

TAUNTON'S

October 2018 No. 270

Fine Woodworking

Perfect dovetails on the bandsaw • Design secrets from an expert
Specialty handplanes • The cabriole leg 3 different ways



Modern desk with a leather top, p. 34

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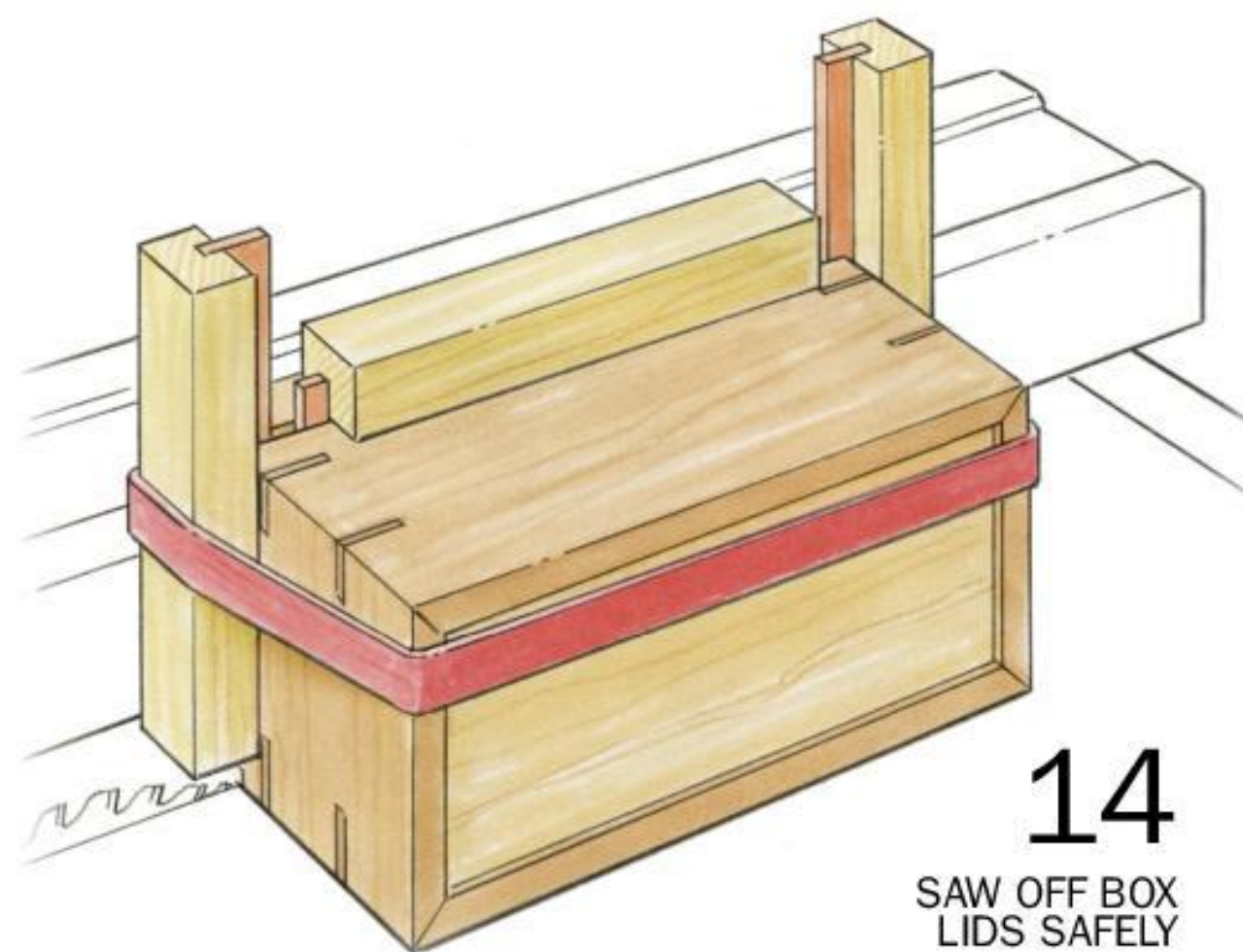
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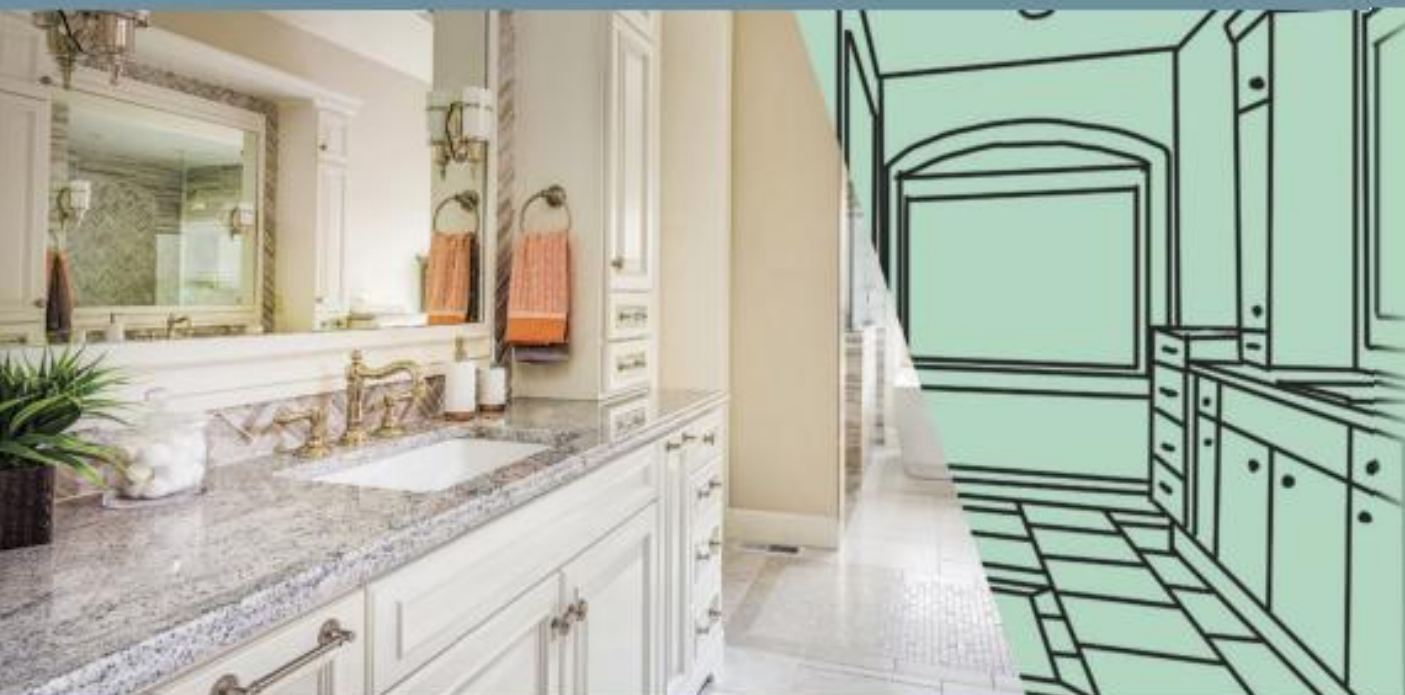
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VIDEO

Set up for success

Michael Fortune's bandsaw jigs make quick work of dovetails (p. 42), but for them to function properly, the bandsaw table must be perfectly aligned to the blade. Fortune shows you how to find and fix any misalignments that could cause problems.



VIDEO Behind the design: Arabesque

Getting a glimpse into a great artist's workflow is always an amazing thing. Tim Coleman (p. 56) takes you through the design process behind his cabinet-on-stand, all the way back to his original sketches.

VIDEO Favorite handplanes

Al Breed (p. 76) has been using handplanes in his professional work for decades. There are some that put a bigger smile on his face than others. He explains what he loves about his favorites as he puts them to use.

VIDEO Masterful paper production

The paper Nancy Hiller used in her wall cabinet (p. 64) is a period reproduction of a wallpaper created by C.F.A. Voysey. We go inside David Berman's studio to watch what goes into a faithful reproduction of this classic wallpaper.

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VIDEO WORKSHOP

Machine maintenance with Matt Wajda and Ellen Kaspern

A well-tuned machine makes woodworking more accurate and shop time more enjoyable. Not only have Wajda and Kaspern spent countless hours making furniture, but they've also both taught classes on setting up and maintaining machinery.

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Web Producer	Ben Strano fw-web@taunton.com
Manager, Video Studio	Jeff Roos
Video Director	Colin Russell
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contributors

Nancy Hiller ("Architectural Wall Cabinet") trained as a furniture maker while living in England. She spent the early years of her career working for others in England and the United States, then opened her own business, NR Hiller Design, in 1995. In addition to custom furniture, Hiller specializes in built-in work for old houses. The best advice she can offer to those contemplating ditching their job to make furniture professionally? "Work for someone else first. You'll learn invaluable lessons about what works and what doesn't, in addition to expanding your technical repertoire."

When she's not working in the shop, Hiller is drawing (with a pencil and paper), bookkeeping, remitting monthly sales tax, and meeting with clients. In her spare time she writes about furniture making; she's the author of four books, among them *Making Things Work: Tales from a Cabinetmaker's Life*. And she makes a mean vodka martini.



Steve Brown ("One Leg, Three Feet") lives in Manchester-by-the-Sea, Mass., and teaches in the full-time Cabinet and Furniture Making program at North Bennet Street School, where he is finishing his 19th year. Why woodworking? "It is such a rich endeavor. It is challenging physically, intellectually, emotionally. There are aesthetic concerns, economic challenges, interpersonal issues with co-workers and clients. It can involve history, engineering, geometry, science among other areas of study. And at the end of the day you can see the tangible results of your work."



Michael Fortune ("Precise Dovetails on the Bandsaw") has earned more than a few awards and honors, but it's the work itself that fuels this Toronto-based furniture maker's passion. "I would not be surprised if someone burst into my workshop and yelled, 'What do you think you're doing; you're having way too much fun!' After 44 years at my drawing desk and workbench it remains the perfect career choice," Fortune says. His latest endeavors include designing and making furniture for several Canadian embassies around the world.

Bob Van Dyke (Fundamentals: "Getting started with router tables") has been teaching woodworking for decades, so it's no wonder he knows the value of a good teacher. In fact, he's always sure to mention his mentors. Spend some time talking shop with him and you're bound to hear him talk about which prominent woodworker has taught him which techniques. Among the most frequently mentioned are Will Neptune and FWW contributing editor Steve Latta, whom Bob also considers a great friend.



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Publisher	Renee Jordan
Director, Advertising Sales & Marketing	Alex Robertson 203-304-3590 arobertson@taunton.com
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Spotlight

Q&A WITH DAVE FISHER

I really enjoyed Dave Fisher's video workshop on carving a greenwood bowl (FineWoodworking.com). In the video, Dave makes his creation from a cherry log. I have a nice cherry log in my yard that I'd like to use to try Dave's technique. What's the best way to store the log before working it, and how long do I have to wait for it to be ready for carving?

—MIKE RICCO, Kalamazoo, Mich.

Dave Fisher replies: My preferred method for storing logs is to leave the bark and paint the end grain with two coats of whatever latex paint I have around. I keep the logs in a relatively shady area. When I'm ready to use one, I cut off an inch or two—or more if necessary to get past checking—from each end and split the log.

For parts of the log I can't get to immediately, I store them in a sealed garbage bag to retain all of the moisture. I use the same method for smaller pieces or when temporarily storing a partially carved bowl. Your Michigan winters will help with long-term bag storage; the bag retains the moisture and the cold temperatures prevent bacteria and mold growth. A refrigerator or freezer can do the same. Save room by getting rid of some bulk from the piece first. In fact, if you remove enough wood and do all of the green carving stage, you can just let the piece dry and revisit it to do the finish carving weeks, or years, later.

I've used green wood that had been stored for several months. Wood gets less green but is still usable unless it has rotted or checked too deeply. You can carve wood at any stage, and the process is magical and delightful. There is much more to say about it, and I have more information on storage and drying on my website and blog (davidffisher.com). For more on carving a bowl, you can also see my article "Carve a Greenwood Bowl," in *FWW* #263. Happy carving.

Function vs. art in woodworking

Michael Pekovich's "From the bench" (*FWW* #266) reflects on intriguing aspects of woodworking. Contemplating the moment when a piece is really done, it seems that Michael could not state matters any more simply or clearly: "A piece will attain its full potential only in time and with use." Two ingredients: time and use. The need for additional

time, in relation to his idea that the last coat of wax is not the definer of a piece's finish line, is indeed persuasive, especially when considering how much woodworkers love to ruminate, re-evaluate, and talk about their works, tools, and processes. On the other hand, relying on "use" as a determinant, rather than closing the argument, opens the conversation in several directions.



Quite often I witness woodworkers promptly and eagerly dismissing the artistic qualities of their works arguing that what they build is "merely functional." First of all, function and art are not mutually exclusive. At its heart is the meaning of the term "art." Artists, philosophers, historians—to name a few—have been at it for quite some time.

On the other hand, more refreshing and pertinent to woodworking is the meaning of the term "use." Not so much what "use" is, but what "use" can be.



With his wall cabinet story, Michael convincingly argues that only when he placed the teapot on the cabinet did he feel that it was really finished. And when we see the picture of his cabinet, we understand what he means by wood and clay working in harmony. He was taken by the way in which the two elements involved complemented each other and created something else. That was their function, and it was precisely the achievement of this function that gave him the feeling of completion for his project.

From Michael's story—an experience that should have resonated as familiar to many—we learn that the use of something, its intrinsic pragmatic value, may simply be: "sit there and be pretty" and that there is absolutely nothing wrong with that.

—ERICK CARBALLO, Bloomington, Ind.

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To contact us:

Fine Woodworking
The Taunton Press
63 South Main St.
PO Box 5506
Newtown, CT 06470-5506

Send an email:

fw@taunton.com

Visit:

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Best Tip



Harvey Baker started woodworking in the 1970s, when his mother needed a yarn rack for her loom. Soon after, she needed a whole new loom, which he built by hand. Baker soon set up shop as a part-time pro. These days, he and a partner specialize in “family furniture, ornate church carving, and architectural oddities.”

Make a foolproof hinge jig in minutes

There have been some very good hinge jigs in *Fine Woodworking*, but I think mine is a little less error-prone and just as quick to make. Like Craig Thibodeau did in *FWW* #266, I create a jig board that fits inside the door opening, marking the hinge locations in pencil. The rest of my jig is different.

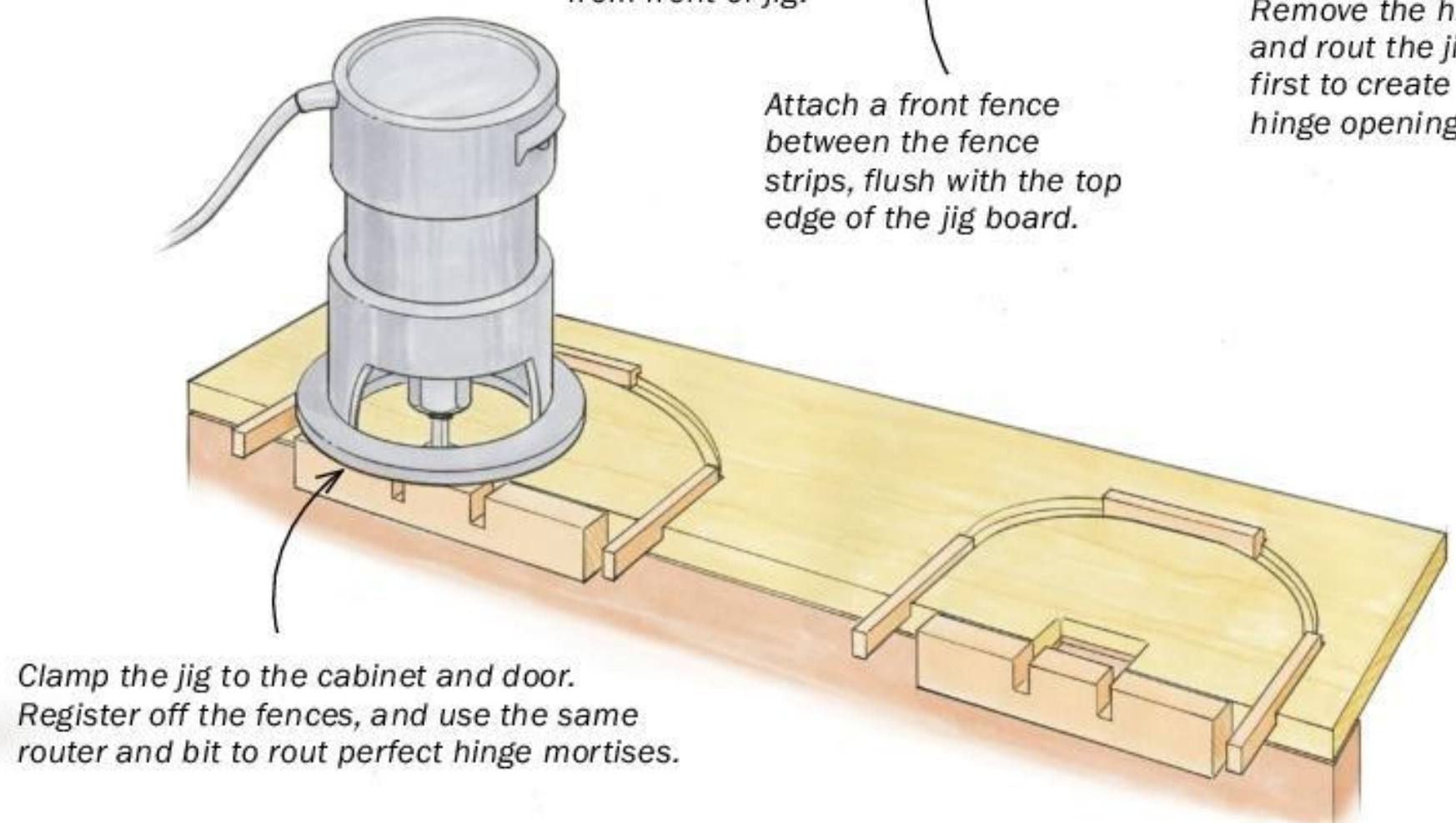
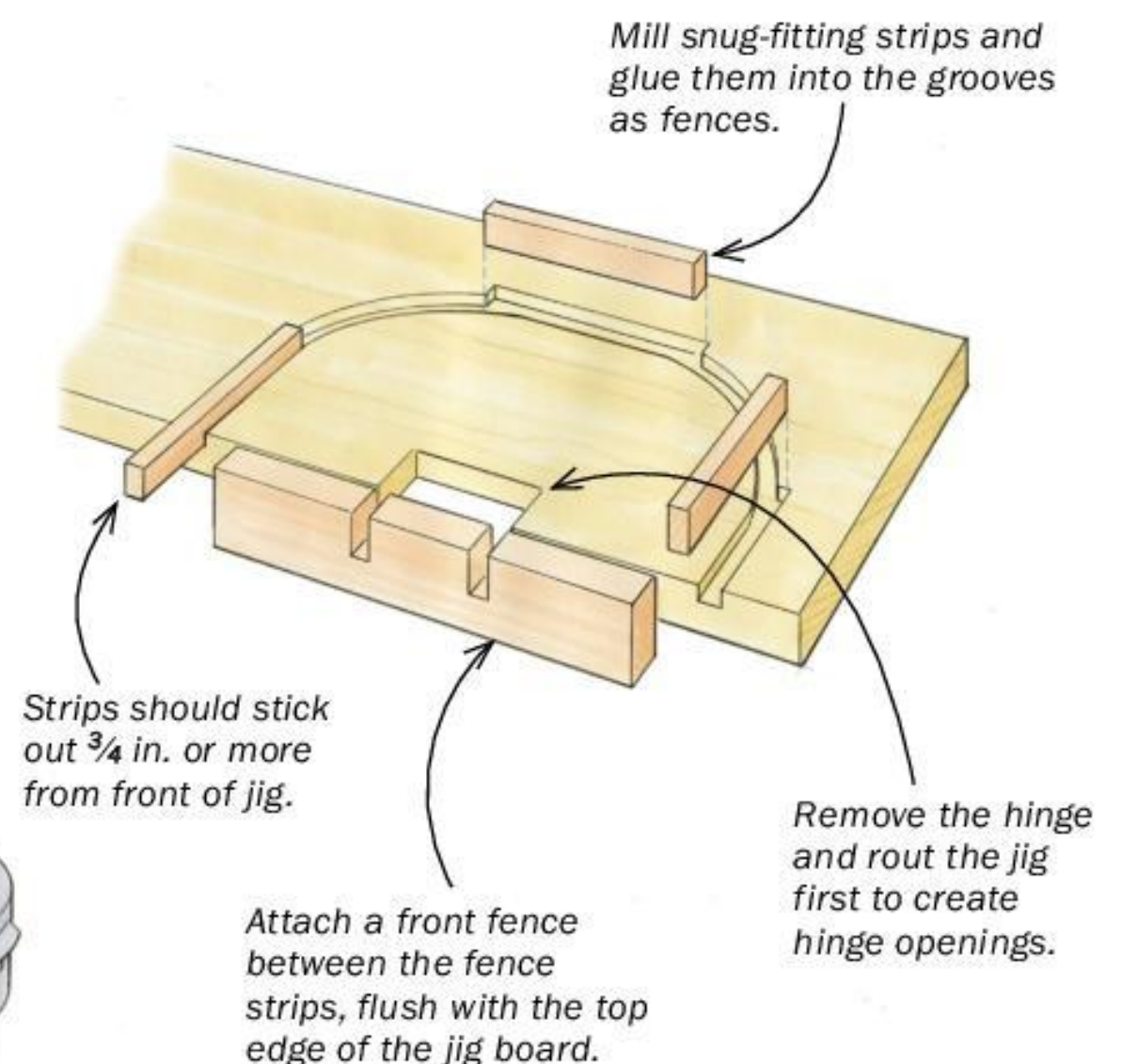
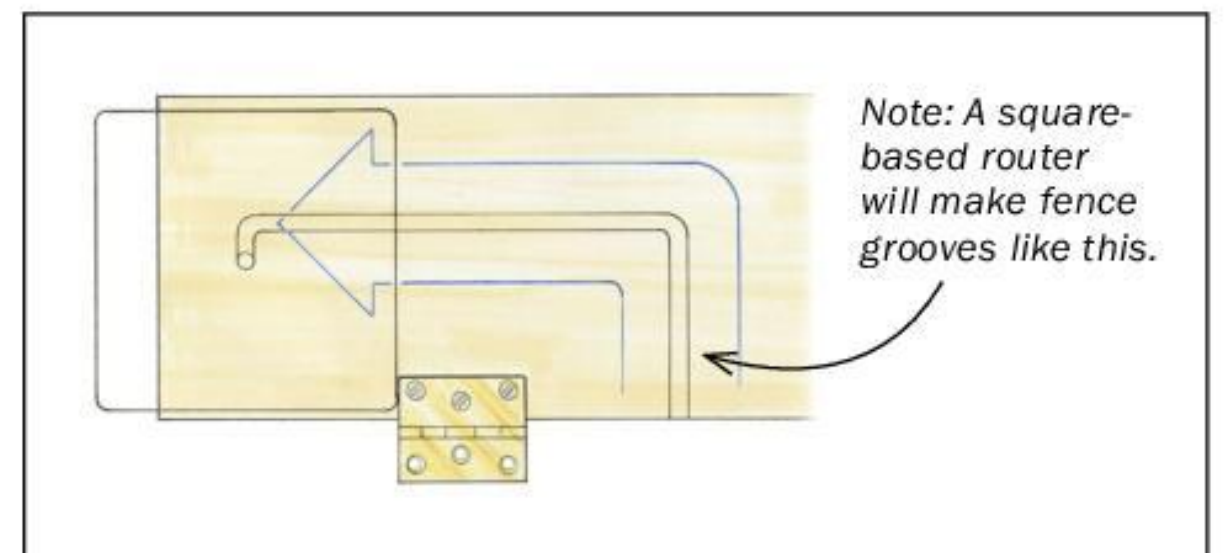
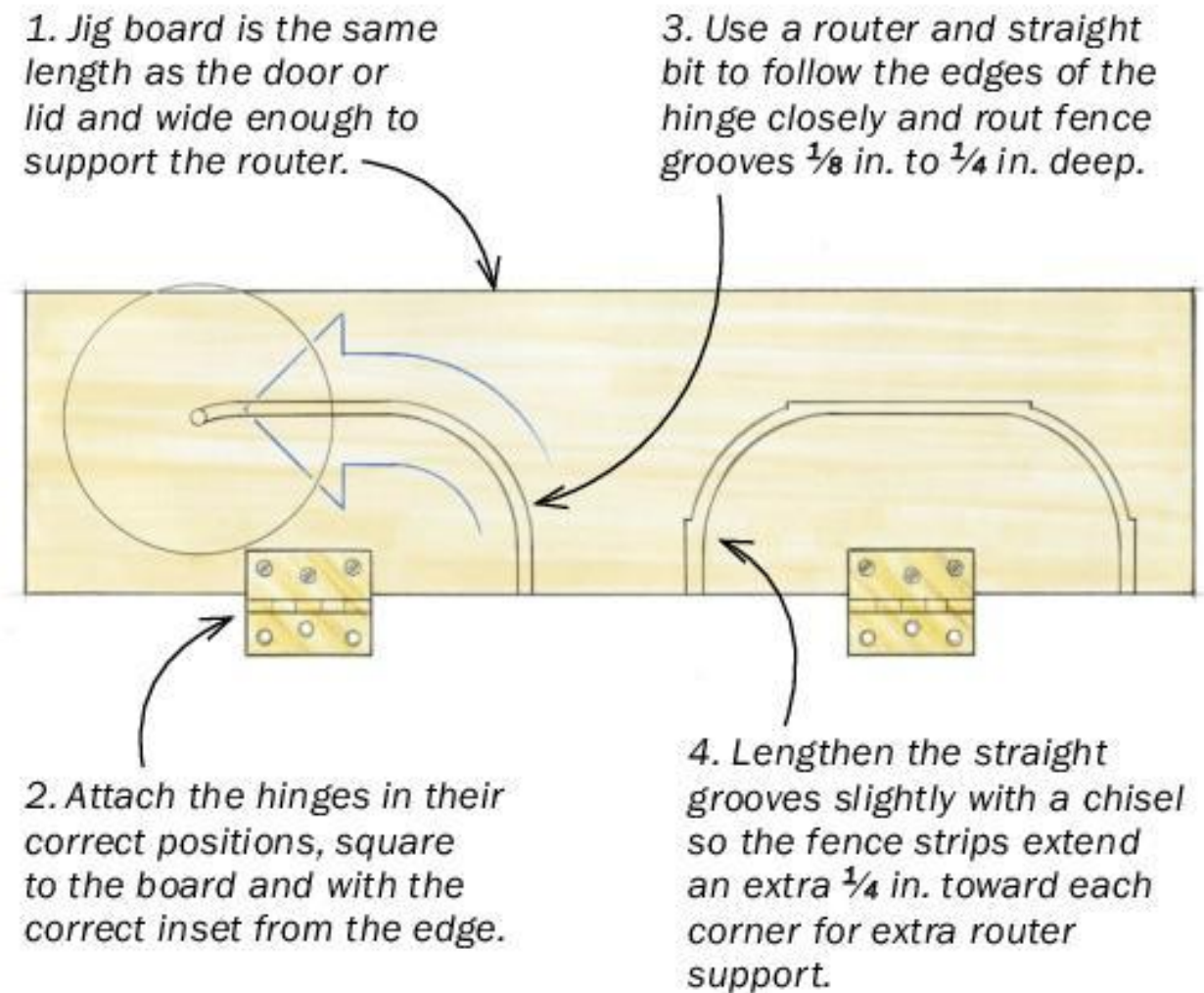
I start by screwing one leaf of each hinge to the jig board exactly where I want it to end up. Be sure that the hinge inset is correct and that it's square to the board. Now, using the same router and bit I'll use to rout the hinge mortise, I rout grooves in the jig with the base of the router riding the edges of the hinge, and then attach fences as shown in the drawing.

When routing the fence grooves, I put a thin strip of masking tape at one end of the hinge, so the final hinge fit is snug but not too tight.

Next, remove the hinges and use the router to cut the hinge openings in the jig, routing to the actual depth you'll rout the mortises (which helps prevent tearout later). Leave the center portion of the front fence intact; it will help support the router.

To use the jig, clamp it to the door or cabinet, and rout as many perfect hinge mortises as you need. You'll have just a bit of squaring to do in the corners.

—HARVEY BAKER, Waynesboro, Tenn.



A Reward for the Best Tip

Send your original tips to fwtips@taunton.com. We pay \$100 for a published tip with illustration; \$50 for one without. The prize for this issue's best tip was a cordless trim router by Ridgid.





Make It Beautiful.

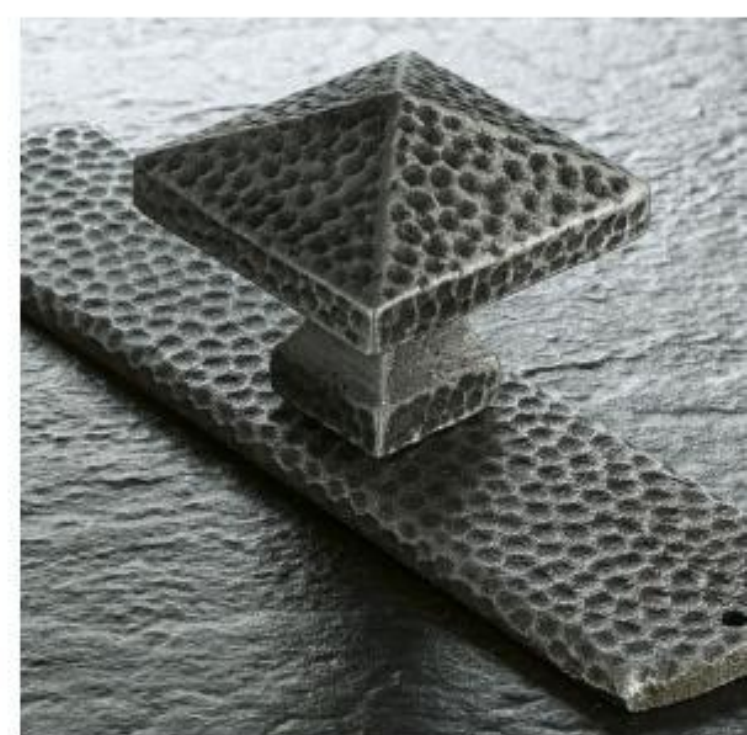
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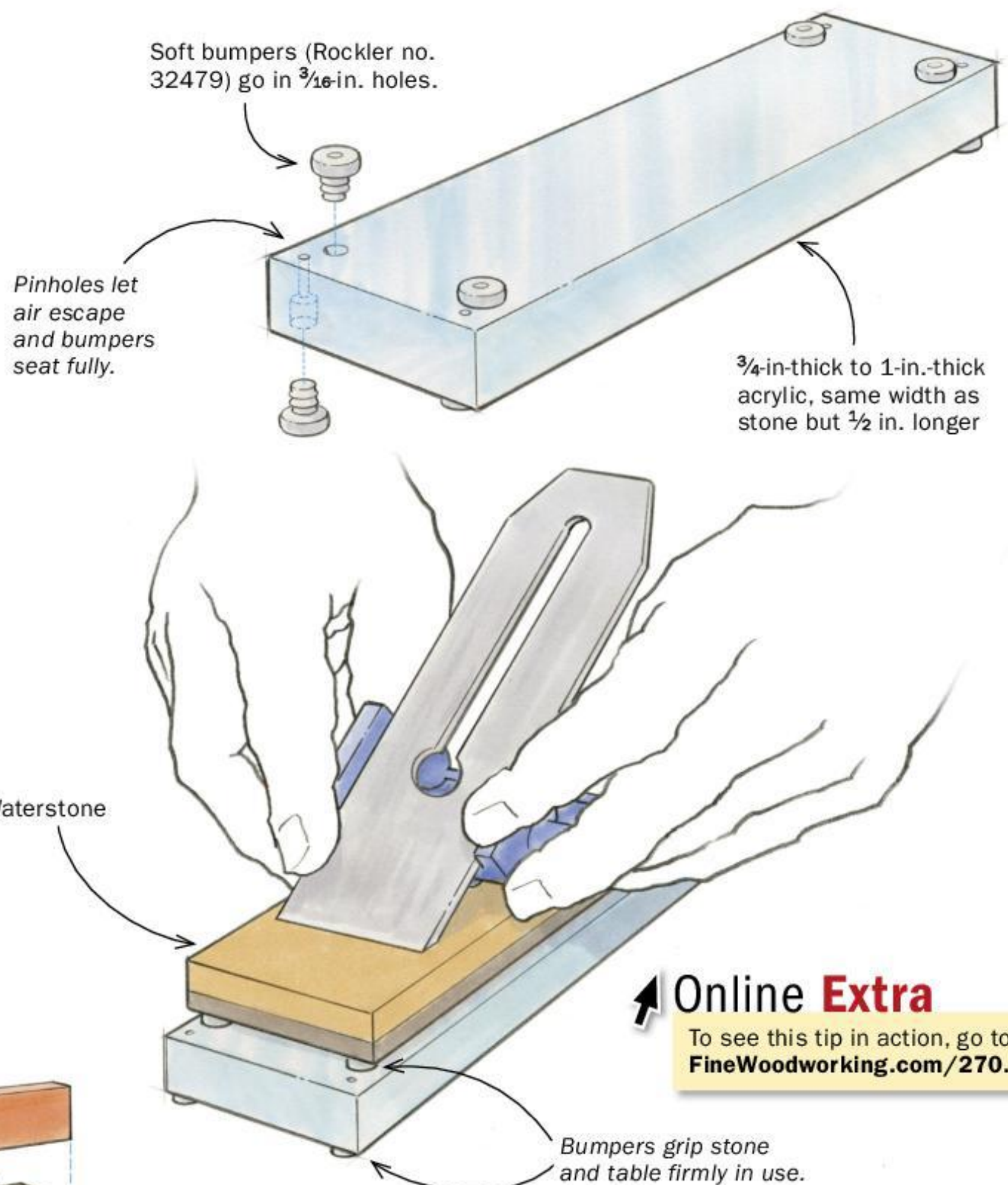
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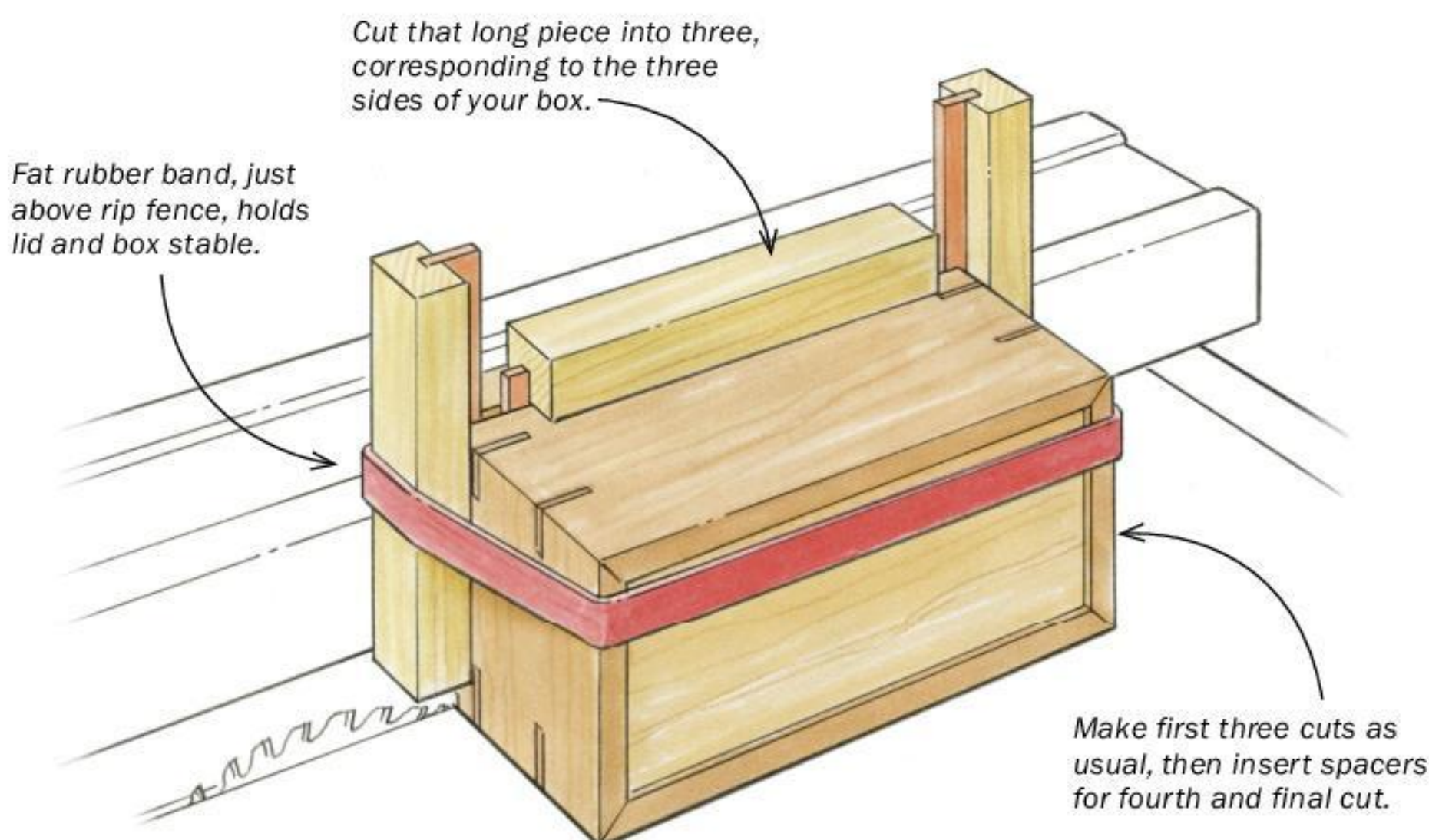
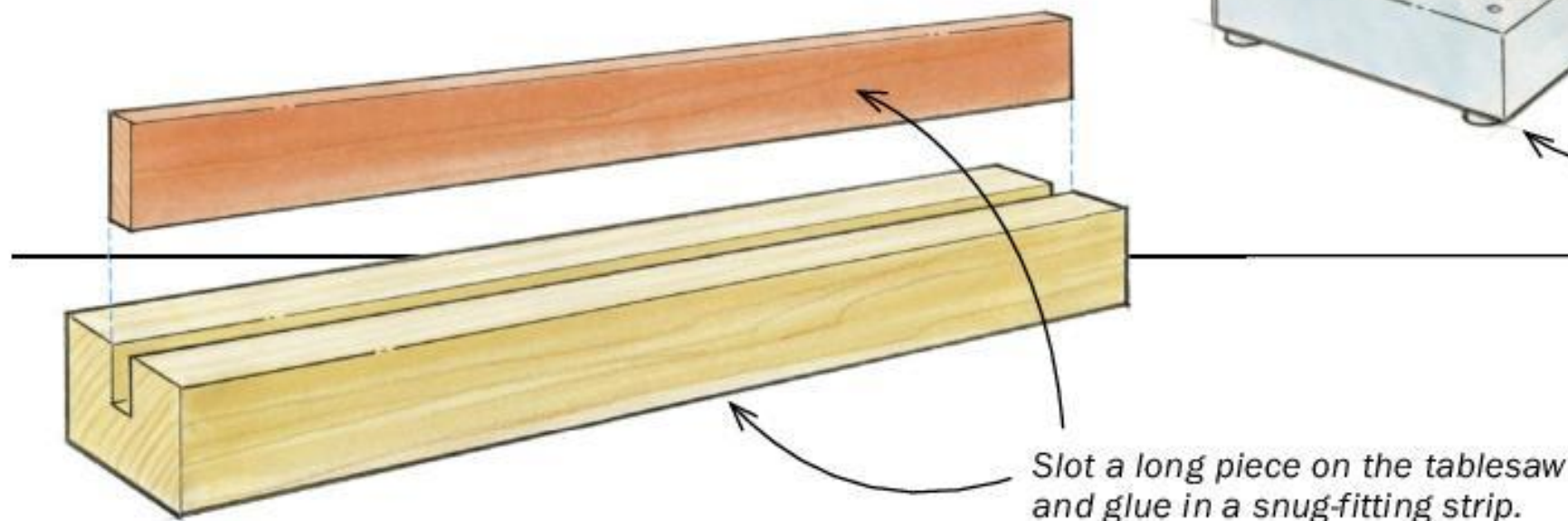
Waterstone holder is simple and stable

This simple holder grips a combination waterstone firmly yet makes it easy to flip to the opposite side. I made it from 1-in.-thick acrylic I had on hand, but other thicknesses would work. The key is the soft rubber bumpers on the top and bottom that grab the stones and a benchtop or tabletop equally well. Cut the acrylic to the same width as your stones, but $\frac{1}{2}$ in. longer. The “soft-stem bumpers” are from Rockler, and they hold tight in $\frac{3}{16}$ -in. holes. To get them to seat fully, drill a pinhole through the acrylic at the center of each bumper hole to allow air to escape. I placed the bottom bumpers at the far ends of the plate for stability and the upper ones a little inboard, under the corners of the stone. My waterstones are very stable in use, and the acrylic is easy to rinse off when it gets dirty.

—DEAN M. VANDE GRIEND, Story City, Iowa



Online Extra
To see this tip in action, go to FineWoodworking.com/270.



Spacers make it safe to saw off box lids

A lot of woodworkers cut the lids off their boxes on the tablesaw. The problem is that the box becomes very unstable when you are making the final cut that frees the lid. Here's a simple way to do it safely. Using the same tablesaw blade you'll use to saw off the lid, rip a slot in a long piece of wood. Now glue a strip of wood into that slot. For me that's usually just more of the stock I use for miter keys. Now cut the long assembled piece into three pieces, which can be inserted into the first three sawcuts when making the fourth. To hold everything together, all you need is a fat rubber band or two, wrapped around the box just above the area where it will ride your rip fence. It works beautifully.

—DOUG STOWE, Eureka Springs, Ark.

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The most important aspect of any lift is the up-and-down operation, and here the Kreg performed really well, moving both smoothly and precisely. And while I don't typically rely on a lift's micro-adjustment guide, preferring to go by eye and test cuts, I found the scale on this one was machined accurately: Each rotation corresponds to $\frac{1}{16}$ in. of travel. And the lines on the dial were a useful visual reference when making small changes.

Unlike most lift models I've used, the Kreg does not have leveling screws on the underside of the plate, instead relying on a separate piece of hardware to level it to the table. This system works fine if you're installing it into the Kreg router table (which I used for this test), as the leveling clips are included in the table kit. Otherwise, you need to either engineer something or purchase the levelers for around \$20.

Router lift by Kreg
Model PRS5000
\$300

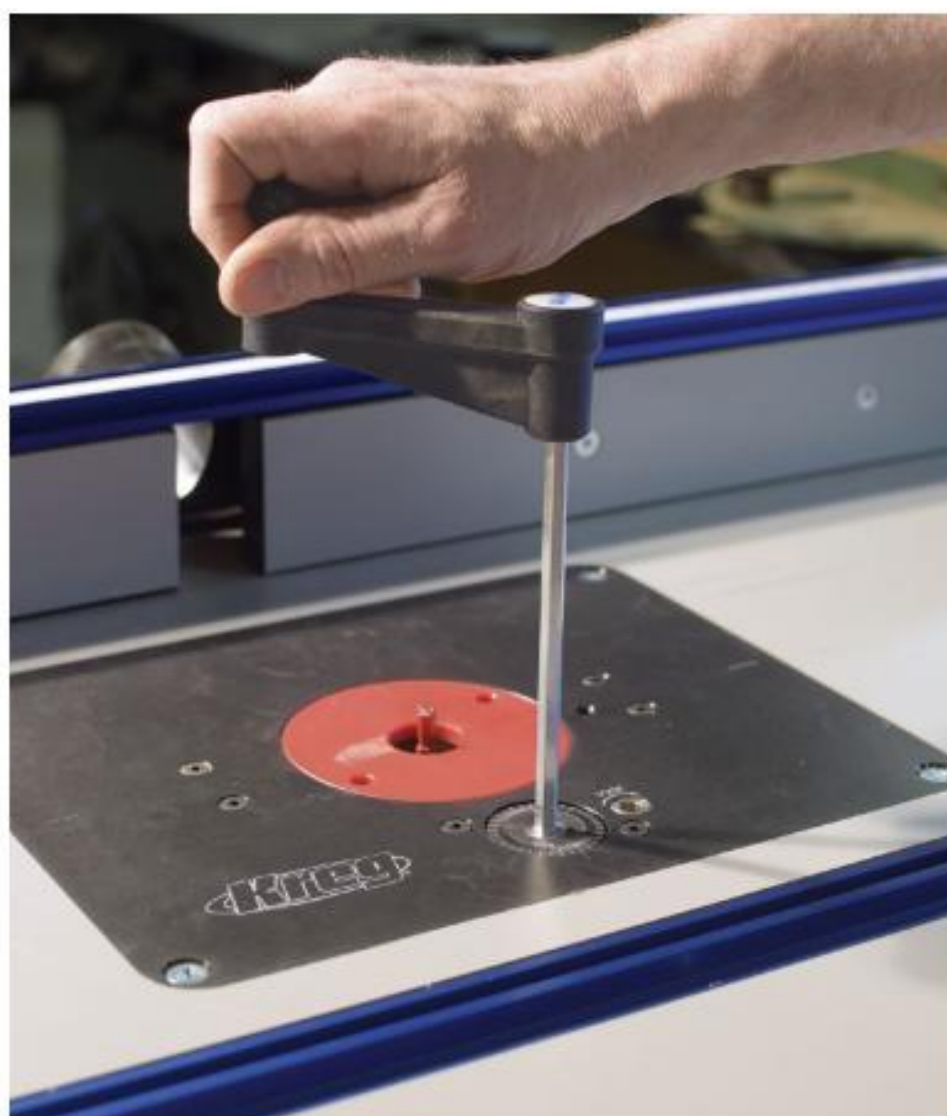


My one complaint is with the plastic insert rings that reduce the plate's opening for different router bits. The lift comes with three rings—a 1-in., a $1\frac{1}{8}$ -in. that is designed to fit a rub collar (a useful addition), and a $2\frac{5}{8}$ -in. Kreg does sell a separate set with a larger range, but an additional ring in between the medium and large sizes would be nice addition to this kit. Also, after just a few weeks of use, the plastic had started to wear.

Nevertheless, this is a tool that I liked overall and recommend.

—Owain Harris is a furniture maker and teacher in New Hampshire.

Dial it in. The height adjustment worked exceptionally well in both directions, and the locking mechanism in the plate is a nice feature.



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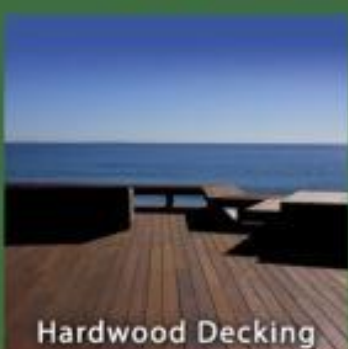
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With their hollowed back, the blades are strikingly similar to Japanese chisels. The hollow makes it particularly easy to produce a flat, polished back by minimizing surface area along the 2½-in. blade. Unlike the laminated blade of a Japanese chisel, though, the Narex blades are entirely chrome-manganese steel. Hardened to Rc59, the blade sharpened to a keen edge with no trouble using waterstones. In use, the chisels held up well.

I like the high-quality fabrication and steel, the hollowed back, and the reasonable price, though I didn't care for the oversize handle. For a finesse tool like a dovetailing chisel, I found the handle clunky and long, and its balance problematic. If you don't find this an issue, though, these dovetail chisels will work for you.

—Chris Gochmour builds furniture and teaches in Salt Lake City.



Ideal for confined spaces. The sides of the Narex are beveled, allowing you to work into tight corners, such as when cleaning out dovetails.

Dovetail chisels by Narex

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(1/4 in., 1/2 in., and 3/4 in.)



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I put the 5-in. sander to work on some cherry and maple and was struck by a few things. The tool was pleasingly quiet and nearly vibration-free, and it felt very light and agile without the encumbrance of a power cord. Also, the motor shuts off almost instantly, whereas my old sander takes about 3 seconds to wind down. Last, the controls are well laid out, with the on/off switch easily triggered with an index finger and the speed setting adjusted with the thumb (assuming you work with your right hand). Each battery provides about 30 minutes of sanding and recharges in about the same amount of time.

The ETSC 125 Li is versatile, as it can be used both corded and cordless. Also, the dust bag can be removed and the unit can be attached to a dust collector. Dust extraction was noticeably better while using the collector, though the sander was very prone to doing a wheelie while connected to the hose, necessitating two-handed operation.

—Ray Finan is a woodworker in Vermont.



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Is design a learnable skill?

BY ANISSA KAPSALES



HANK GILPIN



LAURA MAYS



ALED LEWIS



MICHAEL CULLEN

Long before I ever started thinking about designing furniture, I knew I wanted to build furniture. I grew up watching my dad, a mechanical engineer, making things while I hung out in his basement workshop. I was in awe of the way he would look at a spot in our house, envision what he wanted to build based on a need, and then set to work making it. Voila, it was in place and in use as if the house had never been without it. We had built-in shelving, beds, outdoor furniture, radiator covers, and they all looked perfect. What I now realize is that there's a huge part of the process from the concept to the finished product that I hadn't noticed or considered. The designing.

At some point I started making things, and I quickly realized how separate yet intertwined and muddled are those two aspects of building furniture. Designing vs. building, the creative vs. the practical—where do the two things separate? Converge?

Clearly, it is possible to learn the techniques of building, and with a lot of time logged one can become skillful at it. Sure, some people have better hands than others; some are more mechanically minded and more adept at machine maintenance;

some just have more aptitude or desire for pushing lumber through machines than others. In the end, though, the techniques are concrete, teachable skills.

But can one learn how to be a good designer, or is that an innate talent given only to the lucky? I've made enough of my own furniture, seen enough furniture made by others, juried enough exhibitions, watched enough people struggle through the process, and read enough on the subject to know that this is an elusive, daunting topic. Good design can come with experience, building confidence and trusting in your instincts that something just works or maybe doesn't. I know I've learned a lot about design since I first began thinking about it (and I'm sure there's a lot more I can learn). But I am just one maker. So I turned to a few people for help wrangling the topic, people who have been making beautiful furniture for a long time, and who spend a lot of time writing about or teaching people to make beautiful furniture. I asked them if the fundamentals of good design can be taught.

Anissa Kapsales is an associate editor.

Online Extra

For a slide show of work by these four designers, go to FineWoodworking.com/270.



Gilpin has been designing and building fine art furniture for 45 years. He served in Vietnam as an Army photographer, and returned to the United States with the intention to study photography at the Rhode Island School of Design. A random choice of electives led Gilpin to woodworking. His first teacher (and future mentor) was Tage Frid.

Hank Gilpin

Can good design be taught? Quickly, yes, design can be taught. It might be good if the teacher has both a bit of talent and a lot of patience. Passing on the elements of design that form the current visual zeitgeist is what most teaching is about, even if the teacher has other ideas; the premise being that the objects/ideas we produce must satisfy those who buy them. We are talking teaching and most of this happens in institutions where teachers want to believe that the learners will be able to go out into what Tage Frid called the “cold, cold world” and thrive. They will have to produce stuff that people want. What people want, from my experience, is usually something familiar or at least not too challenging.

What is not teachable, and what I sometimes think is the real question, is talent. Innate talent is one of the gods’ gifts. It’s a gift that few possess and of those who do, only some fully exploit. I’m not talking genius, but rather a simple aptitude that manifests in an ability to see a design in one’s head. The skill that evolves out of that innate ability is a direct result of pushing ideas by drawing, and drawing, and drawing again. The best designers I know draw all the time, filling notebooks with evolving and changing thoughts that only later become things.



Mays has a degree in architecture from University College Dublin and a higher certificate in Furniture Design and Manufacture from GMIT Letterfrack (Galway-Mayo Institute of Technology), both in Ireland. She followed that with two years in the Fine Woodworking program at the College of the Redwoods (now The Krenov School) in Fort Bragg, Calif., where since 2011 she has been the program director.

Laura Mays

I think design can most certainly be taught. To be sure, it’s beneficial to have talent or a natural affinity, or however one might describe a predisposition that is either innate or learned at an early age. But equally important are a desire to learn, enthusiasm, and the willingness to put in the time. Like almost everything, design takes a great deal of time to learn (as well as good teachers)—there’s a reason why most design degrees are four years long. It’s not possible to bypass the time stage. You have to be willing to fail, and fail again, in a supportive environment, and listen to teachers who tell you why and how it could be better. You have to listen with a mix of belief and skepticism.

Having said that, design is a huge category, spanning a spectrum from the almost entirely technical to the almost entirely artistic. It is not only about manipulating form and shape, but understanding user experiences. It requires a material sensitivity, an understanding of the making and assembling process, and an awareness of taste and fashion. The technical side is the easiest to teach, in a way, because it’s more measurable, more definitive in terms of right and wrong. The “artistic” side is more subjective.





Lewis has been designing and making furniture for more than 35 years. He grew up in Wales, and at 16 moved to Oxford to study furniture making at Rycotewood College. In addition to running a busy shop with a team of craftsmen for 18 years, he has worked in others' shops in South Africa, the United States, and the United Kingdom. He is lead instructor for the Nine-month Comprehensive Program at the Center for Furniture Craftsmanship in Maine.

Aled Lewis

I think the short answer to whether good design can be taught is yes, though there are some caveats attached. The first thing to realize is that attaining a design for anything is a process, and within it are a few key factors that plug into the task. Obvious things like function, material, budget, etc., are just a few.

I try to encourage my students to understand that designing is within everyone's grasp and not to be afraid of it. The process is not easy; it is at times riddled with uncertainty, self doubt, and anxiety. It is often the case that unless or until you go through these emotions you cannot claim to have done your best, but if that journey has been traveled then you can defend your decisions with some authority. Sometimes teaching design is a bit like shining a light down a dark rabbit hole and encouraging a student to go there. We don't know what's down there, but we have a good idea of what to do when we find out.

In critiquing design, once the questions of function, structure, build quality, scale, and proportion are addressed, the assessment cannot be anything but subjective. That said, we are nudged along toward a viewpoint by our accumulated knowledge of what has gone before us, what we see around us, and our perceived notion of skill, craft, and artistry. The accumulation of all these elements adds some rigor to the process.



Cullen worked in machine design before he became a furniture maker. He studied under David Powell at Leeds Design Workshops in Easthampton, Mass., then moved to Boston to work with Jamie Robertson at the well-known Emily Street Workshops. He divides his time between creating furniture, teaching, and writing about design and technique.

Michael Cullen

The foundations of good design can be taught or read about. One can learn all the exact dimensions and criteria for a good chair. One can even learn the correct joinery and can become quite adept at making a chair. And of course, one can learn about the material. But all this still doesn't guarantee the chair will be a success. Similarly, one can learn how to play a musical instrument by practicing all the right exercises and scales but that doesn't guarantee the result will be music to the ear. In my own experience, design is something much more elusive; something that isn't captured or defined through measurement or what I've been taught. It's more of a feeling about a shape that one captures in a moment of discovery. And of course good design can be born in failure; where one design idea is tried after another until just the right one appears. I like to say, "when the design presents itself—pounce, and work like hell before you think."



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Getting started with router tables

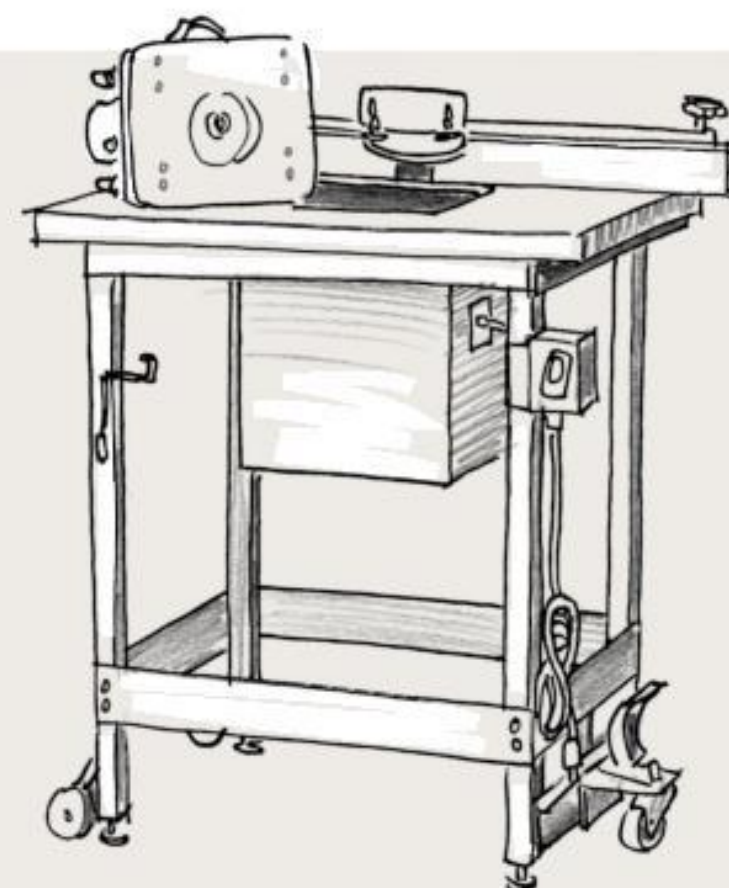
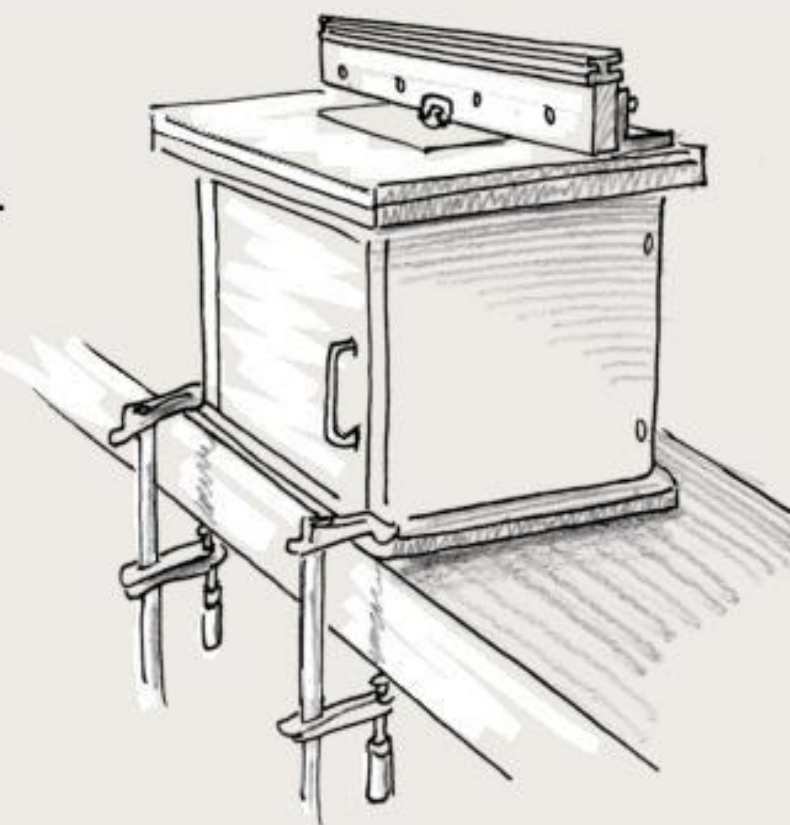
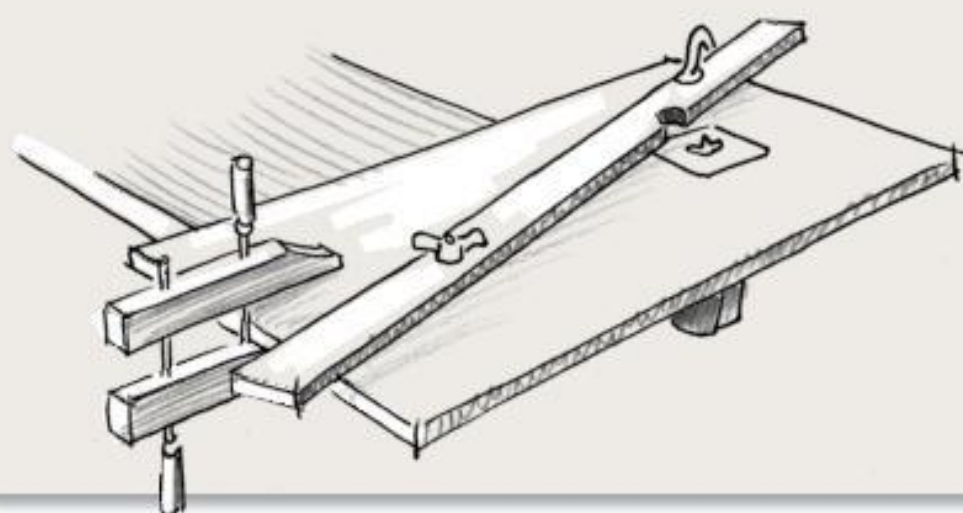
GET THE MOST FROM THIS WORKSHOP WORKHORSE

BY BOB VAN DYKE

What began years ago as a simple homemade device to hold a router has evolved into a common, and often indispensable, piece of shop equipment. Regardless of its level of sophistication, when set up correctly, a router in a table is frequently simpler and more stable to use than a handheld router and, in many cases, will increase the accuracy of your work. I'll explain what you'll want from a router table, the basics of using them, and the tasks at which they excel.

Types of tables

A router table can be anything from a piece of MDF with a router screwed to it and a board clamped across the top as a fence, to a benchtop model, to a complex, freestanding piece of expensive equipment. Set up and used correctly, they all accomplish the same thing and work the same way.



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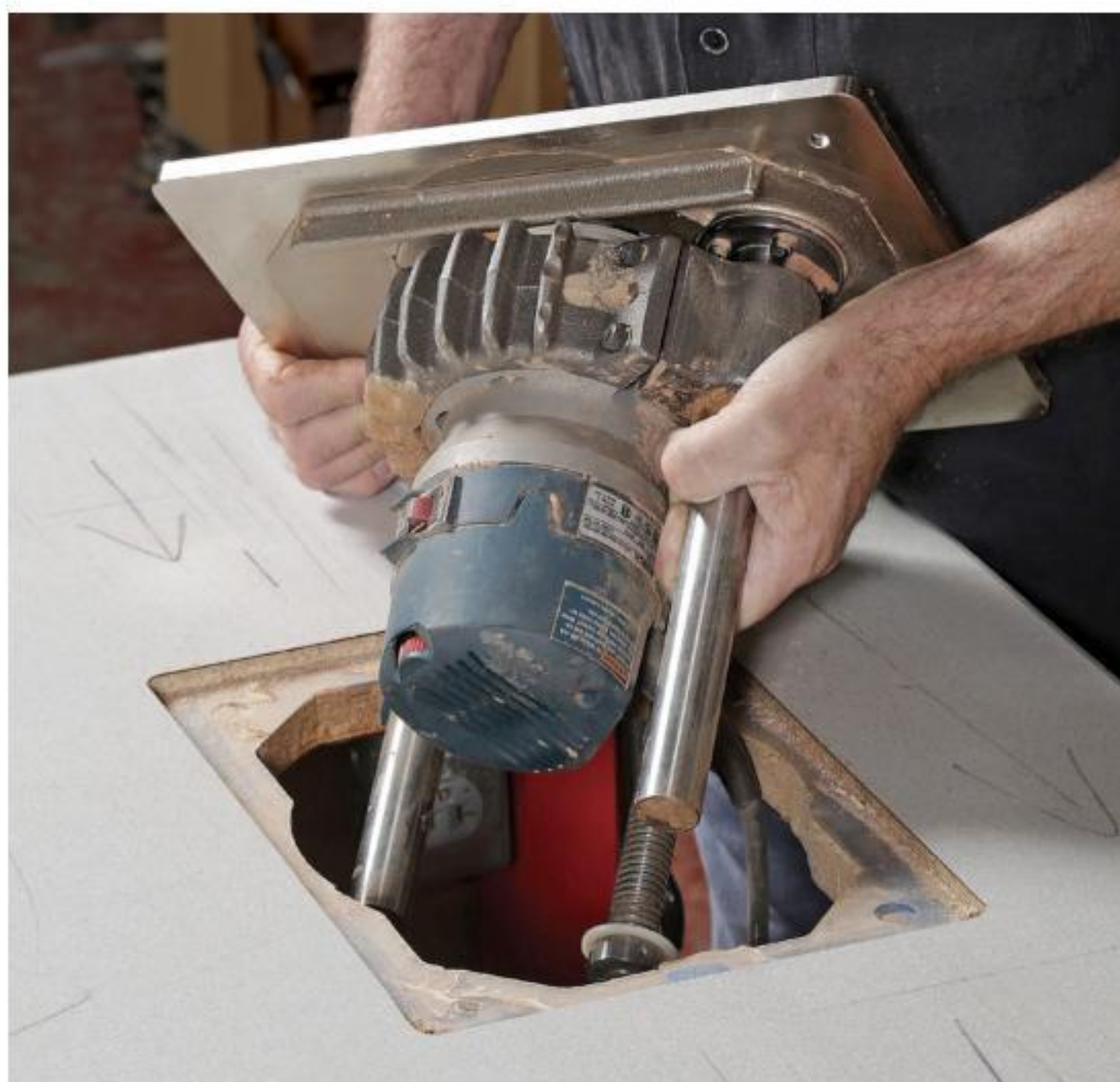
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Set up the table



Install the router and insert. Be sure the table itself is heavy. If it shakes, add weights or mount it to a secure surface.

Why a router table?

Router tables have many advantages over handheld routers, and I gravitate toward them when possible. One of the biggest advantages is that you bring the work to the router. This means that you do not have to devise ways to hold the work in place, thus eliminating the need for the clamps, hold-downs, or wedges that frequently get in the way when routing handheld.

Additionally, because the router, router table, and fence are all one unit, cuts are much less likely to go astray. Handheld routers, on the other hand, are sometimes difficult to hold steady, so the risk of ruining a workpiece increases.

Third, furniture work usually requires accurate repetition. Stop blocks are typically the best way to ensure this, and using them on the router table is straightforward. Although you can clamp stop blocks to a workpiece while handheld routing, it is usually more cumbersome and slow.

The basic setup

Before you get started using a router table, you need to know the basics: the table and the fence.

The table—A router table must be heavy, or at least secured to a stable surface. A table that moves when you push a workpiece through is not only frustrating, but potentially dangerous. Second, the table must be flat and smooth, with no bumps around the router plate, insert ring, or lift system. Plastic laminate, extremely smooth and easily waxed, makes a great router table surface.

The fence—Fences can be shopmade or store-bought. Regardless of which type you use, the entire face of the fence



Check for flat. The table and insert must be flat. Any sag or crown will make setting a consistent depth of cut impossible, while any bump will just make you crazy.



Adjust from above...

Commercial router lifts allow you to adjust the bit's height or switch out bits from above.



... or below. For most shopmade router tables that are simply a router bolted to the bottom of a table, you have to adjust the bit height or change the bit under the table. Van Dyke's shopmade router lift uses threaded rod with a wooden block at the top to raise and lower the bit. He installed a plunge router, which keeps the bit's vertical travel reliably straight.

Adjust the fence

must be straight, smooth, and square to the table. With split fences, which have two sections, make sure the two sides are coplanar. Dust-collection ports should be out of the way so that they don't impede the stock. For safety, bury the bit in the fence, exposing only the part that is actually cutting. This is easy with a split fence. For a fence that's solid, you'll need to make the opening.

I don't worry about making my fence parallel to a miter slot because I don't use a miter gauge. Rather, for cutting across the grain, and especially when cutting end grain on narrow pieces, I back up the stock with a wide backer board pushed against the fence and the workpiece.

Lifts—Commercial router lifts let you easily adjust the bit height or change the bit altogether from above. These are great, but one disadvantage of most is that you cannot set a final depth of cut and then lower the bit and creep back up to that depth. The built-in depth stops on plunge routers easily accommodate this, which is why I prefer them in any homemade router table.



Clamp and check for square. Van Dyke finds that the simplest and most reliable fence is just a thick piece of stock milled straight and square.



See your adjustment. Van Dyke likes a light-colored tabletop because he can draw on it, allowing him to keep track of how much he's adjusted his fence.



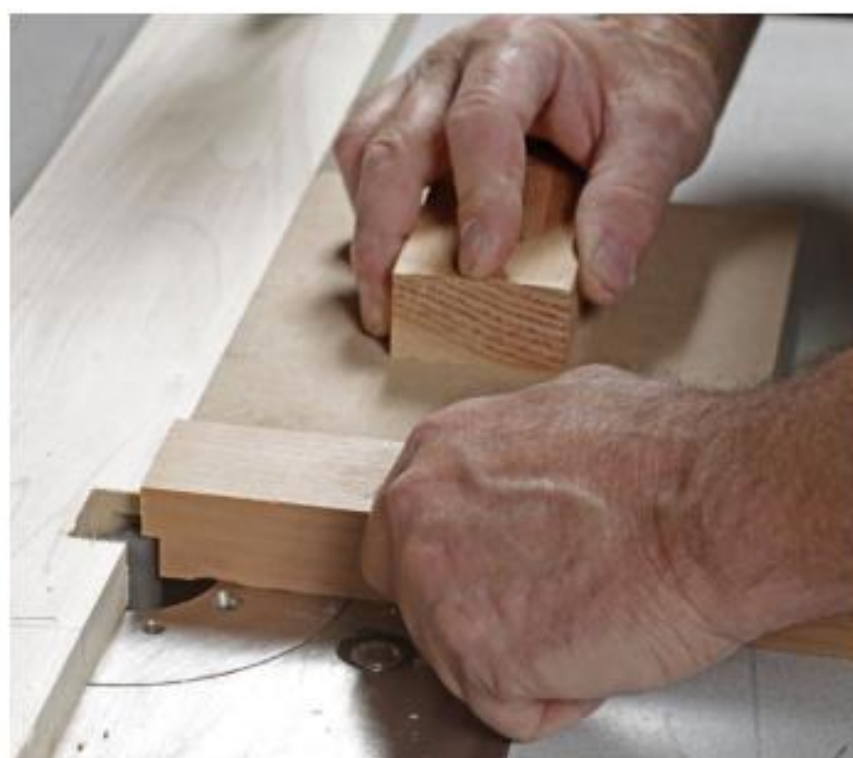
Fence and bearing should be flush. This makes cuts safer and more accurate.



Zero-clearance fence stops tearout. With the right end clamped down, pivot the fence onto the bit so that it cuts the right side of the precut notch. Keep the opening small to prevent stock from tipping into the space.

Basic joinery cuts

RABBETS



Expose only as much bit as necessary. Rabbets are a breeze on the router table, although Van Dyke uses a backer block for crossgrain cuts. This keeps the work square to the fence and backs up the wood fibers, preventing chipout.

DADOES



Bring backup. Because this cut is across the grain and the stock is narrow, Van Dyke again uses a backer block behind the workpiece.

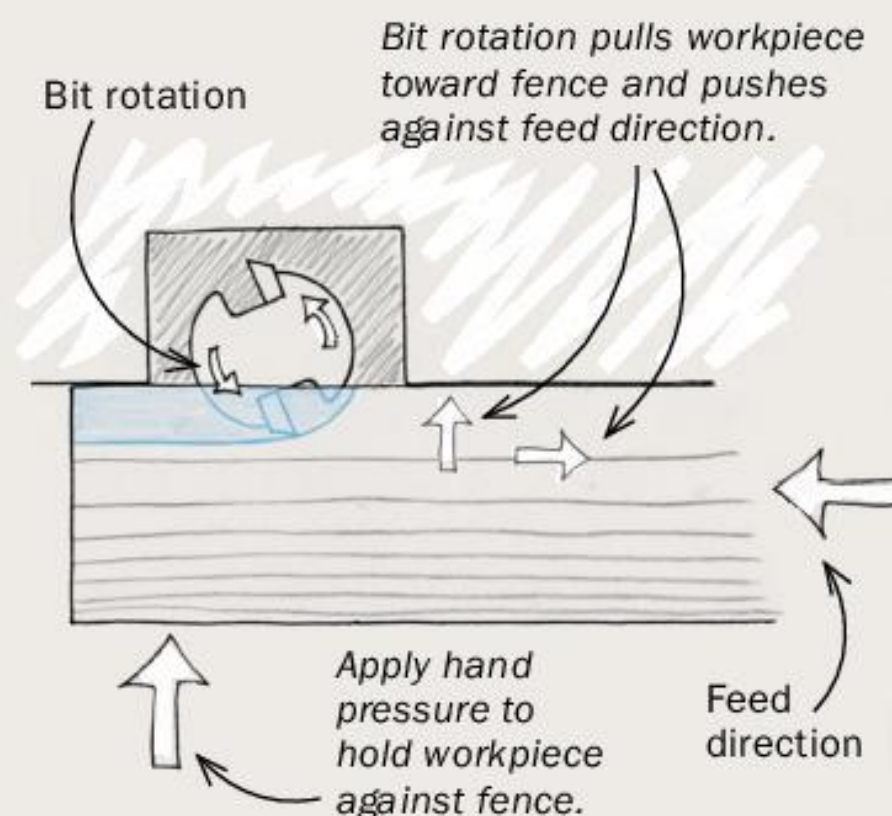
GROOVES



Grooves the width of the bit are simple. Just set the fence and rout the stock.

Feed safely

While holding the stock against the fence, feed it into the face of the bit's cutter.



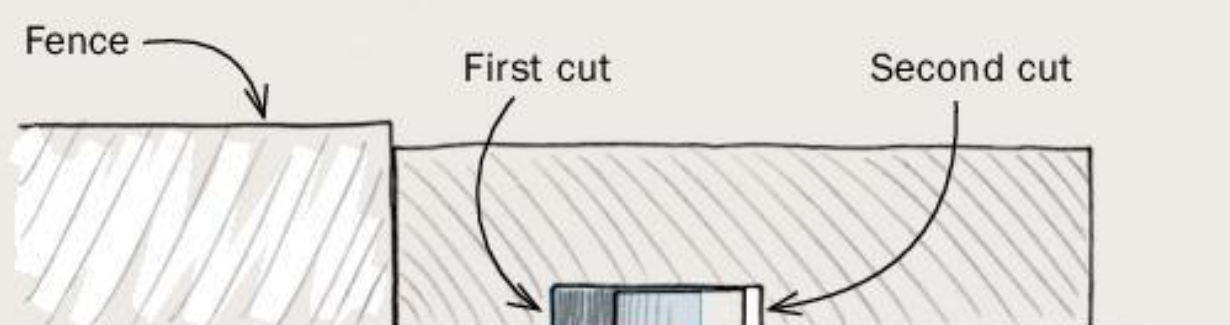
Feed direction

Feed direction is critical to a safe cut. While it is typically described as “feed the stock against the rotation of the bit,” this can still leave uncertainty. Another way to think of it is to consider the forces at play. As you feed the workpiece you want the bit's cutting action to help press the workpiece against the fence and to resist the forward pushing force you are exerting. Typically, this means moving the stock from right to left. It will make for an accurate, safe, and stable cut.

When you feed the stock the wrong way, you feed it into the back of the cutter or with the rotation of the bit. This is called climb-cutting, and it means that the edge of the cutter can grab the wood and pull it, along with your fingers, toward the bit. A heavy enough climb cut can rip the board out of your hands and send it flying across the shop.

Wide grooves

To widen a groove, move the fence farther from the bit, and keep the feed direction running from right to left. Otherwise, you risk a dangerous and unexpected climb cut.



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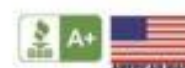
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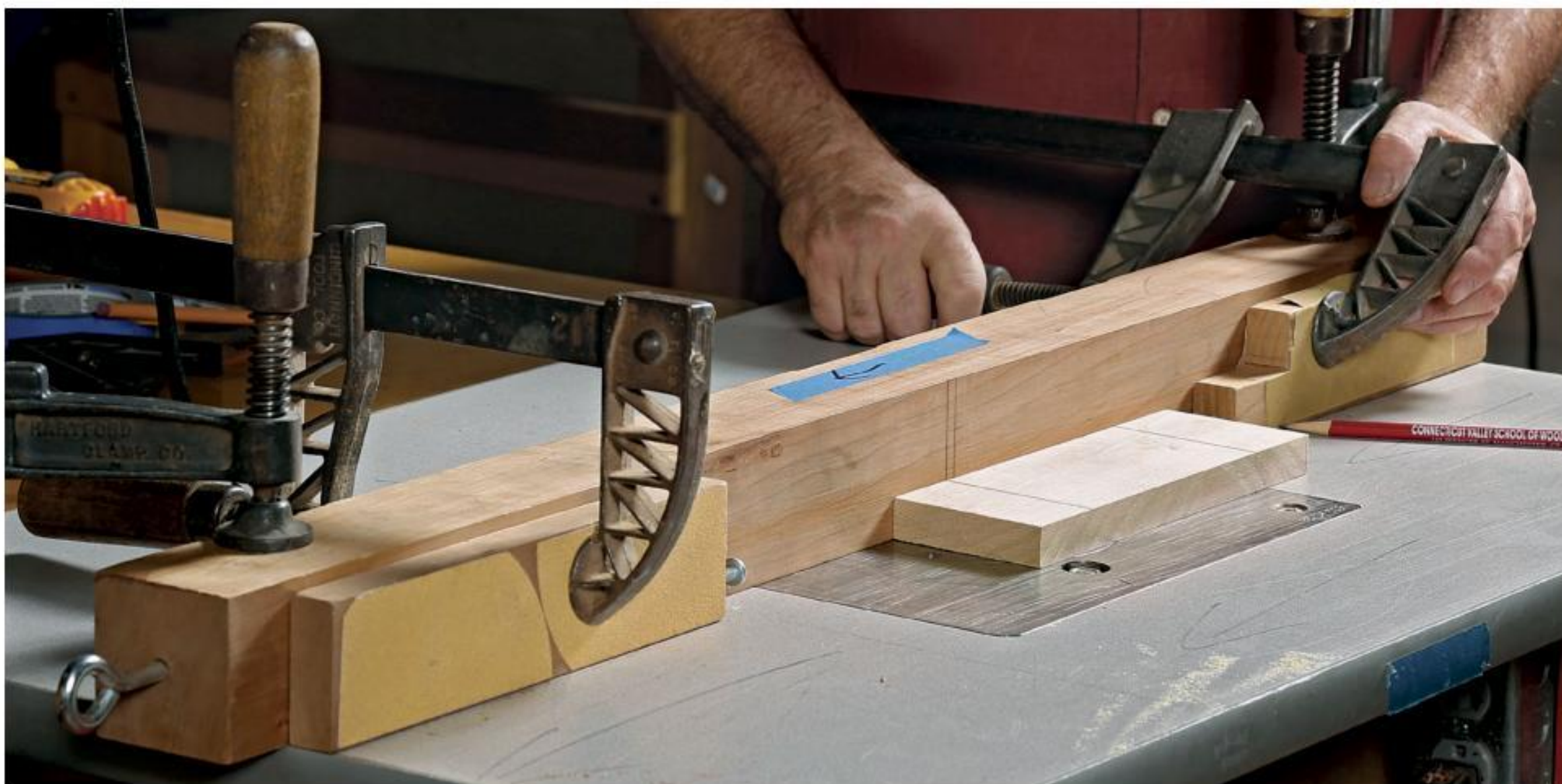
Advanced tasks

STOPPED GROOVES

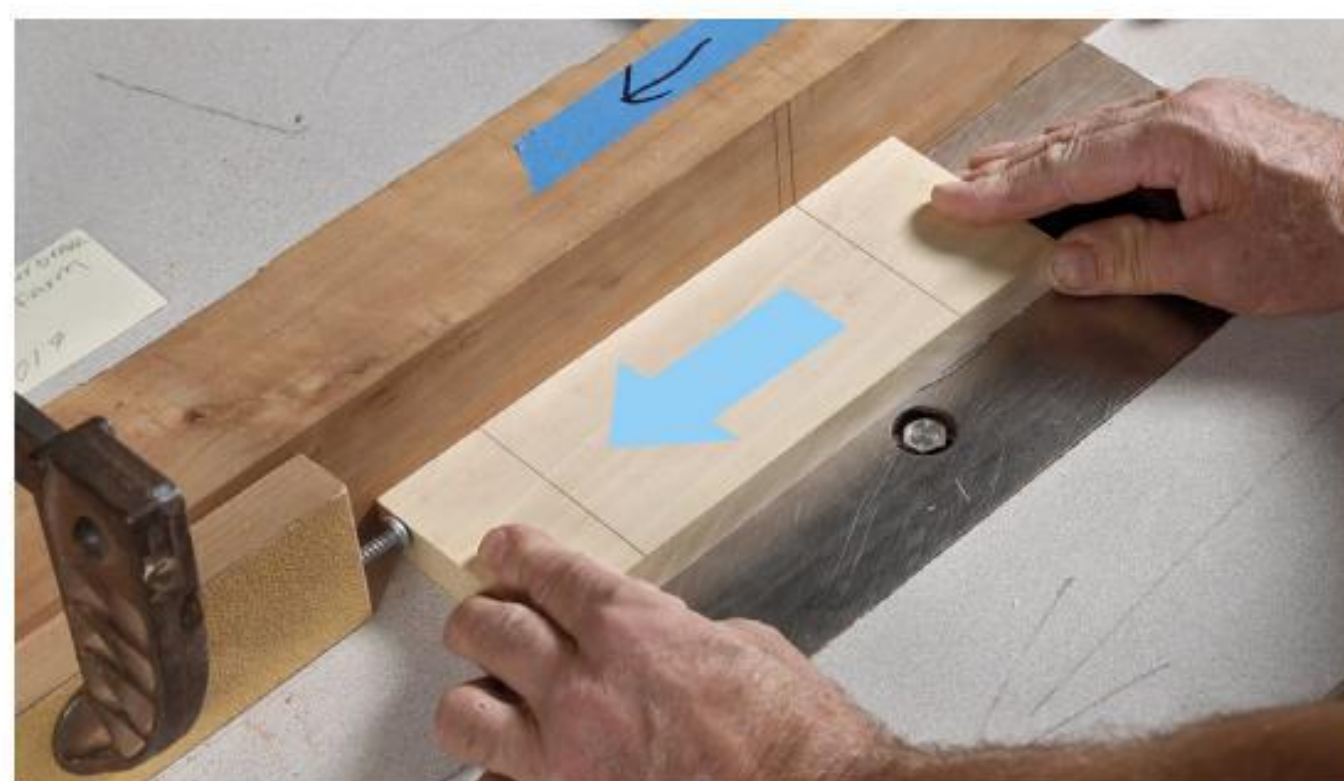
Set start and stop points. Set the fence, then, to see where to begin and end your cut, transfer the bit's diameter to the fence. Slide square stock up to both sides of the bit and pencil a line. Be aware that as soon as you move the fence, these lines are no longer correct.



Stop blocks allow repetition. For consistent and safe results, use a pair of stop blocks, one at the beginning of the cut and one at the end. Set these up by aligning your layout lines with those on the fence. Also, when routing, never cut more than 1/4 in. deep at a time.



Pivot into the cut. To begin, hold the workpiece against the fence with the left end elevated and the right abutted to the stop. Then pivot down onto the spinning bit before feeding right to left.



Route to the second stop. To exit the cut, Van Dyke backs the piece up slightly and lifts it out, holding the stock against the fence the whole time.

Using the table

Once you have the basic setup, it's time to start using the table for tasks from joinery to edge profiles to pattern routing.

Joinery—Rabbets, dadoes, and grooves—either through or stopped—are a breeze on the router table. Do these cuts gradually, cutting no more than 1/4 in. deep with each pass. For cross-grain cuts, back up the cut with a sacrificial board to avoid blowout.

Sliding dovetails are commonly cut using a router table. Remember when cutting the socket to remove as much waste as possible with a straight bit or a dado blade on the tablesaw before switching to the dovetail bit. Trying to cut too much wood with the dovetail bit will result in a socket that is irregular and full of chatter. The same is true for the mating portion of the joint. The less wood you cut each time, the more accurate you will be.

Although not my first choice, router tables are also an effective tool for making accurate and smooth tenons as long as the shoulders and bulk of the waste are cut with a saw.



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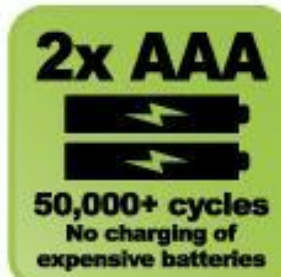
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Quick cabinet door frames. To quickly make decorative door frames, use matched cope-and-stick bits.

EDGE PROFILES



Moldings. Larger edge profiles sometimes require a number of passes to creep up on the final depth of cut. Trying to cut too much at once usually results in tearout. Cutting the bulk of the waste on the tablesaw beforehand is frequently a good option, especially when cutting across the grain.

Edge profiles—To create an edge profile, the router table is my usual preference unless the profile is so simple, like a light roundover or chamfer, that using a trim router is easier or quicker.

Template routing—A bearing-guided flush-trimming or pattern bit running against a pattern of nearly any shape allows you to duplicate that shape over and over. A flush-trimming bit has the bearing at the end, which means the pattern should be on top of the workpiece when routing. Alternatively, a pattern bit has the bearing below the cutter, requiring the template to be under the workpiece.

Cabinet doors—You can make door frames on a router table with cope-and-stick bits. These are matched sets. One bit handles the molding on the inside edge of the frame parts while routing the groove for the panel. The other cuts the cope (the reverse of the molding profile) and the stub tenon on the end of the rails. □

Bob Van Dyke runs the Connecticut Valley School of Woodworking.

TEMPLATES



Accurate repetition. A bearing-guided bit running against a pattern of almost any shape allows you to duplicate that shape in the workpiece. The pattern can be attached to the work with clamps (above), screws, brads, or double-sided tape. Whether the pattern is above the stock or below it (right) depends on the type of bit you're using.



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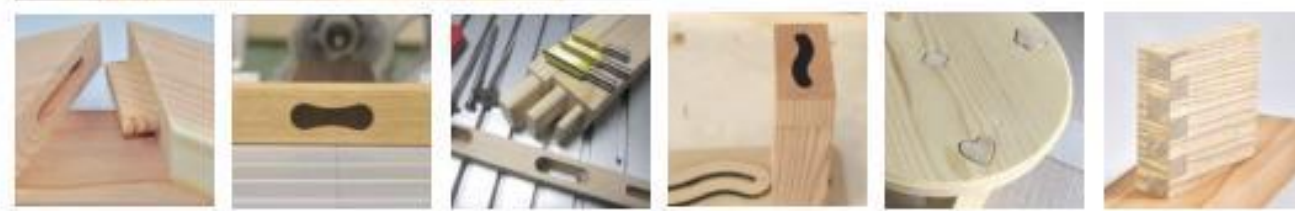
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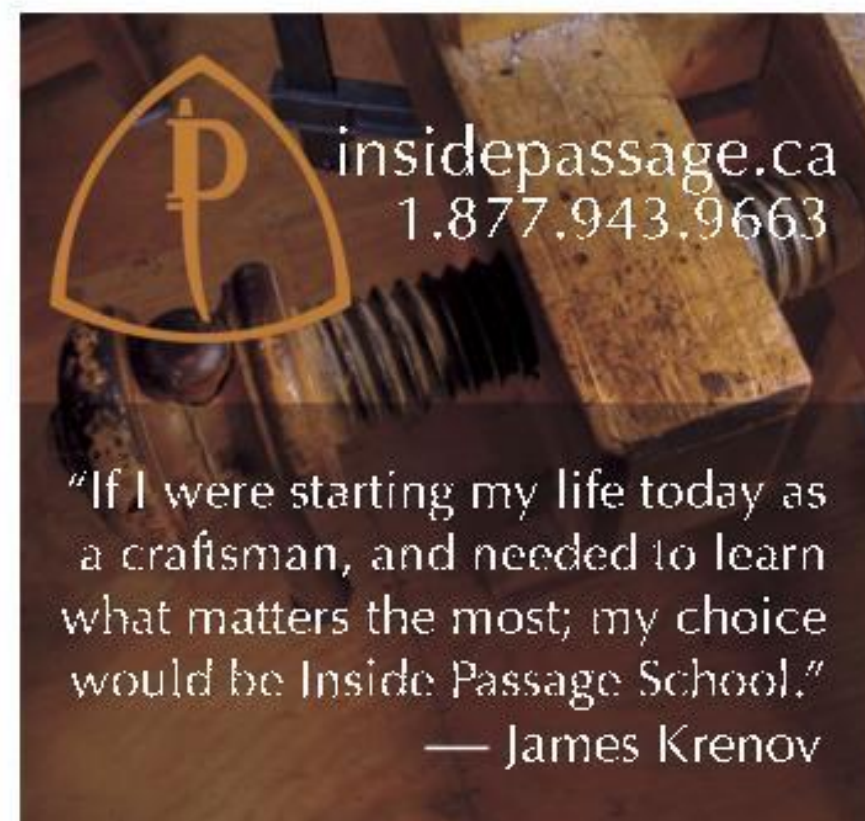
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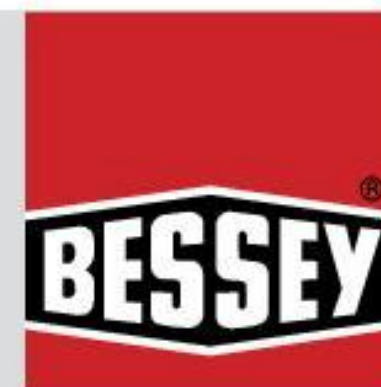
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Contemporary Desk

An elegant approach to design and joinery

BY MICHAEL ROBBINS



MAKE THE LEGS AND STRETCHERS

I designed the first incarnation of this desk for a close friend who needed a simple, elegant station for sketching and designing in his small apartment. Over the past six years, I've built the desk a number of times for others and the design has evolved. Its original chunky, square base was replaced with a slender version with turned legs; and the sides, or end caps, of the desk case are now shaped to flowing curves instead of angles. What has remained the same is its light weight and airy utility—a pared-down, minimalist approach to a place to sit and think and put ideas down on paper.

Begin with the base

I break the building of the desk into two parts, the desk case and the base. Here I'll begin with the base, although it's perfectly fine to build it the other way around. The base consists of a flat frame with the legs tenoned into it. Building it is straightforward. Start with the bridge joints securing the corners of the frame. I cut them on the tablesaw with a tenoning jig.

After gluing up the frame, I drill stepped mortises through it at the corners for the leg tenons. The stepped mortises provide additional strength and a cleaner visual line. To create the correct leg rake and splay, I do the drilling with the drill-press table angled 4° and the frame rotated so it is 45° to the centerline of the slope.

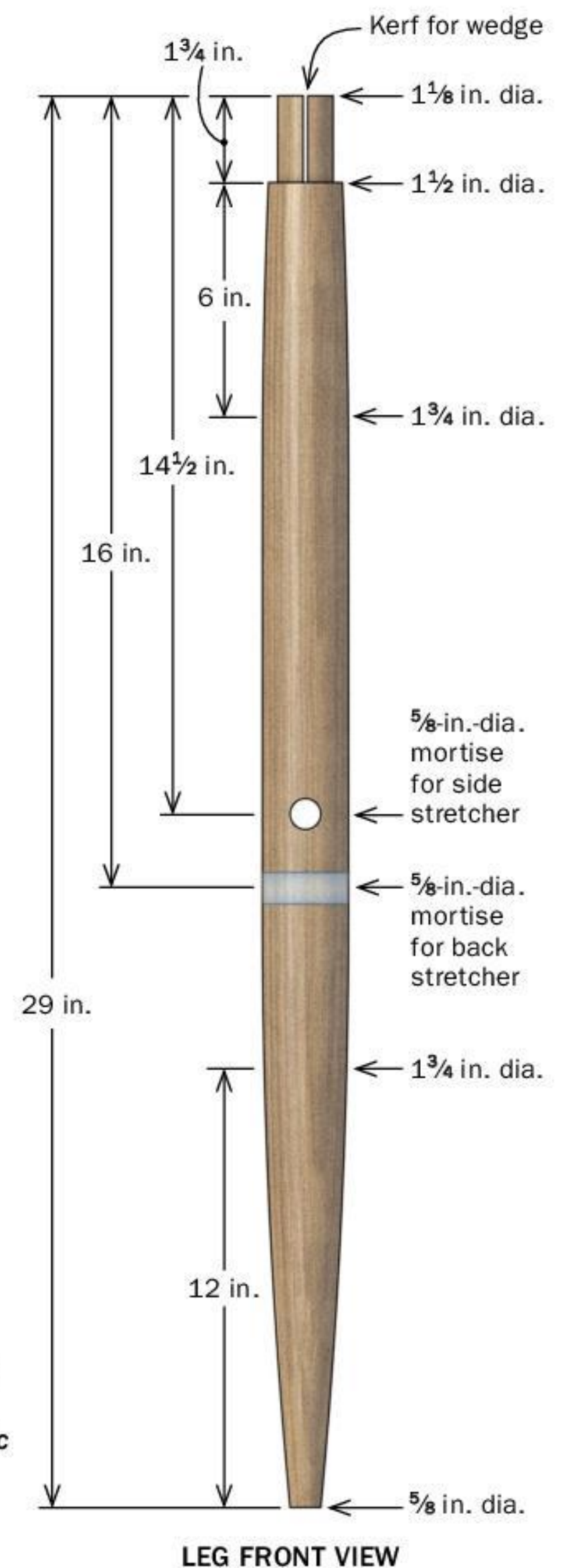
I turn the legs out of 1¾-in.-square stock and then fit the tenons to the stepped mortises. I turn three stretchers to join into the legs, two on the sides and one long stretcher joining the back legs. Then I drill the mortises in the legs using a cradle on the drill press. All

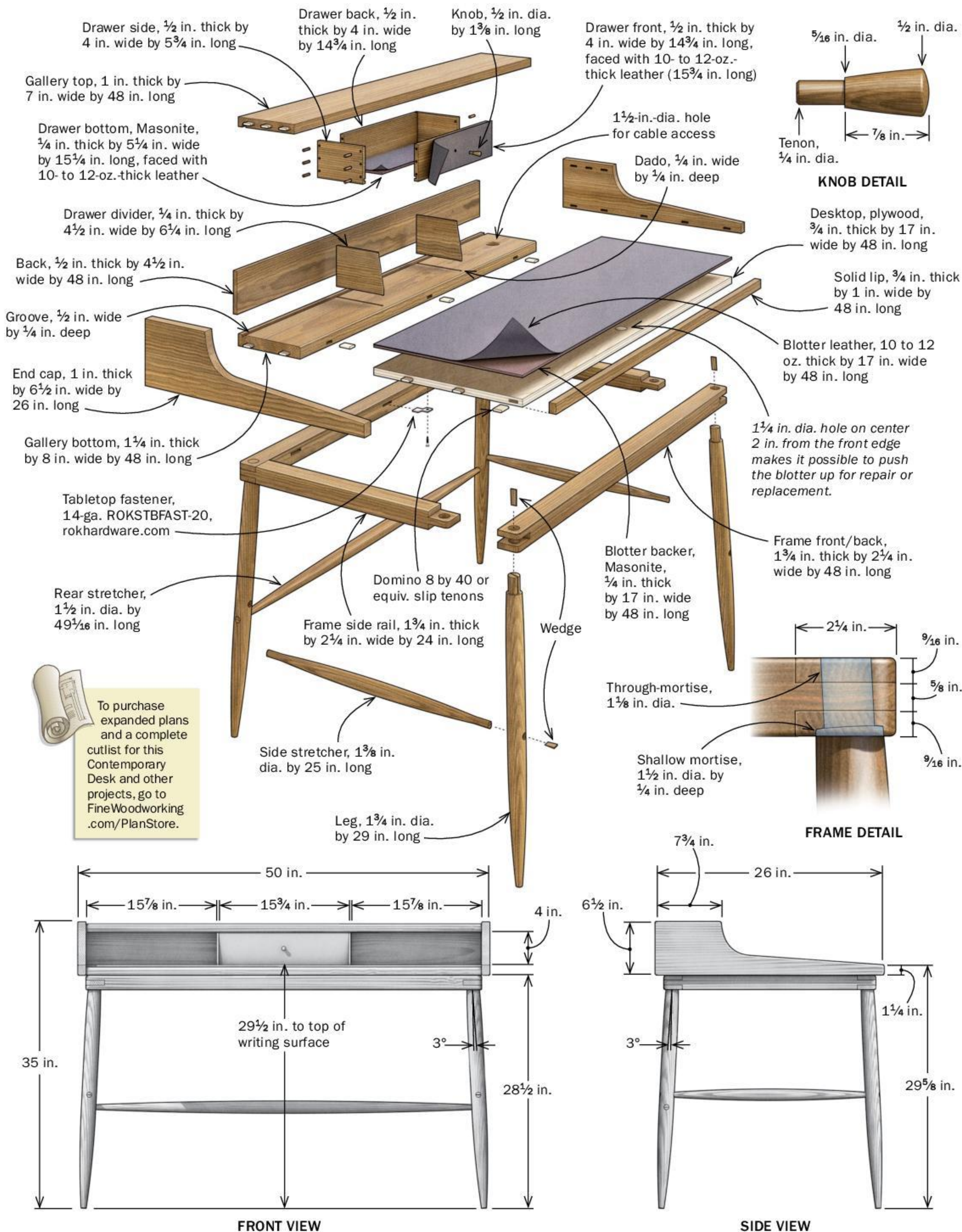


Turn and kerf. After turning the legs and stretchers, prepare the leg tenons for wedging by kerfing them on the bandsaw.



Mortising tips. To be sure the mortises in the rear leg for the side and rear stretchers are perpendicular to each other, Robbins slips a rule into the wedge kerf in the leg tenon and attaches a magnetic level to it. He then drills one mortise when the rule is vertical, the other when it's horizontal. While making the holes, the drill-press table is angled 3° to account for the rake and splay of the leg.





A STRONG, LIGHT BASE



Stepped mortise adds strength. After gluing the bridle-jointed frame, use Forstner bits to cut the stepped mortise from the bottom of the frame. Cut the wider shallow mortise first. Angle the drill-press table to 4° with the frame turned 45° to the slope to create the compound angle. The assembled base will have a 3° splay when viewed from the front or side.



Assemble the base. After gluing the legs to the stretchers, glue the leg/stretcher assembly to the frame and wedge all the leg tenons.

GLUE THE GALLERY TO THE DESKTOP



Join plywood to solid wood. Prepare the gallery bottom by cutting a groove for the back and a chamfer along the top front edge (above). Then edge-glue the solid gallery bottom to the back of the plywood desktop (right).



Create a drawer pocket. Using a template and a router with a straight bit, cut dados in the gallery bottom and top for the drawer dividers.



the tenons, once fitted, are kerfed on the bandsaw to accept wedges during glue-up.

Build the case

The design of the desk case is a little unusual. Often on writing desks the gallery at the back is a separate unit that rests on the desktop. Here the gallery is glued to the back edge of the desktop and both are fitted between the end caps of the desk case. After the desk case is assembled, I fit a leather blotter over the desktop to serve as the writing surface.

I start the case by edge-gluing the solid gallery bottom to the plywood desktop. To prepare the gallery bottom for glue-up, I groove it to accept the back, and then cut a 1/4-in.-wide chamfer along its top front edge. I also bore a 1 1/2-in.-dia. hole through it near one end as a pass-through for cables; I round over the perimeter of the hole on both sides with a 1/4-in. router bit.

Cut the plywood desktop to final width but leave it slightly longer than final length. Then edge-glue the plywood to the solid wood using Dominos or biscuits for alignment. When

ASSEMBLE THE CASE



Mark and cut Domino mortises. Dry-fit and clamp the case parts, and mark the mortise locations. Then cut the mortises.

the glue has cured, cut the two-part panel to final length. At the same time cut the gallery top and the Masonite backer for the leather blotter to the same length.

Next it's time to make the two end caps. I bandsawed the curves to rough shape, then used a shopmade plywood pattern of the curve for final shaping. The pattern can be used with a shaper, router table, or a handheld router. Sand these parts up through the grits and set them aside.

Finish up the case

Two dividers create the drawer pocket in the gallery. Cut dados for them in the gallery top and bottom with a router and a straight bit. Use a straight-edge router guide to locate the dados. Cut the dividers to size next. They are sloped 15° off vertical at the front, and the front edge gets a 1/4-in. roundover.

Once these parts are made, lay out the Domino joinery. Dry-fit the desk case and clamp it together. Then make the registration marks, disassemble, and cut the mortises. I prefinish parts that have tough-to-reach areas and try to glue up very neatly so that there is no squeeze-out. If there is any, I clean it up with a clean, damp rag, sometimes using a small toothbrush to get into corners. Now that the desk case is assembled, I attach it to the base with table clips.

I build the drawer with exposed 1/4-in. dowel joinery. This provides a



Final assembly. After setting the gallery back and drawer dividers in place, fit the gallery top (left). Then add the end caps (below).



MAKE AND FIT THE REMOVABLE LEATHER BLOTTER



Glue leather to a backer. After cutting the Masonite backer to length so it just fits between the end caps (but leaving it oversize in width), apply contact cement and glue the leather to the backer.



Mark the depth of the leather blotter. Press-fit the blotter in the desk, and mark the depth on the bottom of the Masonite while it's in place.



nice visual detail on the side of the drawer and is a perfectly strong joint for a drawer of this size. The drawer bottom, like the blotter, is a sandwich of leather over 1/4-in. Masonite.

Leather is laminated to the front face of the drawer as well. Once you've trimmed the leather flush to the edges of the drawer front, use a brad-point bit to drill a centered 1/4-in. hole through the front for the turned wooden pull.

A leather blotter adds to the design and utility

With the desk nearly done, it's time to add the leather blotter. First drill a hole through the desktop toward the front edge so that in the future the blot-



Cut the blotter to depth. With the leather glued to the Masonite backer, sandwich the leather with another piece of loose Masonite, and rip to final width.



Add a lip. Cut a solid-wood lip for the front of the desk. It will obscure the edges of the plywood and the blotter. Remove the blotter to glue on the lip, then reinstall the blotter.

ter can be easily removed for repair or replacement with the push of a finger from below. The backer should be over-size in the other dimension so that when pushed against the gallery it overhangs the front of the desktop by an inch or more. Cut the leather to exactly the length of the Masonite

backer and glue it down with contact cement, rolling it to smooth out any bumps and to maximize adhesion. Then, at the tablesaw, using a second piece of Masonite on top to produce a clean cut, rip the blotter to width so it's a perfect fit to the front edge of the desktop.

Press-fit the blotter into place, carefully smoothing corners and edges with a bone tool to create a seamless, attractive writing surface.

Last, remove the blotter and glue a solid-wood lip to the front edge of the desktop. It should extend above the plywood just enough to hide

the edge of the leather when the blotter is reinstalled. After a final sanding, the desk is ready for finish. I use Osmo Polyx-Oil. □

Michael Robbins builds furniture in a former garment factory in Philmont, N.Y., and has a storefront showroom in nearby Germantown.



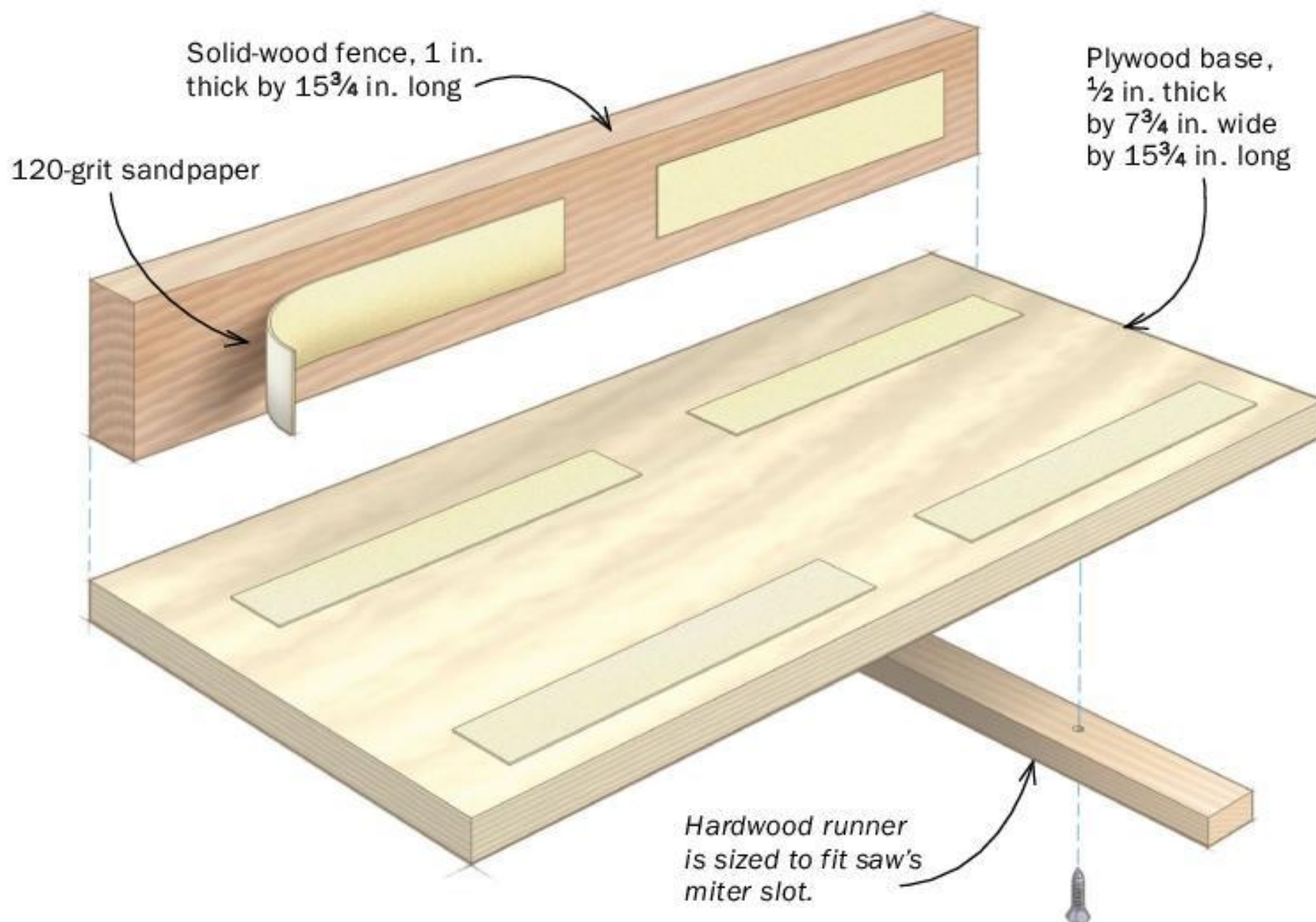
Precise Dovetails on the Bandsaw

Four simple jigs create
beautiful joints quickly

BY MICHAEL C. FORTUNE

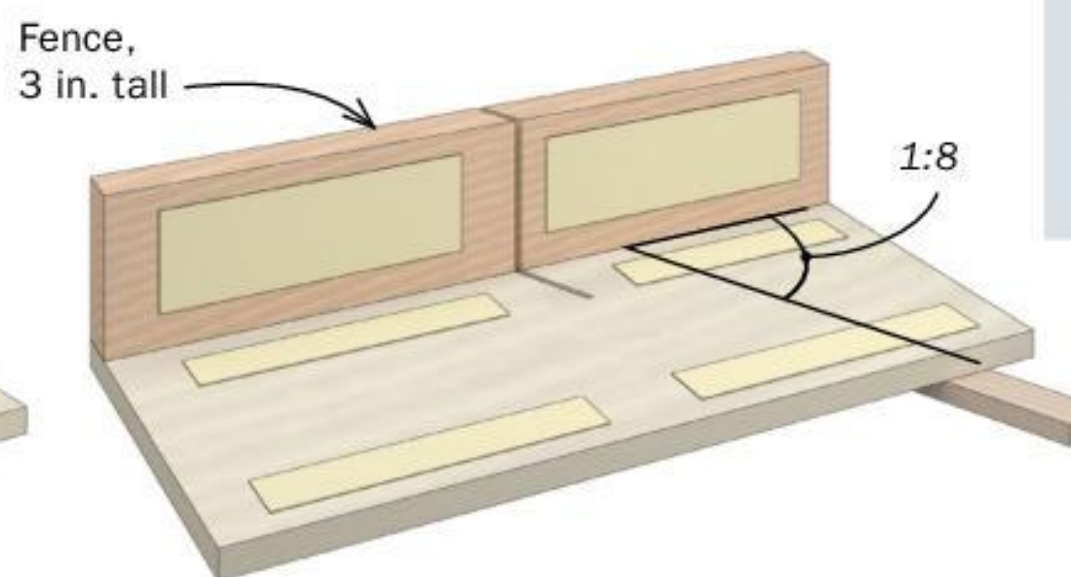
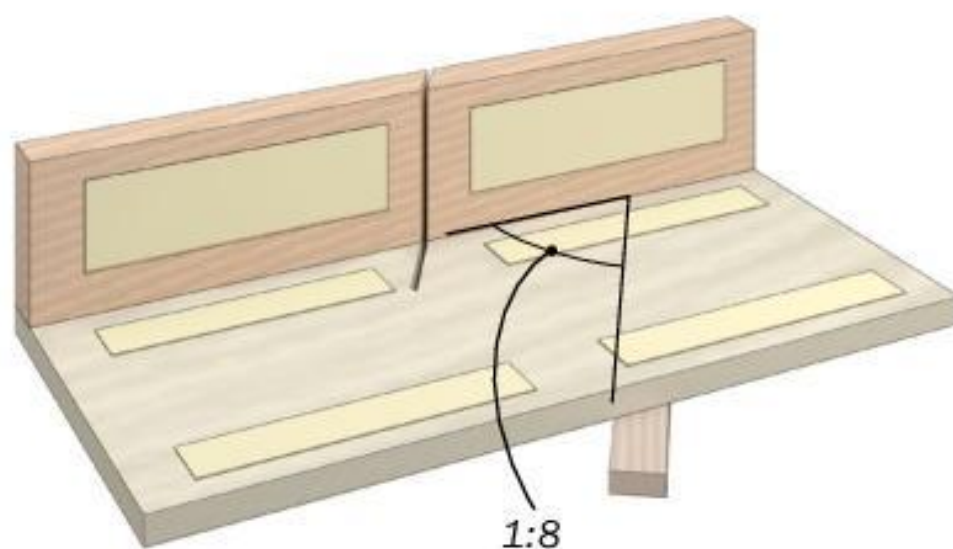
FOUR SLEEK SLEDS

To cut perfectly mating angles on the tails and pins, Fortune uses a pair of small sleds for each. An angled runner gives the tails their slope, while angling the saw's table creates the slope for the pins.



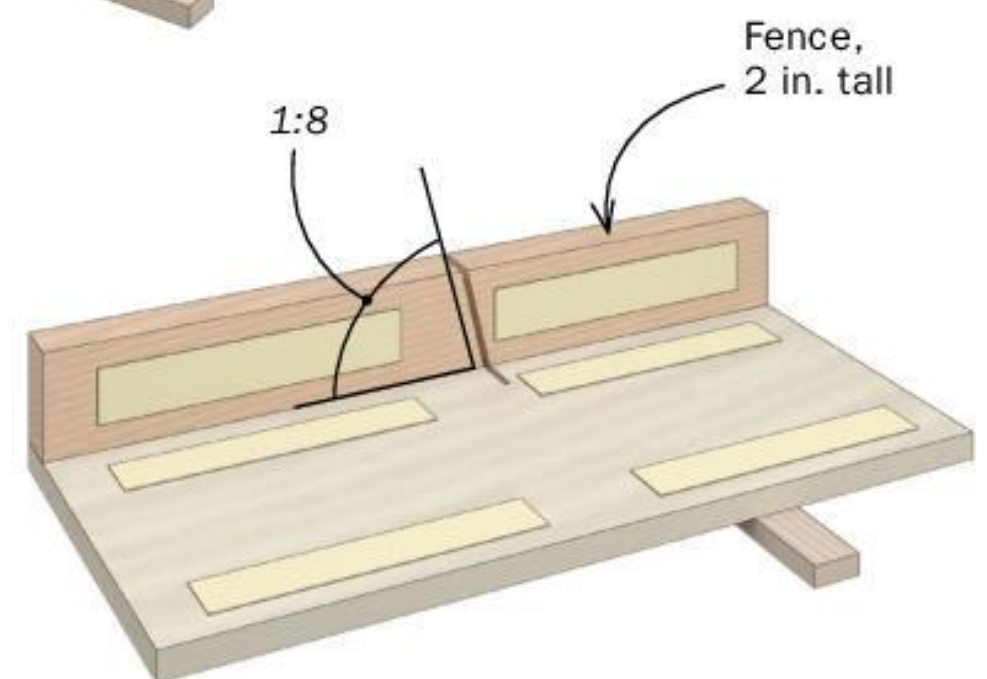
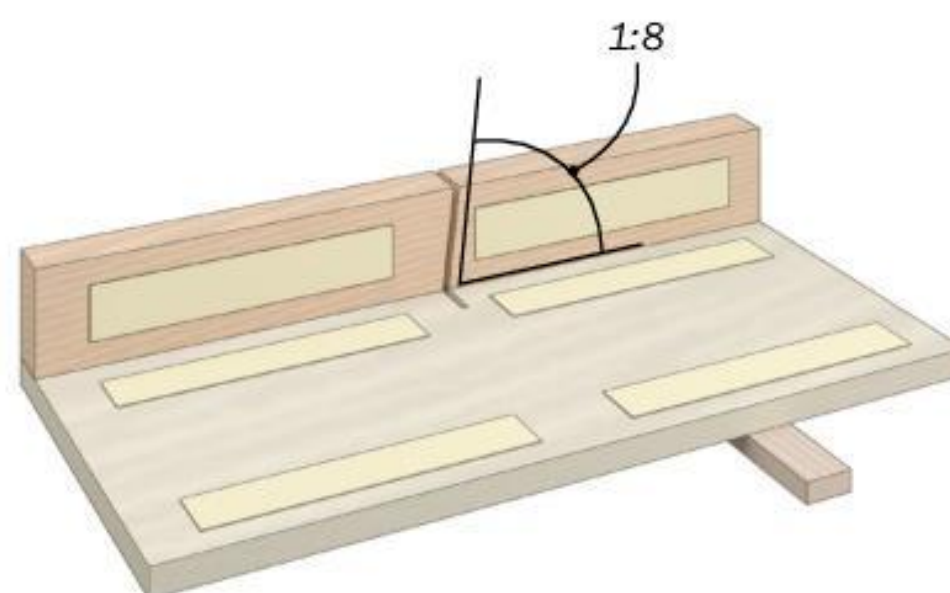
A PAIR FOR TAILS

The tail jig runners are angled to the tails' slope. The jigs are used with the bandsaw table square to the blade.



A PAIR FOR PINS

The pin jig runners are attached square to the fence. The jigs are used with the bandsaw table angled to match the tails' slope.



Angle the runner. The angle should match the slope of the tails. To prevent the runner from shifting as you screw it down, clamp a straightedge to the bottom of the base. Temporarily glue the runner snug against the straightedge using cyanoacrylate glue, and then screw it to the base (bottom).

There must be dozens of ways to cut dovetails, but my favorite is to cut both the tails and the pins with my bandsaw. It's easy to control the angle of both parts and, because the bandsaw blade is as thin as many backsaw blades, there are few limitations to the tail's slope angle, the size of the tails and pins, and

their spacing. What's more, it's fast and efficient.

I use a 14-in. bandsaw to cut dovetails. I bought this machine 44 years ago, and it's still all I really need for joinery. In addition to the saw, I use four jigs. Two of the jigs are used to cut the tails, and the other two to cut the pins. This is a won-

derfully simple and accurate method for cutting dovetails.

Sleds guarantee accurate cuts

Dovetail joinery works because the angled tails fit into mating angled sockets in the pin board. Cutting the joint is greatly simplified if you can cut the tails at a consistent

Tails first

Two angled jigs present the tail boards to the blade. A zero-clearance kerf in the jig's fence makes it easy to locate cuts accurately. To speed up the process, Fortune gangs up tail boards.

SET UP



Mark tails on just one board. When cutting the tails, you will gang up all boards that have the same width and layout, so only the top board needs layout marks.

angle, and then cut the cheeks of the pins at the same angle. One advantage of the bandsaw is the ease of controlling that angle no matter how many individual joints you are making. All it takes is a pair of jigs for the tails and another pair for the pins.

Both sets of jigs have a plywood base with a fence on the leading edge that's square to the blade. They also all have a wooden runner. I register the jigs in the miter slot rather than against the fence, because the jig then has a zero-clearance kerf that helps you locate cuts accurately.

The runner on each pin jig is square to the jig's fence, but the runner on each tail jig is angled. This angle should match the slope of the tails. When you attach the runner, use the base's front edge as a reference surface for the bevel gauge.

After you've made all four jigs, cut a zero-clearance kerf into each one, and they're ready for use.



Set a stop. After laying out the baseline on a piece of scrap, cut to it and leave the jig in place. Clamp a rounded stop against the jig's leading edge, touching the kerf. Use a C-clamp, as the saw's vibration can work an F-style clamp loose.



Stack the tail boards. Tack the boards together with hot-melt glue.

Cut all the tails at once

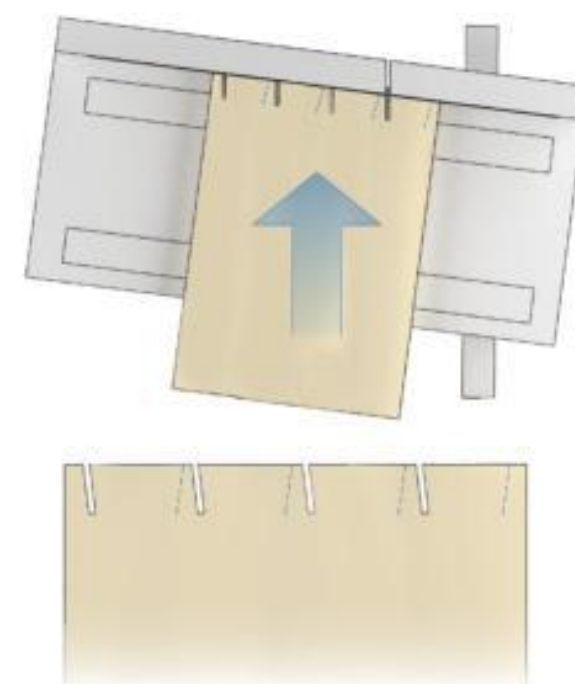
Unless you're using a router and dovetail jig, cutting dovetails always boils down to the same process: Lay out the tails (or pins first, if that's your preference), cut them, clean out the waste, transfer them to the pin board, cut the pin cheeks, get rid of the waste, and pare the pins to fit the tail board. My bandsaw-based process is no different, except that I can cut pins that fit without paring.

There is an advantage to my technique when it comes to layout: Tail boards of the same width can be stacked together and cut at once. This means that you only need to lay out the tails on one part, and put it at the top of the stack. I've cut as many as four drawers' worth of sides at once. However, you should still use a marking gauge to cut the baseline on all the parts, as well as an extra part of the same width.

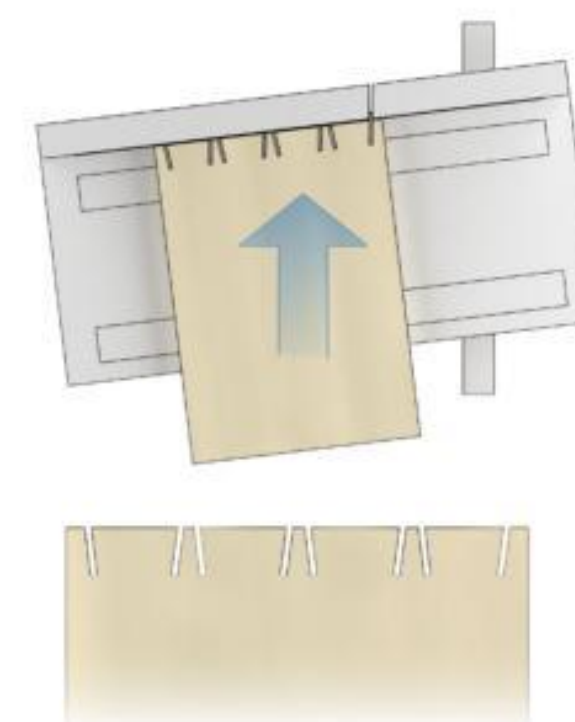
This extra part is used to set a depth stop on the bandsaw so that every cut you make is guaranteed to stop exactly where you want it to: at the baseline. To set the stop, place a tail jig on the bandsaw. Put the extra part on the jig and cut into it until



CUT THE TAILS



First side. Fortune begins with one jig and cuts that side of all the tails.



Second side. After switching to the second jig, angled in the opposite direction, cut the second side of all of the tails.

Online Extra

For a video of Fortune setting up the bandsaw for precise cuts, go to FineWoodworking.com/270.



Cut out the waste and clean up the baseline. Fortune makes multiple cuts freehand to remove the waste, using the stop so that he doesn't cut beyond the baseline. Then all that's needed is a bit of paring with a chisel. The guide ensures that the chisel is perpendicular to the part's face.

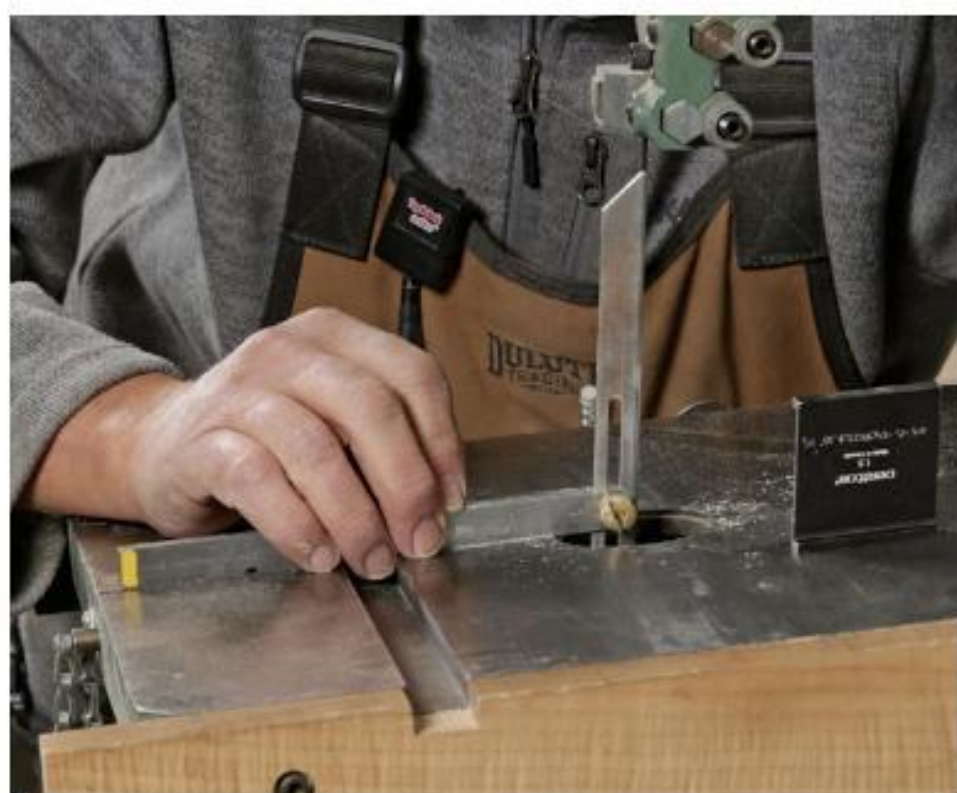
Perfect pins

Take advantage of the jig's zero-clearance kerf and cut right to your layout lines. The pins should slide tightly and fit perfectly into their mating tails.

SET UP



The most important step. When transferring the tails to the pin board, Fortune moves the tail board just a hair ($\frac{1}{128}$ in.) past the pin board to get a tight-fitting, gap-free joint. This way the tails will be slightly larger than the sockets.



Angle the table. Using a bevel gauge set to the angle of his dovetail gauge, Fortune fine-tunes the angle of his bandsaw table to match the slope of the tails.



you're just shy of the marking-gauge line ($\frac{1}{64}$ in.). Turn off the bandsaw. Now clamp a stop with a rounded nose to the bandsaw's table, with the nose set against the jig's fence. The rounded nose is necessary because the two tail jigs are angled in opposite directions. The rounded nose touches right where the bandsaw cuts, so you get the same depth of cut with both jigs.

With the stop set, you can cut the tails. Each jig cuts just one side of the tail, and it doesn't matter which side you cut first. Pick a jig and get to work. Just be sure to align your layout lines with the zero-clearance kerf in the jig. After you've cut that first side on all of the tails, switch to the second tail jig and cut the other

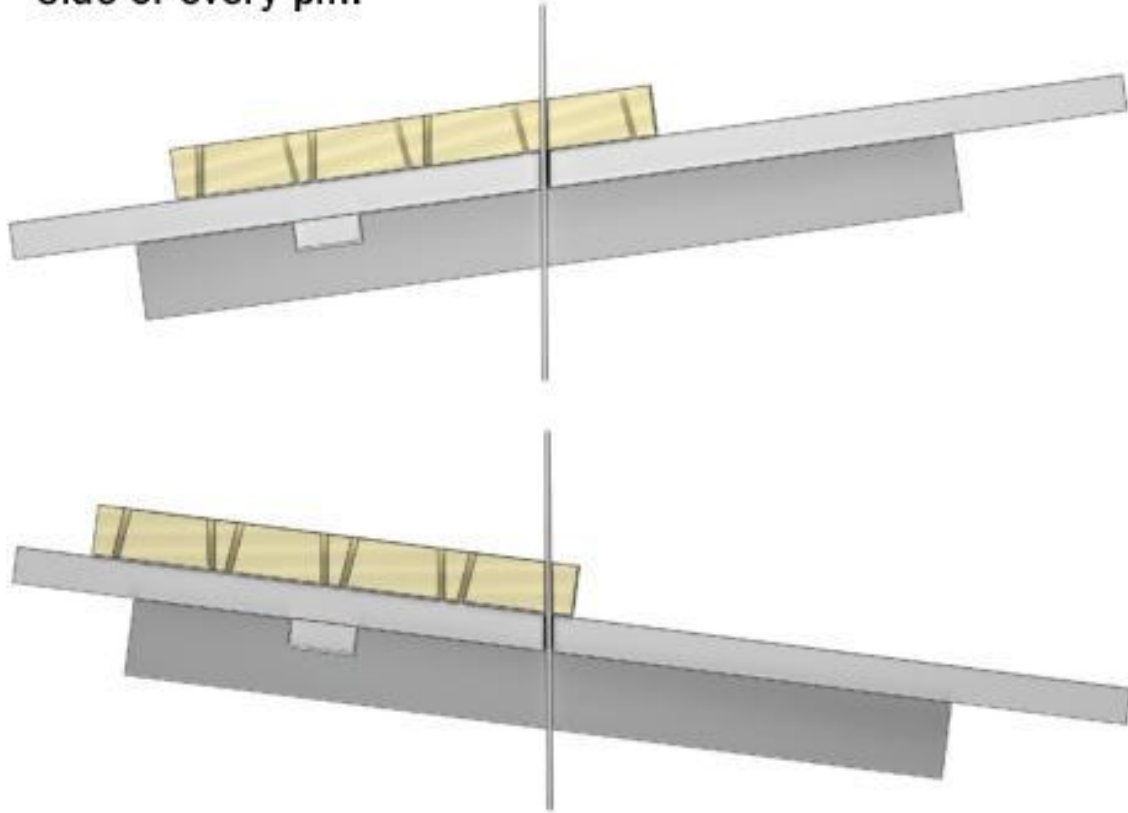
sides. I use the bandsaw to nibble out the waste between the tails, but you can use any method you want.

Pins fit right off the saw

After paring to the marked baseline, transfer the tails to the pin boards. You must transfer each tail board to its mating pin board, and then cut the pin boards one at a time. Before you begin you must angle the bandsaw's table to match the slope of the tails. I use a bevel gauge to get it to the right angle. The table angles left for one of the pin jigs, and right for the other. So, just as you did with the tail jigs, you'll cut the same side of every pin first,

TILT THE TABLE TO CUT THE PINS

The table angles to the left to cut one side of the pins and to the right for the other. Cut one side of every pin first, then tilt the table the other way and cut the second side of every pin.



First tilt cuts right side. Cut to the baseline scribed on a scrap, and then clamp the stop against the jig's leading edge. Cut the right side of all the pins on one board, then work through the other pin boards.



Change the tilt to cut left. To cut the second side of the pins, angle the table in the opposite direction, again using the bevel gauge so that the tilt matches the tails' slope.



Trim between the pins. Fortune uses his chisel guide when paring the baseline. Because he transferred accurately, the cheeks do not need paring.

then switch sleds (and readjust the table) and cut the second side of every pin.

If you transferred the tails carefully, your pins will fit straight from the saw, because the jigs have a zero-clearance kerf. Just remember to align the layout mark right next to the kerf, not in it.

After you've cut all of the pins, cut out the waste between them, then pare down to the baseline. At this point the joint normally comes together for me, but if it is a bit tight, pare the pins until they fit. □

Michael Fortune is a contributing editor.



PAD FOOT

The most familiar foot of the three, the pad foot has plenty of variations. In the simplest and most common version the rim of the foot is $\frac{3}{4}$ in. to 1 in. off the floor and its diameter is just under the size of the leg blank. A competent 18th-century turner easily could have produced it in less than 5 minutes, perhaps explaining its prevalence. This is my interpretation of a typical New England pad foot.



SLIPPER FOOT

To me, the slipper foot is the most successful design for the bottom of a cabriole leg, especially when the arrises on the leg are retained and gracefully end at the point of the foot. There's a blend of soft curves and defined edges that just works. This particular foot design was taken from a Newport tea table in the Pendleton House collection at the Rhode Island School of Design Museum.



A step-by-step guide to creating three distinct period feet for the cabriole leg

BY STEVE BROWN

One Leg, Three Feet

TRIFID FOOT

The trifold foot is similar to the slipper foot in the way the back line sweeps inward from the ankle to the floor. And like the other feet, the trifold's plan-view pattern consists of an outer line indicating the edge at the top of the foot, and an inner line indicating the footprint where it meets the floor. This trifold design is based on an 18th-century Philadelphia Queen Anne side chair. It is one of the most elegant trifold foot designs on an American piece.

In the furniture making program at North Bennet Street School, students usually find inspiration for their projects in books from our extensive library. They'll find many examples of period pieces, but they'll also find more contemporary work. What they won't find is any lack of possibilities. Sometimes limiting their options is the hard part. If a furniture maker is inspired by the cabriole leg, for example, they still have to decide what kind of foot to put on it. There are a lot of options.

To clarify a few of them, I will focus here on three common feet for the cabriole leg: a turned pad foot, a slipper foot, and a trifold foot. All three share some basic steps in layout and execution. For each I've provided a side-profile pattern of the whole leg and a plan-view pattern of the foot, which you can trace onto the bottom of the blank. These two patterns, which embody the sophistication of 18th-century furniture design, are used to create three-dimensional sculptural feet in a way that is surprisingly simple.

The turned pad foot is essentially a flattened oval-shaped block of wood that rests on a disk or pad. The pad foot is sometimes referred to as a Dutch foot or spoon foot.

The slipper foot, which was popular in the Queen Anne period, is aesthetically spare and a very elegant solution to the cabriole leg.

The three-toed paw or trifold foot has animal-like toes and is found on many traditional furniture pieces. I refer to its three divided or cleft elements as toes because the other name for the trifold is a Drake's foot, suggesting that it resembles a duck's three toes.

Steve Brown is an instructor at North Bennet Street School in Boston.



PAD

THE UBIQUITOUS TURNED PAD FOOT

This leg and foot can be sawn first and then turned, or vice versa. I think it's easier to turn first. To begin, trace the side pattern on the blank and mark the elevation of the pad and the top of the foot. Also make a chamfer mark at the thinnest part of the ankle. The blank should be overlong, giving you a way out if the first attempt at turning the pad foot doesn't go well.

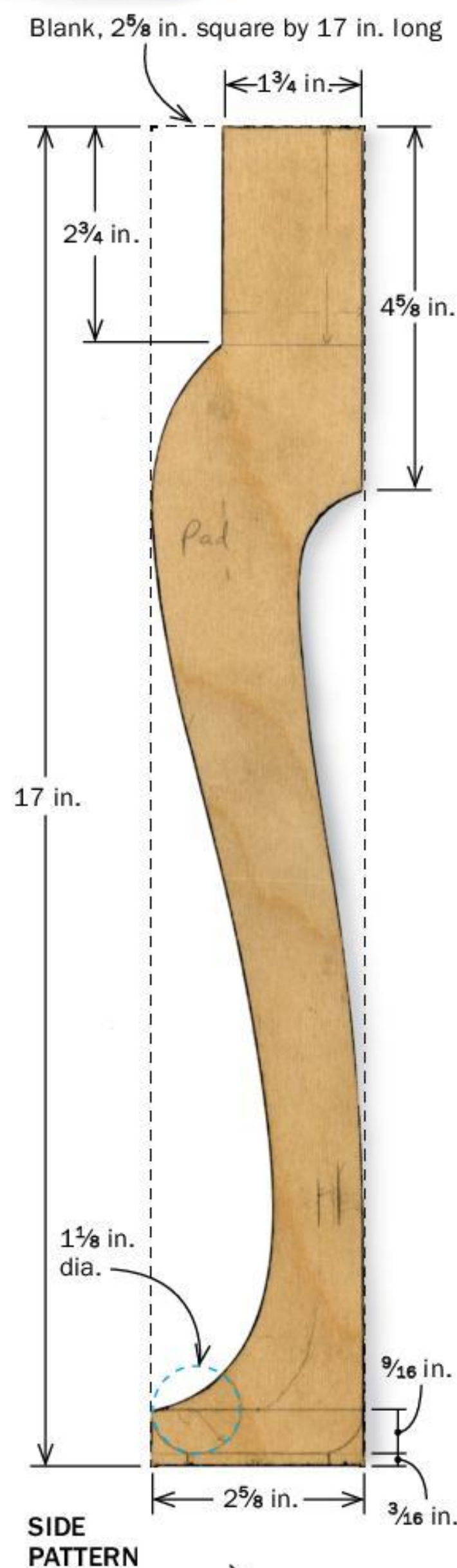
The first thing to be turned is the pad under the foot. Using a parting tool, give it a cylindrical shape. Next, turn a cylinder for the foot itself. Then, using the long point of the skew, scribe a firm line to define the top of the foot. This cut must be deep enough to accept the edge of a chisel when you pare the top of the foot later.

Use the parting tool to cut to the chamfer mark, then continue this chamfer down to the foot. Now, to create the inward sweep of the

back of the ankle, turn a fair curve with the skew from the top end of the chamfer down to the scribe line at the top of the foot. Once the back of the ankle is formed, turn the foot with the skew or with a small spindle gouge or scraper.

Next saw out the leg on the bandsaw and clean up the sawn surfaces. Retrace the side pattern on the turned surfaces, and draw chamfer lines to guide the rough shaping. As you take the leg and foot from square to round you'll remove 80% to 90% of the wood by chamfering before blending the facets into a smoothly curved surface. I use a 1-in. chisel to remove the bulk of each chamfer and switch to a rasp to fine-tune them. Then I knock off the peaks between chamfers and shape the final curves with a rasp. Finally, I use a half-round file and card scraper to refine the surface.

1. TURN FIRST



Leg layout. After tracing the side pattern onto the blank, mark the ankle for a chamfer. Mark the leg's center by eye, then mark a little less than halfway to the back edge.



Turn the pad first. With a parting tool and calipers, turn the pad to a cylinder the same diameter as the inner line on the bottom pattern.



Scribe with a skew. After turning the foot to a cylinder, use a skew to make a deep scribe line at the top of the foot. This will help as you carve the top of the foot.



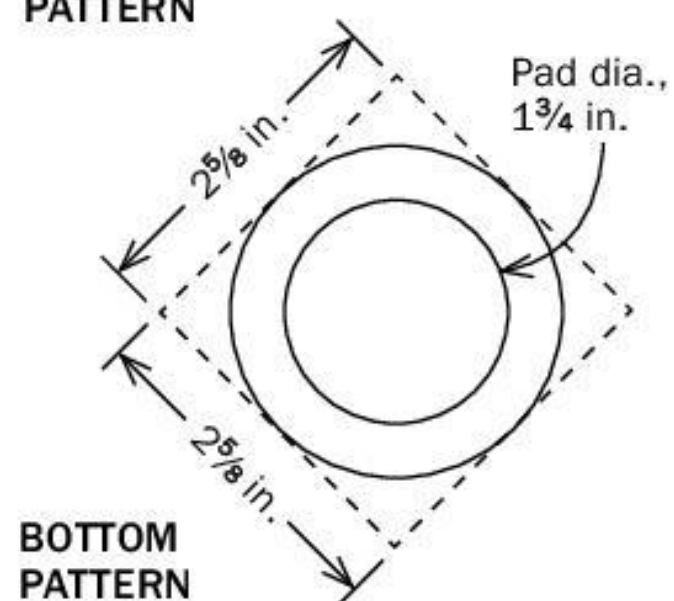
Define the chamfer. Use a parting tool to cut to the depth of the chamfer mark, then carry that chamfer down the rest of the leg.



Turn the heel. The inward sweep at the back of the ankle is created by turning a fair curve with a skew chisel. It begins at the chamfer mark and sweeps right down to the scribe line at the top of the foot.



The foot curves under. With the heel curve shaped, you now have access to turn the underside of the foot to its curved profile. You can make this cut with a skew, a spindle gouge, or a scraper.



2. THEN SHAPE

Creating the cabriole. With the foot turned, reapply the side pattern lines and saw out the leg. Bandsaw one side, tape the cutoff back on, rotate the blank, and saw again. At the foot, cut close to the skew line but don't hit it. Then fair the sawn surfaces with a rasp or spokeshave.



Freehand layout lines guide the shaping. To lay out chamfers, Brown eyeballs the space in half, then draws his chamfer line a little more than halfway from the edge to the center.



Chamfers take the leg from square to round. For the major leg chamfers, Brown often uses a 1-in. chisel and a drawknife to remove the bulk of the wood. Then he switches to a rasp to fine-tune the surface.

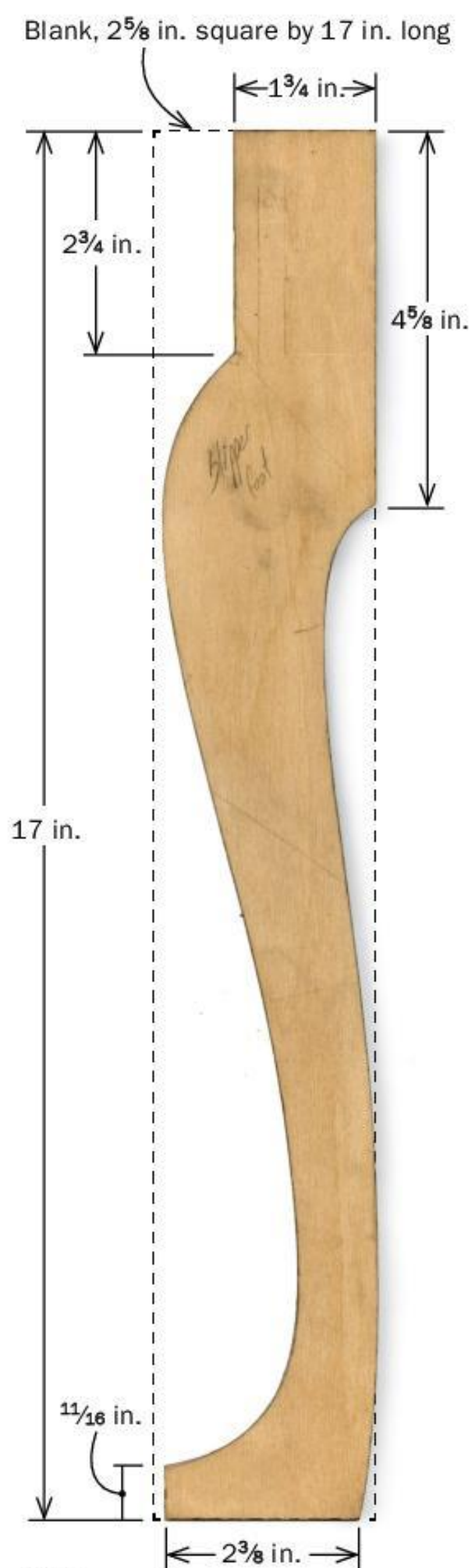


Chamfers shape the top of the foot. To finish shaping the foot, draw layout lines for chamfers from the foot up to the ankle. Use a chisel and rasp to cut the chamfers and then to create narrower chamfers. Work carefully near the skew line, and when there is very little wood above it, use a chisel to pare to the line. Once the shape is fair in all directions, file away the rasp marks.

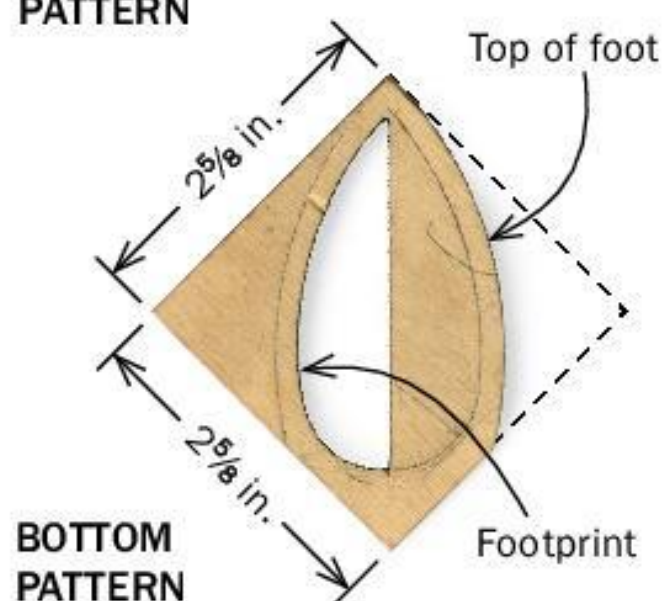


SLIPPER

THE ELEGANT SLIPPER FOOT



SIDE
PATTERN



BOTTOM
PATTERN

Shaping the slipper foot begins once you've sawn out the rest of the leg. Start the foot by tracing the bottom pattern onto the bottom of the leg. This is a hybrid pattern, which includes a half-pattern for the shape at the top of the foot and a half-pattern for the footprint; flip it and trace it twice to complete the layout. Then remove all the wood outside the outer foot line with a chisel, first chopping, then paring to create a plumb surface. Next, bevel the sides of the foot from the top edge you've just created to the inner line for the footprint. The last task in forming the sides and back of the foot is to blend off the corner that the first steps have left at the heel. Now the bevel will be continuous from the tip of the toe right around the back of the heel.

With all else finished, you'll crown the top surfaces of the foot up to the ankle. The table that this foot design was taken from had a very subtle crowning on all four faces of the leg from

the knee down to the foot. It is so subtle that it's hard to make out when the leg has no finish on it. But once finished it softens the look of the leg, creating a blend of softness and crispness between the leg face and the arrises.

Before you begin the crowning, be sure that the arrises are fair curves from the top of the foot up the ankle. I use a round-bottom spokeshave to do the crowning. Because of the grain direction, I work from the edge of the toe up to the ankle, creating a very slight bevel on either side of a given surface. I continue by shaving narrower bevels and taking less and less off each time until the surface is an even curve. This is repeated on all four faces up to the ankle. On the back surfaces, the crowning will blend into the curving bevel that runs around the heel. The foot bevel itself does not get crowned. Now the foot can be cleaned up and sanded to 220 grit.



Trace the bottom pattern twice. The outside curve of the pattern represents the top of the foot; the curve of the cutout is for the footprint. Set the pattern on the bottom of the blank and trace both curves. Then flip the pattern, leaving the toe at the same corner, and trace both curves again. Use a chisel and mallet to knock off a lot of the waste outside the layout lines.





Pare to the outer line. Using a 1-in. chisel, pare to the outer pattern line on both sides of the foot, creating a surface perpendicular to the bottom of the blank. In doing so, you transfer the outline to the top of the foot.



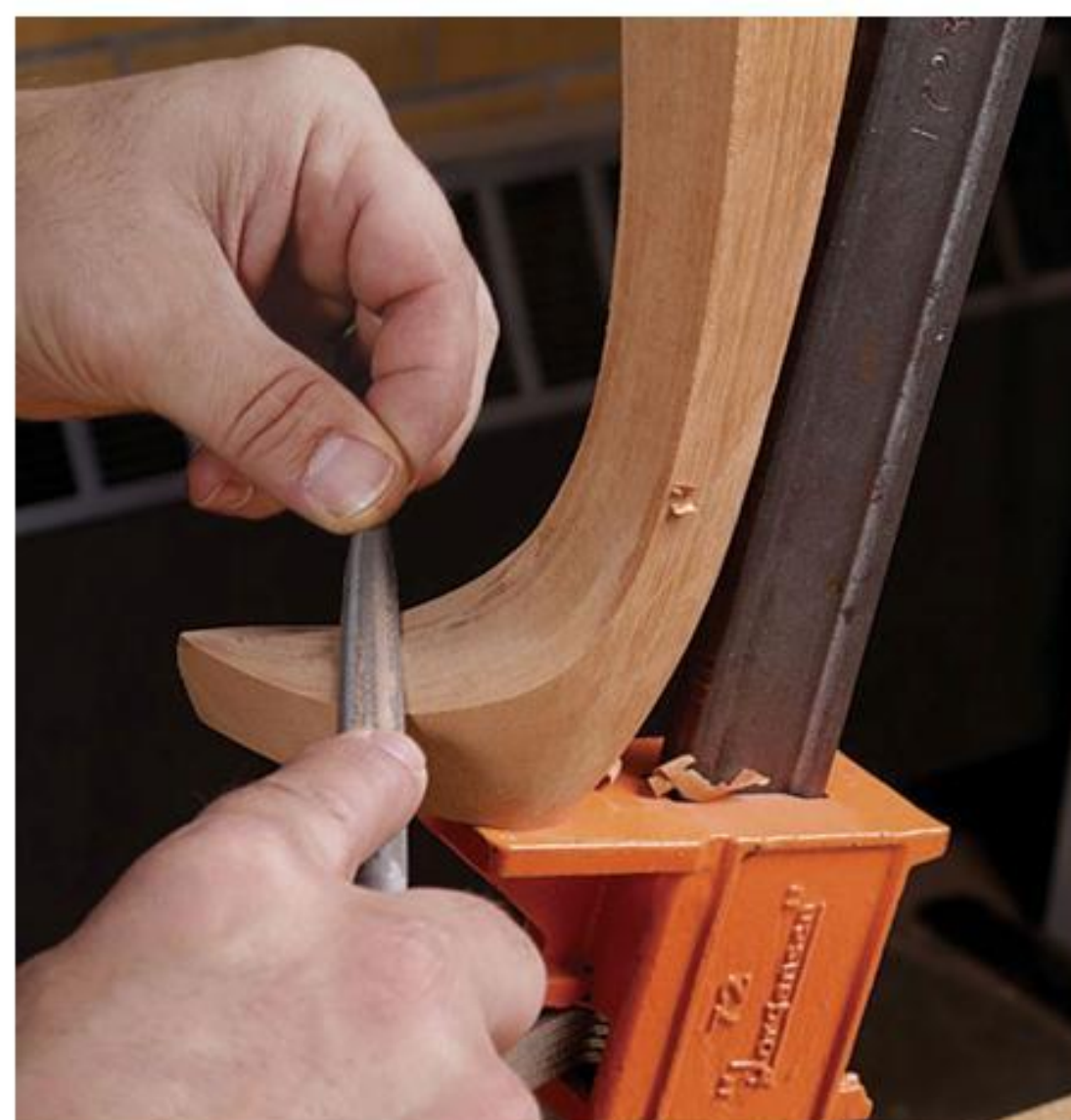
Bevel to the footprint. With a chisel, bevel the surface you've just created. The bevel will connect the outline at the top of the foot with the outline of the footprint. Then use a rasp to blend the bevel fair to the back section of the foot.



Shape the heel and back of the ankle. The previous steps leave a triangular chunk to be removed at the heel. Draw the layout lines so they meet where the ankle becomes vertical. Then use a chisel, rasp, and file to remove the waste and fair the heel into the bevels on either side.



Crowning moment. The final step in forming the foot involves crowning the top surfaces from the edges up to the ankle. A round-bottom spokeshave works well here. You can use a series of slight bevels to create the crown.

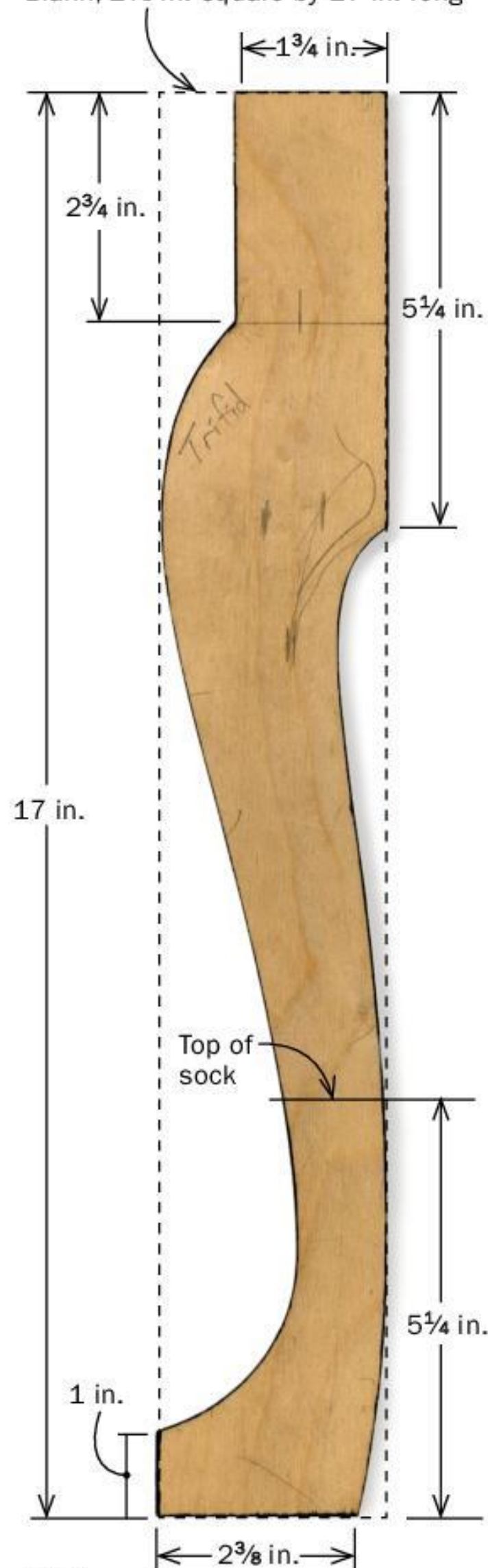


Clean up on top. Use a file to smooth the crowning on the top of the foot, but keep the arrises sharp. The foot can now be sanded to 220 grit.

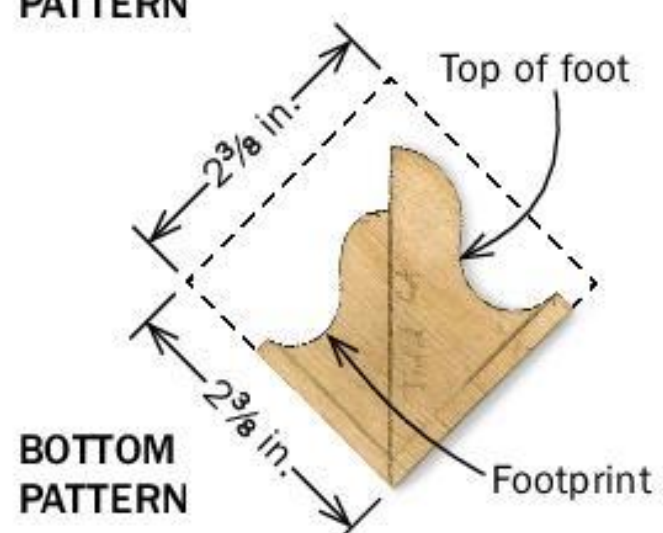
TRIFID

TRIFID FOOT HAS PIZZAZZ

Blank, $2\frac{5}{8}$ in. square by 17 in. long



SIDE PATTERN



BOTTOM PATTERN

The first couple steps to shaping the trifid foot are similar to those on the slipper foot. After sawing out the leg and tracing the bottom pattern, start shaping to the outside line of the foot, creating a surface perpendicular to the bottom of the blank. I rough out the shape with a saw and use a chisel and rasp to finish as much of the surface as I can. Where I can't reach with the rasp I use a #11–10mm veiner gouge. Once those curving surfaces are established, use the same tools to bevel down to the footprint line. A rat-tail rasp works well for the inside curves.

Next, with a veiner, carve the tapering coves from the toes up the ankle to the top of the sock. Start with penciled layout lines, drawn by eye and flowing from the toes. Mark the top of the sock $5\frac{1}{4}$ in. up from the bottom of the foot. The cove doesn't need to be more than $\frac{1}{8}$ in. to $\frac{3}{16}$ in. deep. To deal with changing grain you

may want to carve part of the cove from top to bottom; for the transition area, a small round scraper is handy.

The three elements that form the sock terminate at the top in shallow arcs, which can be made with a #5 or #7 sweep, 20mm gouge. The arcs should be set in about $\frac{1}{16}$ in. Once those set-ins are created, the surface of the leg above the sock can be relieved down to the depth of the coves using a 1-in. chisel, a half-round file, and a scraper.

The last step in forming the foot is to shape the tops of the toes up the ankle. The middle toe will have a slight crown that blends to a quarter-round up at the ankle. All the toes can be shaped with a chisel, rasp, file, and scraper. I have no qualms about using sandpaper to improve the surfaces of the coves, though I wouldn't use anything coarser than 220 grit.



Begin at the bottom. Trace the bottom pattern on the bottom of the blank. Like the pattern for the slipper foot, the trifid pattern generates perimeter lines for both the top of the foot and the footprint. And it also must be traced on both sides, flipped, and then traced again on both sides.



Saw it off. As much as possible, rough out the shapes with a dovetail saw, being careful not to cut past the outer lines. Diagonal cuts remove the front and side corners. Two angled cuts meet at the deepest part of the cove between the toes.



Work to the lines. Using a paring chisel, work carefully to the outer line of the pattern, keeping the surface perpendicular to the bottom of the blank. This will establish the perimeter at the top of the foot. Then with chisel, gouge, and rasp, create a beveled surface from the top line down to the footprint line. For shaping the heel, a spokeshave works well.



Coves between the toes. To define the area between the toes, draw layout lines from the sides of the toes up the leg. Cut narrow channels to the inside of the lines and widen them into shallow coves that run up the ankle to the top of the sock.



Reverse engines. You may need to carve from the ankle toward the foot when working at the top of the sock. Brown's tool of choice for carving the coves is a #11–10mm veiner gouge. The coves needn't be more than $\frac{1}{8}$ in. or $\frac{3}{16}$ in. deep.



A sock for the trifold foot. The sock is a feature typical on trifold feet. The tops of the sock elements end in arched cuts made with a shallow gouge pushed in at 90°. Then the arches are defined, or set in, from above with a chisel. The surface of the leg is then relieved to the depth of the coves, leaving the sock proud of the surface.



Composing: A Flexible Way





to Design

Keep options open
from the initial idea
to the finished piece

BY TIMOTHY COLEMAN

James Krenov may be remembered best for his charming, diminutive cabinets, his emphasis on unusual woods and hand-wrought details, and his practice of working with tools and methods that encourage intimacy between maker and material. As a student at the school where he taught, though, I learned the most by observing him immersed in the creative experience as he brought a piece to life: “composing,” as he called it.

He would scurry about the workshop making parts, rough-clamping them together, stepping back with a fist under his chin, and looking long and hard. The piece might stay in that place for days before the next steps were clear to him. Other times he would see right away, take things apart, and chop 2 in. off the legs.

Composing, as Krenov saw it, was a way for the maker to have freedom to improvise and make discoveries during the build. One could respond to characteristics in the material as they emerged, and make changes to the piece as it evolved.

This method had enormous appeal to me. By creating a flexible process, I could weave together designing and building



Design doesn't stop at the drawing board

The key to success in composing is to develop a method that keeps options open as long as possible. This means making design choices even during the build, when there are still plenty of options for shaping parts, profiling edges, and determining the role the material will play.



Capture the idea

Before you build, you may begin with a sketch, a model, a full-size drawing, a mockup, or some combination of these.

SKETCHES

Bold lines limit fussiness. Move quickly from one notion to another as you try to capture the overall shape and feeling of the piece. Sometimes this means quick work with a marker; other times it means color and isometric views. But don't dive deeper than necessary.



in a way that would allow me to be more spontaneous. Having worked this way for three decades, I've developed some strategies to leave wiggle room and manage what can be an unwieldy process.

Remember that learning the techniques of composing takes practice, like any other furniture-making skill. Try it on small projects at first, or on just a few components of a piece while you develop your own strategies and become comfortable with the process.

Before you build

In the beginning, all options are open. There is the idea of the piece and the desire to work, but where to start? Look for an anchor, a fixed starting point from which you can begin working and exploring possibilities for the next steps. Sometimes the search is easy, like when dimensions are determined by the space for the piece. Other times, the starting point is elusive and it may take some pondering before you find it. Ultimately, you are looking for a spark—it may be a sketch, model, mockup, full-size drawing, or mix of these—that gives you the confidence and energy to begin building. It's not necessary, or even desirable, to have everything figured out at this stage.

Dive in with sketches, scale models, and mockups

Sketches are rough by nature, so I often use a broad marker for its bold lines. Using a scale ruler can help give a rough approximation of the dimensions as drawn, and colored markers can mimic different wood tones.

While sketching, envision the piece but also pay attention to what is emerging on paper. Sometimes an errant line will suggest



SCALE MODELS

Scale models bring the design into tangible reality, giving you a further sense of the piece, from its visual heft to joinery considerations. Coleman handles the small parts at the scrollsaw. Hot glue and double-sided tape make quick work of attaching the little pieces together (1). Take a photo to get a preview of the full-size piece. Set up a small environment, with a fake wall and floor, to photograph the model (2). Evaluate its proportions and shapes. Then use the model to identify complex joinery or shapely curves, which you should then explore and record on a full-size drawing (3).

an unexpected direction. Squint your eyes at the sketch to take it out of focus and just show the outline.

A scale model turns a sketch into a 3-D object, which can be studied from multiple angles. Setting up a small environment for the piece and photographing it helps, too. After you crop and edit the photos to remove distractions, the shot can make the model look quite realistic. Still, avoid being fussy with the details. This is about establishing overall proportions and shapes.

A full-size mockup takes you a step further toward determining the proportions and volume of a piece. Large case pieces with curving surfaces in particular benefit from mocking up so you get a clearer sense of the actual volume. Leave the details sketchy. You can even simply staple and tape sheets of cardboard to a stick frame. When possible, though, make the



Put your ideas to the test

Try out ideas full-size, whether they're leg shapes, material options, or decorative panels.

FULL-SIZE MOCKUPS

Scaling up gives you a much better sense of a piece's impact, including how its volume, lines, and material will look when the project's done. For a dining table's mockup, Coleman pulled up a chair to examine the veneer and make sure there was sufficient leg room.



mockup using the same type of wood you plan to use in the piece. Sheets of veneer taped to plywood are a crude but effective way to do this. If your piece includes patterns or decorative elements, add a rough version of them too, but don't do more than you have to.

Observe the mockup in different lighting conditions, especially low light at night, which can emphasize the volume. Keep the full-size mockup around while building to test out details.

Full-size drawings are useful for working out joinery details and precisely laying out parts, but it's typically not necessary to rely on them early in the process. If there is a dominant feature, such as a curving leg or bow front, full-size drawings can be a good place to define it. Most of the time, however, mine are a record of where I've been, rather than a road map from the outset. So much happens in the moment that I find it impossible to make a firm plan in advance.

During construction

By now you have established overall dimensions and proportions, but there are still plenty of choices to be made regarding shaping, profiles, and the material's role in the piece. For each project, make a roadmap identifying a few tasks that will be pivotal in determining the look of the piece. These fixed points act as guideposts as you build and also keep you from limiting your options too early.

For instance, it may be important to see the doors of a cabinet before you can envision other details of the construction. So build the doors first. They will help determine the volume of the cabinet and the next steps in the construction.

Staying flexible with joinery

Joinery will be a key component on your roadmap, but if you plan ahead it doesn't need to lock in your overall design. When composing, the general strategy around joinery is to make parts larger and less shapely than you think they'll end up. This leaves you with the flexibility to decide as you build. For example, when building a cabinet, keep the panels for the case oversize while you decide on the joinery. Also, if you plan for a cabinet top that



TRY OUT DETAILS

if you're integrating a pattern—whether pierced, carved, or inlaid—make a sample of it or sketch it out to see how it looks on a mockup. Even patterns that you decide not to use could inspire a related design in the final piece of furniture.



overhangs the sides, it will allow you to trim the height of the sides before cutting joints.

A sample apron—There are even strategies to create options after the mortises and tenons have been cut. Take, for example, a cabinet with a shaped apron and leg (see photos, p. 62). Once you have a general idea of the size and shape of the legs and aprons, define the margins around the joinery where shaping can begin. You don't need to know the precise shapes yet, just the potential margins.

Make an extra leg and apron to help test shaping ideas. It helps to create a full-size drawing of the joint area with top and side views. These drawings need to be precise, since moving a mortise just $\frac{1}{8}$ in. can greatly limit or expand your options when refining the parts. Leave as much as $\frac{1}{2}$ in. at the bottom shoulder of the tenons. This allows you to trim the width of the apron or add a curve along the bottom edge. You can cut to the very bottom of the tenon without exposing the joint.

Even after you've cut the tenons on the apron blank, the length of the apron can be adjusted by cutting back the shoulders of one tenon and recutting the cheeks. Slip tenons make it even easier to trim the length. Leave the legs oversize, primarily at the two



Refine as you build

Build in a way that doesn't shut down your options prematurely.



LEAVE ROOM FOR SHAPING

On this apron and leg, Coleman left plenty of stock around the mortise and tenon to explore shaping options. Coleman uses drawing templates, a ruler, and a pencil to outline his shapes, and he doesn't hesitate to erase and try again.



outside faces. With the piece dry-fitted and standing, use tape or a marker to define shapes on the leg or apron. You can do the shaping now, or after assembly.

Don't veneer yourself into a corner

Building oversize is useful with veneered work, too. Consider a veneered tabletop and three methods for constructing it, each with its own degree of flexibility: 1) an edge-banded plywood core with veneer on top, 2) veneer on plywood with edge-banding applied after the veneer, and 3) a solid-wood core with veneer running the same direction as the core. Option one is the least flexible, as it forces you to size the top close to its final dimensions to avoid cutting off the banding and exposing the substrate. Option 2 leaves more room to compose because you can make the panel oversize, but applied edge-banding could disturb the flow of the face grain. Option 3, veneer on solid wood, offers the most flexibility. You can make the veneered panel oversize and retain the freedom to size the panel and shape the edge in a way that best suits the base without adding an edge band. This is

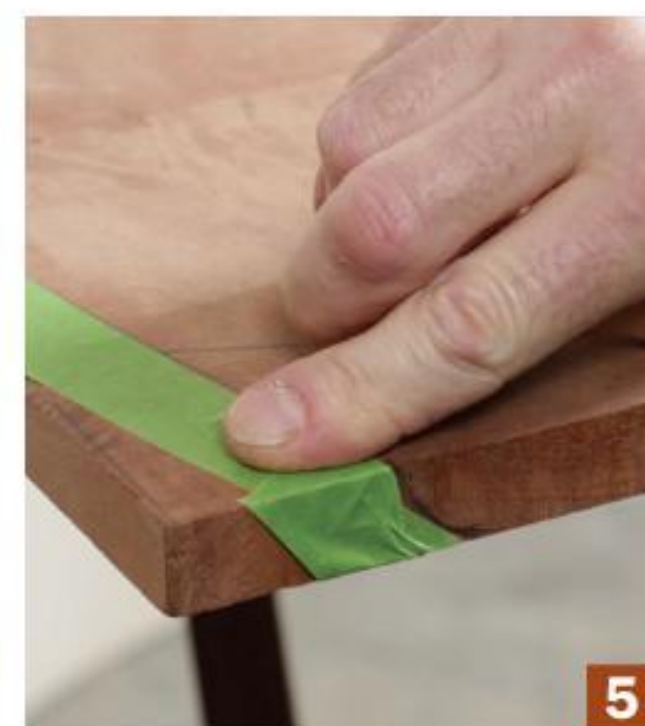
Online Extra

For a glimpse into the design journey behind one of Coleman's cabinets, watch the video at FineWoodworking.com/270.



KEEP MOCKING UP

Drawings and full-size mockups can be helpful during construction. Here, with the real legs shaped and glued to the short stretchers (1), Coleman uses a piece of 1/4-in. plywood to explore possible shapes for the long stretcher. After cutting out the mock stretcher, Coleman colors in the shape (2) to better match it with the table. For the tabletop, he starts with an oversize blank (3), which allows him to dial in the shape. Laying down tape sets off the piece's outline (4). Determining the edge profile is the next step (5). He uses tape again to explore square, bullnose, thumbnail, undercut, and beveled profiles.



valuable because it's important to see the top on the actual table base before deciding on the top's shape and edge profile.

Edge profiles can often be decided later, so leave enough dimension for options once the piece comes into focus. You may have to guess on the thickness of the top when you build it, but the edge can be made to look thinner and lighter with an undercut, or thicker and heavier with a thumbnail profile or bevel on top. Similarly, when building a table or cabinet with an overhanging top, leave the maximum overhang, knowing it can be trimmed back.

Walk away

One further strategy I find helpful if I'm feeling stuck: healthy disengagement from a project. It can be frustrating when the next move isn't clear, but it's a natural part of the process. Put it aside for a while and work on something else. You can still look for ways to keep the project moving forward while ignoring the immediate roadblock. □

Timothy Coleman is a furniture maker in Shelburne, Mass.





Architectural Wall Cabinet

Traditional joinery is the foundation
for this fresh twist on a period design

BY NANCY R. HILLER

This simple hanging cabinet topped with a roof is inspired by the work of 19th-century Scottish architect Bruce Talbert (1838–1881). Talbert may not be widely known on our side of the Atlantic today, but in his own time and place, he was an acclaimed Victorian Gothic Revival architect and designer. I have long been intrigued by one of his architecture wall cabinets, a small piece of case furniture with an elaborate roof.

Talbert's cabinet is ornate, with inlay, fretwork, and gilding. I wanted to make a cabinet that drew on the architectural character of the roof and its Tudor-esque shoulders without being so ornate that it would look out of place in a simple contemporary room. Not to mention that I wanted something I could make in several days, rather than several weeks or months. Adding wallpaper to the back of the open upper section adds a decorative element to my version.

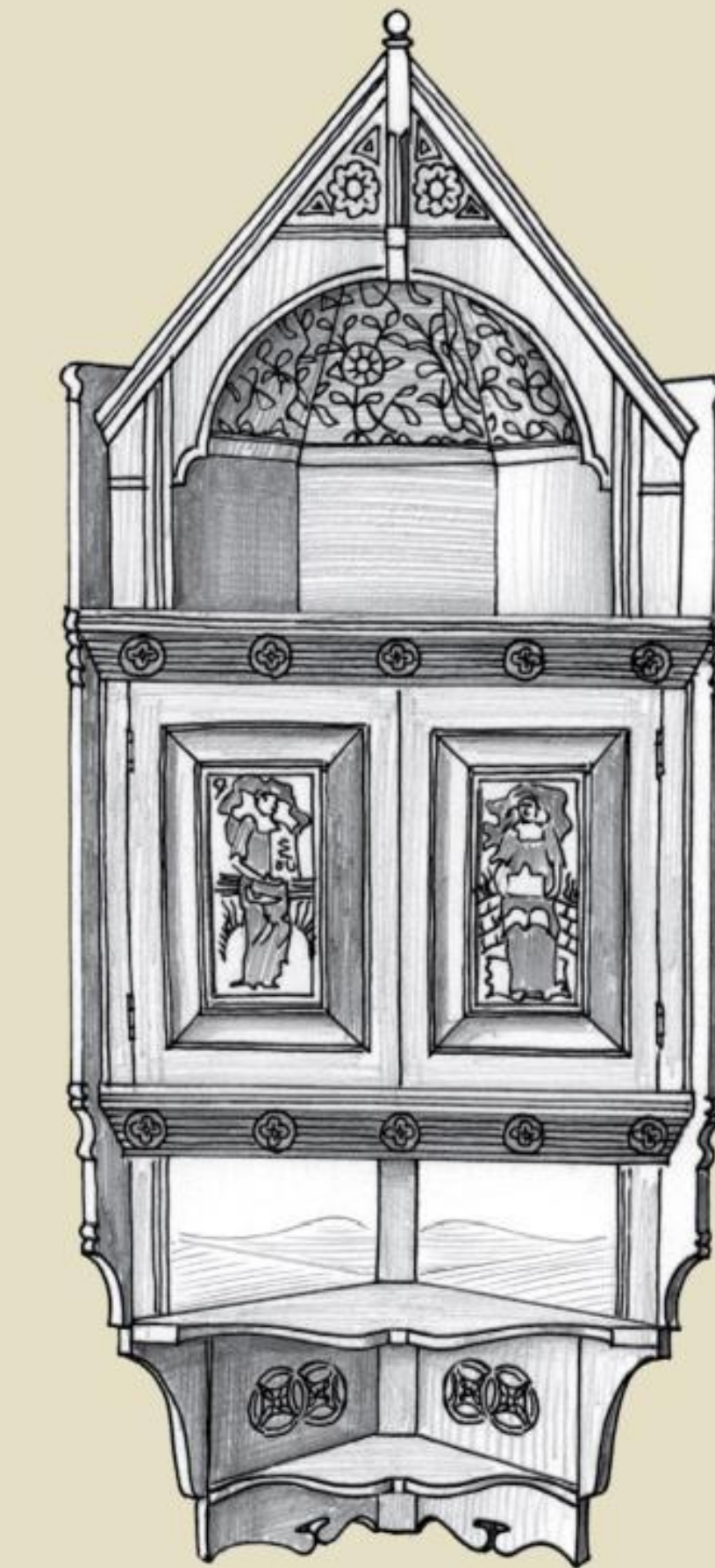
Dovetails are first

Construction begins with the main section of the case. The bottom-to-side joints are dovetailed. I cut the dovetails by hand, removing the waste with a coping saw and chisels. After transferring the tail markings onto each end of the bottom, I sawed the pins, then cut out most of the waste with a coping saw and cleaned up with chisels.

Add the joinery for the fixed shelf

The fixed shelf is joined to the sides with through-tenons. Although the shelf will be trimmed eventually to make way for the back, leave it full depth for now so that you can use the same gauge settings for the mortises and tenons.

Lay out the tenons on the shelf. Start by marking the thickness of the cabinet sides



with the same cutting-gauge setting you used for the dovetails. Then use the gauge to mark out the tenons.

Cut the shoulders of the tenons on the tablesaw, staying just shy of the gauged line indicating the cabinet side thickness. Then remove the waste with a coping saw and clean up with a chisel.

Next, mark the top and bottom edges of the shelf position in pencil on one of the sides, then use a square to transfer these lines around all four faces. Lay the other

side next to the first and transfer the lines. Mark the ends of the mortises with the same gauge settings you used for the tenons, then score the fibers between the end marks, knifing along the shelf thickness lines; these knife lines will guide your chisel. Drill out most of the waste, starting on one side and going about halfway through, then turning the piece over to drill out the remainder. Clean up the edges with a chisel.

Constructing a cornice

The cornices are joined to the cabinet sides with sliding dovetails cut on the router table. Start with cornice blanks a little oversize in width and length, and rout a stopped dovetail socket down the middle.

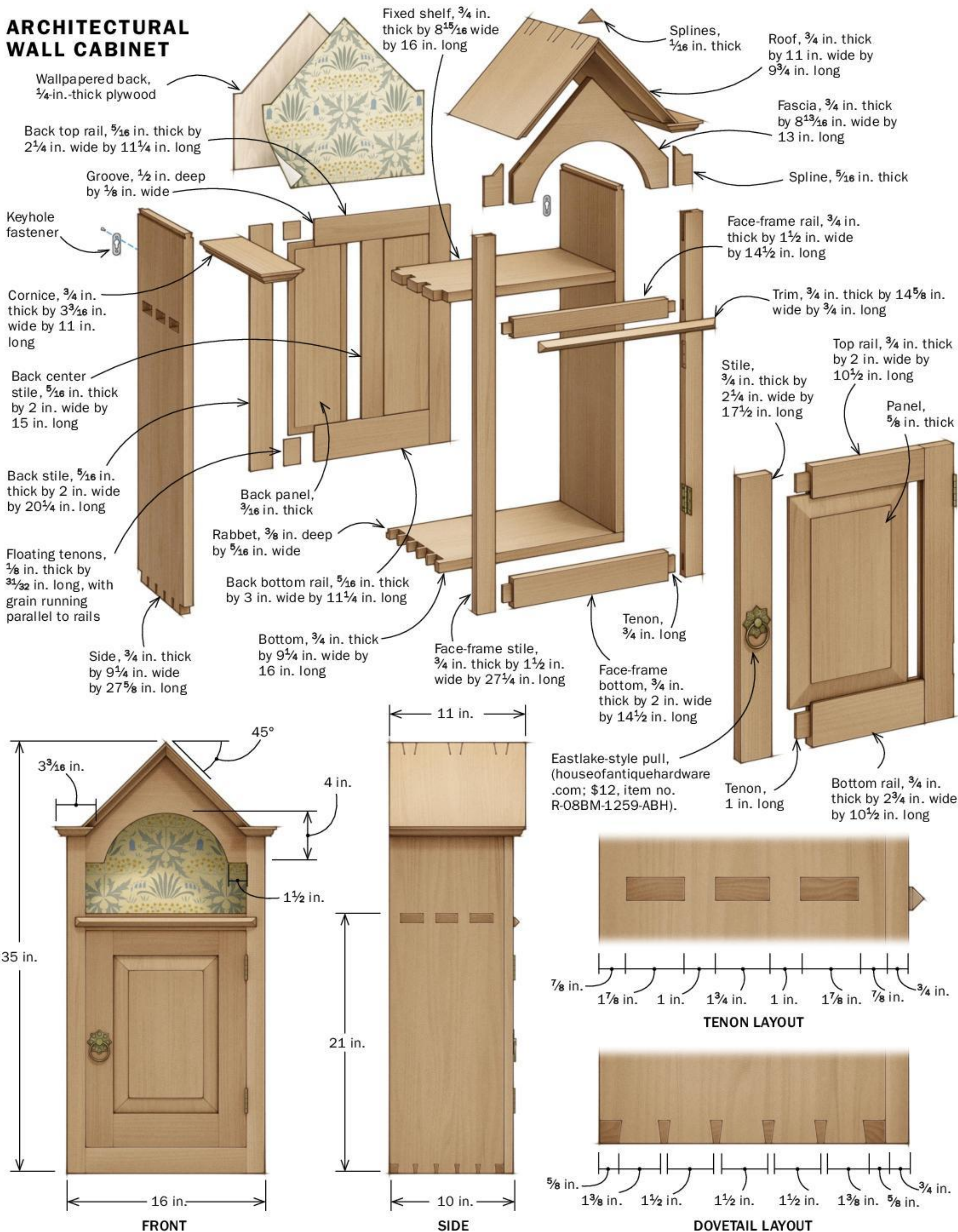
Now adjust the router table's fence to cut the dovetail keys at the top edge of each cabinet side; the dovetail should be centered in the side's thickness and run all the way from the front of the side to the back. Check the fit: It's better to leave it a little on the tight side and clean up with a chisel than to have it be loose.

Now, rip the shelf so that its back edge will align with the rabbets in the case sides. The rabbets will be $\frac{5}{16}$ in. deep. You can rout them after assembling the case. Glue the case together.

Add the face frame

While the case is in clamps, make the face frame with mortise-and-tenon joints. First mark the positions of the mortises, then cut them. With the same fence setting, cut an open-ended mortise $\frac{1}{2}$ in. deep at the top of each face frame side; this will hold the spline for the fascia. Now set up the tablesaw using a dado blade to cut the tenons to fit. Cut the shoulders back by hand. For me, it's quicker and easier to do it by hand than setting up the saw. Glue

ARCHITECTURAL WALL CABINET



A not-so-basic box



Sliding dovetail joins cornice to case. Before gluing the case together, cut the dovetail on the top of the sides. Each cornice will get a mating slot.

up the face frame, and then glue the face frame to the case.

Lay the cabinet on its face and rout a rabbet in the back edge of the sides and bottom. This will accommodate the frame-and-panel back for the cabinet's lower section and the wallpapered plywood back for the upper part. Chop the bottom corners square with a chisel and remove the little portions that remain above and below the fixed shelf.

Return to the cornice

Set up the router table with an ogee cutter and rout the profile on the outside and front end of each cornice.

Slide each cornice into position and mark where it meets the inside top corner of the face-frame stile. Then miter the cornices on their long inside edges. With your tablesaw blade at 45°, set the fence so you rip the miter where your mark is.

Fascia supports the roof

Cut the fascia blank to width. Now use a mortise gauge to transfer the position of the spline slot from each face-frame stile to the fascia blank. On the tablesaw, cut a groove for the splines coinciding with these lines.

Now mark and cut the top of the fascia to accept the roof. I made my first cut, a 45°

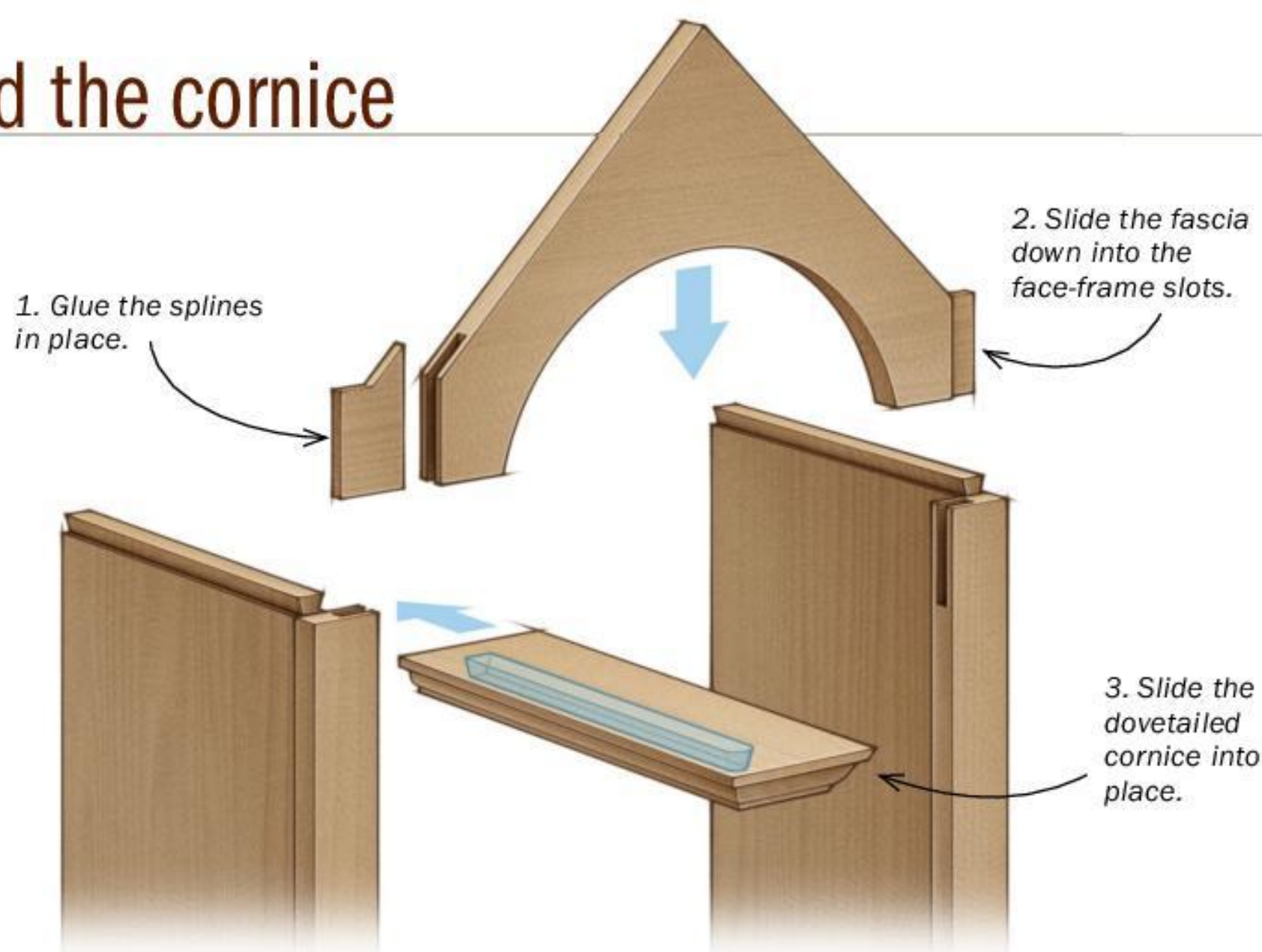


Glue the case. The bottom corners are dovetailed, and the shelf has through-tenons. It's not typical case construction, but it's quite strong and not difficult to manage.

Add the face frame. Hiller first glues up the face frame, then glues and clamps the face frame to the case. The face frame is joined with mortise-and-tenon joints and slotted for splines that will link the fascia to it.



Add the cornice



Start with the dovetail socket. Cut it on the router table, centered and running from the back of the cornice to about 2 in. from where the front edge will land. Here the blank is still overlong.



Add an ogee profile. Each cornice gets profiled on the outside edge (above) and on the front. Use a backer block when you rout the front to prevent blowout (right).

Cut the long miter. To mark the cornice for the miter, dry-fit the cornice on its dovetail without the fascia in place, and mark at the inside edge of the face-frame stile. Then rip the miter on the inside edge of the cornice.



angle, on a sliding compound miter saw, then moved to the tablesaw and used the miter gauge to make the second cut 90° to the first. Next draw the arc below the peak and cut it out with a bandsaw.

Clamp the fascia in place dry-fitted with splines. Slide the cornices onto the sides. Mark the length of the cornices at the back of the cabinet, and cut them to length. Then glue the fascia and cornice pieces in place. I apply glue only to the first few inches at the front of the dovetail slot; this locks the front in place relative to the face frame while allowing the cabinet sides to move.

Raise the roof

The roof is made of two boards with their grain running in the same direction as that of the case sides. They will be joined at the top with a keyed miter and affixed to



the cornice with brads; the front half will be glued to the cornice.

Route the cove molding on the underside of the roof. Next, at the tablesaw, cut the 45° angle on the lower edge of each roof side. Set one side in place on its cornice and clamp it to the fascia. Mark the point at the peak of the fascia. Repeat with the other side. Cut the 45° angles for the miter at the peak of the roof on the tablesaw. Finally, rout a rabbet in the back edge of the roof pieces to accept the back. Glue the roof pieces to the top edge of the fascia, to the front half of the cornices, and to each other at the ridge. When the glue has dried, kerf the ridge with a handsaw and glue in keys.

Make the back

The lower section of the back is a frame-and-panel unit. At its top end it overlies

half the thickness of the fixed shelf. Cut the stiles and rails to length, leaving them about $\frac{1}{16}$ in. over for fitting. Groove the length of the stiles and rails, and the ends of the rails on the tablesaw. Then mill floating tenons to fit. Cut rabbet around the inside face of each panel so that it will be flush with the face of the frame. Glue and clamp the back panel. Now attach it with wood screws.

Mark out the shape of the upper back section by holding a piece of plywood up to the opening and tracing it. Cut it out just a little larger than your marks, then trim to fit with enough margin around the edges so that the paper can be folded around and pasted to the reverse side. Apply the paper, and fit in place. You can leave the back as a press-fit or secure it with screws.

Fascia establishes the roofline



Cut grooves and arch. Groove the sides of the fascia while the blank is square (left). Set the tablesaw fence to cut grooves that line up with mortises in the face frame. Then, after mitering the peak, bandsaw the arch (right), and use a spokeshave, files, and sandpaper to clean up the cut.



Glue the fascia in place. First glue in the splines. They are notched and mitered to follow the roofline where it meets the inside edge of the cornice. Then slide the fascia down into the face-frame slots and clamp it.

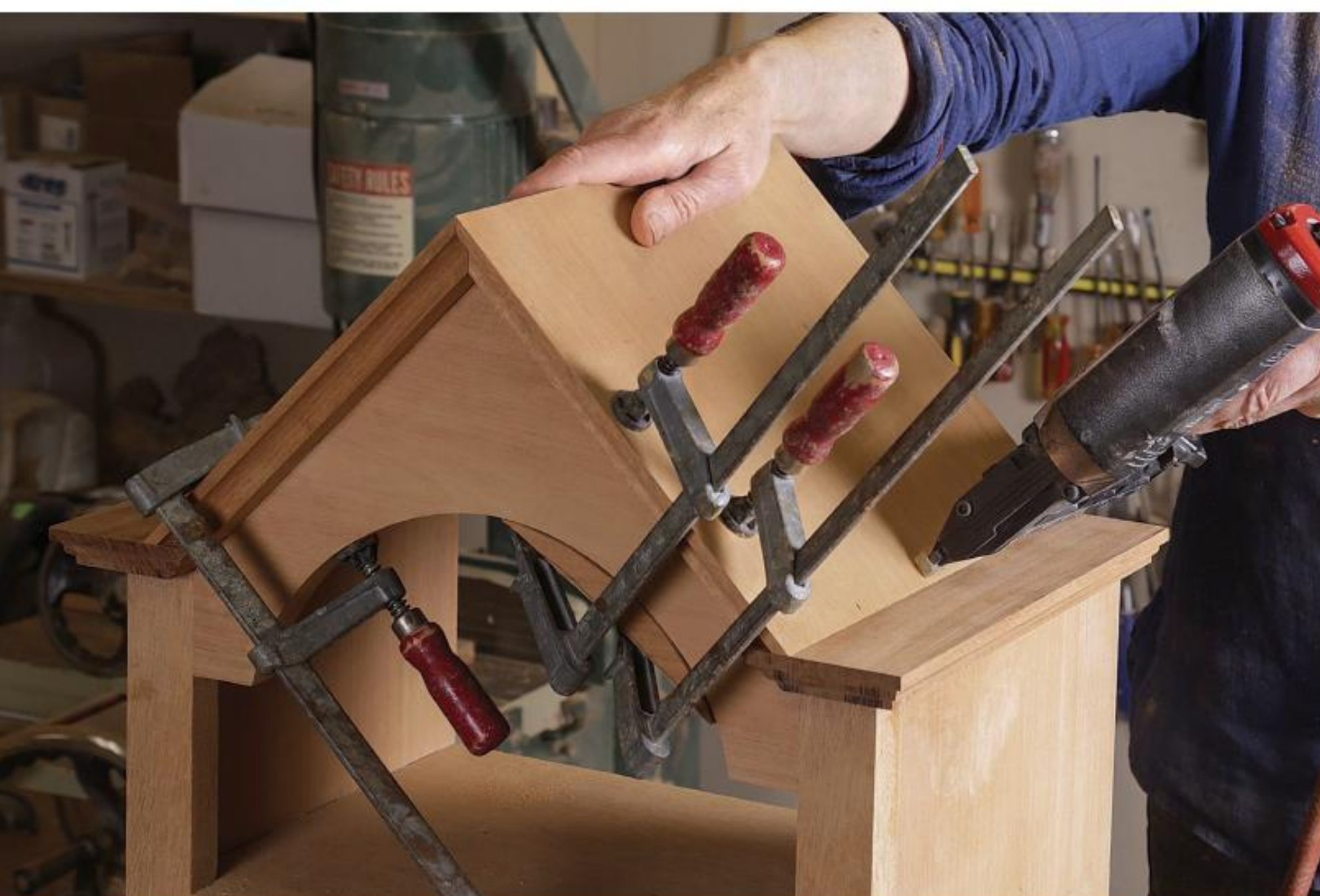


Glue in the cornices. Once the fascia is glued in, add the cornices. To allow the side to move, apply glue to just the front half of the cornice's dovetail socket.

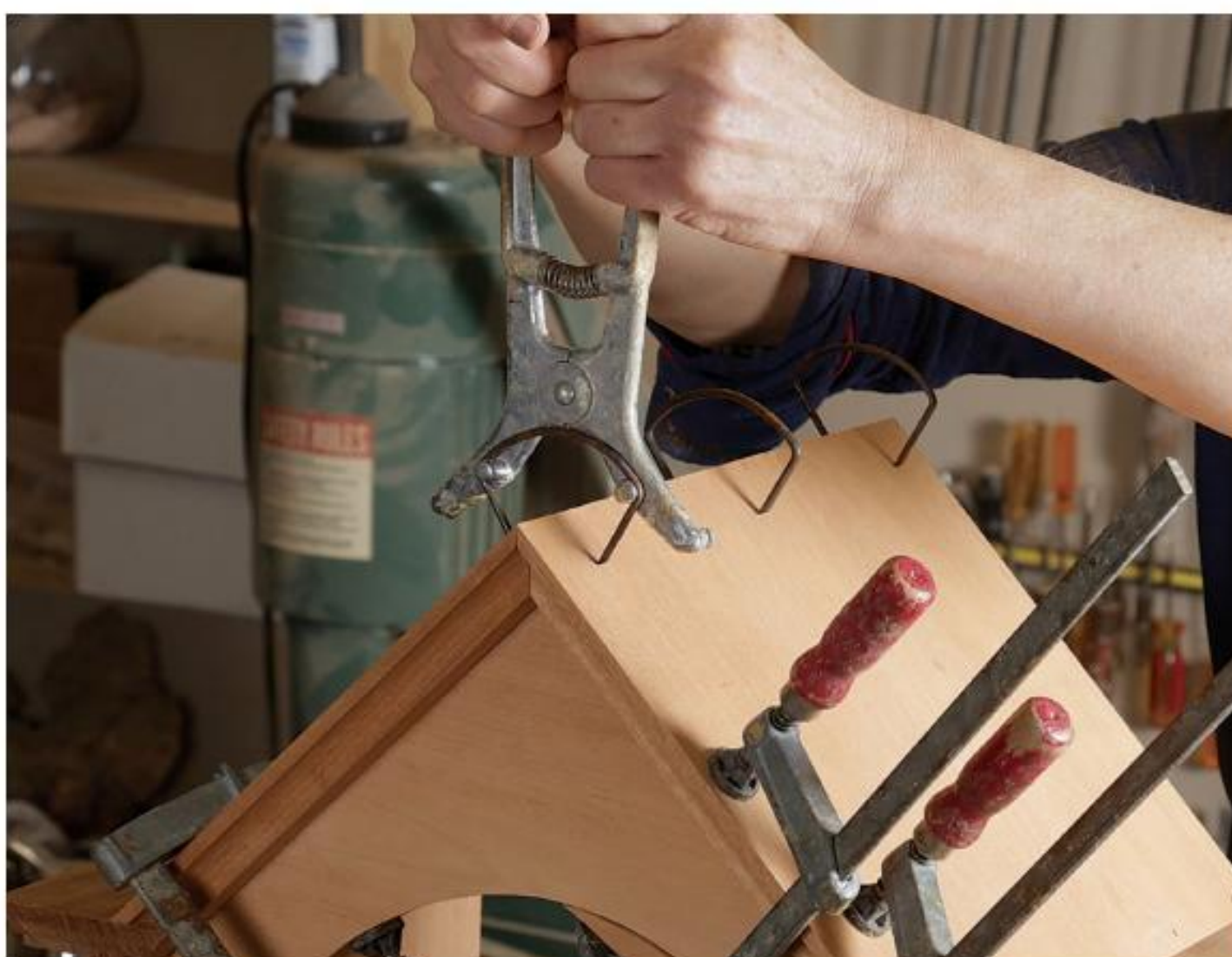


Through the roof

Cut one side at a time. After mitering the lower edge of one roof piece, set it in place against the cornice, and mark where the fascia peaks. Sneak up on this miter cut on the tablesaw. Repeat on the other roof piece with the first one dry-clamped in place.



Glue down the roof. Glue and clamp the roof in place. You can use arch cutoffs as clamping cauls. Hiller uses a pin nailer to secure the end-grain miter on the cornice (above) and Ulmia miter clamps to clamp the points of the roof together (right).



A raised-panel door

The door, like the face frame, will be mortise-and-tenoned together. Groove the rails and stiles on the tablesaw, then chop the mortises. Cut the tenons using the dado set up as you did with the face frame, then haunch them. Dry-fit the door and measure for the panel.

The door panel will be raised on the tablesaw. Set your tablesaw blade at 7° and raise it to 1¼ in. above the table, adjusting the fence until your test piece slides easily into the groove. Raise the four edges, then clean up by hand. Glue up the door and check for square and twist.

To fit the door, rest it in the cabinet against the hinge side of the face frame. If it does not fit squarely, plane it so. Set the door on a pair of dimes or pennies, depending on how large a gap you want, and mark the position of the top face-frame rail on both stiles. Plane or saw until it just fits inside the opening.

Now mortise the door for the hinges and screw them in place with two screws in each hinge. Set the door back on the coins and hold it in place against the face frame, then transfer the top and bottom mark of each hinge. Mortise the face frame for the hinges.

Place the door in its opening and eyeball how much material needs to be removed from the opening stile. Plane the opening stile, beveling it. When the back corner will just go in, hang the door with one screw in each hinge, and gently plane the rest of the opening stile with the door hanging. Glue and pin a small door stop, 5⁄8 in. thick by



Kerf the ridge. For added strength, Hiller uses a handsaw to cut angled kerfs in the roof ridge and then glues in thin splines.

Add the details



Papering the upper back. Hiller takes the extra time to wrap the paper around the edges of the plywood back. First, though, she traces the outline using a spacer between the back and pencil to give extra room for wrapping. After applying wallpaper adhesive, she presses everything smooth with a J-roller.



Add double mitered trim. Glue and pin the trim to the front of the fixed shelf.

Online Extra

Head over to FineWoodworking.com/270 to see David Berman re-creating antique Voysey wallpaper.

1¼ in. wide by 1½ in. long, to the floor of the cabinet at the opening stile.

The final details

To add dimension to the front of the fixed shelf, I make a piece of double-beveled trim and glue and pin it to the front of the shelf.

Next, if you want to add adjustable shelves, mill them and drill holes in the cabinet sides for supports. There could be one or two shelves, depending on how the cabinet will be used. I would make them ⅝ in. thick by 8¾ in. deep by 14⅞ in. long. I would support them on ¼-in. metal shelf supports with hole positions determined with respect to the objects I intended to keep in the cabinet.

The cabinet is designed to be hung with keyhole fasteners. Mark the position of the fasteners on each side of the cabinet's back and rout for them.

I wanted a pull that was true to the period, available, and affordable, so after much research I fitted my cabinet with an Eastlake-style pull (houseofantiquehardware.com; \$12, item no. R-08BM-1259-ABH). For the finish, I followed the mahogany formula in Tim Puro's article, "Four Great Finishes with Hardware-Store Supplies" (*FWW* #267). □

Nancy Hiller builds custom furniture (nrhillerdesign.com) in Bloomington, Ind.



Hang the door. Mortise the door for the hinges, transfer the marks to the face frame, mortise the face frame, and then finish fitting the door.



FRANK DUFF

Monkton, Md.

A period furniture maker, Duff had always loved the high chests made in Philadelphia in the late 18th century, especially the ones by Henry Clifton and Thomas Carteret. While attending the Working Wood in the 18th Century conference at Colonial Williamsburg in Virginia, Duff saw a similar piece on display. Later, he arranged with the curator of furniture to return and take measurements of the piece. His chest took three years from conception to completion and incorporates the details he likes best.

BLACK WALNUT, 22 $\frac{7}{8}$ D X 45 $\frac{3}{4}$ W X 90H

Photo: Vivian Marie Doering



ROBERT STEVENSON

Chula Vista, Calif.

Stevenson decided to make a portable writing desk after seeing two he admired in the collections at the U.S. Department of State in Washington and Winterthur Museum in Delaware. As you open the drawer, the tambour retracts, revealing compartments for writing instruments, a pounce pad, and an inkwell.

MAHOGANY, WHITE PINE, HOLLY, AND SATINWOOD VENEER
10D X 14W X 6 $\frac{5}{8}$ H

Photo: Andrew Patterson

MICHAEL McDUNN

Greenville, S.C.

When a client wanted to replace an 18th-century-style table with a more modern version, McDunn designed this one. The owners particularly liked the satinwood inlay around the border of the older table, so McDunn created a satinwood weave pattern around the top of this table using sand-shaded inlay pieces. The middle of the tabletop has inlay pieces that get progressively smaller as they approach the center, which is walnut burl. "They give the illusion of entering into another dimension," Dunn says.

SAPELE, WITH SATINWOOD, EBONY, WALNUT BURL VENEERS, 73 DIA. X 30H

Photo: John Fowler





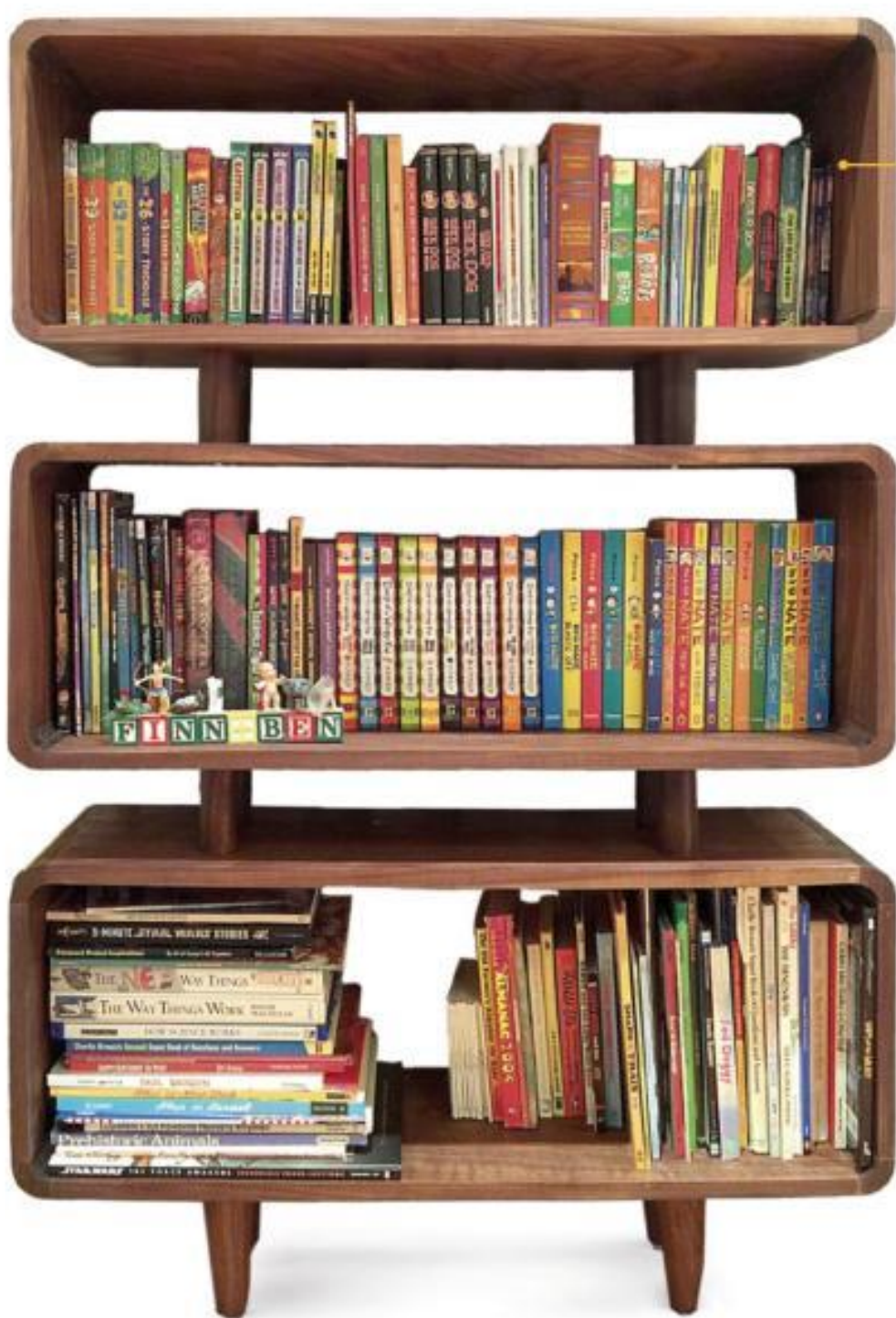
FRED ROSSI

Manchester, Mass.

Rossi created the dark, textured surface of the doors and drawers on his ash sideboard using the Japanese wood-charring technique known as *shou sugi ban*. "I was fascinated with the rich grain texture and natural color the charring revealed. The contrast of the creamy quilted ash and the horizontal charred grain is very rich."

ASH, AROMATIC CEDAR (INTERIOR), 20D X 72W X 31H

Photos: Marshall Dackert



TIRAN DAGAN

Westfield, N.J.

"We live in a Mid-Century Modern home and love the round curves of Eames furniture and simple, elegant designs such as those by Danish designer Poul Cadovius," Dagan says, describing the inspiration for this modular bookcase. He made the cove cuts for the rounded corners using a tablesaw, and used biscuits to reinforce the joints. The spacers and legs were turned on a lathe.

BLACK WALNUT, 15D X 40W X 60H

DANNY KAMERATH

Mason, Texas

Kamarath made this oak vessel out of wood he rescued from a firewood pile. Although at first glance it may look like something that was turned on a lathe, it was carved. Kamarath carves each of his vessels from a block of wood chosen for its interesting grain and color. Each takes several days to complete.

OAK BURL, 8 DIA. X 9H



ARTISTRY IN WOOD

Artistry in Wood is the exhibit presented each fall by the Sonoma County Woodworkers Association in Santa Rosa, Calif. There were many pieces from the most recent fall show that caught our attention. Here are a few.

LARRY STROUD

Sebastopol, Calif.

Stroud designed this shoe storage bench to make the most of the contrast between the English oak framework and the spalted-maple panels. "Both woods achieved their ultimate color through interaction with various fungi."

OAK AND MAPLE, 17 $\frac{1}{2}$ D X 51 $\frac{3}{4}$ W X 27 $\frac{1}{4}$ H



Show your best work

For submission instructions and an entry form, go to FineWoodworking.com/rg.



THOMAS VOGEL

Petaluma, Calif.

"In Japanese, this would be called *usu kasumi dana*, or thin-mist shelf," Vogel says. Inspired by Japanese architecture, it was Vogel's first time using what he calls the candle-flame joint, a type of mortise-and-tenon that pierces the shelves and lets him create the long posts in multiple sections.

BLACK WALNUT, 8D X 21 $\frac{1}{2}$ W X 32H

Photo: Deborah Wilson



HUGH BUTTRUM

Sonoma, Calif.

Buttrum harvested the "very nice piece of claro walnut" used for this bowl from a large tree branch in Napa, Calif. He turned the bowl, then tried out a new carving pattern to embellish it.

CLARO WALNUT, 15 DIA. X 5H



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Specialty handplanes

SEVEN FAVORITE TOOLS FROM A LIFETIME COLLECTION

BY ALLAN BREED

When I was in my teens, while many of my contemporaries were buying and fixing up cars, I was busy buying and fixing up antique furniture. I was also fascinated by the tools used to make the pieces I bought. One of the first planes I acquired was given to me by a man in town who repaired old furniture. He called it a bridge-builder's plane. (I didn't try too hard to figure out exactly which part of a bridge you might plane with this 32-in.-long, 9½-lb. wooden monster.) I took it home and attempted to plane the side of an ash log I had hewn with another of my early finds, a broadaxe. Of course the plane did not work. Given my inexperience at the time and the number of factors needed to make a plane work, it would have been a miracle if it had. I did finally manage to get

the bridge-builder's plane to function, and I still have it; it works beautifully to flatten my workbenches (and it's pictured above).

I think planes are the most complex hand tools in the shop, there being numerous gremlins in each one that can prevent them from working as they should. Once these are exorcised, though, the handplane is also the most rewarding of tools to use, and over the decades I've amassed quite a few. I'll describe a handful of the less common ones here. I have certain favorites that I've used so often that I would truly mourn their loss.

Allan Breed builds furniture and teaches carving and period furniture making in Rollinsford, N.H. (on Instagram @al.breed).

PANEL-RAISING PLANE

Early in my career I worked at Carter's antique shop in Portsmouth, N.H., which specialized in old tools. I traded a bronze router plane to Scotty Carter, the shop owner, for this early panel-raising plane, which creates a concave border and makes a really beautiful fielded panel. I've used this plane, made by John Taber in the late 18th or early 19th century, to make lots of paneled walls, window shutters, and doors. The fence allows for borders of different widths, up to about 1½ in. The blade holds a good edge and doesn't clog up. Some will advocate for using both left and right models, but I clean up any tearout with a modified hollowing plane. I also have a scraper I ground to the same profile, and I can use that to clean up tearout as well. This may be the most valuable plane I own, but I would never sell it because it just works so well and makes such a pretty panel.



Preparing for the panel. The fence on Breed's antique panel-raising plane, set with two screws, controls the width of the border the plane cuts around a panel. Before cutting cross-grain, Breed scribes the edge of the border with a cutting gauge.



Plow around the field. Breed's plane cuts a slightly concave border to create a handsome fielded panel.

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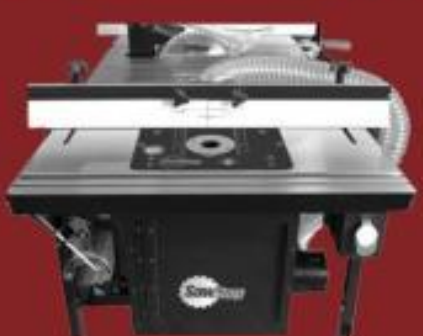
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SHOPMADE PLANES

Of necessity, I have had to make quite a few planes over the years. When I have, it's usually because I need to reproduce some molding while repairing or reproducing early furniture. I start by making the body of the plane. I'll use other planes and/or scrapers to shape the sole. The slot for the blade and wedge I will either drill and chisel out or create by sandwiching outside pieces around a central core.

For blades in these planes I have often modified old Stanley 45 or 55 blades or used irons from old bench

planes. I'll slide the blade blank into the new plane, wedge it tight, and trace the profile of the plane's sole onto the blade. Then I remove the blade and grind it to shape. It can be a long process, but once the plane is working, the molding I need can be made quickly. I leave most of these planes pretty rough, just concentrating on getting them to work. But I've spent the extra time on a few to make them more presentable. I usually write the date on them and what the molding was for. I've made planes for two different sizes of Chippendale table legs, including the plane shown here, made to reproduce a Portsmouth tea table. I will admit to having once spent more than a day making a plane in

order to produce a 7-in. length of molding; then again, the missing molding on that 350-year-old piece of furniture had been made with a plane, so for a good restoration it had to be done!

Online Extra

To see Al Breed using his favorite specialty planes, go to FineWoodworking.com/270.

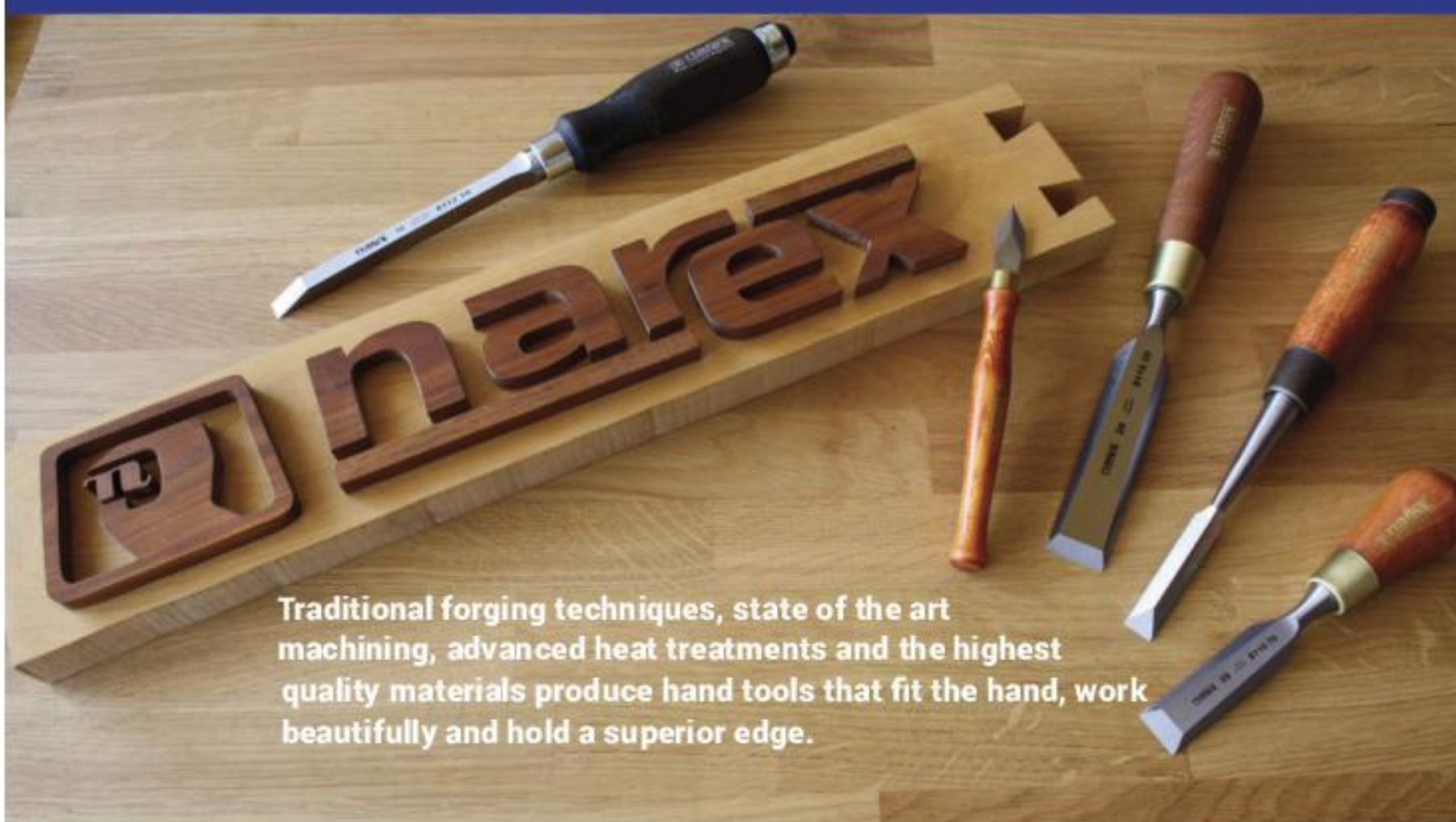


Leg maker. Breed built this plane to re-create the legs of a Chippendale table. To shape the contours on the plane's sole, he roughed out the shape on the tablesaw, then refined it with a scratch stock he ground from an old sawblade.



Outrigger coving. Another plane Breed made himself, this one with an outrigger fence, allowed him to plow channels into the stiles of a reproduction 17th-century chest.

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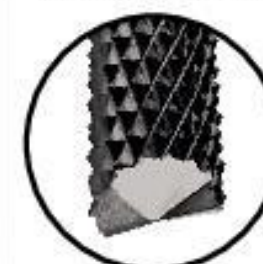
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STANLEY 45

I was about 17 when I bought this early version of the Stanley 45 along with a boxwood plough plane from an old cabinetmaker in Troy, N.H. I got them for \$7.50 each. This plane went through a fire in the seller's shop, but escaped with only some damage to the wooden knobs. I never restored them, because they feel fine and I like the story they tell. The plane runs well and has a depth stop and nickers which I use from time to time. It also has a floral design in the casting that I love. The 45 was designed as a multi-purpose plane, of course, but I use it almost exclusively for making grooves in drawer sides. I usually have it set up with a $\frac{3}{16}$ -in.-wide blade, though I have a number of other straight blades for cutting wider grooves.



One-trick pony? The Stanley 45 combination plane, with its slew of different cutters, was famously intended to take the place of a whole rack of specialty planes. Ironically, Breed uses his for just one task: plowing grooves for drawer bottoms.

STANLEY 79 SIDE RABBIT PLANE

I don't use this plane often, but when I need it, I need it: It's the only thing that expands the width of a groove or dado with ease. Once in a while, when I dry-fit a frame-and-panel door or cabinet, I'll find that the panel grooves don't meet perfectly. In that case I pull out the side rabbet plane and widen one groove to enable the panel to slide into place. Having a blade at each end, this plane can be run in either



direction, which is essential, because due to its wide throat it only really works when cutting with the grain. The depth stop is handy, making sure you don't dig into the bottom of the groove. I bought this plane from the estate of my early mentor, Vincent Cerbone, who restored furniture at the Museum of Fine Arts in Boston.



Groove improver. The Stanley 79 side rabbet plane comes in handy for fixing misaligned grooves. The plane, which cuts just the cheek of the rabbet, has two blades so it can be used in either direction.



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TOOTHING PLANE

I probably bought this plane at Carter's Antiques too. Carter's had lots of tools imported from England, and part of my job when I worked there was to unpack the boxes of tools when the shipments arrived—quite a thrill for a woodworker! Lots of wonderful stuff passed through my hands, even if I only possessed it for a few minutes. I bought some tools that I still use every day, and lots of others that enthralled me at the time but that I later traded for something more useful. I use this plane, with its serrated iron and almost vertical bedding, to prepare a solid-wood substrate to receive veneer. You tooth on one diagonal and then the other. Tothing the ground creates more glue surface, keeps the veneer from sliding, and provides pathways for excess glue to escape when you are hammer veneering. I size the toothed ground with hide glue. If you can't find a tothing plane you can use an old worn Japanese sawblade and drag it across the substrate in a crisscross pattern and get the same result.



Crisscrossed contours. The tothing plane is used to texture a solid-wood substrate to prepare it for hammer veneering. After making a series of passes on one diagonal axis, Breed does another series skewed the other way. With its nearly vertical bedding angle, the tothing plane produces more of a scraping than a slicing action. The toothed iron is sharpened like a normal one on the stone.

KUNZ SKUNK PLANE

Except for the cast skunk-tail handle at the back, which allows for an easier grip, this is really no different from any small plane. I tend to use it to level hard-to-reach areas on tabletops, especially ones where the perimeter molding is worked from the solid like on piecrust or tea tables. I'll get as close as I can with the skunk plane and then scrape what the plane won't reach.



Edgework with a skunk plane. Breed uses his Kunz skunk plane for flattening areas hard to reach with a larger plane. The skunk-tail handle makes it a bit easier to maneuver.



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The story of a chair

BY LUDWIG OSTFELD

Why do we build the things we do? When I look back, having completed a piece, I can see that for me, the inspirations that lead to a specific project are often planted over the years and slowly germinate until they come together to produce a piece of work. That's how it was with my replica of the Bull Chair.

When I was growing up, my parents loved to take me to museums, and a big favorite was The Yale Art Gallery in New Haven, Conn. I've been a regular visitor there ever since. A number of years ago, the gallery had an exhibit called "Have a Seat," featuring American chairs made in the 17th, 18th, and 19th centuries. The exhibit had everything from Queen Anne, Chippendale, and Windsor chairs to plainer versions. Many of the chairs were highly ornamented, with ball-and-claw feet, cabriole legs, and carvings, but a major emphasis of the show was that the chairs were designed to be comfortable. There even was a place to sit in the chairs and evaluate which were the most comfortable. That memory has stayed with me.

Woodworking is not my only creative outlet. I've studied glass for years, and I made my living as a union carpenter. Over the years I acquired skills in furniture making by reading books and articles and learning from Harold Hayes, a fine craftsman who made his living replicating early American furniture. Harold used to say, "Making chairs separates the serious woodworkers," because there are so many daunting skills associated with the process.

When I began to build furniture I was not only taken with early American, but also Scandinavian and Japanese designs. I closely followed the writings of

This chair deserved to be made of figured wood, an obvious statement that my version was a modern replica.

James Krenov, George Nakashima, and Soetsu Yanagi, author of *The Unknown Craftsman*. Mr. Krenov instilled in me the importance of using special boards in a clean design. I made tables, chests, and chairs—some of them reproductions of early American furniture—and from that I learned more about the importance of proportion and good design.

A few years ago, I paid a visit to an antiques store in Colchester, Conn., where the owner showed me miniature reproductions of one-of-a-kind chairs that had been carved by a dentist. One of these was the Bull Chair, and it fascinated me. It seemed familiar, and I wanted to learn more about it, but there was little information. Then, on a return visit to Yale in 2016, I came upon the full-size Bull Chair itself. Immediately, I knew that I had to try to make a replica.

Still, there was limited information: The chair was described as maple, made around 1750. Sources speculated that it was crafted somewhere near the Connecticut-Rhode Island border. After taking a discreet series of photos over a few weeks I gleaned a couple of dimensions from the front and side. A friend helped me figure out the templates and proportions from these few dimensions.



In my view, this chair deserved to be made of beautifully figured wood, so I chose quilted maple. In 1750 big-leaf maple (*acer macrophyllum*), was not available in New England, but I had some special boards laid away and thought this was the time to use them. This choice of wood was an obvious statement that my version was a modern replica and not a true period reproduction.

I did encounter some difficulties as I built the chair, due to the curvilinear qualities of the splat and arms. The original chair used leather and heavy nails on the splat and seat, which I didn't want. Instead I focused on using the figured wood to best show the beauty of the arms and proportions of the chair. I also modified the front feet to make them more durable and I added some padding to make the seat more comfortable.

When the chair was finally completed and I'd spent some time sitting in it, my mind went back to that Yale exhibit and I was reminded why I had been attracted to it in the first place—it's comfortable! It is one of the most comfortable chairs I have had the pleasure of sitting in. □

Ludwig Ostfeld (ludwigostfeld.com) is a woodworker and glass artist in East Lyme, Conn.

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Memories of Egypt

Most trips these days are recorded in snapshots and selfies. But sometimes it pays to do a sketch or two instead. When Napoleon mounted his campaign in Egypt in 1798, Dominique Vivant Denon was along as a recording draftsman. The book Denon wrote and illustrated in 1802 after his return to France helped ignite a rage for the arts of Egyptian antiquity that transformed the design of buildings and furnishings throughout Europe and America. A decade later this cabinet, made to hold medals

and coins and thought to have been commissioned by Napoleon, was designed by the French architect Charles Percier, and much of its form and decoration is based directly on the drawings in Denon's book. The cabinet, 35½ in. tall and housed since 1900 in the Metropolitan Museum of Art in New York City, was likely made by the Parisian furniture maker François Jacob-Desmalter, whose shop employed some

350 craftsmen. Built of plum pudding mahogany, it has 44 drawers (22 on each end) concealed behind locking doors. The silver embellishments take the form of pharaonic touchstones including the winged sun disk at the cornice, cobras on lotus stalks on the front panel, and a scarab or bee-like insect on the drawer fronts. Napoleon's Egyptian campaign, whatever its military merits, was very memorably recorded.

—Jonathan Binzen



A key for the cobra. When the cabinet is closed there's no visible evidence of doors or drawers. Pushing a pin into the eye of the cobra, however, reveals the lock, and turning the key unlocks the door and opens it with a spring-loaded pin. On the drawers, one wing of each bee swings forward to serve as a pull. The silverwork is by Martin-Guillaume Biennais.