

All-Wood Drawer Slides

Full-extension slides that are as pretty
as the rest of your piece

BY ROB HARE

Early in my career as a furniture maker, a client asked me to design and build an entry table. The client wanted an elegant piece *and* the practicality of drawers that would open all the way, giving full access to the contents. If I didn't come up with a unique solution, I would be stuck with those convenient but ugly commercial metal slides.

With some forethought and trial-and-error, I developed a system that supports a drawer when pulled completely out of the case using attractive hardwood slides that harmonize with the piece.

I built my first set of these slides 25 years ago. That set is still going strong, and I am still building and installing these drawer slides the same way. The process isn't hard. Beyond a couple of special tapping bits and a full-size plan, all it really calls for is a little extra care and patience. In the example I built for this article, I used thick, solid case sides, but the technique can also be adapted for use with a frame-and-panel case or a traditionally framed opening



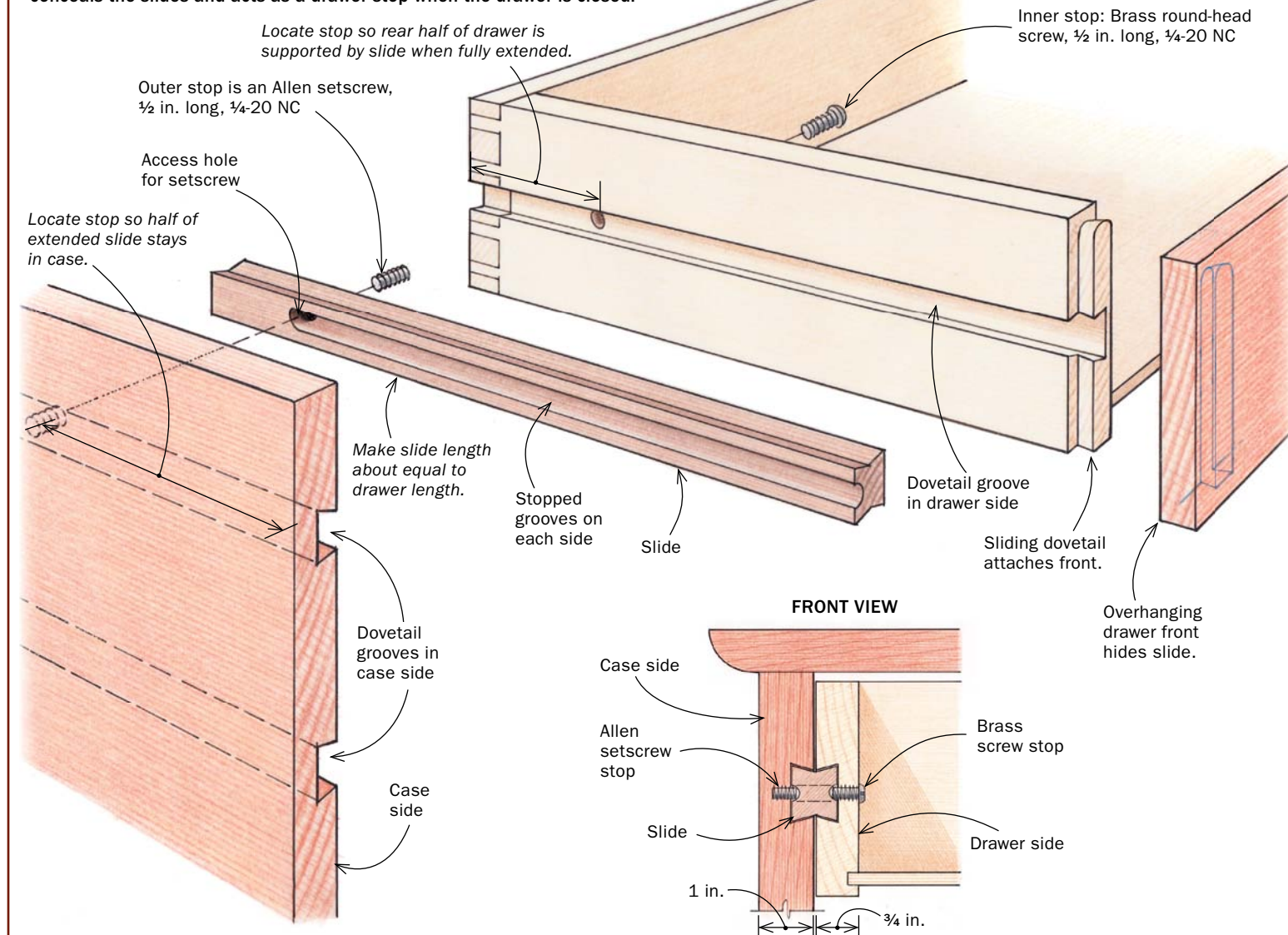
TIP

WORK FROM A FULL-SIZE PLAN

Pick up measurements from the drawing to guide machine setups. Then compare cuts in test pieces directly with the plan to make any needed adjustments.

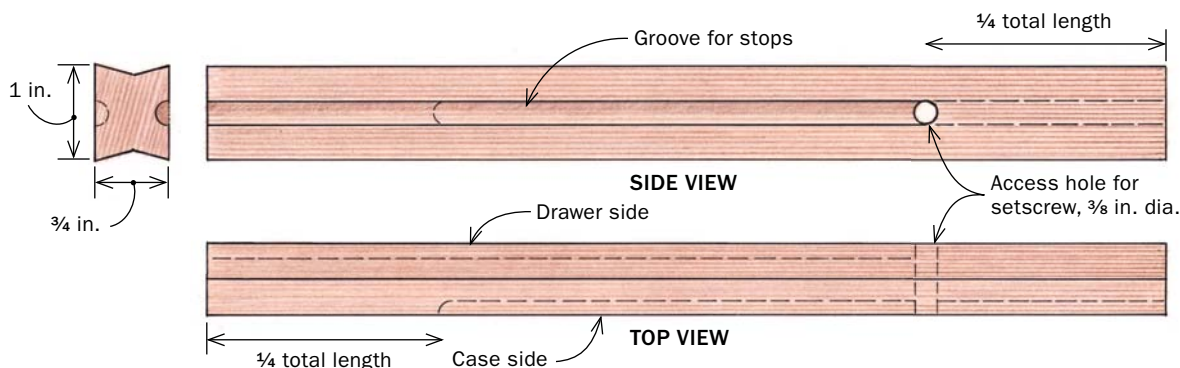
SLIDE RIDES IN MATCHING GROOVES

Here's slide system carries the drawer on lengths of hardwood that ride in dovetailed grooves in the case and drawer side. An oversize drawer front conceals the slides and acts as a drawer stop when the drawer is closed.

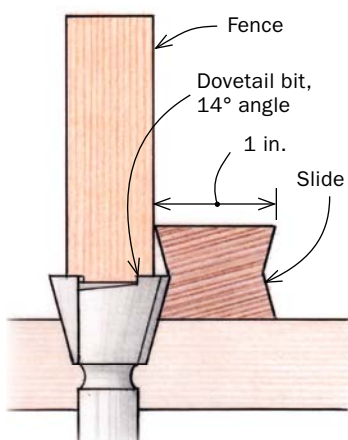


One slide per side

A single hardwood slide mates with dovetailed grooves in both the drawer and case sides to create full-extension action. Stopped grooves and screws limit the travel.



ROUT THE BEVELS



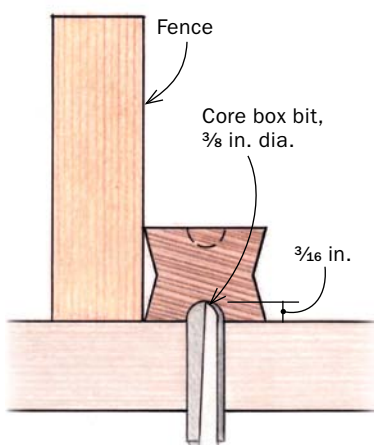
Rout the V. Mark the midpoint of the stock and set the bit height so that the cut doesn't touch the top half. With the top and bottom of the dovetail cut, you may be left with a thin line down the center that can be snapped off by hand.

for a table drawer. In any case, the results, as you'll see, are beautiful enough for a finely made piece of furniture.

A blueprint for success

When building the piece, it's important to locate the dovetailed grooves that hold the slides accurately so that the drawer hangs properly in its opening. A full-scale drawing helps with this by showing exactly where to cut each groove. It also lets you check each machine setup by cutting a test piece and laying it directly on the plan for comparison. Finally, a drawing helps you plan the layout for the dovetails at the drawer's back corners. The center pin, on the drawer's side, should be wide enough to let you cut the groove for the slide without cutting into the joinery.

ROUT THE GROOVES



Cut the stopped grooves. Use a stop on the router table fence and pivot the workpiece up when you reach it. Remember that the grooves are on opposing faces and start at opposite ends of the slide.

A sliding dovetail that really slides

I begin building by cutting the dovetailed slides, because I can use them to check and adjust the fit of the dovetailed grooves that will house them. For the slides, use a hardwood with straight grain. Maple works well, but I favor wenge because it lasts forever and the dark color contrasts attractively with a variety of other woods. To extend a drawer fully, the slides must be as long as the drawer is deep, excluding the front. I make most slides 3/4 in. thick by 1 in. high. Keep the grain straight when milling; any runout can eventually cause the slides to bind. Be sure to mill up a couple of test blanks.

I profile the slides at the router table, using a 14° dovetail bit to rout a V-shape into the top and bottom of each slide. Precise setup is crucial. Set the bit height at 3/8 in. and position the fence for a test cut just deep enough to angle the entire bottom half of the 3/4-in. face, without touching the outside corner. Now flip the test piece and make another pass to create the V. Its

Drill access holes. In each slide, drill a through-hole centered in the stopped end of one groove. This hole provides access to the inside of the case side during installation of the drawer stops.

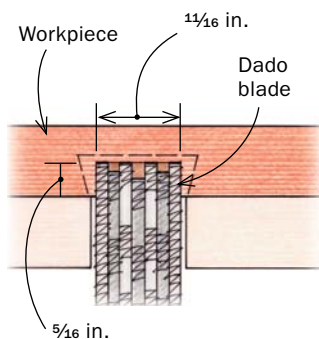


Slot the case sides and drawer sides

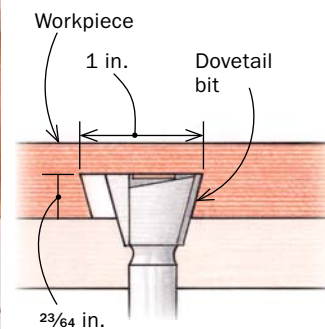
Work from your full-size plans to determine exactly where these grooves should go.

TWO STEPS TO A DOVETAILED GROOVE

1. Starting with the drawer sides, use a dado set on the tablesaw to waste away the center of the dovetail groove.



2. Finish at the router table with a dovetail bit. Use measurements from the full-scale drawing to locate the fence.



Build in some play.

A slightly oversize groove will help prevent the slide from jamming due to humidity changes. Set the bit about $\frac{1}{64}$ in. lower than you did for cutting the slides. Sand the grooves with an angled block for smooth travel.

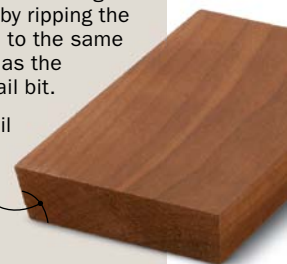


CUSTOMIZE A SANDING BLOCK

For the grooves, create a sanding block by ripping the edges to the same angle as the dovetail bit.

Dovetail angle

TIP



bottom should be perfectly centered and show no lapping of the cuts. Use a machinist's square to check that the outside corners remain square after cutting a complete tail. Once the setup is right, profile all the slides at one time for consistency.

The last step is to cut a stopped groove in each side of the slide to house the stops. Use a $\frac{3}{8}$ -in. core-box bit in the router table. Adjust the bit height to $\frac{3}{16}$ in., and set the fence to center the bit on the slide. For each slide, rout a three-quarter-length groove on one side, then flip the piece and rout a matching groove on the opposite side and from the opposite end. Afterward, drill a $\frac{3}{8}$ -in.-dia. hole at the stopped end of one groove on each slide.

The slide is only as true as its groove

Your carefully machined slides now need a carefully matched set of dovetailed grooves



Case sides follow suit. Use your full-size plans again to carefully locate the grooves in the case sides, and use the same tablesaw and router-table techniques to cut them.

Assembly, step by step

There are stops in the case that keep the slide from coming all the way out, and similar ones in the drawer sides.

1. LOCK THE RUNNER INTO THE CASE FIRST



Drill for the first stop. Mark the case side at the point where the access hole falls when the slide is inserted a little more than a quarter of the way into the case. Use a guide block as shown to keep the drill straight; a piece of tape marks the bit depth. A $\frac{3}{16}$ -in. brad-point bit centers easily and cuts cleanly.



This hole needs threads. The setscrew that serves as the stop in the case side can't cut its own threads, so you'll need to cut them using a standard $\frac{1}{4}$ -20 NC tap, available at Amazon.com and online hardware dealers. Follow up with a $\frac{1}{4}$ -20 bottoming tap to thread the hole all the way to the bottom.



to carry them. The grooves must be cut to the right size for the slides to move smoothly, and located accurately for the drawers to hang properly with even gaps between them. Fortunately, the task is straightforward and essentially the same for both drawer sides and case sides. It involves taking measurements from the full-scale drawing for machine setups that are then fine-tuned with cuts on full-size test pieces.

Start at the tablesaw, using a dado set that is $\frac{1}{8}$ in. narrower than the neck of the finished groove. Set the height $\frac{1}{16}$ in. lower than the finished depth of the groove. On the drawing, measure from the top of the drawer side to the groove opening. Add $\frac{1}{16}$ in. to account for the narrower dado stack, and use this measurement to set the fence. After plowing a groove in a test piece, check the groove's location by setting the workpiece directly on the drawing for comparison. When the fence is located correctly, cut the grooves in all of the drawer sides. Now repeat the entire process for the grooves in the case sides, using the top of the case side as the starting point for your measurement on the drawing.

(By the way, if you are making your case from open-pored wood or veneered plywood, it's a good idea to inlay a strip of maple in each groove location before



Install the set screw. With the slide in the groove, insert the screw through the access hole and into the threaded hole in the case. Continue turning the screw until the slide moves freely in its slot but is halted by the stop.

cutting the grooves so that the slide has a smoother bearing surface to ride against. Cut the inlay mortise with the dado head, making it $\frac{1}{4}$ in. wider and $\frac{1}{8}$ in. deeper than the finished groove will be.)

With all of the square grooves cut, move to the router table to finish the dovetail. Measure on the drawing from the top of the drawer side or case to the dovetailed corner at the bottom of the groove. Use

these measurements to set the fence for each angled wall in turn, using the tip of the router bit as a reference. Set the bit about $\frac{3}{64}$ in. higher than you set the dado cutter at the tablesaw, to deepen the entire groove as you are cutting the angled walls. After cutting the angled walls in a test piece, check the fit of the slide and adjust if needed. The fit should be snug, not tight. A light sanding will create a little

2. INSTALL THE DRAWER

Locate the second stop. To locate the stops in the drawer sides, extend the hardwood slides completely and place the drawer on them in the position where you want its travel to stop. Make sure the top of the slide is marked to show where the inner groove ends.



extra space. You want about $\frac{1}{32}$ in. of breathing room all around.

Fit each slide with a pair of stops

Each slide gets two stops. One keeps the drawer attached to the slide and the other keeps the slide from coming out of the case. Each stop consists of a screw that bottoms out in one of the grooves on each side of the slide. To keep the slide in the case, I use an Allen setscrew driven into the case side through the access hole in the slide. First drill and tap the hole in the case. Install the setscrew, then check the clearance by moving the slide back and forth while holding it tight against the groove. If you feel any friction from the screw, set it in a little deeper and check that the slide doesn't skip past the stop. If it feels loose, back out the screw a little bit.

To keep the drawer on the slide, I use a brass round-head screw driven from inside the drawer. Where you locate this stop determines how far the drawer will open. Start by mounting the drawer on the slides in the case and then pulling the slides and drawer out until you reach the desired opening—it should come out far enough



Install the stop. Transfer the mark from the top of the slide to mark the drawer side for drilling (left). Drill with a $\frac{3}{16}$ -in. Fuller taper bit, cut the threads with your standard tapered tap, and then insert the stop (right) from inside the drawer while the drawer is resting on the slides.



that you can see its entire contents. With the drawer fully extended, the slide should be roughly halfway out of the casework.

Mark the drawer sides at the spot where the stopped grooves end, then remove the drawer, drill and tap through the side for the stop (see photo, above). Then put the drawer back on the slides and install the stop. To remove the drawer from the slide, unscrew the stop.

Sand all surfaces of the grooves and slides to P220-grit and lightly bevel all corners at the ends of the slides. Don't apply finish: It can get sticky from the friction. Instead, lightly rub the surfaces with bar soap. The small amount of oil and wax it contains works perfectly. □

Rob Hare builds custom furniture in Ulster Park, N.Y.