

WOODWORKER'S JOURNAL

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A craftsman with a beard and safety glasses, wearing a brown leather apron over a red plaid shirt, is using a Rockler drill press. The drill press is blue and black, mounted on a wooden workbench. The craftsman is holding the handle of the drill press with his right hand and adjusting the workpiece with his left hand. In the background, there are wooden shelves and a Rockler vise on the workbench.

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WOODWORKER'S JOURNAL

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PROJECTS



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Stickley Small Server

By Willie Sandry

Build this rare single-drawer version of a Stickley classic. It's as handsome in today's homes as it was in the early 1900s.



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Gluing Supplies Caddy

By Chris Marshall

This convenient tote with two-way drawer will stow every "flavor" of glue and applicator you need.



Page 28

Slab-built Bookcase

By Nick Brady

Turn a slab of showy lumber into an impressive bookcase using a new Benchtop Slab Flattening Jig from Rockler!

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Editor Picks: Box Joint Cauls

No matter how carefully I cut and fit my box joints, if they aren't clamped thoroughly at glue-up, there's no guarantee all the pins and slots will be pushed fully together. The key to effective clamping, however, is applying pressure against every pin. That's where Rockler's Box Joint Cauls (item GRP25132) are the ideal solution. Their inner surfaces are laid out with alternating pin-and-slot patterns to match whatever common joint I'm making — 1/4", 3/8", 1/2" or 3/4". Thin slots on their rounded outer corners enable pennies to be inserted to keep strap clamps from falling down when they're tightened. These cauls were super handy to have for assembling both the carcass and drawer of our "Gluing Supplies Caddy" project on page 34. The 1/4" size covers joints up to 6 1/4" tall. The 3/8" cauls are 6 3/8" tall; 1/2" cauls are 6 1/2" tall and the 3/4" cauls are 8 1/4" tall.

—Chris Marshall



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FROM OUR READERS

Circling the Sun — The Time is Now



THE AMAZING GIFT OF A NEW YEAR!

It is common to spend some time, as one year turns to the next, considering what has gone before and using it to chart a path forward. This is true even as we get a bit older; the illusion of control evaporates and the irony of our efforts becomes more clear. As singer Jim Morrison once said, "The future is uncertain, but the end is always near." Prophetic in his case.

We occasionally think of time as a gift, which once was surprisingly well summed up by cartoonist Bil Keane: "Yesterday's the past, tomorrow's the future, but today is a gift. That's why it is called the present."

Looking back over last year, it has become clear to me that I have been doing a lot of "getting ready" and not much "doing" with regard to my woodworking. In my tiny shop I keep moving things around, hanging stuff on the wall, making new shelves and stuffing them full ... but not much actual woodworking. I am going to change that this year. My goal is to take the list of stuff that I have wanted to build for a while and make one of each item on the list. My hope is that I will be energized by my success and move on to the next one. Only time will tell if I succeed. But I do hope to avoid the situation declared by one of our nation's most enduring philosophers, Dr. Seuss: "How did it get so late so soon? It's night before it's afternoon. December is here before it's June. My goodness how the time has flown. How did it get so late so soon?"

Ignoring that kind of wisdom is something we do to our peril.

— Rob Johnstone

LETTERS

New Meter Reader!

Now that I own a moisture meter, what do you recommend as the allowable moisture in wood? I have purchased air-dried oak, walnut and cherry I'll use for furniture projects. Currently the moisture meter registers approximately 10 percent for my wood inventory. Thank you for your help!

Wade Nitz
Via the Internet



Rob Johnstone Responds: For everyday woodworking, 10 to 12 percent moisture content is perfect for hardwoods. If you are thinking of doing something like steam-bending wood, then moisture in the 20 percent range is ideal. Glad you are making good use of your new meter!

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FEBRUARY 2024
Volume 48, Number 1

ROB JOHNSTONE *Publisher*
ALYSSA TAUER *Associate Publisher*
CHRIS MARSHALL *Senior Content Editor*
VERN JOHNSON *Art Director*
DAN CARY *Senior Content Strategist*
COLLEEN CAREY *Videographer*
NICK BRADY *Project Builder/Designer*
MATTHEW HOCKING *Internet Production Coordinator*

Founder and Chairman
ANN ROCKLER JACKSON

Advertising Sales
ALYSSA TAUER *Advertising Sales*
atauer@woodworkersjournal.com

Editorial Inquiries
editor@woodworkersjournal.com

Subscription Problems/Inquiries

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www.woodworkersjournal.com
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Safety First Learning how to operate power and hand tools is essential for developing safe woodworking practices. For purposes of clarity, necessary guards have been removed from equipment shown in our magazine. We in no way recommend using this equipment without safety guards and urge readers to strictly follow manufacturers' instructions and safety precautions.

Woodworker's Journal (ISSN: 0199-1892), is published in February, April, June, August, October and December by Rockler Press Inc., 4365 Willow Dr., Medina, MN 55340. Periodical postage paid at Medina, Minnesota and additional mailing offices. Postmaster: Send all address changes to Woodworker's Journal, P.O. Box 6211, Harlan, IA 51593-1711. Subscription Rates: One-year, \$19.95 (U.S.); \$28.95 U.S. funds (Canada and other countries). Single copy price, \$7.99. Reproduction without permission prohibited. Publications Mail Agreement Number 0861065. Canadian Publication Agreement #40009401.

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February 2024 Woodworker's Journal

Why Not Three Slots?

A fundamental question came to me while reading your “Modern Nesting Tables” project in the October 2023 issue. While I understand the necessity of allowing for movement between the tables’ top panels and the subtops underneath, why would you have one hole and two slots? Why would you not make all of them slots to allow for the movement? Thank you for all your work!

Greg Roberts
Via the Internet



Chris Marshall Responds:

Glad you ask, Greg. In the case of this particular design, you are correct. All three of the holes could have been slotted, because the alignment of the tops and subtops can’t be thrown out of whack if the top moves. Sometimes it’s advantageous to drive one screw into a round hole but create slots

for the rest so the top moves in one direction only (outward from the center or back or front forward or backward as needed). It wouldn’t matter here, as long as all the screw holes or at least the outboard screw holes are slotted. I should point out that I built these tables when my shop’s humidity was very low, and I’m anticipating that

the tops will expand widthwise when the humidity increases. If these tables are built when the humidity is high, it would be wise to shorten the length of the subtops by an amount that reflects the expected contraction of the top panels so they can shrink some without being impeded by the cross-grain subtops.

READER PROJECTS

Dock Board Upcycle

Here’s a 6-ft-diameter patio table I built for my daughter’s home. It’s made entirely with 2x6 reclaimed wood. We live on a lake, and when I resurfaced our dock a few years ago, I kept most of the planks we removed. For this project I used a stiff brush to remove loose dirt and ran them through my planer to remove maybe 1/16” of the weathered and splintered surface while keeping the “old” character of the wood. I applied a couple of coats of clear oil stain to protect the wood a bit, but I have no expectation that it will keep any kind of real “finish.” The only downside is, it’s a VERY heavy table!

Henry Burks
Via the Internet



Daughter’s Custom Patterned Rolling Pin

My daughter opened a bake shop in Norton, Massachusetts, after many years of baking in her home. She needed some various sized rolling pins that I made for her. But I decided she needed a special one, so I turned this with laser printed logos on the ends.

Michael Armstrong
Via the Internet

FROM OUR READERS CONTINUED



Our expert overlooked the vixen-tooth file. A reader notes the absence.

Don't Forget the Vixen

I noticed in Ernie Conover's "Files and Rasps" article [Modern Shop Hand Tools, page 24] in the October issue that he failed to mention the vixen-tooth (also known as crescent) file. I have been in love with mine since I made its handle in ninth-grade shop! Here's a photo of what mine looks like [above].

George Hoskin
Via the Internet

about 1 ft long. I spent some time searching the Internet for this with no success. My results were either not straight enough or too long. Where might I find a calibration rod like Hamler's?

Adriaan Sachtler
Via the Internet

A.J. Hamler Responds: You can find steel and aluminum

rods at pretty much any hardware store or home center in a variety of diameters. I used a 1/4" rod, but a 3/8" would also work well. When you go shopping for one, take along a reliable straightedge to check that the rod you're buying is straight. They're generally sold in 3-ft lengths, so don't expect to find one exactly a foot long. You'll need to cut it to length, but that's easy enough to do with a hacksaw or other abrasive cutoff tool.

Calibration Rod Source?

I found the article "Diving Deeper into a Drill Press" by A.J. Hamler [October 2023, page 54] quite interesting. Based on his advice, I have been looking for a "straight metal calibration rod" that's



Shop-made aluminum calibration rod

OUR WEEKLY READERS

Nick Brady builds a bookcase from slab lumber on page 28 of this issue. In that spirit, we recently asked the readers of our Weekly online newsletter if they like working with slab lumber. Here are a few responses!

"I love the live-edge trend. I believe the use of live edge started with George Nakashima, and I for one am happy to see it come back. I do wonder how long it will last this time."
— David Weber



"I just read your latest Weekly editorial about slab projects and wanted to share a picture of a bar table that I did. The slab is monkeypod wood with an oil-rubbed finish. The bases are on lockable wheels to make it easier to move, if needed."
— Dave Bontjes



Bob Beran

"I like the look of live-edge lumber, but it seems most of the furniture pieces are made using metal legs. I don't care for that particular look. It also requires minimal woodworking skills. Here's a photo of one of my live-edge projects."
— Don Rosano



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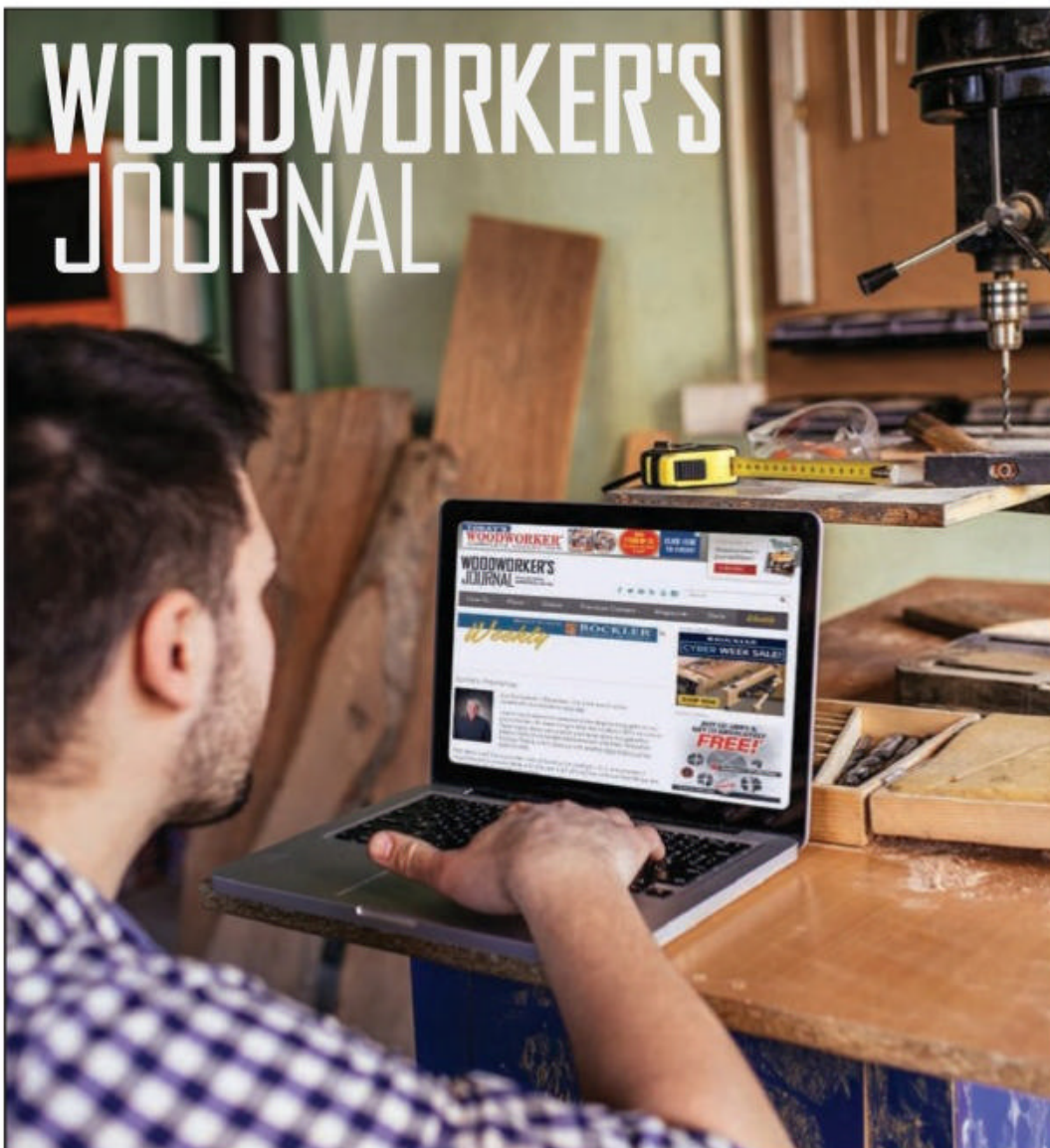
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Check online for more content
covering the articles below:

**Shaper Origin Comes to
Town! (page 18):**

*Routing a Mid-Century Modern
Clock using Shaper Origin
(video)*

**Slab-built Bookcase
(page 28):**

*See Rockler's new Benchtop
Slab Flattening Jig in action
(video)*

**Advanced Power Tool
Techniques (page 40):**

*Learn how to rout circles and
ellipses with Rockler's Ellipse/
Circle Cutting Jig (video)*

What's in Store (page 46):

Featured tools in action (videos)

This Doctor Disagrees

I have read several comments in recent issues stating that hydrogen peroxide is bad for treating wounds. I disagree.

I worked as the medical director and wound care specialist for 15 years in a chronic wound healing center before I retired. There is absolutely nothing wrong with using hydrogen peroxide to clean and decontaminate an acute wound in the workshop or elsewhere. It is actually a great way to clean an acute wound. It helps remove dirt and other material and kills bacteria. After the initial cleansing and first day or two, I would agree with switching to other wound cleansers that are not cytotoxic and may slow healing at that point.

Dr. Randy Wolfe
Via the Internet



Please Protect those Precious Peepers!

While reading the article about Dan Wellens in the October issue ["Wellens Creates Tables Made for TV," page 16], I noticed that he was not wearing safety glasses while only inches away from his CNC milling machine, which appears to be on (see above). Woodworkers in all the other articles had adequate eye protection. I would hate to see Mr. Wellens's career ruined by a serious eye injury.

Dr. Robert Pedersen
Gainesville, Georgia



**A keen-eyed former shop
teacher points out the inherent
danger of setting up a table
saw crosscut this way.**

A Concerning Crosscut

I am a longtime reader and a 20-year industrial arts teacher, now retired. I appreciate the good safety practices usually presented in your publication. That's why I was caught by surprise with the photo at the top of page 37 in the December 2023 issue. The photo (at left) shows a woodworker performing what I have learned the hard way is a very dangerous move: cutting a piece of material to length that will result in a cutoff that is longer than wide, captured between the saw blade and the rip fence. It is not likely to stay there! Embarrassment and pain are next!

Wes Newswanger
Litiz, Pennsylvania

Rob Johnstone Responds:

Far be it from me to argue table saw techniques with a retired shop teacher! Wes, you raise an excellent point. Even though my table saw's rip fence was dead parallel to the blade, I was still in error here. I should have installed a step-off block on the rip fence to gauge the length of that cutoff piece between the blade and the fence to allow for some clear space when it was cut free. Or, I could have used a longer auxiliary fence on the miter gauge, with a stop block clamped to it, to cut that part to length instead and not used the rip fence at all for this cut. Thanks for keeping safety a top priority in your woodworking ... and ours.

STUMPERS

Clearer Views

Seal broken on cutter's purpose

The purpose of Noel Pesce's October mystery tool was no head-scratcher for 113 guessers who say it's an automotive windshield removal tool – or some derivative of that name.

However, **Ivan Adams** of Perry, Utah, thought it could be a canvas-cutting tool. **Mark Allen** wondered if it might be an early version of a log scribing tool. Nope, guys.

"It's a tool to remove front and back windows of cars and trucks that are glued in with that black, gooey adhesive," says **Frederick Seal** of St. Louis, Missouri. "The L-shaped cutter is worked under the glass and into the sealant/adhesive," adds **Karl Hoffman**. "And the blade is pulled around the periphery of the windshield with the cable attached to the T-handle while guiding the tool with the solid handle," says **Joseph Marchlewski**, hailing from Cadillac, Michigan. **Brian**



Duane Hill of Lewisville, Texas, formerly used Noel Pesce's style of windshield removal tool, shown here, to extract the glass from his demolition derby cars. "Now I use an old kitchen knife and some wire instead," he says.

Gustin mentions that the double-edged blade can be pulled either way, "after which the old seal is scraped away, a new one is applied and the windshield is then installed."

"In 1964," **Larry Sackmann** of Spokane, Washington, begins, "General Motors started using glue to install the windshields and back glasses in the Buick Special and Skylarks, the '64 Chevilles and Malibus, the Oldsmobile Cutlass and the Pontiac Tempest ... [this] was the very basic tool used in 1964 and is still sold and used today."

"One hand can help guide the cutting blade, but it requires both handles to produce enough force for the blade to do its job. Like most

skills, an expert makes the task look easy. It isn't," reports **John Wolf**. **Steve Morrow** adds, "When the blade breaks, if you're not careful, you will go flying backwards hard!" **Bruce Gamroth** says there are power tools that do the job more easily now.

Four first responders – **Sean Malloy, Donald Tully, Michael Wales** and **Ryan Bishop** – have relied on this tool to quickly rescue trapped people in auto accidents. **Wayne Sellers** of Holden Beach, North Carolina, knows it well, too: "I worked in the Automotive Replacement Glass Division of PPG Industries for 32 years. I've seen many versions of these cutout tools."

What's This?



Todd Double's mystery tool has a wooden handle labeled "Lutz" that is mounted to a metal shaft. Two adjustable collars on the shaft are stamped with a number 8. Do you know what this item is intended to do? Email your answers to

stumpers@woodworkersjournal.com or write to "Stumpers," Woodworker's Journal, 4365 Willow Drive, Medina, MN 55340.

INSIGHTS

How Important is Your Project?

As much as we want to get into the shop, it's just as important to sit down and really think about what we want to make and whether it's the best choice when we stop to consider every other potential project on the list. When in doubt, I turn to the purpose of what I'm making. What need does it fulfill and how important is it? The urge to get out and make is often about our desire to find bliss in our connection to the craft. To consider the purpose of what we're making connects us to the people who will be using it. With that focus in mind, I tend to be a little more thoughtful and patient with the design process. And I'm usually happier with the results.



Michael Pekovich

The Why & How of Woodworking: A Simple Approach to Making Meaningful Work
The Taunton Press; ISBN: 1631869273

TRICKS OF THE TRADE

Better Vise Base; Handy Router Table Shim



Vise in a Vise

I don't use my metalworking vise often enough that it earns a permanent spot on my woodworking bench. So I mounted it to a piece of scrap wood and then attached that to a 2x scrap underneath to serve as a cleat. With this arrangement, I can store my vise under the bench, then just clamp it by the cleat to my bench's large end vise when needed.

David DePauw
Cincinnati, Ohio



Notched Blocks Help Clamp Angled Corners Easily

When I built a corner table recently with three sides, I needed a way to clamp the apron to each leg on a 45-degree angle. I cut a 45-degree notch in a couple of pieces of 2x4 so that one face of the notch was parallel to the one apron and the other face to the joining apron. The corners then became easy to clamp.

Andrew Limeri
Framingham, Massachusetts



Thicker Driver Tip with Electrical Tape

Be careful when removing the soft brass screw that attaches the handle to a hand plane – it's easy to deform and scratch with a flat-blade screwdriver. When I needed to remove a broken handle on one of my planes recently, I wrapped the tip of my screwdriver with several loops of green electrical tape so that it would fit the screw slot better, preventing screw damage. I use the same trick when I need to tighten the screws on my vintage hand saws, because those screws are hard to replace if I damage them.

Alejandro Balbis
Longueuil, Quebec



Laminate Your Finishing Table

I covered the outfeed table of my table saw with plastic laminate. It not only helps workpieces slide over it more easily during sawing but also makes an ideal surface for finishing small projects. Any drips of finish are easy to wipe off the laminate with a paper towel and the appropriate solvent for the finish.

Bob Mohalski
Hebron, Kentucky

PICK OF THE TRICKS



Adjusting Height of Long Bit by Shimming Router Table's Top

Not long ago, I encountered the problem that I couldn't adjust my router table motor low enough in its lift to use a very long straight bit for cutting the shallow groove I needed to make. So instead of buying a shorter bit, I just attached a piece of slippery melamine board with a hole in it to my router table's top with carpet tape. The board acted like a giant shim to give the bit the lower cutting height this operation required. I positioned the through hole for the bit so that I could slide my router table fence up beside it. In the future, I can just drill more holes in this melamine board at whatever fence setting I need to use it again in the same way.

Serge Duclos
Delson, Quebec



In addition to our standard payment (below), Serge Duclos of Delson, Quebec, will also receive a Milwaukee M12 FUEL™ Jig Saw for being selected as the "Pick of the Tricks" winner. We pay a one-time sum of \$150 for each trick used. To join in the fun, send us your original, unpublished trick. Please include a photo or drawing if necessary. For your chance to win, submit your Tricks to Woodworker's Journal, Dept. T/T, P.O. Box 261, Medina, MN 55340. Or send us an email: tricks@woodworkersjournal.com

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SHOP TALK

Cherished Grandfather Clock Continues to Inspire

By Grace and Leslie Blix

Plans from two 1984 Woodworker's Journals help a passionate woodworker create family heirlooms.

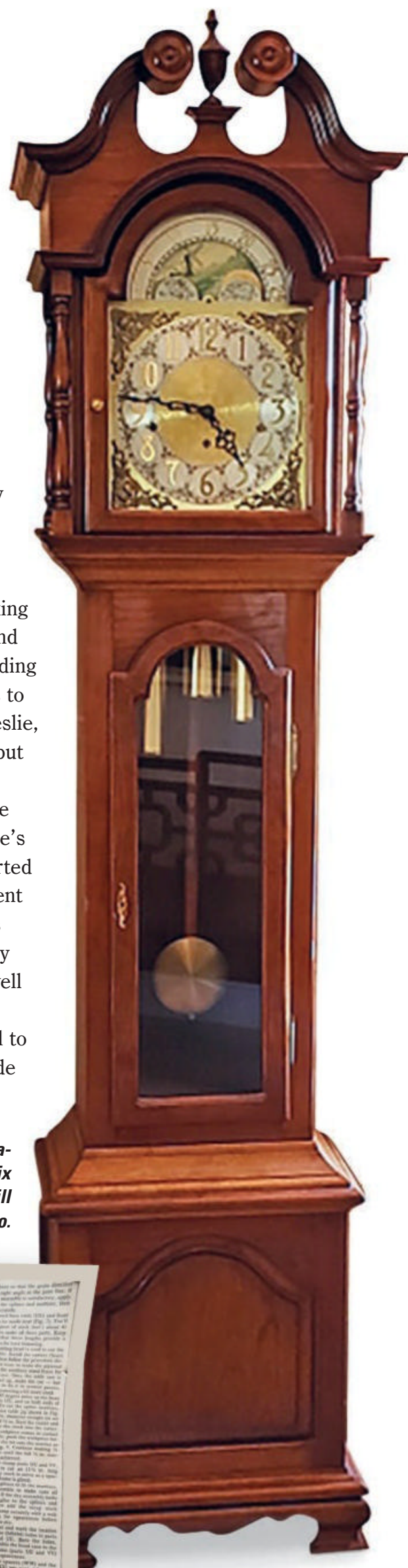
They call me Gepetto..." our dad jokes to others when he points to the weathered wooden engraved plaque hanging above the workbench in his workshop. Growing up, we believed our dad, William "Bill" Blix, could create and build anything. Now that we're adults, we know he can! He really is the Geppetto in our lives.

Dad took up woodworking as a hobby after watching his father and older brothers build their woodshop projects. He made his first woodworking creation in junior high school back in 1960 — a flying wooden goose with copper wings that still sits perched on the wall of his workshop today. Recently, he took it down to show us the intricate curves of the wood and how difficult

a project it was for him as a teenager. No matter how difficult, Dad loved the challenge. As a CPA and accounting professor by day, he's a natural at working with dimensions, angles and measurements. When building a project, he never forgets to remind us, "Gracie and Leslie, you measure three times but you cut only once."

Of course, Dad has made mistakes along the way. He's thrown away projects, started over, wasted wood and spent extra money. But once his projects are complete, they are always beautiful and well worth the time and effort. They're even more special to our family because he made them.

This handsome grandfather clock has been a Blix family heirloom since Bill built it 40 years ago.



Here's Bill's original page of the clock article, part 2, from an issue of Woodworker's Journal in 1984.

Just Couldn't Wait!

In 1984, Dad began working on a grandfather clock. He found the design and plans in the November/December 1984 issue of *Woodworker's Journal*, as a matter of fact. Falling in love with this new and detailed project, our dad started ordering wood, sharpening tools and getting to work on it — his first grandfather clock! Unfortunately, that magazine issue only provided part one of the clock build. He was so excited to keep building and finished the clock up to the end of part one in no time. He knew he needed part two to finish it and recalls that he just couldn't wait!

Since *Woodworker's Journal* was only published every few months, Dad reached out to the magazine by phone to request the rest of the clock plans, hoping he could continue sooner than anticipated. The magazine staff was kind enough to not only get back to him but also print out the second installment and mail the plans to him before they were even published! Now, four decades later, he still has that printed paper plan.

More Clocks Coming

After years of designing and creating new projects, Dad has started to build grandfather clocks once again. He's working on the second and third clocks now, and we can't wait to see how they turn out! The original sits in our family home, and the two new clocks will be for us, his two daughters. Reading your articles and thumbing through the pages has led Dad to create the most beautiful pieces of woodworking throughout the years ... from small table clocks to



outdoor benches, wooden reindeer lining our front yard for Christmas (we even were in the newspaper once for those!), figurine chests, a Murphy bed for Leslie and even a dining room table for Gracie's new home.

Over the 40 years that have passed since Dad made that first clock, he says a great deal has changed in the woodworking world — digital clock mechanisms, easier tools for creating delicate moldings, new advanced saws and sanding machines ... But one thing remains the same: his creations are still filled with beauty and love, and they remain timeless for our family. Dad's first clock has inspired us every day of our lives, thanks to his woodworking skills and that original two-part article from 1984.



Shaper Origin Comes to Town!

By WJ Staff

Origin experts share a recent clock build with our publisher.

Last summer, Russ Fogel and Jake Stilwell from Shaper Origin joined Rob Johnstone at Rockler headquarters to make a mid-century styled clock. It has a padauk body, a resin clock face and 60 (yes 60!) raised rays of wenge and canary wood. The project would have been tremendously difficult to make without their high-tech routing tool.

To watch a full-build video of us making the clock, go to Rockler's YouTube channel (youtu.be/tGe5ZAwn-b4). Russ and Jake helped Rob make the clock and, while doing so, demonstrated not only the remarkable features of the Shaper Origin but also how to



Jake Stilwell and Russ Fogel from Shaper Origin joined Rob Johnstone to make a highly detailed clock, which demonstrated the versatility and accuracy of this remarkable machine.

properly order the construction steps. Rob had used the Shaper Origin several times before, but he benefited from their expert instruction.

"I love the remarkable scope of what Shaper Origin can do," Rob says, "but now I am much more confident when I use the tool."

Understanding Origin

So what is a Shaper Origin? "Think of it as a router with a super accurate GPS system," Jake says. It is essentially a handheld CNC machine.

Shaper Origin locates itself within a workspace created by the user via strips of domino-looking adhesive tape placed on the workpiece. The user can then place a "digital template" onto the workspace, and Shaper Origin machines it by reading the programming. The user steers the tool along a path shown on its touch screen on



Whether you see it as a handheld CNC or a router with a GPS system, Shaper Origin vastly expands the scope of what a woodworker can do.

top. Shaper Origin adjusts its cutting position instantly to correct for minor user errors.

The programming is easy to make on the machine or by using Shaper Studio, and there are also hundreds of designs available at Shaper Hub, including the programming for the clock you see here. That's one of the best

things about the Shaper Origin system. When you buy a Shaper, you get access to all sorts of programming – from plans to hardware installation to templates. There are accessories that add functionality to the tool, too. Learn more by visiting a Rockler store or at shapertools.com.



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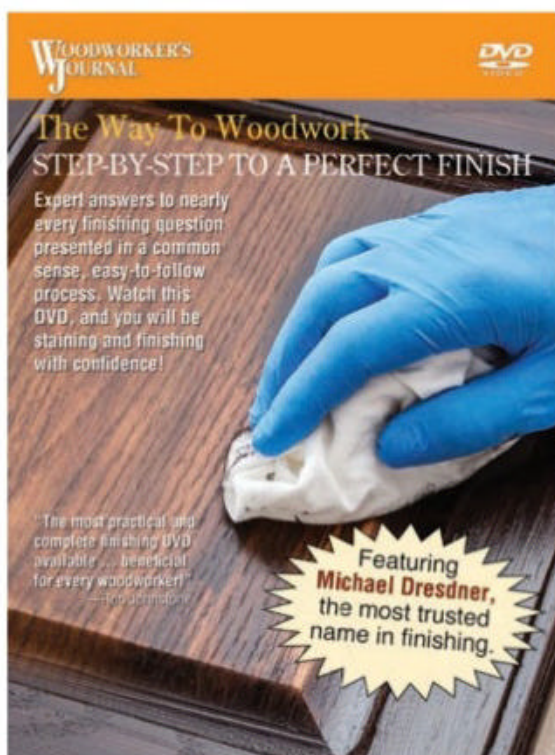


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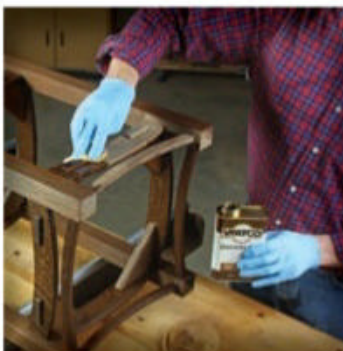
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Stickley Small Server

By Willie Sandry

Build this rare, single-drawer version of a Stickley classic. Its timeless styling and compact size will complement any room.

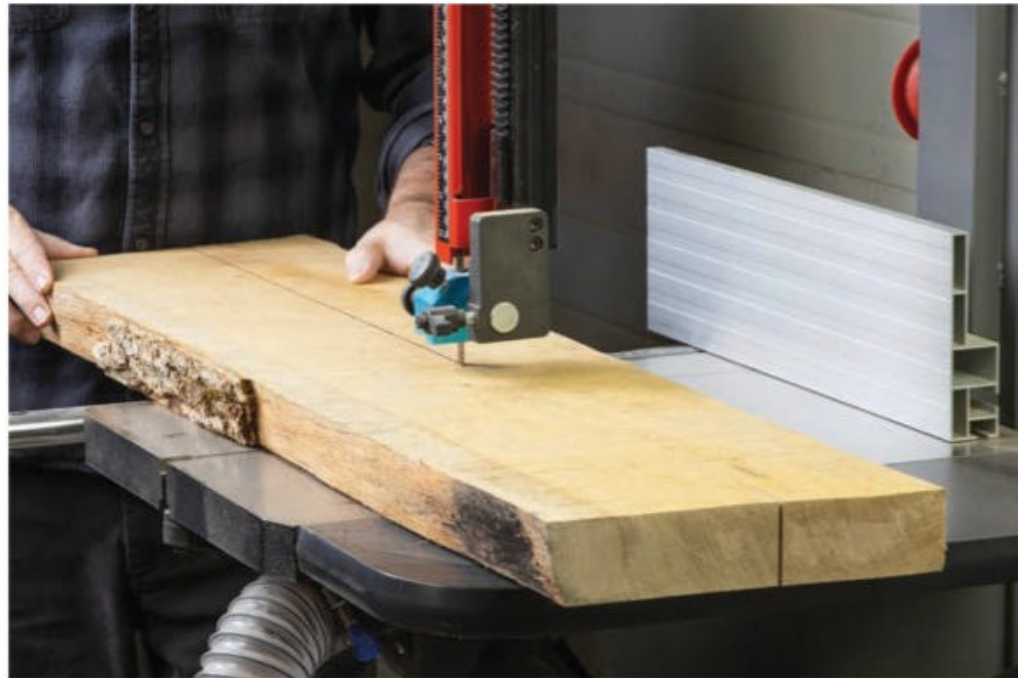
Originally cataloged as a sideboard, this #802 Gustav Stickley Server was a wider, two-drawer version. The full-size form was very popular in the early 1900s and has continued to be prized by collectors. Voorhees Craftsman, a purveyor of antique Arts & Crafts-style furniture in Pasadena, found a rare single-drawer version that they dubbed a small server. It might have been a one-off custom order from the Stickley factory in Syracuse, New York, or perhaps a rare uncatalogued form. At any rate, its compact size functions perfectly as a server for a smaller home. It would also make a nice entry table or nightstand. If you've built other tables with drawers, this project should be well within your skill set.

Preparing Quartersawn Stock

Round up some attractive 4/4 quartersawn white oak so you can make the four big panels for this project – the top, two side rails and the shelf. The top is large enough that if you don't have a large planer or drum sander, you might need to glue it up in sections. While the panels are in clamps, mill the 1 3/4"-thick leg blanks from some 8/4 stock, making sure they come out flat and square. Go ahead and make blanks for the front, back and shelf rails as well as the backsplash from 3/4" material.

I often mutter, "Joinery before curves" and "Mortises before tenons," and we'll take both of those mottoes to heart with this build. Lay out the 1/4"-wide mortises as shown in the *Leg Mortise/Taper Detail Drawings* on page 26, and machine or chop them with your best method. Cut 1/4"-wide x 3 1/2"-long mortises on the inside of the front legs to receive the curved front rail. Start these mortises 4 1/4" from the tops of the legs, and inset them 3/8" from the front faces. The back rail requires 1/4" x 4 1/2" mortises that start 1/2" from the top of the legs. Position them 1/2" in from the back faces of the back of the legs so the outward face of the back rail will be flush with the back faces of the legs. The mortises for the shelf rails need to be 2 1/2" long, and they start 7 3/4" up from the bottom of the legs. Locate these mortises 5/8" away from the inside edge of the leg so they will be properly positioned once the legs are tapered.

I was tempted to make the centered 11"-long mortises for the side rails with a router and edge guide, but clamping the work-



Rough out the leg blanks at the band saw from 8/4 stock. If the board is warped or twisted, it's helpful to cut the plank lengthwise before jointing one face flat and planing the workpieces to final thickness.



Once the leg stock is ripped into leg blanks, crosscut them to 33 1/4" long. The author does this using an oversized crosscut sled equipped with an adjustable flip stop.

piece for that operation is sometimes problematic. So, I used a 1/4" hollow chisel in my mortising machine instead. Take note that the mortises for the side rails are only 3/4" deep, while all the other mortises are 1" deep.

Once the mortises are chopped and cleaned out, it makes sense to work on the tenons next. When you look over the plans for this project, there are admittedly some cross-grain issues, and it would be difficult to build this form conventionally without violating some rules of wood movement. That's why, as with the original, the grain of the side rails runs vertically and not horizontally. With a dado stack installed on the table saw, cut 3/4"-long tenons on the side panels to fit the long mortises.



Label the legs 1 through 4 in a clockwise direction, starting at the front left (inset) to help keep their orientation clear when marking the mortises. Chop them with a mortising machine or your preferred method.



Form 3/4"-long tenons on the side rails with a dado blade and sacrificial rip fence at the table saw. Notice that these tenons are located on the long-grain edges of the side rails to avoid wood movement problems.



Without changing the rip fence position, raise the blade to 1/2" and turn the panel up on end to create shoulders on the ends of the side rail tenons. Back these cuts up with a miter gauge equipped with a sacrificial fence.

Aim for an easy friction fit, because these long-grain tenons are somewhat vulnerable to breaking until the frame is glued together, if they are flexed. Then reset the rip fence for making 1"-long tenons on the front, back and shelf rails. The front rail has a simple centered "blind" tenon, however the back rail is a little different. To position the outer face of the back rail flush with the outer faces of the back legs, an offset tenon is required. So, raise the blade incrementally to cut those tenons until they fit the 4 1/2"-long mortises you made in the back legs. When all the tenons are sawn, fine-tune their fit with a shoulder plane until they slide easily but not sloppily into their mortises.

More Preliminary Details

Now that the basic joinery for the server is complete, go ahead and mark out the curve on the front rail. Use a flexible strip of wood or a thin metal yardstick to lay out this line so it creates a smooth, flowing arch and leaves the front rail just 1 1/2" wide at the apex of the curve. Cut the arch at your band saw or with a handheld jigsaw, sawing just to the waste side of the layout line. Then fair and smooth the curve up to your layout line using a drum or spindle sander. Start with 80- or 100-grit, and work up from there.

This is also a good time to cut 1/4"-deep grooves along the inside faces of the side rails to receive the shelf. Center these 3/4"-wide grooves on the rail widths. I have found it easiest to cut the grooves first, then plane the shelf's thickness down until it fits the grooves without gaps. Then, assemble all the parts you've made so far to confirm the actual size of the shelf. Measuring directly off the project will give you confidence to proceed with trimming the shelf to final size.

Next up, we need to taper the legs on two sides. There's a long taper on the front face of the front legs and on the back face of the back legs. The left or right outer faces of all four legs have two tapers instead of one: a short one on top and a long one below it, which matches the long tapers on the adjacent faces of the legs. The four long tapers remove 1/2" of material at the bottom of the legs, reducing them to 1 1/4" x 1 1/4" at the floor. These primary tapers are 25" long, stopping just short of the upper rail joinery. The subtle top outer tapers are 4" long, and they remove just 1/8" of material from the top left or right faces of the legs. This gives the server "hips" when viewed from the front. While you could certainly band-saw the tapers, I like the precision of using a tapering jig at the table saw. Mark the taper cuts carefully and saw the first long one on each leg. Then rotate the leg blank away from the blade to make the second long taper cut. The single short side taper at the top of each leg can be completed in the same way.

Take a little time now to ease edges of the parts you've made. Pay particular attention to "safe edges" or areas you don't want to round over. Notably, these are where the back legs intersect the back rail. Likewise, the back edge of the top panel stays crisp for the addition of the backsplash. None of the shelf edges should be eased, either. Finish-sand all the parts up to 150- or 180-grit.



The shelf rail tenons are longer than the side rail tenons by 1/4", so make sure the resulting "shoulder-to-shoulder" dimension is 12 3/4" for both parts.



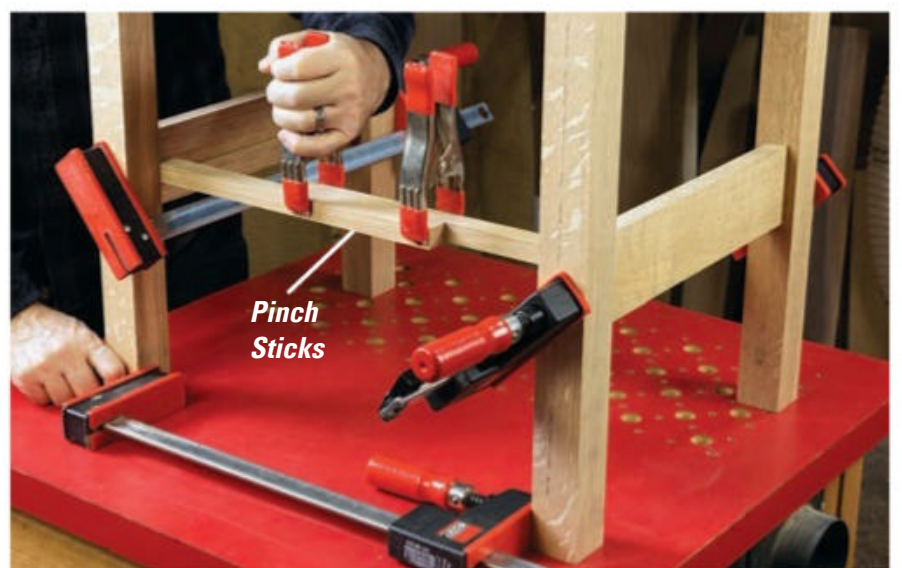
With the rip fence set for a 1" long cut, create offset tenons on the back rail. Raise the blade incrementally until these 1/4"-thick tenons fit the leg mortises and the outside face of the back rail is flush with the back legs.



Trim the tenons as needed with a shoulder plane until they slide into their mortises with a bit of friction; they shouldn't need force.



Plow a 3/4"-wide, 1/4"-deep groove along the inside face of the shelf rails and centered on the part widths.



Dry-assemble the server's frame, and use "pinch sticks" to measure an accurate length for the shelf. The bottom clamp, with one jaw reversed so it can be used as a spreader, is positioning the legs 18" apart.

Assembling the Sideboard Framework

Retrieve the backsplash workpiece you made earlier so you can round both of its top corners to a 1/4" radius before attaching it permanently to the top panel. Finish-sand both of these workpieces up to 150- or 180-grit first. Glue alone is sufficient for strength, but I always add a row of #20 biscuits for alignment when attaching a backsplash in this manner, so cut those mating biscuit slots if you decide to do the same. Glue and clamp the backsplash to the top panel with the biscuits installed, then start assembling the server's frame. First, create a pair of side assemblies by gluing two pairs of legs together with their side and shelf rails. Be sure the top edges of the side rails are flush with the tops of the legs as you draw the clamps tight. Allow those joints to dry. When the side assemblies come out of the clamps, bring the two together by gluing the front and back rail tenons into their mortises and the shelf in its rail grooves. Double-check the height between the top of the front rail and the tops of the front legs, which should be 4". Tighten the clamps, and set the frame aside to dry overnight. Then drill 7/8"-deep holes through the long tenons, centered 3/8" from the edge of the leg, so you can peg the joints with 3/8"-diameter dowels. The front and shelf rails receive two pegs per joint.

Building a Side-Hung, Center-Guided Drawer

You can construct the drawer box however you like, but I thought half-blind dovetails were a proper choice for a Stickley-style reproduction. You can see the dovetail layout I used with my router dovetail jig in the *Dovetail Detail Drawing* on page 26. The original server appears to have a "piston-fit" drawer, but I elected to use a different Stickley hallmark: a side-hung and center-guided drawer. While there's a little more work constructing a drawer with these features, it promises trouble-free operation for a long time. The center runner prevents racking and conveniently acts as a drawer stop, while the top edges of the side runners are the only points of contact when sliding the drawer in or out. (To see side-hung, center-guided drawers in action, look for a video on my YouTube channel, The Thoughtful Woodworker.)

Joint and plane enough oak stock for the drawer front, back, sides and divider, and cut them to the *Material List* sizes. Then saw the dovetails by hand or using a routing jig as I did. Now mill a 1/4"-wide, 1/4"-deep groove for the plywood drawer bottom, spaced 1/2" up from the bottom edge. You also need to mill

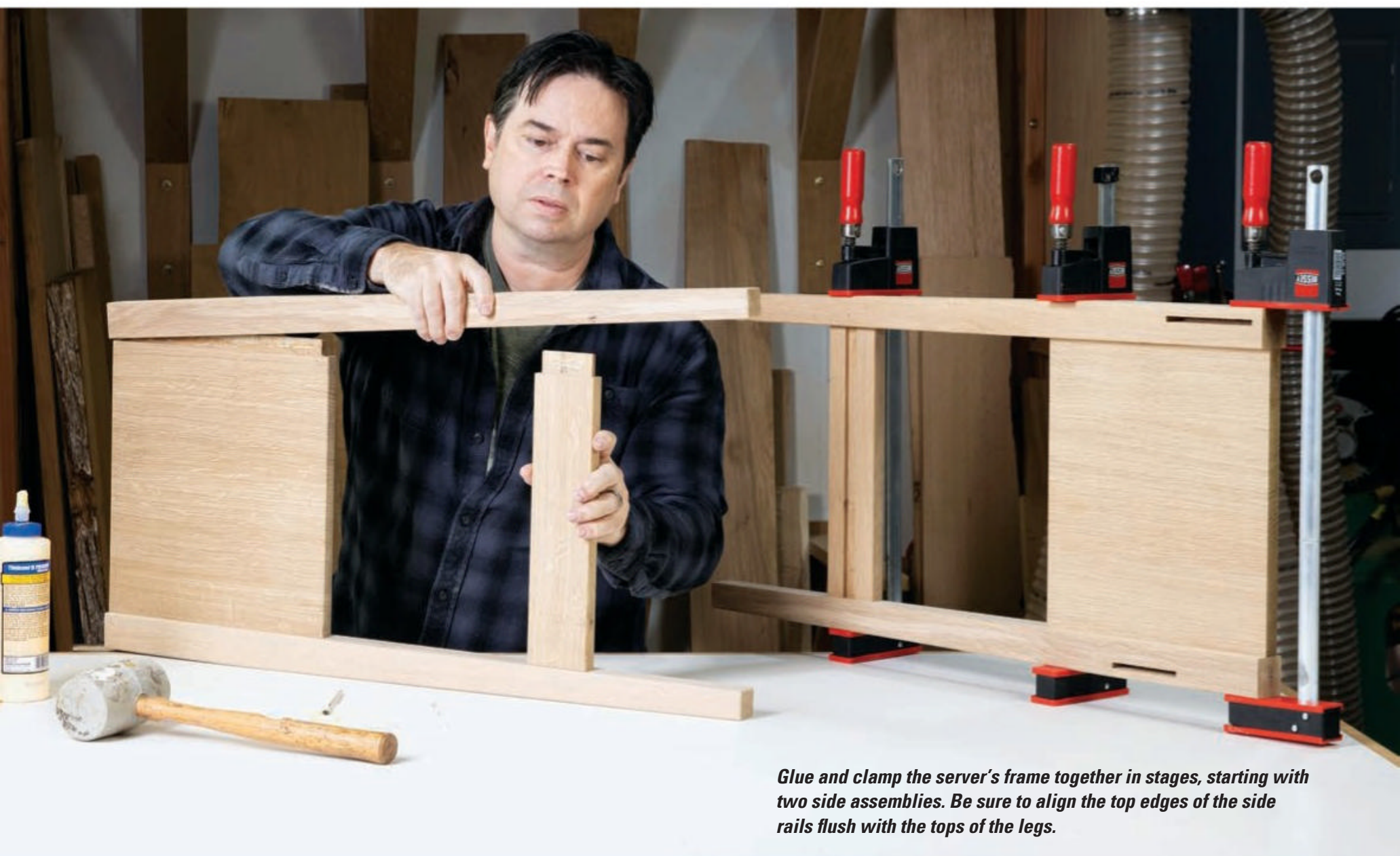


Taper the legs on two outside faces with a tapering jig. Complete the first long taper, then rotate the leg away from the blade for the second cut. Finish up by sawing the short taper on the outside left or right face of each leg (see inset). It removes 1/8" of width from the top of the leg.



a 1/4" x 2 1/2" mortise 1/4" deep underneath the drawer bottom groove on the drawer front workpiece. (It will house the front end of the drawer center track.) The drawer sides also require a 1/8"-deep x 5/8"-wide dado for the drawer divider. It serves as a false drawer back, which creates an interesting secret compartment behind the main drawer compartment.

Now rout a groove in the drawer sides to receive the side runners. This 3/4"-wide groove needs to stop about 1 1/4" from the front of the drawer sides, and it's best cut on the router table. Make sure to use a router bit capable of making plunge cuts, as one of the grooves should be made by tipping the drawer down over the bit with the drawer standing on its side and against the router table fence (often referred to as a "drop cut"). The groove in the other drawer side can be cut in the traditional fashion, starting the groove from the back edge of the drawer



Glue and clamp the server's frame together in stages, starting with two side assemblies. Be sure to align the top edges of the side rails flush with the tops of the legs.



Bring the two side subassemblies together with the front rail, back rail, and shelf to complete the framework. The top edge of the front rail should be positioned 4" down from the tops of the front legs.

instead of at the stopped end of the cut. Set the length of these groove cuts with a stop block clamped to the router table fence. The reason for routing these two side runner grooves differently – a drop cut for one and a typical groove cut for the other – is to ensure that both grooves line up exactly with one another across the drawer so it will hang evenly in its opening and slide smoothly.

Loosely assemble the drawer to check the final sizing of the drawer bottom panel. Cut a plywood panel for it to size. Finish-sand all the drawer parts, then prefinish the drawer front (see my staining method on page 27). Once the finish dries, glue the drawer together with the bottom and divider in place.

The secret to fitting this type of drawer is to mill the 1/2"-thick filler strips with the same router table setup as the side runner grooves you just made. So, make up a pair of filler strips from scrap stock and lower the router bit height to 1/16". Rout a groove into one face of each filler strip along its full length. Mark the edge of each filler strip that was against the router table fence "top." Then bore three pocket holes that face the "top" edge of the filler strips for attaching the top panel later. Fasten the filler strips to the inside faces of the side rails with screws. Set their marked "top" edges flush with the top edges of the rails. Then head to the table saw and trim 1/16" of width from the drawer parts on both the top and bottom edges to set the drawer reveal. Hand-plane the divider's top edge flush with the other edges.

At this point we've laid the groundwork for a really nice drawer, and there are just a few remaining parts to build. Make up a pair of drawer runners from maple or other dimensionally stable



Attach the backsplash to the top panel with glue and #20 biscuits, dowels or some variation of loose tenons. Leave the back edge crisp where it intersects the backsplash for a nice tight joint.



The author cuts these half-blind dovetails with a router jig. He uses two routers to produce cleaner cuts. The first, with a 1/4" spiral bit installed, hogs out the pin sockets, followed by the second with a dovetail bit for final shaping.

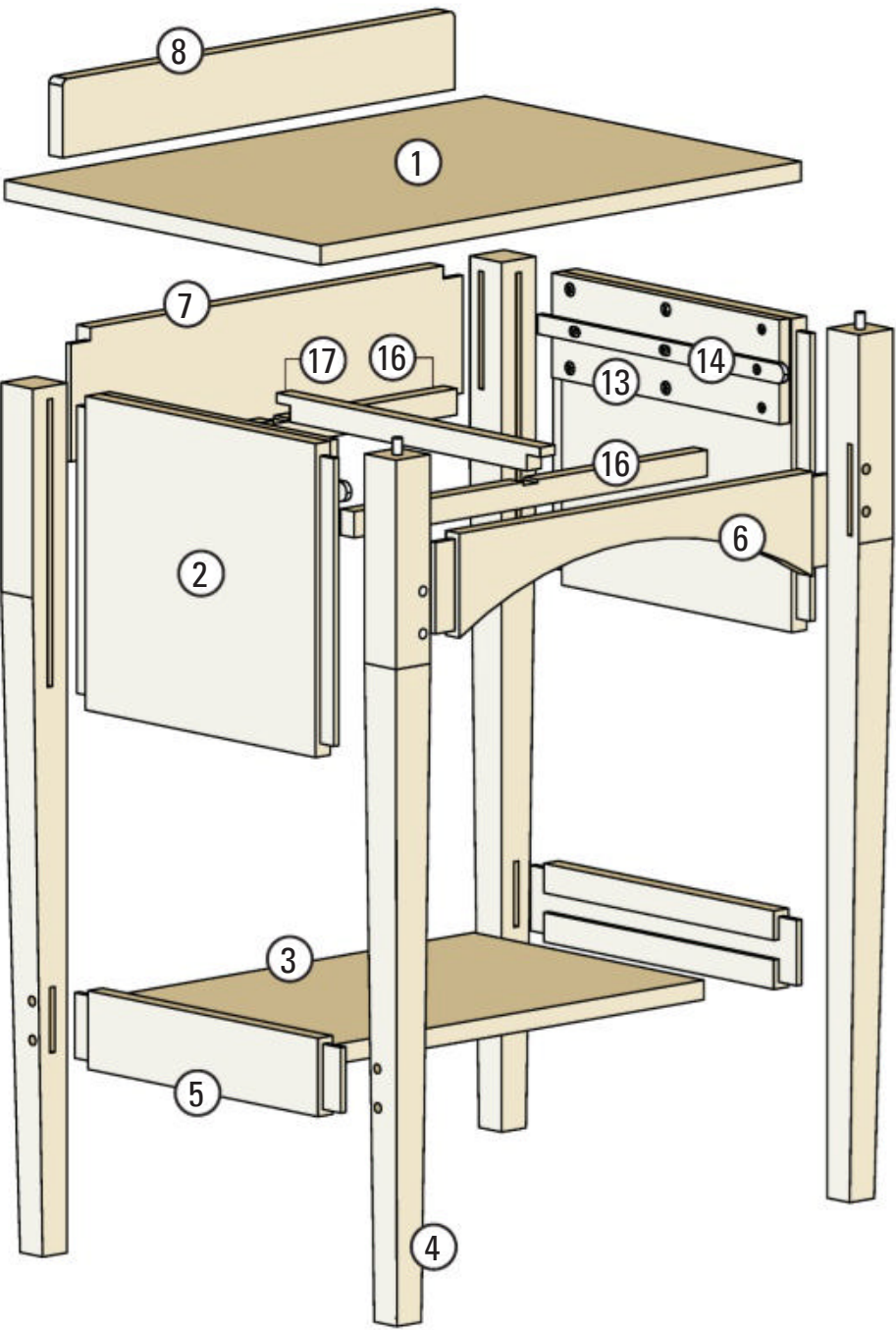


Rout a 1/4" deep stopped-groove in the drawer sides with a 3/4"-diameter bit capable of making plunge cuts. Reference the top edge toward the router fence for both cuts so these grooves match on both drawer sides.

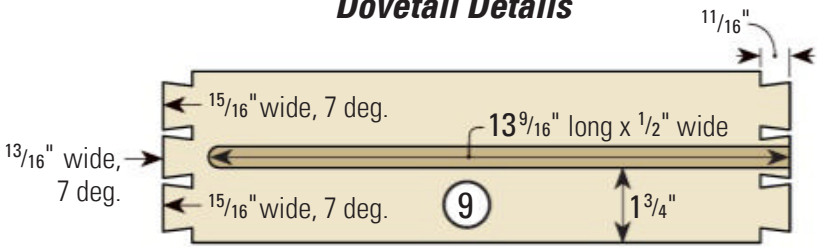


Lower the bit height to 1/16" and make a through groove in the filler strips with the same router table setup. This shallow groove will register the drawer slides in the perfect position, without trial and error.

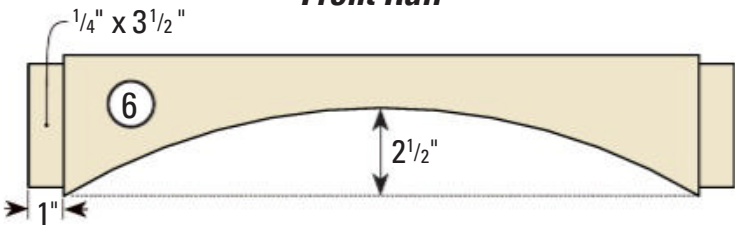
Exploded View



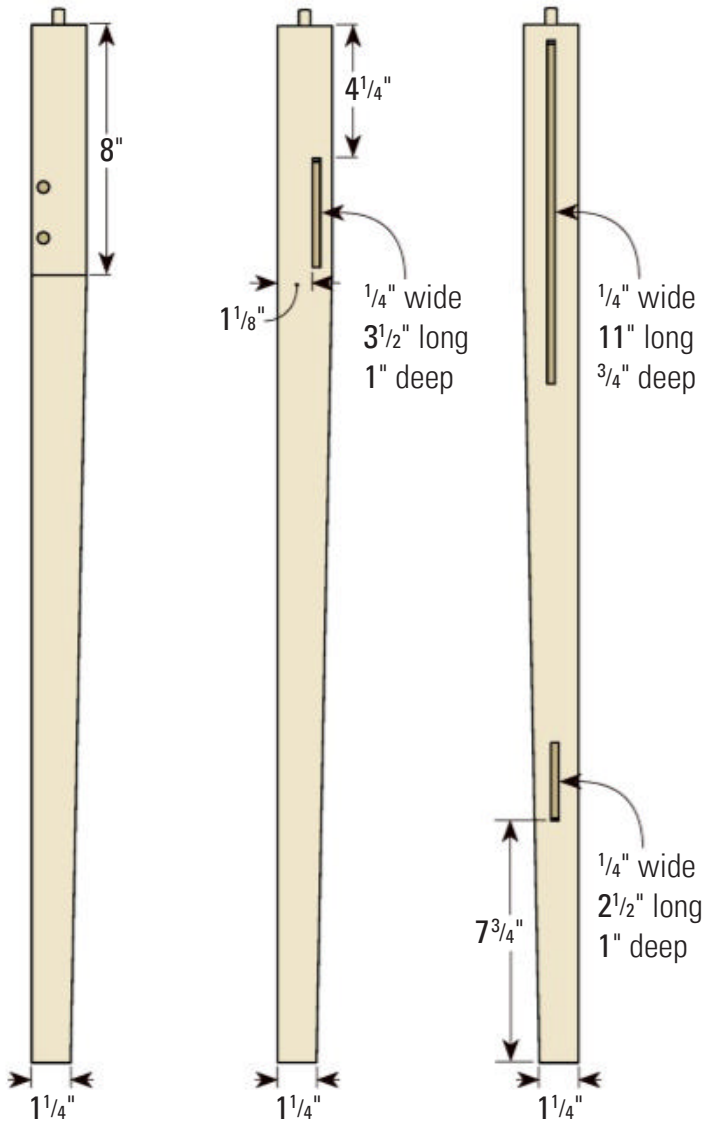
Dovetail Details



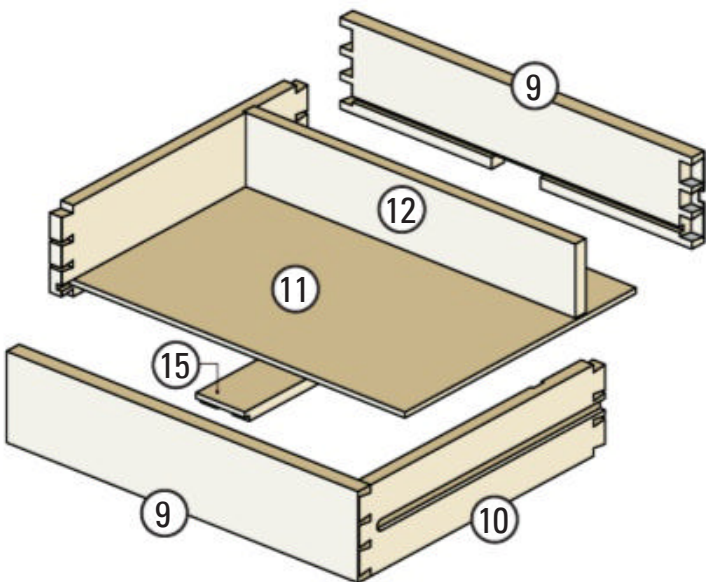
Front Rail



Leg Mortise/Taper Details



Drawer Exploded View



MATERIAL LIST

	T x W x L
1 Top (1)	3/4" x 17 1/2" x 24 1/2"
2 Side Rails (2)	3/4" x 14 1/4" x 12"
3 Shelf (1)	3/4" x 12 3/4" x 19 1/4"
4 Legs (4)	1 3/4" x 1 3/4" x 33 1/4"
5 Shelf Rails (2)	3/4" x 3" x 14 3/4"
6 Front Rail (1)	3/4" x 4" x 20"
7 Back Rail (1)	3/4" x 5 1/2" x 20"
8 Backsplash (1)	3/4" x 3" x 20"
9 Drawer Front, Back (2)	3/4" x 4" x 18"
10 Drawer Sides (2)	5/8" x 4" x 14 5/8"
11 Drawer Bottom (1)	1/4" x 13 3/4" x 17 1/4"
12 Drawer Divider (1)	5/8" x 3 1/4" x 17"
13 Filler Strips (2)	1/2" x 4" x 12 5/8"
14 Side Runners (2)	5/16" x 3/4" x 13 5/8"
15 Drawer Center Track (1)	1/2" x 2 1/2" x 14 1/4"
16 Center Slide Cleats (2)	3/4" x 1" x 18"
17 Center Slide (1)	3/4" x 1" x 14 5/8"



Install the center slide into the 1/16"-deep notches in the top edges of the cleats and secure it with a pair of wood screws, one driven through each of the slide's tongues.



Insert the center track's tongue into the mortise below the drawer bottom in the drawer front, and drop it into the notch in the back of the drawer. Two screws at the rear secure the track to the drawer.



The author uses a two-stage coloring process: dye first (above), followed by gel stain (inset). He applies a barrier coat of dewaxed shellac after dyeing the wood to seal it in. The final topcoat is satin lacquer.

hardwood. Size them to slide easily in the drawer grooves, and notch their back ends so they'll fit around the back legs. Mount them in the filler strip grooves with countersunk screws.

The back of the drawer also needs a 1/4" x 2 1/2" centered notch to make room for the track that's mounted underneath it. Saw that notch now. Then make the drawer track component from 1/2" stock, and cut a tongue on one end to fit the mortise you made earlier beneath the bottom panel groove in the drawer front. The track also needs a 1/4"-deep x 2 1/2"-wide groove plowed into its bottom face and centered on its width to receive the center slide. Install the track on the drawer by fitting its tongue into the drawer front mortise and securing the back end in the notch in the drawer back with a couple of small screws.

You're ready to install cleats in the server to support the center slide. Make up the 1"-wide cleats from scrap stock. Cut centered notches, about 1/16" deep, into the top edges of both cleats to register the slide before fastening the cleats to the inside faces of the front and back rails with screws. Locate them so the top edge of the front cleat is flush with the top edge of the front rail. Position the back cleat's top edge 4" down from the top edge of the back rail.

Make up the center slide from a piece of dimensionally stable hardwood. Cut a notch into its front and back bottom edges, leaving a 3/8"-thick tongue to fit into the slide cleat notches. Set the slide into place in the server and test the drawer action. If

it opens and closes smoothly, fasten the slide's tongues to the cleats with countersunk screws.

Applying a Multi-step Finish

I use a multi-step stain-over-dye technique, which enhances the figure of quartersawn white oak and lends a vintage appearance to the piece. I start with TransTint Dark Mission Brown Dye. To avoid raising the grain, I mix 1 1/2 ounces of concentrated dye into a quart of a 50/50 mix of denatured alcohol and lacquer thinner. Apply the dye with a terrycloth-wrapped sponge. Adding five to 10 percent lacquer retarder will slow the drying time and help avoid lap marks. I then seal the dye with a light coat of sprayed shellac (don't wipe or brush on the shellac, as it will resuspend the alcohol-based dye) before applying General Finishes Antique Walnut Gel Stain. I complete the finish by spraying on two coats of satin lacquer.

Attach the top panel to the server's frame by driving 1 1/4" pocket screws up into the filler strip pocket holes. You will notice that I added dowel pins to the tops of the front legs. They are optional but do help to register the top evenly. Complete this lovely little server by installing a reproduction Stickley drawer pull, centered on the drawer front.

Willie Sandry enjoys building custom and reproduction Arts & Crafts-style furniture with traditional joinery.

Slab-built Bookcase

By Nick Brady

Ruggedly beautiful as it is practical, this bookcase's red elm slab lumber was milled with a new Benchtop Slab Flattening Jig from Rockler.



River tables and live-edged furniture are immensely popular, but I've been thinking about other interesting ways to use a slab in a more non-traditional way. Slabs can offer spectacular grain patterns and more character than you'll often find on typical dimension lumber, because they're frequently sourced from trees that aren't part of forests that are periodically logged.

Since this sturdy bookcase has fairly simply styling, I thought resawing a unique slab might provide a chance to spice up the design with thicker components, showier grain and distressed figure. So I went to a local sawmill and selected a slab of red elm — it's a species you won't find at many lumberyards. I think its strong grain pattern, natural defects and warm color look great. The large box joints on the corners of the carcass complement the bookcase's black, stocky base to give the project a contemporary look. Here's a design that should work well with many home decors.

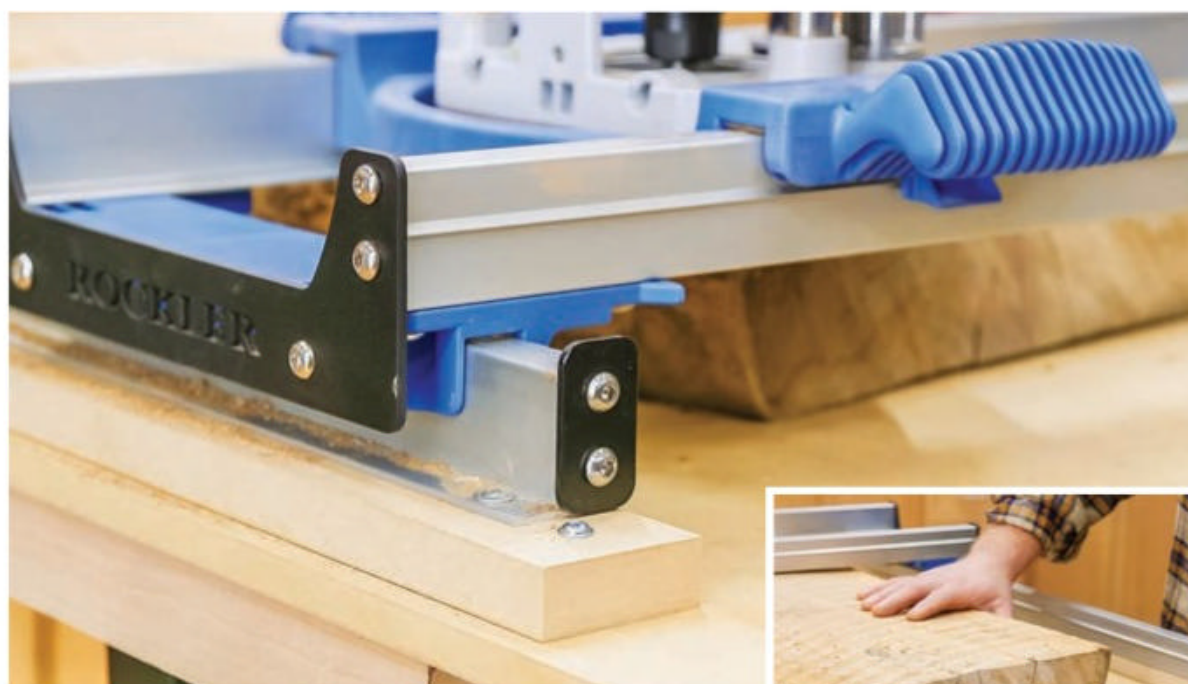
Selecting the Slab

When I had my piece of red elm picked out, I made sure to take note of its moisture content. Material around 12 percent or less moisture content is ideal for furniture building, and mine was dry enough for immediate use. The slab I bought was 7 ft long and about 14" wide. I checked for any embedded metal objects with a metal detector and then rough-cut the plank into three sections that were about 26" long.

I sized my pieces, in part, to fit into Rockler's soon-to-be-released (late February) Benchtop Slab Flattening Jig. It fits workpieces up to 18" wide, 28" long and 1¾" thick. My slab was about 2⅜" thick and had a slight crown to it, but that was no problem for this slab-flattening system. One of the unique features of this aluminum-railed jig is that it can be shimmed up to any height to match the thickness of the slab for surfacing. I raised the jig by inserting strips of ¾" MDF under its rails on top of the jig's MDF substrate.



Rockler's Benchtop Slab Flattening Jig (above), coming in February, features a reinforced plastic router carriage with ergonomic handles that slides along pairs of aluminum cross rails. A clear acrylic baseplate (not shown) attaches to the router carriage and is pre-drilled to fit a variety of mid-sized routers. Used in tandem with a spoilboard surfacing router bit, such as the one shown at left (sold separately), this setup and your router will make quick work of many smaller slab-flattening tasks.



While this Slab Flattening Jig is intended for slabs up to 1¾" thick, it can be raised higher with spacers for thicker slabs, as the author did here (above). Be sure to shim and secure the slab (inset) so it won't shift during routing.



With the router set to remove about 1/8" of material thickness, flattening a slab involves sliding the router carriage back and forth slowly in side-by-side passes from one end of the slab to the other. You'll be left with a dead-flat surface (inset).



Starting an ambitious resaw cut at the table saw is one way to reduce the amount of material that a modestly powered band saw must then cut through. Square both workpiece edges first.

Flattening Both Sides

When preparing a slab for flattening, it's important to stabilize and secure it to the jig's MDF or plywood substrate so it can't shift. I used a combination of shims and blocking, hot-glued to the substrate and the slab sections, to lock things down. With a 1½"-diameter carbide-insert spoil bit (see page 29) installed in my mid-size router, and the router mounted to the jig's reinforced plastic router sled, I was able to easily remove the rough surface of the wood and eliminate

the cupping/crowning. The process to flatten a slab in this jig is simple: Slide the router carriage back and forth on the jig's aluminum rails, taking off about 1/8" of material or less of thickness at a time. After one side is flat, you could flip the slab over and repeat the flattening process to create a second smooth face. That might be really helpful if you don't own a planer. But since I do, I ran the slab sections through my planer at this point with the flattened faces down to reduce their thickness to 2⅜". This way, I could resaw them to achieve the 1" stock thickness I needed plus account for the material lost to the blade kerf and a bit of cleanup.

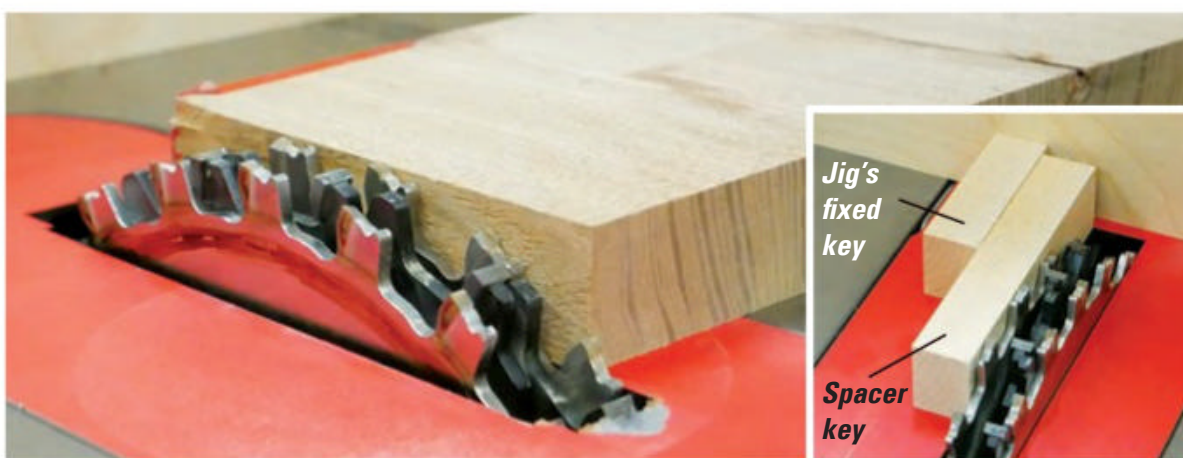
Once the faces of my slabs were flat, smooth and parallel to each other, it was time to work on their live edges. At the table saw, I used Rockler's Straight-Line Rip Hold-Down Clamps (item 67042) attached to a plywood sled to rip one irregular edge off of each slab. I cut the opposite edges off using the rip fence, leaving each piece about 1/2" wider than the *Material List* dimensions (see page 32). I squared up their ends at the miter saw and kept them a tad overly long.



Even though the rip fence on this Laguna band saw isn't in view (the tall workpiece obscures it), it's supporting the opposite face of the slab section to help guide the cut along the line the author marked on top of the workpiece. A tall featherboard presses the slab against the fence to also help keep the cut on track.



Once a resaw cut is completed, the roughsawn faces can then be smoothed in a surface planer. If you don't own one, however, a belt sander or bench plane can do the job by hand, too.



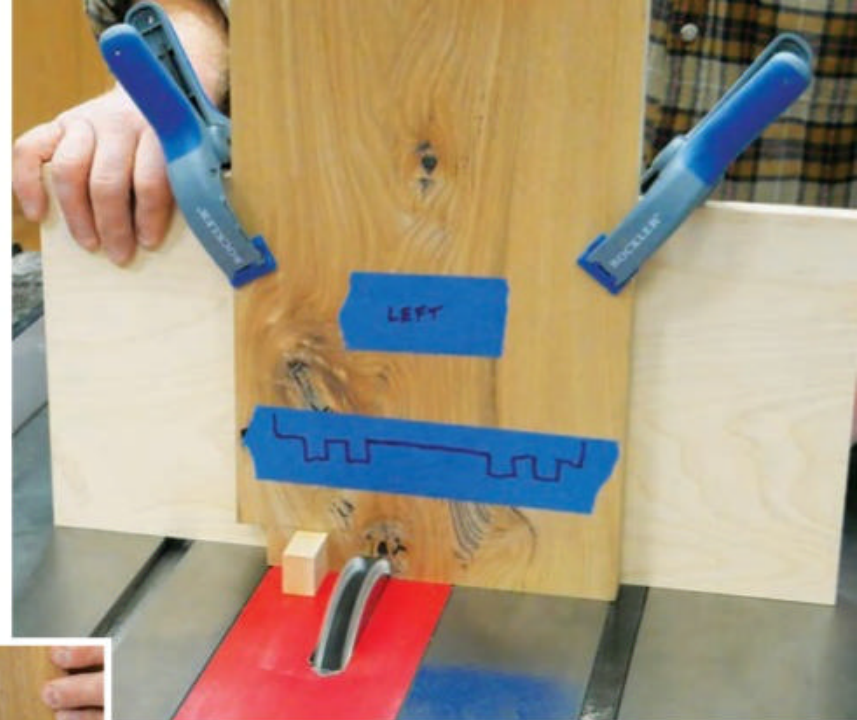
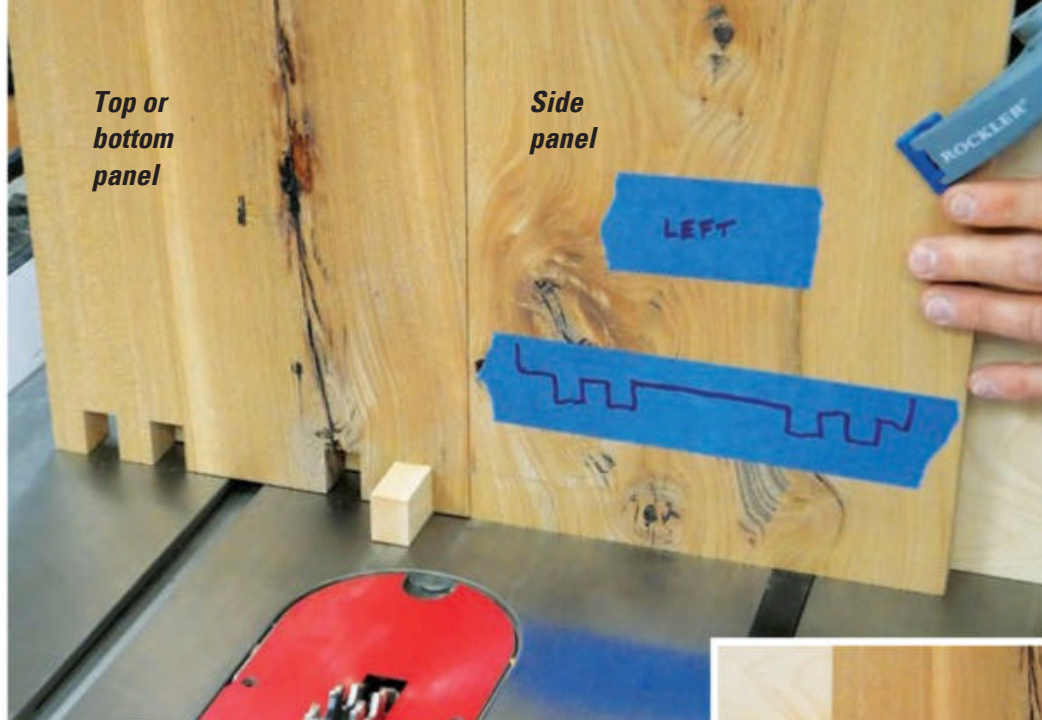
The author set the height of his ¾"-wide dado blade just slightly above the 1"-thick bookcase stock so the box joint pins would be cut a tad proud. A second wood key (inset) served as a spacer for indexing the box joint jig's fixed key the correct distance away from the blade during setup.

On to Resawing, Gap-filling

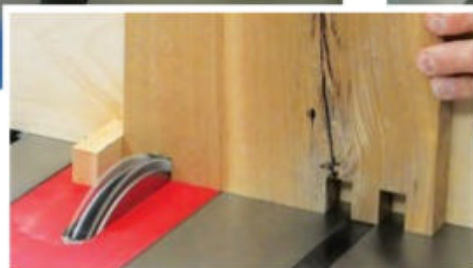
It's sometimes easier with modestly powered band saws to first begin a resaw cut at the table saw, making a deep cut into both edges. That's what I did here, which reduced what would be left for the band saw to finish up. After making the table saw cuts along the slab's centerlines, I took them over to the band saw and split them the rest of the way, turning three thicker pieces into six thinner ones.

I cleaned up the six sawn faces with one more pass through my planer, which brought them all to 1" thickness. But you could use the flattening jig instead, or even a belt sander or a bench plane. It's up to you. The important thing is, make sure the stock thickness for the bookcase's top, bottom and sides match.

One of the reasons I selected this slab was because of the unique cracks and voids in it. I filled those defects with



A pair of slot cuts, made by flipping the bookcase top and bottom panels edge-for-edge and fitting them over the jig key (inset) create the irregular box joint pattern. Then these panels act as indexes for setting up the first slot cuts along the edges of the side panels (above).



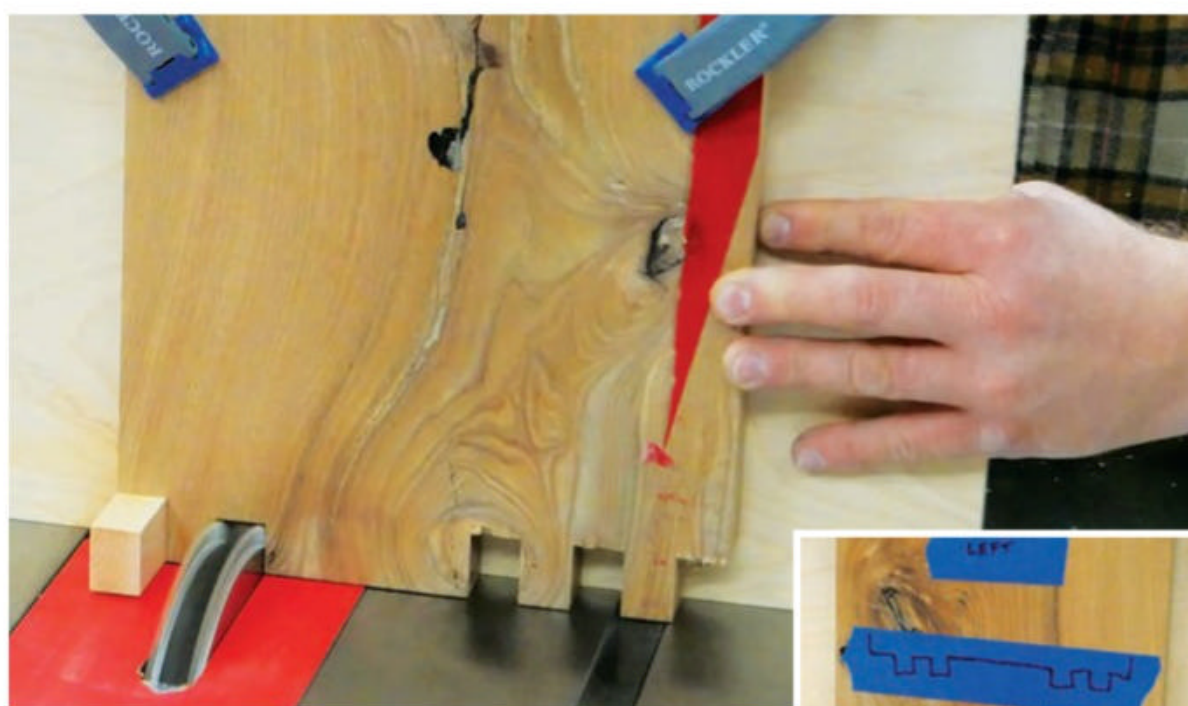
Two more slot cuts create the outer pairs of pins that fit in the top and bottom panel slots. The inner slot cut being made here also defines one inside edge of the 3"-wide center slot. Masking tape helped the author keep this tricky pattern clear.

a black tinted epoxy designed for this application. After a few hours of curing, the epoxy was ready to sand flat, which I did with my random orbit sander. Then I trimmed the bookcase's top, bottom and sides to final size.

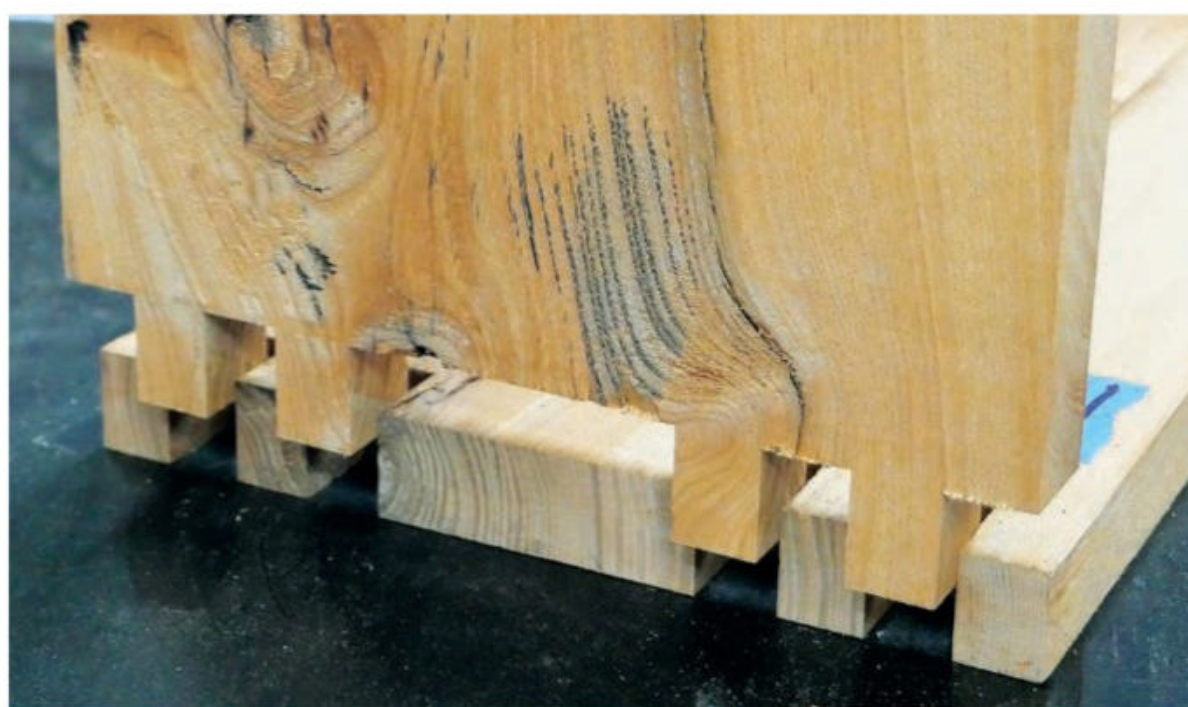
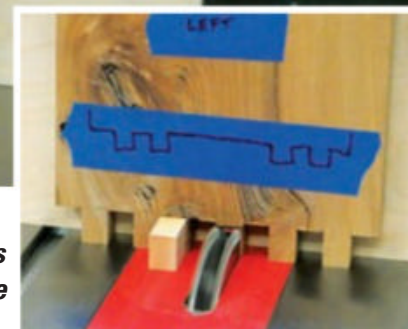
Cutting Box Joints

This bookcase features an irregular box joint pattern on the corners to add some visual interest as well as strength, since the project has no back panel. I cut my box joints using the old tried-and-true shop-made "miter gauge" jig. It consists of a piece of 3/4" plywood attached to my miter gauge's fence with a 3/4" x 1" wooden key installed in a notch in its bottom edge. I chose a piece of plywood measuring roughly 12" x 16" for the jig fence — it was large enough to provide plenty of vertical and horizontal support for these large bookcase components, particularly when two of them need to be standing side by side on the jig for cutting the box joints. With a 3/4"-wide dado stack installed in the table saw, I set the height a hair above 1", so the pins of the joints would extend just a bit past the workpiece faces when assembled. (I think it's easier to level those flush than have the pins come up short and need to plane the whole faces of the parts instead.)

I cut a 3/4" slot through the edge of the jig's fence, about halfway along its length, for the wooden key. Then I made up a piece of 3/4" x 1" key stock about 4" long. I cut it in half and installed one piece in the jig's notch so it was flush to the back



After making the necessary slot cuts on one side of the bookcase side pieces, flip them over, edge-for-edge, to repeat the three cuts in from the opposite edge. Then remove the last of the inner waste in side-by-side passes (inset) to complete the wide center slot.

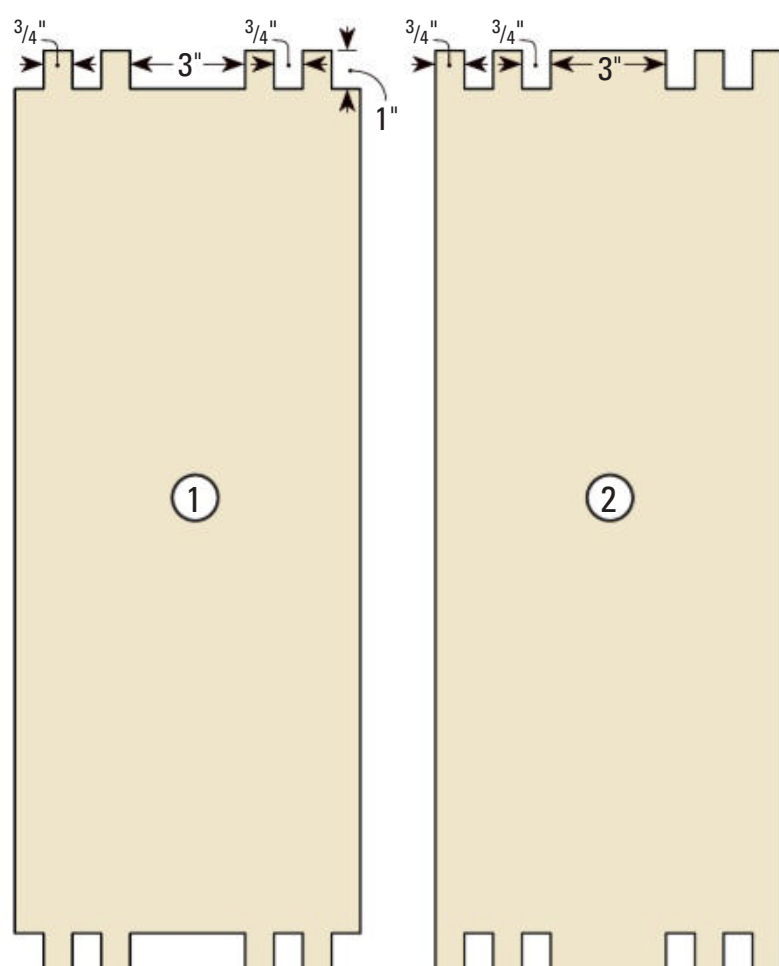


If you do a careful job of setting up the box joint jig initially, these joints should slip together without needing to be pounded home or showing extra gaps. However, if this is your first attempt at making box joints, be sure to test your jig setup and the entire cutting sequence on scrap stock first.

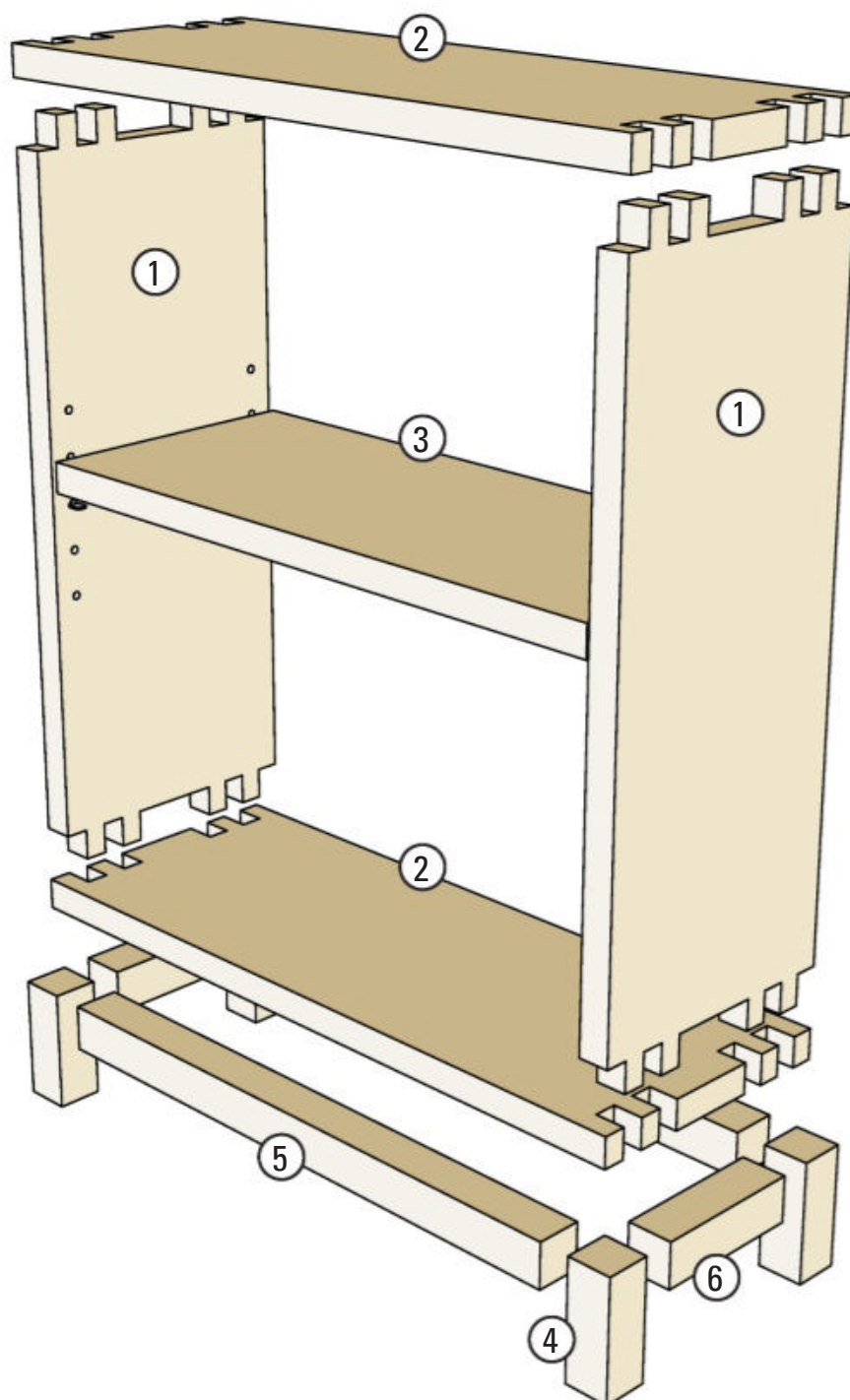
MATERIAL LIST

	T x W x L
1 Sides (2)	1" x 9" x 24"
2 Top, Bottom (2)	1" x 9" x 24"
3 Shelf (1)	1" x 9" x 21 ³ / ₄ "
4 Legs (4)	1 ¹ / ₂ " x 1 ¹ / ₂ " x 4"
5 Long Stretchers (2)	1 ¹ / ₂ " x 1 ¹ / ₂ " x 20"
6 Short Stretchers (2)	1 ¹ / ₂ " x 1 ¹ / ₂ " x 5"

Box Joint Layout



Exploded View



face of the fence and projected outward.

To prepare the box joint jig, set the second key against the first key on its left side (looking down from above) to act as a spacer, and place the jig fence against the miter gauge fence with the miter gauge in your saw's left miter slot. Slide the fence assembly over so the spacer key touches the right side of the dado blade. Holding it carefully in this position, fasten the miter gauge to the box joint jig with several screws driven through both fences. Then remove the spacer key and cut a second notch through the jig fence. The distance between the jig's key and the blade must match the width of the blade precisely, or the joints will be difficult to assemble. Accurate setup is really crucial here!

I used masking tape to lay out my box joint pattern on each of the bookcase's top, bottom and side workpieces to help avoid confusion — no room for mistakes here on one-of-a-kind lumber! The tape layouts are merely visual guides, not exact templates for cutting.

As you can see in the *Box Joint Layout Drawing* above, the 3/4"-wide pins are spaced between 3/4"-wide slots, and there's a 3"-wide "pin" in the middle of the pattern on the bookcase top and bottom panels. I cut the joints on the ends of the top and bottom panels first, indexing each slot cut by fitting it over the jig's key. Notice that you cut two slots in from each edge of these parts to form two thin pins. What's left in the middle is the wider pin. Once the top and bottom panels

are cut, use them to index the first slot cuts on the edges of the bookcase sides. It's typical box-joint cutting procedure. Finish cutting the wider center slots by removing the waste in several passes.

Assembly Time!

With the tricky step now behind you, dry-fit the corner joints to make sure they slip together — if you made the jig correctly and worked carefully, they will! Then I disassembled the carcass, gave all four parts a finish-sanding up to 220-grit and brought them together one last time with glue and clamps. When the glue dried, I flattened the protruding pins with 60-grit abrasive in my random orbit sander, then finish-sanded those areas again.

I wanted the bookcase shelf to be



Assemble the bookcase's carcass with glue and plenty of clamps so the joints close fully.

adjustable, so it was time to pull out my Rockler shelf pin jig and drill/driver to bore the 1/4" shelf pin holes. Make sure all the rows of holes you drill align with one another so the shelf will sit evenly.

The base's legs and short and long stretchers are simply 1½" x 1½" stock joined with pocket screws and glue. Since I would be painting the base, I just milled down economical 8/4 poplar for these parts. Once you've got the components cut to size and shape, fasten pairs of legs to each short stretcher with glue and pocket screws, orienting the pocket holes so they're inside the base where they won't be seen. Then join these base end subassemblies to the long stretchers, again hiding the pocket holes on the back sides of the parts. When the glue dried, I sanded the base and brushed on two coats of General Finishes Lamp Black Milk Paint to wrap up its construction.

Finishing Up

This bookcase will receive lots of use in my busy home, so I opted to finish the carcass and shelf with a hard wax oil. It's easy to apply by hand, and it buffs beautifully to a soft luster. It's also easy to repair down the road by simply wiping more finish on again.

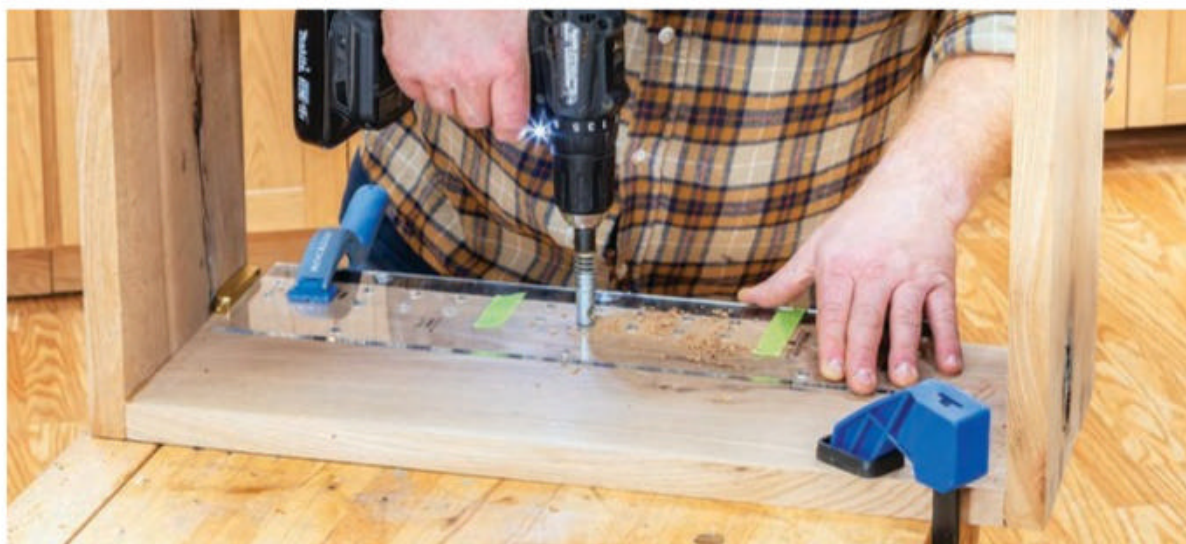
Once the paint and finish thoroughly dried, I bored 1/4"-deep countersunk holes into the bottom of the base stretchers, centered the base on the bookcase's bottom panel and fastened the components together with 2" wood screws.

Now grab some metal shelf pins and install the shelf at a height that works for you. I hope you'll enjoy this rugged and attractive bookcase as much as I do!

Nick Brady is a project builder for both Rockler and Woodworker's Journal.



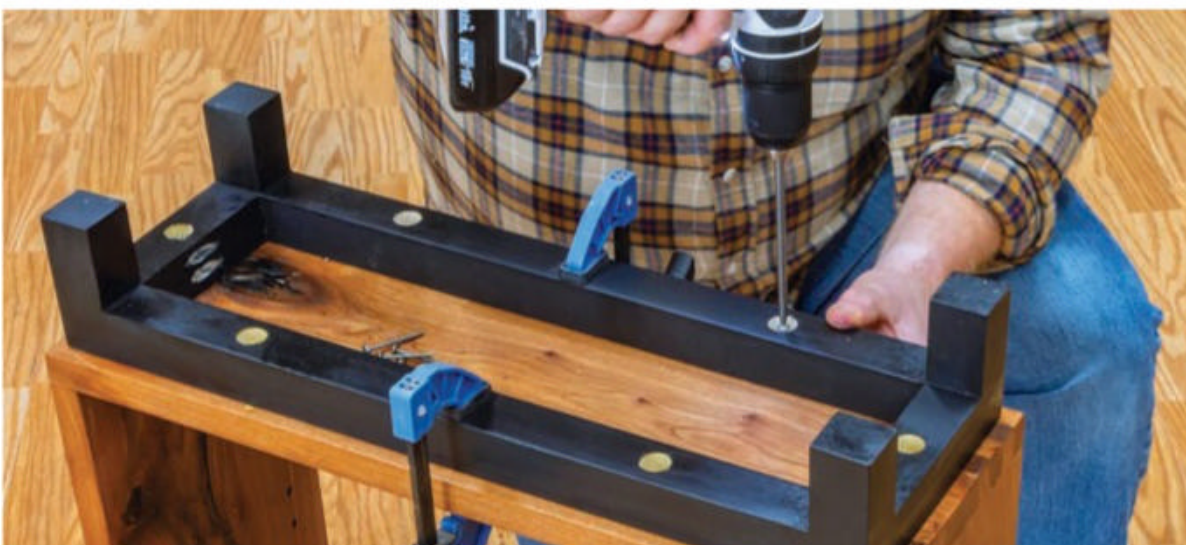
Flatten the protruding pins of all four joints with a sharp hand plane or with 60-grit sandpaper in a random orbit sander. Work up through the grits from there to 220. To avoid scratches, don't skip grits.



Bore two rows of shelf pin holes into the inside face of each bookcase side. A shelf pin drilling jig like this makes the task easy. Masking tape can help avoid accidentally drilling too many holes.



Poplar is a sturdy paint-grade hardwood for this bookcase's base. Assemble the legs and stretchers with glue and pairs of pocket screws at each joint. Orient the screw pockets to hide them.



Paint the base and apply a topcoat to the carcass and shelf before attaching the base to the carcass with 2" screws driven into countersunk holes.

Gluing Supplies Caddy

By Chris Marshall

This portable organizer can help corral all your woodworking glues and applicators.



DOUBLE-SIDED DRAWER



Mill 1/2"-wide x 3/4"-deep notches on the ends of the carcass front and back, and a mating pattern into the top ends of the carcass sides, to form interlocking box joints. Be sure to test your setup on scrap stock first.



Plow 1/4" x 1/4" grooves along the inside faces of the carcass front, back and sides for the deck panel. Mark the cutting limits of the router bit so you can start and stop the groove cuts in the side panels accurately.

It's tough to do much woodworking without reaching for a glue bottle and some means of spreading it around or dispensing it into joint parts. Over time, you'll likely end up with a bottle of nearly every "flavor" of glue out there. I keep five types of PVA glue, hide glue, four viscosities of CA glue and a couple of small bottles of five-minute epoxy. Along with the adhesives, I have all sorts of Rockler silicone glue brushes, including those made for dowel, biscuit and other specific joints. And just recently, I've added some new silicone glue bottle caps for joinery to my collection too — they're brand new from Rockler.

All of this stuff has needed organization for some time, and with this gluing supplies caddy, I think I have the solution. On top it's amply sized to hold all the glue options, plus a quart of mineral spirits for checking for glue splotches and a small pail and sponge for cleaning up squeeze-out. Underneath, there's a drawer for storing a bunch of glue brushes, a putty knife and my new Rockler glue bottle caps. The drawer is divided and slides out from either the front or back of the caddy to make it easier to find what I need. It's held closed with pairs of rare-earth magnets to keep it from sliding open when I carry the caddy from where I'll keep it to the bench for use. If your gluing supplies could use tidying up too, that's a good excuse to commit some energy and a bit of lumber to this project on a Saturday morning sometime soon.



While the author opted to use #20 biscuits to attach the bottom panel to the sides, other joinery options would be fine choices too, including nailed or screwed butt joints or loose-tenon variations.



A pair of 3/8"-dia. rare-earth magnets, set flush with the top face of the bottom panel near both ends, will provide half of the drawer "catch" feature. Rough up the bottom surface of the magnets with a fine-grit sharpening stone or sandpaper before installing them in their holes with 5-minute epoxy.

Sharpening stone



Glue up the carcass with the deck and bottom panels installed. Rockler's blue 1/2" Box Joint Cauls (item 34974) and a pair of strap clamps are an effective way to press the joints' pins and slots together snugly. Hide glue, used here, makes squeeze-out easy to clean up with water and a sponge.



Glue a pair of 1/4"-thick scrap drawer guides to the bottom face of the deck panel. They'll prevent the drawer from tipping down excessively when it's opened. If they're initially flat, the guides don't need to be clamped in place.



Saw the handle to shape and sand it smooth. Then ease the sharp edges above the carcass area with a 1/8" roundover bit in a handheld router, as shown here, or with sandpaper, to make it more comfortable to grip.



Fasten the upper divider to the front end of the handle with a couple of #8 x 2" countersunk screws. Then attach the handle/divider assembly to the carcass with more screws.



Wood plugs aren't necessary for shop projects like this, but they do make evidence of screws less noticeable. Install them with glue, then saw off the excess and sand the areas flush.

Building the Carcass

Get this build underway by gluing up panels for the carcass sides from 3/4" stock, as needed. Rip and crosscut them to final size, according to the *Material List* on page 39. Then cut a pair of workpieces for the carcass front and back to size.

The front, back and side panels connect with 1/2" box joints. I made them on the router table with Rockler's box joint jig and a 1/2"-dia. upcut spiral bit. But, you could also make them on the table saw with a 1/2"-wide dado blade and a shop-made jig. Raise the bit or blade to 3/4" so the pins and slots of the joints will enable the workpieces to mesh completely together. Start the joints with a pin at the top edges of the front and back pieces, and machine the pattern across the full width of these two parts. Then use them as spacers to mill a mating joint on the top edges of both side panels. Here, there should be a slot that starts the pattern. Mill four slots and three pins only.

Next, install a 1/4" straight or spiral bit in your router table so you can plow 1/4"-deep grooves on the inside faces of the front, back and sides for the caddy's top deck. Adjust your router table's fence so these grooves align with the bottom edge of the bottom pin on the front and back panels. Plow them the full length of the workpieces.

Use the same router table setup to plow grooves for the deck on the side panels. This time, however, mark the cutting limits of the router bit on the fence so you can start and stop these groove cuts 1/2" in from the front and back ends of the side panels in order to hide them when the carcass is assembled. Square up the ends of the grooves with a chisel.

Now you can cut a 1/4"-thick deck panel to size – I used MDF for mine. Prepare a 3/4"-thick bottom panel, too. Then go ahead and dry-assemble the six carcass parts you've made up to this point to ensure that the box joints close properly with the deck and bottom panel in place. If they do, sand the inside faces of the front, back, side and bottom panels up to 180-grit.

How you'll install the bottom panel in the carcass is entirely up to you. I decided to use biscuit joints and machined four evenly spaced #20 biscuit slots into the adjacent surfaces of the bottom and side panels for this purpose.

As you can see on page 34, the drawer can be opened from either end of the caddy. And since this project is intended to be carried where it's needed, it's a good idea to provide some provision for a drawer "catch." Four 3/8"-dia. rare-earth magnets can accomplish this purpose nicely! We'll embed two magnets in the top face of the bottom panel and do the same in the bottom edges of the drawer's front and back pieces. This way, when the drawer is closed, the pairs of magnets will attract one another and hold the drawer in place. I used a 3/8"-dia. Forstner bit to drill shallow holes for the magnets in the inside face of the bottom panel and then glued the magnets into place with quick-setting two-part epoxy. Make sure the top faces of the magnets are flush with the panel's face.

Next, spread glue over the pins and slots of the four box joints and into the biscuit slots, and clamp the carcass together with the deck, bottom panel and biscuits in place. When the glue cures, rip and cross-cut two strips of 1/4"-thick scrap to create drawer guides. Glue and clamp them to the bottom of the deck inside the drawer "tunnel," with their long outer edges flush against the carcass sides.

Adding the Handle

Cut a blank for the handle to size, as outlined in the *Material List*. If you're building your caddy from solid lumber as I did, make sure to orient the grain direction so the long grain will be parallel to the handle's top grip (the grain should run horizontally when the handle is in place on the caddy). Lay out the handle's shape, using the *Handle Drawing* on page 39 as a guide.

Now step over to your band saw to cut out the handle, or use a handheld jigsaw. Sand the cut edges and faces of the handle smooth. Then ease the sharp edges of the portion of the handle that will extend above the carcass with a router and 1/8"-radius roundover bit. Or break these edges with sandpaper.

Cut a divider for the upper area of the caddy to size from 3/4" material. It should fit snugly between the side walls of the carcass. Center the front end of the handle on the length of the divider, and fasten the parts together by driving #8 x 2" countersunk screws through the divider and into the handle.



Box joints are an attractive and sturdy choice for the caddy's drawer, too. This time, set the 1/2"-dia. spiral or straight bit to cut 1/2"-deep slots. Mill the joint patterns on the drawer front and back first so the outer corners become pins. The drawer sides have slotted corners instead of pins.



Cut a 1/8"-deep x 1/2"-wide dado across the inside face of each drawer side for the drawer divider. This way, you can simply glue the divider into place without using nails or screws.

Slide the handle assembly into place on the caddy. Drive more countersunk screws through the sides and back of the caddy to secure the divider and back end of the handle. Cover the exposed screwheads, if you wish, with matching wood plugs. Trim the plugs flush and sand them smooth.

Assembling the Drawer

Joint and plane enough 1/2" stock to make the drawer's front, back, sides and drawer divider. Cut the parts to size. We'll assemble the drawer with box joints to mimic those on the caddy. Set up your box joint-making system again, only this time, adjust the cutter height to 1/2". I arranged the pattern so the drawer faces



Assemble the drawer with glue and clamps. Be careful not to apply excessive pressure, which could throw the drawer out of square. Its diagonal measurements should match.

would have pins on their top and bottom edges. Mill all four corner joints.

Just as before with the carcass, dry-fit the corner joints. If all looks good, plow a 1/4" x 1/4" groove for the drawer's bottom panel into the inside faces of all four parts. Locate these grooves 1/2" up from the bottom edges of drawer workpieces. That placement enables you to rout the grooves along the full length of the draw-



Drill a shallow 3/8"-dia. hole into the bottom edge of the drawer front and back for inserting the second pair of magnets. Be sure to double-check for correct polarity with the bottom panel magnets before gluing these into place.



Drill a centered hole through the drawer front and back for the drawer knob machine screws. It never hurts to back up the drilling area with a piece of scrap clamped in place to prevent the bit from splintering wood as it punches through.



After applying several coats of a wipe-on oil/varnish blend, the author added a hook to the back of the handle for hanging Rockler's 5" Glue Roller. He also mounted a Glue Bottle Dock to the caddy's front, above the drawer opening.

er front and back. Stop the grooves 1/4" in from the ends of the drawer sides so they won't show.

I decided to install the drawer divider with dadoes rather than simply nail or screw it to the sides, because sometimes a rogue nail will go sideways when driven into such thin material. I used a 1/2"-wide dado blade set 1/8" above the table to plow dadoes all the way across the width of the drawer sides for the divider panel. I located these dadoes 8 1/4" from the same ends of the drawer sides.

After you cut a 1/4"-thick bottom panel and a divider to size, fit all the drawer parts together without glue to make sure the joints close correctly. If they do, sand the inside faces of the parts up to 180-grit. Then glue and clamp the drawer together. Make sure the corners remain square under clamping pressure; the diagonal corner-to-corner measurements of the drawer should match.

Once the glue dries, mark and drill a centered hole into the bottom faces of the drawer front and back for the other pair of magnets. Epoxy them into place, but before you do that, make sure to orient them so their polarity will attract the magnets in the carcass bottom instead of repel them.

Finishing Up

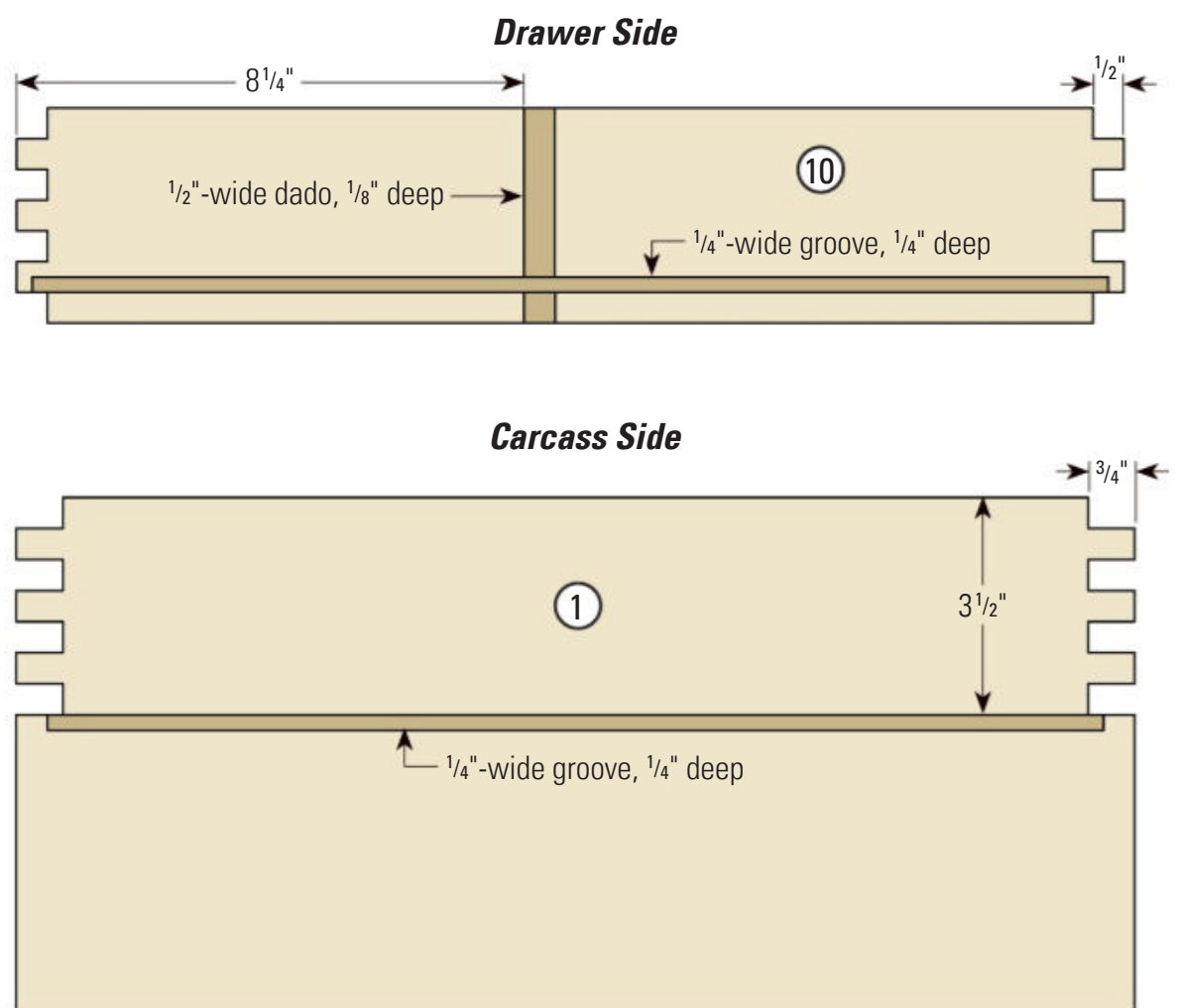
Finish-sand the outer surfaces of the caddy and drawer, and break all sharp edges either with sandpaper or a 1/8" round-

ver bit. Then measure and mark a center point on the outer faces of the drawer front and back, and bore a 3/16"-dia. hole through each for a machine screw to attach the drawer knobs.

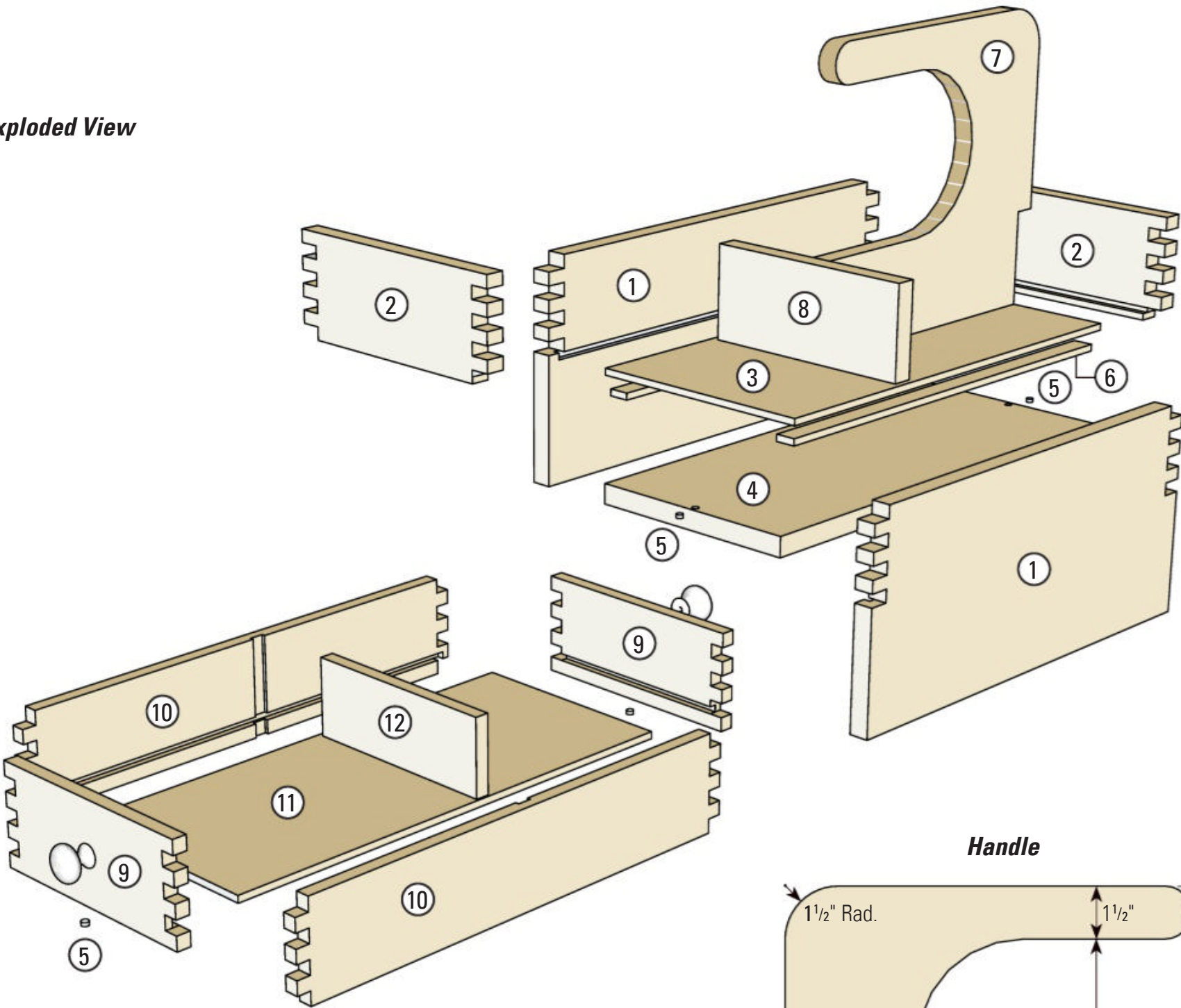
Apply finish to your new caddy. I wiped on several coats of Rockler's Sam Maloof Poly/Oil Finish (item 58636) – it's an amber-toned oil/varnish blend – to make the most of the grain pattern and color of my caddy's southern yellow pine.

When the topcoat cures, install the two drawer knobs and fill this handy shop project up with your collection of glues and applicators. I attached a hook to the back of the handle for hanging Rockler's 5" Glue Roller (item 61645) and mounted a Glue Bottle Dock (item 61892) to the front with a couple of machine screws.

Chris Marshall is senior content editor of Woodworker's Journal.



Exploded View



MATERIAL LIST	
	T x W x L
1 Sides (2)	3/4" x 8 ⁵ / ₁₆ " x 18"
2 Front, Back (2)	3/4" x 4" x 9 ⁹ / ₁₆ "
3 Deck (1)	1/4" x 8 ⁹ / ₁₆ " x 17"
4 Bottom (1)	3/4" x 8 ¹ / ₁₆ " x 18"
5 Magnets (4)	3/8"-Dia. rare-earth
6 Drawer Guides (2)	1/4" x 3/4" x 16 ¹ / ₂ "
7 Handle (1)	3/4" x 11" x 11 ¹ / ₂ "
8 Divider (1)	3/4" x 3 ¹ / ₂ " x 8 ¹ / ₁₆ "
9 Drawer Front, Back (2)	1/2" x 3 ¹ / ₂ " x 8"
10 Drawer Sides (2)	1/2" x 3 ¹ / ₂ " x 18"
11 Drawer Bottom (1)	1/4" x 7 ¹ / ₂ " x 17 ¹ / ₂ "
12 Drawer Divider (1)	1/2" x 2 ³ / ₄ " x 7 ¹ / ₄ "

Gluing Supplies Caddy Hard-to-Find Hardware

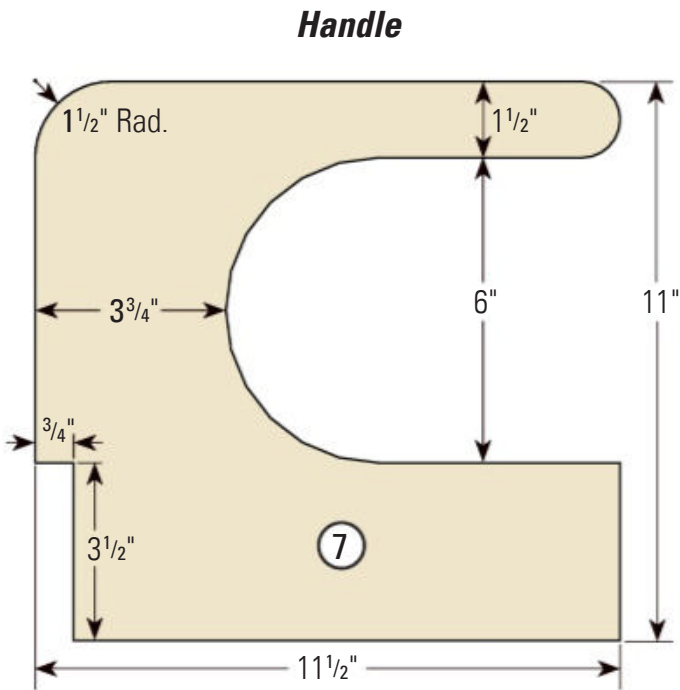
Router Table Box Joint Jig (1) #59032 \$89.99 ea.

3/8" x 1/10" Rare Earth Magnets, 10-Pk (1) #32907 \$14.99 ea.

Gunmetal Slade Knob, 1" (2) #57641 \$2.47 ea.

Glue Bottle Dock (1) #61892 \$7.99 ea.

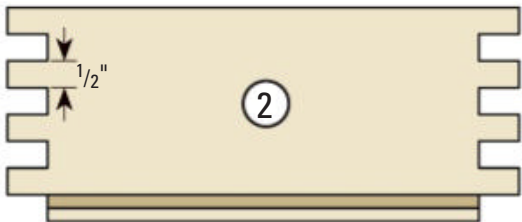
To purchase these and other products online,
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Or, call 800-610-0883 (code WJ1577).



Drawer Front/Back



Carcass Front/Back



ADVANCED POWER TOOL TECHNIQUES

Extend Your Router's Repertoire

By A.J. Hamler

A handheld router can cut perfect circles or ellipses, trim various protrusions flush and mill signs handily when paired with a selection of jigs, bases and templates.



As we've explored in a previous *Advanced Power Tool Techniques* article, a router table can handle a host of woodworking chores — template routing, jointing and cutting mortise-and-tenon joints. Handheld routers, meanwhile, are used most often for the edge-shaping and trimming tasks at which they excel.

But when outfitted with jigs or a specialized base plate, a router table's handheld cousins take on a whole new range of useful abilities that prove once again why the router is the most versatile shop tool.

Routing Ellipses, Circles

You can cut circular shapes on a band saw if they're not too large and with a jigsaw if they are. While both techniques are fast, the resulting shapes don't always turn out perfect since the workpiece is cut by hand without guidance.

Circle-cutting jigs are helpful, but not for oval shapes. But a combination setup, like



For securing the workpiece to a sacrificial surface underneath, double-sided tape is your friend. It will hold the work steady without marring it.



To lay out an ellipse, draw grid lines to mark the major and minor axes. Then mark the ends of the desired radius for each line.

Rockler's various ellipse/circle cutting jig options, enable your router to handle both tasks. These jigs feature a dovetailed jig base with a pair of sliding pivot pins, while the jig itself (a pivoting arm) is mounted under the router. Let's demonstrate this with a sample ellipse.

Before you begin, understand that the workpiece – both the ellipse and the outer waste – must be fully supported and unmovable. You'll rout all the way through the workpiece, so a sacrificial surface underneath the work is essential. A sheet of plywood or MDF clamped to your workbench works fine.

You can clamp the workpiece down, too, if it's large enough that the clamps are out of the way. But you can't clamp the ellipse you're cutting out in the center. The answer is to forget clamps and use double-stick tape to hold everything securely.

To plot the ellipse, draw center pencil lines on your workpiece for the major and minor axes. Then make marks on each radius to define the size. In the top right photo, I've marked the lines

at 5" and 7½" radii for an ellipse measuring 10" x 15".

Now, mount the jig base in the center of the workpiece aligned with your penciled lines. The jig base attaches with screws, so if the resulting marks will be visible in the finished piece, you can either screw the base down to what will be the unseen side, or use double-stick tape to secure it. Slip the two sliding pivots into the base's dovetail slots.

Install a straight cutter into your router – either an upcut spiral or regular straight bit – and set the plunge depth to about 1/8". We'll make the ellipse with repeated cuts, not in a single pass. Line up the locking attachment knobs on the jig arm with the pivot pins on the base and slip the assembly into place, which will allow the router to rotate freely around the base. Slide the router until the bit lines up with the radius mark for your major axis, and tighten its knob. Then swing the router around to the minor axis mark and tighten it. The router will now rotate in a perfect ellipse.

Turn on the router and plunge the bit into the work,



Attach the jig's pivot base to your workpiece, aligning it with your grid lines. With the jig arm placed on the pivot pins and the router attached to it, adjust the router bit to your marks and tighten the locking pivot knobs.



When everything is secure, plunge the router bit into the work about 1/8" and rotate the router to begin the cut. Make subsequent passes, resetting the depth each time until you've cut through the workpiece.

ADVANCED POWER TOOL TECHNIQUES CONTINUED



Routing a circle is the same process as an ellipse, but you only use one centered pivot pin and rotate the arm around a single set radius.

then steadily rotate it around the pivots to complete the first cut. Raise the bit, turn off the router and increase the plunge depth another 1/8", then make another full rotation. Repeat this process until you've routed all the way through and slightly into the sacrificial sheet underneath.

Note in the bottom right photo, previous page, that I've wrapped the cord clockwise around the router. It's a great tip that I've discovered! As you rotate the router, the cord will want to coil around

the router and possibly snag. Wrapping the cord one turn in the same direction you're routing will instead unwrap the cord in a more controllable fashion as you rout.

Routing a circle is the same process but even easier. For this, you'll need just a single pivot pin, which is solidly screwed into the jig base through a provided set of holes. There's no sliding along the jig base's slots this time; a simple circular rotation is all that's required to cut the workpiece.



An easy-to-make subbase suspends the collet and bit above a work surface, allowing you to adjust the depth to shave a perfect amount off plugs, tenons, box joints or anything else you need to level.

Leveling Wood Plugs, Joint Protrusions and More

Sometimes when crafting dovetails or box joints, and usually when installing wooden plugs, you end up with material proud of the surface that must be leveled. If you're not confident using a hand plane or chisel for this job, and the idea of endless sanding isn't appealing, you can turn to your router instead.

Leveling dovetails and plugs isn't power-intensive, so this is a perfect job for a trim or compact router. The secret is

to replace the base plate with an extended "partial" base that raises the router and allows the bit to be lowered until it's flush with the surface of the main workpiece.

For this task, I've constructed the two-level partial base in the top left photo, but a single-level base would work just fine if the bottom of your router allows it to attach securely without flexing. An upcut spiral bit or a regular straight bit will work fine. Adjust the bit so it is just slightly above the workpiece surface. Once set, slide the router over a test piece of scrap or even a sheet of paper to make certain that it doesn't make contact with the main surface.

Start the router and gradually run it over the plug, tenon or dovetail in a sweeping motion. Work in a clockwise fashion whenever possible to take the bit's spin direction into account. When done, you'll have perfectly leveled protrusions without all the work, and a quick sanding will effortlessly make them flush.



With the bit set just shy of the main workpiece, slide it over the plugs in a clockwise circular motion until the waste is removed.



Once leveled, the tiny amount of the plug still above the surface can be quickly sanded smooth. Here, the author has shaved the plug to less than 1/32" proud.



Attach a guide bushing to your router's baseplate, then install a signmaking bit set to a depth of about 1/4".

Routing Signs

Short of using an expensive CNC machine or doing it entirely by hand with careful and laborious chiseling, the best way to create signs quickly and accurately is with a handheld router paired with lettering templates.

Lettering guides, such as Rockler's Interlock Signmaker's Templates, consist of a series of polymer capital and lowercase letters, various spacers and punctuation. The guides fit together like puzzle pieces to make full templates of words or phrases, just right for a plunge router equipped with a guide bushing and signmaking bit.

For signs with standardized all-capital letters, everything is the same size; you just spell out what you want with your templates and rout away. Script lettering, however, is more involved. Because the letters are "kerned" to accommodate different widths and make the script flow smoothly, the sign is routed in separate passes with different letter parts and spacers.

Rockler makes this easy with an online tool wizard

(interlocksign.rockler.com), where you simply type in the words you want and it plots the entire template arranged for each pass. You can then print this guide out to use as you arrange the templates on your workpiece.

For this example, we'll rout the six-character word "Signs!" This is only a two-



Rockler's online signmaking wizard automatically shows how letters and spacing need to be arranged for any word entered into the app, and it produces setup illustrations you can print out as a guide.

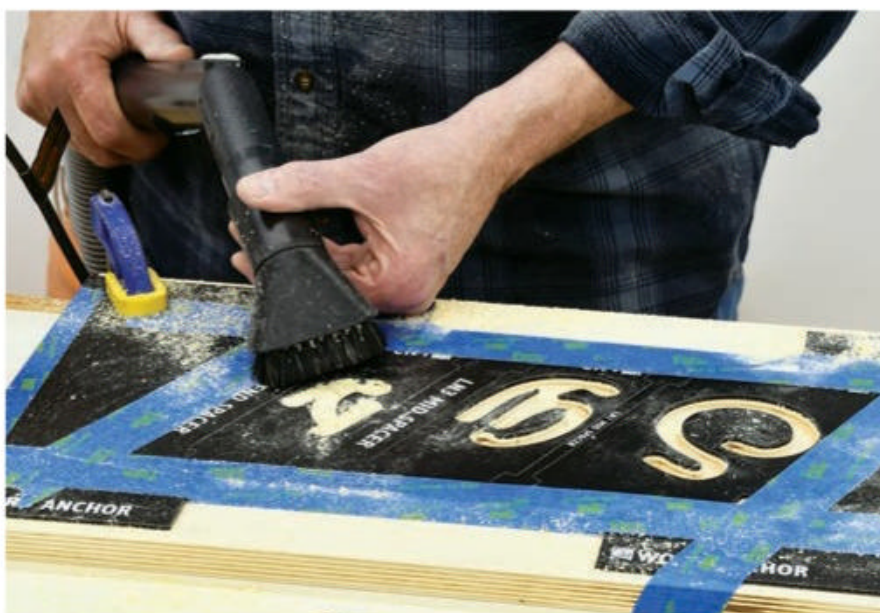


Once you've arranged the letters on the workpiece, use masking tape to secure everything. This sign will take two routing passes, so the letters will be changed for the second pass.

ADVANCED POWER TOOL TECHNIQUES CONTINUED



Carefully insert the collar of the bushing into the first letter template, plunge the bit and simply follow the template to rout each letter in turn.



Stop periodically to remove debris impacted into the letters. This will make for easier routing and allow you to carefully confirm that all the waste was removed for fully formed lettering.



Being careful to leave the end word anchors in place, remove the letter templates from the first pass and insert those for the second pass. Tape them down securely and rout the new templates as before.

pass project, but other words can require five or six passes. By the way, the number of passes isn't dependent on word length but rather letter complexity. For example, the shorter word "cat" is a three-pass routing operation.

Begin by selecting all the letters and spacers as detailed on the guide along with word anchors on each end, and center the assembled template for the first pass on your workpiece. Separately secure the word anchors first with double-stick tape. These anchors stay in place through all the passes.

Now use masking tape to secure the edges of letters and spacers, and smooth the tape down completely so the router base doesn't catch on loose edges. Also, it's a good idea to secure any thin, extended interior parts of letters with a small piece of double-stick tape underneath to keep them from flexing as you bear down when routing.

Clamp the workpiece securely, set the bit to 1/4" cutting depth and place the router's guide bushing into the template for the first letter. Turn on the router and plunge it into the work,

following the templates as you cut each letter.

After making a complete pass, vacuum out all the debris, which has a tendency to pack down into the letters. It is essential to check that each letter is fully formed with all waste removed. Chances are, you missed some here and there and will need to repeat the first pass to clear out any remaining waste.

When the letters in the first pass are fully formed, be sure to leave the two word anchors solidly in place but remove the lettering and spacing templates from the center. Replace them with those for the second pass, and tape them down. Make the second routing pass the same as the first to complete this sample sign.

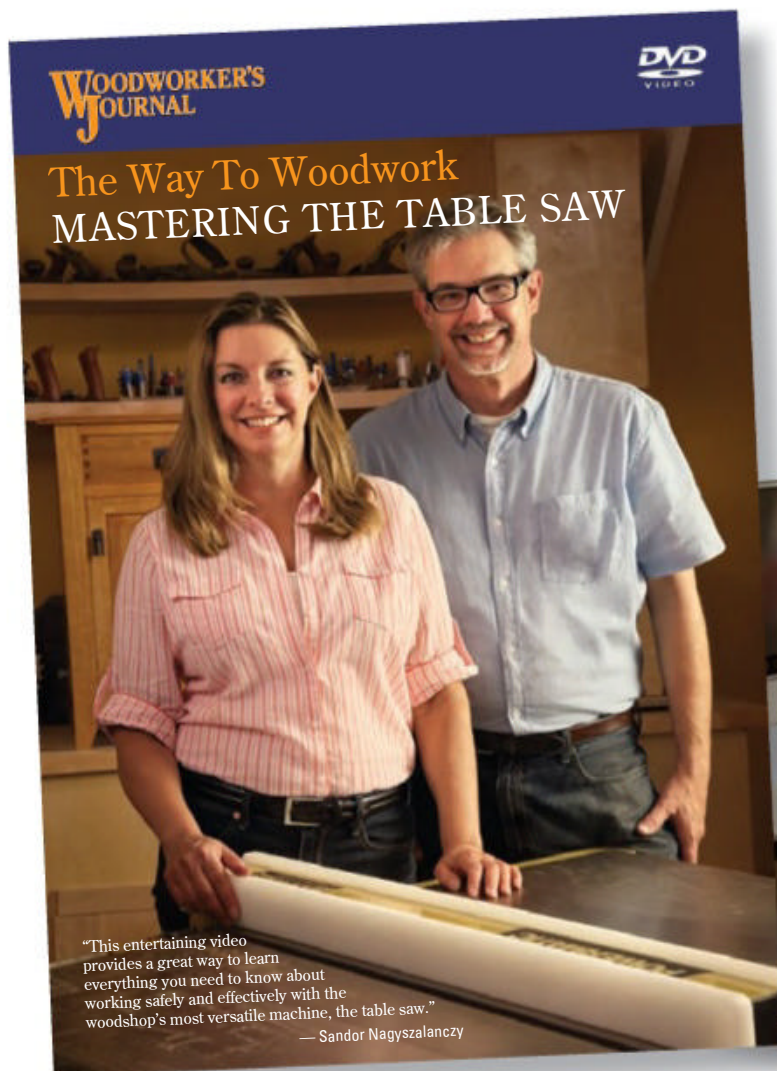
The last step is to remove all the templates and refine the lettering with a bit of folded sandpaper. This will remove any burn marks or light "feathering" around the routed grooves left by the bit. Once sanded, the sign is ready for paint or a final finish of your choice.

A.J. Hamler writes frequently for Woodworker's Journal.



With the second pass complete, remove all the letter templates and use folded sandpaper to smooth and refine each letter. There typically will be a bit of burning or fuzz left behind, depending on the wood species and bit.

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Touching up or reshaping the primary bevels of chisels or plane irons, then adding a razor-sharp micro-bevel, is easy with **Rockler's Grinding and Honing Jig with Guide** (item 53018; \$119.99). The jig includes a fully adjustable grinding support base that can be used with most 6" or 8" conventional or low-speed bench grinders (sold separately). A honing guide fits into a sliding carriage on top of the base and securely holds chisels or plane iron blades from 1/4" to 2 3/8" wide. Sliding the honing guide back and forth along the base's polished linear rods is all it takes to grind the primary bevel. Nylon bushings on the honing guide provide smooth sliding action. Three plastic



Rockler
Grinding
and Honing
Jig with
Guide



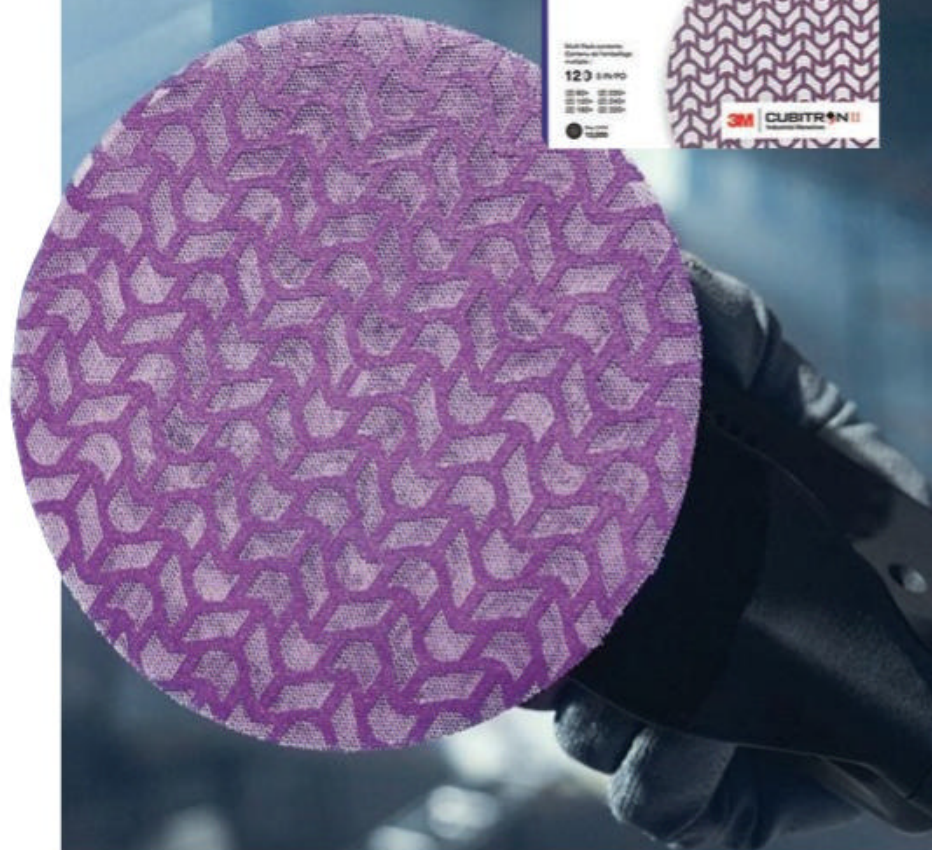
angle gauges set the system up quickly and easily to grind 20-, 25- or 30-degree bevels. A tray with removable water bin stores the angle guides and references the correct blade extensions without the need for measuring. Once the bevel angle is ground to shape, you can use the same honing guide for achieving a micro-bevel by lifting it off the base and rolling it over a fine-grit sharpening stone (not included). There's no need to reset the blade in the guide to switch from grinding to honing for added convenience.

The **TSA-SMG Scale Miter Gauge** from **SawStop** can help perfect the crosscutting accuracy of any table saw with conventionally sized miter slots. Its miter head features

a pointer and 90 notches on either side of 0 degrees for locking settings in 1-degree increments, including one for 22.5 degrees on each side. A Vernier scale enables every angle detent to be fine-tuned in 1/10-degree increments. The miter gauge's 18"-long bar fits into 3/8" x 3/4" miter slots and has six adjustable expansion discs to eliminate any side-to-side slop. An 18"-long aluminum fence is equipped with a double-flip stop system that micro-adjusts independently at different lengths. The fence also has a telescoping extension that expands its support length up to 31". Accessory tracks in the fence make it easy to attach sacrificial fences. SawStop's Scale Miter Gauge (Rockler item 74912) is priced at \$249.

SawStop TSA-SMG Scale Miter Gauge

3M Xtract Cubitron II 710W
5" Dia. Net Disc Multi-Pack



These 5" hook-and-loop discs from 3M feature Cubitron™ II abrasive, a hard ceramic that behaves like carbide. When the grains break, they expose a new sharp edge, resulting in rapid sanding and long-lasting performance. Under a microscope, Cubitron II appears as a field of neatly triangular abrasive particles, all oriented vertically for keen cutting power. 710W abrasive distribution puts the abrasive on top of 3M's Xtract™ net backing for greater durability, and its network of open mesh areas promotes cleaner dust-collection efficiency than traditional discs with dust extraction holes. This 3M Xtract Cubitron II 710W 5" Dia. Net Disc Multi-Pack contains two discs of each of the following six grits: 80, 120, 180, 220, 240 and 320. Rockler sells it as item 76114 for \$7.99. Single-grit packs of 50 discs (item GRP41575) are also available in the same range of grits for \$24.99 each.

Milwaukee's M18 FUEL™ 1/2" Router develops 2.25 peak hp when coupled with a REDLITHIUM™ HIGH OUTPUT™ XC6.0 battery pack. On a full charge, this variable-speed (12,000 to 25,000 rpm) machine can rout 225 lineal ft of 5/8" roundovers in pine on a single charge. It also has a micro-adjust knob and macro-adjust button. When installed in the plunge base, the tool offers 2½" of plunge travel. Other key features include an ergonomic BODYGRIP® and overmolded pommels, spindle lock, 1/4" and 1/2" collets, dual LED worklights and a modular console. In kit



Rockler Needle-Nose Spring Clamps



Milwaukee M18 FUEL 1/2" Router



form with a rapid charger, XC6.0 battery pack, plunge base and soft-sided carry case (item 2838-21), it sells for \$599. A bare-tool version without plunge base, battery, charger or case (item 2838-20) is \$349.

Two sizes of *Needle-Nose Spring Clamps* from **Rockler** feature narrow, pivoting, non-marring pads that fit into tight spaces. The small ver-

sion (item 64124; \$2.49) has 5/16" pads, a 1⅞" jaw opening and 1¾" throat depth. The medium clamp (item 66285; \$3.99) has 3/8" pads, 2½" jaw opening and 2¼" throat depth. Both sizes are engineered to open easily with one hand and achieve maximum throat depth access across the jaw opening.



TOOL PREVIEW

Nova's New Neptune Lathe

By Rob Johnstone

This “tweener” lathe is unique in design and concept. It fills an important space in the industry, delivering easy-to-use advanced technology.



For woodworking shops with a little more room, the Neptune Max is a version that comes with a longer bed (28" between centers) and is outfitted with heavy-duty legs.

Nova has a history of making high-quality lathes and turning accessories. Their new Neptune lathe takes it to the next level by creating a new niche in woodturning between extremely large (and expensive) lathes and the more affordable but limited mid-level lathes. What do you mean by that? I'm glad you asked.

DVR in the Driver's Seat

Let's start with the lathe's business end — a 1.5hp direct-drive Digital Variable Reluctance (DVR) motor. It's both powerful and coupled with an advanced control system. Striatech's Intelligent Direct Drive controls deliver remarkable torque across all

speed settings — from 100 to 3,500 rpm. Included in the programming for the motor is a chisel jam detection feature that will stop the machine if something goes awry. Also part of the safety package is electronic braking to ensure rapid stops. I believe it's the most sophisticated lathe motor system in the industry.

The Neptune is sized to allow home-shop turners the opportunity to create really large bowls inboard with its 15" swing (18" between centers) and outboard turning diameters up to 20". Outboard turning is accomplished with a power head that slides the full length of the bed and pivots 360 degrees. To further accommodate outboard turning, Nova has developed a full set of tool-rest extensions and outriggers.

The takeaway from all this is that the Neptune performs well above its “weight class,” so to speak. It will likely fulfill

Nova Neptune

Street Price: \$1499.99

Motor: 1.5hp DVR, 110/240-volt

Speed Range: 100 to 3,500 rpm

Swing Over Bed: 15"

Distance Between Centers: 18"

Spindle: 1 1/4" diameter, 8 tpi

Quill: 2.4" travel; #2 Morse Taper

Headstock: Swivels 360 degrees

Indexing: 24 positions, electronic

Controls: Icon-based screen;
Intelligent Direct Drive

Safety: Electronic braking,
chisel jam detection

Weight: 125 lbs

www.teknatool.com



The Neptune's high-tech DVR programmable motor is paired with an icon-based HMI control screen that provides accurate and exacting control to the user.

many turner's desires for a large lathe without the significant footprint or price.

Screen Time

In addition to the high-tech motor, this lathe's control screen is an HMI (Human Machine Interface) icon-based system. There are speed chart icons for rough cuts, fine and finish cuts, load level, a diameter-based speed chart, an unbalanced load icon, favorite speed control, a break-enabled warning icon and a reverse rotation icon. All of those surround a large active rpm display. This icon-based layout is another step forward in lathe design.

Nova has taken the time to fully accessorize the Neptune, too. The standard benchtop version is shown in the photo at right. From there you can add benchtop mounting plates, heavy-duty legs, a bed extension, tool-rest extension for turning large-diameter stock

and an outrigger for even larger-diameter turnings. In other words, the basic unit can grow as your skills expand. Fully outfitted with all the accessories, it becomes a lifetime tool — one that few home-shop turners will ever outgrow.

Nicely done, Nova. Here's a new niche in the lathe marketplace that will fit many woodturners' shop spaces and pocketbooks.



The headstock can slide across the full length of the bed and rotate 360 degrees. Outboard turning is one of the "big" lathe features on this model.



The new Neptune lathe from Nova is a groundbreaking machine with a long list of accessory options that likely will make it the only lathe a woodturner will ever need to buy.

FINISHING CORNER

Back to Basics: Milk Paint

By WJ Staff

A variety of rich colors, matte sheen and surprising durability make it popular.



The Real Milk Paint Co. water-based milk paint can be applied with brush, roller or sprayer.

Before the advent of petroleum-based paints, casein (milk protein)-based paints were commonplace. In recent years, these historically inspired paints have had a resurgence in popularity among DIYers, crafters and woodworkers alike. Part of that revival has to do with the nontoxic nature of this powdered paint. It is VOC-free, making it a safe and eco-friendly option for indoor or outdoor use.

Other benefits include milk paint's versatility and visual appeal. It can be applied over absorbent surfaces such as wood, concrete, plaster or

brick without the need for primer. It is UV fade-resistant and will accept all topcoats and finishes, which can alter the sheen or add even more durability. Milk paint dries quickly without residual odor and cleans up with water. Waste paint is worry-free, too — just pour it down the drain, flush it or compost it.

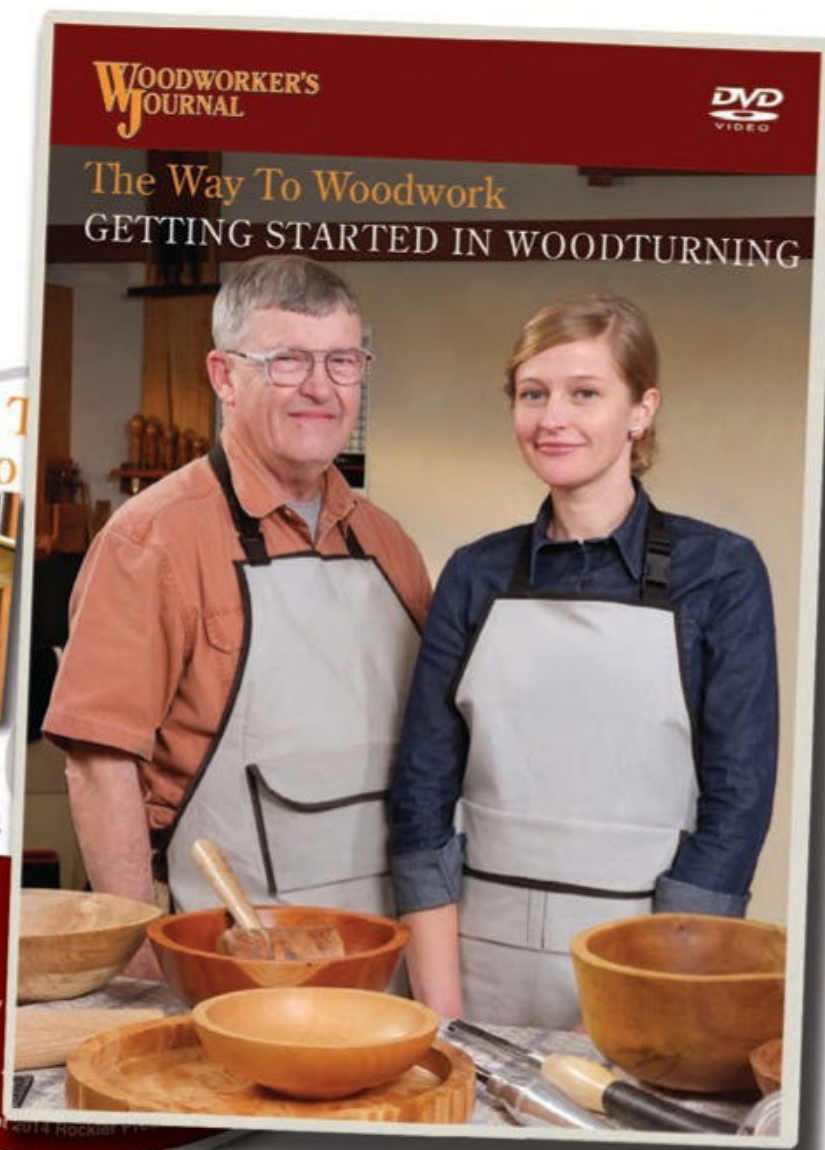
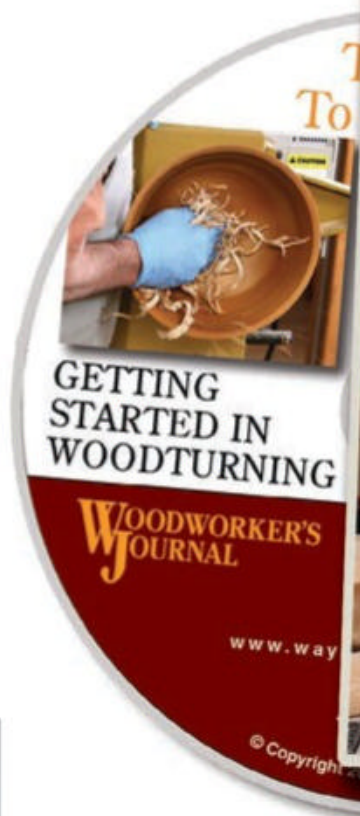
The Real Milk Paint Co. Milk Paint, now available in an assortment of colors from Rockler, is made from natural ingredients: casein, lime, pigments and a plant-based filler. The paint is simple to prepare for use by mixing it 50/50 with tap water. Each

can includes 1¼ cups of paint powder and a handy glass mixing marble. Pour the amount of dry paint and water you need into the plastic can, drop the marble in, snap on the lid and shake the can vigorously for 5 minutes.

Once mixed, the paint is workable for up to two weeks if kept refrigerated. In powdered form, it's shelf stable and will last for years. The dry contents of the can forms one pint of liquid paint, which covers about 35 sq ft.

Currently Rockler offers 10 color options. Each can sells for \$18.99.

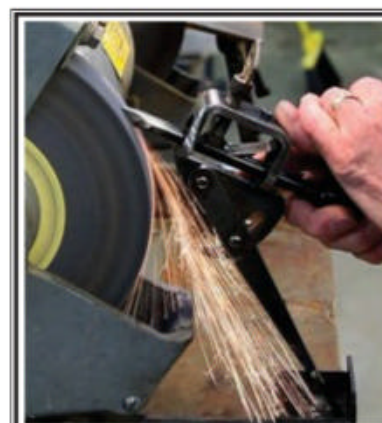
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