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The fine art of stringing, p. 76



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44

JOINTER
TEST



60

TILT-TOP TABLE



50

DARK, RICH
CHERRY FINISH

features

34

COVER
STORY

Modern Adirondack Chair

A comfortable, contemporary take on the backyard classic

BY TOM McLAUGHLIN

44

TOOL
TEST

8-in. Jointers

Equipped with spiral cutterheads, the latest models promise smoother surfaces

BY ELLEN KASPERN

50

Dark, Rich Cherry with Household Products

Drain cleaner, roofing tar, and shellac team up for a foolproof finish

BY TIM PURO

55

The Illustrated Cutlist

Innovative approach turbocharges this staid staple of the craft

BY HANK GILPIN

60

Tilt-Top Table

Clean lines and a clever pivot highlight this attractive and useful table

BY WILL MYERS



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in every issue

6 On the Web

8 Contributors

10 Letters

14 Workshop Tips

- Router mortising template
- Furniture dollies make a great base for a rolling lumber rack

20 Tools & Materials

- Newfangled bench ax
- Sharpening attaché kit

24 Designer's Notebook

The passage of time

NEW 26 Greenwood

Shrink pots

70 Gallery

76 Master Class

Add a traditional stringing pattern to a leg

84 From the Bench

A tree in the chair shop

Back Cover

The Power of the Pentagon



74

GALLERY:
DRAGONFLY CHEST



16

ADJUSTABLE
SHOP STOOL



26

SHRINK POTS



22

ERGONOMIC
ROUTER



76

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STRINGING



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VIDEO

Pot of magic

Danielle Rose Byrd's shrink pots (p. 26) are an artistic take on an old green woodworking classic. In this video, she demonstrates how she creates them.



VIDEO

Butterfly effect

In a three-part video series, Steve Latta (p. 76) shows you how he creates a complex butterfly shape with a double-line inlay.

VIDEO

Jointer setup

In a two-part video, woodworking teacher Matt Wajda demonstrates how to set up a jointer using tools that you probably already own.

Online extras

Free content at finewoodworking.com/273



VIDEO

Update an old friend

A new jointer (p. 44) isn't the only way of achieving spiral cutterhead bliss. In this video, Rollie Johnson shows you how to upgrade your trusty old jointer with a spiral cutterhead.

VIDEO

Angled arms

Tom McLaughlin demonstrates that making the angled arms of his Adirondack chair (p. 34) is much simpler than it looks.

VIDEO

Computerized cutlist

A cutlist isn't that difficult to create by hand, but if you're modeling your projects in SketchUp, there's a far easier way. Watch as our resident SketchUp guru, Dave Richards, shows you how.

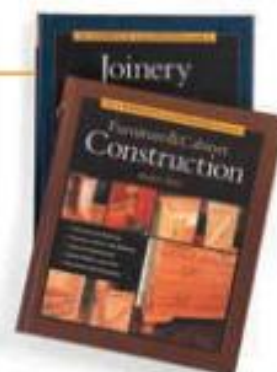
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- Max. rabbeting capacity: 1/2"
- Cutterhead diameter: 2 1/2"
- Cutterhead speed: 4800 RPM
- Table size: 7 1/2" x 46"
- Floor-to-table height: 32 1/2"
- Cuts per minute: 19,200
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- Cutterhead diameter: 3"
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- Number of cutterhead inserts: 36
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- Floor-to-table height: 31 1/8"
- Max. depth of cut: 1/8"
- Rabbeting capacity: 3/4"
- Cutterhead dia.: 3 3/8"
- Cutterhead speed: 4300 RPM
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contributors

Danielle Rose Byrd (Greenwood: "Shrink pots") is a professional woodworker based in Maine. While she's studied furniture making and makes pieces for her house, carving is her real specialty. Last year, she was awarded the Belvedere Handcraft Fellowship by the Maine Arts Commission, an independent state agency supported by the National Endowment for the Arts. She often teaches at Lie-Nielsen Toolworks in Warren, Maine. You can see more of her work at daniellerosebyrd.com and follow her on Instagram at [@danielle_rose_byrd](https://www.instagram.com/danielle_rose_byrd).



Will Myers ("Tilt-Top Table") lives in the foothills of the Blue Ridge Mountains in North Carolina with his wife and two daughters. Since childhood, Myers has loved making things with his hands. In recent years he has concentrated on original Shaker pieces, but he also finds inspiration in other American furniture styles. He teaches hand-tool woodworking at schools around the country, has hosted several how-to woodworking videos, and has been a guest on *The Woodwright's Shop* on PBS.



Ellen Kaspern ("Tool Test: 8-in. Joints") graduated in 2003 from the Cabinet and Furniture Making program at North Bennet Street School in Boston, where she has been an adjunct instructor for the past 15 years. She is a member of the cooperative Fort Point Cabinetmakers in Boston, where she designs and builds custom furniture, built-ins, and small objects for her business. Her work has appeared in galleries and she has given talks about woodworking around much of the northeastern United States. You can see more of her work at ellenkasperndesign.com.

Jeremy Zietz (Designer's Notebook: "The passage of time") is a studio furniture maker and industrial designer based in Richmond, Va. He has created award-winning product designs for a range of industries from medical devices, to toys, to athletic equipment. But it's his training in, and passion for, furniture making that earned him a spot on these pages. Zietz has trained with masters such as Sam Norris and Mario Messina at the Vermont Woodworking School, Charles Shackleton, and Garrett Hack. From directing workshops in sustainable table-making to crafting one-off pieces of furniture, his pursuit of the craft is ongoing. For more of his work, go to zietzfurniture.com.



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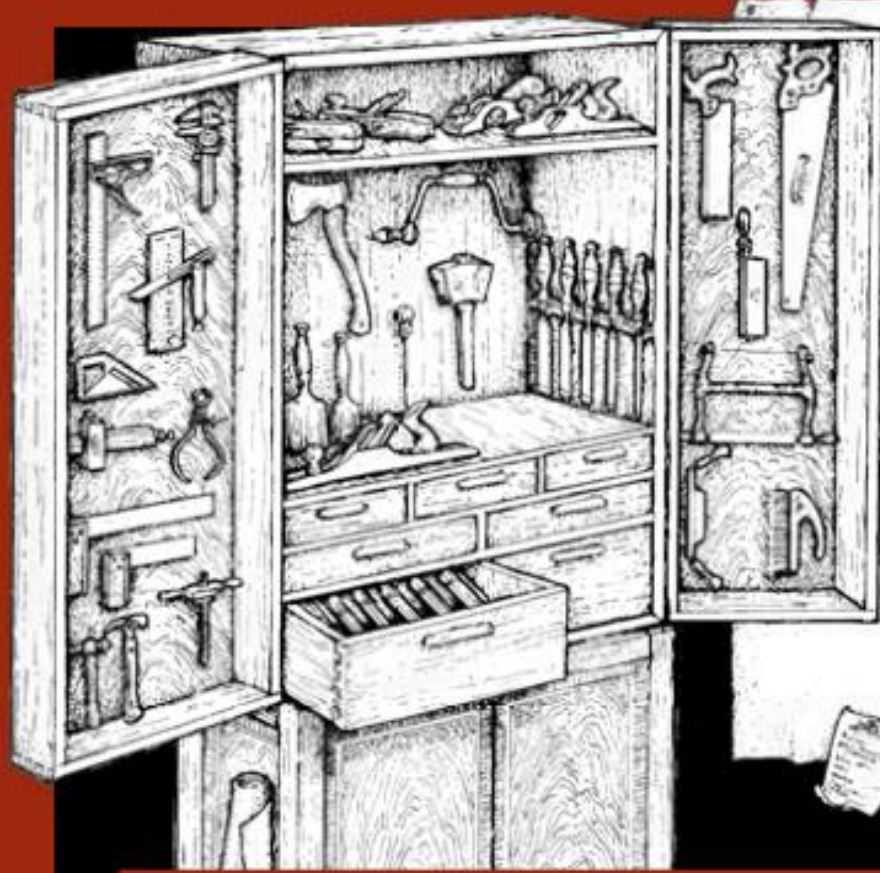
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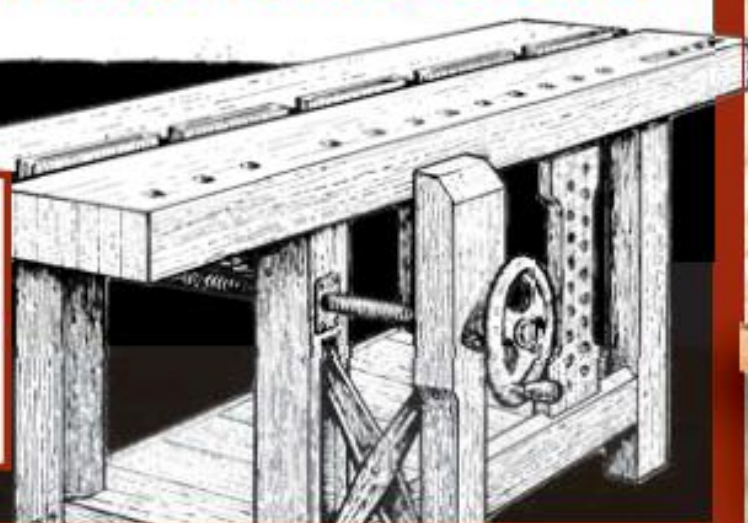
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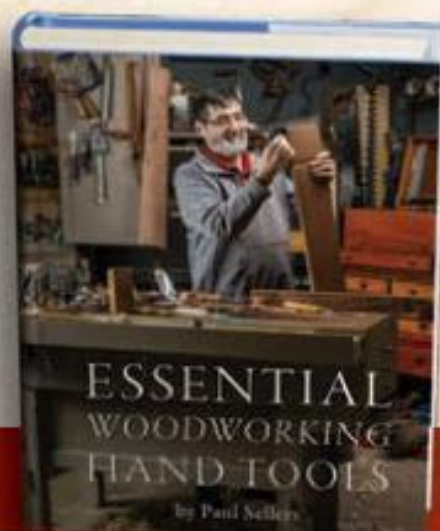
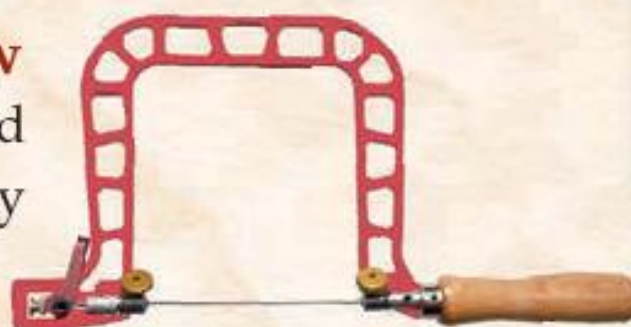


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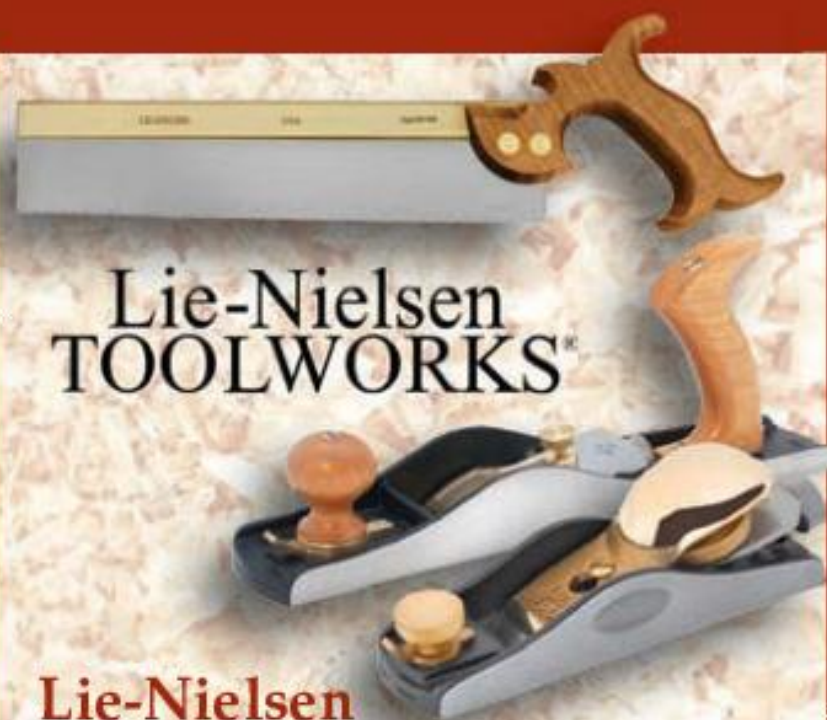
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From the Editor

Welcome to Fine Woodworking UNLIMITED

For more than 43 years, Fine Woodworking has been teaching and inspiring woodworkers to do their best work. But we also want to connect with our audience, and to connect them with other woodworkers, so that we can create relationships that build a strong community of education and inspiration that will last generations.

The print magazine initially was the primary way that we connected with fellow woodworkers. But today it's our Shop Talk Live podcast, our face-to-face events, our social media presence, and our website that enable real-time, lively conversations about the craft that lead to more personal connections.



PRINT AND
DIGITAL
EDITIONS

Two years ago we redesigned FineWoodworking.com to make the membership experience easier, more reliable, more informative, and more fun. Since then we've continued to add refinements, and all of the improvements and enhancements have led us to the next iteration of the Fine Woodworking brand: Fine Woodworking Unlimited.

The Unlimited membership experience brings synergy across all of Fine Woodworking's content, giving members exclusive access to an even broader menu of woodworking talent, techniques, and projects—from print



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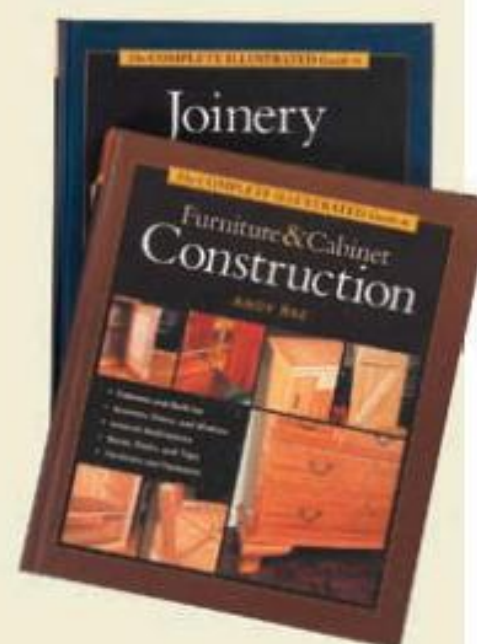


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—Tom McKenna, editorial director



DIGITAL BOOKS

Worthwhile investment

After reading my copy of *Handmade: Creative Focus in the Age of Distraction* (Linden Publishing, 2017), I realized that Gary Rogowski and I were brothers from different mothers. It was only reinforced by Mr. Rogowski's article (From the Bench, *FWW* #271). I consider my subscription a good investment if I find one article of good information to me personally (I started woodworking at an early age in 1945—professionally quite some years later). My shelves are heavily weighted with years of *Fine Woodworking* issues. Keep up the good work.

—JAMES VIBERT, Ottawa, Kan.

On design

In its 40-plus years of existence, *Fine Woodworking* has distinguished itself from the other woodworking magazines in its emphasis on building innovative, well-designed furniture. A case in point is the October 2018 issue, which contains two thought-provoking articles on design ("Composing: A Flexible Way to Design" and Designer's Notebook, *FWW* #270).

Good design can be many things to many people; personal taste certainly plays a major role. But history is even more important; it determines, for example, which pieces of art or musical compositions are hailed as masterpieces by future generations.

There also are certain basic concepts intrinsic to any good design: balance, symmetry (or a conscious avoidance of same), "flow," simplicity, and in the case of furniture, functionality and practicality.

The subject of good design is a huge but worthy topic—I hope that the editors will not shy away from tackling it head on in future articles. Coverage of a subject like this can only make a good magazine even better.

—CHRISTOPHER BRODERSEN, Northville, Mich.

'Ordinary' work

I thought that you would like to hear a positive response to your magazine. I am

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a modest woodworker who has a small shop with mostly hand tools, and also a bandsaw, which allowed me to tackle the “Arts and Crafts Bed” by Kevin Rodel featured in the March/April 2017 edition (FWW #260).

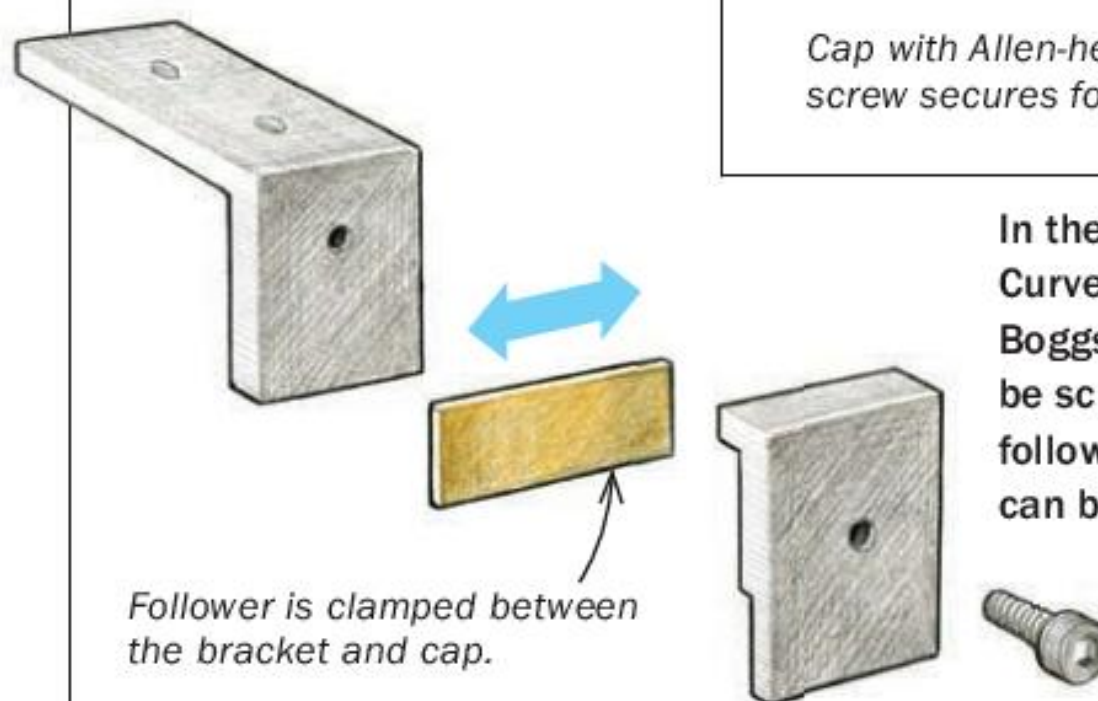
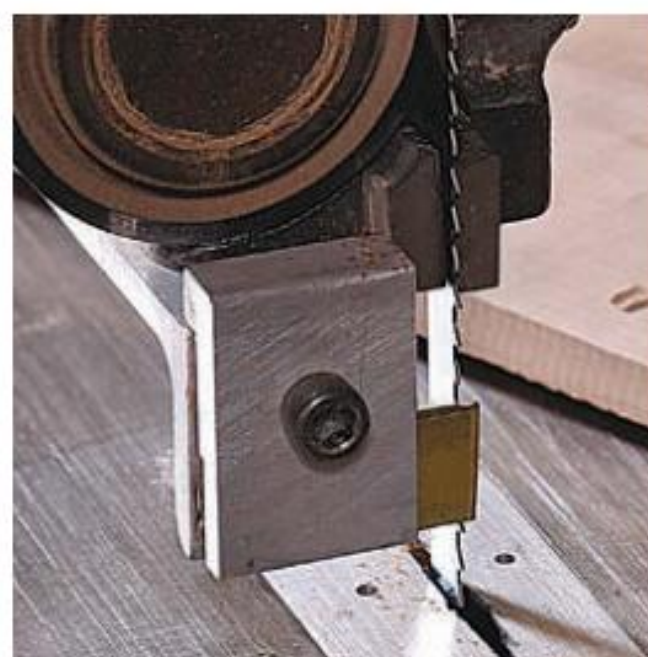
I am proud of my accomplishment, which was a stretch in both craftsmanship and endurance, especially after 42 hand-cut mortise-and-tenon joints. I took the published plan, converted it to a standard double bed size, and added a curve under the top rails. I made a scale model to make sure I liked it, then began the work over a year ago.

My workmanship comes nowhere near what is published, but I was inspired by your article, used the plans carefully, and finished up with a respectable bed that is as solid as a bridge. I left off the stringing because I have never attempted that before; maybe next time.

I pretty much read *Fine Woodworking* from cover to cover. Many of the projects are over the top for me, but certainly not all, and I learn little snippets here and there that I apply to my playing in sawdust.

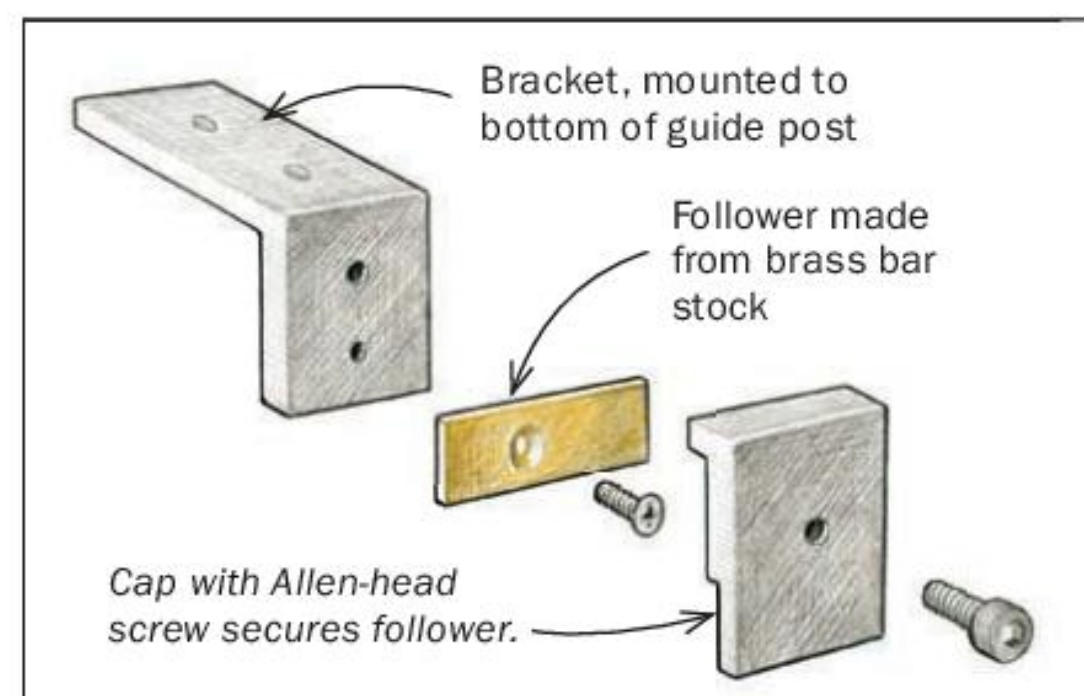
So I thought you would like to hear about some of the ordinary work done as a direct result of your efforts.

—JOHN MEZOFF, Gallup, N.M.



Follower is clamped between the bracket and cap.

Issue 271 corrections



In the illustration on p. 29 of “Bandsawn Curves, Precise and Repeatable” by Brian Boggs, the brass follower was shown to be screwed in place (above). Instead, the follower is held in place by the cap and can be adjusted as needed (left).



In the photo on p. 47 of “Make a Wooden Pendant Pull” by Philip Morley, the drill bit used as a spacer between the post and the pendant is $\frac{1}{8}$ in. dia., not $\frac{1}{16}$ in. as described in the original caption.

NEWS FROM FWW

Save the date

We're happy to announce that Fine Woodworking Live is returning in 2019. It will take place April 26–28 at the Southbridge Hotel and Conference Center in Southbridge,



Mass.—the same great location we've been at for the last two years. For details and to register, go to finewoodworking.com/live.

New feature

This issue we are rolling out a new department, called Greenwood. This feature will appear a few times a year and will focus on green woodworking methods and projects. To get us started, we enlisted Danielle Rose Byrd to show how to make her signature shrink pots. We hope you enjoy this freeform type of woodworking.



About your safety

Working wood is inherently dangerous. Using hand or power tools improperly or ignoring standard safety practices can lead to permanent injury or even death. Don't perform operations you learn about here

(or elsewhere) until you're certain they are safe for you. If something about an operation doesn't feel right, find another way. We want you to enjoy the craft, so please keep safety foremost in your mind.

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workshop tips

Best Tip



Richard Ross took up woodworking 35 years ago to see if he could build a bookcase. After that, “the more things I made, the more fun I was having.” As a hobbyist, Ross has made everything from furniture for his grandson to small items like trivets, cutting boards, and a holder that displays both sides of his father-in-law’s Congressional Gold Medal.

Router mortising template has interchangeable spacers

I’ve tried hand-cutting mortises, but I find that I get a much cleaner and more accurate slot using a router template and guide bushing. In the past, I created separate jigs for each size mortise I needed. That meant I had to cut parts for each new jig and then wait for the glue to dry. So I developed a single reusable jig that can be set up for any mortise or slot I need.

The secret is pocket screws. These let me attach two outer boards to a pair of spacer blocks that go between them. It’s easy to rip or plane the spacer blocks to a precise size and make any number of matched pairs. You can size them to match the router bushing diameter precisely, or use larger ones for wider mortises.

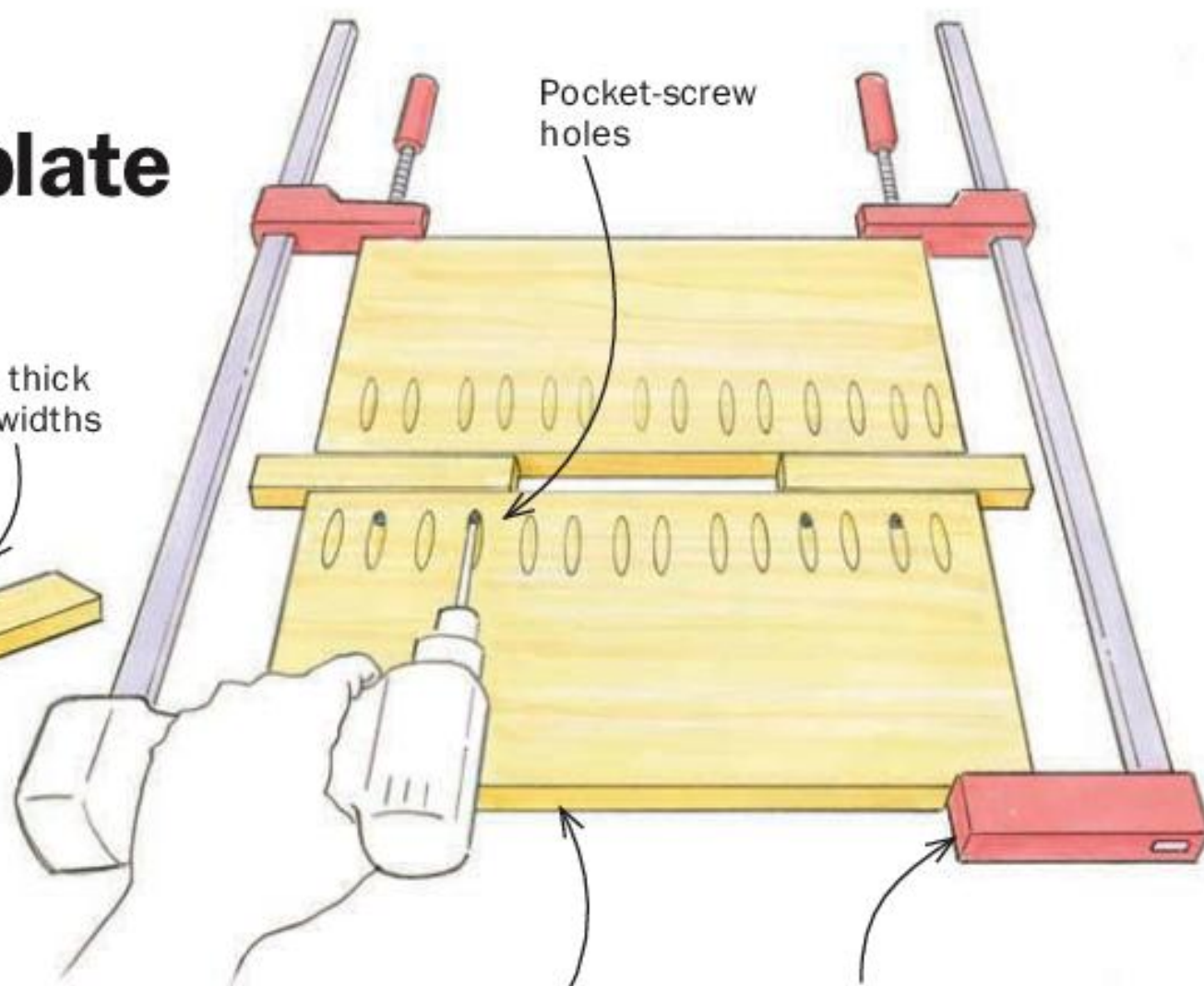
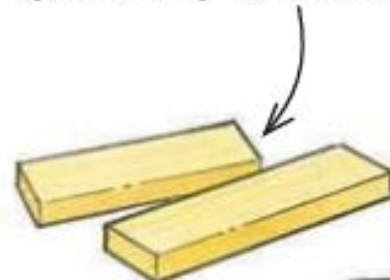
When a set of spacers gets chewed up by screw holes, it’s easy to replace them. The outer template boards won’t need replacing unless they warp over time.

To assemble a jig, I flip the outer template boards upside down, add the spacers, press everything down flat on the workbench, clamp the parts together, and drive pocket screws where needed.

With the jig made, I attach a fence on the underside to locate the jig on the workpiece. As for clamping the jig to the workpiece, I make the outer boards large enough to be clamped down without impeding the router. If that doesn’t work, you can attach a thicker fence and clamp that to the workpiece.

—RICHARD ROSS, Longmont, Colo.

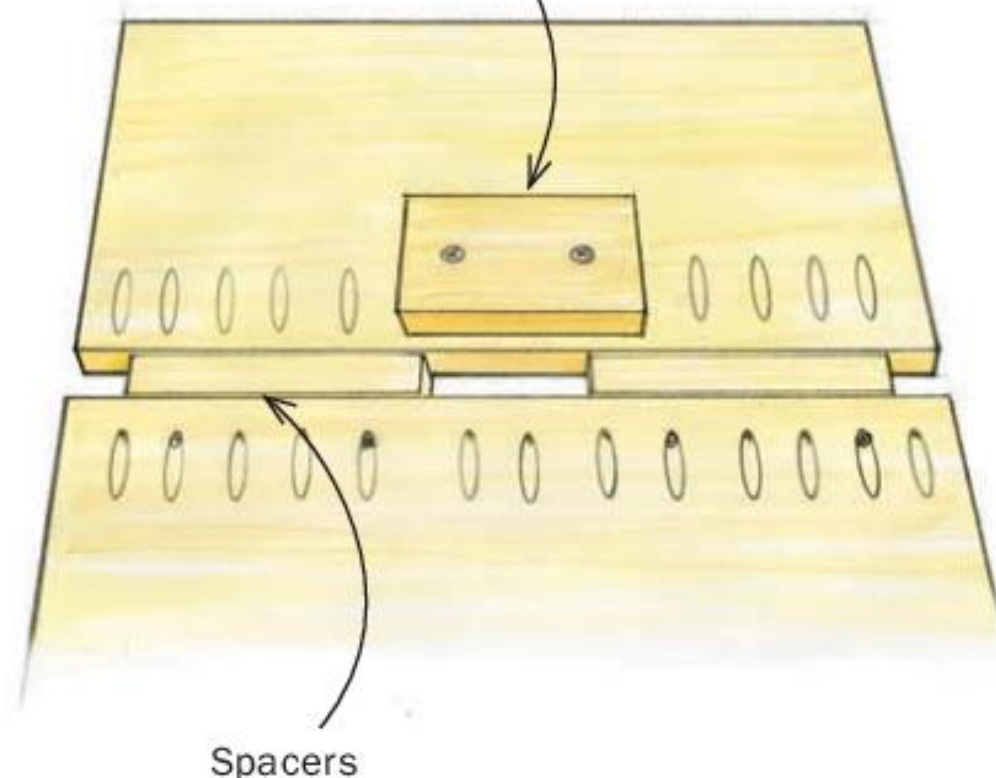
Spacers, $\frac{3}{4}$ in. thick by a variety of widths



Outer boards, $\frac{3}{4}$ in. thick by roughly 6 in. wide by 15 in. long

Press parts down on bench and clamp before driving pocket screws.

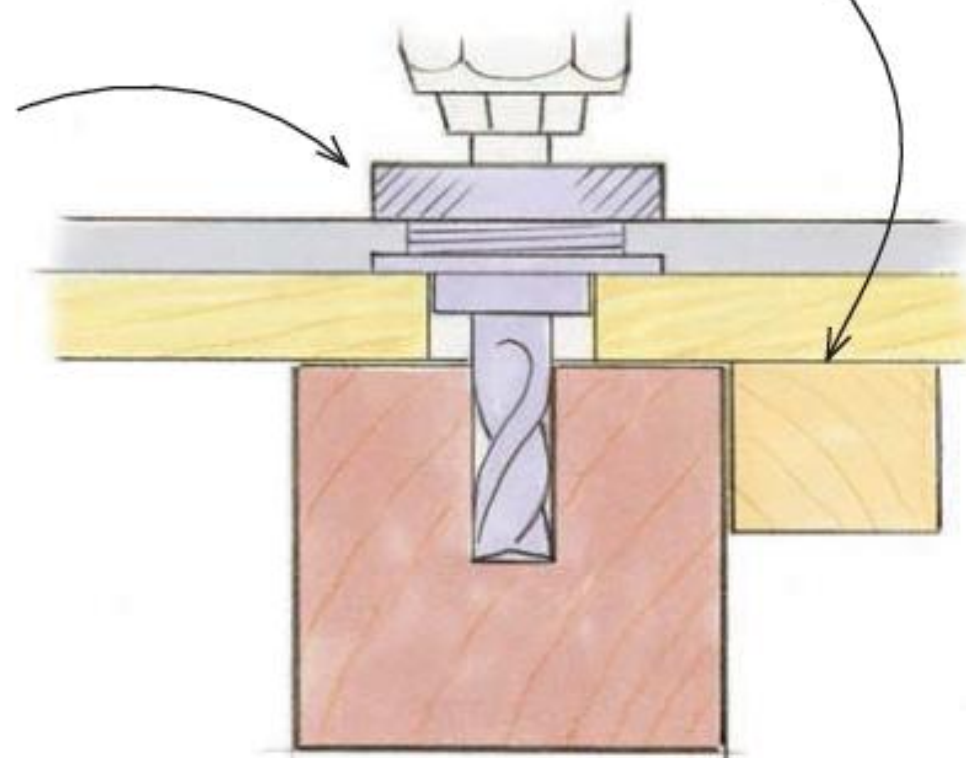
Fence registers workpiece.



Spacers

To locate fence, measure from edge of guide slot, factoring in bushing/bit offset.

Factor in bushing and bit size when choosing and locating spacers.



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 Veritas layout kit that includes a marking gauge, precision square, marking knife, sliding square, 12-in. rule, and pocket rule.



Store pipe clamps under your workbench

Storing my 4-ft. pipe clamps, as well as the extra lengths of 4-ft. pipe I use as extenders, has always been a problem. Putting them up high makes them difficult to access. Leaning them against something is risky. Instead I store a row of them under my workbench, which keeps them out of the way yet fully accessible, makes use of wasted space, adds weight and stability to the bench, and creates an additional shelf that comes in handy sometimes. All it takes is a couple of scrap boards screwed to the inside of the legs, with a row of 1-in. holes in each one. You could drill two rows of holes if you have more pipe clamps. Quick, easy, and effective.

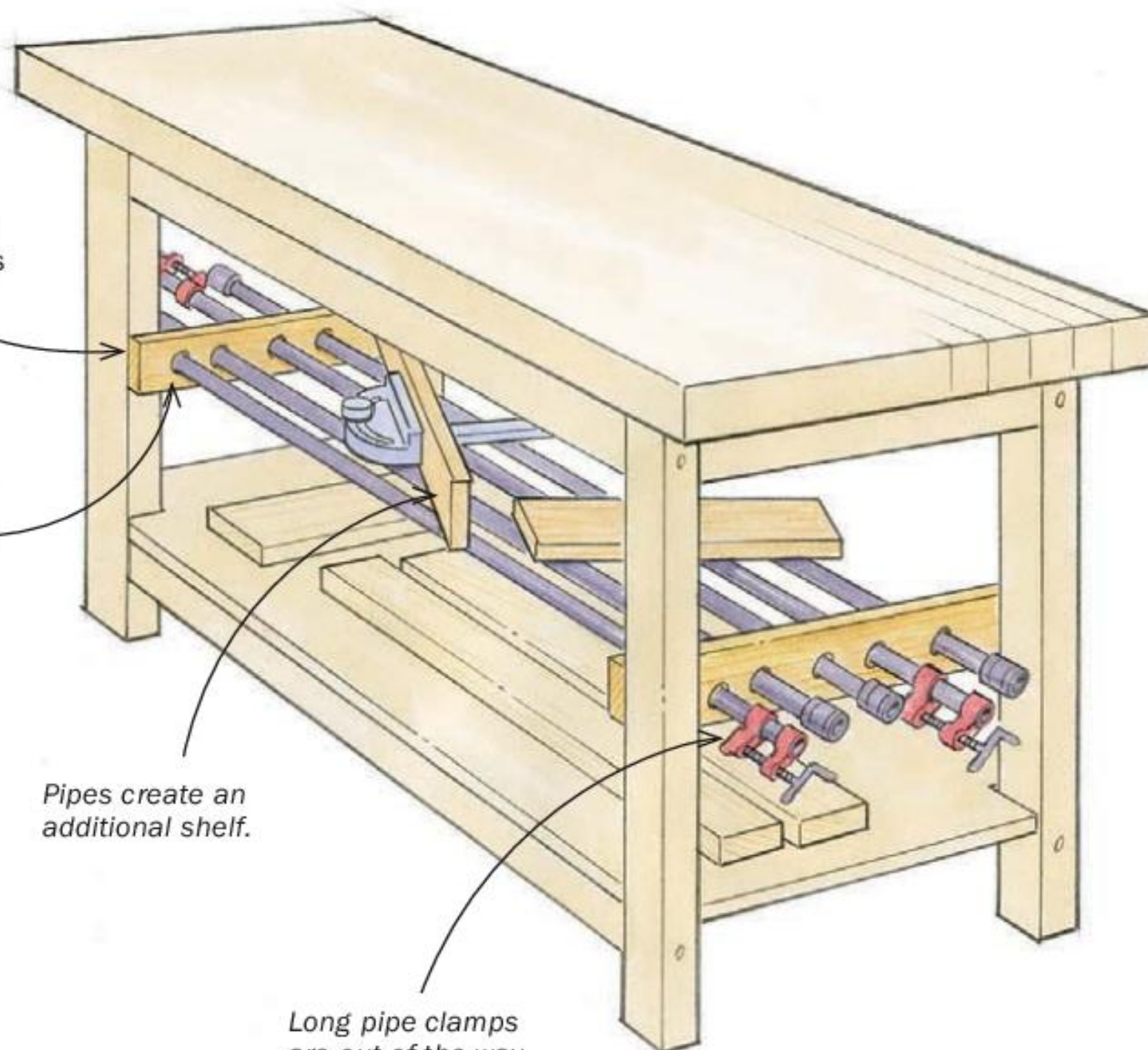
—HOWARD HIRSCH, Malvern, Pa.

Boards, roughly 2½ in. wide, screwed to inside of workbench legs

Holes are 1 in. dia.

Pipes create an additional shelf.

Long pipe clamps are out of the way yet easy to access.



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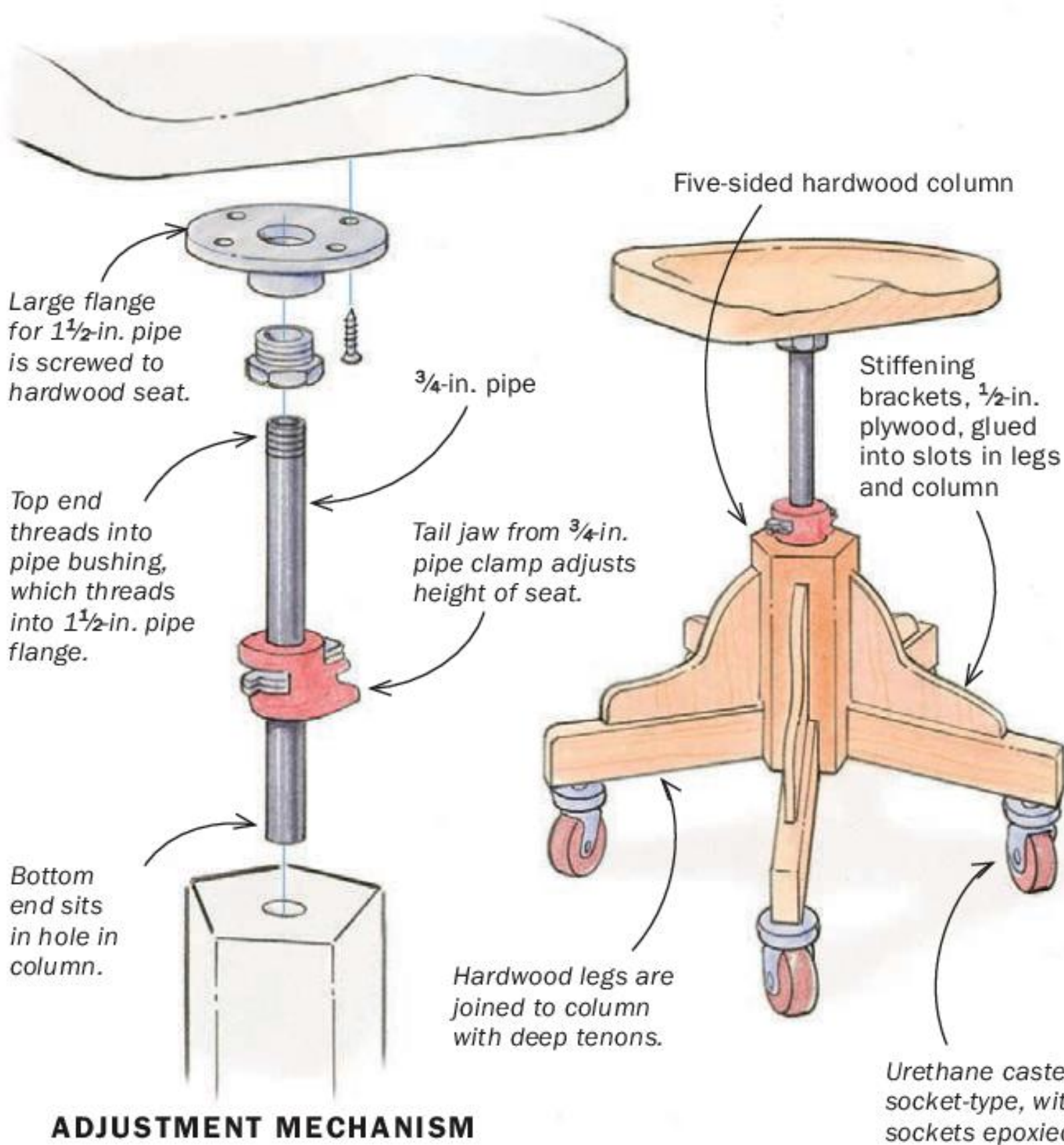
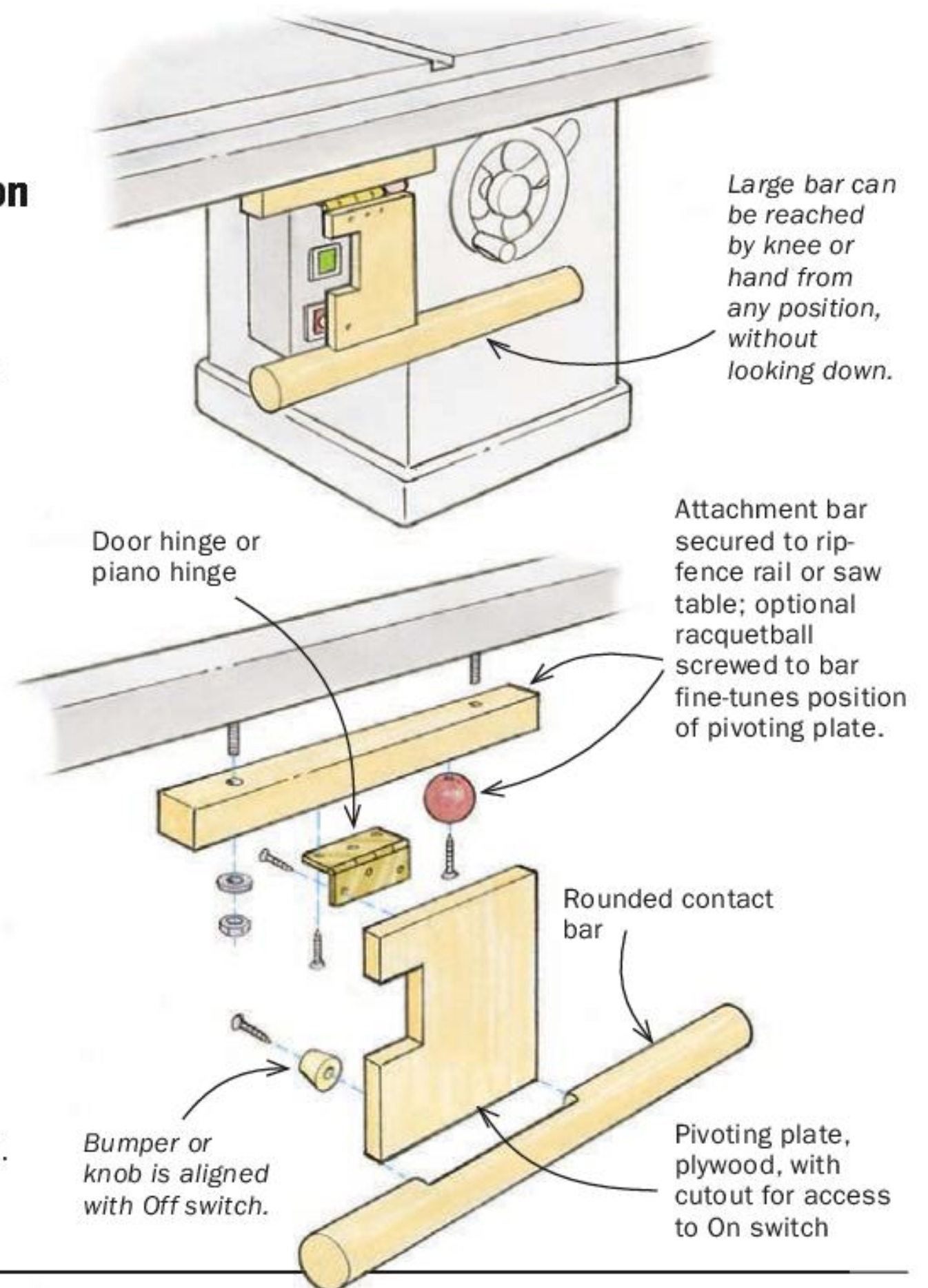
Tablesaw shutoff switch can be accessed in any position

The pivoting shutoff switch I added to my tablesaw is even easier to access than those on commercial models. It includes a big bar that reaches across the front of the saw, where I can hit it instantly with a hand or knee no matter where I'm standing or what I'm cutting.

First I attached a narrow board to the support rail of my rip fence. To that board I attached a pivoting piece of plywood with a 3-in. door hinge. A short section of piano hinge would also work. The plywood has a cutout to allow me to access the On switch, and a rubber bumper screwed to the back to hit the Off button. I used the bumper from the back end of an old pool cue, though all sorts of knobs would work. At the bottom of the pivoting plywood plate, I screwed a long turning I had left over from a past project, though any long, rounded board will serve the purpose.

Aside from locating the knob and cutout, the other key is fine-tuning the assembly so the knob or bumper hangs about 1/2 in. in front of the Off switch. I did that by screwing an old racquetball to the attachment bar so it just contacted the pivoting plate. You might not need to. When the job is done, you'll be able to switch off your saw instantly if something goes wrong, without looking down or moving your hands. In fact, it's always nice to be able to turn off the saw quickly and easily when you're done cutting.

—LEON SEGAL, Monroe Township, N.J.



ADJUSTMENT MECHANISM

Make an adjustable-height shop stool

After breaking one of the legs on my shop stool, I decided to build an adjustable version. I made the base from a pentagonal hardwood column, attached five hardwood legs with deep tenons, and then, for additional strength, routed slots in the column and legs for plywood brackets. After adding casters to the legs, I went on an unsuccessful search for a seat-adjustment mechanism. Then the perfect solution came to me: the tail jaw of a 3/4-in. pipe clamp.

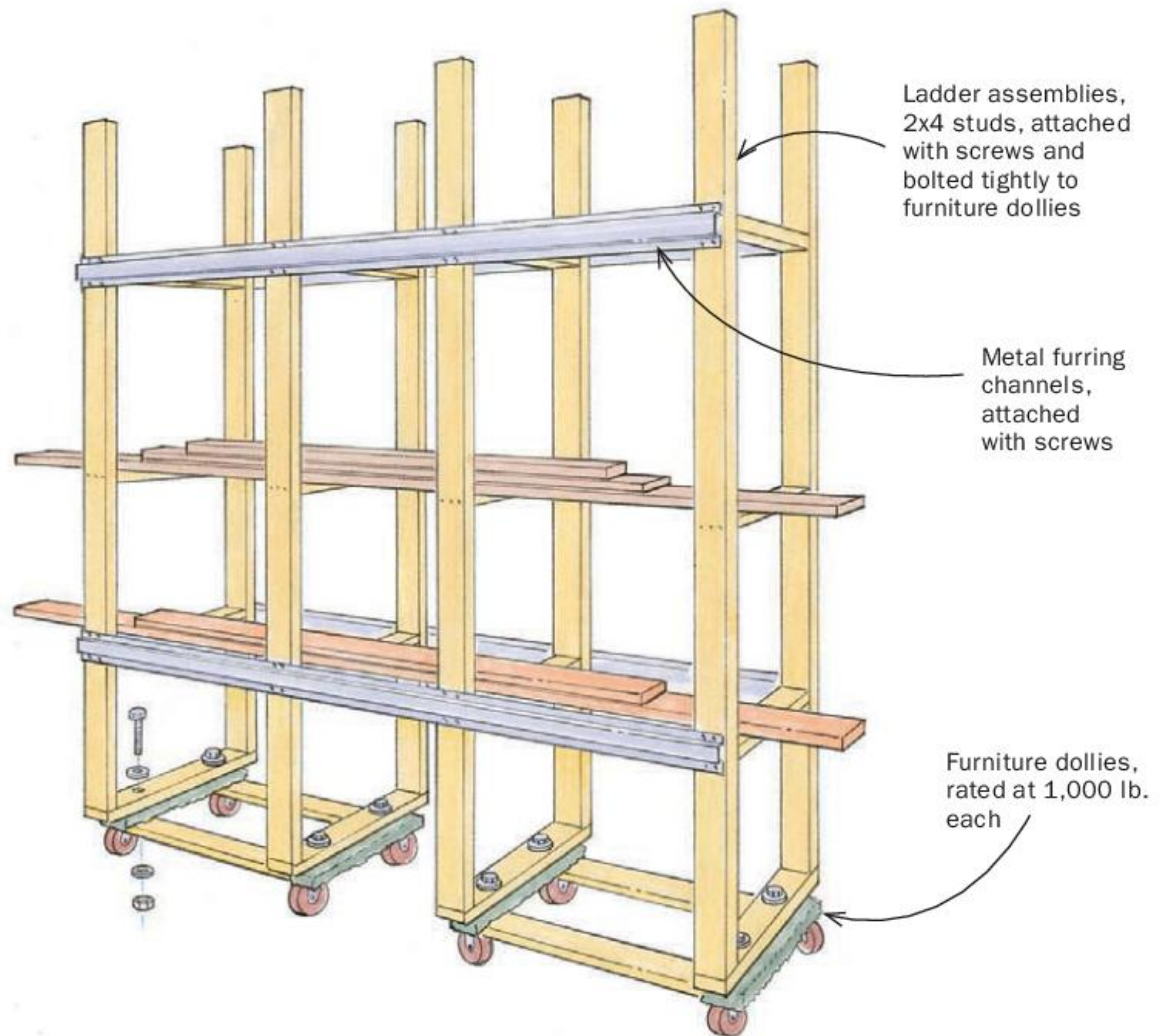
The bottom end of the pipe goes into a hole in the column, with the clamp jaw resting on top. At the top end, I threaded on a pipe flange for attaching a hardwood seat. To make the seat as strong as possible, I used the largest pipe flange I could find at the home center, which has a 4 1/2-in. overall diameter and fits onto 1 1/2-in. pipe. To make that work I screwed a pipe bushing onto the end of the 3/4-in. pipe to take it to 1 1/2 in. dia. Then I attached the flange and seat, and started using my new adjustable stool right away.

—GARY ELLIOTT, Wildwood, Mo.

Furniture dollies make a great base for a rolling lumber rack

If you're like me, you come across lumber deals that are just too good to pass up. Rather than store this valuable stock on the concrete floor, where it will soak up moisture and space, I stack it on rolling racks that I build atop furniture dollies. These racks let me bring lumber where I need it in the shop, and roll the rest out of the way. The dollies are affordable and rated to carry more than enough weight. The rest of the rack couldn't be simpler, just four 2x4 ladders plus a few metal furring channels to keep them aligned (though plywood strips would work well in place of the channels). Don't worry about the carpet on top of the dollies; bolt down the 2x4 assemblies firmly, and there will be no wobble.

—JERRY C. FORSHEE, Bloomington, Ind.



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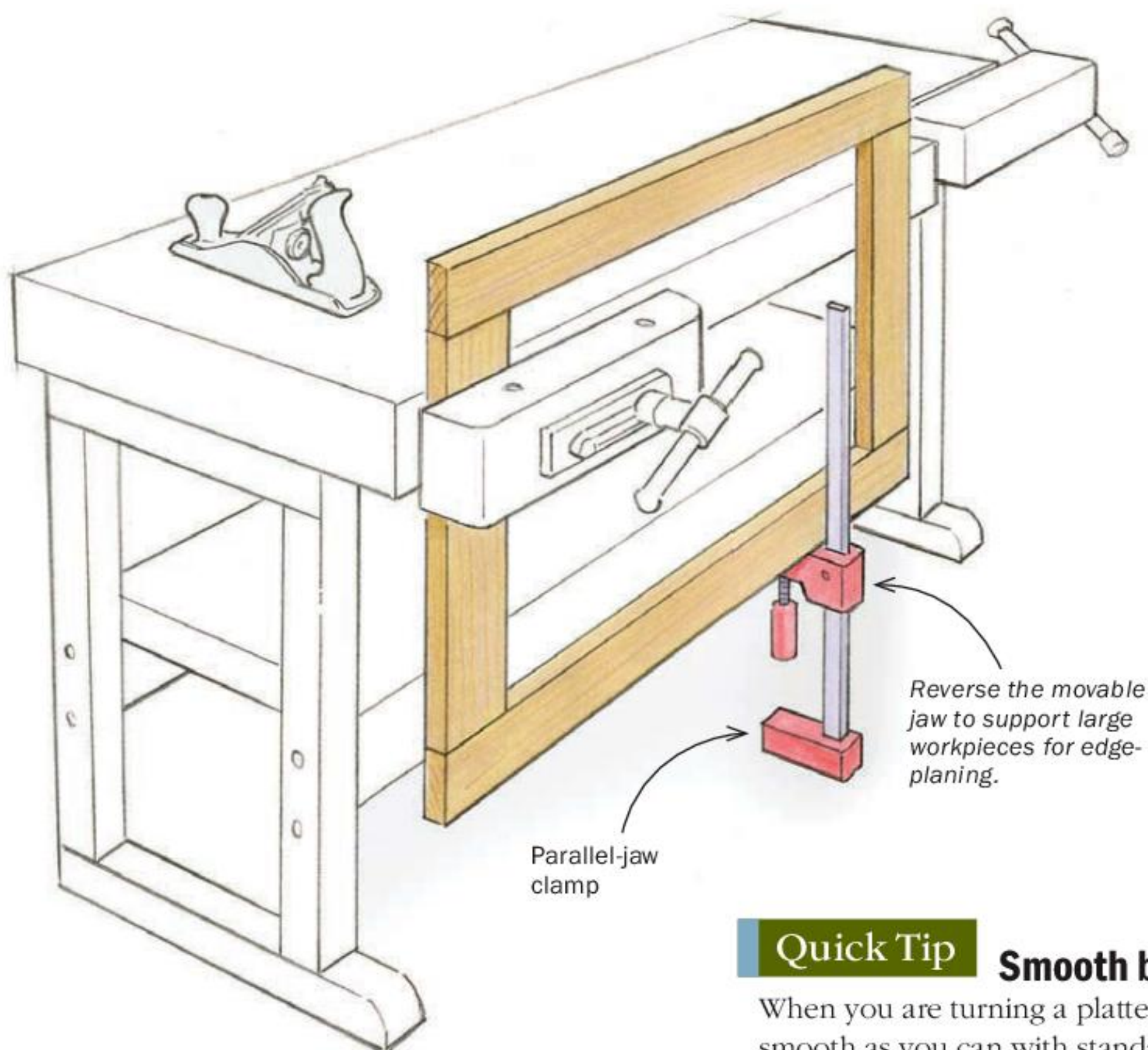
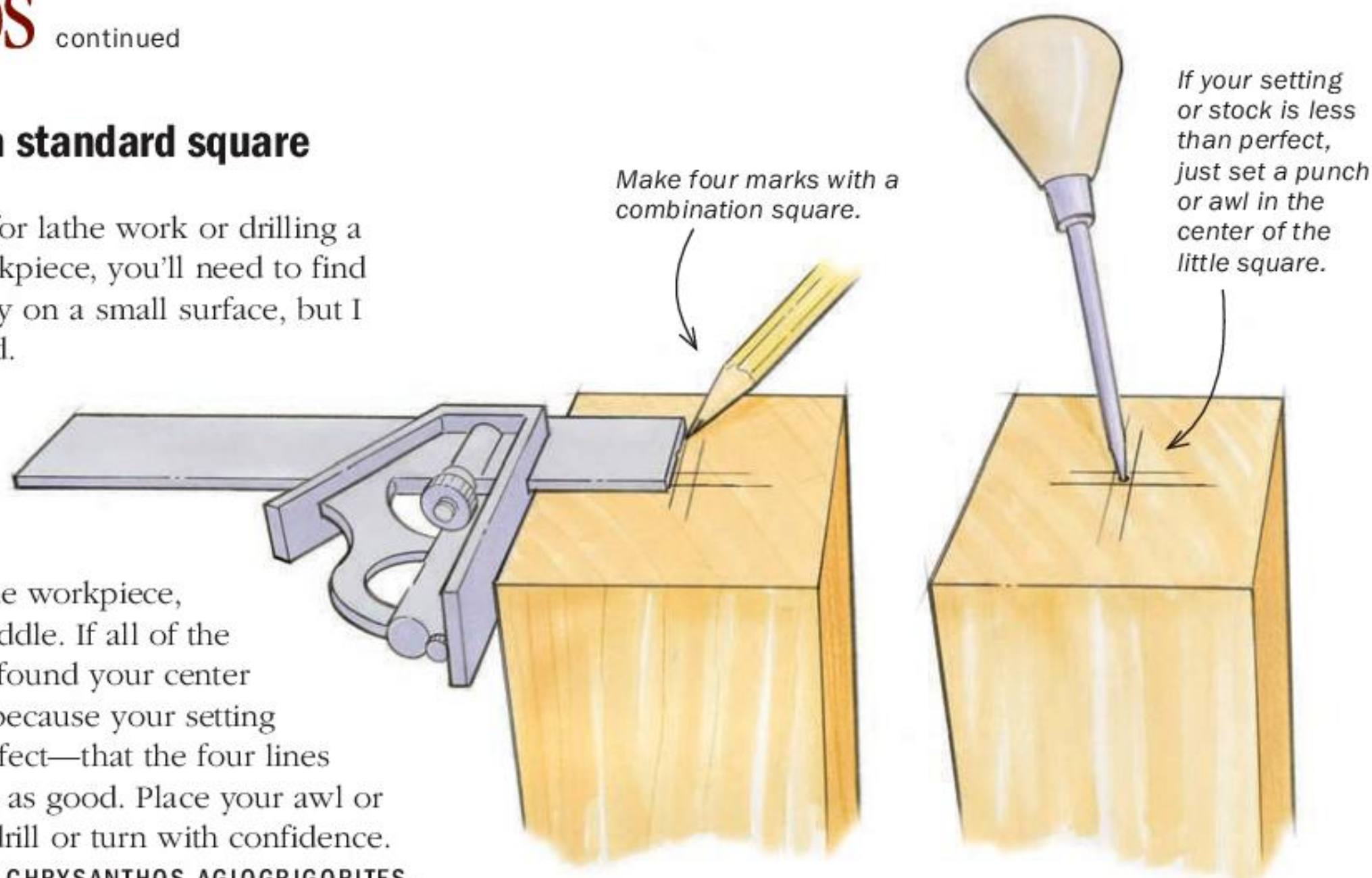
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Find perfect center using a standard square

Whether you are prepping stock for lathe work or drilling a centered hole in the end of a workpiece, you'll need to find the exact center. This can be tricky on a small surface, but I have a quick and accurate method.

Using a combination square or a stop rule, get as close to the center as you can, working from one side of the workpiece. Lock the square there, and then rotate it around the workpiece, marking four short lines in the middle. If all of the lines form a perfect cross, you've found your center point. It's more likely, however—because your setting was off or the workpiece isn't perfect—that the four lines will form a tiny square. That's just as good. Place your awl or center punch in the middle, and drill or turn with confidence.

—FATHER CHRYSANTHOS AGIOGRIGORITES,
St. Gregory Palamas Monastery, Etna, Calif.



Parallel-jaw clamp makes a handy board jack

The first time you place a long board or tall door in your front vise to plane its edges, you'll realize you need a board jack at one end. These traditional work supports usually require a complex addition to your workbench. Looking at my new Bessey K-Body Revolution clamps, which, like other parallel-jaw clamps, have jaws that can be reversed for pushing joints apart, I realized that one of them would make an excellent board jack. The Bessey works especially well for the purpose. It has wide jaws that make it stable on the floor, and a moving jaw that stays locked in place when any pressure is applied.

—TAAVI TIMBERG, Tallinn, Estonia

Quick Tip

Smooth bowls with a gooseneck scraper

When you are turning a platter or a shallow bowl, get the inside curve as smooth as you can with standard tools and then use a gooseneck card scraper to refine and smooth the surface. Joint and hone the edge first, but do not turn a burr on it. A burr (or "hook") will catch, pulling the scraper out of your hand. Run the lathe at medium speed and you'll be amazed at the results.

—JEFF PETERS, Redgranite, Wis.

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BOOKS

New book gives some perspective

Hands Employed Aright
by Joshua Klein

Published by Lost Art Press
\$57

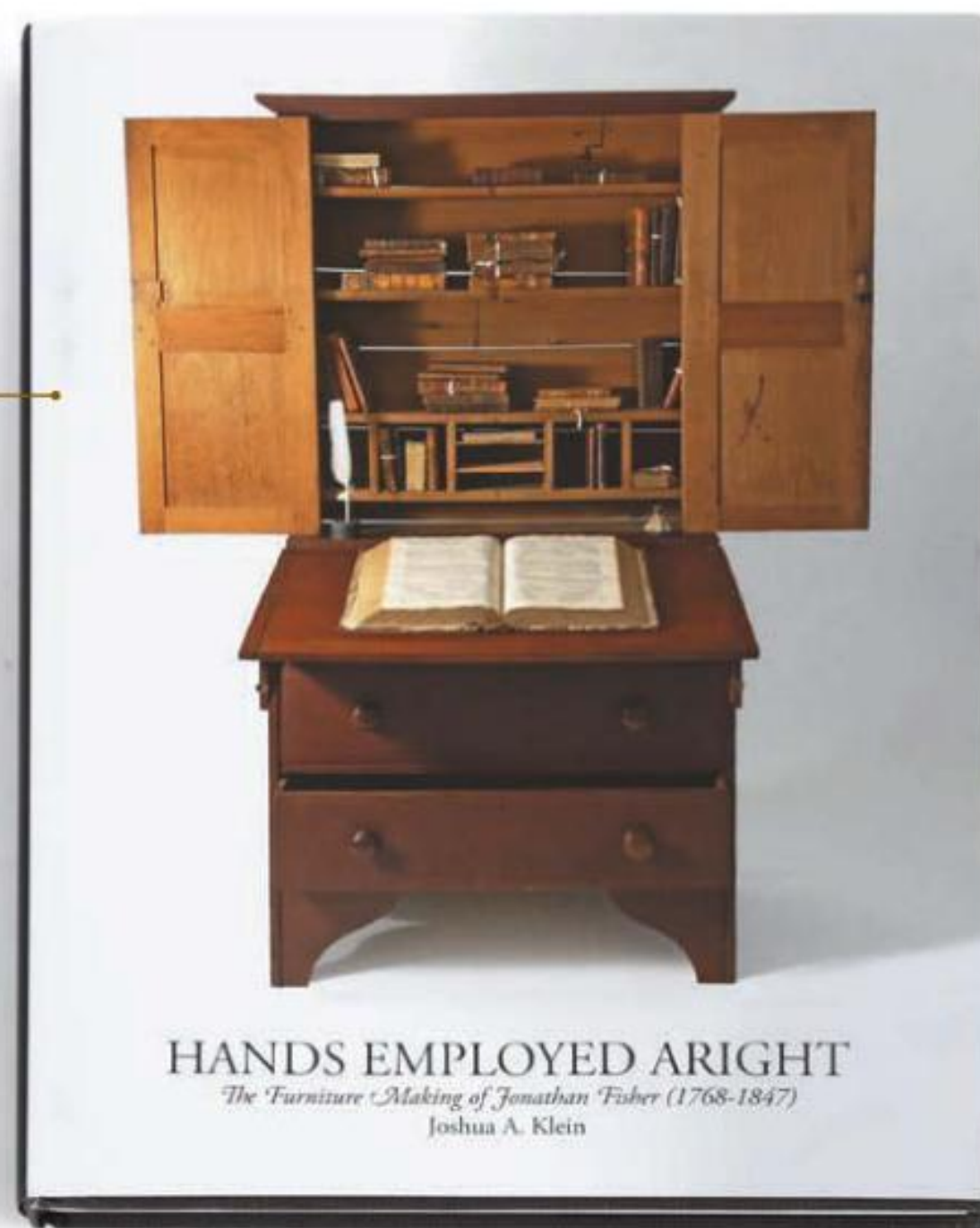
TRUTH BE TOLD, I'M A READER MORE THAN A WOODWORKER. Books are in my blood, I guess. So naturally, as a woodworker, I read about the craft whenever I can't be in the shop. Luckily for me, there's a wide swath of choices, from Eric Sloane's wonderfully illustrated books on hand tools to Tague Frid's classic three-book set on simply doing things well. My love of reading (and woodworking) and the wealth of books on the craft combined, though, leave me pretty picky. As quick as I am to pick up a book, I'm just as quick to put it down if it's not cutting it. Joshua Klein's *Hands Employed Aright: The Furniture Making of Jonathan Fisher (1768–1847)*—I savored that cover to cover.

Klein may be most familiar in his role as editor-in-chief of *Mortise & Tenon*, a magazine dedicated to historic furniture and pre-industrial methods. *Hands Employed Aright* is directly in that vein, and what you've come to expect from *Mortise & Tenon* you can expect from *Hands*, just deeper and richer since it's one author looking at one fascinating polymath who fortunately left behind plenty of journal entries, tools, and furniture.

This isn't a how-to book. Rather, it dives into Fisher's woodworking as it relates to his sense of morality and his community, which he served as both a preacher and maker. Working was fundamental to Fisher's morality and pocketbook, so he didn't do half measures. He even built a windmill to saw lumber and power his lathe. Klein does an excellent, engaging job of portraying this small-town Maine preacher in full color, giving the reader historical context, specifics about Fisher, and the practicalities and design considerations of his admittedly "humble and solid" woodworking. To that end, the book contains numerous pictures of Fisher's tools and furniture, as well as a short section on shop-based research in which the author, a woodworker himself, puts some of Fisher's methods to the test. As a selfish woodworker, I wish this section was a little longer.

So what if you don't enjoy history books, handwork, or vernacular furniture? If you're a woodworker, *Hands* still has something solid for you: personal context. It doesn't matter if you build modern pieces and couldn't care less about marks left by a fore plane; this book is neither an apology nor an advertisement for humble furniture or hand tools. Instead, this interpretation of the past is meant to illuminate and inspire how we work today. I'm never going to build a windmill, but my shop time is going to be more meaningful going forward thanks to this book.

—Barry NM Dima is an associate editor.



Cool tools. Fisher made many of his own tools. Some, like this frame miter saw intended for a "circulating miter box," speak to his remarkable industriousness and ingenuity.



Mickey Mouse tote. Part of Klein's shop-based research included testing Fisher's off-center mouse-shaped plane tote, which Klein says is "amazing" and is "changing [his] work for the better."

■ HAND TOOLS

Newfangled ax

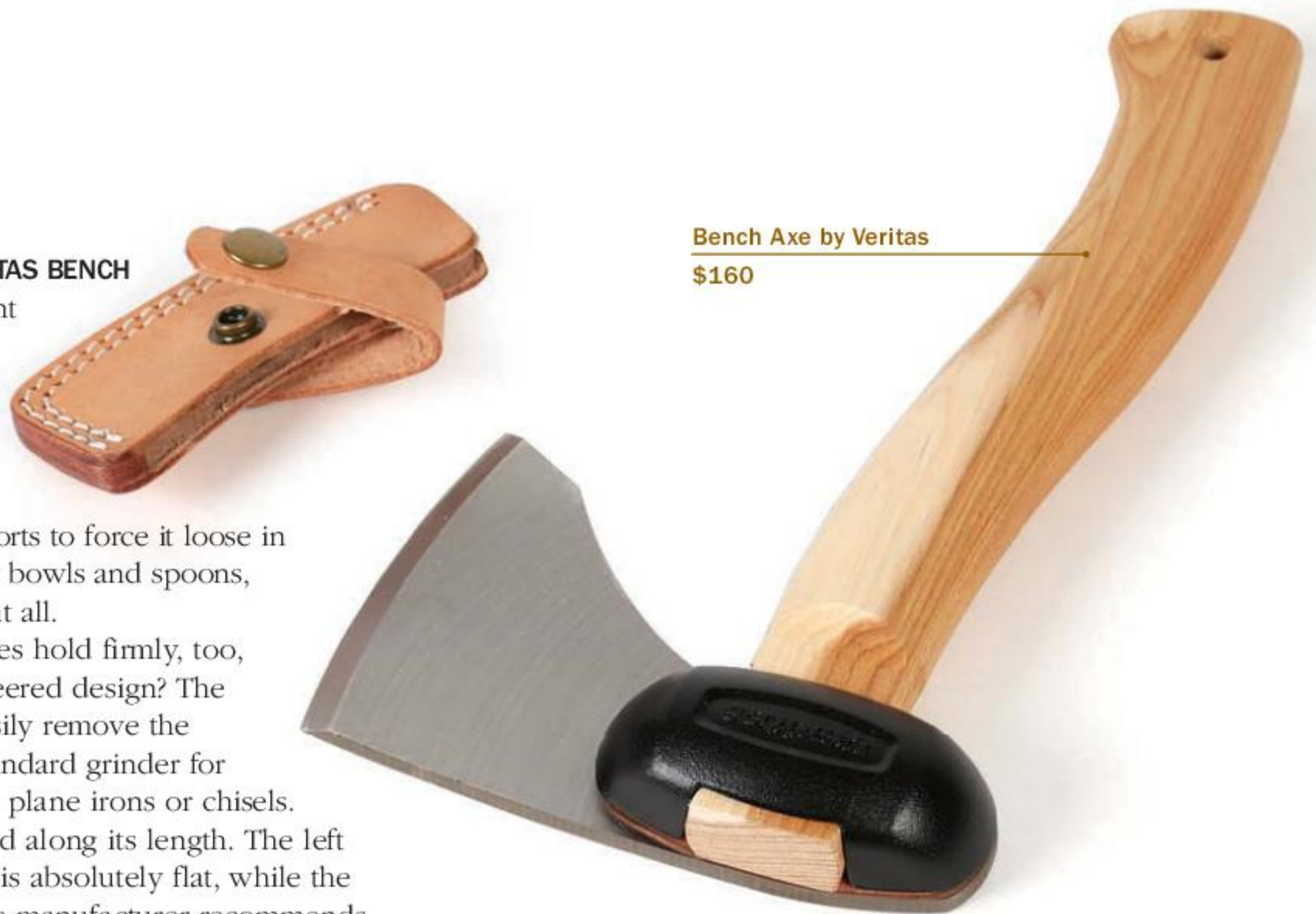
THE INNOVATIVE DESIGN OF THE VERITAS BENCH

AXE piqued my curiosity the moment I saw it. The handle is secured to the $\frac{3}{16}$ -in.-thick plate steel blade by an ingenious system of two mounting screws that draw a cast steel collar around the handle and against the blade. In spite of my efforts to force it loose in general use and while roughing out bowls and spoons, there was no wiggle to the handle at all.

The handles on my traditional axes hold firmly, too, so why bother with such an engineered design? The main advantage is the ability to easily remove the handle and grind the edge on a standard grinder for a precise hollow-grind, just as with plane irons or chisels.

The blade has a 4-in. edge, curved along its length. The left side (for the right-handed version) is absolutely flat, while the right side has a 30° bevel. As is, the manufacturer recommends it for “roughing cuts of convex and flat shapes.” I used it to trim the edges of riven planks and shape convex curves on boards and it performed very well. When carving, though, I prefer an ax with some bevel on the left side. It was easy to pop off the blade, grind a small 5° bevel on the left side, and adjust the right bevel to 25° at the grinding wheel with a tool rest.

Veritas used its premium PM-V11 steel for the head. The edge held up very well, with no sharpening hurdles. A nicely made protective leather sheath snaps on securely.



Bench Axe by Veritas
\$160

The ax weighs 3½ lb., so it provides plenty of oomph. I could have used a little more handle length at times to add momentum to the swing for heavy roughing cuts, but for most tasks, the handle length makes sense, and the design allows for a grip right behind the edge for extra control. It would be a useful ax for general trimming and shaping jobs, as well as for spoons and small bowls.

—Dave Fisher is a woodworker in Greenville, Pa.

■ ACCESSORIES

Contortionist sanding sheets

RUBBERY AND SOMEWHAT TRANSLUCENT, 3M Ultra Flexible Sanding Sheets excel at conforming to just about any profile. Available in grits of 100, 150, 220, and 320, it's the only sanding sheet I've ever used that actually stretches, refusing to tear. It can be crumpled as tight as you want during use and then it returns to its original flat state.

Although this flexibility is its main attraction, the sandpaper also shines when used with a sanding block, where it refuses to tear when easing sharp corners and edges. That, along with its non-clogging characteristics, means it needs to be changed only when its grit finally gives up the ghost.

These assets can at times be liabilities. Because it doesn't hold a crease, it tends to roll when sanding without a backer. Also, its rubbery backing can overheat if pushed too hard during high-speed sanding sessions at the lathe.

It has certainly earned a spot on my shelf.

—Ben Brunick is a woodworker in Yankton, S.D.



Ultra Flexible
sanding sheets by 3M
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■ ACCESSORIES

Sharpening attaché

I USE DIAMOND STONES for the vast majority of my honing. Most of the things I sharpen have curved edges, which can dish other stones quickly. Diamond stones stay flat and cut fast. They are also easy to transport and set up.

The Trend Diamond Sharpening Kit keeps everything in one convenient, portable place. The case keeps the contents organized and protected. The two double-sided 3-in. by 8-in. diamond stones in the kit provide four grits—180, 300, 600, and 1,000—marked clearly and permanently on the face of each surface. The 180- and 300-grit stones (70 and 50 micron, respectively) work fast and well for re-establishing a bevel or reshaping an edge. They incorporate an X pattern of clearance channels to keep the upper surface clear of residue. I used them to flatten an old oilstone and the job was done efficiently. I sharpened tools on the 180- and 300-grit stones and the X pattern did not interfere at all.

The 600- and 1,000-grit stones (25 and 15 micron) quickly flatten and hone a bevel. The provided lapping fluid eases



Sharpening kit by Trend
\$309

sharpening and protects the stones against rust. A high-quality 3-in. by 8-in. leather strop is provided, along with a bar of stropping compound. Especially after a break-in period, I was able to go from the 1,000-grit stone to the strop and get a very good edge. The large surface of these stones would be ideal for sharpening wide plane irons with a honing guide. I also really liked it for sharpening large kitchen knives.

—D.F.

■ POWER TOOLS

Handy ergonomic router

WHEN I UNPACKED THE BOSCH GKF12V-25N 12-volt Max Palm Edge Router for the first time, I was somewhat puzzled by the odd-shaped pistol-grip body. But within a couple of passes edging a board with a small roundover bit, I began to understand. The offset and slightly canted grip allows easy one-handed operation without the tendency for the router to try and twist in your hand. The canted grip creates an axis that is not centered through the bit or perpendicular to the base, so control is easy and positive. The base has corrugations cast into slight indentations, offering a slip-free grip pad.

A single button on the side of the motor housing allows easy plunge and the integrated fine-adjust thumbwheel moves the housing 0.04 in. (1 mm) per full revolution, making it effortless to fine-tune the cutting action. A thumb-wheel stop lock, on the opposite side from the plunge release, allows positive locking of the depth adjustment. Bosch's single tool bit-change system has a collet lock that is obvious and easy to use.

Of course, freedom from cords is a huge asset, and the 2.0 amp/hr., 12-volt, lithium-ion battery offers plenty of power and operating time. This is the handiest edge trimmer I've had the pleasure of using.

—Roland Johnson is a woodworker in Minnesota.



Palm router by Bosch
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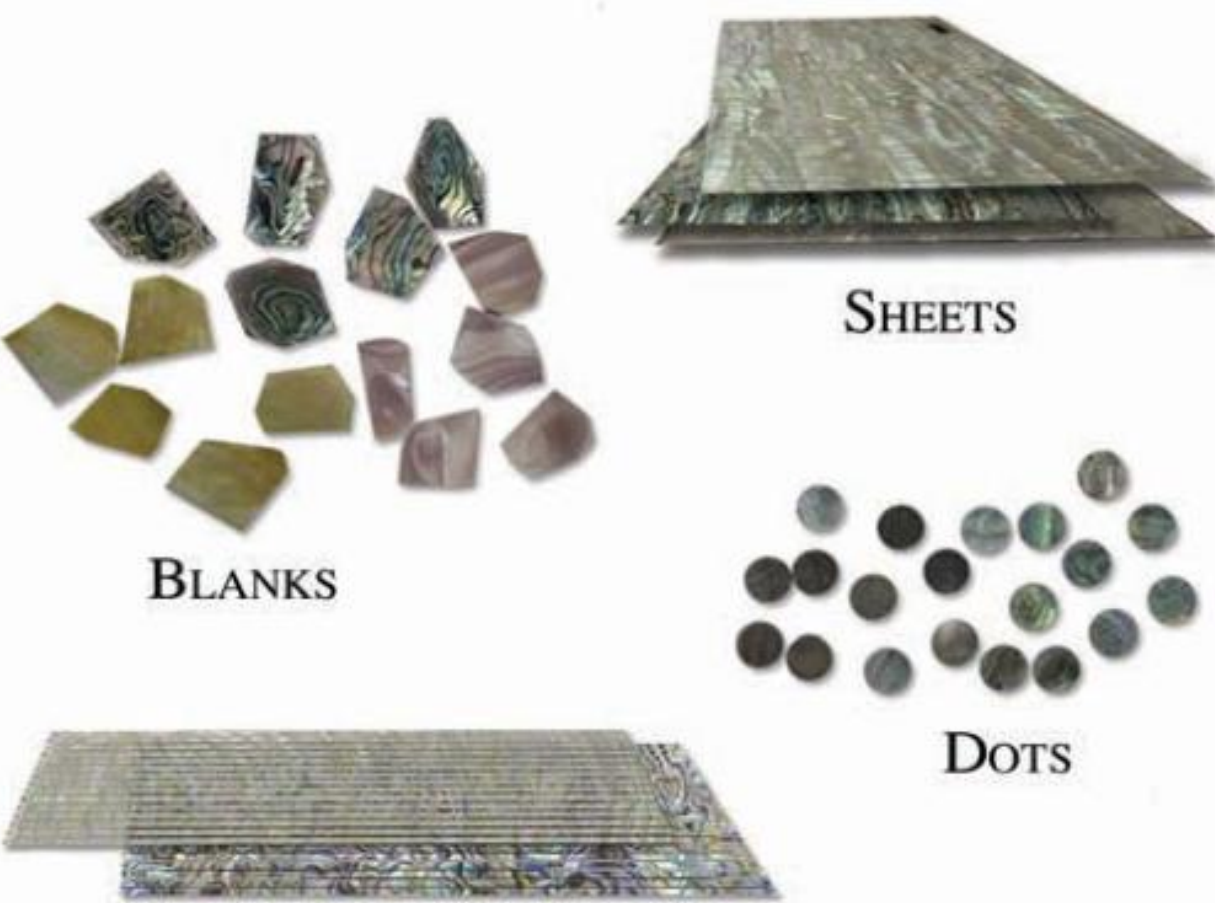
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designer's notebook



The passage of time

BY JEREMY ZIETZ



Standing on a tree stump, I feel a solemn weight, a sense of time and the sheer mass once planted there. I can imagine the monolith of the trunk and then, glancing skyward, all the offshooting branches that filled the expanse around it. I look down and marvel at the wavy circumference of the stump and its bark edge, remembering as a child learning that each ring marks a full year of the tree's life.

The rings are a reminder that trees far surpass us in age, growing slowly over hundreds and sometimes thousands of years. The light-colored parts of the rings show exuberant springtime growth and the dark areas mark long dormant winters. To scientists, these rings tell histories of climate, environment, forest fires, and more.

Celebrating trees as natural timelines and storytellers is a thread in my work and is exemplified in my 300-Year Mantel. The concept of the piece is this: By orienting the drawer fronts so quartersawn grain stretches all the way across the mantel, I made an abstract timeline. In this piece each drawer width is measured not in inches, but by 25 years of tree-ring growth.

With 12 drawers, a 300-year timeline occurs in just over 5 ft. of length. While the drawer fronts are not literally a cross-section of the tree, they aim to convey the same sense of gravity and slowness that the tree embodied.

Hand-shaped brass tabs act as pulls as well as indicators pointing to a specific year. The year the piece was made (2015) is marked in the center drawer; the outermost drawers represent the years 1865 and 2165. The resulting case piece becomes a natural archive where a sliver of a note, a faded photo, or a significant memento placed in a drawer can mark a moment in time.

Whatever is stored in it, the mantel should bring new meaning and ritual to the hearth where it might hang—a focal point in the home—and tie the milestones of our lives into the life of the tree. My hope is that when somebody experiences this piece, it sparks thoughts of past and future generations and the span of time in which the tree lived.

Jeremy Zietz is a studio furniture maker and industrial designer in Richmond, Va.

Shrink pots

THIS TRADITIONAL CONTAINER
HOLDS A LOT OF PERSONALITY

BY DANIELLE ROSE BYRD

mirknig.su



Shrink pot tool kit

Making shrink pots requires just a handful of green woodworking tools. The T-auger (center) may be hard to find, but you use it for only one task, coring the pot blank, and luckily, a drill press will also work. If you do find a T-auger, be sure the lead screw is intact. The scorp (bottom left), used to make the channel that the bottom fits into, is from Flexcut, and sloyd knives (center left) and hook knives (far left) are available from a number of makers both large and small. Drawknives (right) are fairly easy to find, both antique and new.

Making shrink pots is a great, straightforward green woodworking project that relies on the magic of wet-dry joinery. After hollowing a wet round, you let it shrink as it loses moisture, trapping a dry solid-wood bottom within. I love the intersection of utility and beauty, so the limitless options that shrink pots present are very appealing to me. They're commonly used to hold dry goods, pencils, candy, cat treats (at least for me), and other knickknacks. Also, once dry, they're great vessels for exploring design options such as colors, textures, and chip carving. Shrink pots are part of a home, and I think they should reflect some of that personality. But I'll let you explore that on your own, as this article covers only the fundamentals of making one.

Choose the right wood

Birch is my favorite wood to use for shrink pots, though maple, alder, and aspen can be

■ Rough out when wet



Cut the blank and mark the diameter. Byrd uses a V-sled at the bandsaw to cut the wet rounds to length. Then she scribes the inner and outer diameters using a compass. Aim for the shrink pot's walls to be an even $\frac{3}{8}$ in. thickness. Uniformly thick walls allow the pot to release moisture evenly as it dries, reducing the chances of cracking.



Bore a hole as large as you can. Byrd uses a T-handle auger to clear as much waste as possible. She sights straight down the bit to make sure she's parallel to the blank. If there's a kink in the round, she bores from both ends.



Chisel away the remaining bulk. If your bit's too small to drill out all the waste, use a mallet and a stout gouge with a deep sweep to approach the lines. Byrd sits to clamp the pot with her leg, allowing her to reposition the vessel quickly and easily.



Hook knife cuts to your line. Hold the tool in your dominant hand and the pot in the other, rotating the pot away from your body while carving toward yourself with the knife. These counter motions allow for a longer, more fluid cut.



Debark. As you work to the exterior lines, start with a small drawknife before moving to a spokeshave or block plane for finer cuts. But don't go all the way to the line yet. Leave material for finishing cuts after the blank has dried.

■ Add the bottom

Bottom fits in a groove. Byrd uses a Flexcut scorp to carve this channel. The knuckle on her right index finger acts as a fence.



Trace the inside rim on dry stock. Then bandsaw out the bottom, sawing wide of your line to account for the groove. Byrd uses a sloyd knife (far right) to heavily chamfer and shape the bottom until it fits snugly within its groove. If she needs finer cuts, she grabs her spokeshave.



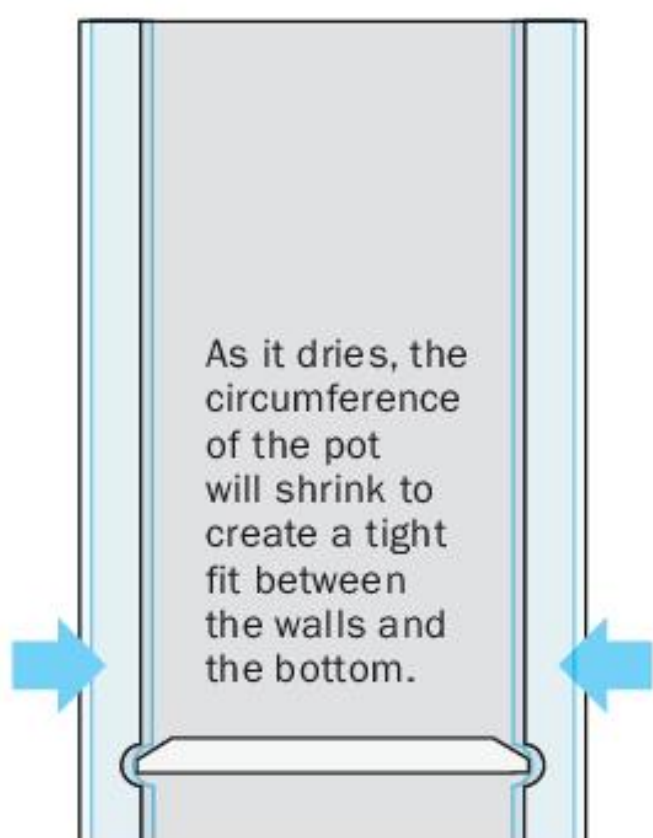
used, too. Stay away from aromatic woods, like cedar, for any jar that will store dry goods, candies, or other food items. For the lids, though, wood selection doesn't have much effect.

Look for smooth, knot-free sections from trunks or branches. Shrink pots 5 in. dia. or smaller are easier to process, though much larger ones are doable.

Lay out the walls and core the blanks

After cutting the stock to length, making sure each end is flat, use a compass to lay out the vessel's walls about $\frac{3}{8}$ in. thick. Thicker walls can be trickier when fitting the bottom because they contain more moisture, which means more shrinkage as the pot dries. The opposite is true for thinner walls.

I use a T-auger to core the blanks, but other woodworkers have used a drill press and Forstner bit. Power drills can be used, but just make sure to



See the light. The bottom should audibly pop into place, but you still want a gappy fit. This allows the pot to shrink around and capture the bottom without splitting.

use smaller bits. I've killed a motor trying to use the biggest bit possible.

When drilling out the blank, don't cut right to your inner layout line. Instead, leave room to smooth the surface with a hook knife. If there's a significant amount of material to remove after coring the blank, turn to a mallet and a hearty gouge with a deep sweep before using your hook knife. For this work, I like a hook knife with a long handle. Make sure the texture you leave at this stage is what you want, because once the bottom is fitted, you won't be able to easily reach all parts of the inner walls again.

Now clean up the exterior. Remove the bark and work close to, but not up to, the exterior layout line.

Drying pot captures dry bottom

To plow the groove for the bottom, I use a small Flexcut scorp. A straight knife or veiner gouge also

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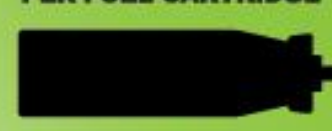
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Final shaping when dry

Dry cuts are crisper. While green wood is easier to work than dry stock, it doesn't take finishing cuts well. For final surfacing, wait until the pot is dry and your finish cuts will be much smoother and cleaner.



Clean and level the top and bottom. Make sure the plane blade is super sharp and set for a fine shaving so the end-grain cuts are smooth and consistent. Byrd wraps the pot in a towel to protect it in the vise (right). Mark any high spots (far right) on both ends, and plane them to ensure the pot won't wobble and the lid will lie flush.



works. Make sure you don't make this channel so deep that you compromise the walls of the pot.

Before fitting the bottom, lightly chamfer the inside edge of the bottom of the pot with a straight knife. It can be done after, but it's harder to do.

Cut the bottom from a dried piece of wood. I trace the inner rim of the pot's bottom onto the bottom blank and draw marriage marks on the blank and pot. These help when fitting the piece.

Bandsaw out the bottom slightly larger than the outline to account for the depth of the pot's groove. Chamfer and shape the bottom's inside face so it fits snugly within the channel. The bottom must fit tight enough to rest within the groove, but not so tight that the pot splits as it shrinks around it. You should hear a nice popping sound but still see gaps when the bottom is in place. To fit it in, tilt one end into the groove before pressing the other end in place.



Chamfer the inside of the top. Byrd uses her sloyd knife to break the sharp edge within the shrink pot, pressing the blade with her thumb for a fine, controlled cut.

Finish cuts when dry

Wait to take the finish cuts until after the pot has dried, as they'll be much crisper and cleaner than the cuts on green wood. If you're unsure whether the pot is dry, weigh it periodically. When its weight plateaus, it's ready. I usually leave them for a few weeks to avoid any worry.

Two-part lid

Once you've done the finish cuts on the dry pot, start fitting the lid, which consists of two separate pieces of dry wood that you'll glue together. The lower lid rests inside the pot; the upper lid goes on top.

I make a pencil rubbing on paper of the top rim, then cut it out to use as a template for the lower lid. For the upper lid, I simply trace around the pot onto the blank. Then I cut out both at the bandsaw.



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Two-part lid

Trace for the lower and upper lid. After making a pencil rubbing of the pot's rim on paper and cutting it out, use it as a template for the lower lid. Alignment marks help fit the part after bandsawing for the upper lid. Byrd simply traces the outside of the pot onto $\frac{5}{8}$ -in. dry pine stock to lay it out.



Glue and center the lid. After fitting the lower lid, apply glue, align the marriage marks, and hold the parts together until they stay adhered but can still move. Lower the lid onto the pot with the marks aligned and then gently slide the upper lid flush with the pot's walls. Remove the lid and clamp its two parts together with a weight.



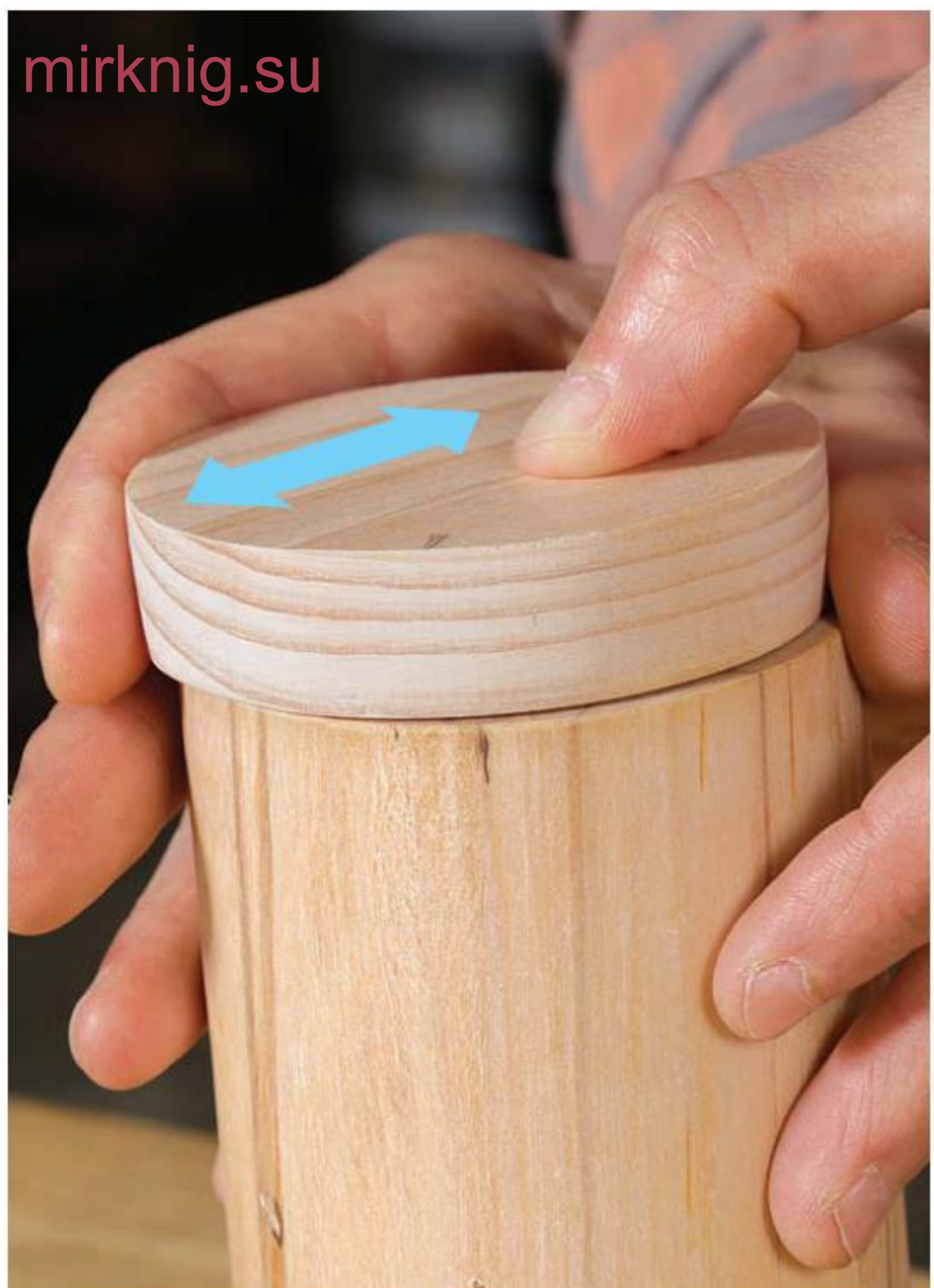
Checking the fit of the lower lid is a slow process, so take your time. If it's done well, you can achieve a twist-lock fit, where the lid locks when turned. After the lower lid fits, you can glue it to the upper lid. While the glue is still wet, though, carefully put the lid onto the pot and gently shift the upper lid to line up with the outer walls of the pot.

Then remove the lids and clamp them together using a heavy weight. After the glue has dried, I very lightly chamfer the top and bottom edges of both the lid and pot, both for aesthetics and to prevent the grain from tearing.

Finishing touches

The shrink pot is now ready to be decorated, which can take so many different forms. I've used chip carving to create a series of geometric patterns and shapes, homemade or repurposed punches to create patterns, and oil or milk paint to decorate and add to the carved patterns. You can also leave a natural surface protected by linseed or tung oil on the outside. □

Danielle Rose Byrd is a professional woodworker in Bar Harbor, Maine. To see more of her work, go to daniellerosebyrd.com.



Online Extra

To watch a video of Danielle Rose Byrd making a shrink pot, go to FineWoodworking.com/273.



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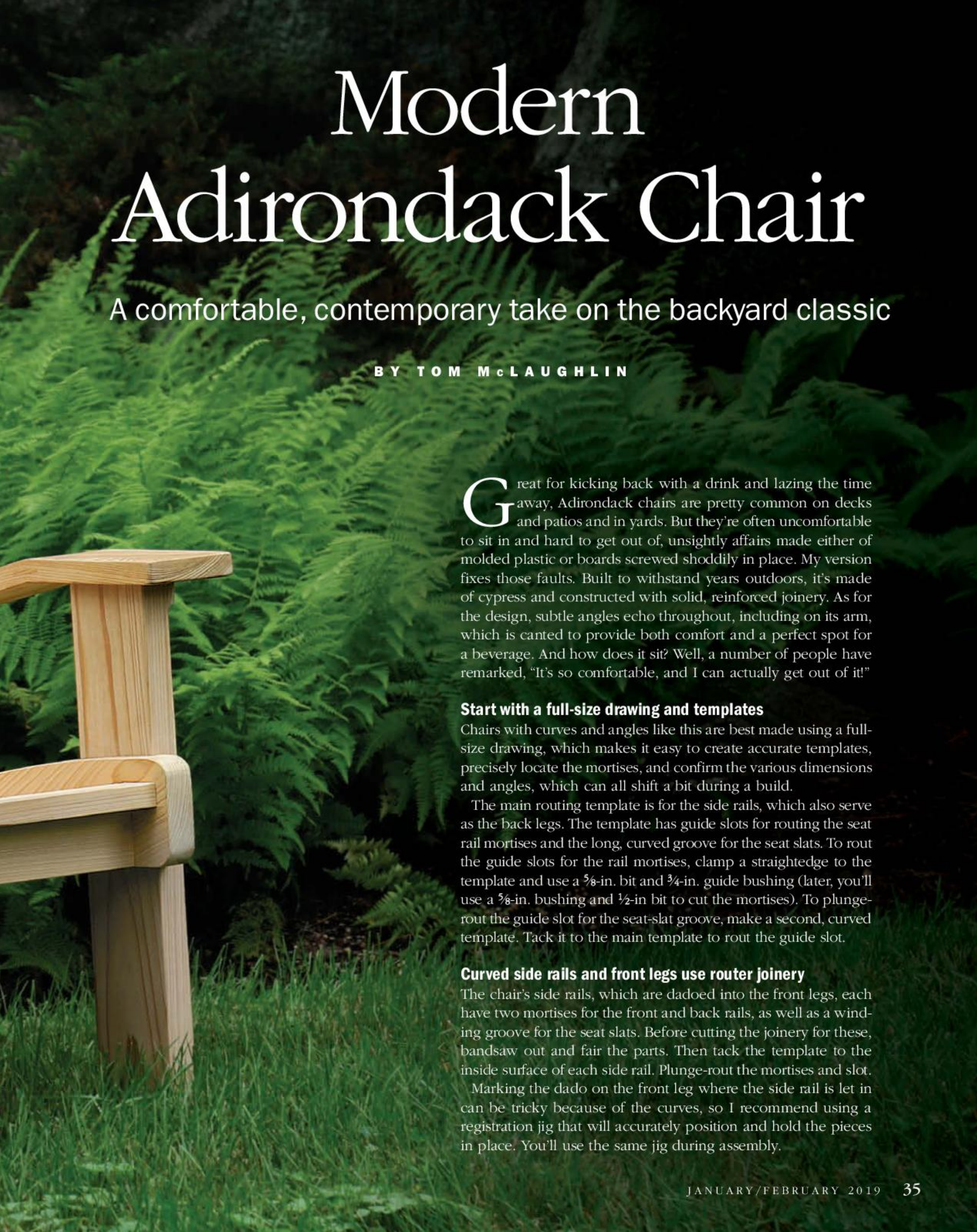


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Modern Adirondack Chair

A comfortable, contemporary take on the backyard classic

BY TOM McLAUGHLIN

Great for kicking back with a drink and lazing the time away, Adirondack chairs are pretty common on decks and patios and in yards. But they're often uncomfortable to sit in and hard to get out of, unsightly affairs made either of molded plastic or boards screwed shoddily in place. My version fixes those faults. Built to withstand years outdoors, it's made of cypress and constructed with solid, reinforced joinery. As for the design, subtle angles echo throughout, including on its arm, which is canted to provide both comfort and a perfect spot for a beverage. And how does it sit? Well, a number of people have remarked, "It's so comfortable, and I can actually get out of it!"

Start with a full-size drawing and templates

Chairs with curves and angles like this are best made using a full-size drawing, which makes it easy to create accurate templates, precisely locate the mortises, and confirm the various dimensions and angles, which can all shift a bit during a build.

The main routing template is for the side rails, which also serve as the back legs. The template has guide slots for routing the seat rail mortises and the long, curved groove for the seat slats. To rout the guide slots for the rail mortises, clamp a straightedge to the template and use a $\frac{5}{8}$ -in. bit and $\frac{3}{4}$ -in. guide bushing (later, you'll use a $\frac{5}{8}$ -in. bushing and $\frac{1}{2}$ -in. bit to cut the mortises). To plunge-rout the guide slot for the seat-slat groove, make a second, curved template. Tack it to the main template to rout the guide slot.

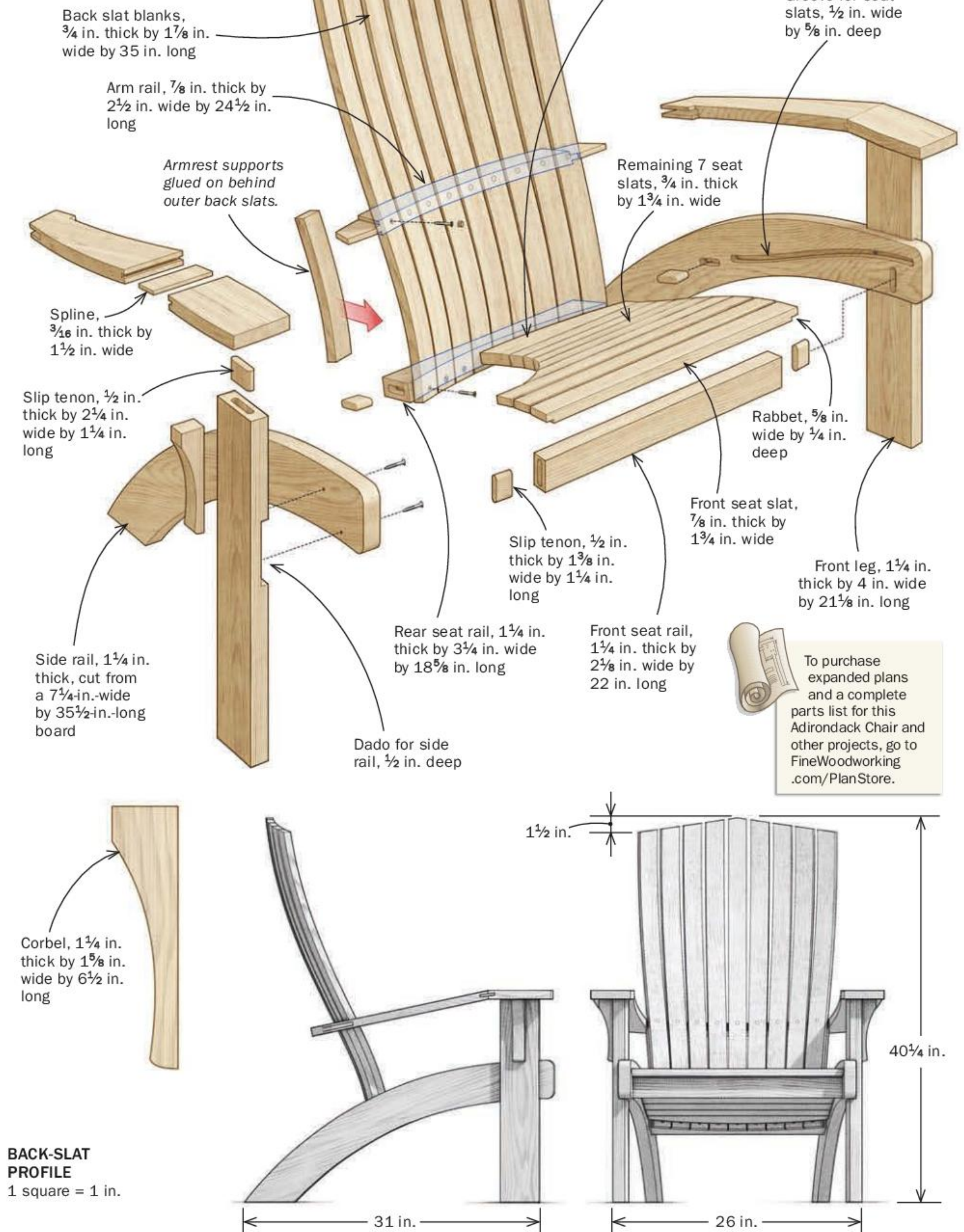
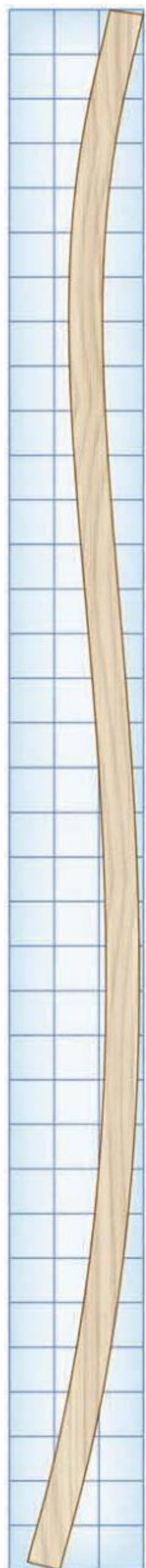
Curved side rails and front legs use router joinery

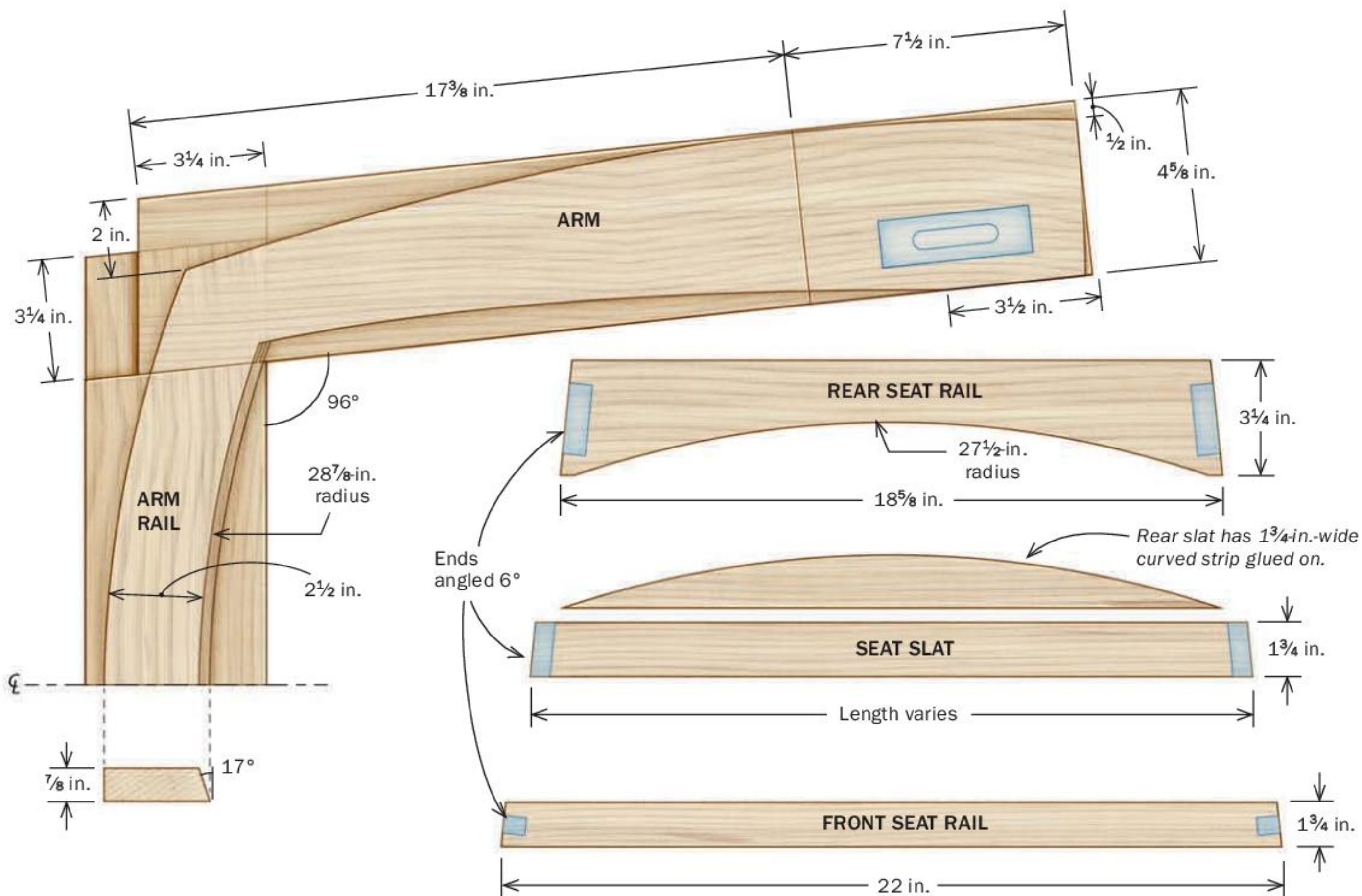
The chair's side rails, which are dadoed into the front legs, each have two mortises for the front and back rails, as well as a winding groove for the seat slats. Before cutting the joinery for these, bandsaw out and fair the parts. Then tack the template to the inside surface of each side rail. Plunge-rout the mortises and slot.

Marking the dado on the front leg where the side rail is let in can be tricky because of the curves, so I recommend using a registration jig that will accurately position and hold the pieces in place. You'll use the same jig during assembly.

OUTDOOR CHAIR BUILT TO LAST

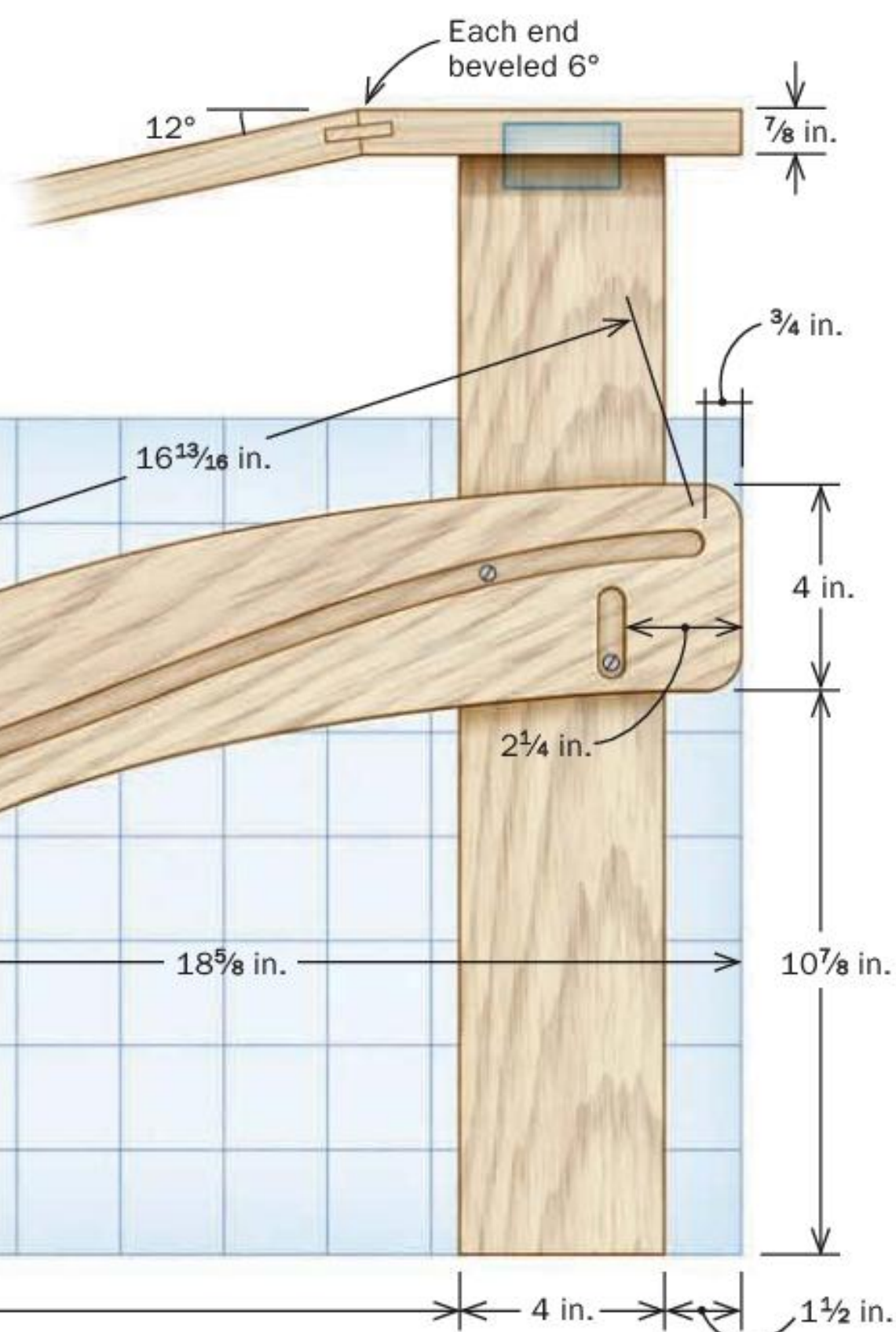
While this version is more challenging to build than a traditional Adirondack, its rock-solid construction will reward you with decades of relaxation.





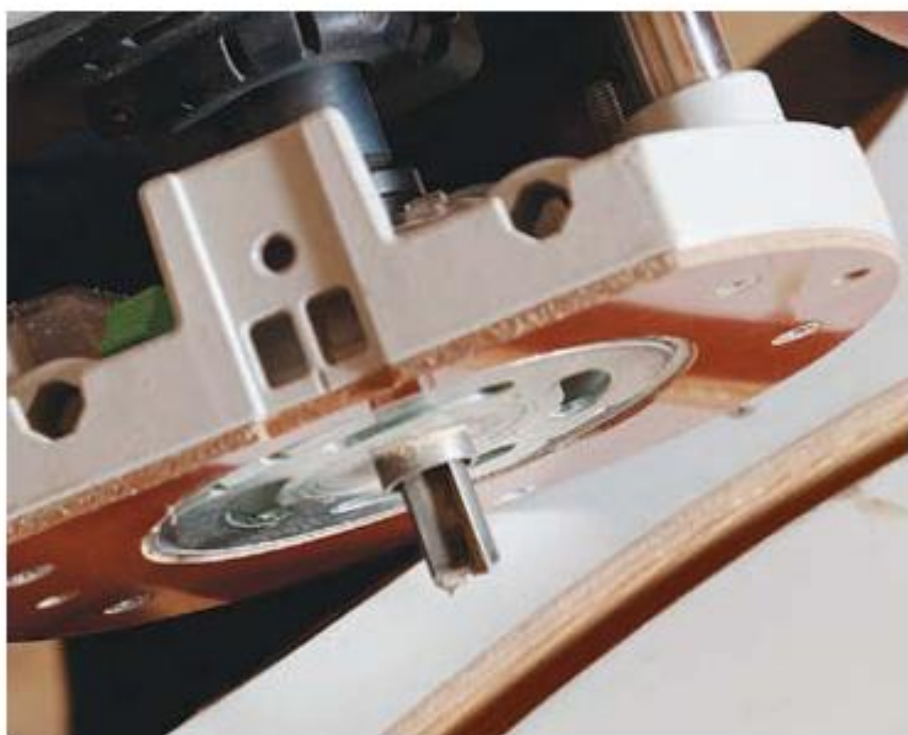
A template for a template. To rout the guide slot for the seat slats, McLaughlin tacks a curved template onto the side rail template. He uses a ⁵/₈ in.-dia. bit and a ³/₄ in. guide bushing. End stops are added to determine the length of the slot.

SEAT SLAT LENGTHS	
23 ⁹ / ₁₆ in.	21 ⁷ / ₁₆ in.
23 in.	21 ¹ / ₁₆ in.
22 ⁹ / ₁₆ in.	20 ¹¹ / ₁₆ in.
22 ³ / ₁₆ in.	20 ⁵ / ₁₆ in.
21 ¹³ / ₁₆ in.	



Begin with the base

LEG/SIDE-RAIL ASSEMBLY



A template for the side rails. To rout the mortises for the back and front seat rails, as well as the winding slot for the seat slats, McLaughlin uses a template, tacked in place, and a guide bushing for repeatable results.



Notch the leg for the side rail.

McLaughlin built a simple layout jig to help register the side rail and front leg and hold them in place while he uses a knife to mark the dado for the rail. He routs the waste freehand, staying away from his knife lines. He then chisels to the lines until the side rail fits snugly.

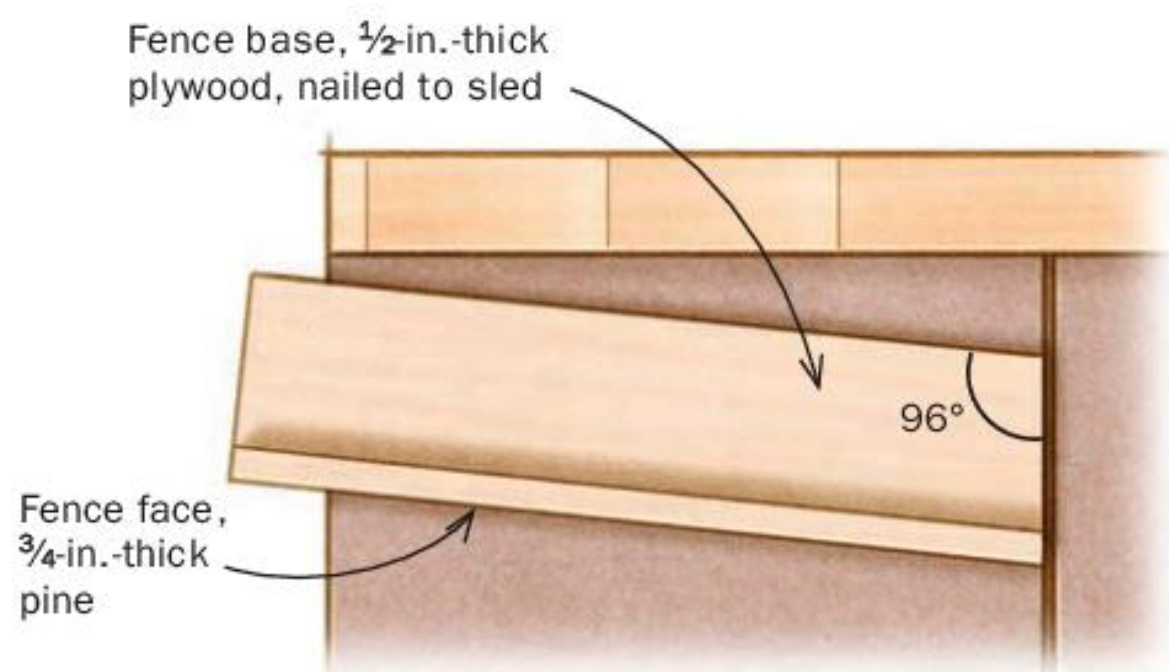


Mortise the top of the front leg with a plunge router. This template uses centerlines to align the mortise and is tacked in place.



Glue and screw the assembly. Instead of clamping, run screws from the inside, concealing them at the bottom of the slots. Using the same layout jig is a boon here. Set this assembly aside until later.

SEAT RAILS NEED ANGLED ENDS



Angled fence guides the cuts. The base of the fence is tacked to the sled at the seat rail angle. The tall face is tacked to the base, providing sturdy support for the stock.



With the parts in place, use a sharp marking knife to scribe the curved shape of the side rail across the inside of the front leg. Rout to just shy of the knife lines. I draw a pen line $\frac{1}{16}$ in. inside the knife lines to make it easier to see where to rout. Then I chisel cleanly to the knife lines.

The top of each front leg is mortised for a slip tenon using a template and plunge router. This tenon will join the leg with the arm.

After routing the mortise, glue and screw the side rails to the legs using rustproof screws and waterproof glue, which you should use throughout the project. The registration jig again helps here.

The seat rails and slats get angled ends

The chair's front and rear seat rails are angled at each end, as are the seat slats. The rear seat rail is also tilted, making that a compound-angle cut. This geometry is easy to tackle with an angled fence in your crosscut sled and a 14° wedge (see photos, below). When the front and rear rails are done, plunge-rout their



Cut the front seat rail to length. Hold the stock tight to the fence when making these cuts.

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Back seat rail needs a wedge. This cut's a compound angle. To reduce the headache, put a 14° wedge under the stock. When cutting the other end, you'll need to flip the wedge so the low side is against the fence.



Assemble the armrest

ANGLED JOINERY



Miter the arms. Tilt the sawblade to 6° to form the arms' 12° slant. McLaughlin cuts and rejoins a single board for each arm, so the grain flows continuously along the arm's length.



Angled cuts for the spline. To create a slot 90° to the miter, keep the blade tilted to 6° when cutting grooves for the splines. Register the inside faces of the parts on the fence.



Wedge angles arm assembly. Use a 6° wedge while cutting both halves of the bridge joint. Be sure to flip it for opposing cuts to keep the joint angled appropriately.

GLUE AND TRIM

Cauls direct pressure. Blocks temporarily glued to the arm parts ensure clamping pressure is square to the joint. Orient the spline's grain so that it follows the grain of the arms.



Arm assembly comes together with a bridge joint. When gluing up the arm assembly, which consists of the arms and arm rail, horizontal clamps close up shoulders while vertical clamps pinch the mortise walls to the cheeks of the tenon. Cut the arm rail's angled inside arc before assembly.

Online Extra

To follow along as Tom McLaughlin makes the angled arms of this chair, go to FineWoodworking.com/273.

As for the rabbets at the end of the seat slats, I cut them on the tablesaw using a miter gauge and a dado set. The slats will be nailed in place, so a little end-to-end wiggle room is fine—except on the front one. The front seat slat is more structural, so it is crucial that its shoulders are tight to the side rails. Also, it is $\frac{1}{8}$ in. thicker than the others and glued in place. Lastly, the rear slat needs to be wider than the rest so its back edge can be sawn to a curve to fill in the negative space where the vertical back slats are attached along the arc of the rear seat rail.

Splines add strength to mitered arms

The arms are flat for about $7\frac{1}{2}$ in. at the front and angle down 12° from there. A miter cut makes this possible. To make the miter, angle the tablesaw blade to 6° and crosscut both ends of the joint.



Bandsaw to shape. After the glue dries, cut the arms and back of the rail to shape at the bandsaw. Clean up these cuts with hand tools.

Tackle the slats

BACK SLATS



Pivot fence lets you follow the curve. To bandsaw parallel to the curve, clamp a pivot fence just ahead of the blade. Keep the section being sawn approximately 90° to the pivot point while moving through the cut (1). After each cut, tack a template onto the board, setting it slightly back from the sawn edge (2), and trim flush to the pattern using a bearing-guided bit at the router table (3). This will leave you with just one face to clean up after sawing. Repeat this process for each of the back slats.



Since this is a butt joint, I use splines for reinforcement. To make the spline grooves 90° to the miter, hold each piece vertically and cut them with the sawblade still at 6°. The grain of the splines should run in the same direction as that of the arms. When assembling this miter, glue temporary clamping blocks to the arm to keep clamping pressure square across the joint. The arms connect to the arm rail with a bridle joint cut at the tablesaw. Be sure to bandsaw the angled curve of the rail's inside edge before gluing the parts together. When the glue is dry, bandsaw the rest of the arm assembly's shape. Clean up these cuts by hand.

Bandsaw and router team up on curved back slats

For consistent grain across the nine curved back slats, saw them from a single board milled to 1 7/8 in. thick by 10 in. wide by 38 in. long. This board is longer than the slats; you will cut the slats to length later.

Making the curved back slats involves some back-and-forth between the bandsaw and router table. Using a template, trace the shape of the slat along one side of the board and then bandsaw to it. Then set the template slightly back from the sawn edge, tack it down, and flush-trim to the pattern. You'll need a flush-trimming bit at least 2 in. high. After removing the template, bandsaw out the curved slat using a pivot fence. To be sure the curve is sawn parallel, guide the routed surface against the fence, keeping the section being sawn approximately 90° to the pivot point.

Repeat this sequence—tacking the template slightly back from the sawn curve, routing flush along the template, and bandsawing

SEAT SLATS



Angle and rabbet. Trim the ends of the slats to the same angle as the front seat rail using the same angled fence (above). Then use an angled miter gauge and a dado set to rabbet the slats so they fit into the grooves in the side rails.

Dry-fit for final trimming and mortising

Attach the back slats. Pre-drill and use rustproof screws to attach the slats to the rear seat rail. Make sure the slats are evenly spaced and flush with the bottom of the rail.



Mark and rout the arm mortise. Dry-fit the chair and clamp the arm assembly to the front legs. Then trace around the leg to locate the mortise position. Center the mortise within the leg outline and use the same template to rout this mortise as you did for the leg's mortise.



against the pivot fence—until all nine slats are done. The bandsawn surface on the back side of each slat can be quickly cleaned up with a spokeshave and block plane. Also, it's helpful to make the two rear arm supports now, since they need the same curve as the slats. These get glued to the back of the two outer back slats and fit between the rear seat rail and the arm rail, strengthening the arm assembly.

Finally, crosscut each back slat to length by trimming the bottoms. The tops will be trimmed to shape later.

Fit the arm assembly and then add the back slats

While the arm rail simply rests on the two arm supports, the arms connect to the front legs via a slip tenon. Despite having a full-size drawing, I save the layout of this mortise until now so I can dry-fit the chair and trace around where the legs meet the arms in the actual chair, not my drawing of it. Use the same template for this mortise as you did for the mortise into the top of the leg.

With these slip tenons in place, dry-fit the chair again so you can mark where to pre-drill for the screws that secure the back slats to the arm rail, as well as for the plugs that will cover the screws.

Now you can temporarily screw on the back slats to mark their upper peaked profile with a straightedge. Disassemble the chair to cut the tops of the slats on the bandsaw.

Put it together one last time

The pre-assemblies are done and it's time for the real deal. I recommend following a few steps here.

First, re-screw the back slats to the rear seat rail. Then apply glue to the tenons of the front and rear seat rails, but don't install them fully. For now, partially insert these pieces into the leg/side rail assembly, with



Draw the back slats' profile. With the chair dry-fitted again, use a pencil and straightedge to mark the top of the slats for final trimming.

Final assembly



Assemble the sides and slip the slats into place. Glue the parts and bring them part way together, but don't clamp yet. With the front and back seat rails loose, you'll be able to pivot the seat slats into place one by one. Afterward, clamp across the rails and let the glue dry. Use shims to space the seat slats equally. Glue only the front slat in place. The others are simply nailed in from underneath.



the front more open than the back, allowing you to slide the seat slats into the channel. Add glue only to the front, thicker slat.

With all these slats in place, clamp across the front and rear seat rails. Space the seat slats evenly and drive nails up through the bottom of the rabbeted ends.

Now glue and clamp the front legs to the arm assembly. Screw the back slats to the arm rail. Then glue in the plugs and trim and sand them flush.

The last pieces are the corbels, which help support the part of the arm that overhangs the outside of the leg. Simply glue these in place.

Finish is not really needed

Finish is optional with a wood that weathers as well as cypress. It will oxidize in the sun and naturally turn a pleasing gray. However, if you don't prefer the natural look, you can paint the chair or apply a clear outdoor finish. But bear in mind this comes with a price, as the chair will require nearly annual recoating to keep it looking good. □

Tom McLaughlin is a furniture maker, woodworking teacher, and host of Fine Woodworking's show on public television.



Arms and back. With the arms glued and clamped to the front legs, screw the back slats to the arm rail with small brass screws. Conceal these with long-grain plugs. Make them with a plug cutter from leftover slat stock, and orient the grain vertically to match the slats.

TOOL TEST

8-in. Jointers

Equipped with spiral cutterheads, the latest models promise smoother surfaces

BY ELLEN KASPERN



 **Online Extra**

A new jointer isn't in the cards? Watch Roland Johnson show how to outfit your old one with a spiral cutterhead. FineWoodworking.com/273.

Spiral cutterheads

Spiral is superior. The test was limited to jointers with spiral cutterheads. Each insert on the cutterhead has four carbide cutting edges. For a fresh edge, just rotate the cutter.



Smooth results. Spiral cutterheads leave smoother surfaces than straight knives, even on curly maple. In our tests, when there was tearout, it was minimal and localized.

A jointer might not be your first big tool purchase, but when you do buy one, it will make milling so much smoother. Tuned up right, jointers let you easily get a flat face and a square edge, two critical reference points for nearly every step in a build.

While jointers come in a wide range of sizes, the 8-in. jointer hits the sweet spot for price, footprint, and capability in the small shop. Jointers of this size handle wider boards than smaller models, and their typically longer beds provide more infeed and outfeed support.

The models I looked at all have spiral cutterheads. While jointers have traditionally had

cutterheads with straight knives oriented perpendicular to the feed direction, that approach is being supplanted by spiral cutterheads, which have a series of small, square cutters running in a spiral pattern. This design reduces tearout, leaving smoother surfaces, especially on figured stock. Because the advantage in surface quality is so clear, we left jointers with straight cutterheads out of the test.

The inserts on spiral cutterheads can be oriented straight, making them square to the feed direction, or angled, for a shearing cut. I didn't notice a difference in performance between the two.

Changing all these square cutters might seem daunting,

Beds



Beds must be flat. When setting up each jointer, Kaspersn used a long straightedge and paper shims to ensure the infeed and outfeed tables were coplanar.



Wheels over levers. Some jointers rely on a wheel to adjust the height of the infeed table; others use a lever. Kaspersn prefers the wheel because it lets you make finer adjustments with more precision.



8-in. jointers

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Jet JWJ-8HH	\$2,100/ 5 years	36	Angled	Very good	72 in.	Dovetail	Wheel	Excellent
Laguna MJOIN8012 -0130	\$2,000/ 2 years	54	Angled	Very good	75 in.	Dovetail	Wheel	Very good
Laguna MJOIN8020 -0130	\$3,000/ 2 years	54	Angled	Very good	83 in.	Parallelogram	Wheel	Very good
Oliver 4230	\$2,880/ 2 years	54	Angled	Very good	74⅞ in.	Dovetail	Wheel	Very good
Powermatic PJ-882HH	\$3,200/ 5 years	54	Angled	Excellent	82 in.	Parallelogram	Lever	Good
Rikon 20-108H	\$2,300/ 5 years	40	Angled	Excellent	73½ in.	Dovetail	Lever	Good

* Check with manufacturers for limitations.



GRIZZLY G0495X

Regardless of the board's grain, this jointer produced excellent results. Its fence was totally flat, worked smoothly, and locked well, staying in place even after jointing multiple edges. Getting the fence to 90° was very easy, but the 90° stop was a little tricky to set and the fence did not go back to square when using it. For those who would use it, there is also a digital depth-of-cut scale.

JET JWJ-8HH

This machine joints a very good surface, with a fence that is flat and smooth-moving. The fence is easy to set to 90°, and it stayed that way. The 90° stop was also easy to set and reliable. The start and stop buttons can be installed above or below the infeed table.



GUARD	FENCE		DUST COLLECTION
	Rack and pinion	Quality	
Excellent	Yes	Excellent	Excellent
Very good	No	Excellent	Very good
Good	No	Very good	Fair
Very good	Yes	Good	Very good
Excellent	Yes	Poor	Fair
Poor	No	Good	Excellent
Excellent	No	Fair	Poor

On/off location



Easy access. A power button closer to the cutter means it's easier to turn off a machine midcut if something goes wrong.

but on the jointers I tested, the task is simply a matter of loosening the set screw that holds down each insert, turning or removing the insert, and then retightening.

To see how each jointer performed, I assessed the surface quality it left behind. All the models performed well on both pine and curly maple. With these results being so similar, the real test came down to how user-friendly the jointers were. First, and most important, the fence should be easily set and locked at 90° to the tables. Additionally, the fence shouldn't interfere when feeding a board. And it needs to adjust smoothly, which is why I prefer jointers that use a rack-and-pinion mechanism to move the fence to those that have you just pushing or pulling it. Setting the infeed table, which determines



LAGUNA MJ0IN8012-0130

This machine left very good surfaces. However, just beyond the cutterhead was a slightly recessed plastic insert on the fence that allowed thin stock to catch when flattening faces. The fence was slightly bowed, but it caused no problems during use. The fence adjusted smoothly. The 90° stop was very easy to set and worked well.

LAGUNA MJ0IN8020-0130

The larger Laguna jointer left very good surfaces. However, like on the smaller model, the slightly recessed plastic insert in the fence allowed thin stock to catch when flattening faces. All moving parts on the jointer worked smoothly, which made getting the tables coplanar and the fence set to 90° easy. The fence had a bow that affected setup but not the cut, and the fence stayed at 90° without any play during cuts. The 90° stop, though, proved awkward to set and unreliable.



8-in. jointers

OLIVER 4230

The Oliver jointer left very good surfaces. Its fence, however, while perfectly flat, suffered from several problems. It had a lot of play, even when locked, and I wasn't able to get it square to the table. Also, the 90° stop, while easy to adjust, wouldn't keep its setting.



POWERMATIC PJ-882HH

The Powermatic smoothed boards excellently. It has a plastic insert that sits shallow of the fence, where thin boards tended to catch when flattening faces. The Powermatic was the only model that uses a knob to adjust the angle of the fence—a nice feature—except that locking it caused the fence to move slightly, which made it tricky to square the fence. But when locked, the fence did not move. The 90° stop was easy to set but wasn't reliable. The guard was finicky to install and would often not snap back fully after a board passed by.



RIKON 20-108H

This machine produced excellent surface quality. It has levers to adjust the table height. The fence is rack-and-pinion with a solid knob. The fence was flat, but it has a large cutout for clearance for the cutterhead, allowing thin stock to catch when flattening faces. It was easy to set the fence at 90°, and although it rocked slightly when locked, cuts weren't off square. The fence's stop for 90° was unreliable.

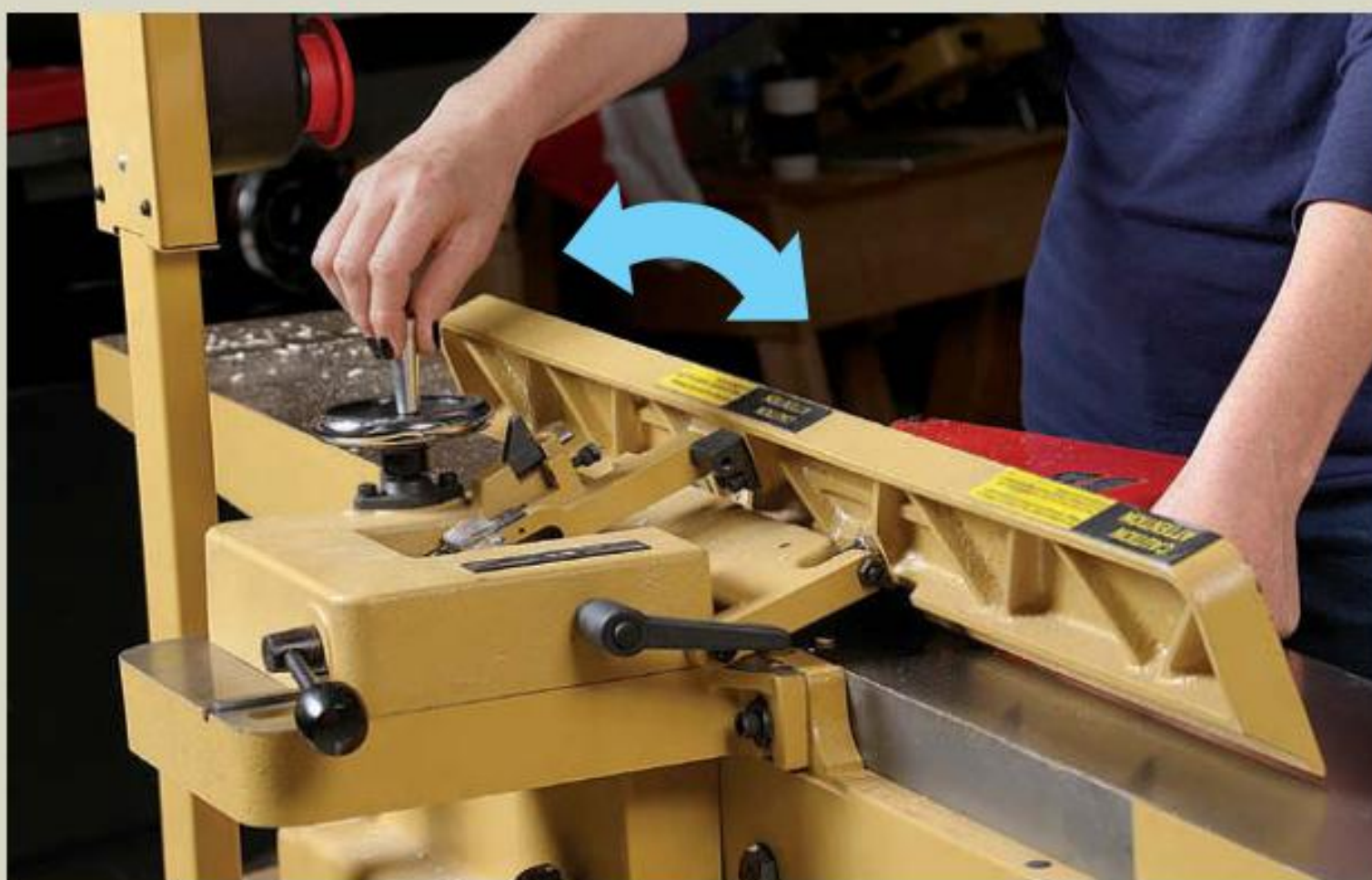


your depth of cut, should also be easy. For these jointers, that means turning a wheel or using a lever. I prefer the wheel for its more precise control. Last, there's the guard, the spring-loaded cover over the knives. It should push out of the way as you feed a board but snap back in place when the board has passed. If this doesn't work well, it's not just a hassle; it's dangerous.

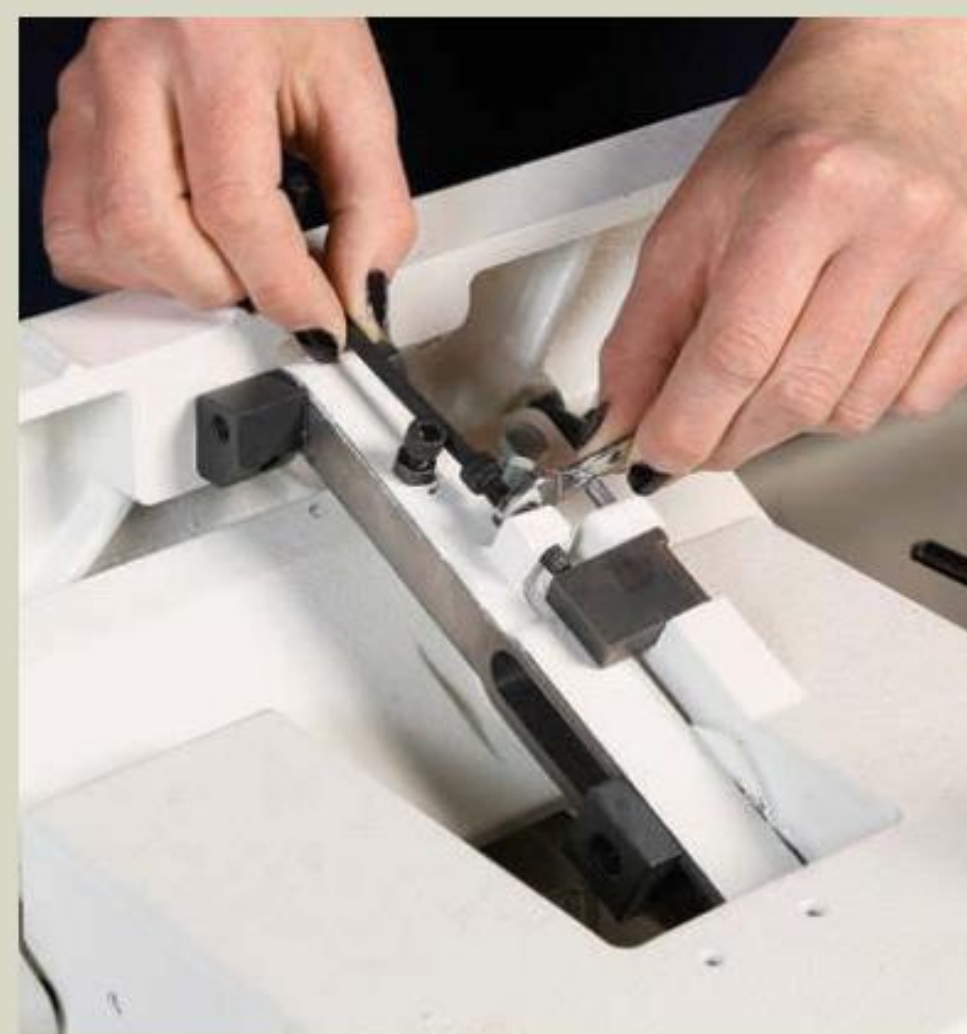
There are two types of jointer beds—those that adjust on dovetailed ways, and those with parallelogram adjusters. I checked that all the beds were coplanar. But gravity always wins, so in time a jointer bed may sag. With sliding dovetails, you have to shim the bed to make changes. But with the parallelogram type, you can make adjustments on the jointer itself thanks to a series of built-in cams, no shims necessary. That's a nice feature. But keep in mind that you'll likely pay more for a jointer with parallelogram beds. □

Ellen Kaspern is a woodworker and machine instructor at North Bennet Street School in Boston.

Fences



Rack-and-pinion adjustment preferable. Whether it's to move the fence back and forth over the cutterhead (above) or change its angle (left), Kaspern prefers rack-and-pinion mechanisms because they allow finer, surer adjustments.



Fence should be simple to set and lock tight. A jointer's fence needs to be easy to square (left) and should stay there when locked. While every jointer had a 90° stop for the fence (right), not all were reliable, and would lose their setting.



Dark, Rich Cherry with Household Products

Drain cleaner, roofing tar, and shellac team up for a foolproof finish

BY TIMOTHY PURO

Students often ask me to name my favorite cherry finish. I tell them that there's nothing wrong with using a clear, oil-based finish on this popular hardwood, but I know another finish that imparts deep, rich color and more depth. Better yet, it consists of common products, all available from the local hardware store or home center: lye (in the form of drain cleaner), asphaltum (from roofing tar), and SealCoat shellac.

These inexpensive products darken cherry and highlight the grain in a way that no dye, stain, or oil can on its own, creating

depth and color that attracts attention from across the room. And the shellac makes it durable enough to use on almost any piece of furniture.

The lye reacts with the cherry to create rich color without blotching, and brings out beautiful yellow and orange figured grain lines in the wood. It makes good cherry look great and figured cherry look spectacular. Shellac seals in the first step and lets you then use diluted tar as a glaze, adding more warmth and getting into nooks and crannies to create a subtle aged effect. Used over shellac, the tar glaze is reversible, meaning you can wipe it off if you don't like the look. The final topcoats of shellac deliver shimmering depth and a soft sheen.

I used it on this cherry blanket chest, built by Ralph Buschbacher and his son John, who are woodworkers and clients of mine, and I'll demonstrate the whole process on sample boards.

Prep some sample boards

I always start with sample boards. This is critical for multi-step finishes. One of the main reasons people don't color wood is because they've had bad experiences in the past with dyes and stains, which can be expensive and unpredictable. I'm using inexpensive products and an almost foolproof approach here, but sample boards are still an important insurance policy.

Make yours from the same wood you used to build the actual piece, prepped



Instant aging

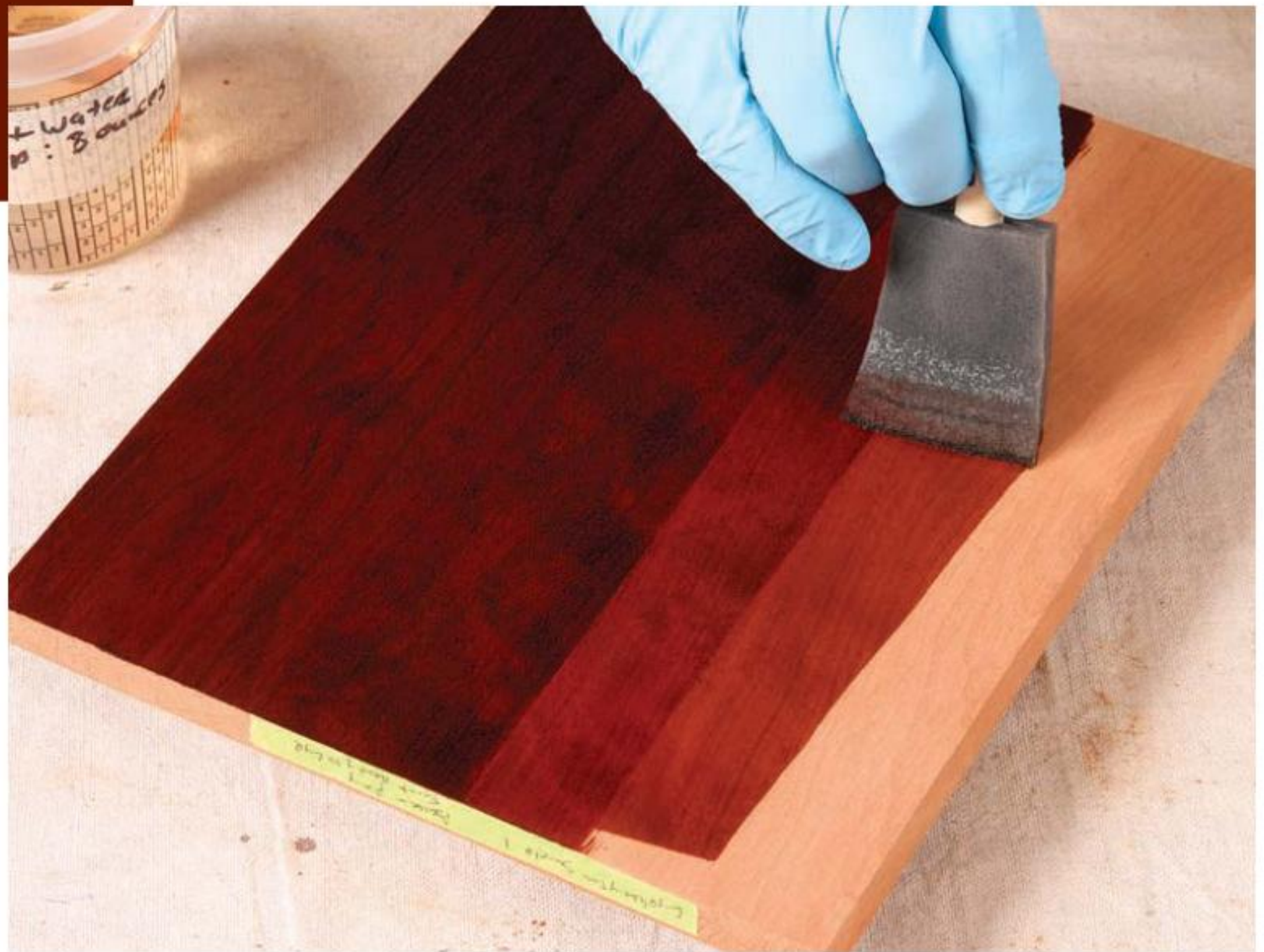
To obtain a rich, aged appearance, Puro uses 100% lye drain cleaner mixed with distilled water, non-fibred roofing tar mixed with mineral spirits, and SealCoat dewaxed shellac right out of the can.

LYE ADDS COLOR

The lye imparts a deep, rich red to the cherry. It will look dark at first, but the color will lighten as it dries.



Stay safe. Wearing nitrile gloves and using eye protection, mix up a solution of 2 tsp. of lye powder to 8 oz. of distilled water, stirring it well. Use a foam brush or rag, and get it wet but not saturated. Work from close to far, so any drips go onto wet wood, not dry, where they would cause spots and streaks. The water will raise the grain, but don't sand yet.



Seal with shellac. Use Zinsser SealCoat out of the can (2-lb. cut) and a Taklon brush, applying one thin coat, waiting 20 to 30 minutes, and then applying another. Working with a cork or rubber block, sand with 320-grit paper to level the two sealer coats and the wood fibers raised by the earlier step. Then apply two more coats, sanding lightly afterward.



the same way. On the back of the board, take notes on each step, such as how you mixed and applied the lye to the wood.

The wood for this project was sanded up to 180 grit. Sanding beyond 180 for a film finish like shellac does not make the wood or the final finish any smoother. Whether you go to 180 or to 1,000 grit, that first coat of finish will swell the wood fibers and make them feel a little rough. That's when the finer sandpaper comes in, to level the finish between coats.

Lye adds rich color with no blotching

Lye, used in soaps and drain cleaners, changes the color of the wood chemically, imparting color without blotching or obscuring the wood's natural beauty. But it's nasty to use, so treat it with respect. Wear long sleeves, nitrile gloves, and use eye protection as you mix the lye and distilled water and apply the solution. I use 100% lye (sodium hydroxide) drain cleaner (Rooto is one brand and Red Devil is another). Lye reacts with metal, so use a glass or high-density polyethylene (HDPE) container from the hardware store.

Like any wood, cherry can vary widely, so if your sample board is still too dark after it dries, make a more diluted mixture and try it on a new sample.

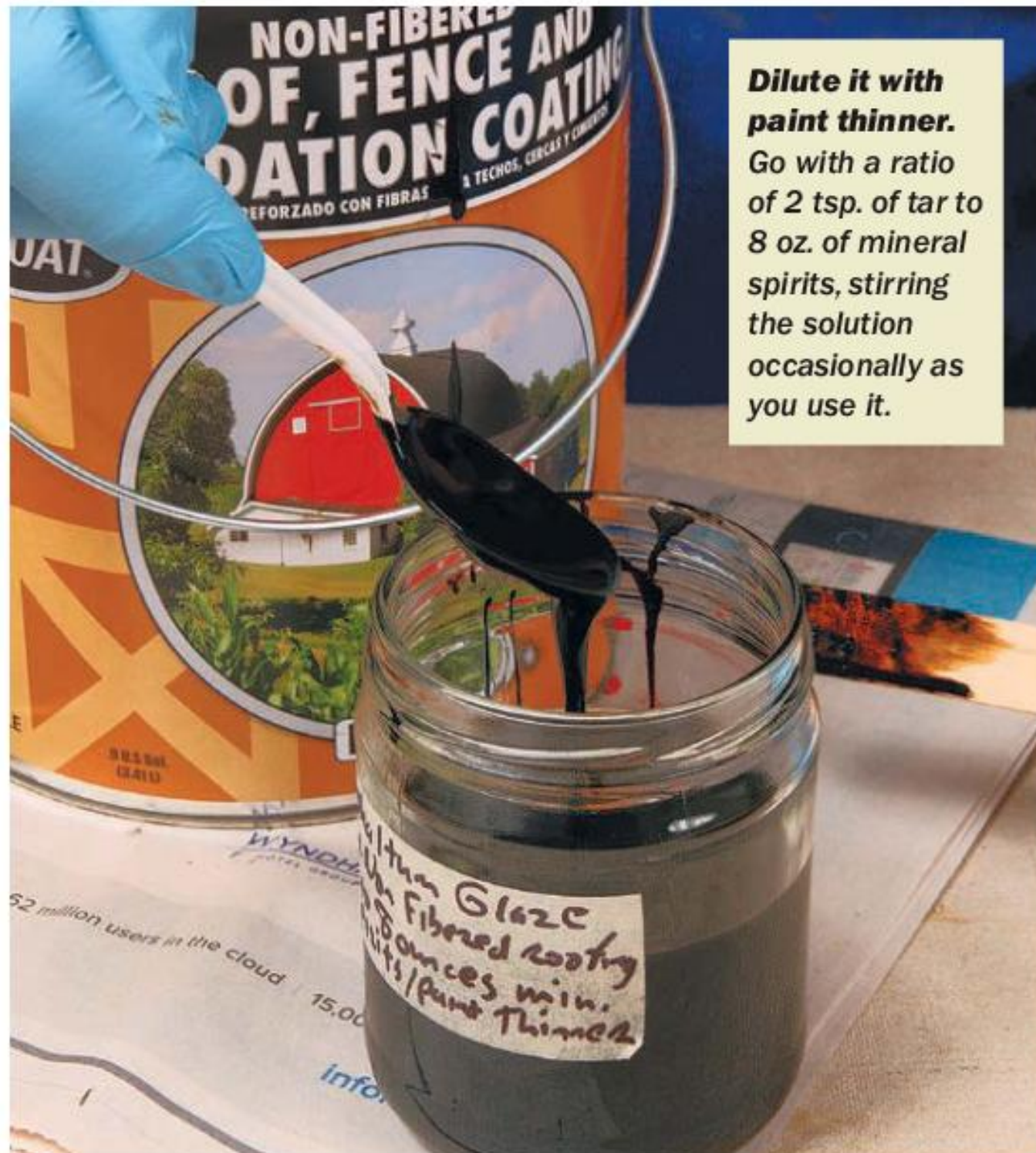
Seal with shellac

The tar will be applied as a glaze, and that requires that the wood be sealed first. The best sealer for this finish is Zinsser's SealCoat, a dewaxed blond shellac that comes in a perfect 2-lb. ratio ("cut") right out of the can. Shellac seals in contaminants like lye really well, but is also a very iridescent finish that shows off color and makes figure shimmer.

I apply four thin coats of shellac, two at a time, using a golden Taklon artist's wash brush. The Taklon brush allows you to quickly apply a very thin coat of shellac, which dries and can be recoated

ASPHALTUM ADDS AGE

Applied over the shellac, the diluted tar acts as a glaze, which is easy to wipe away if you don't like the look.



almost immediately. (I like the 1-in. oval wash Robert Simmons Sapphire #52, available at dickblick.com.) Always pour the finish you need out of the can into a separate container before using it, so you don't contaminate the rest of the finish with any dust, stain, or gunk you pick up on the brush or rag.

After two hours, sand the first two sealer coats smooth and level with a 320-grit, stearated sandpaper, such as 3M pro-grade. Change the paper when the shellac builds up on it.

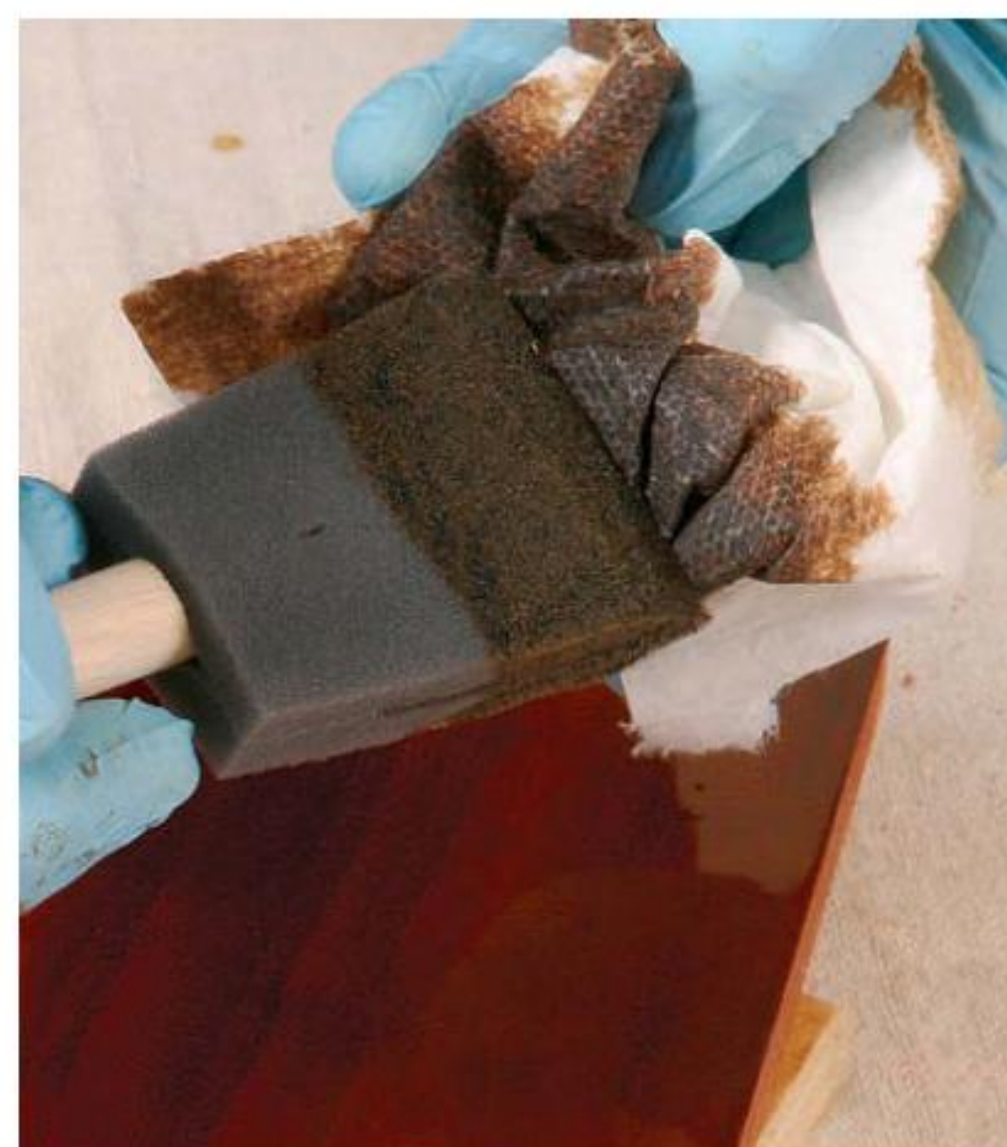
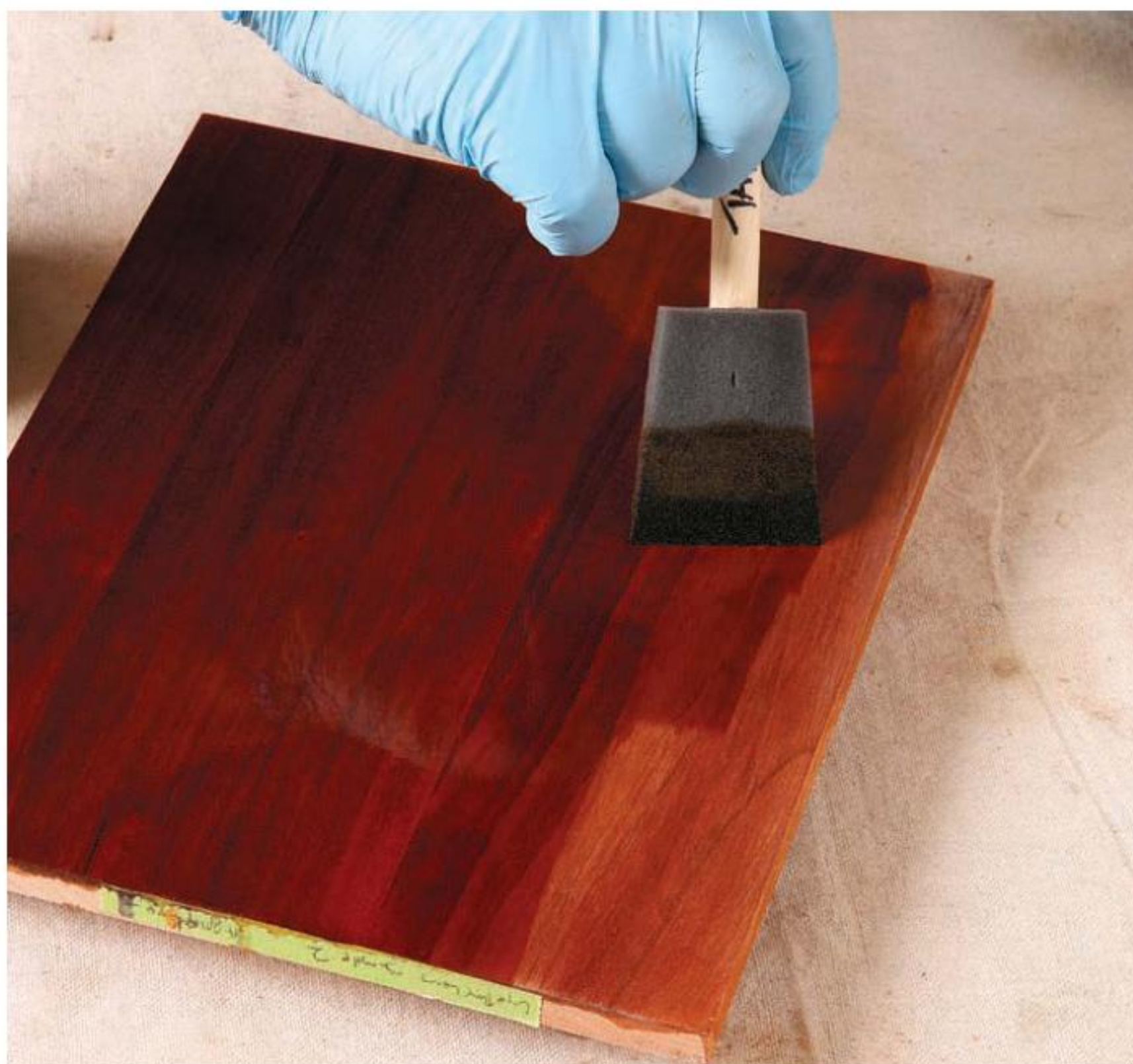
Continue with two more coats of shellac, applied as before. After these cure for a few hours, lightly sand the surface with 320-grit paper, and wipe off the dust with a clean paper towel lightly dampened with water. Don't skip this last sanding step, because the glaze will accentuate any brush marks you leave behind.

Add age and warmth with tar

Asphaltum has been used for generations to add instant age to gilded frames, and it's a secret weapon for refinishing shops that want to make stripped and sanded furniture look old again. Better yet, it is widely available as roofing tar. Look for the non-fibered variety. The only ingredients should be asphalt and mineral spirits.

You will be significantly diluting the tar, creating a thin wash that will subtly mimic the decades of dirt that accumulates on old furniture. Apply the glaze with a rag or a brush to create a warm, rich look. Make sure that you leave enough glaze behind so it is noticeable. I find that people who try the tar glaze for the first time tend to brush or wipe off too much.

Once the mineral spirits flash off, in 20 to 30 minutes, lock in the glaze with a thin coat of shellac—full-strength SealCoat again, applied lightly with the Taklon brush. Don't overbrush it or you



Brush it on. A foam brush works well here, too. Work in the direction of the grain. You can unload the brush on a paper towel as you adjust the look, but leave enough glaze on the wood to have an effect. The glaze is self-leveling, so don't worry too much about brush marks. After about 30 minutes, the mineral spirits will have evaporated and you can move to the next step.

SHELLAC FOR A FINAL FINISH

The final coats of shellac act as a magnifier, and rubbing them out with steel wool creates a soft sheen and a buttery feel.



Final topcoats are just more shellac. Be sure to sand with 320 or 400 grit between the coats, but not after. Let the entire finish fully cure for a few days before rubbing out that last topcoat.

THE MAGIC OF TAKLON

Look for an artist's wash brush, made with golden Taklon fibers, available at art-supply stores. These lay down thin, level coats of shellac, which dry quickly.

will lift the tar. An alternative is applying a thin coat of lacquer from an aerosol can. Don't wait long before sealing in the tar or you will allow more dust to accumulate on the surface. This sealer coat might be a little bumpy because it is resisting the tar, but don't sand it yet. You might sand through. Move on to the topcoats.

Two or three topcoats and you're done

The final coats will magnify the effects of the glaze and give the finish real depth. Apply two or three more coats of SealCoat at full strength, waiting three to four hours between each coat, lightly sanding and leveling each one with 320-grit paper.

When I'm satisfied with the finish's thickness and depth, I let the piece rest for three or four days until the shellac dries fully. Then I rub the surface to a satin sheen with 0000 steel wool, Behlen's Wool-Lube, and water. The Wool-Lube leaves its own slick coating on the surface, so there is no need to apply wax.

If you still aren't convinced by your sample board, make another one with your normal clear coat and ask friends to pick their favorite. When they point to the multi-step finish, you'll have a winner. □

Tim Puro is a professional finisher and finishing teacher in Bloomington, Ind.



Rub out the finish with steel wool and a lubricant. Behlen's Wool-Lube works beautifully. Squirt some on a pad of 0000 steel wool, mist with water, and buff the final surface evenly. Wipe off the water to reveal a soft sheen. There's no need for wax.



The Illustrated Cutlist

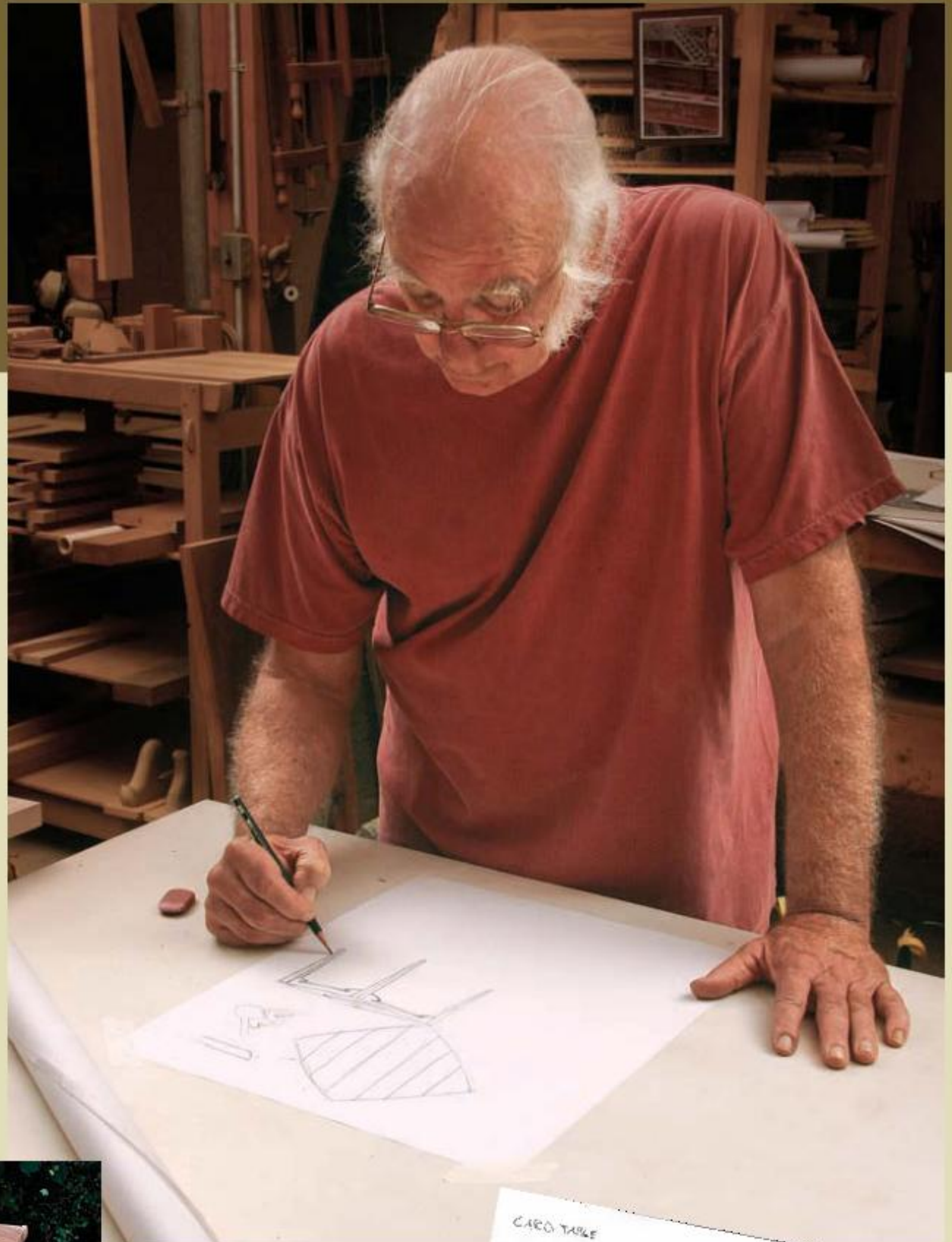
Innovative approach
turbocharges this staid
staple of the craft

BY HANK GILPIN

A couple of years ago I asked a friend of mine, an excellent craftsman with decades of experience, to build a piece of furniture that I had designed. In addition to measured drawings of the piece, I gave him a cutlist. The next time we talked he said, "Yow, Gilpin, that cutlist of yours is an incredible tool! It made planning and building way simpler. Anyone in the shop could pick up the job at any point and understand it." I was a little surprised, and it made me think about the method I developed for doing cutlists. So here it is.

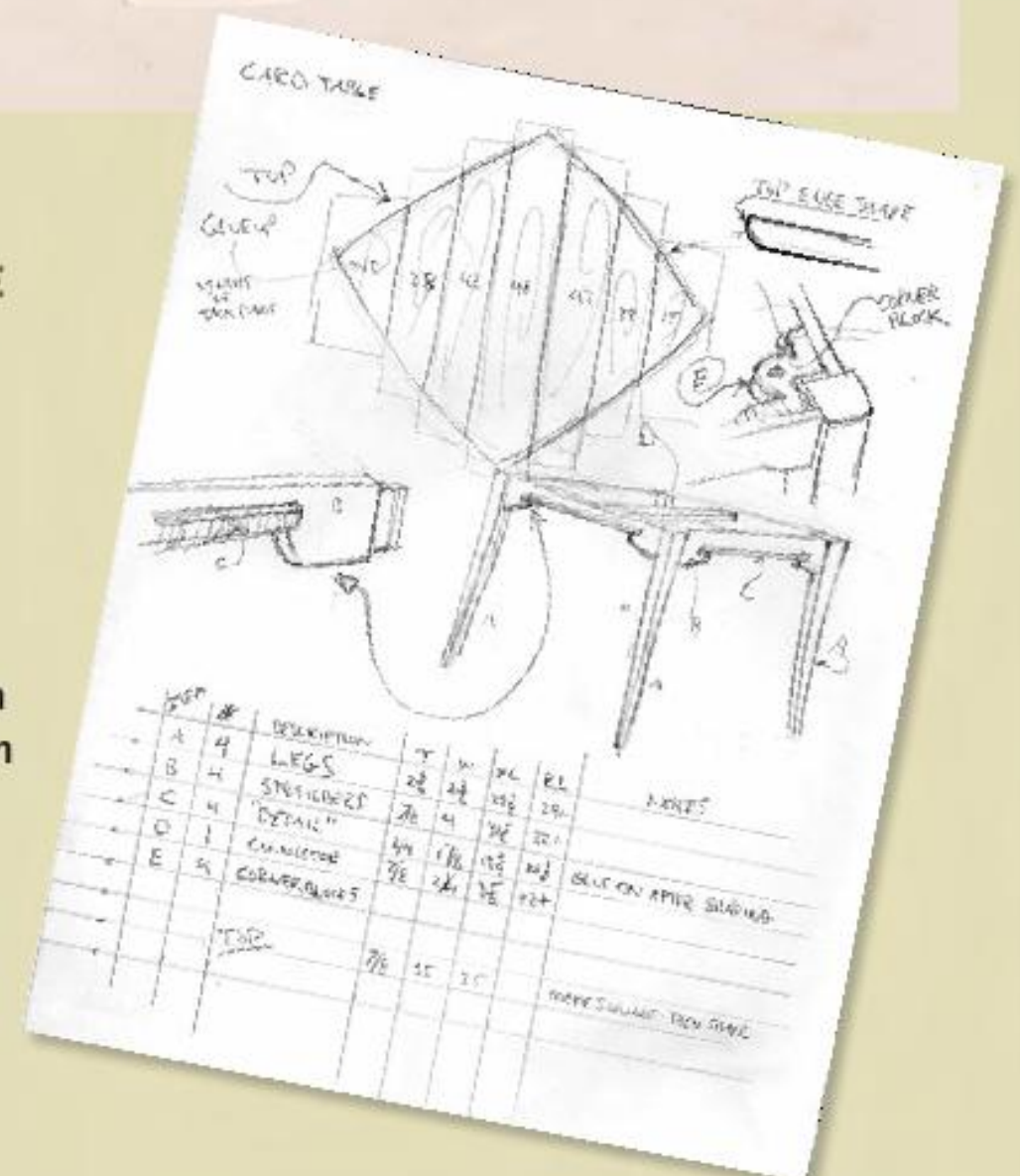
The illustration is essential

The most important element is a three-quarter-view freehand sketch of the piece on the same page with the parts list. Having that sketch right there makes it much easier to envision each part. It's also very helpful when I'm selecting the wood and as I'm milling, cutting, shaping, and joining it. I include quick detail



A VISUAL GUIDE FOR BUILDING

For this veteran furniture maker, a cutlist is not just a jumble of numbers. Gilpin includes labeled sketches on the same sheet with the list of parts, enabling him to easily envision the piece and all its parts throughout the build.



Making an illustrated cutlist

ANATOMY OF A USEFUL CUTLIST

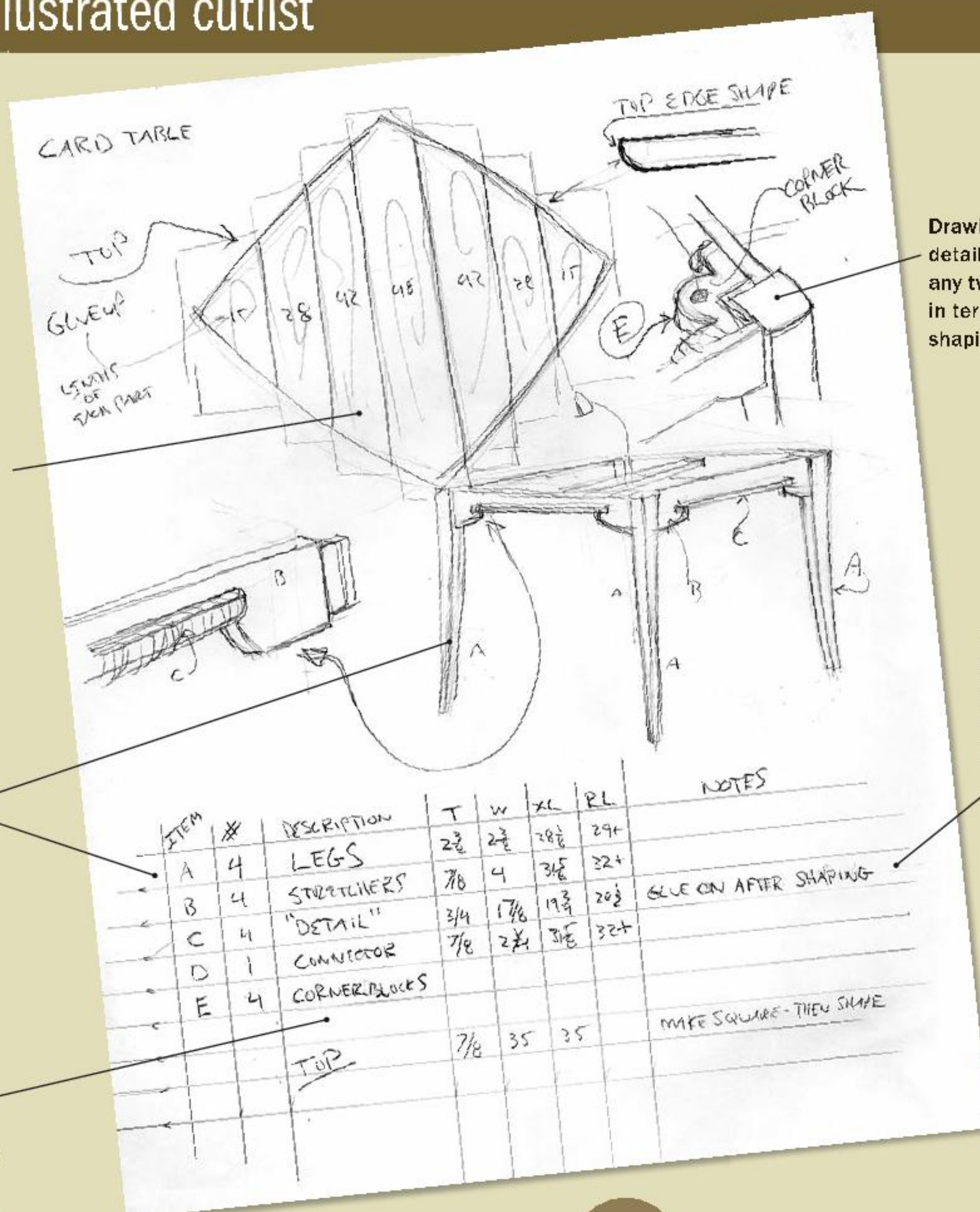
A freehand sketch brings the list of parts to life. All through the milling and building process it gives you a convenient reference image of the piece you're making.

Each part gets a letter in the grid, on the sketch, and on the end grain of the workpiece.

Parts are named on the list but labeled simply by letter on the workpiece, saving lots of writing and erasing.

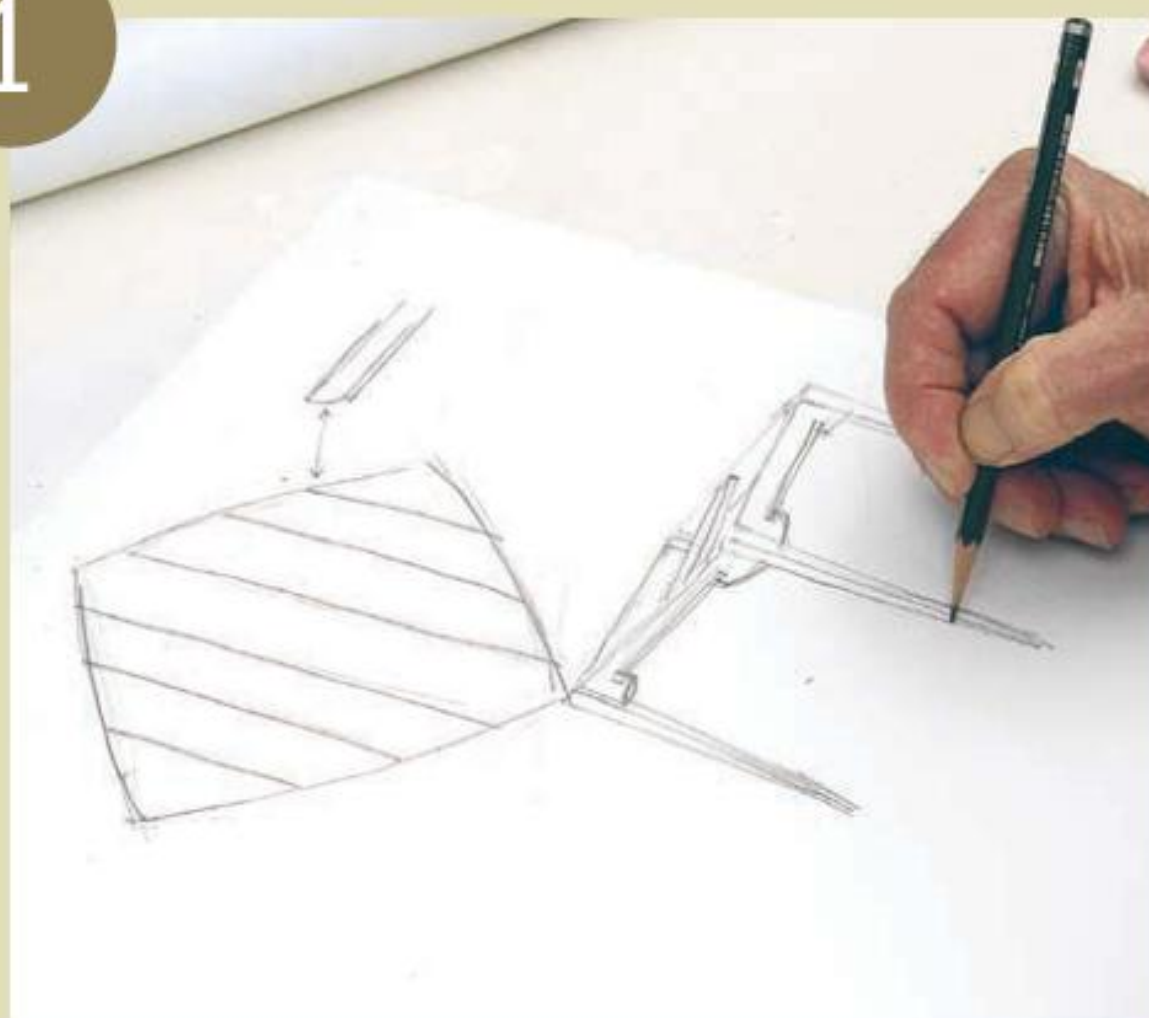
Drawings of selected details illuminate any twists in the road in terms of milling, shaping, and joinery.

The Notes column provides a place for information about unusual shaping or joinery.

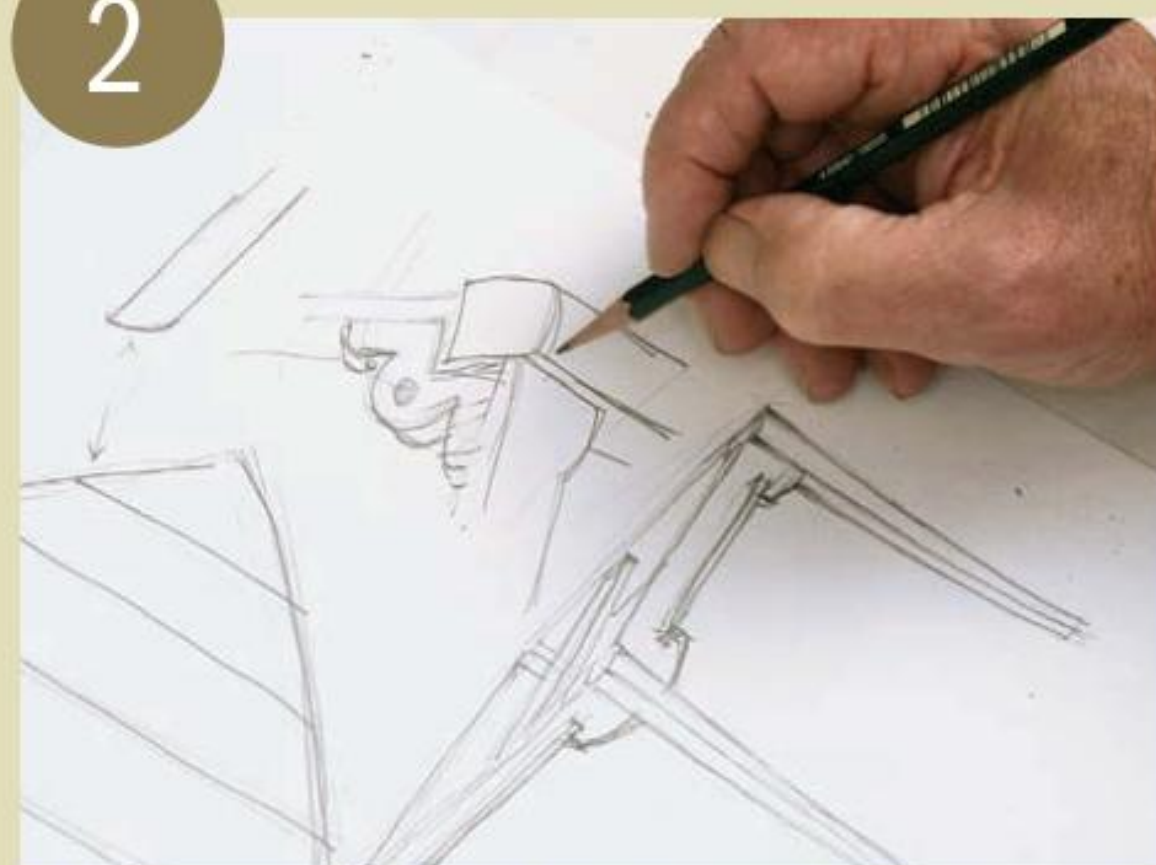


1

Start with a sketch. After designing the piece and doing full-scale shop drawings, Gilpin begins his cutlist with a three-quarter view freehand drawing.



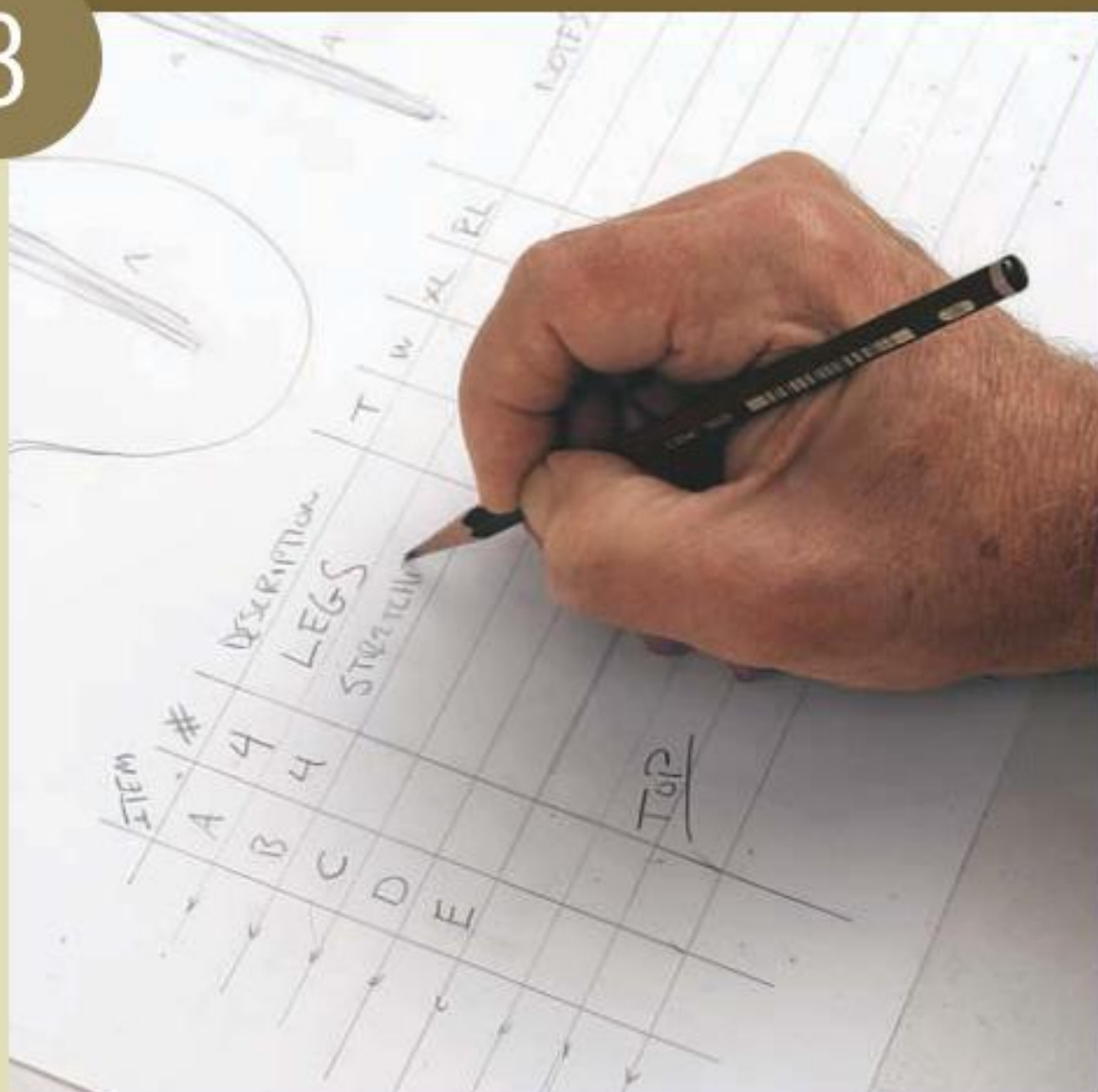
2



Add prominent details. Where he feels they will be helpful for envisioning the way the piece is to be built, Gilpin adds quick sketches of certain details to the cutlist.

3

Alphabetize. Parts are lettered to simplify labeling both on the drawing and on the workpieces. All parts shaped alike are lettered alike.

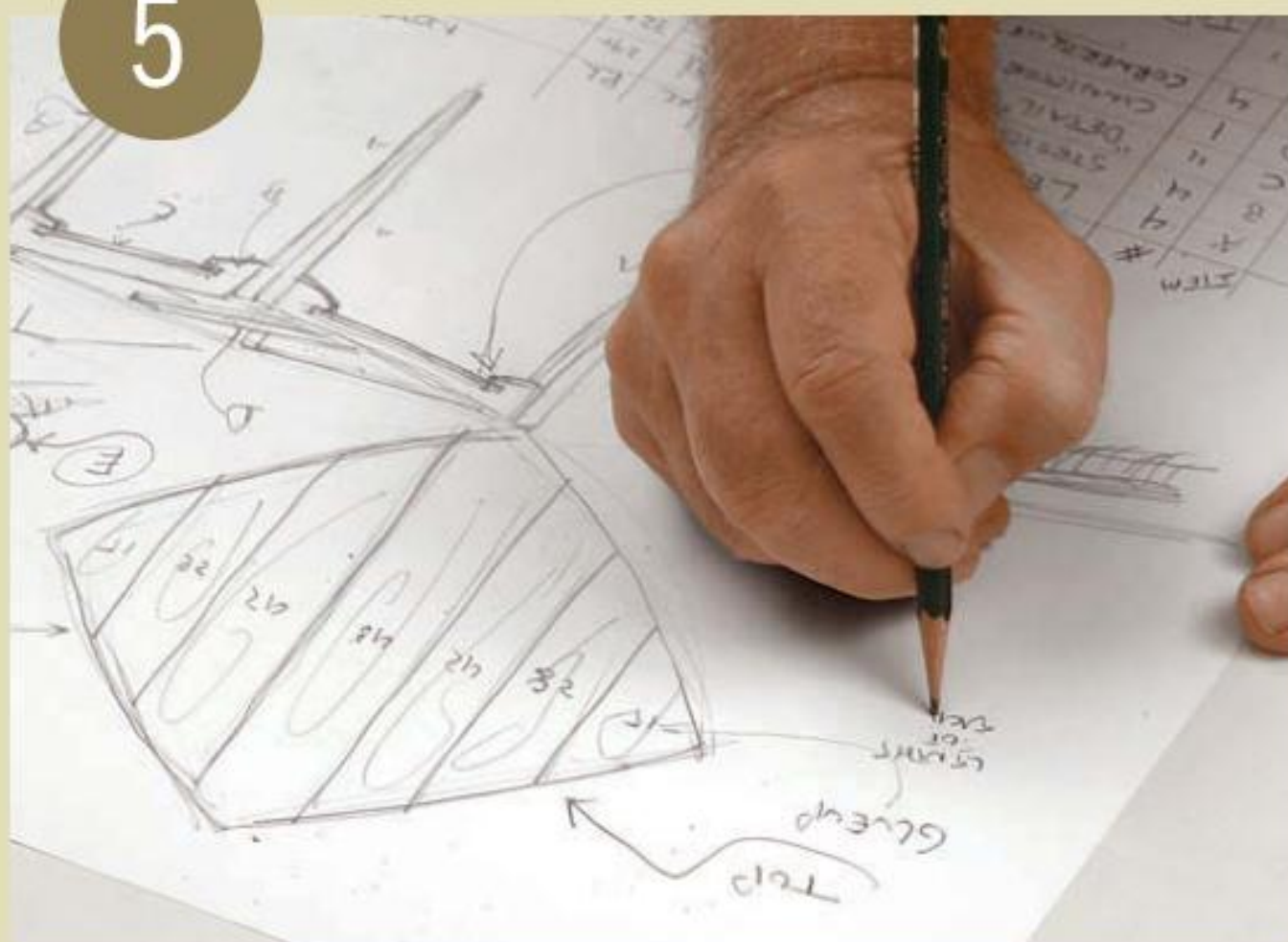


4



Take notes. Notes aren't always necessary, but sometimes they're key. Gilpin adds information in the Notes column for parts that will be milled, shaped, or glued up in an unusual way.

5



Focus on the less familiar. One of the detail sketches for Gilpin's table explains how the top will be glued up from narrow soft maple boards contrasting heartwood and sapwood.

drawings of joinery and shaping. These sketches are an invaluable reference during the job, but they don't take the place of full-scale shop drawings, which I do before making the cutlist.

Big, stiff sheet

What kind of paper should you create the cutlist on? It could be anything: scratch paper, a yellow lined pad, white printer paper, whatever works. I use 14-in. by 17-in. sketchpad sheets clipped to a piece of 1/4-in. plywood. I like this size because it allows for a fairly large and detailed sketch along with the grid listing the parts. The plywood backer keeps the cutlist in good shape as it follows you through the job. And after using the cutlist I keep it in a stack with the others from over the years until the next time I make the same piece.

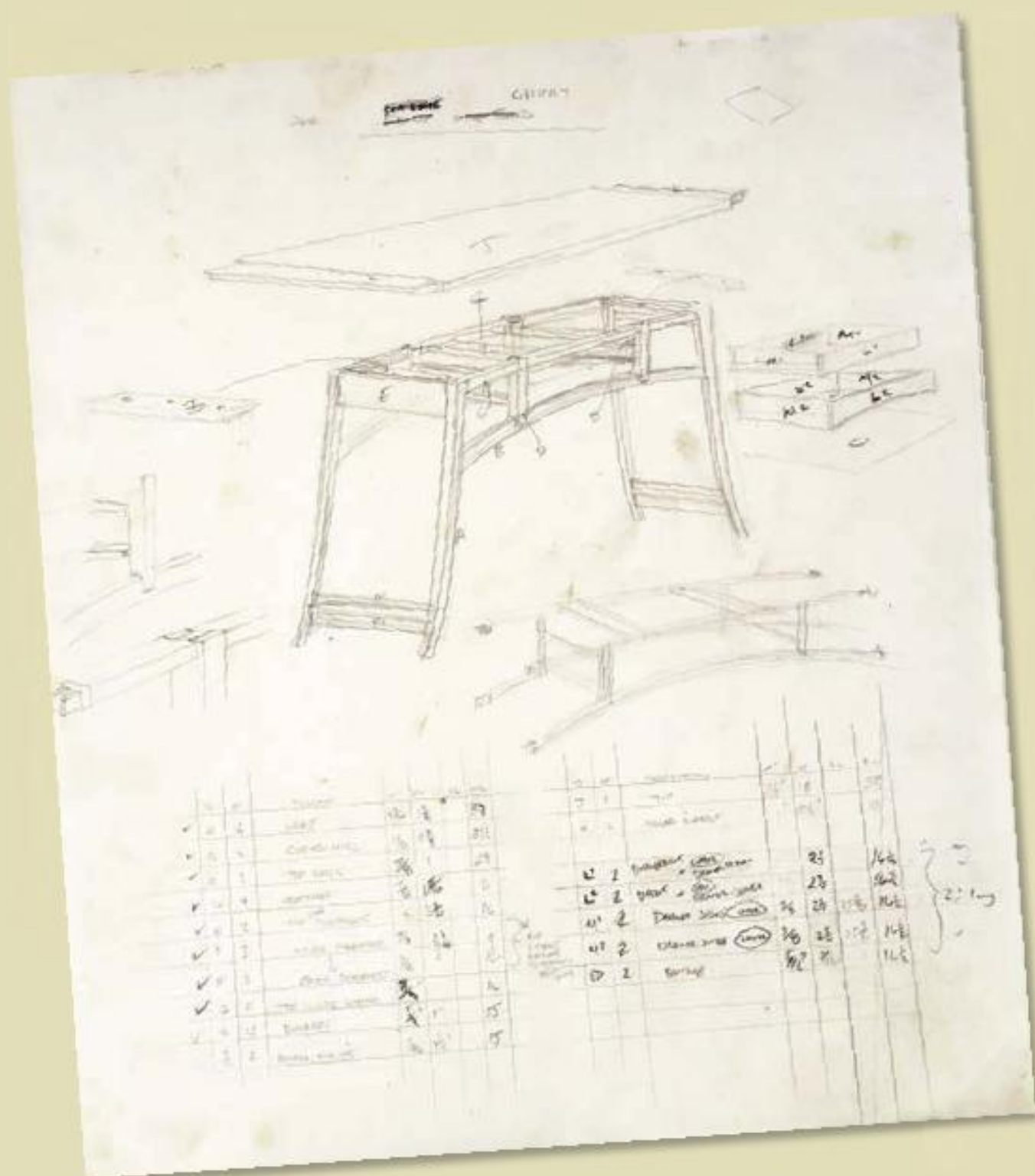
I make the grid with nine columns. The first column is left open, and I use it to make a checkmark when I've rough-cut the part. I cross the checkmark when I cut the part to final size.

6



Put it to use. The cutlist, providing a clear view of the finished piece and all of its parts, helps Gilpin make well-informed wood choices at the lumber rack.

Cutlist case studies



A few well-chosen joints. Two quick detail drawings on the cutlist for Gilpin's cherry sideboard elucidate the unusual joinery of the vertical drawer dividers. Another detail conveys in a few lines how the lower drawer front curves to match the arched stretcher.

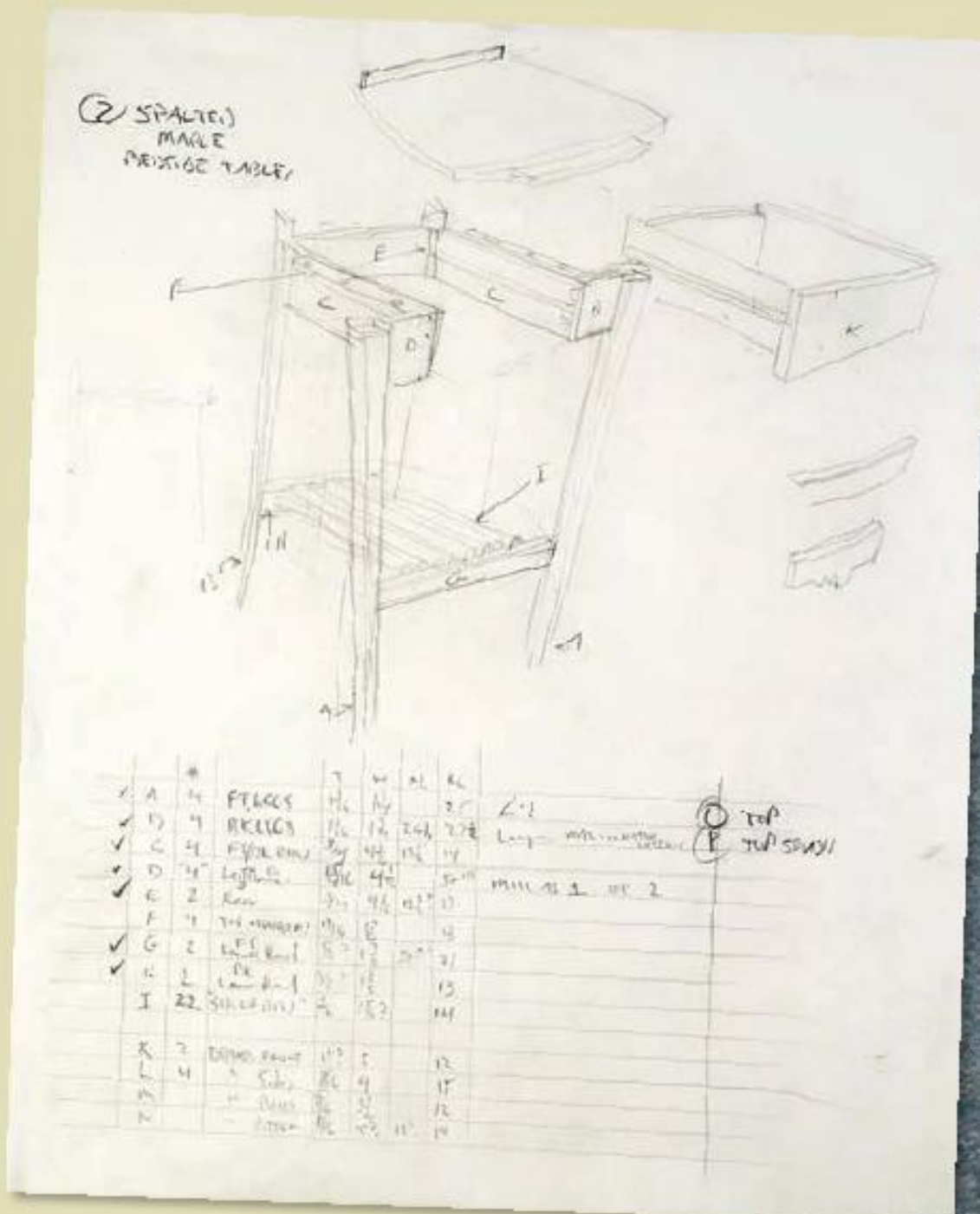
Alphabetize the furniture

The most important column is the second one, the Item column. I label each part in the piece with a letter. Parts that are exactly alike—the drawer dividers in a chest, for example—all get the same letter. The letters show up on the drawing, in column two on the cutlist, and on the parts themselves. Instead of having to write out the name of each part on dozens of workpieces, a single letter on each does the job. I sometimes prioritize the parts, putting the more complex or prominent ones at the top of the list.

The column marked with a number symbol (#) tallies the like parts you'll make, and the Description column names the parts, tying the letter to the specific part.

Dimensions

In addition to columns for thickness and width, I usually include one for exact length and another for rough length. Many parts in a piece of furniture have angled



Just enough to go on. Gilpin doesn't worry about making a tidy or totally accurate drawing on his cutlist; he just wants a sketch that clearly shows how the piece will be built. The drawing for this spalted maple side table focuses on the unusual structure of the drawer pocket.



Online Extra

There are many ways to use cutlists. If SketchUp is your method of choice, check out FineWoodworking.com/273.



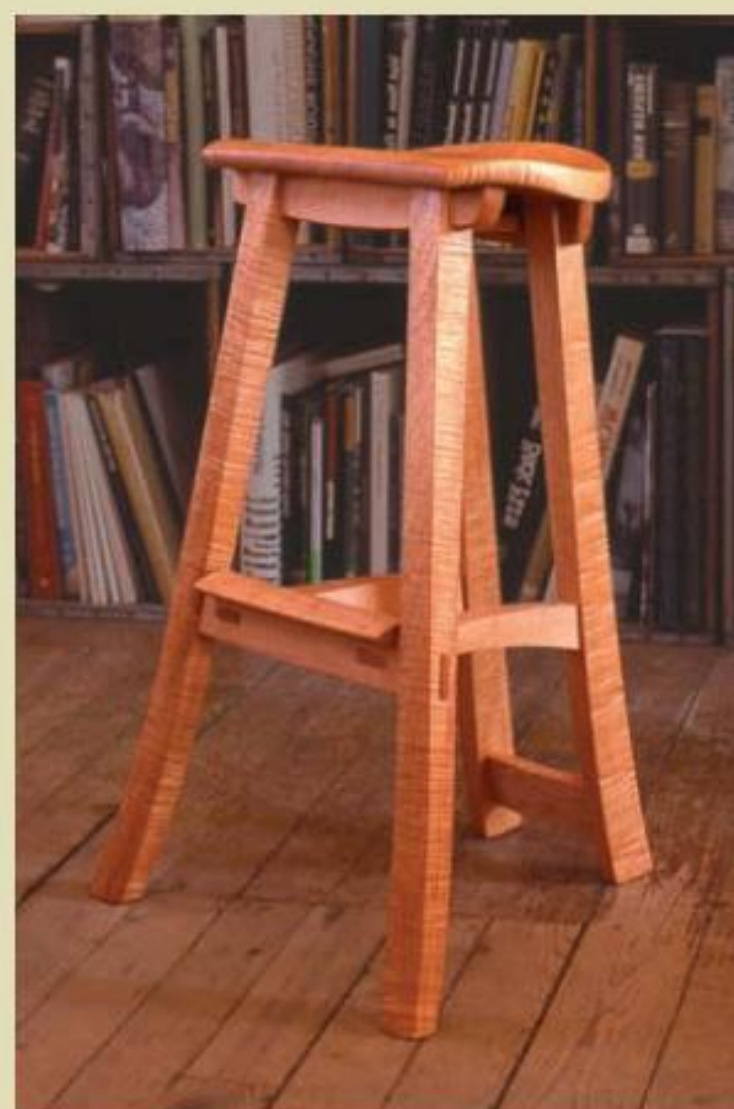
Complexity clarified. Gilpin's chest of drawers in elm may appear elegantly simple in a photograph, but his cutlist reveals—and provides a sure guide to—its many parts and subtleties.

ELM CHEST
TAGE FRID 1/8

ITEM	QTY	DESCRIPTION	W	H	THICK	REMARKS
✓ A	4	LEG'S	2 1/2	24	1 1/2	
✓ B	2	FRONT LAY	1 1/2	24	1 1/2	
✓ C	2	SIDE LAY	1 1/2	24	1 1/2	
✓ D	2	SPR. BACK	1 1/2	24	1 1/2	
✓ E	2	SPR. BACK	1 1/2	24	1 1/2	
✓ F	3	DR. DRAWER	1 1/2	12	1 1/2	
✓ G	3	DR. DRAWER	1 1/2	12	1 1/2	
✓ H	1	TOP	1 1/2	24	1 1/2	
✓ I	1	TOP	1 1/2	24	1 1/2	
✓ J	1	TOP	1 1/2	24	1 1/2	
✓ K	1	TOP	1 1/2	24	1 1/2	
✓ L	1	TOP	1 1/2	24	1 1/2	
✓ M	1	TOP	1 1/2	24	1 1/2	
✓ N	1	TOP	1 1/2	24	1 1/2	
✓ O	1	TOP	1 1/2	24	1 1/2	
✓ P	1	TOP	1 1/2	24	1 1/2	
✓ Q	1	TOP	1 1/2	24	1 1/2	
✓ R	1	TOP	1 1/2	24	1 1/2	
✓ S	1	TOP	1 1/2	24	1 1/2	
✓ T	1	TOP	1 1/2	24	1 1/2	

STOOL

ITEM	QTY	DESCRIPTION	W	H	THICK	REMARKS
✓ A	4	LEG'S	2 1/2	24	1 1/2	
✓ B	2	FRONT LAY	1 1/2	24	1 1/2	
✓ C	2	SIDE LAY	1 1/2	24	1 1/2	
✓ D	2	SPR. BACK	1 1/2	24	1 1/2	
✓ E	2	SPR. BACK	1 1/2	24	1 1/2	
✓ F	3	DR. DRAWER	1 1/2	12	1 1/2	
✓ G	3	DR. DRAWER	1 1/2	12	1 1/2	
✓ H	1	TOP	1 1/2	24	1 1/2	
✓ I	1	TOP	1 1/2	24	1 1/2	
✓ J	1	TOP	1 1/2	24	1 1/2	
✓ K	1	TOP	1 1/2	24	1 1/2	
✓ L	1	TOP	1 1/2	24	1 1/2	
✓ M	1	TOP	1 1/2	24	1 1/2	
✓ N	1	TOP	1 1/2	24	1 1/2	
✓ O	1	TOP	1 1/2	24	1 1/2	
✓ P	1	TOP	1 1/2	24	1 1/2	
✓ Q	1	TOP	1 1/2	24	1 1/2	
✓ R	1	TOP	1 1/2	24	1 1/2	
✓ S	1	TOP	1 1/2	24	1 1/2	
✓ T	1	TOP	1 1/2	24	1 1/2	



Multiplication is no problem. On one job for a home in southern Florida, Gilpin built 14 of his signature bar stools in 13 different woods, most native to the region. For the cutlist, one quick drawing and a short list of parts did the trick for all of them. He simply added a vertical column to the right of the grid for each additional species, enabling him to check off and keep track of the scores of parts.

ends—legs, stretchers, drawer fronts, etc.—and determining exact final length can be vexing. So I find that adding some extra length to the workpiece simplifies the thing. I sometimes have a column for rough width, but not often.

Notes to self

The last column is a vital one. My assistants call it Notes, and it's where you make little reminders to yourself. You might write: "mill to 13/16's and cut down after joinery." Or remind yourself to "laminate to achieve final thickness," "leave extra width for joinery," "cut angled shoulders before tenons," "mill AFTER joinery." Or the note could be that the drawer parts are of a different species than the rest of the chest. Often this column is empty, but it is valuable for those times when you really need to take note. □

Hank Gilpin, a student of Tage Frid, has been making furniture since 1974.

Tilt-Top Table

Clean lines and
a clever pivot highlight
this attractive
and useful table

BY WILL MYERS

I found the inspiration for this table inside one of the handsome brick buildings of Tryon Palace in New Bern, N.C. Built as the residence and headquarters of North Carolina's British governor in 1770, Tryon Palace was seized by American forces in 1775 and served as the state capitol until 1794. Destroyed by fire in 1798, the palace was rebuilt to the original plans in the 1950s, and fitted with furniture appropriate to the period. The table that caught my eye was in the palace's kitchen building.

Commonly called a wine-tasting table, it has a round top that pivots on two pins so that it can be brought vertical and stored against a wall. There is a swing arm that looks like an inverted A in the frame that spins out to support the top when it's swung down for use, and rotates back flush with the frame when the top is up for storage.

The table I'll show you how to make here is slightly different from the one at Tryon Palace. It has a larger top, and I've given the feet a modern shape. Also, the original



SMALL FOOTPRINT

With the top swung up, the table fits neatly against a wall, freeing up floor space.



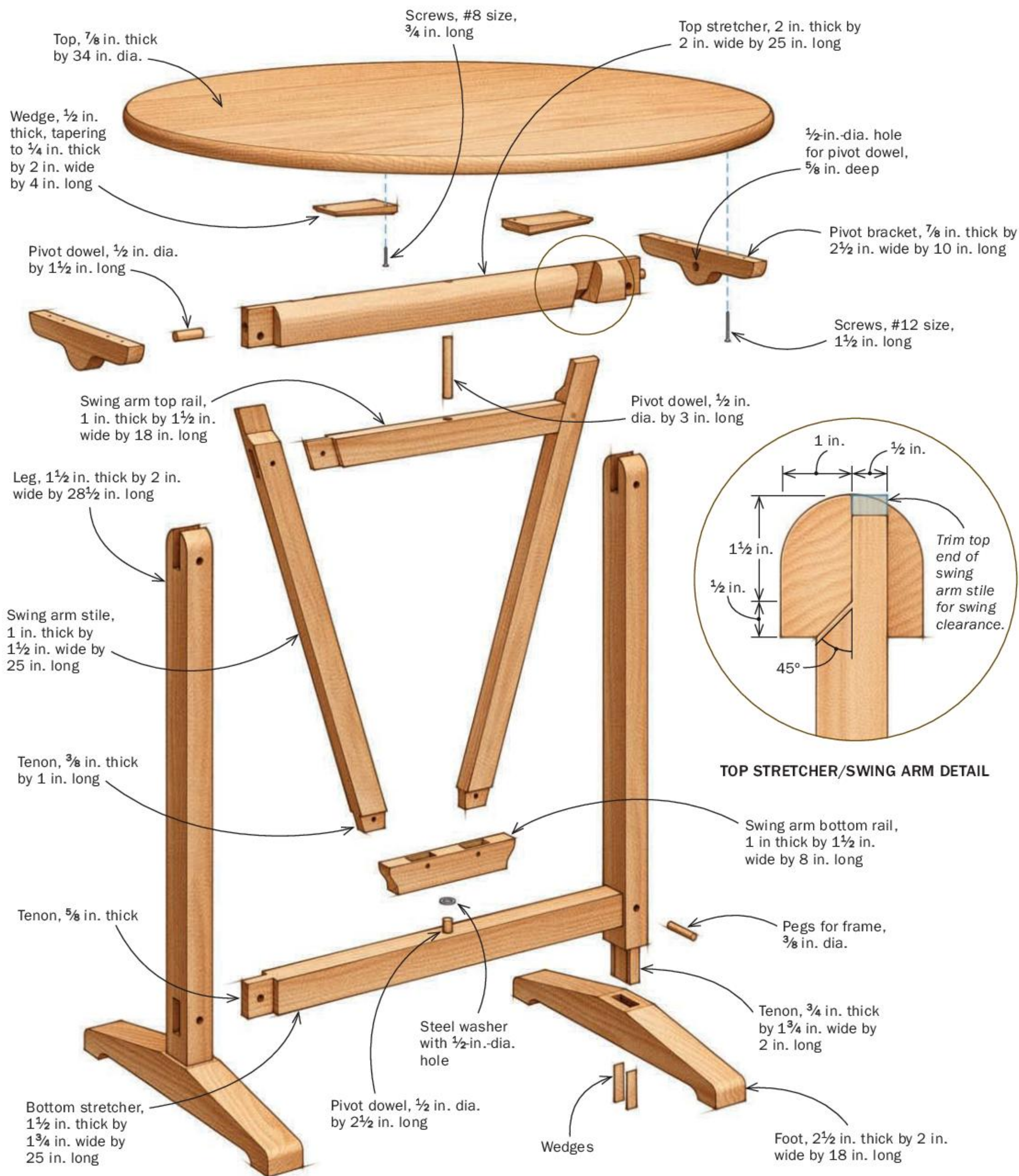
READY FOR DINNER

Swing the top down and you have a beautiful table ready for a cozy meal.



Beautiful, practical, and ingenious

This is a great project to make with hand tools, as the joinery is almost all mortise-and-tenons. A rectangular frame supports the top, and a rounded top stretcher and pivoting swing arm allow the top to swing up for storage and down when you want to use it.





END VIEW



This isn't a difficult table to make, and it's a great project for hand tools. I cut all the joinery by hand, and after milling, it took just a couple of days to make the table. It's a handy table to have in the house. It doesn't take up much floor space when not in use, and it is ready to seat four in a quick minute when company shows up.

Beneath the table's round top is a rectangular frame that consists of two legs and two stretchers. You can make the feet at the same time that you make the frame, but don't attach them until right before you add the top. They'll just be in the way as you make and install the swing arm.

Because I cut all of the joinery with hand tools, I carefully lay out joint locations with paired parts, such as the legs, clamped together. After laying out all of the joinery, I chop the mortises with a chisel and mallet. I use the same technique for the slot of the bridle joint at the top of the leg.

Start with the frame

The structure of the table's base is fairly simple: two legs joined in a frame by two stretchers and stabilized by two feet. It's held together with mortise-and-tenon joinery, so it's plenty strong.

Round the top stretcher. After dry-fitting the frame, use a compass to lay out a half circle on each end of the top stretcher (right). Take the frame apart, and then round over the top of the legs with a chisel (far right). Finally, use a plane to rough out the arc on the top edge of the stretcher (below).



However, the through-mortises in the feet are better done by first drilling out the waste with a brace and bit, and then squaring them with a chisel.

Cut the tenons next. After they're done, dry-fit the legs and stretchers. The top stretcher must be rounded over so that the top can pivot, so assemble the frame, clamp it in your bench vise, and lay out the half circle with a compass. Pull the frame apart and rough out the roundover. On the top of the legs, I use a chisel and mallet to remove most of the waste, and then refine the curve by paring to the layout lines. For the top stretcher, I use a jack plane to round the top edge roughly at this point.

Now glue the frame together. After the glue has dried, clamp the frame in your bench vise and refine the roundover on the top stretcher. It doesn't need to be perfect to work well, but I get the facets as small as I can, and then run some



Glue up the legs. Spread glue on the joinery and then bring the parts together. Add clamps to keep the joints tight as the glue dries.



Peg the joints. After the glue has dried and you've drilled holes through the joint, spread some glue in the hole and knock in a peg.



Smooth the curve. Final rounding comes after assembly. It doesn't need to be perfect, but it should be straight. You can smooth small facets with sandpaper.

Make the swing arm

The tabletop is supported by a simple but ingenious mechanism: the swing arm, a four-piece frame that spins on two pins and stores flat within the frame when the table is not in use.



sandpaper over the surface to remove them.

Swing arm pivots on two pins

The best way I have found to make the swing arm and get a good fit is to lay the base frame on my bench and then lay the arm's parts on top of it. This method of layout quickly and accurately gives you the tenon and mortise locations for the entire swing-arm assembly.

To begin, mill the parts to their final width and thickness, but leave them a few inches too long, so you have some leeway when laying out the swing arm.

After you've laid the stiles on the base frame, place the rails on top of them. The bottom edge of the bottom rail should be just even with the top edge of the frame's bottom rail. The top rail should be about $\frac{1}{4}$ in. below the bottom edge of the top stretcher. With a pencil, mark the stiles where the upper and lower rails cross them. Before you move anything, also make tick marks on the rails to



No-fuss layout. Locate the two stiles on the base frame (top). Then, after placing the rails on the stiles, trace their location onto the stiles (above). Also, make tick marks on the rails to locate the edges of the stiles.



Big caul is a big help. Because of its width, the caul applies adequate pressure on the joints at the bottom of the swing arm, even with light clamping pressure, which is necessary to avoid damaging the top rail.



Dry-fit the swing arm. Place a washer over the bottom pin (so that the swing arm doesn't scrape the stretcher) and put the bottom of the swing arm on the pin (above). Then position the swing arm's top rail beneath the frame's top stretcher (right) and press a pin through the frame and into the swing arm.



Mark where the swing arm hits. The frame's top stretcher gets "pockets" so the swing arm can close flush with the frame. A snug fit isn't necessary, so make the pockets wider than the arm. After defining the sides of the pocket with a saw, remove the waste in chunks with a chisel (right), but be careful not to go too deep.



Swing arm needs a rabbet to match. Pivot the swing arm into the pocket and mark where the bottom of the frame's top stretcher hits the swing arm (above). After roughing out the rabbet with a saw, clean up the surfaces with a chisel (right).



Finish up with the feet and top

After installing the swing arm, you are ready to add the feet. They dance a delicate line between small enough for the table to remain compact when against a wall and large enough to steady the table when put to use.

Glue in the pivot pins. It doesn't matter if you glue the pins to the frame or the swing arm. Just don't glue them to both.



locate the edges of the stiles. Cut the mortise-and-tenon joinery.

Before you glue the swing arm together, prep the inside edges of the parts for finishing, and shape the ends of the bottom rail. After you've glued up the swing arm, it's time to install it in the base frame.

The swing arm mounts on two 1/2-in.-dia. pins. After drilling through-holes in the base frame and stopped holes in the swing arm, fit the lower pin into the frame (no glue), put a washer over it, and put the swing arm on it. Then align the hole in the swing arm's top rail with the one in the top stretcher and push the pin into place.

Now rotate the swing arm so that it presses against the frame. Trace around the arm's stiles where they hit the top stretcher. Remove the swing arm from the frame, and cut notches in the top stretcher to house the swing arm when it's not in use. Then cut mating rabbets in the top of the swing arm stiles. This allows the swing arm to close completely in line with the frame.

It's time to permanently install the swing arm. You can glue the pins into either the base frame or the swing arm. By spinning the swing arm when it's dry-fitted in the frame, you get a sense of whether the pin spins better in the arm or the frame. Glue it into the one in which it doesn't spin as well.

Attach the feet to the base now. Then, after making the top and the pivot brackets, attach the top to the base. Put the pivot pins into the ends of the frame's top stretchers, and fit the brackets to the pins. Screw them to the top. Finally, screw the wedges to the top. Apply your favorite finish, and then move the table into the house and enjoy its beauty and utility. □

Will Myers makes furniture in Hamptonville, N.C., and teaches hand-tool woodworking at The Woodwright's School in Pittsboro, N.C.



Wedge the feet.
The wedges lock the tenon into the mortise, ensuring that the foot won't work free from the leg.



Attach the top.
Keep the seasonal movement of the top in mind when spacing the bracket from the frame.



Wedges lock the swing arm.
Size them so they provide enough tension to hold the arm open but not so much as to bow the top.

Inspiration for our readers, from our readers

DAVID BOEFF

Lakewood, Ohio

This block-front chest of drawers is a reproduction of a John Townsend bureau, circa 1785–1790, on display at the Yale University Art Gallery. Boeff used drawings provided by the gallery to reproduce the piece. The crosshatching detail in the center of the carved shells is rare—Townsend used it on this piece and only one other, Boeff says.

MAHOGANY, 20D X 36W X 34H



ERIN IRBER

Fort Bragg, Calif.

Before beginning her studies at The Krenov School, Irber took a solo backpacking trip near the Devils Postpile National Monument in California and put her endurance to the test. This console table, with its post-and-panel construction, marquetry, curved front, and bent-laminated drawer fronts, also pushed her to the limit. “It was another kind of test—a test of dedication, creativity, and hard work.”

SAPELE, 12D X 42L X 34H

Photo: Todd Sorenson

JOHN DeHOOG

Ann Arbor, Mich.

This box has three primary parts—a sliding lid, a hinged lid, and the carcase. Although DeHoog has made versions with finger holds, pulls, and other details, he made this one minimal in design “as an opportunity to play with color and proportions in this otherwise simple form.”

DOUGLAS FIR, GONCALO ALVES, AND WENGE
6W X 8L X 2¼H





MATTIE HINKLEY

Richmond, Va.

Named "Pennsylvania valet" for the state where George Nakashima's studio is located and loosely inspired by his work, this box, veneered in nutmeg, sits atop solid pau ferro feet. A braided stay for the lid was made by weaver Linda Turner.

PAU FERRO, NUTMEG, AND EBONY, 13D X 9½W X 4H

Photo: Todd Sorenson

RICHARD MARCIN

San Diego, Calif.

This jewelry cabinet has a vacuum-pressed oval carcass that sits on hand-shaped Ruhlmann-style legs. But it's the veneer mosaic that grabs attention. Marcin created the pattern using illustration software and then used a ScanNCut automated hobby cutting machine to cut the 2,000-plus individual pieces. "It took months of experimentation to figure out how to get the machine to cut veneer without tearing it into shreds."

WALNUT AND MAPLE, 14D X 27W X 47H

Photo: Tim Adams



THOMAS STARBUCK STOCKTON

Montgomery Creek, Calif.

Because this cabinet was made for a show in the Sonoma wine country, Stockton designed it to hold wine. But he made the interior wine racks removable so the design would be flexible enough for another use. "The cabinet also was a good way to use some odds and ends of nice veneer I had."

SAPELE AND EBONY, 16D X 32W X 32H



JOHN GREENE

Menston, England

Greene made two of these bedside cabinets, each with a roomy shelf for books and a suspended drawer unit. The push-to-open drawer fronts are carved to add texture and, as Greene says, "I'm hoping they will not show finger marks to the extent that a smooth, high-gloss surface would."

CHERRY, 17³/₁₀D X 28³/₁₀W X 23⁸/₁₀H



CHAD HILL

Nokesville, Va.

Cutoffs from a walnut slab that were just the right size and had just the right figure to be used as chair seats were the genesis of this chair's design. Hill stashed them away until he had collected enough walnut to complete four chairs. He carved the seats on the tablesaw using a jig he saw on YouTube. The backs are bent-laminated plywood veneered with walnut.

WALNUT, 21D X 22W X 35H



JAMES STURGEON

Naples, Fla.

Sturgeon decorated this Chippendale-style table with pre-Islamic designs from Persia. "Of the three nations in existence continuously for 2,500 years (China, Egypt and Persia), only Persian designs have never entered Anglo-American period furniture," he says. "I created 'Persian Chippendale.'"

MAHOGANY AND LINDEN, WITH A MARBLE TOP
23D X 36W X 34H



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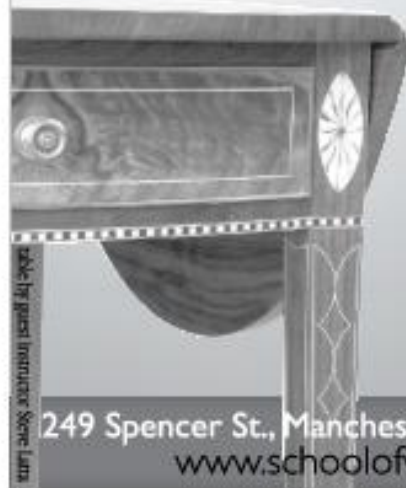
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DANA DUDARCHIK

Manlius, N.Y.

A tea cabinet with many drawers made by fellow woodworker Jeremy Coy helped inspire this large jewelry cabinet. The dragonfly was requested by the client; Dudarchik carved it into the drawer fronts using an Epilog Zing laser and then filled it in with black paint to make it stand out. The drawers are made with pinned rabbets à la Hendrik Varju ("Fine Drawers without Dovetails," *FWW* #208).

CHERRY, MAPLE, AND SPALTED MAPLE, 18D X 60W X 30H

Photo: Nick Weslowski



ERIC ERVIN

West Hollywood, Calif.

Ervin made this wall shelf with Danish Modern style in mind: "I've always loved those profiles and integrated pulls." His idea was to make a small piece that would complement other furniture. "In my house I have one over a credenza, accessorized with some nice pottery."

WHITE OAK, 9D X 37W X 13H

Show your best work

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

NICHOLAS VANARIA

Romeoville, Ill.

Although the original inspiration for this corner cupboard was a 19th-century Pennsylvania cupboard, the design evolved as Vanaria built it to include details from a variety of period pieces. The interior is finished with milk paint. For the outside, Vanaria used a finishing recipe of dye, boiled linseed oil, SealCoat, and Arm-R-Seal to get the grain to really pop. "It was my first time using this finishing process."

FLAME BIRCH, 20D X 26W X 81H

Photo: James Vanaria





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master class

Liven up legs with traditional stringing

BY STEVE LATTA

Setting stringing into the face of a table leg is a great way to give it visual vitality. The way I do it, all you need to get started is an image of a table leg with a design you like and a simple fixture to hold the workpiece. You'll enlarge the photo until the width of the leg in the photo matches the width of the actual leg—in this case, $1\frac{5}{8}$ in. In doing so, you get a full-scale representation of the stringing pattern. Using a compass, you'll locate the centerpoints of the arcs in the pattern, and then you'll transfer those centerpoints to the fixture and use them to guide the radius tool that cuts the arced grooves.

For years, I fabricated my own inlay tools, but a few years back I collaborated with Lie-Nielsen to make tools specifically for this task. You can still make your own, but stringing life is way easier with tools designed for the job.

Lay out the design

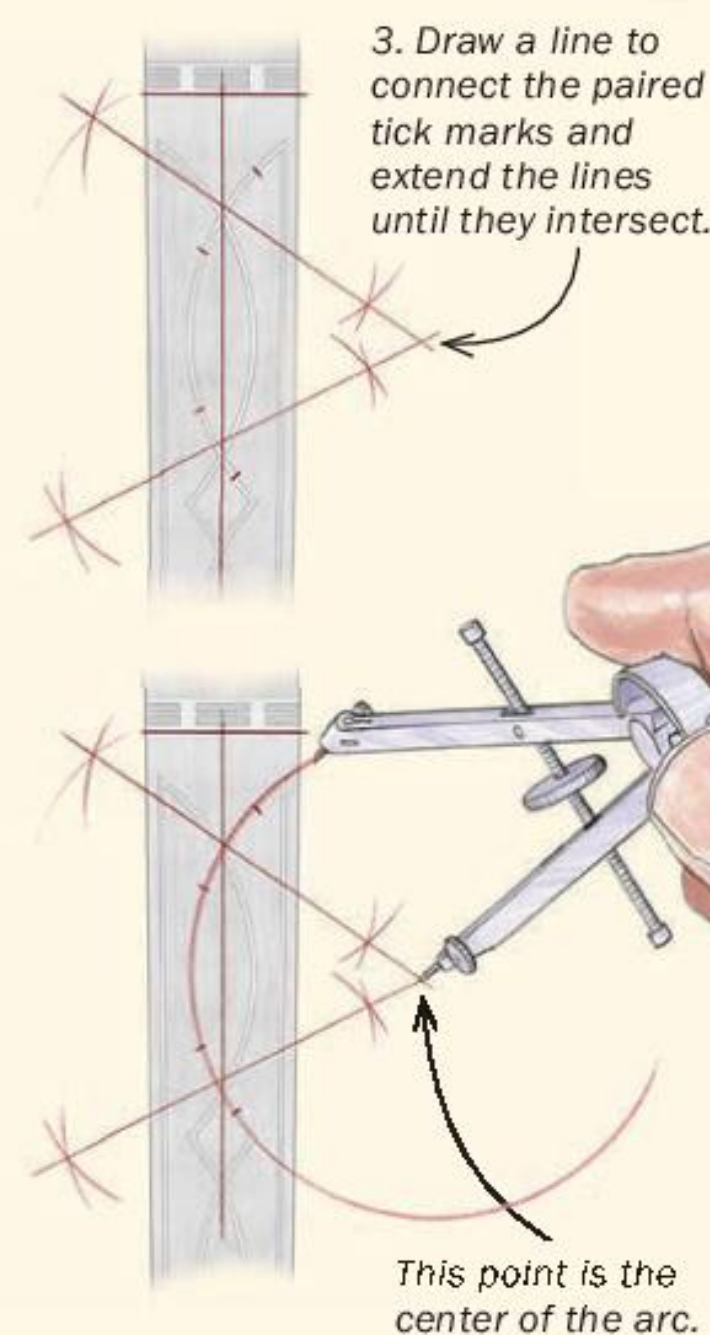
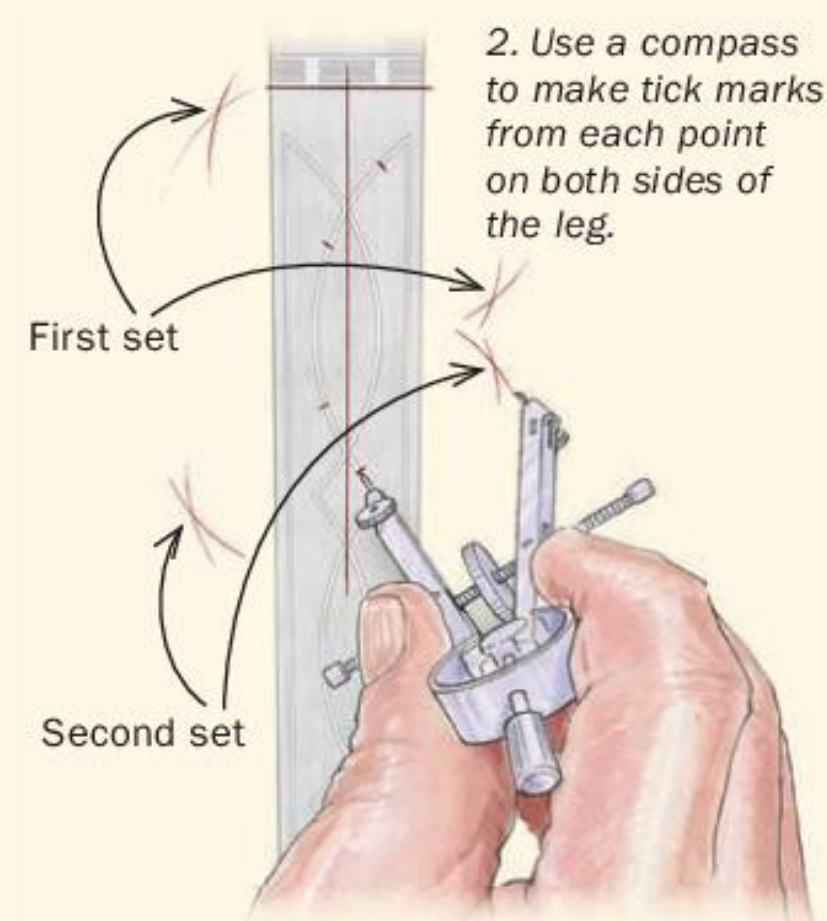
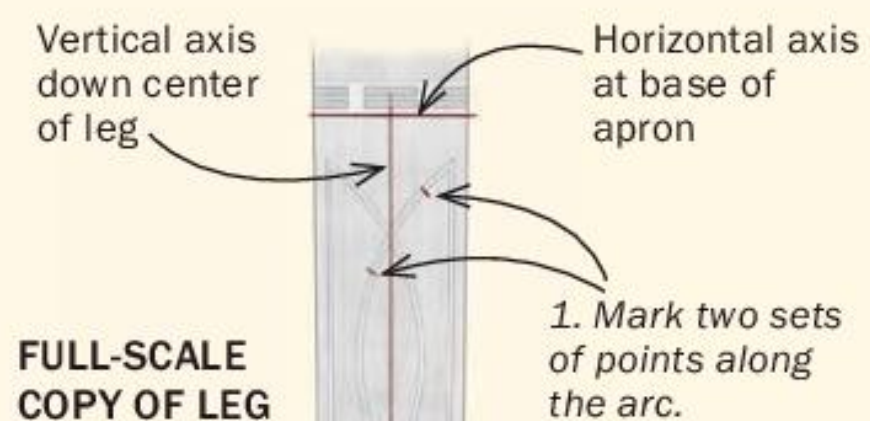
Once you have the leg image full size, begin laying out directly on it. First run a vertical axis down the center of the leg. Run a horizontal axis perpendicular to this line at the base of the apron, which is typically both the bottom



Work on paper first. Create a paper copy of the leg at full scale. Draw a vertical line down the center of the leg, and add a horizontal line at the apron. Then find the center of each arc by plotting two perpendicular bisectors along the arc, and extending them until they intersect.

LAYING IT ALL OUT

Find the center points of the arcs and their distances from the horizontal and vertical axes. These points will guide the radius cutting tool.



MAKE A SIMPLE FIXTURE



Start with one side of the fixture. Set the two hardwood blocks and the leg on the $\frac{1}{2}$ -in.-thick MDF base. Pencil around them to mark the position. Clamp one hardwood block in place, and predrill and screw it to the base from underneath.



Add the second hardwood block. Reposition the leg and second block. Clamp them to the secured block, and predrill and screw the second block to the MDF.



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Transfer the layout to the leg. Start by drawing the vertical line down the center of the leg.

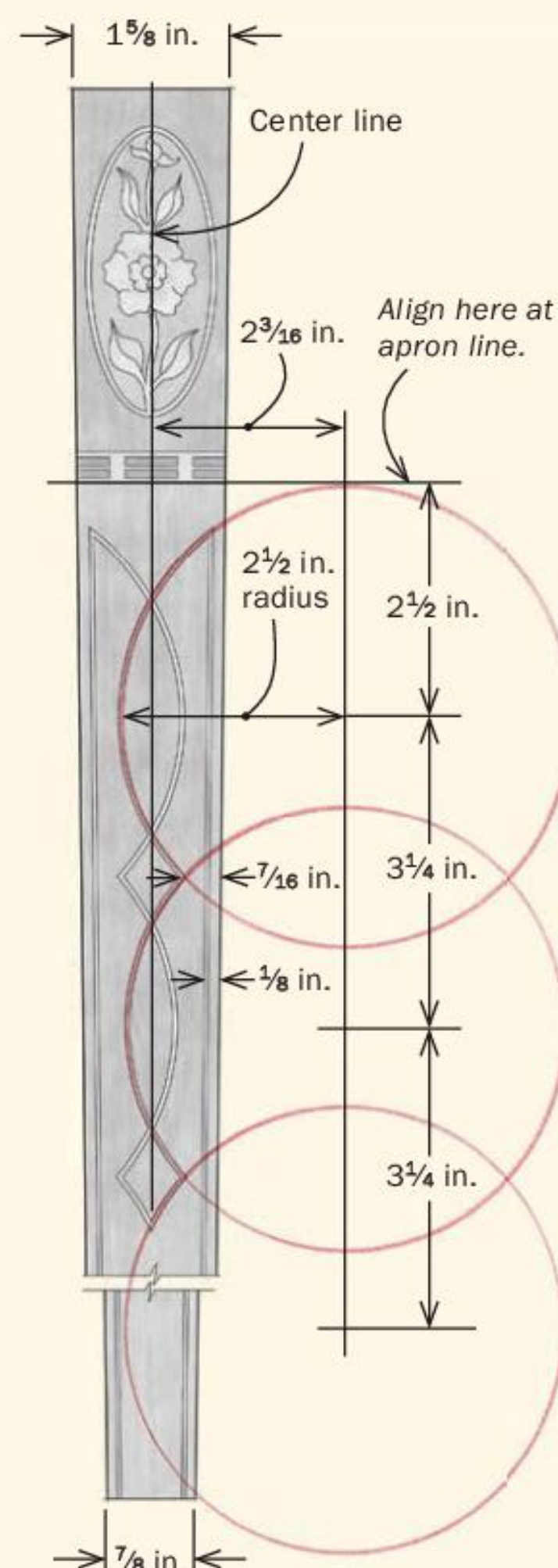


Add a horizontal line. With the leg in the fixture, draw the line marking the bottom of the apron perpendicular to the center line. Extend the line across the two blocks of the fixture.



Transfer the arcs. Using dividers, transfer all the center points from the paper layout to the leg, and then draw the arcs with a compass.

A TRADITIONAL DESIGN



CUT THE GROOVES FOR THE STRINGING

Complete one side of the pattern by grooving and inlaying, and then move to the other side.

Start with the straight lines. Using a straight line tool, Latta grooves the outside border that runs from the cuff banding at the foot to about $\frac{1}{2}$ in. below the apron line.



Pivot pin



Move to the arcs. With the leg in the fixture, use a radius tool (left) to cut all three arcs. Stop where they meet other arcs or the border line.



Clean up the intersections. Depending on the situation, Latta uses a #3-10mm gouge, a piece of a card scraper, or a modified X-Acto blade to fine-tune the grooves.



edge of any banding and also the start of the taper. Now find the centerpoints of all the arcs in the design. To find the centerpoint of an arc, plot perpendicular bisectors at two different points along the path of the arc. Extend the bisectors until they intersect, and this is the center of the arc. Repeat

this process for all of the arcs on half of the inlay; because the pattern is symmetrical, you won't need to lay out both sides. Historically, a single radius was typically used, so if you are coming up with arcs that are really close to each other, pick an average.

Now that you have found the center points, measure their distance from the horizontal and vertical axes. You need to know how far they are from the center of the leg, how far apart they are from each other, and how far they are from the apron line.

Make the fixture and transfer the pattern to the leg

To make the fixture, screw two maple blocks, $1\frac{5}{8}$ in. thick by 2 in. wide by 10 in. long, to a piece of $\frac{1}{2}$ -in.-thick plywood or MDF. The two blocks should be spaced so that you'll need a little bit of pressure to slide the leg between them. Make sure the lower banding line fits just inside the top of the fixture so you can use it as a reference.

Start by marking vertical and horizontal axes on the actual leg just as you did on the drawing. Then run lines down the leg $\frac{1}{8}$ in. from the sides to indicate where the straight border stringing will go. Slide the leg securely into the fixture and add a clamp to keep the face of the leg flush with the top of the maple blocks. Continue the horizontal axis out across the maple blocks, making certain this line is perpendicular to the vertical line down the face of the leg. The horizontal apron line on the blocks will become a reference mark for all the legs when inserted into the fixture.

With the leg firmly mounted, use dividers to transfer all the pivot points from your drawing to the fixture. Sometimes a little fudging needs to happen to get the pattern to work out just right. In this case, because the leg tapers, I wanted the lower enclosure



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a little smaller than the top, so I bumped the center points out about $\frac{1}{32}$ in. It is only a small adjustment but it does have a significant impact on the final design.

Plow the grooves and cut the stringing

Before cutting the border stringing, determine its range by drawing the upper arc with a compass and then locating the top of the cuff banding on the bottom of the leg. The stringing will extend a little past this line and will be trimmed when the cuff is mounted. The straight-line tool makes quick work of the border groove. To cut it I remove the leg from the fixture and clamp it in a vise. Cut the grooves and glue the stringing in place for one half of the pattern at a time. This ensures that the places where the arcs cross are cut cleanly.

With one border groove cut I put the leg back into the fixture. Then, to cut the arced grooves, I set my radius cutting tool to $2\frac{1}{2}$ in., fit its pivot pin into the centerpoint of an arc, and begin. Before I start grooving the whole arc, though, the points where the arcs intersect need to be firmly established. To do this I use the tip of the radius tool's tooth—the tooth closest to the pivot—to make a series of very light scribes indicating the points of intersection. These marks show exactly where my grooves need to stop to avoid cutting too far. Then I can cut all three arcs with the radius tool. I stop the lower arc where it intersects the center axis. There will be a little handwork cleaning up the intersections of the grooves.

I slice my stringing from holly veneer sawn at about 0.035 in. thick on the tablesaw or bandsaw. Using a slicing gauge and slicing fixture, cut off a strip about $\frac{1}{8}$ in. wide. To standardize the stringing, pull it through a thicknessing tool.

Glue the stringing into the grooves

The intersections can be managed in one of two ways: with a miter or with what I call a run-by, which is basically a butt joint. Choose the joint you prefer. When properly executed, a run-by and a miter are indistinguishable from each other.

I start at the bottom arc and shape its bottom terminal point so that intersecting it from the other side will be easy. Using a sharp chisel, I cut all the miter joints in the arcs, working my way up the

CUTTING STRINGING IS AN EASY THREE-STEP PROCESS

Slice, cut, and thickness.

Once you saw the veneers on the tablesaw or bandsaw, use a slicing gauge to cut them into strips, and then pull them through a thicknessing tool to make all the stringing uniform.



Online Extra

To watch a video showing how Steve Latta sizes his stringing to perfection, go to FineWoodworking.com/273.



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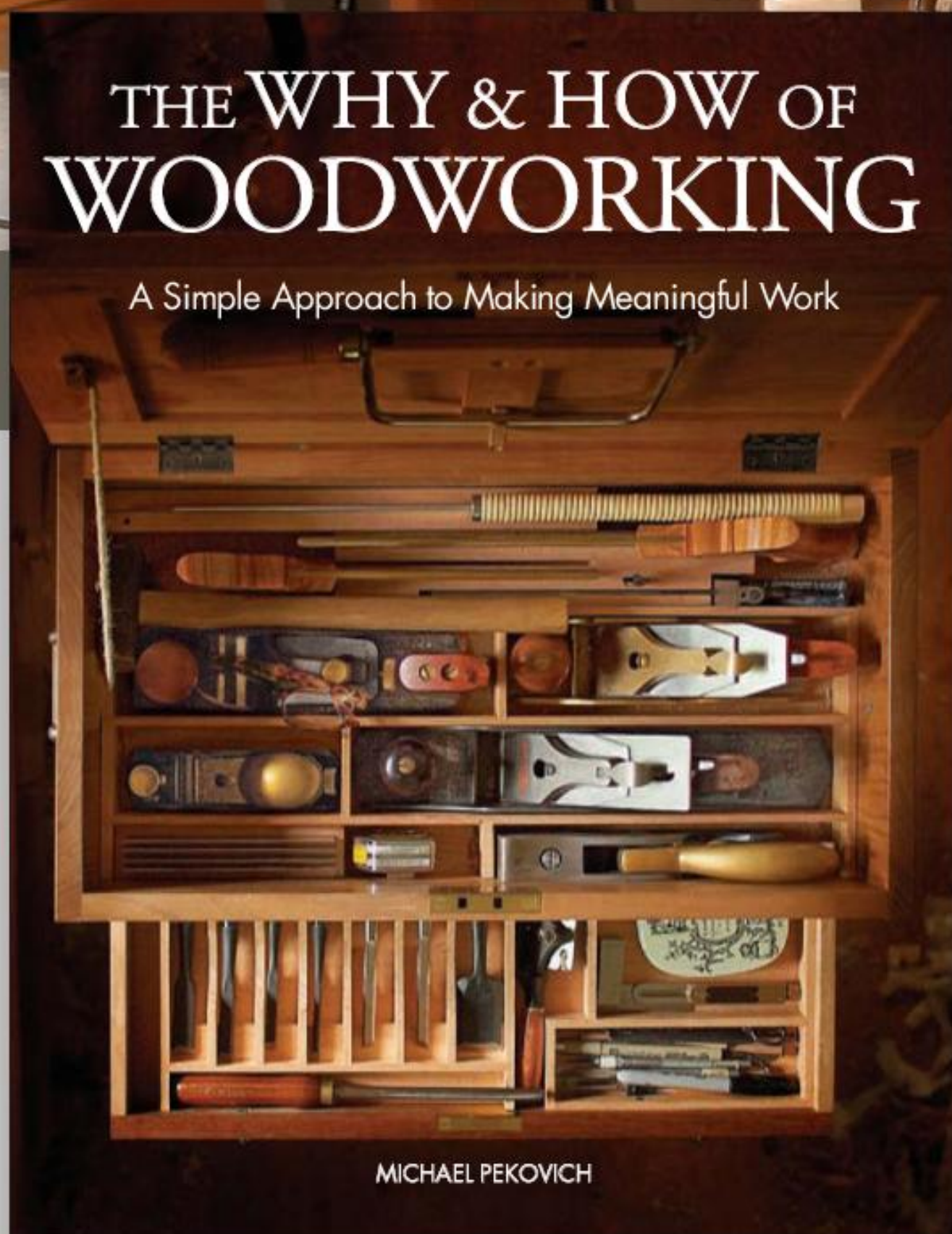
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side of the leg. Properly cutting a joint requires two cuts. The first cut comes close; the second cut firmly establishes the joint.

Glue and insert the three arcs, making sure the joints are tight. End the top arc in the middle of the vertical border groove. At this top joint, I always do a run-by joint. It is far easier to execute and looks every bit as good as a miter. A properly fit run-by displays no intersections and just looks like a solid white line. To cut the run-by, I take my 1-in. chisel, align it with the side of the border groove, and snip the end of the top arc. The most important aspect of making this top joint work is the end shape of the border stringing. It must be cut as a natural extension of the arc, and I use my #3 gouge for this purpose. Often, the top of the groove itself needs work to allow the stringing to slide in to just the right location.

Once the stringing is mounted and the glue has dried, I level it to the background using a small block plane and a card scraper.

With the right side completed, repeat the process on the left. As always, if you are new to this type of work, invest the time to make two or three practice legs and you will be repaid many times over in terms of efficiency and appearance. □

Steve Latta teaches woodworking at Thaddeus Stevens College in Lancaster, Pa.



INLAY THE STRINGING MATERIAL

Start at the bottom and work your way up. Latta cuts and inlays one piece at a time. He fits the miters and butt joints just so. Each joint requires two cuts; the first comes close and the second nails it. Use a glue syringe to deposit yellow glue and press the stringing in place with a metal ruler.



Moving upward. Repeat the process for each joint, stopping the top arc in the middle of the vertical border groove. At this top joint, rather than mitering, Latta does a run-by, or butt, joint. Flush each arc to the leg before moving on to the next arc.



Add the vertical border and switch sides. Once the first set of arcs is inlaid, glue in the border stringing (left). Then move on to cutting the grooves for the other half of the pattern.

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Forrest Blades	www.forrestblades.com	<i>p. 19</i>	Varathane		<i>p. 5</i>
Furn. Institute of Massachusetts	www.furnituremakingclasses.com	<i>p. 85</i>	Wagner Meters	wagnermeters.com	<i>p. 33</i>
Grex Tools	www.grextools.com	<i>p. 29</i>	<i>The Why & How of Woodworking</i>	tauntonstore.com	<i>p. 81</i>
Grizzly Industrial	grizzly.com	<i>p. 7</i>	Woodcraft	woodcraft.com	<i>p. 33</i>
Groff & Groff Lumber, Inc.	www.groffslumber.com	<i>p. 23</i>	Woodpeckers	woodpeck.com	<i>p. 13</i>
Hands On Tampa	finewoodworking.com/hands-on	<i>p. 83</i>	Woodworkers Source	www.101woods.com	<i>p. 85</i>
Hearne Hardwoods	www.hearnehardwoods.com	<i>p. 73</i>			
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A tree in the chair shop

BY JONATHAN YARNALL

While I was away at college my father moved his one-man architecture office from Philadelphia out to rural Doylestown, Pa. And one time when I came home for vacation, he took me with him to George Nakashima's place in nearby New Hope. I remember George from that encounter as very quiet, and I felt a certain peacefulness on the property. After college I came back to Pennsylvania and knocked on the door to see about a job; George said I could start in two weeks. There was no formal apprenticeship in furniture making; I just began to work.



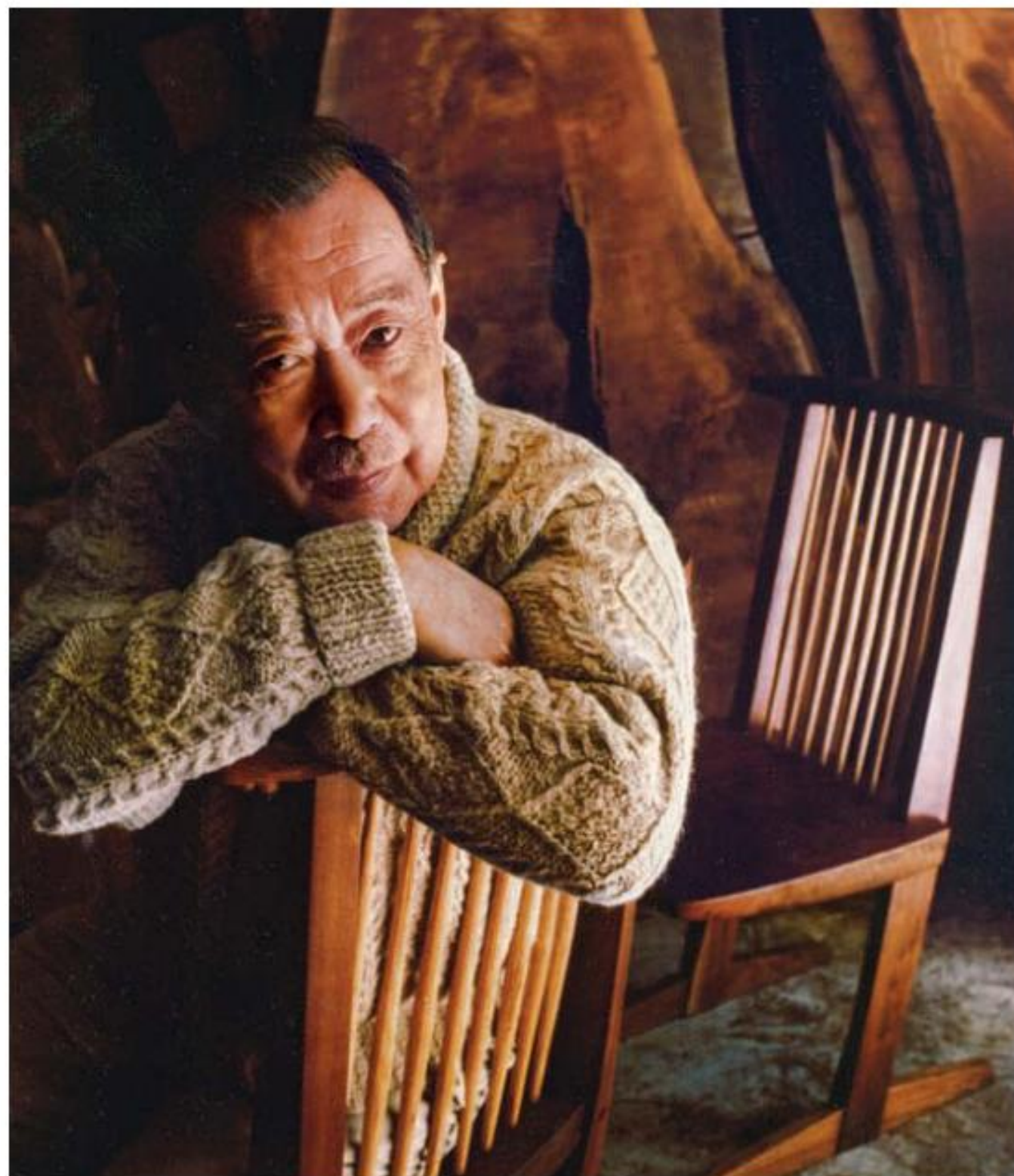
Jonathan Yarnall has been working at George Nakashima Woodworkers since 1974. He is married to George Nakashima's daughter, Mira.

I started in the finishing department, and then to my great good fortune in 1974 the last building George would build on the property was about to commence, and I had the privilege of working on it alongside Robert Lovett, a consummate craftsman. It took us two and a half years. George would come out several times a day to see how we were doing. There were no time constraints and there was no master plan; no drawings, per se. When we couldn't go any further he would do some freehand sketches.

I remember noting the way George carried himself; his walk conveyed a dignity that was remarkable. It was something you don't often see in our culture

these days: a person with poise—a perfect balance between one's outward life and inward life. I considered it an honor to work for a man of that caliber.

But shortly before we finished the building I told George that when it was done I would be leaving. There were economic pressures, and I had agreed when a friend asked me to start a construction business with him.



I remember noting the way George carried himself; his walk conveyed a dignity that was remarkable.

As I thought more about it, though, I realized I wanted to stay. So then I had the difficult task of approaching George and informing him that I had changed my mind; asking if it would be possible to stay. When I did he was very cold. He didn't appreciate the wavering. He said he'd let me know. Days went by.

Eventually he said, very abruptly, "You can stay. We'll find something for you to do." And then, "Go help Adam."

Adam Martini, a craftsman who was born in Yugoslavia, displaced during the war, and trained in Austria, ran the Nakashima chair shop. "Go help Adam." That was 43 years ago, and those were my last instructions from George. I've been in the chair

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shop, happily, ever since. For the most part it was just Adam and me in that little shop for 25 years until he retired.

George designed a few new chairs after I started, but most of the chair designs were already established, so he didn't have to be involved with every chair order the way he was with tables and cabinets. Still, he would come through the chair shop several times a day. I think since he wasn't doing any benchwork—probably hadn't since the mid-'50s—he got vicarious enjoyment seeing that we were enjoying ourselves at the bench. George was Samurai, and he had been pretty tough on the men who worked for him in the early years. But by this time he could rest a little easier. The big fight was over. He'd established himself, it was running, and he was mellowing a little bit.

Also, the three of us had something of a philosopher's club. Adam was free-thinking and very much a seeker, as was George, of course. We would often discuss what we were reading, topics of the day, or philosophy, religion, politics. George enjoyed

that there was some intellectual activity along with the handwork.

I think he had hopes for everyone who came here to work. As woodworkers, but also as to the yoga, the spiritual method that he was establishing. And I got it, but it took a while. When I realized what it was, and how fathomless it was, and that one lifetime wouldn't nearly exhaust the potential here, then I dug in, and that question of finding another path was no more a question.

There was a personal part of my relationship with

George enjoyed that there was some intellectual activity along with the handwork.

George, and an impersonal part. The personal part of it was friendly and cordial, though I wouldn't say it was particularly warm. But it was the impersonal part that was most significant.

And that didn't depend much on emotion. It went much deeper. It had to do with the yoga. Yoga being yoke, the union with the divine and with all creation. I'd say it was so deep you couldn't even talk about it. I knew what he was trying to do; and that was what I wanted to do. Woodwork just happened to be the vehicle. He left me room to pursue it without much criticism, without much direction. You're here, there's work to be done. Adjust to the work, the schedule, the business; establish your relationship with the wood. Let the wood work on you while you work on the wood. Find the soul of the tree. Let the wood teach you how to forget yourself and connect with its soul.

I think George wanted to live and work like a tree. You're rooted; your leaves are in the heavens; bloom—if you can, flower, bear fruit. Join the earth and the celestial. Adjust to the seasons. Be stable; bend with the wind. Aspire; reach for the sun. □



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The Power of the Pentagon

When Ottawa-based furniture maker Christopher Solar was invited to build a sideboard for the Canadian ambassador's residence in Hanoi, he decided he wanted the cabinet's doors to be the focus of the piece. He might have chosen wood with wild grain to create visual excitement, but Solar, a former software engineer with an affection for math, wanted to create a dynamic composition using plain-grained wood cut to repeating geometric shapes. He knew that tiling—filling a plane entirely with one repeated polygon—is a challenge mathematicians have savored for centuries. And he had recently read about Marjorie Rice, a self-taught amateur mathematician, who had shocked the math world in the 1970s by discovering new tiling patterns for pentagons. Solar, self-taught as a designer, was particularly inspired by her story. He also loved her patterns, especially “type 13,” which he used on his sideboard, cutting pentagons from thick-sliced walnut veneer and outlining them with pigmented epoxy resin. The way the pentagons nest, and the power of their pattern, echoes the interlocking of Solar's twin talents in mathematics and design.

—Jonathan Binzen

