Box with a Built-in Hinge

Splined miters and a flip-top lid add character to a simple project

BY BARRY NM DIMA

This box was a happy accident. I wanted to make a salt cellar for my brother, a serious cook, but that's just a box, right? No design inspired me until I saw chef J. Kenji López-Alt's salt box. He flipped its overhanging lid open and shut with ease, letting him grab a pinch of seasoning with one hand while the other minded the food. I used his box as a jumping-off point and landed somewhere much more my own, both stylistically and functionally. Mine combines continuous grain, 1/16-in. shadowlines around the lid, and paint—my mix of fussy and fun.

The key detail is the back. It sits lower than the sides, and is dadoed into them. This lets it act as a stop for the lid, which hinges

Photo, this page: Michael Pekovich; drawings: John Tetreault

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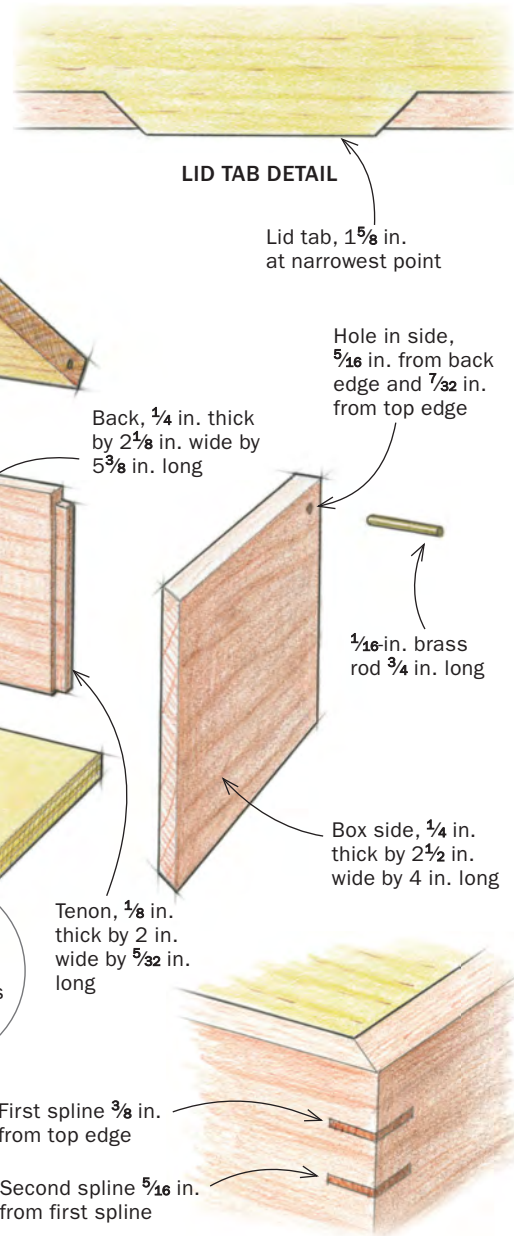
FOUR SIDES, BUT ONE'S A HIDDEN STOP

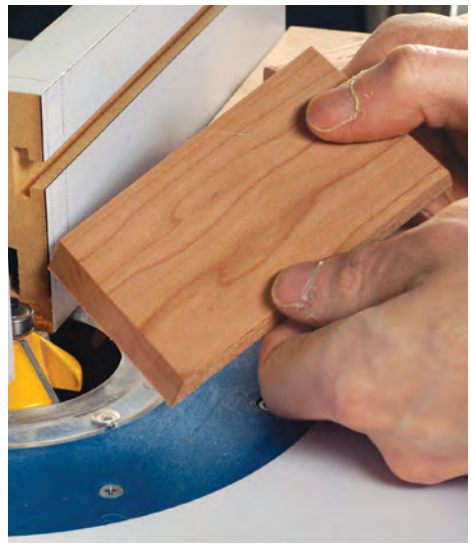
By mitering the front but insetting the back, you can reap benefits both aesthetic and structural. Similarly, the painted plywood bottom strengthens the box while simultaneously opening design opportunities. All the box parts are solid wood except the bottom.



MITER THE FRONT CORNERS

Cut the miters using a mitering bit. *Dima lines up the router table's fence with the bit's bearing and raises the bit to the stock's top face. He uses a push block long enough to leave good support on the infeed fence even after the cut, since the fence opening is large.*

Miter both ends of the box front, and only the front ends of the sides. *Since the box has only two miters, it's easy to wrap the grain around the show faces. Make sure the side pieces remain the same length after the cut.*



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STOPPED DADOES AND TENONS

Mark the stop and start points on the fence. *After setting the fence, transfer the bit's diameter to it. Then extend these lines up the fence for better visibility.*

One cut stops at the top of the dado; the other starts on it. *Mark the dado's top on the outside face of each side. Stop one side's dado when that mark meets the right line on the fence. For the other side, pivot the piece onto the bit by lining up its mark with the left line. Continue that cut through the workpiece.*

Drill for the hinge with a stop clamped to the fence. *These are mirrored holes, so you'll drill from the inside out on one side and vice versa on the other. Use a backer to absorb any blowout.*

on brass pins through the sides—an easy, inexpensive alternative to leaved hinges. A notch in the front lets the lid lie flush with the back's top edge, sealing the box all around.

Locating the hinges may be the most pivotal part of the build, but it's just a matter of measuring correctly. The joinery, mostly done at the router table with affordable bits, is simple miters and stopped dadoes. To strengthen the miters, you'll add thin splines toward the top and glue on plywood at the bottom.

This box is cherry with a pine lid and a painted plywood bottom. In previous versions I used different woods with differently colored plywood bottoms. Thanks to their size, these boxes are a fun, low-stakes way to experiment with wood selection, contrast, and color.

Miters with continuous grain

One of the lovely advantages of miters is that they let you wrap grain around corners without interruption. To wrap grain on a typical four-sided box, you need to carefully resaw a board, and then crosscut and assemble the parts in sequence. This box requires far fewer brain cells. Because only three sides are visible, you just need a board the combined length of the front and sides, plus a little for sawkerfs. I don't treat the grain on the back as an afterthought, but I don't prioritize it either.

Because I don't have a table saw, I miter on the router table; I crosscut and shoot the sides to length before mitering. It's a fine option provided you have a good, square fence; the bit's vertical travel is 90° to the tabletop and the bit itself is 45°. I like a ½-in. shank too. I use a push block behind the workpieces to stabilize the stock and limit blowout.

Ensure the sides remain the same length. If you need to take an additional pass on one side, do so on the other side too, even if the miter is already sharp on that one.

Stopped dado houses the back's tenons

The back is tenoned to fit in a narrow, shallow stopped dado in each side. You can clamp stops on the router fence for the dadoes, but I just use pencil lines. Because the tenons are notched up top, the lengths of the tenons and dadoes don't need to match perfectly. I don't even bother squaring the end of the dado.

On the other hand, the distance between the back's shoulders defi-

Photos, except where noted: Barry NM Dima

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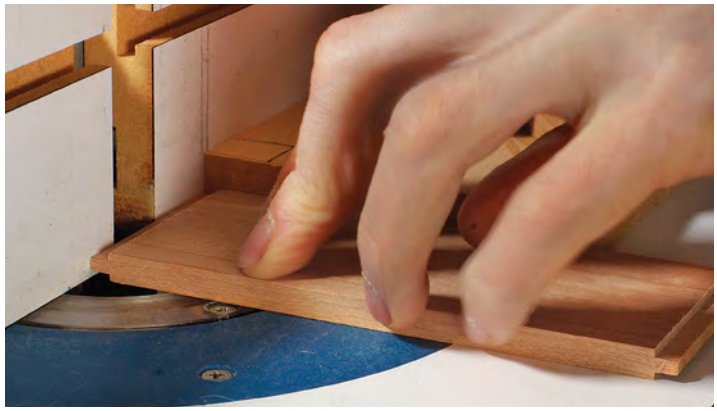


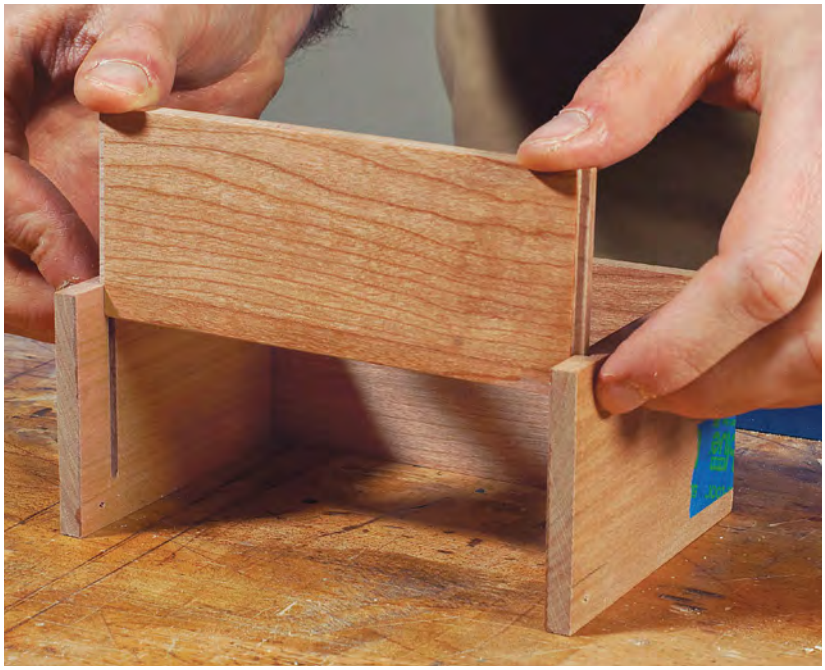
Rout centered tenons with a straight bit and push block. *Dima first dials in the tenon's thickness before incrementally nudging the fence to achieve the exact shoulder-to-shoulder dimension he wants, which must be the same as the inside dimension of the mitered front.*

Notch the tops of the tenons. *After knifing the edge at the shoulder, saw away most of the waste. Then slowly pare to the knife line with a chisel.*

Blue tape taut across the miters acts as clamps. *Dima stretches the tape over the joints while registering the box's bottom edge against a straightedge (above). When he folds up the miters (right), the tape stretches further to keep pressure along the joint while the glue dries.*

nitely needs to be bang-on. If it's not, the box won't end up square, which will lead to a nightmare fitting the lid, unsightly gaps around it, or both. Fortunately, the front serves as an easy reference for this dimension. The shoulder-to-shoulder measurement of the back must match the inside distance between the front's miters. If the tenons end up long, trim them. The priority is the distance between the shoulders.

The lid pivots on 1/16-in.-dia. brass pins. I locate the hole through the side so the pin is centered on the lid's thickness and the lid lies 1/16 in. below the top of the side. Front-to-back, the hole is placed so the top can open entirely before it hits the back, which acts as a stop. Locating this hole correctly is



Install the back next. *Before the glue begins to set on the miters, glue in the back and clamp across the joint. There's not much reference surface along the joints to square the box, so check and double-check to make sure it's square.*

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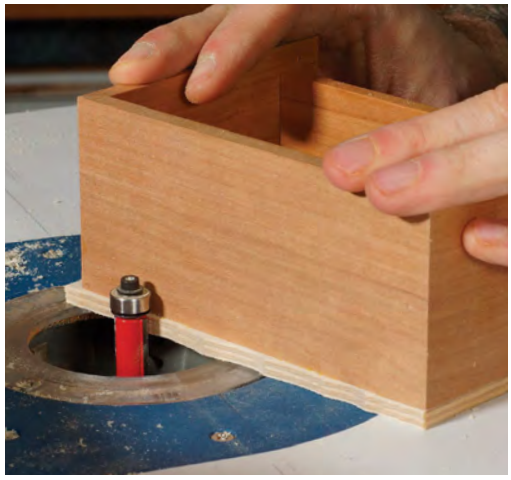
PLYWOOD AND SPLINES ADD STRENGTH

Align the bottom with the back of the sides when gluing it on. *The bottom should overhang at the sides and front, which will be flush-cut after the glue-up. Dima doesn't rout at the back of the box.*

Flush-trim the bottom at the router table. *Raise the bearing on a flush-trimming bit to the box body and rout. Take small cuts and, where possible, enter the cut with a starting pin for control.*



crucial. I figured out its placement in SketchUp.

Pay attention at glue-up

The box's size belies how finicky the glue-up can be. I use tape at the miters and miniature bar clamps (hatagane clamps, specifically) at the dado—simple enough. But with just two miters and small tenon shoulders to reference the joints, it's easy to fall out of square. This is why I prefer small clamps here: They more easily limit how much pressure I apply to the box. Check the box for square at several stages during glue-up.

If I want to finish the box's interior, I do so before assembly. Leave the bottom edges bare, however, because they're a glue surface.

Plywood and splines for strength

The small joinery surfaces mean that at this stage, the box is rather fragile. To shore up the bottom, I glue plywood directly to the box. It locks the joints closed, and I gussy it up later. Use good plywood if you can, with solid, visible plys, like Baltic-birch. If solid wood is more your speed, stick to quartersawn pine, which has almost zero seasonal movement.

Make sure the back edge of the plywood is flush with the back edges of the sides when you glue it on. When the glue is dry, head to the router table to trim the bottom flush to the box's front and sides. Because the bottom is glued on flush to the back edge of the sides and the back is inset, I don't flush-trim back there.

While the plywood strengthens the bottom of the box, the top needs some help. That's what the splines are for. I have veneer that fits excellently in my ryoba's sawkerf. Do test cuts with your saw to see what works.

Saw the slots for the splines. *Lay out both the length and depth of the slots. Saw slowly and carefully, since the splines will be highly visible.*

Glue in the splines. *Dima uses two-layer veneer, which fits nicely in the kerf from his saw's rip teeth. If the fit's too tight, he hammers the veneer thinner before installation. The glue will swell it to fill the slot.*

Flush the splines to the box. *Dima first cuts close with a fine-tooth saw, which is gentler on the thin veneer. He then pares the veneer flush with a chisel, working in from each corner to prevent blowout.*

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Protect the box body with tape. *Instead of trying to align the tape perfectly, use a cutting gauge to trim it exactly where the bottom meets the box. In the back, use a knife at the seam or apply the tape very carefully. Firmly press down the remaining tape to avoid paint bleeding.*

I like plywood bottoms because when glued on, they provide instant reinforcement. They're ugly too, so I paint them. I start by finish-sanding the whole box. I then tape off the box, including around back, to shield it from paint. Press the tape down firmly to prevent paint from leaking underneath. I used an acrylic paint because I wanted a solid, stark, playful contrast with the wood. If you want a little more warmth and charm, go with milk paint. For richness so deep you could dive into it, I recommend oil paint.

If you plan to add a finish after paint, test it to make sure it doesn't smear, pull, or dissolve the paint.

Paint the bottom. *Dima applies two coats of acrylic paint,. After each coat, he knocks back rough spots with pieces of a brown paper bag.*

Lipped lid, notched box

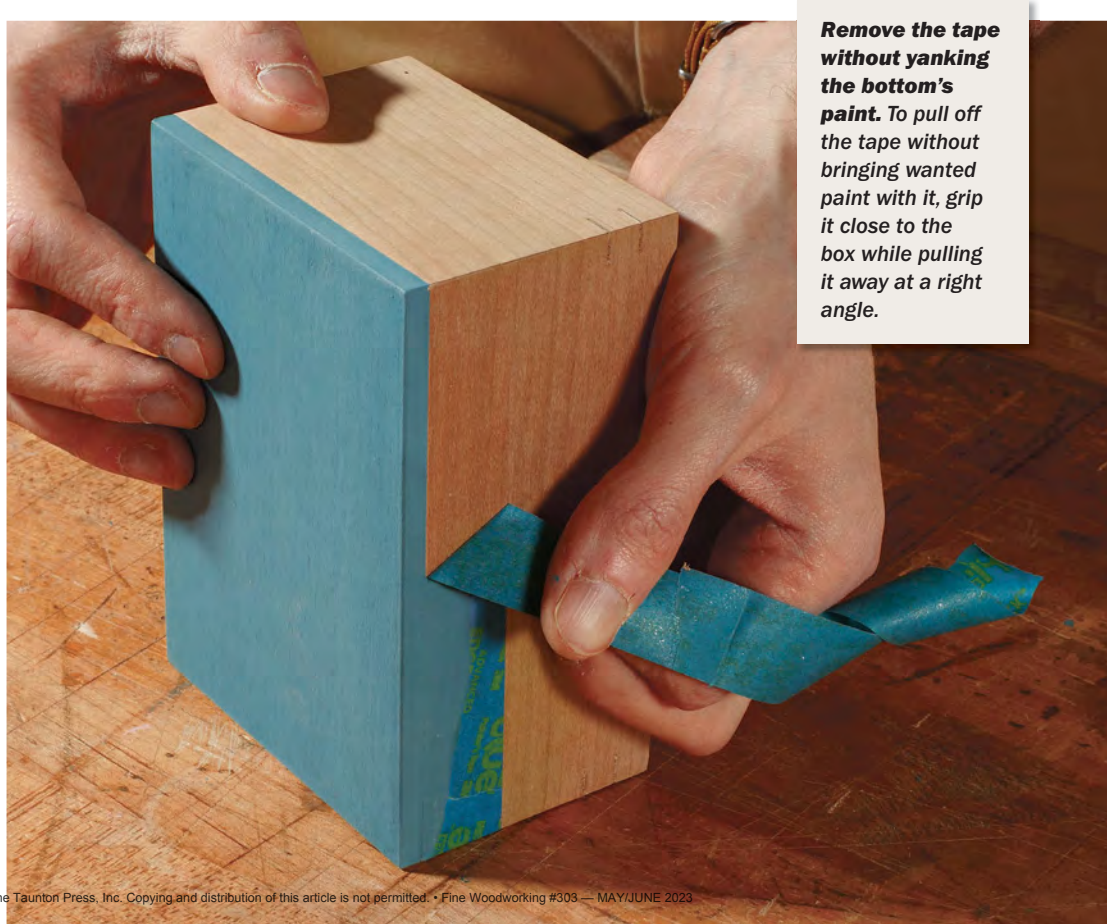
On earlier boxes, I notched the box front, created the tab on the lid separately, and then tried to marry them. Then editor Michael Pekovich asked, "Why not just make the tab and then trace it to the box?" So I did. Trust me, his method is much easier.

To make the tab, I use a 45° V-groove flat-bottom router bit, which looks like my miter bit but with flat cutters up top instead of a bearing. For the notch, I saw the ends, cope out most of the waste, and then use a pattern bit with a cutter ⅛ in. long. There are myriad ways to do either method, though, so choose what fits you and your tooling.

I recommend making the lid slightly oversize and trimming it to size. This way, you can sneak up on the 1/16-in. shadow lines around the lid, especially tricky if the box isn't square.

Drill the lid for the hinge

After you cut the lid to size and shape, put it in place to drill it for the hinge. The holes in the sides will guide your drill. Lightly file the pin's leading end so that it enters the hole easily.



Remove the tape without yanking the bottom's paint. *To pull off the tape without bringing wanted paint with it, grip it close to the box while pulling it away at a right angle.*

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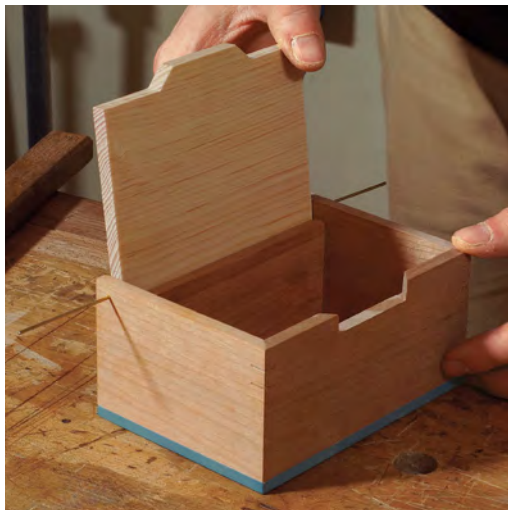
LIPPED LID HINGES INTO A NOTCH

Trace the lid onto the box, then cut and refine the notch to fit. *This is easier than trying to cut the notch first, especially if the box isn't perfectly square. For small adjustments, Dima uses sandpaper affixed to a block with double-faced tape. He aims for a 1/16-in. shadow line between the lid and the box.*

Use the pre-drilled holes in the sides when drilling into the lid. *Clamp the lid in place to keep it from slipping and ruining the hinge action. Drill carefully to avoid going out of alignment.*



Insert the pins just far enough to check the hinge action. *Drive the pins so they just meet the lid's holes. Then test how the lid works. If the lid doesn't open far enough, slightly bevel its lower back arris before rechecking.*

Even though the holes are located so the top doesn't hang up on the back, sometimes they're not perfect. So, I test the hinge with the brass pins inserted just far enough to grip the lid gingerly but still let me slide it on and off. If the top prematurely catches on the back, round over or chamfer the lid there with a hand plane.

When your lid's good to go, hammer the pins home; snip them as close to the box as you can manage; and file the snipped ends very, very carefully.

All that's left is to fill the box with stuff. I hear it's good with salt. □

Flush the pins after seating them. *Use flush-cutters to get the soft brass close, then finish with gentle passes with a fine file.*

Barry NM Dima, former FWW *associate editor, moved in February to Vietnam, where he will teach English.*

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