



Make and Fit a Dovetailed Drawer

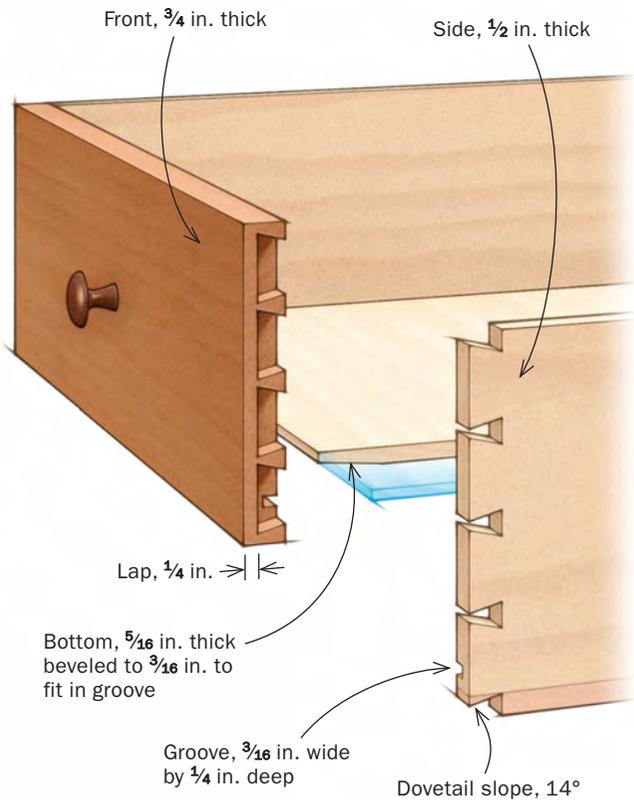
A recipe for drawers that look great and work flawlessly

BY TOM McLAUGHLIN

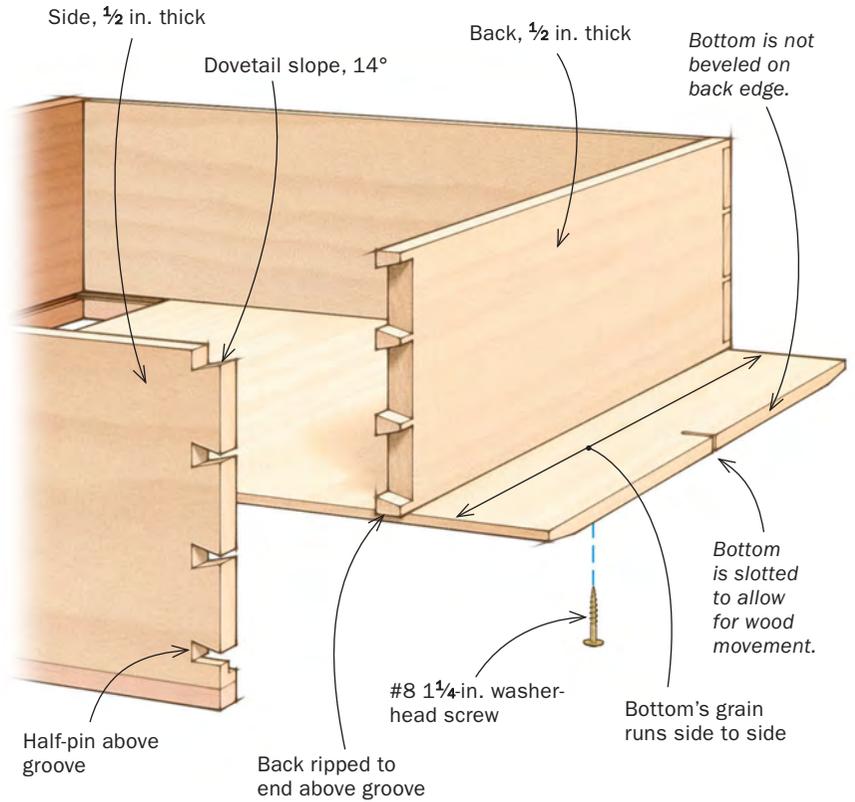
Drawers will add flavor to any project. On top of the design opportunities they open up, they add a large degree of function. The last bit of spice comes in building and fitting them. A drawer that operates poorly or looks sloppy will leave a bitter taste in your mouth, whereas an attractive, smooth operator is satisfying.

Dovetailed drawers with solid-wood components are the traditional option, and the one I typically turn to for furniture. From cutting the dovetails to planing the sides to installing the bottom, I'll take you through the steps necessary to make drawers that look and work just right.

HALF-BLIND DOVETAILS IN THE FRONT



THROUGH-DOVETAILS IN THE BACK



TIP



LAMINATE SIDES WITH HARD-WEARING WOOD

Because McLaughlin has repaired drawers with softwood sides that have dished out from use, he laminates maple onto the bottom of his (and pairs them with maple runners). To simplify the process, he glues an overwide maple strip to the bottom of two drawer sides at once. He then saws the two apart and joints their maple bottoms.



Fit the front to the case



SIZE THE PARTS

Drawer fronts should have a small gap top and bottom, but be snug side to side. When ripping the drawer fronts to width, size them so they leave a $\frac{1}{32}$ -in. gap to the case. Conversely, their ends should have a snug press-fit, which will be addressed after building the drawer.

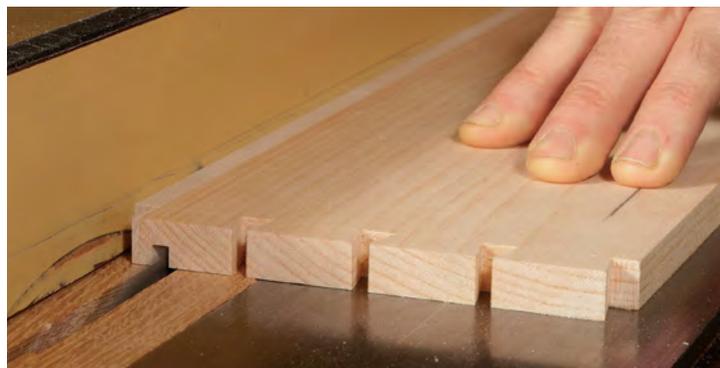
HALF-BLINDS

The drawers get half-blinds in the front.

After cutting the tails on the sides, scribe their shapes to the drawer front. McLaughlin uses a flat-backed marking knife because he can easily keep it tight to the tails for accurate marking.



GROOVE FOR THE BOTTOM



Front and sides get the same groove. The grooves in the front and sides need to line up, so run these parts at the same time. Because the front joint is a half-blind, this through-groove will be hidden in front.

Strategic sizing

The goals for a drawer are to have even reveals around the front and a smooth ride in and out of the case all year long. This result starts when sizing the front, back, and sides.

I start by ripping the drawer front and sides to width so that there's a gap of approximately $\frac{1}{32}$ in. Later, you'll plane this as necessary to account for seasonal movement. The back's width is determined after you run the grooves for the drawer bottom.

The sides are mostly pine, a traditional secondary wood because of its light weight and stability. But, it's also quite soft. So before ripping the sides to width I laminate on a strip of maple, a hard-wearing wood. These two woods give me the best of both worlds. I use maple runners as well.

The length of the front and back should be sized for a gentle friction fit in the drawer opening. This fit leaves you room for cleanup and refinement after dovetailing, since I recommend cutting the joints so that the pins are a little proud. It's easier to level them to the sides than vice versa.

Dovetails and grooves

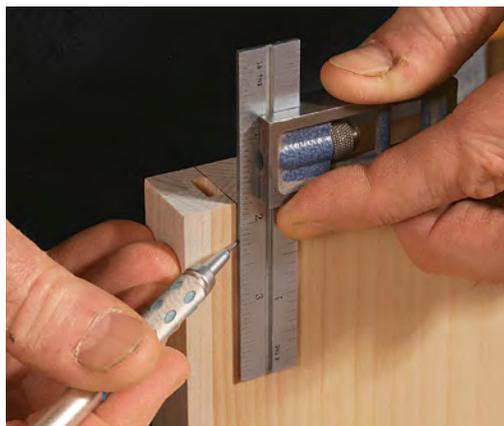
To keep the drawer front uninterrupted, I use half-blind dovetails to join the front to the sides. At the back, I prefer through-dovetails because they're easier to cut, although there I need to be mindful of the drawer bottom.

Start by cutting the half-blinds, locating the bottom tail so it will hide the groove for the drawer bottom. Then run the grooves.

Now you can determine the back's width. The drawer back needs to be narrower than the sides; its bottom edge should align with the top of the groove, allowing the drawer bottom to be slid in just beneath it. This width is easily

Clearance for the drawer bottom

Spacer helps lay out width of back. To allow the drawer bottom to slide in, the back sits above the groove. To size the back, McLaughlin places a spacer in the groove, abuts the back blank to it, and marks the width so it ends up flush with the top of the drawer. He then rips it.



The half-pin above the groove means a 90° cut. The back of the drawer is through-dovetailed. To accommodate the groove, McLaughlin needs a half-pin that ends where the groove starts. He uses a square to lay out this cut on the sides before laying out the rest of the tails.



Spacer aligns parts when transferring the joinery. The spacer indexes the drawer back precisely at the top of the drawer bottom groove, streamlining the process when you knife the tail board to the pin board. After cutting the joint, you should be left with a half pin that rests just above the groove.

Glue and fit



Seat the joints, then check for square. Gently clamp the drawer after applying glue. Before the glue sets, remove the clamps. The dovetails will hold the drawer together and removing the clamps lets you make minor tweaks if you're not square.



Level the pins to the sides.

McLaughlin cuts his pins so they sit just a hair proud of the sides. This is because it's easier to level the pins to the sides than vice versa, and it begins the process of fine-tuning the side-to-side fit of the drawer.



determined by placing a spacer in the groove, registering the back on it, and marking the back's width so it will be flush with the top of the sides. After that, it's just a matter of ripping the back to width.

Now I tackle the through-dovetails in back. Because their layout needs to account for the drawer bottom, I hold off on them until after I have ripped the back. To allow for the bottom, I use a half pin just above the groove. I space the rest of the joint from there.

Cut the tails and pins and glue up the drawer box. To limit headaches in the next step, fitting it, check and double-check it for square.



Plane the sides until the drawer slides well. The drawer should slide smoothly and not bind. Sneak up on this by repeatedly checking the drawer in the opening as you carefully plane down the sides.



Flush the front



Install the drawer stops first. For this case piece, McLaughlin places the stops behind the drawer fronts. To locate the stops, he sets a combination square to a hair over the thickness of the drawer front, and uses that setting to place his stops. The stops are lined with leather for a softer sound when the drawer closes.

Fine-tuning the fit

With the drawer pretty much made, now's the time to adjust its fit, namely how it looks in the opening and how well it rides on the runners.

Begin by lightly hand-planing the pins, which were left slightly proud, flush with the drawer sides. Because the front and back started out as a press-fit end to end and you glued up the drawer square, flushing these pins should leave you with a drawer that travels well. Still, you may have to plane the sides too to get it moving as smoothly as possible in its opening.

Next, skim-plane the bottom edges of the drawer front and drawer sides smooth, and then add a slight ski-tip shape on the back of the sides' bottom edge. This ski tip lets you slide the drawers in place easily without catching a hard back corner.

Third, make sure the drawer fronts are flush with the case. Start by installing the drawer stops, since this will determine where the drawers actually stop. Then, with a drawer in place, feel around the front and mark where it sits proud of the case. Carefully plane down these areas until the front is flush.

The location of the stops depends on the kind of piece you've built. In a piece like the one pictured, where the case sides' grain runs vertically--perpendicular to the grain in the drawer sides--install the stops right behind the drawer front. Putting the stop there lets the case move seasonally while keeping the front flush with the opening. (Additionally, cut the drawer sides $\frac{1}{4}$ in. short of the back to leave room for the case's seasonal movement.)



Feel for high spots, then plane them down. Run your hand around the drawer front to feel where it sits. Mark the high spots with a pencil and carefully use a handplane to knock them down.



Install the bottom

Bevel the bottom on the front and ends. McLaughlin does this on the tablesaw with a tilted blade and a tenoning jig that slides along the fence. He then hand planes the bevels to fit and to remove sawmarks. Leave the back edge square.



Slide the bottom in place. After slotting the back edge for a screw, install the drawer bottom in the grooves. The bottom's grain should run side to side.



If the drawer is in a table, where the aprons' grain typically runs horizontally, you can put the stops at the back of the drawer since the piece's grain runs the same direction as that of the drawer sides.

The last step is to plane around the top of the drawer sides and front to create space for seasonal movement and a parallel reveal when the drawer is closed. Then true up the ends of the drawer front, making them parallel with the case sides and their reveals even.

Add the bottom

To continue the traditional look, I often make drawer bottoms from white pine for its lighter weight and dimensional stability. They're also beveled underneath to fit into the groove without thinning the panel too much. The grain should run side to side. Otherwise, seasonal expansion will push the bottom against the drawer sides.

Secure the bottom's front edge in place with a glue block, beveled to match the bottom. I like hide glue here because it's reversible. The back of the drawer is held with one or more washer-head screws running through a slot in the bottom's back edge and into the drawer back. This arrangement keeps the bottom tight to the drawer front while directing seasonal movement to the back, where it won't affect the drawer's look or operation. □

Tom McLaughlin teaches at epicwoodworking.com.



A glue block secures the front. To keep the bottom panel in the front groove, McLaughlin uses a short glue block beveled to the same angle as the panel. He uses hide glue, which is reversible, in case repairs are needed later on.



Washer-head screw secures the back. The glue block locks the bottom's front edge in place, directing the seasonal movement toward the back. To accommodate the movement, screw—don't glue—the bottom to the drawer back and cut a slot around the screw.