parts should be milled to finish thickness. Drawer fronts should be $\frac{3}{4}$ in. to $\frac{7}{8}$ in. thick; sides and back should be $\frac{3}{8}$ in. to $\frac{1}{2}$ in. thick.

Now cut drawer parts to length and width based on the opening in the case piece or table. For a flush drawer, rip the fronts and sides approximately $\frac{1}{4}$ in. smaller than the height of the opening. To accommodate the bottom, cut the drawer back $\frac{1}{2}$ in. narrower than the sides. Now mark the lengths directly off the case piece and crosscut them to size at the tablesaw. The length of the sides should be approximately $\frac{1}{2}$ in. shorter than the depth of the drawer opening in the case.

Now you need to decide which will be the inside and outside faces of each drawer part. If you place the heart side of the board facing out, the drawer parts will cup toward the inside. The mechanics of the joint will help control this cupping. However, aesthetics rule—especially on the drawer front. If the bark side is more attractive, place that side out and mark the board accordingly.

With all of the pieces marked, cut grooves along the lower edge of the front and sides. The $\frac{1}{4}$ -in.-wide by $\frac{1}{4}$ -in.-deep grooves should be $\frac{1}{4}$ in. up from the bottom on the inside of the drawer front and



FIT THE DRAWER TO THE OPENING

Measure the drawer parts straight off the case. Cut the sides about $\frac{1}{4}$ in. shy of the height of the drawer opening (left). Trim the drawer front for an even reveal at the top, bottom and sides (below).



sides. This can be done with a dado set on the tablesaw or on the router table. Once the grooves have been cut, you're ready to start marking the parts.

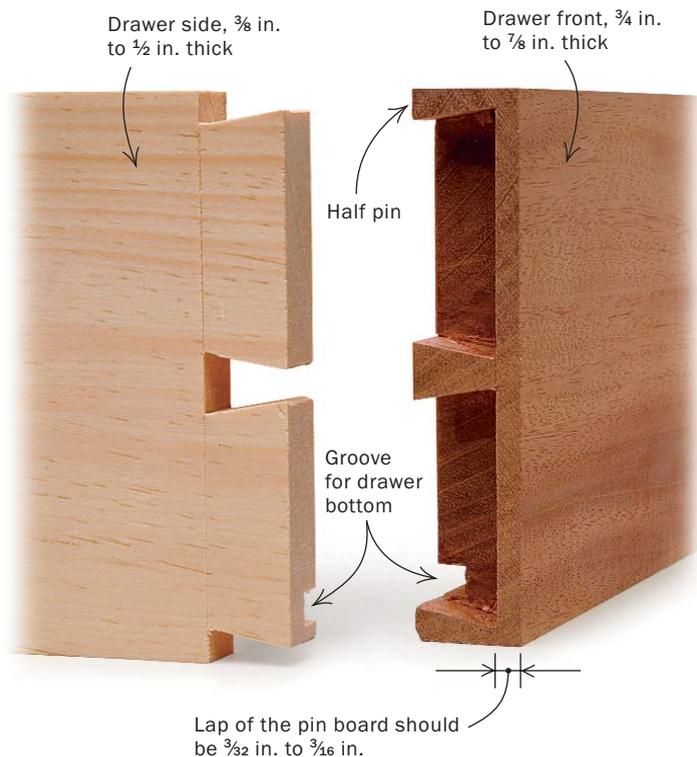
The shoulder lines of the dovetails are based on the thickness of each part, which changes slightly in final preparation. Be sure to plane, scrape or sand (to 220 grit) the drawer parts before laying out and cutting any dovetails. Once you've removed the machine mill marks, organize and label

all drawer parts. Mark the inside face and adjacent drawer bottom edge of the front, sides and backs. Mock up or explode the box and mark adjacent corners to be dovetailed. You will be checking for this orientation and reference marks as you lay out and cut the dovetails.

Cut the pins first

Because half-blind dovetails are slightly more difficult to cut than through-dove-

HALF-BLIND DOVETAILS JOIN THE FRONT TO THE SIDES



1 LAY OUT AND CUT THE PINS

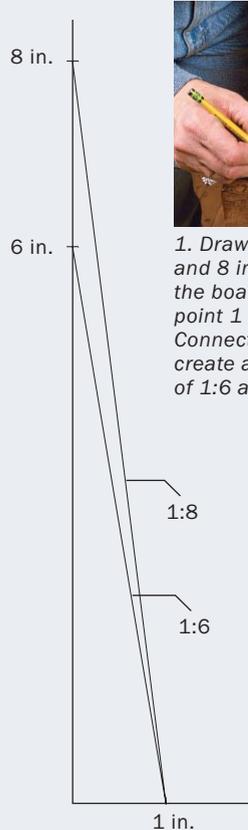


Lay out the depth of the tails. Mark the lap where the drawer side joins the drawer front. Leave between $\frac{3}{32}$ in. and $\frac{3}{16}$ in. so that the tails are hidden when the drawer is closed.



Mark the pins. Set the bevel gauge (see the box below left), then begin marking pins. The first and last are half pins; any others are equally spaced between them.

SETTING THE BEVEL-GAUGE ANGLE



1. Draw tick marks 6 in. and 8 in. from the end of the board. Next, mark a point 1 in. from the edge. Connect these points to create angles with ratios of 1:6 and 1:8.



2. Set the bevel gauge against the board and adjust to the desired angle.

tails, I'll focus on cutting the half-blind dovetails at the front of the drawer, because they are slightly more challenging. But the same principles apply. There is much debate over whether to cut the pins or the tails first, but I always cut the pins first. I find it is easier to square up the surfaces of the pins and use them to scribe the tails, rather than the other way around.

Shoulder lines are the first layout marks placed on each piece and reflect the thickness of the piece being dovetailed into it. Set a marking gauge to the exact thickness of the sides and scribe a shoulder line on all four edges of each end of the back. If the sides are the same thickness as the back, scribe the ends of the sides with the same gauge setting. If the sides are not the same thickness as the back, reset the gauge and scribe the shoulder lines to the thickness of the drawer back. By setting the gauge to the exact thickness of the pieces and cutting accurately, you eliminate a fair amount of handplaning and sanding.

should be $\frac{3}{32}$ in. to $\frac{3}{16}$ in. A lap thinner than that can be weak and may break when you chop between pins. Remember to use the inside face of the drawer as your reference face. If the drawer front is $\frac{3}{4}$ in. thick, set the marking gauge to $\frac{1}{16}$ in., leaving a $\frac{3}{16}$ -in. lap. Set the marking gauge to scribe a line in the end of the board. Be sure to leave $\frac{3}{32}$ in. to $\frac{3}{16}$ in. as the lap. Scribe the ends of the drawer front as well as all sides of the ends of the tail boards. Change the marking gauge to match the thickness of the tail board and scribe this line only on the inside face of the pin board.

Place the pin board in the vise with the inside surface facing you. Doing it this way consistently helps ensure that you orient the pins correctly over and over again. To help students orient the pins correctly, I tell them to remember "fat side or wide side, inside." Mark the angle of the pin on the end grain with the widest part of the dovetail on the inside of the drawer. To save yourself work later when you're chopping out the tails, make sure your pins are only as narrow as the thinnest chisel you own.

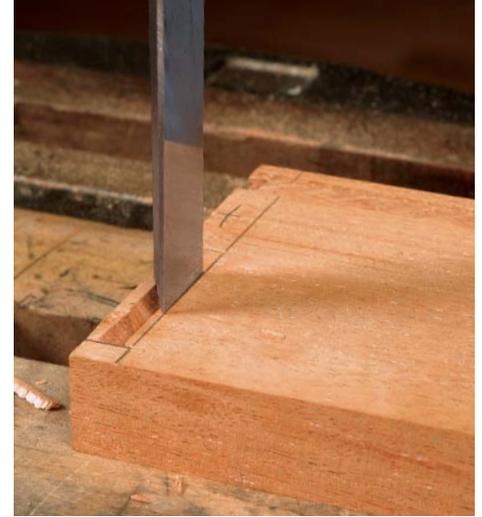
For both through- and half-blind dovetails, both edges of the pin board should have what are called half pins. These half pins can be up to the same width as the full



Continue the lines around the corner. Use a square to mark out the pins to a shoulder line that represents the thickness of the drawer side. Mark areas to be removed with an X.



Follow the lines. To cut out the area between the pins, use a fine dovetail saw (15 tpi or more) and cut to both lines.



Chop out the pins. Begin by chopping down just inside the shoulder line, then chip away the stock with horizontal blows. Pare to the shoulder line and clean up the sides.

2 SCRIBE AND CUT THE TAILS

pins but have the angle on only one side. The half pins help keep the edges of the tail board from cupping. Space the pins by measuring and dividing the board evenly. The way I do it is quick and simple. I use the width of my index and middle fingers to mark the space between the centers of the pins. These marks are made on the inside edge. Then I mark $\frac{3}{16}$ in. to each side of the center mark for each pin to end up with pins that are $\frac{3}{8}$ in. wide (fat side).

Use a bevel gauge to draw the angle on the end grain for each pin. The angle should be approximately a 1:6 to 1:8 ratio. Use a square to connect the line and continue it down the shoulder line. The angle line and this square line are the only two lines you need to cut the pins (or tails).

Mark the area to be removed with an X and use a fine dovetail saw (15 tpi or more) to cut to the line. Saw the pins, making sure not to cut into the lap or the inside of the drawer. Chop out the cheeks of the pins that cannot be cut with the saw. Clamp the pin board inside face up to the workbench. Start away from the shoulder line and alternate chisel blows between horizontal and vertical. Do not undercut the lap or shoulder too much. Place the board back in the vise and pare the cheeks. Use the back of

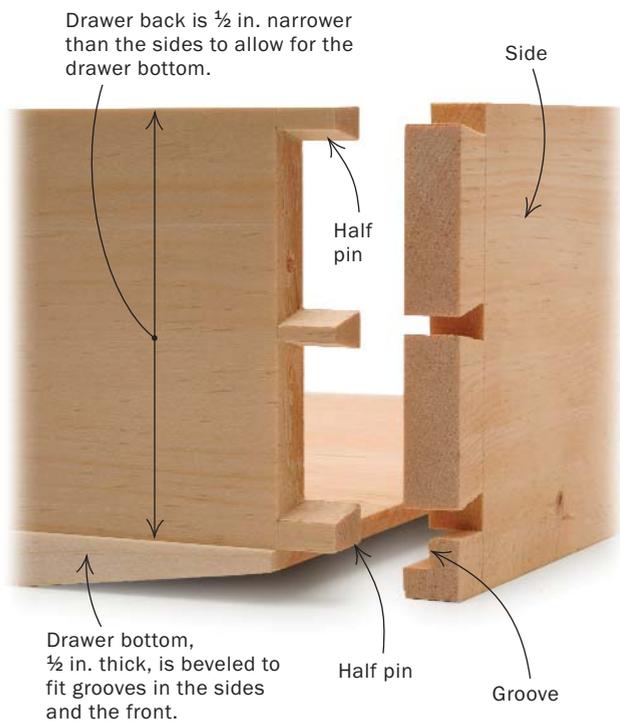


Mark out the tails. With the drawer side flat on the bench, clamp the drawer front at a right angle. With the end of the side flush to the end of the lap, mark the tails using a sharp pencil.



Saw away what you can. The edges of the sides can be cut close to the line. Pare away what little is left using a sharp chisel, and chop out the area between the tails just as you chopped out the waste between the pins.

THROUGH-DOVETAILS JOIN THE BACK TO THE SIDES



There's no need to angle the saw. When cutting the pins for through-dovetails, you can cut all the way to the shoulder line.

the chisel to follow both the angled line and square line to bring the entire cheek of the pin into square. Use a combination square to check that the pin edges and shoulders are square.

Scribe tails from pins, then cut away the waste—The tails are scribed off the pins only after you are satisfied that all of the pins are square. Place the tail board inside face-up on the bench. Clamp the pin board 90° to the face of the tail board, just as if the drawer were going together. Line up the inside face of the pin board directly on the inside edge of the tail-board shoulder line. Scribe the tails using a sharp, hard-lead drafting pencil, which leaves a thin, definite line to cut to.

Place the tail board in the vise with the inside facing you. Draw a square line across the end grain from the end of each angled line. Remember that the angle of the pins appears on the end grain and that the angle of the tails appears on the face of the board. Mark the waste with an X and cut to the pencil line, not into it. If you cut beyond the pencil line you will have a gap. Chop out the waste as you did for the pins, but stop at half depth and flip over the board. Repeat the process on the other side and check to see that everything is square. At this point, your dovetails should start to fit together. If they are a little snug, pare only the tails. Once you have squared the pins, they should not be touched again.

Cut the through-dovetails

Through-dovetails join the drawer sides to the back. Lay out the pins using the same technique described for the half-blind dovetails, but you don't have to leave room for the lap. Once the pins have been cut, chop out the waste halfway through the pin board's thickness, leaving some material to support the end. Then pare to the shoulder line. Flip over the piece, continue to chop out waste and then pare to the shoulder line. Place the piece back in the vise and pare the cheeks square. This area can be slightly undercut in the center. Tails are marked and cut exactly the same as they are on the half-blind dovetails.

Glue up the drawer and slide the bottom in place

Now, when you assemble the dovetails, you have four pieces of wood that are starting to resemble a drawer. At this point, you



GLUING AND CLAMPING



Glue blocks fit the tails. Use clamping blocks made of the same species as the drawer sides (or a softer wood). Be sure to remove any material that might crush the pins. Taping the blocks in place helps ease assembly.

Check for square. Once the clamps are in place, check the diagonals to see whether the drawer is square.



can glue up the drawer, making sure that it is kept square while you clamp it.

A traditional dovetailed drawer uses a solid-wood bottom. The grain of the drawer bottom runs side to side, allowing it to expand and contract from front to back. Edge-glue enough $\frac{3}{8}$ -in.-thick stock to equal the drawer depth. Cut these panels $\frac{1}{16}$ in. smaller than the dimension of the drawer and the bottom of the grooves. Bevel the bottom of the drawer with either

a handplane or a machine. I typically use the tablesaw to cut this bevel and handplane the bottom to fit. The bottom should slide easily but not be so loose that it rattles. Finally, cut a slot ($\frac{1}{8}$ -in.-wide sawblade kerf) in the back edge of the bottom to screw the bottom to the drawer back. The slot should be long enough to allow the bottom to expand and contract freely.

For the final drawer fitting, lightly plane the sides to fit the case. If the drawer needs

to have some height shaved off, take it off the top of the drawer, leaving your flat (reference) edge alone on the drawer bottom.

I usually finish the inside of the drawers and the case itself with shellac. Oil finish inside a case takes longer to cure, usually smells for a long time and can become gummy and tacky over time. □

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Raised-panel drawer bottom. Once the drawer bottom has been sized and beveled at the tablesaw, handplane the bevels to fit.

INSTALLING THE DRAWER BOTTOM



Slide the bottom in place. Beveled sides of the bottom should fit smoothly into the drawer grooves. A single screw at the back—and no glue—is all that is needed to hold the bottom in place and allow for seasonal movement.

