# All-Wood Extension Drawer Slides

*Telescoping dovetails support a fully opened drawer with style*

by Karen Robertson

I was rifling through my desk drawer trying to find a key, when the drawer spilled for the third time that day. As I crawled around collecting paper clips, empty film canisters and pens with no springs, I decided to design a drawer slide that would put an end to this sort of thing. I wanted something that worked like a metal, full-extension drawer slide but was good-looking enough to use on fine furniture.

I played around with several versions and finally settled on a telescoping dovetail mechanism (see the drawing on the facing page). The key to the system is an intermediate slider with a dovetail on one face that fits a groove in the drawer side. The other face is grooved to match a dovetailed cleat fastened to the inside of the cabinet.

Like a metal slide, these slides hold a drawer level and stop it from coming out all the way. But unlike a metal slide, this one is easy to make. It uses simple setups and reduces fussing around to a minimum.

As you begin to open the drawer, the slider remains inside the cabinet. When the drawer is halfway open, a pin engages the slider and pulls it out along with the drawer, and when the drawer and slider reach full extension, another pin stops them. At this point, half the slider remains inside the cabinet, acting as a cantilever to support the drawer in the open position.

## Build the drawer first

The telescoping dovetail system works best on small- to medium-sized drawers, like those used in dressers and hallway tables. The dimensions shown in the drawing are suitable for drawers from 12 in. to 16 in. deep and 3 in. to 6 in. tall. I've also scaled down the dimensions on the drawing and used the system on small, lightweight drawers, such as the 1½-in. drawers that hold my drafting instruments.

The sliders fit between the drawer and its



Photos: Aimé Fraser

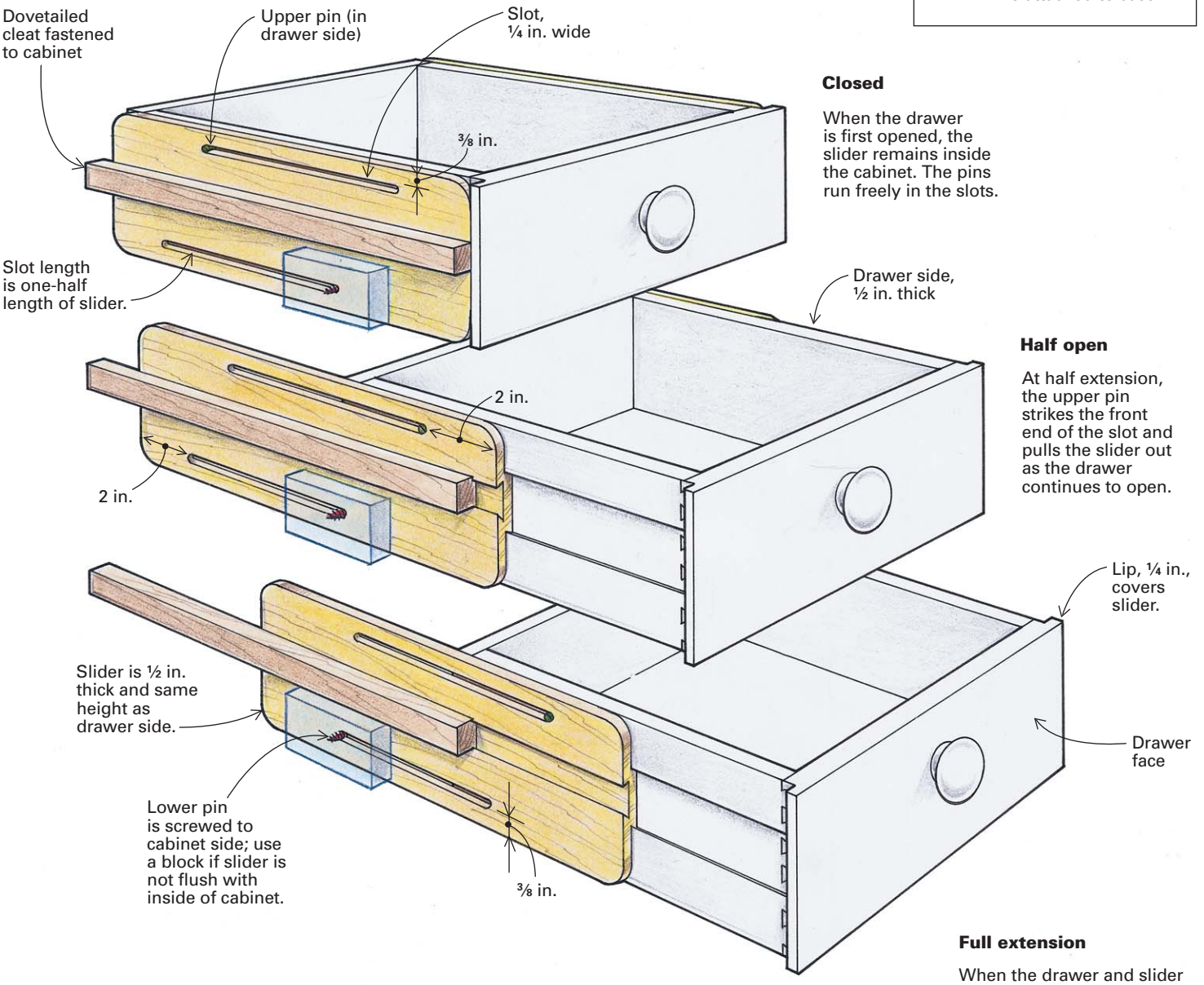
## How the telescoping dovetail mechanism works

The key to the mechanism is a maple slider with a dovetail on one face that fits a groove in the drawer side. The other face is grooved to match a dovetailed cleat fastened to the inside of the cabinet. Two brass pins engage the slider and limit the drawer's extension.

Both pins are #8 or #9 screws with heads removed.

Upper pin is attached to drawer.

Stationary lower pin is attached to case.




**Closed**

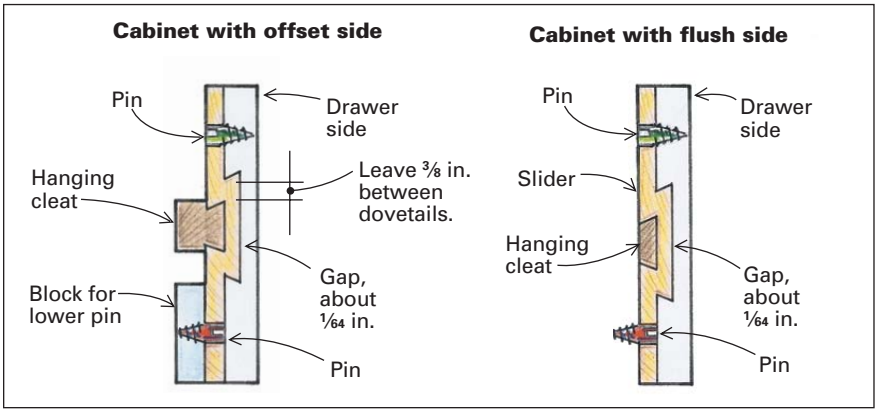
When the drawer is first opened, the slider remains inside the cabinet. The pins run freely in the slots.

**Half open**

At half extension, the upper pin strikes the front end of the slot and pulls the slider out as the drawer continues to open.

**Full extension**

When the drawer and slider reach full extension, the bottom pin hits the back of the bottom slot, preventing the drawer from opening farther. The drawer is cantilevered from the slider and can't come out of the cabinet until the upper pin is removed.




Drawings: David Dann

## *Sequence of cuts*

**1. Cut the dovetail profiles on both edges of the hanging cleats.**

**2. Groove and dovetail the outside faces of the sliders to fit the cleats.**

**3. Leave ⅜ in. of stock between the profiles.**

**4. Machine the inside face of the sliders into a dovetail.**

**5. Cut the groove in the drawer sides to match the sliders.**

**Cutting safety:** *The slider gets a little tippy when making the final cuts on its inside face. The only contact with the table is the relatively narrow dovetail. To keep the piece from tipping, leave a thin leg of waste near each edge until the last cut. The leg will split off easily (see the photo below). Make one last careful pass to clean up the face.*


1


2


3


4


5

frame, so the drawers are narrower than the opening in the cabinet by twice the thickness of the sliders. To hide them, I put a ¼-in. lip on each side of the drawer front (see the drawing).

The sides of the drawer are part of the telescoping mechanism, so they have to be strong and smooth. I make them from a dense hardwood—usually ½-in. maple. Beyond that, it doesn't matter how you build your drawers. I use dovetails most of the time because I like the way they look.

I cut the grooves for the slider in the drawer side after the dovetails are cut, so when I reassemble the drawer, some of the drawer-front pins will be in the way. I just pare them down with a chisel after the glue is dry. Label the drawer parts before you take them apart to cut the grooves. Note the faces where the grooves will be cut.

### Making cleats and sliders

I chose a dovetail profile for the sliders because the shape keeps the drawer aligned even when the fit is loose enough to accommodate seasonal wood changes. The exact amount of play is not critical, but if the groove is too wide, the action will feel sloppy. I make the grooves about 1/64 in. wider than the dovetail, and I've had no problem with binding parts, even in our damp British Columbia weather.

Far more important to prevent binding is the selection of wood. I use ½-in. hard maple for all the parts of the mechanism, except the cleat inside the cabinet, which I

make from a clear, straight-grained wood like mahogany or cherry. I also keep the height of the sliders to less than 6 in. because the wider they get, the more likely they are to warp and bind.

Because you are machining back-to-back dovetails in the slider, the amount of material between the two profiles is very important to its integrity. The slider needs at least ⅜ in. of wood at the shoulder where it meshes with the drawer side (see the drawing on p. 57).

## Machine setups and sliding dovetails

When working with something as hard as maple, I like to play it safe and remove stock with a series of light cuts. It's easier on the equipment and on the nerves. I remove the bulk of the waste with a dado cutter. Then I use a router mounted in a table to cut the dovetail profiles and remove the sawmarks. Depending on the amount of wood to be removed, I might make as many as four passes.

For wasting the excess quickly, I use ½-in. dado cutters adjusted to cut a 7/32-in.-deep groove. I set up the table-mounted router with a ½-in., 14° dovetail bit to cut to a depth of exactly ¼ in. (1/32 in. deeper than the dado). Once set, neither of these heights is adjusted. Only the fences move.

The machining process will be far less confusing if you keep the cuts centered on the drawer sides and sliders. I do that by making two cuts for each fence setup. Run the piece through, end-for-end it and cut the other side. Then set the fence for the next cut (for details of the sequence of cuts, see the list and photos on the facing page).

## Installing the stop pins

The telescoping mechanism depends on two brass stop pins that pull the slider into its supporting position and prevent the drawer from falling out of the cabinet.

I make the pins by sawing the heads off #8 or #9 by ½-in. round-head, brass wood screws and slotting the shanks for a screwdriver. Rather than trying to drive the soft brass pins into pilot holes, I first run in a steel screw a few turns to cut the threads.

Before you install the pins, put in the hanging cleats, and slide the drawers and sliders in place. Check the fit. If the drawer is too loose side to side, shim under the hanging cleats with paper or business cards. If it's too tight, carefully sand the drawer sides (not the groove).

When the drawer fits properly, it's time to drill pilot holes for the pins in the sliders. Remove the drawer, and push the sliders in all the way. Drill the pilot hole into the cabinet side at the front of the bottom slot. You may need to glue a block to the cabinet to receive the pin (see the drawing detail on p. 57). Install the pin so that the slotted head is just below flush with the slider.

To install the upper pin, pull the slider all the way out, and line up the inside back of the drawer with the front of the cabinet. Drill the pilot hole for the upper pin into the drawer side at the forward end of the slot. As you disassemble everything for finishing, make sure all the parts are clearly marked for easy reassembly. To keep everything moving freely, apply three coats of wax to the drawer sides, sliders and hanging cleats, and buff with steel wool. □

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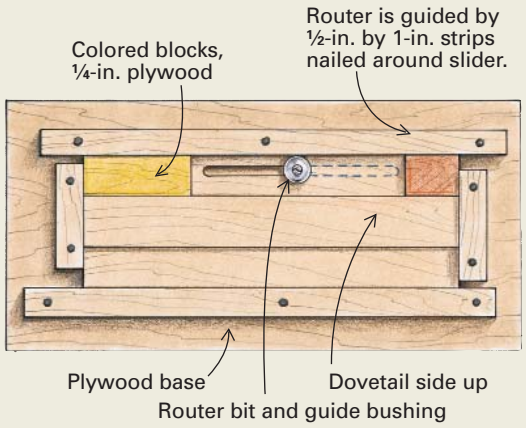
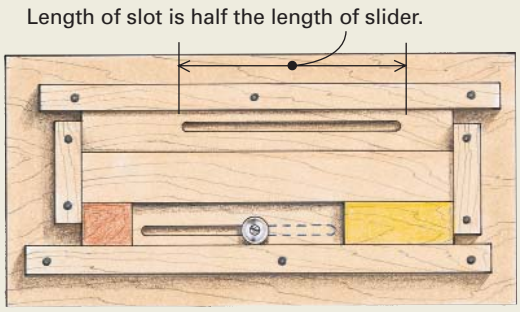
**Slotting jig**

Color-coded blocks, sized to the slider, stop the router cut at each end. The right and left sliders are mirror images, so the blocks will be reversed.

**Routing the top slot**




**Routing the bottom slot**




# *A jig for plunge routing the slots*

The slots in the drawer slider are half as long as the slider's overall length. They're laid out with the top slot toward the front of the slider and the bottom slot toward the back (see the drawings at left). For strength, I leave at least 2 in. of stock between a slot and the end of the slider and ⅜ in. between a slot and the edge of the slider.

Mark the right and left sliders and designate the front and back of each. Now the sliders are identical, but they need to be slotted as mirror images of each other.

A plunge router and a jig make slotting easy (see the drawings). I set up my router with a downcut spiral bit and a guide collar. It's sized so that when I push the collar against the strips, the router cuts the slot ⅜ in. from the edge. I size the stop blocks at either end of the jig to take the collar offset into account.

For the first slot, the blocks are laid in the jig, as shown in the top drawing. When routing the lower slot, the short block is at the back. Remember that the sliders are mirror images, so when you slot the second slider, the blocks will be reversed. Think it through carefully because the placement of the blocks is different for each slot. Coloring the blocks helps to keep things straight. —*K.R.*