

5 PROJECTS IN

GUILD ♦ EDITION

EVERY ISSUE!

Woodsmith®

Woodsmith.com

Vol. 44 / No. 259



MEGA 20 INCH DISC SANDER

INSIDE:

All-New Projects:

- Counter-Height Stools
- Modular Wall Storage System
- Arts & Crafts Organizer

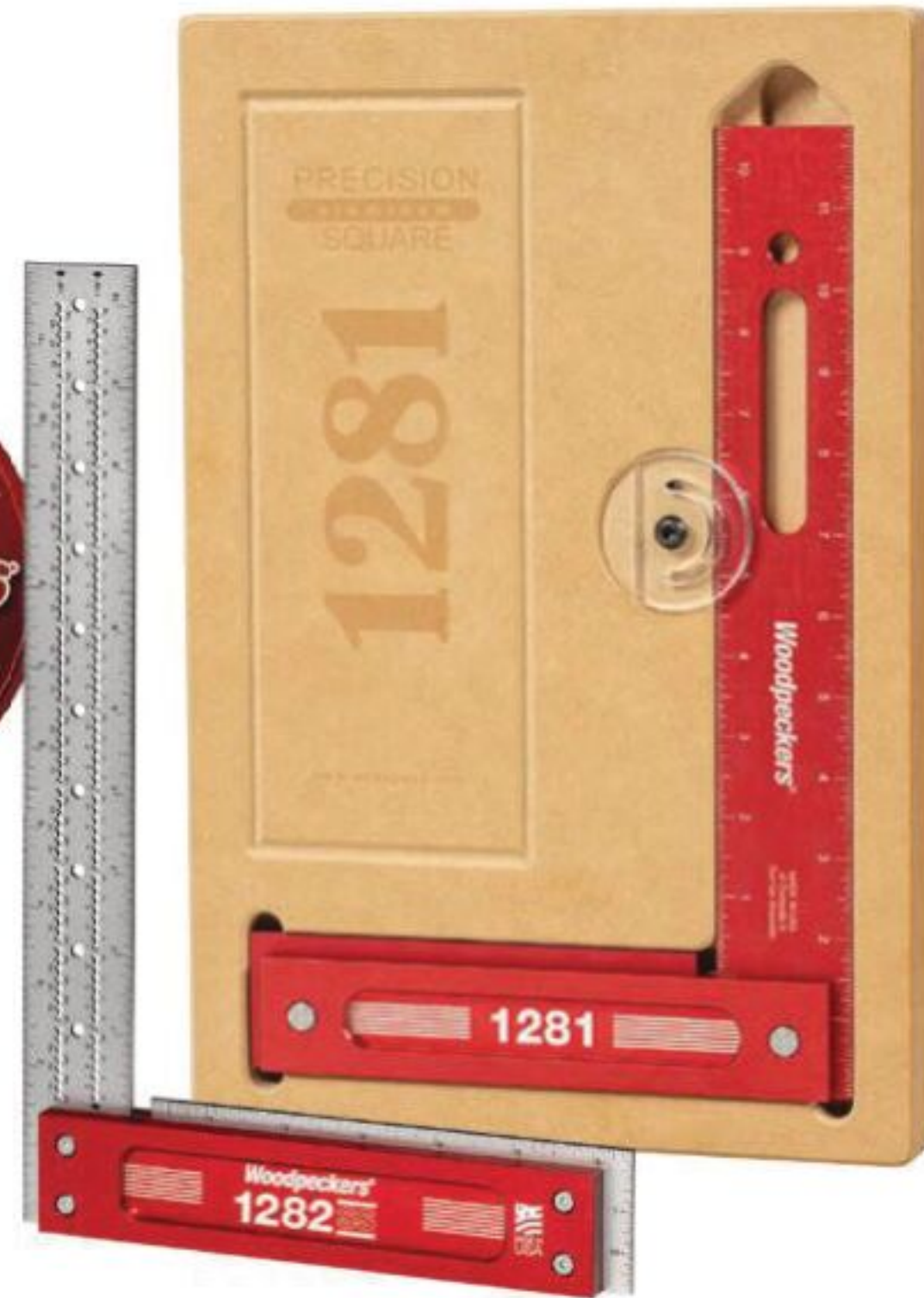
Finger Joints On the Table Saw

Grooves & Slots — Router Workshop

Woodpeckers®

Precision Woodworking Squares

- One-piece central core machined to exacting tolerance.
- Stainless model includes scribing guides for perfect parallel layout.
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- Scales engraved to a tolerance of $\pm .004$ " total stack-up error.
- Guaranteed accurate to $\pm .0085^\circ$ for life.
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Precision Woodworking Square

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Other Sizes Available on Woodpeck.com

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Includes a wall-mountable Rack-It™

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- Clamp material securely to sacrificial base.
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Precision Taper Jig

32"....\$279.99

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- 3 radius profiles & 45° chamfer available.
- Hardened blades are easy to re-hone.
- Profile perfectly centered on your stock.

EZ Edge Corner Plane

Includes a wall-mountable Rack-It™

1/8", 3/16", 1/4" Radius

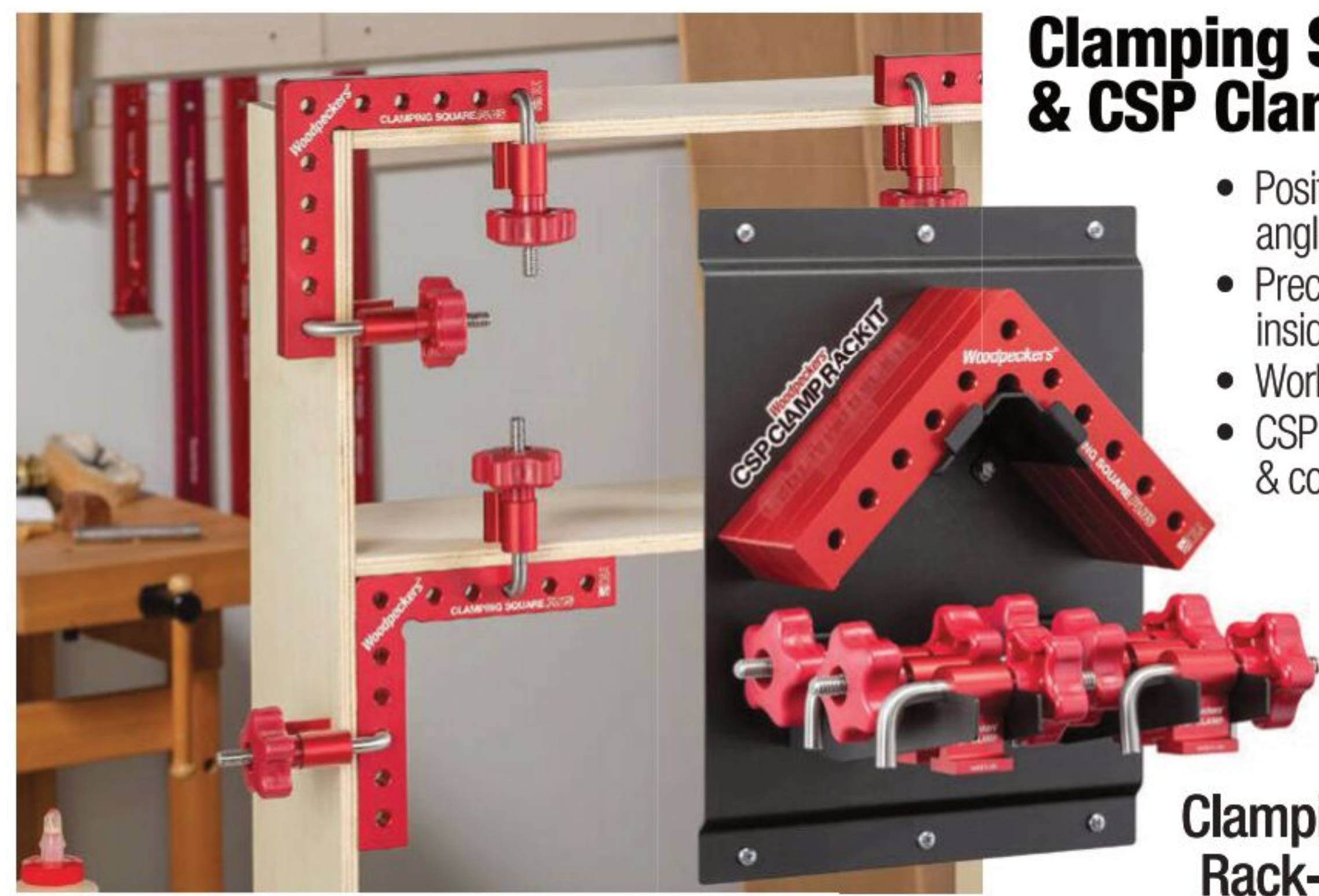
-or- 45° Chamfer....\$159.99

Deluxe Set....\$569.99

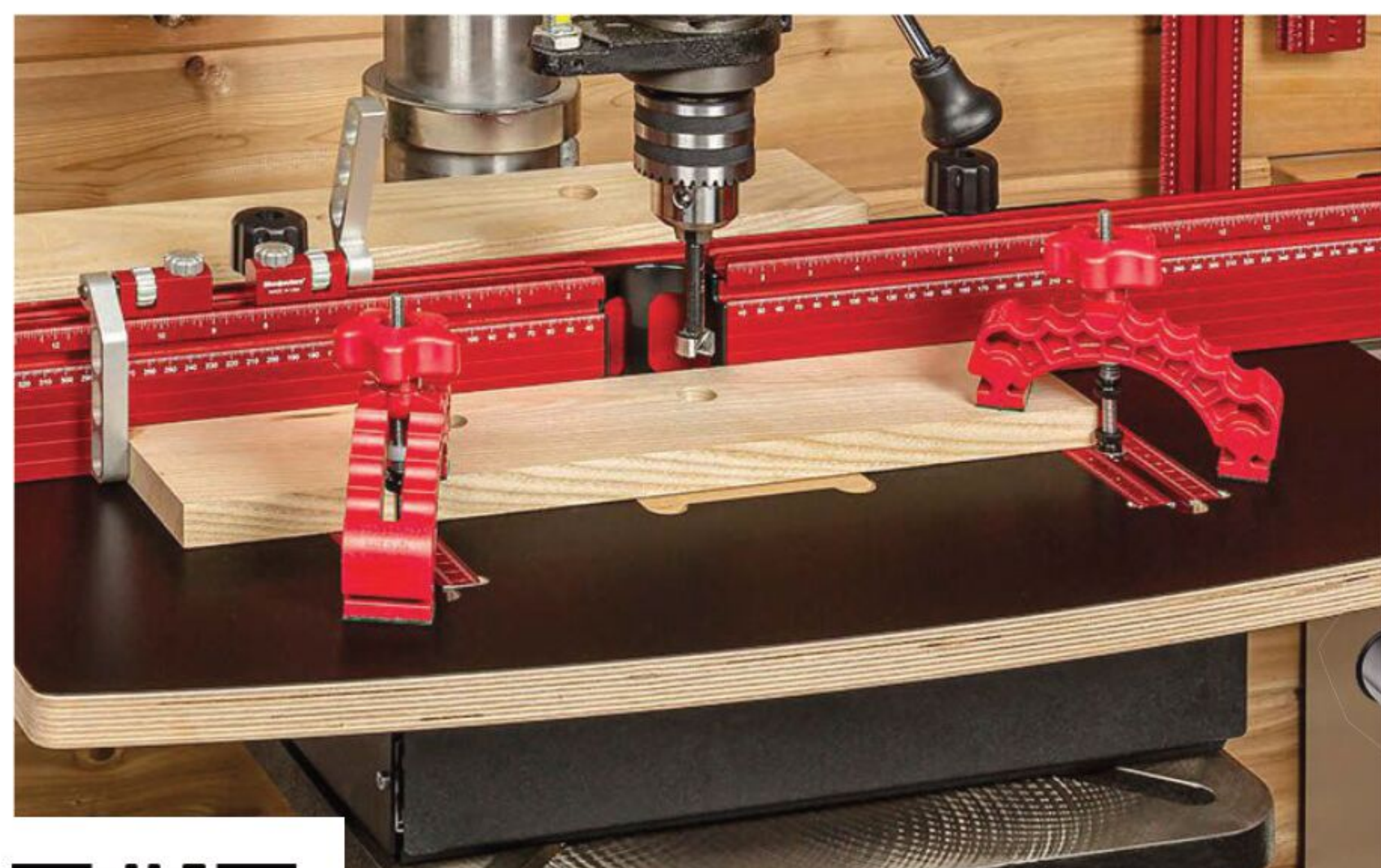


Clamping Squares PLUS & CSP Clamps

- Positions stock at right angles for joinery & fastening.
- Precision milled for both inside & outside alignment.
- Works with any clamp.
- CSP Clamps add speed & convenience.



Clamping Squares PLUS Rack-It™ Kit....\$259.99



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- DP-PRO Fence integrates dust collection & delivers accuracy.
- Micro-adjustable DP-PRO Flip Stops.
- DP-PRO Drawer Base simplifies installation on any drill press.
- DP-PRO Tables are full 1" thick with laminate top & bottom.
- Extension Wings for long material support.
- Drawer Base and Fence compatible with all drill press tables.

DP-PRO Drill Press Table Master System

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36" Table, 36" Fence....\$419.99

48" Table, 36" Fence....\$449.99

48" Table, 48" Fence....\$469.99



Drill Press & Hose not included.

AUTO-LINE DRILL GUIDE™

- Drill perfectly perpendicular holes anywhere.
- Fence fits on all 4 sides & works 4 different ways.
- Laser-engraved target lines indicate center of bit.
- Works with nearly all 1/2" & smaller drills.
- 1" capacity inside frame & 2" capacity outboard.
- Optional extensions & stops available.

Auto-Line Drill Guide
Drill Guide....\$259.99
Deluxe Kit....\$369.99



Drill not included.

DUAX Angle Drilling Table

- Auxiliary table mounts to your drill press.
- Adjusts to any angle from 0° to 90°.
- Laser-cut teeth engage for precise angle setting.
- Optional Clamping Kit adds workholding ability.
- Designed to fit most drill presses 12" & larger.
- Ideal for chair and stool projects.
- Keyhole slots for hanging storage.

Duax Angle Drilling Table
Duax....\$299.99
Deluxe Kit....\$339.99



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- Micrometer adjustment positions cutter perfectly.
- Cut parallel to existing edge or pivot in a perfect arc.
- Wide, stable base improves routing accuracy.
- Works with most routers that have guide rod holes.

Multi-Function Router Base
Includes 1 Pair Extension Rods
w/ 5/16" Guide Rods....\$239.99
w/ 3/8" Guide Rods....\$239.99
w/ 10mm & 1/4" Guide Rods....\$239.99



Router not included.



Exact-90 Miter Gauge

- Perfectly square cuts every time.
- Patent pending miter bar adjusts to any 3/4" miter slot.
- Graduated fence with micro-adjustable flip stop & 45" extension.
- Extra-long miter bar increases cross-cut capacity of most saws to 24".
- Miter Bar available separately to build jigs & cut-off tables.
- Flop Stop keeps wide panels level with table for perfect squaring cuts.

Exact-90
Miter Gauge....\$329.99
25.5" Miter Bar....\$69.99

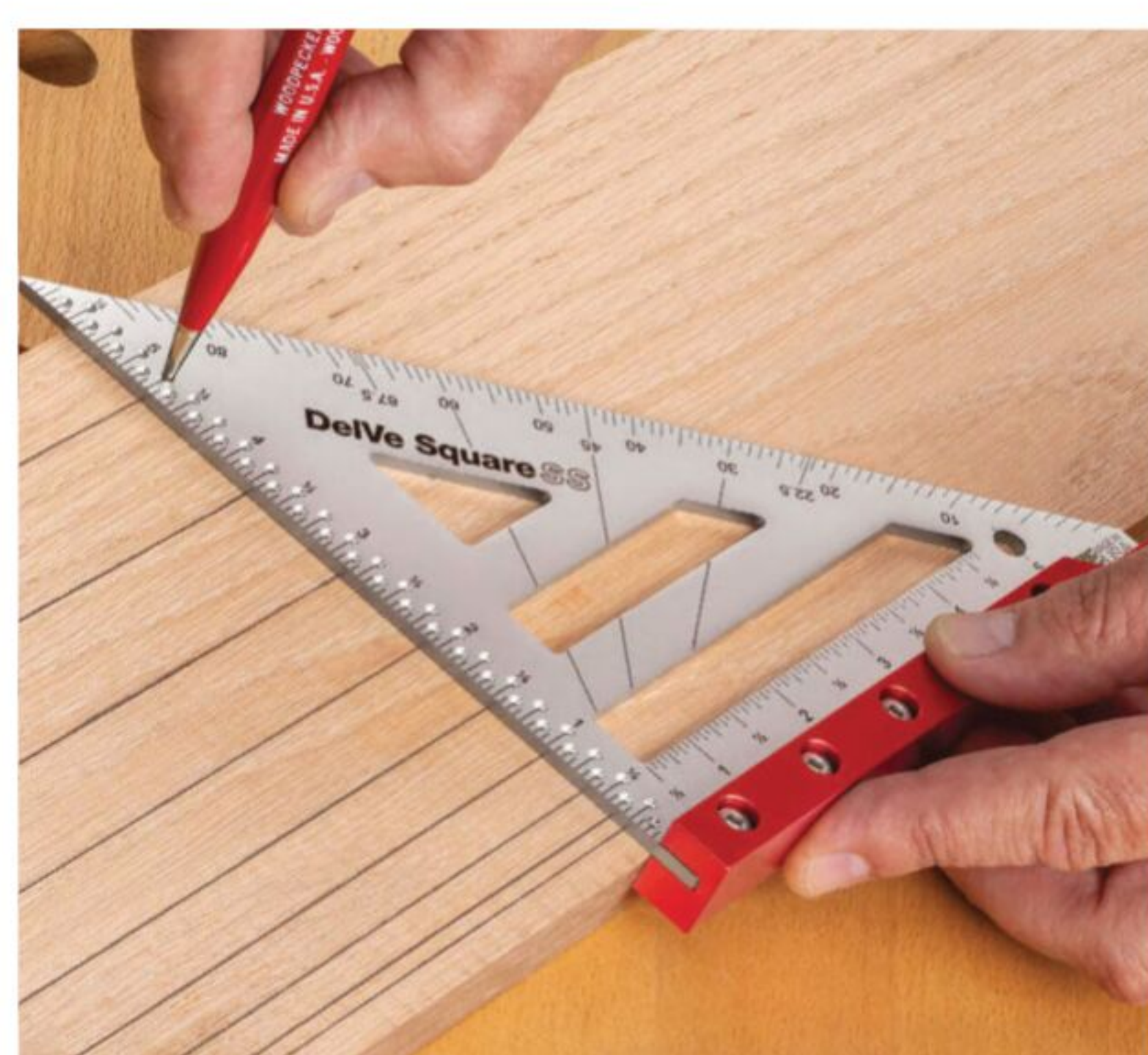


Table Saw not included.

RIP-FLIP Fence Stop System™

- Bring your rip fence back to the same spot each & every time you need it.
- Stop drops out of the way when not needed, flips up when you want it.
- Couple two stops together for perfect fitting dados in two cuts.
- Extra stops & dado couplers available.

RIP-FLIP Fence Stop System
*Fits SawStop**
36" Capacity....\$209.99
52" Capacity....\$219.99
*Powermatic/Biesemeyer**
30" Capacity....\$219.99
50" Capacity....\$229.99



DeVe Square SS®

- Offset base simplifies layout on standard 3/4" material.
- Perfect thirds for mortise and tenon layout.
- Perfect centers for dowel pins & loose tenons.
- Scribing Guides on eighth-inch centers.
- Machined steps in base create accurate setup blocks.
- Angles in 1° increments plus 22-1/2° & 67-1/2°.

DeVe Square SS
Includes a wall-mountable Rack-It™
3-1/2"....\$89.99
6"....\$119.99
Inch Set....\$189.99

Slab Flattening Mill-PRO

- Router carriage now has adjustable height & built-in dust ports.
- Standard width of 48-1/2" expands to 62" with optional extension.
- Standard length of 59" expands to 132" with optional extension.
- Flatten stock as thin as 3/4" & up to 3-7/16" without shimming.
- Straight-line edges on stock up to 2" thick.

**Rail can be positioned
for narrower slabs or
all the way to the edge!**

Slab Flattening Mill-PRO
Basic....\$899.99
Extended....\$1199.99



Router not included.

StealthStop™ Miter Saw & Fence Stop System

- Simple installation on shop-built miter saw stations.
- Stops retract completely within track when not needed.
- Rugged glass-reinforced polycarbonate stops hold up to heavy use.
- Micro-adjuster provides precise control of stop position.
- Flush mount, vertical mount or stacked options.
- All kits include track, stops, mounting brackets & adhesive-backed rule.

StealthStop
Left -or- Right
4' Fence....\$129.99
4' Combination....\$199.99



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ASSISTANT EDITOR Rob Petrie

CONTRIBUTING WRITERS Logan Wittmer, Vic Tesolin

EXECUTIVE ART DIRECTOR Todd Lambirth

SENIOR ILLUSTRATOR Dirk Ver Steeg

SENIOR GRAPHIC DESIGNERS Bob Zimmerman,
Becky Kralicek

CONTRIBUTING ILLUSTRATOR Erich Lage

CREATIVE DIRECTOR Chris Fitch

PROJECT DESIGNER Dillon Baker

PROJECT DESIGNER/BUILDER John Doyle

CAD SPECIALIST/BUILDER Steve Johnson

SHOP CRAFTSMAN Marc Hopkins

CONTRIBUTING PHOTOGRAPHERS Chris Hennessey,
Jack Coyier

CREATIVE DIRECTOR Edie Mann



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EDITORIAL

Woodsmith Magazine
2143 Grand Avenue
Des Moines, IA 50312
woodsmith@woodsmith.com



ACTIVE INTEREST MEDIA

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847-724-5633

jchristiansen@aimmedia.com

AD PRODUCTION COORDINATOR Julie Dillon

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from the editor Sawdust

It's easy to get carried away in my workshop. I've been known to sneak out for a few minutes to work on something only to come back in an hour (or more) later. Turns out that a lot of woodworkers around Woodsmith are like that, too. For example, John Doyle was tasked with designing a "simple wall shelf." It's the kind of thing we feature as a Weekend Project. Instead, he got a little carried away. His version is shown on page 54. It's inspired by modular Mid-Century Modern wall systems. To be fair, each of the elements in the design are simple projects on their own. And an appealing part of these wall systems is how you can make the final project as large or as small as you want. Building a system like this is one of the few "bucket list" projects I have.

If you're interested in finding out more about what goes on behind the scenes, we post a weekly Shop Update video on Facebook. We're live at 1pm Central time, but you can watch whenever. Also, don't forget to give our ShopNotes Podcast a listen. You can find it in all the usual podcast places, as well as www.Woodsmith.com/podcast



STEVE JOHNSON, PROJECT BUILDER

◀ I have been working in wood since my days in junior high school. Always with the emphasis on furniture.

Carving would be a close second since I can incorporate it into a lot of furniture types. It was a dream come true to be hired as one of only a few project builders over the last 30 years here at Woodsmith magazine.

I have always been attracted to the professional way designers & shop craftsman approach a particular project. My other interests are computers & astronomy.

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A home office space never looked so good. This compact design conceals clutter and shows off an elegant inlay.

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designer project

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The Mid-Century vibes of this wall system belie its practicality. Mix and match sections to suit your needs.

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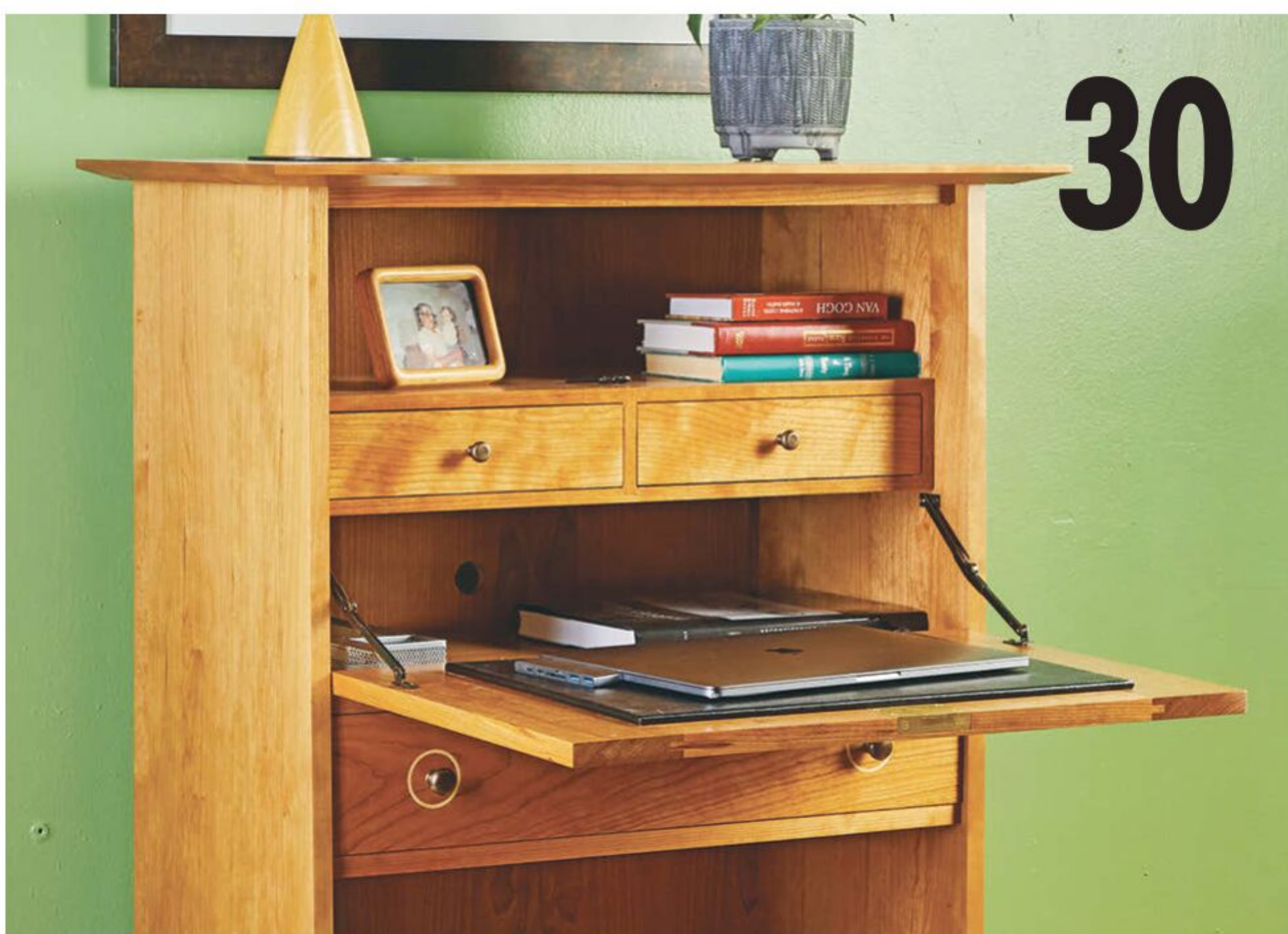
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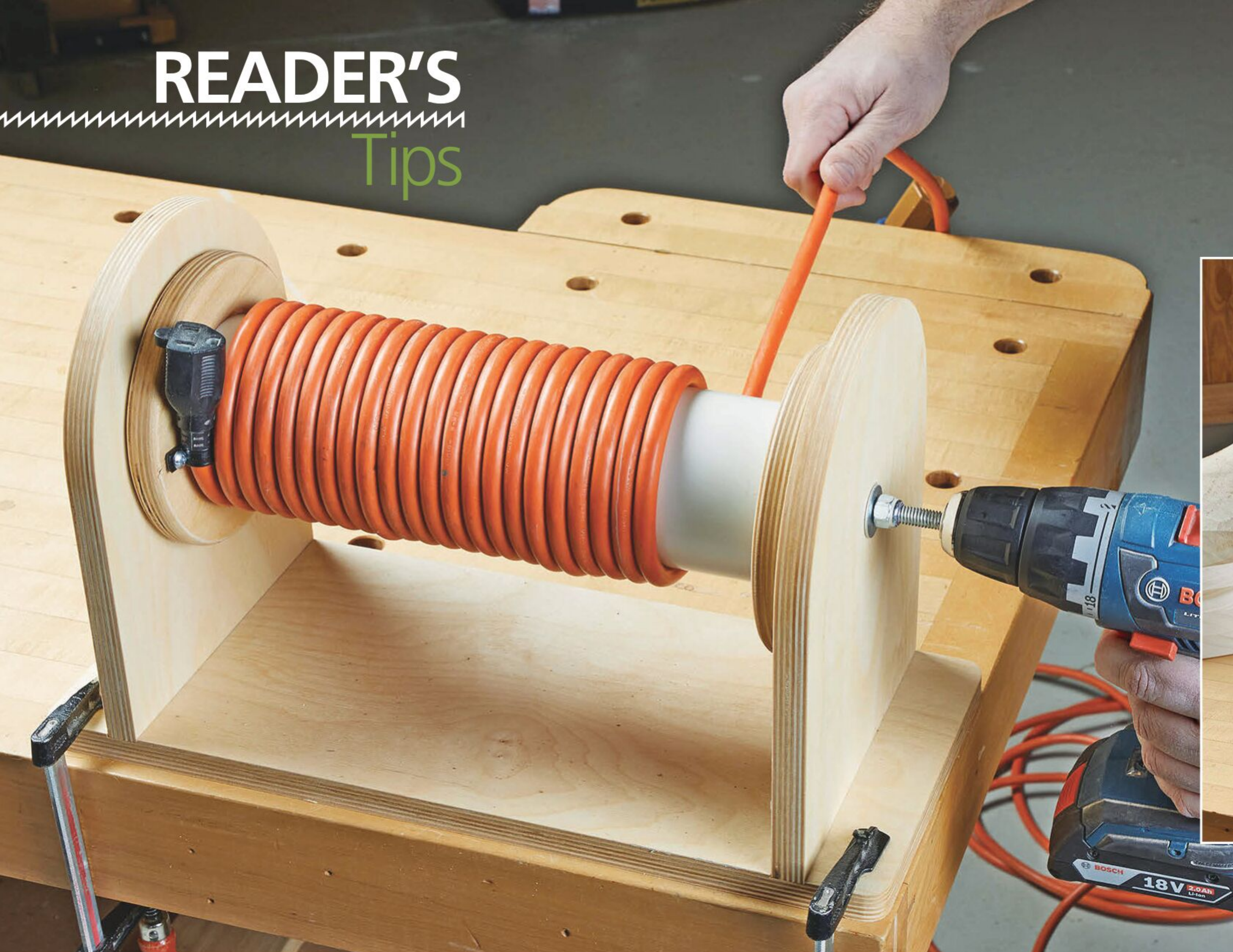
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▲ Moving the reel to wherever it's needed provides you with a portable power outlet anywhere in your shop.

Cord Reel

This easy weekend project is a great way to keep your extension cords (up to 100') untangled and ready for use, as well as reel them back up at record speed.

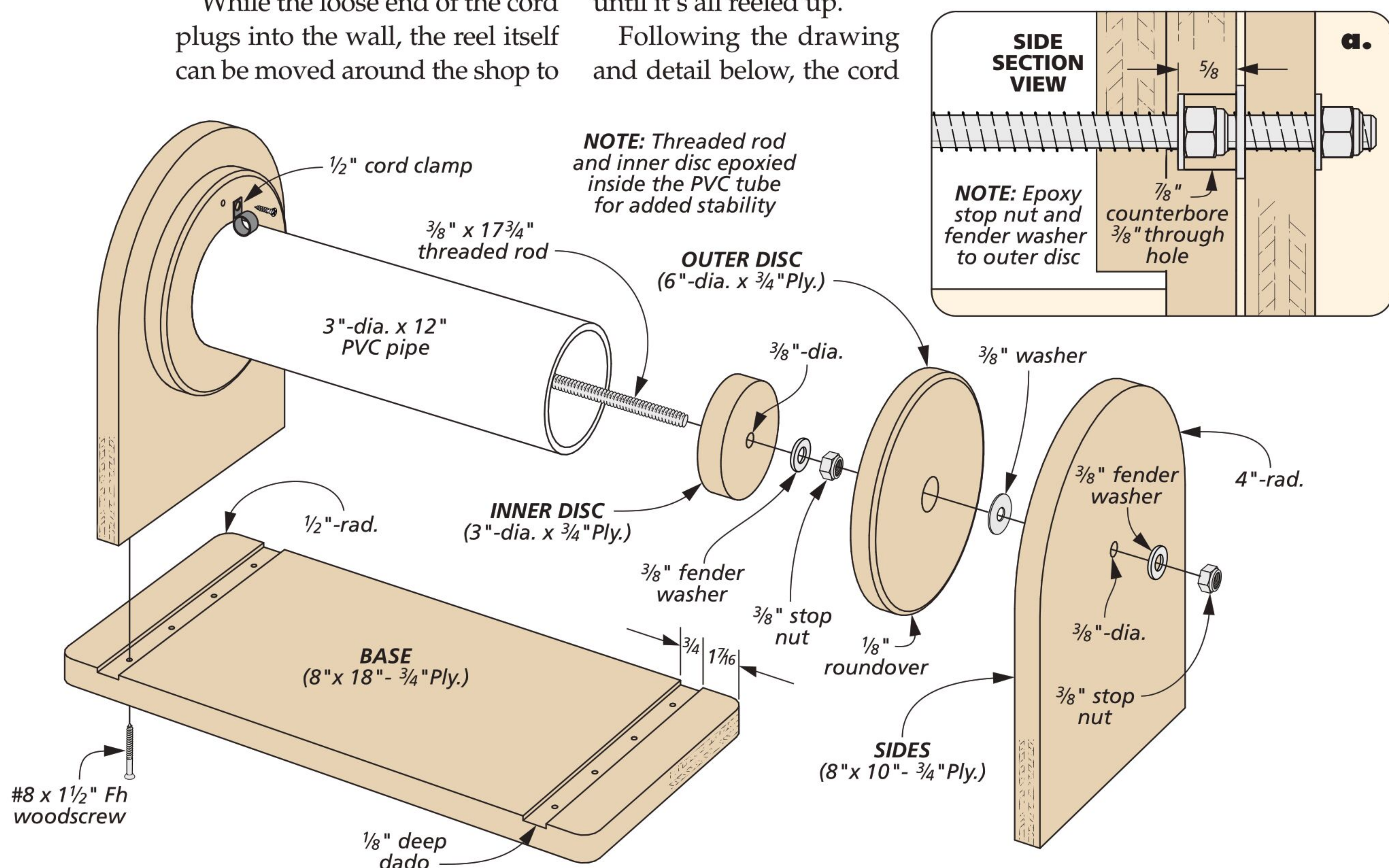
While the loose end of the cord plugs into the wall, the reel itself can be moved around the shop to

where you're working. When it comes time to pack the cord up, all you need to do is clamp the reel down, tighten a hand drill chuck over the threaded rod, and run it until it's all reeled up.

Following the drawing and detail below, the cord

reel can easily be made from $\frac{3}{4}$ " plywood, some hardware, and a little time in the shop.

*Gene Adams
Frisco, Texas*





Panel Cart Workstation

I made a grid-based workstation for sheet goods out of 2x4s clamped on a rolling cart. It's the perfect height for unloading panels from my truck and cutting them to size. The cart is made from four 4' boards interlocked

with two 8' boards. Notches are cut in each 2x4 that fit the thickness of their mating piece, loosely holding the boards together and making them easy to replace.

*Donald Dunstan
Caledonia, Michigan*



▲ These cutouts, which I made by boring out most of the waste at the drill press and chiselling them into a semi-circle, allow clamps to hold the 2x4s to the cart.



SUBMIT A TIP TO WIN

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You'll be able to tell us all about your tip and upload your photos and drawings. You can also mail your tips to "Woodsmith Tips" at the editorial address shown on page 2. We will pay up to \$200 if we publish your tip.



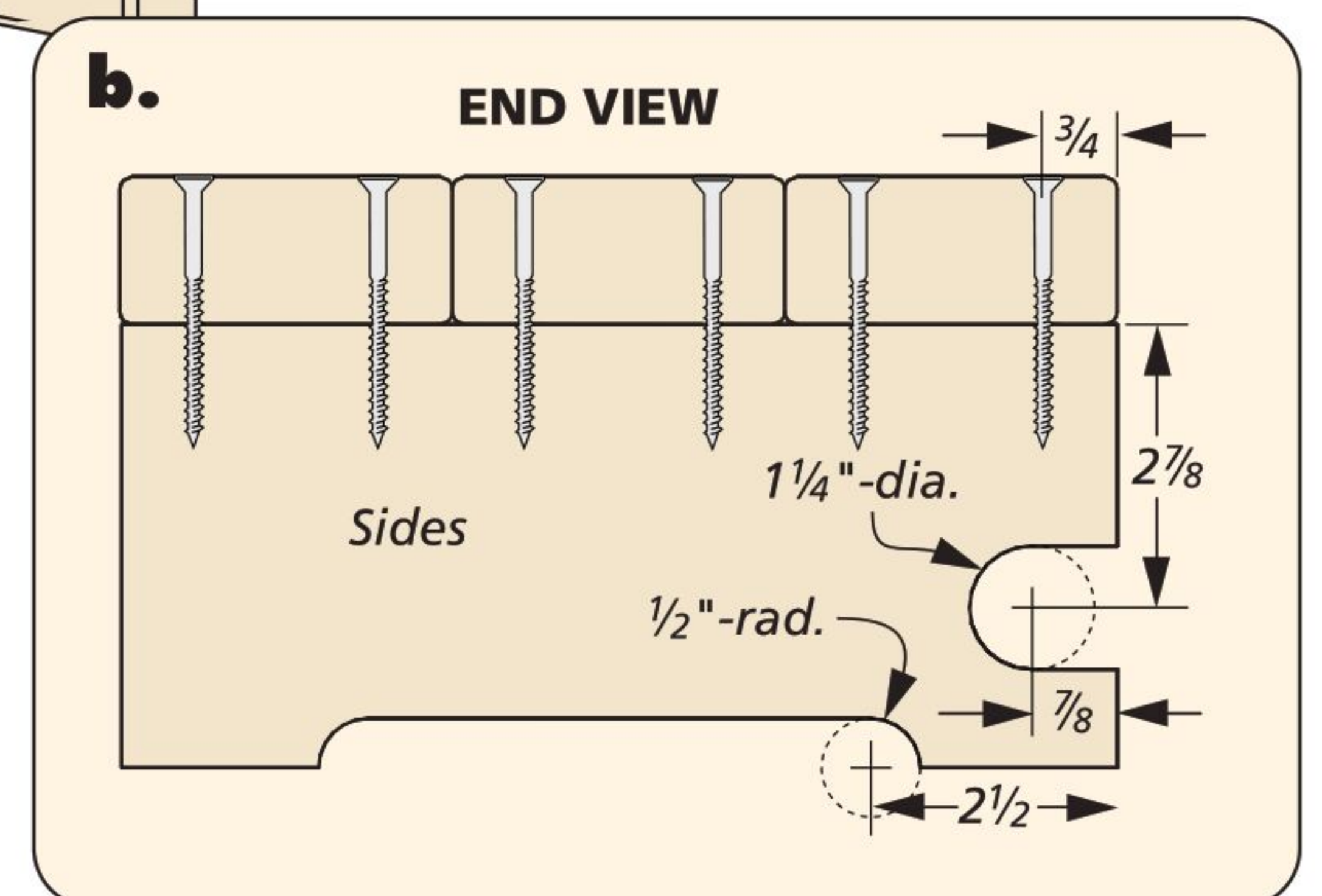
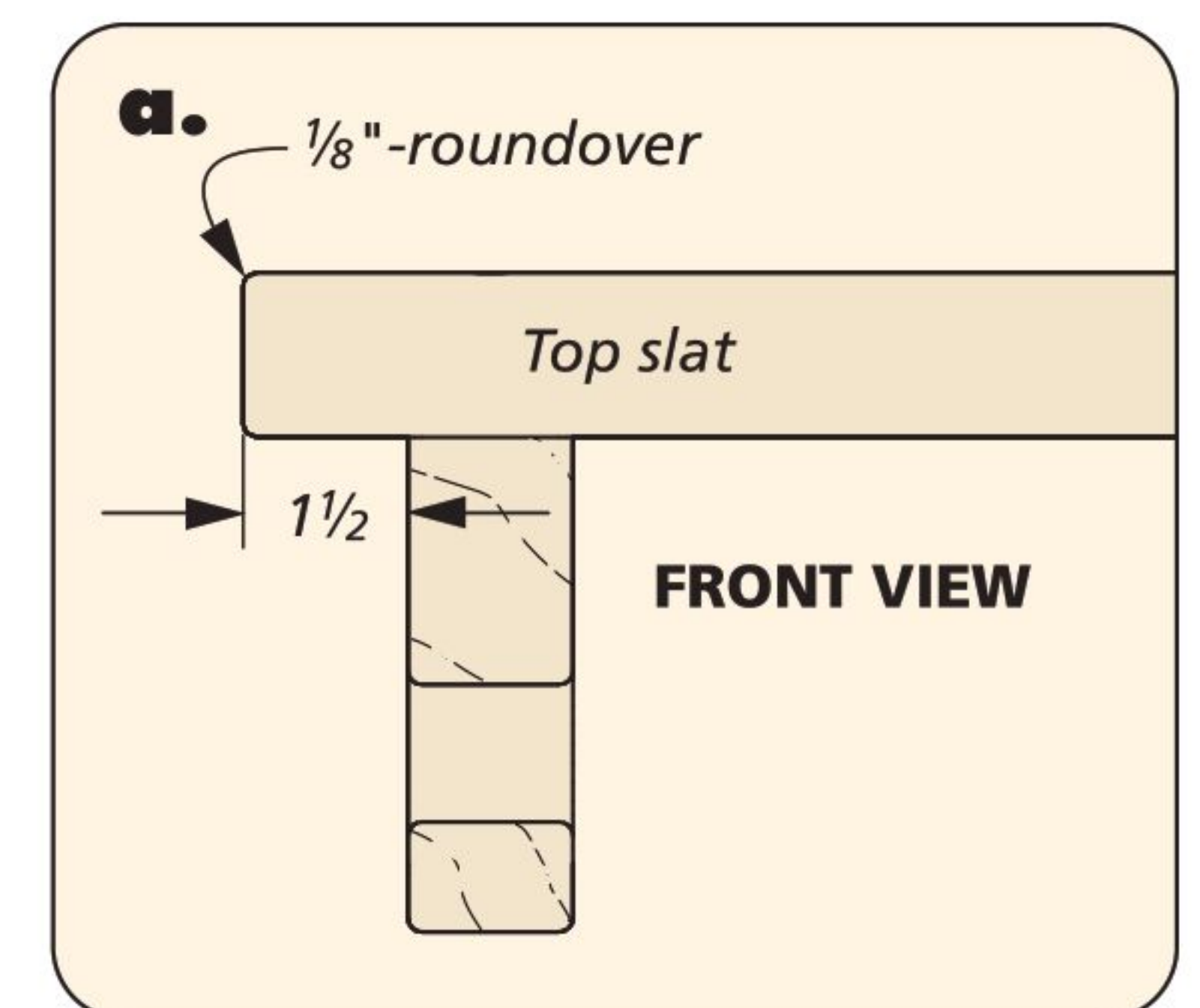
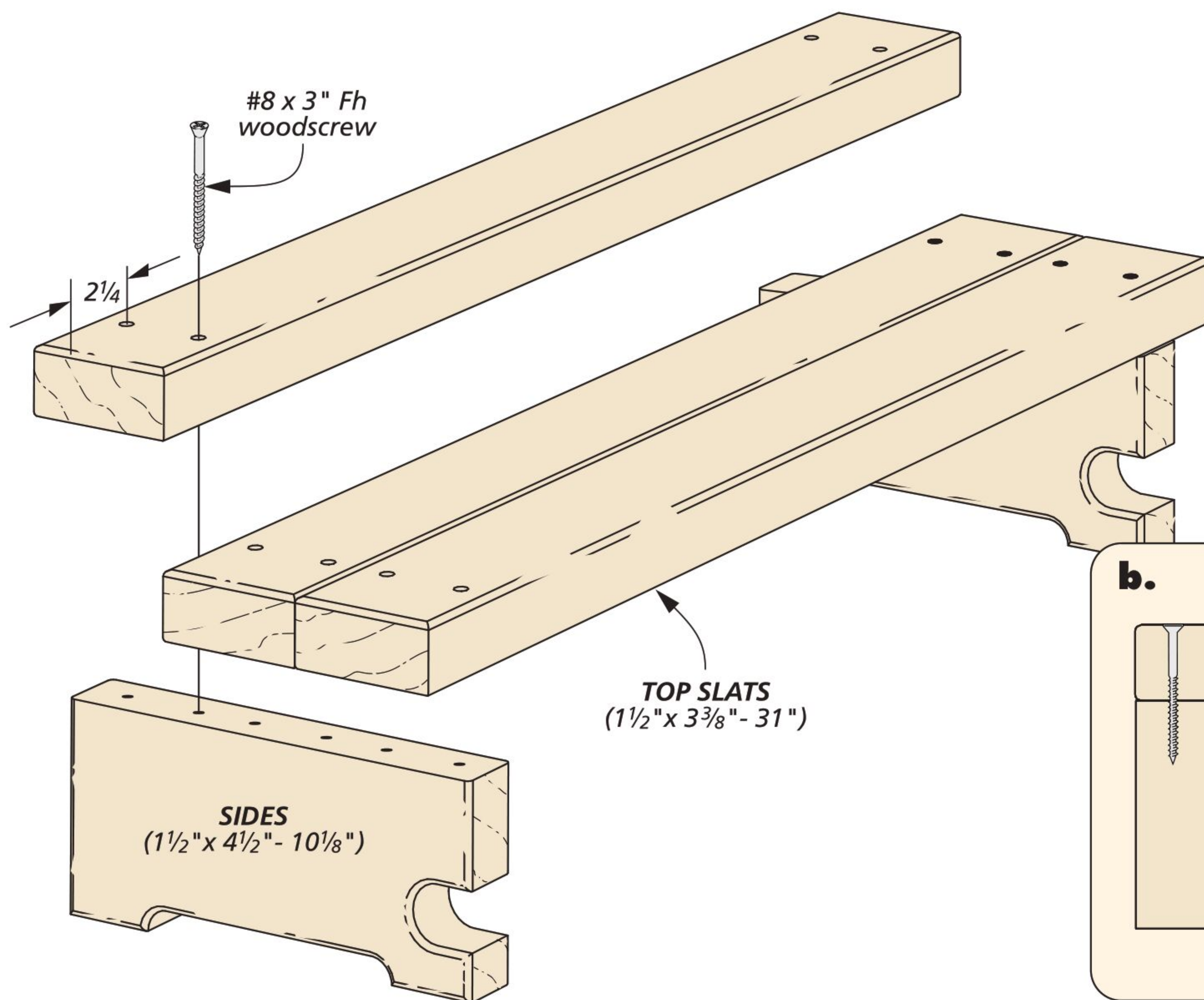
Back-Saving Benchtop

Normal workbench heights are fine for most work, but for many people, fine detail work at that height will have them hunching for hours. This “back-saving” benchtop is amazingly rigid and

solid when clamped to the top front of your workbench. Your workpiece is then clamped up at a comfortable height, whether you’re cutting dovetails or carving. The project can be made to

fit you, and best of all, it only takes an hour or so of shop time and a few pieces of spare scrap lying around.

*Larry Poore
Issaquah, Washington*



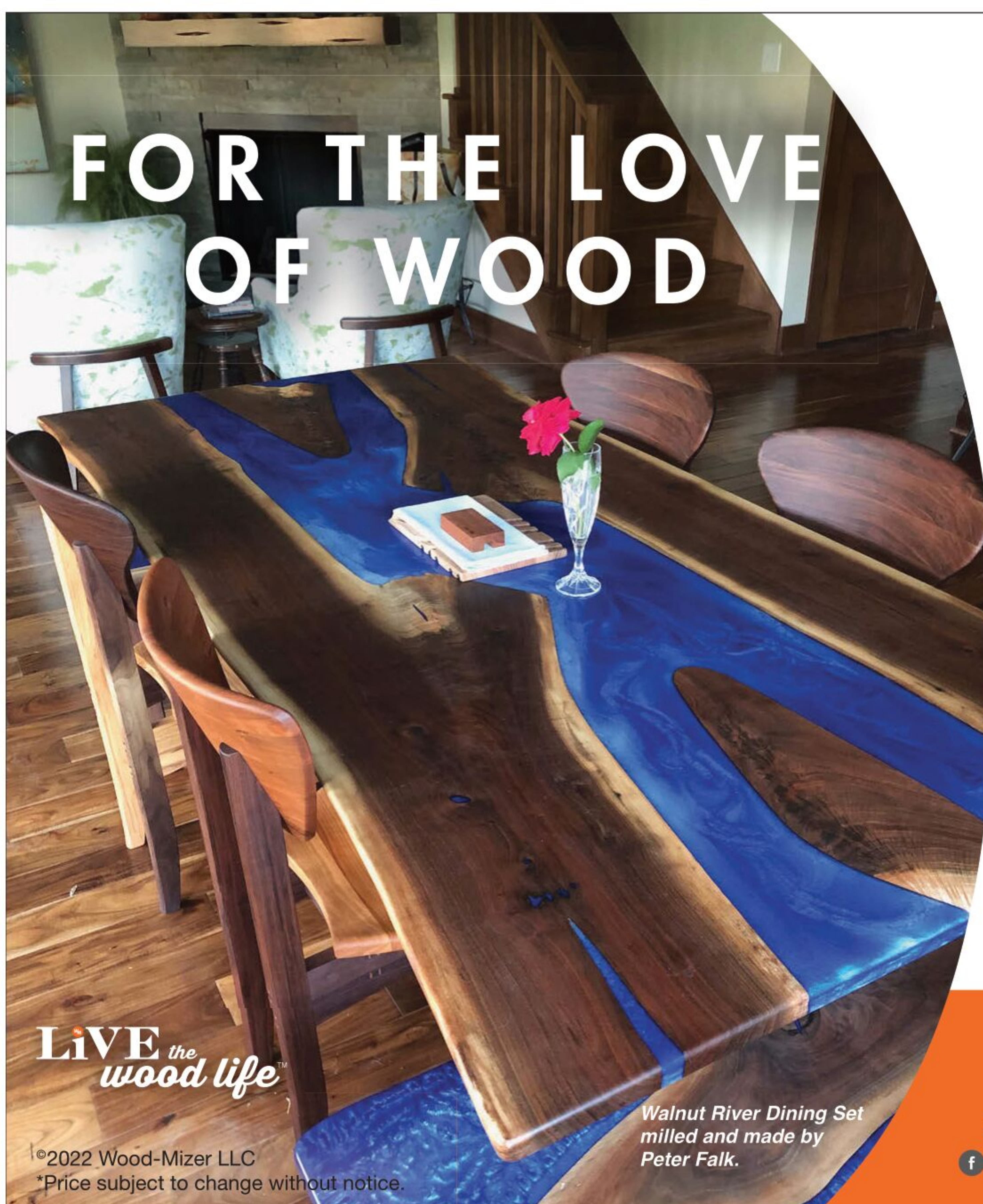
QUICK TIPS



Picking the Backing. *Tim DeKorte of Santa Maria, CA* needed to remove the backing from double-sided tape adhered to his template. Using a pick (such as a dental pick or a vinyl weeder) made the job much easier, allowing him to snag the backing with the hook and pull it right off.



Hole In One. *Russell Griesmer of West Melbourne, FL* had a recent project that called for drilling 96 pocket holes into 24 rails. With all these pieces, speed and efficiency were vital. A golf tee served to plug the unneeded hole so he could focus solely on his drilling.



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▲ Once the epoxy cures, remove the painter's tape and drill through the epoxy. Then tap it to accept the set screw.



▲ Once the insert is set in place, use an Allen wrench to adjust each set screw until the insert is flush with the saw table.

Zero Clearance Table Saw Insert

After purchasing a new table saw, I needed to make extra zero clearance table inserts. The problem was adjusting the table insert to be flush with the top of the table. I decided to drill oversized holes in each corner, which ended up being about one-and-a-half times the size of my set screws. I countersunk each side, then I filled each hole with epoxy. The countersunk holes are important to lock the epoxy in place from both sides. Then I just drilled and tapped the epoxied holes as normal.

Be sure to keep track of the hole's center for when it comes time to tap. Since these tapped holes aren't through steel, you should use as long a set screw as possible to utilize as many threads as you can, providing extra strength and stability to the insert.

As you can see from the pictures, I now have my ½" zero-clearance table insert with a set screw in each corner to adjust the height.

*Michael Behrmann
Lampe, Missouri*

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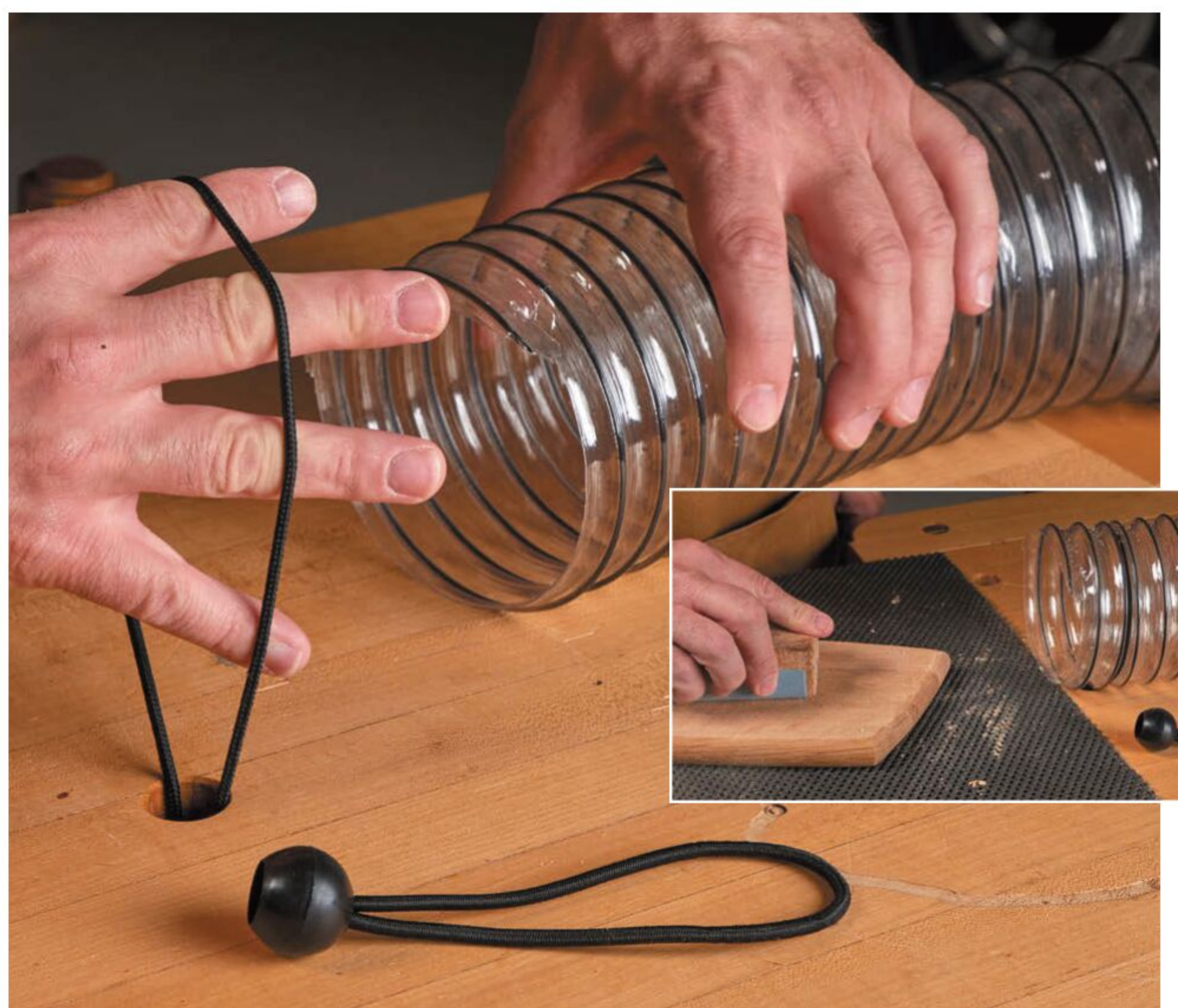
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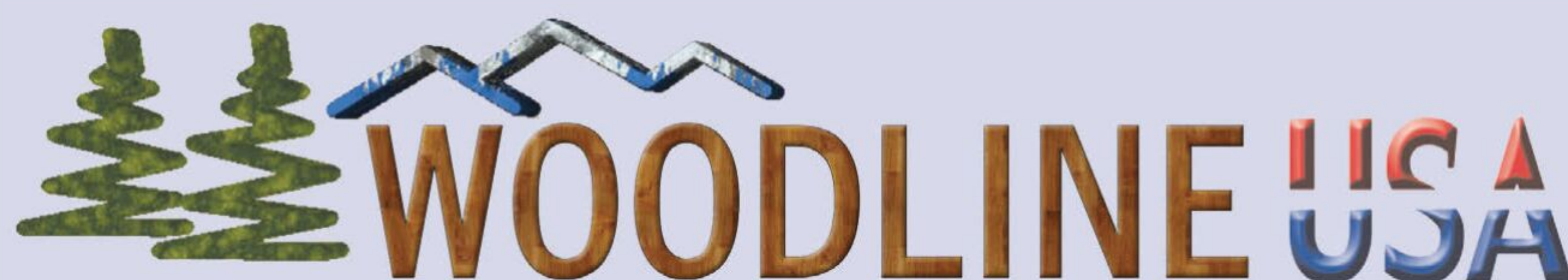
QUICK TIPS



Hose Holder. Bobby Mink of Oregonia, OH was doing quite a bit of sanding when he had the idea to use a tarp strap bungee to hold a dust collection hose down to his workbench. All he had to do was pull the elastic cord of the bungee up through the dog hole in the bench and secure it around the hose. Then he could sand dust free.



Tape Marking. Charles Mak of Calgary, Canada chose to use masking tape to mark the four corners a table top's position. Once taped, he could remove the top to predrill the holes without having to fuss it back into position afterward.



800-472-6950

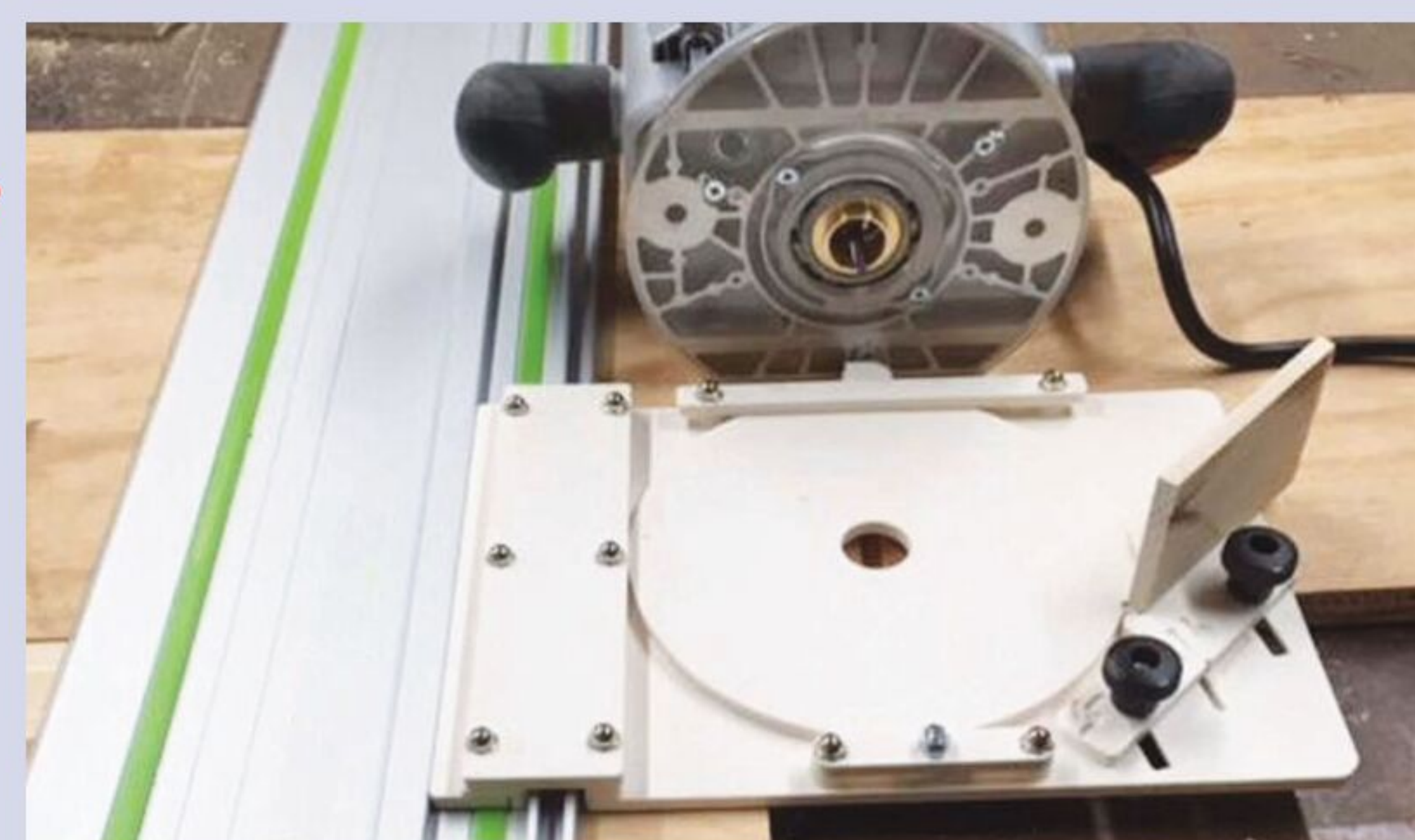
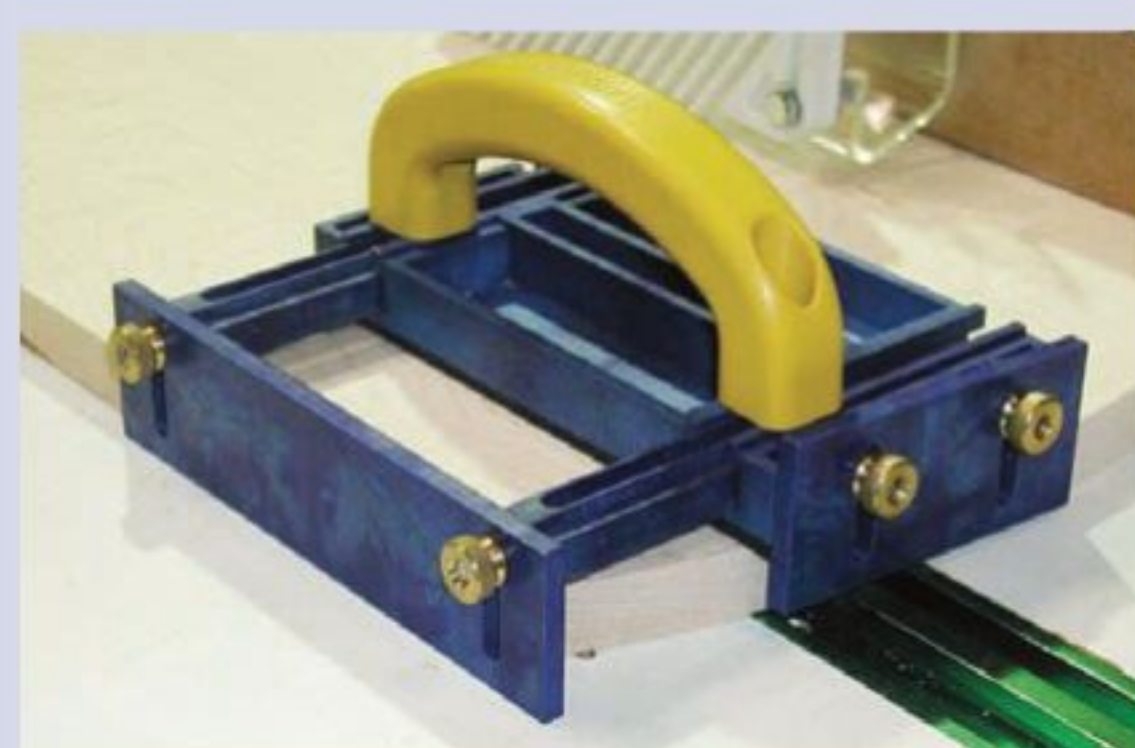
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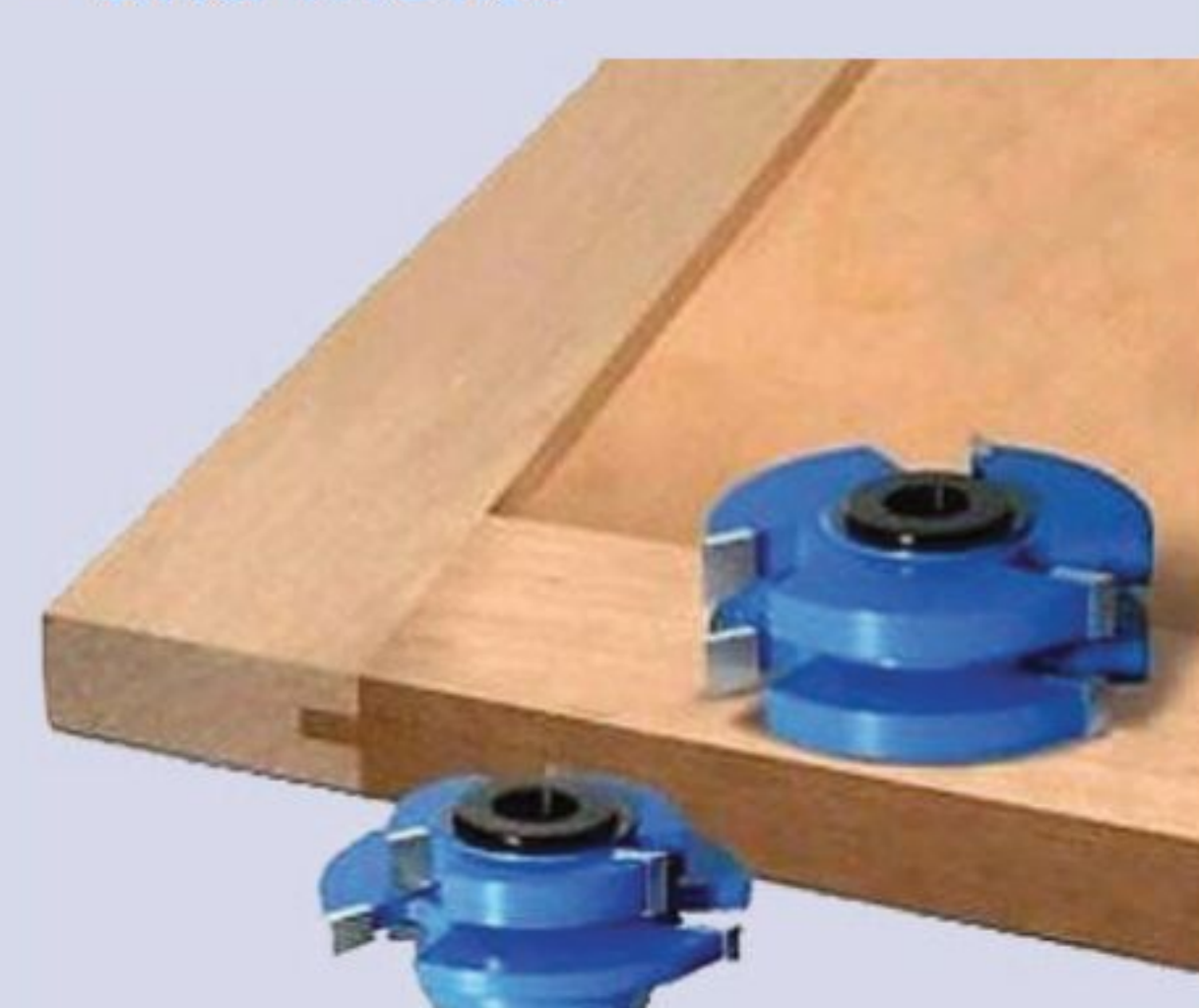
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What can we help you make today?

Mixed-Media Inlay



For a full-size floral pattern, go to:

Woodsmith.com/259

The Harvey Ellis organizer on page 30 makes great use of the art of inlay in the door of the project. Most of the time inlay is thinly sliced wood (or metal) that is recessed into the

surface of a larger board. Here, the larger board is the center panel of the door.

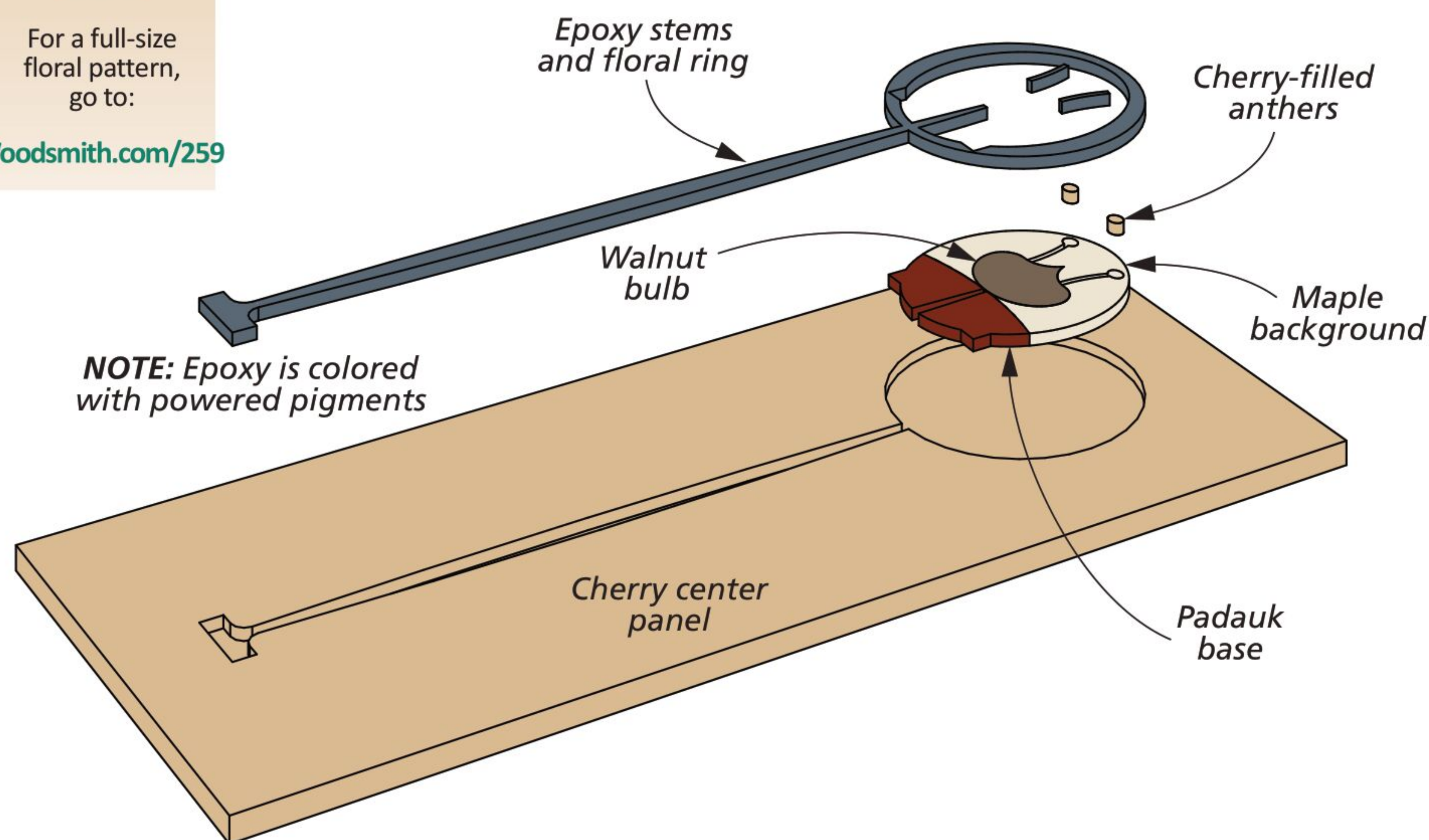
The inlay is made from a combination of materials. Maple, padauk, walnut, and cherry,

with some colored epoxy thrown in for good measure.

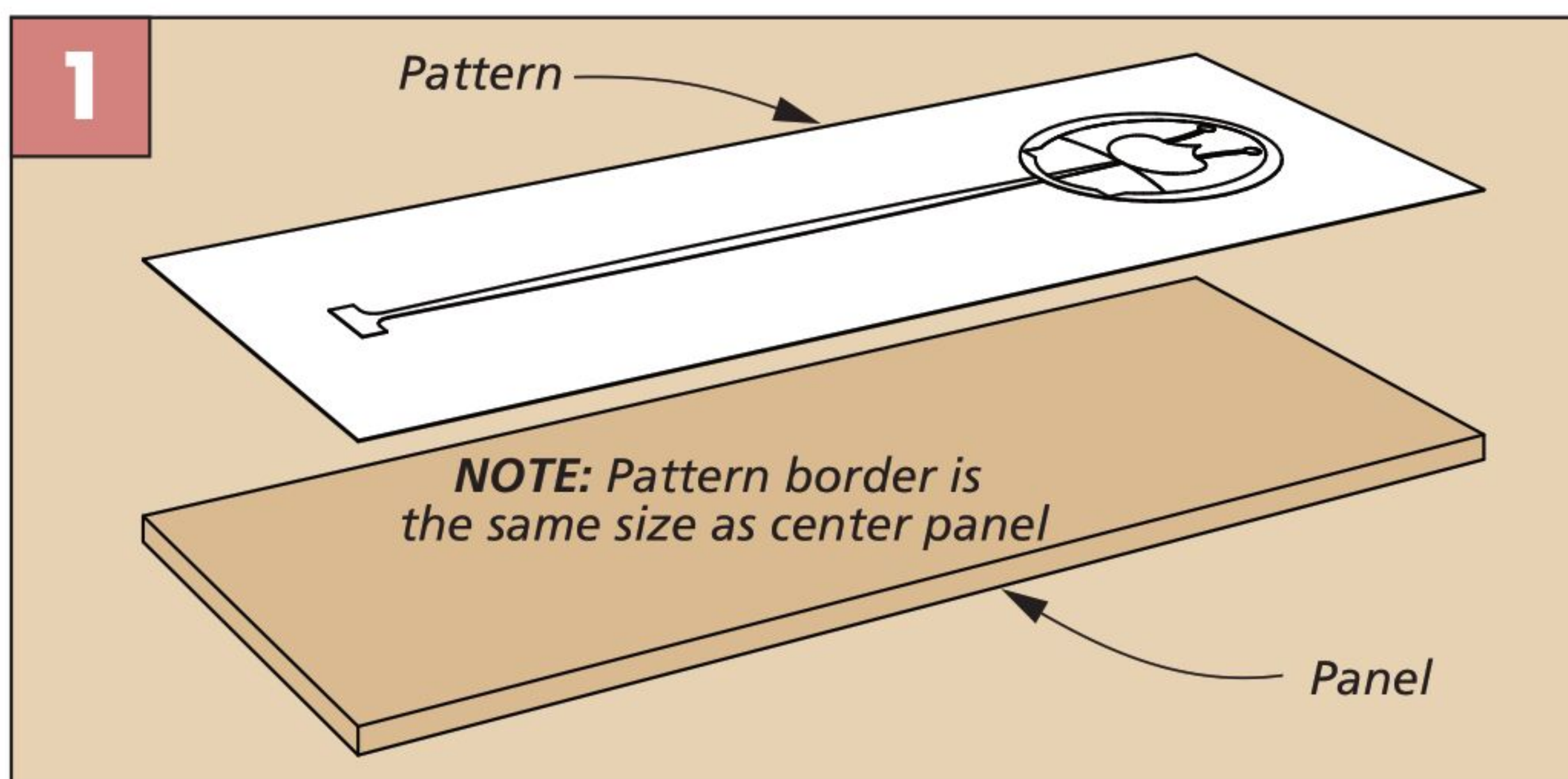
PANEL PROFILE FIRST. I used a spray adhesive to attach the pattern of the inlay profile to the panel. There's a full-size pattern online at Woodsmith.com/259. Or you can scale and print the one on page 15. Either way the pattern is designed to go to the edges of the panel (Figure 1).

Next, use a plunge router with a combination of small straight bits to remove most of the waste in the flower (Figure 2). To create the precise profile Figure 3 shows, use a combination of your favorite wood carving chisels (*Swiss Made 514* fish tail takes care of most of the curves).

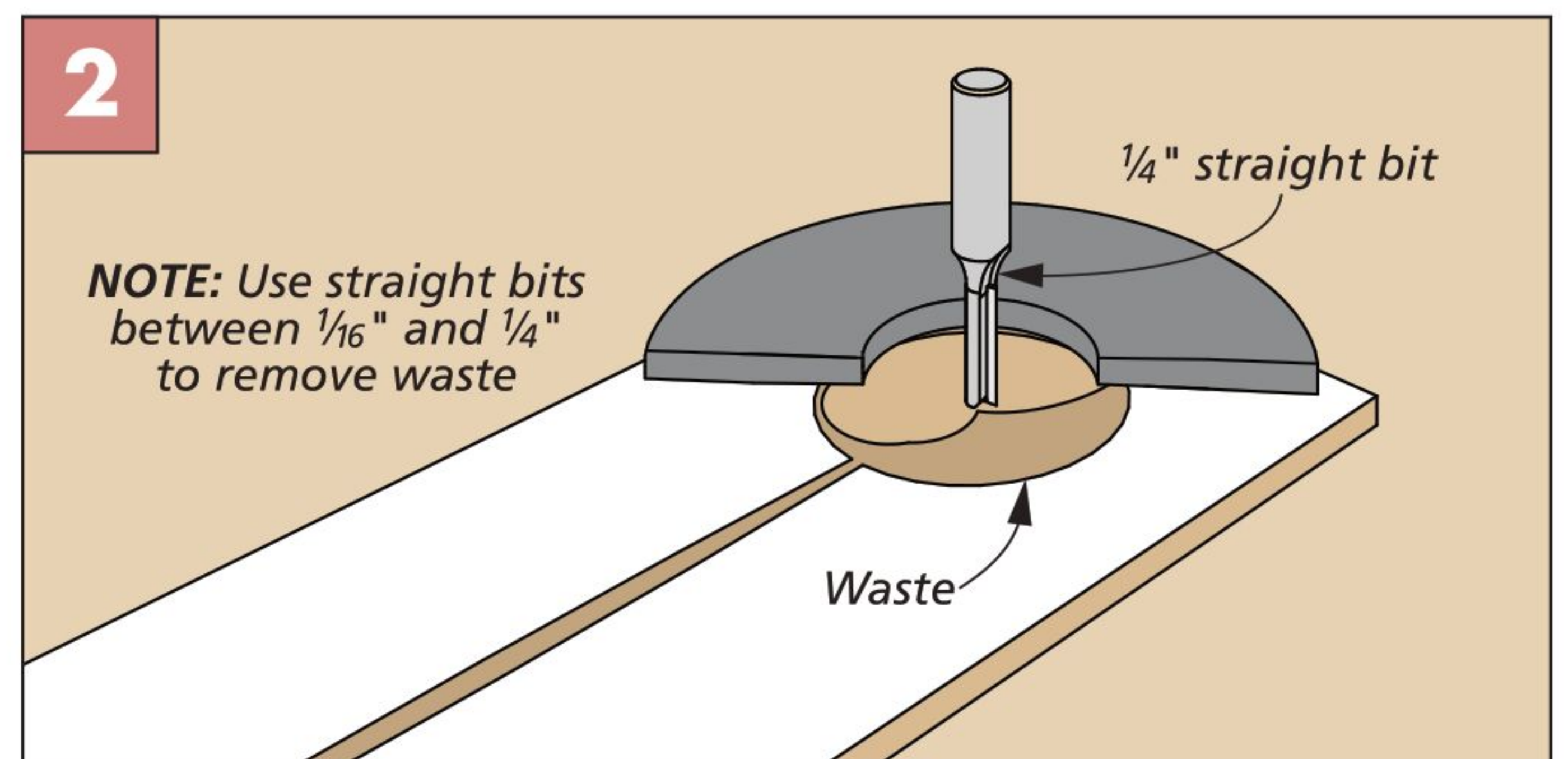
FLORAL PATTERNS. There are three patterns for the interior parts



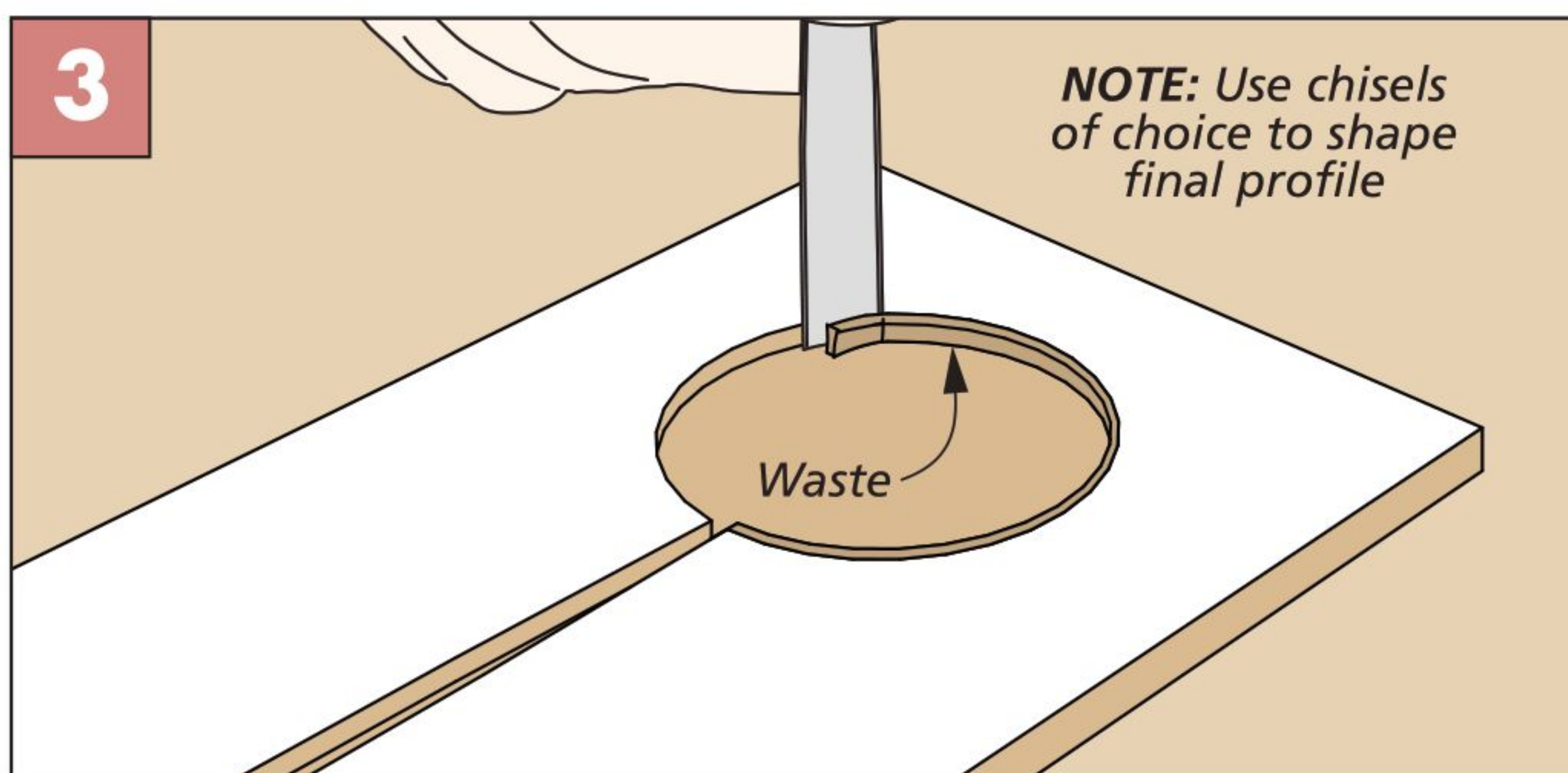
PANEL PROFILE & FLORAL PARTS



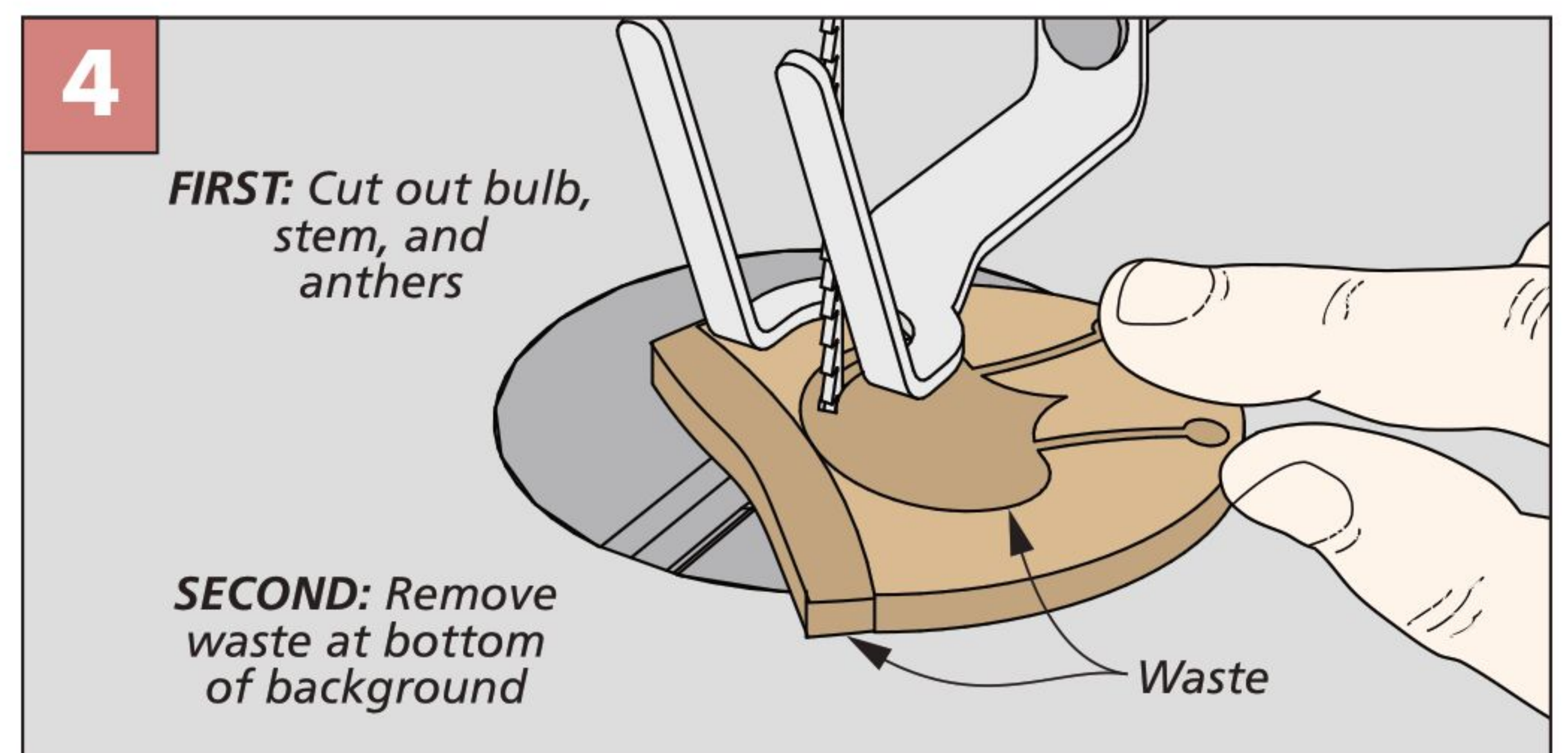
The Perfect Pattern. First, cut the panel of the door to final size. Then, use spray adhesive to attach the pattern to the panel. Use a sharp knife to remove the center of the pattern.



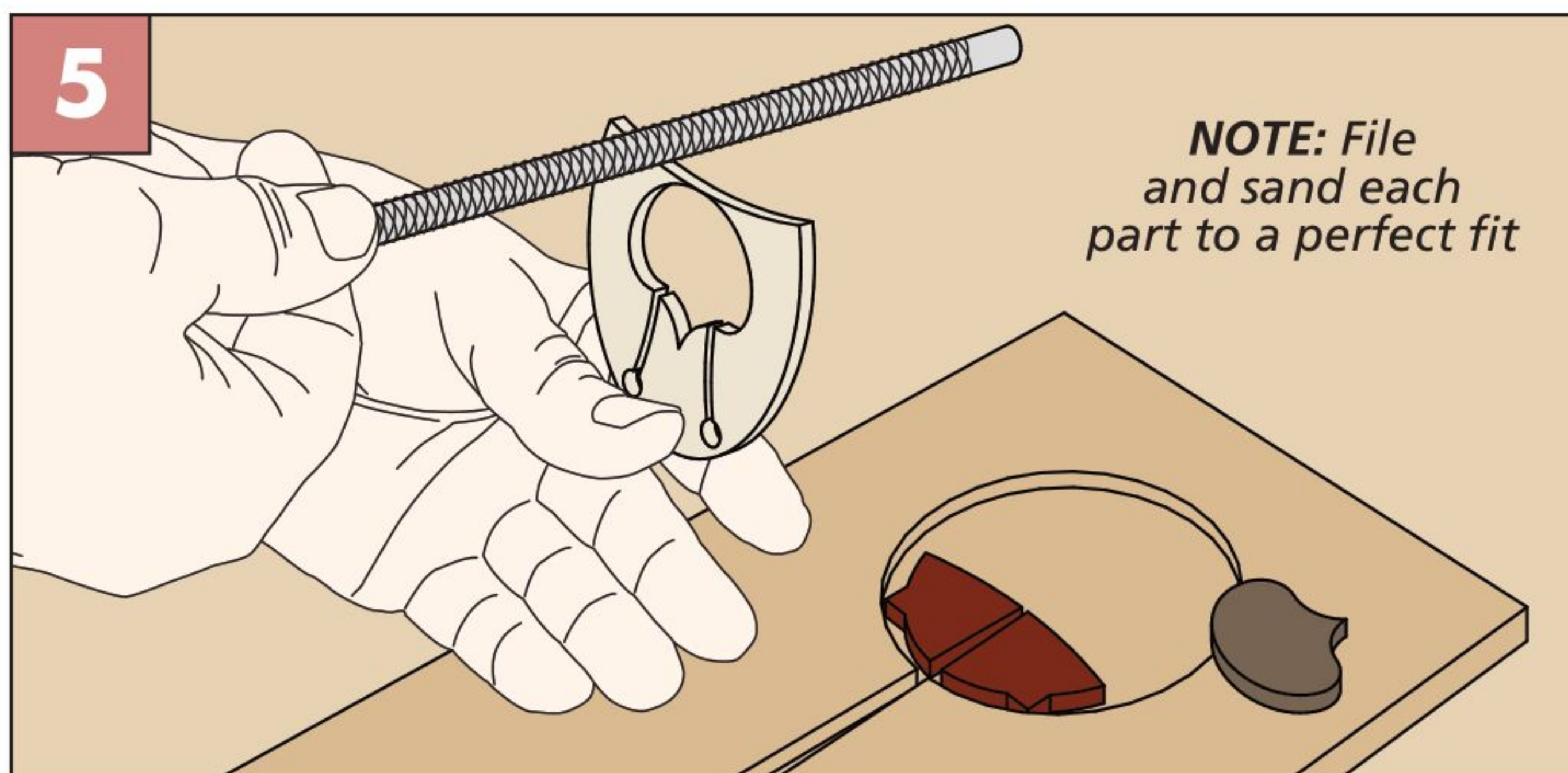
Rout the Panel. A plunge router and various sizes of straight bits will remove most of the waste. Don't try and trim to the final line, you'll do that in the next step.



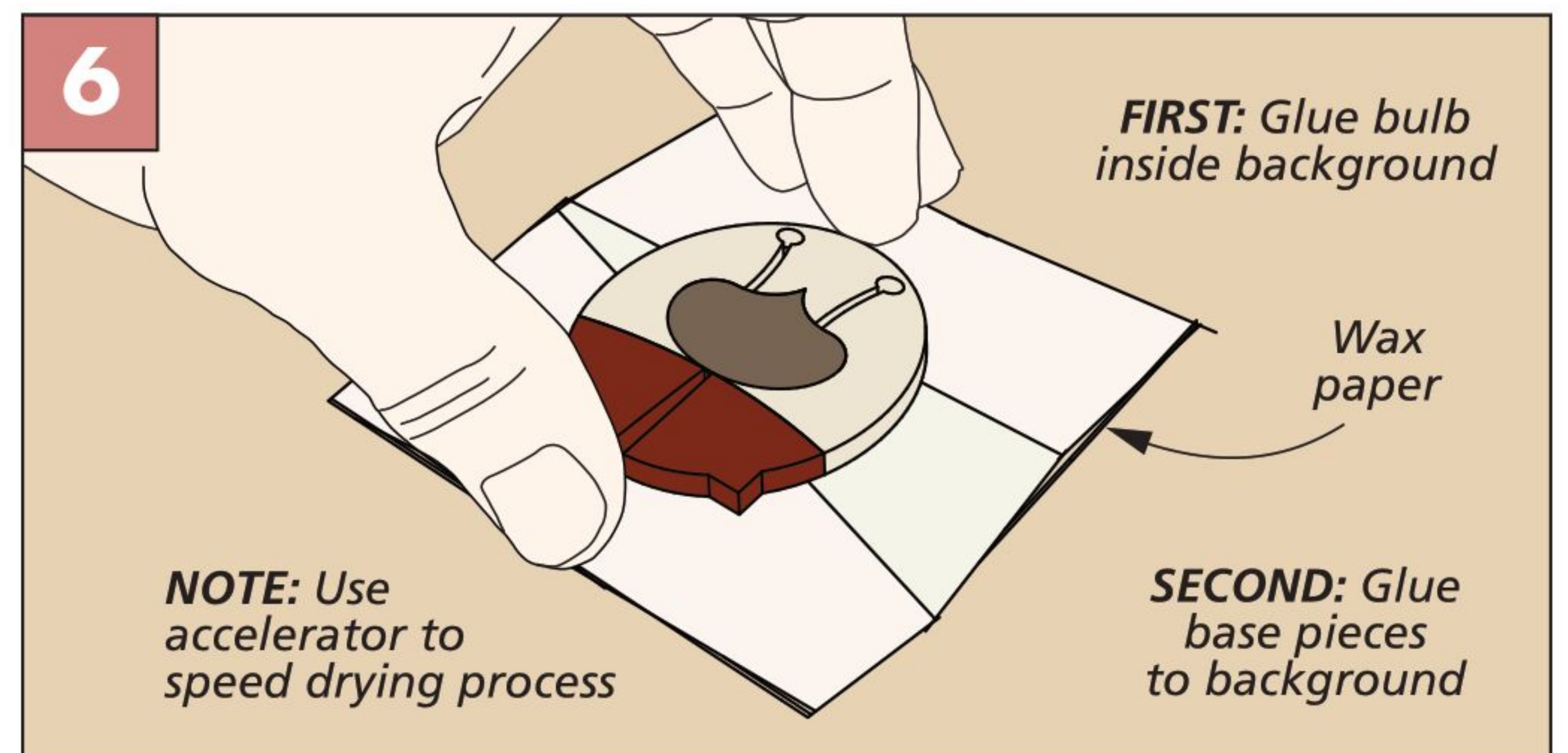
Trim the Profile. To make a perfect floral profile use a variety of chisels and carving tools. Nibble and slice away at the profile while holding the tools square to the panel.



Scroll Saw Work. Your scroll saw is the ideal tool for roughing out all the parts of the flower inlay. Be sure to stay to the waste side of each piece as you go.



Perfect Puzzle Pieces. You're in for some quiet time at the bench while shaping the floral parts. Small files, rasps, and sandpaper are the tools and supplies needed.



Floral Glue-Up. The easiest way to put the flower together is to use CA glue (super glue). Use a medium viscosity version of the glue for optimal results.

within the flower. Thinly sliced maple is used with the background piece, padauk for the base, and walnut for the bulb.

SHAPING THE PARTS. Cut close to the line of the pieces with your scroll saw (Figure 4). Then hand sand each piece and test-fit to each other along the way (Figure 5).

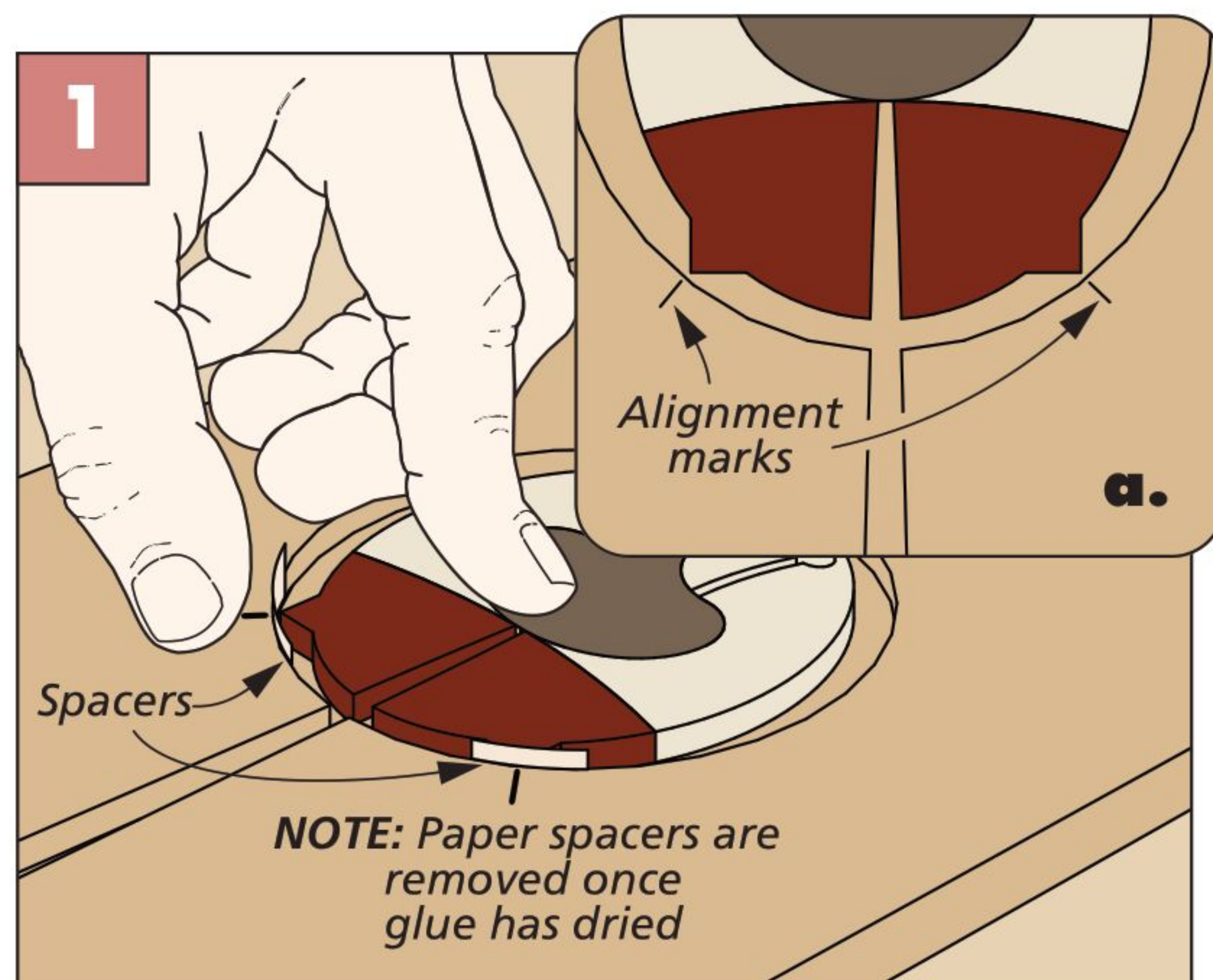
When the fit is perfect, the next move is to glue them together.

GLUE UP. Cyanoacrylate glue is just the ticket for putting together the small delicate parts of the flower. Glue the bulb to the background first. Next, place that assembly close to the base parts on wax paper.

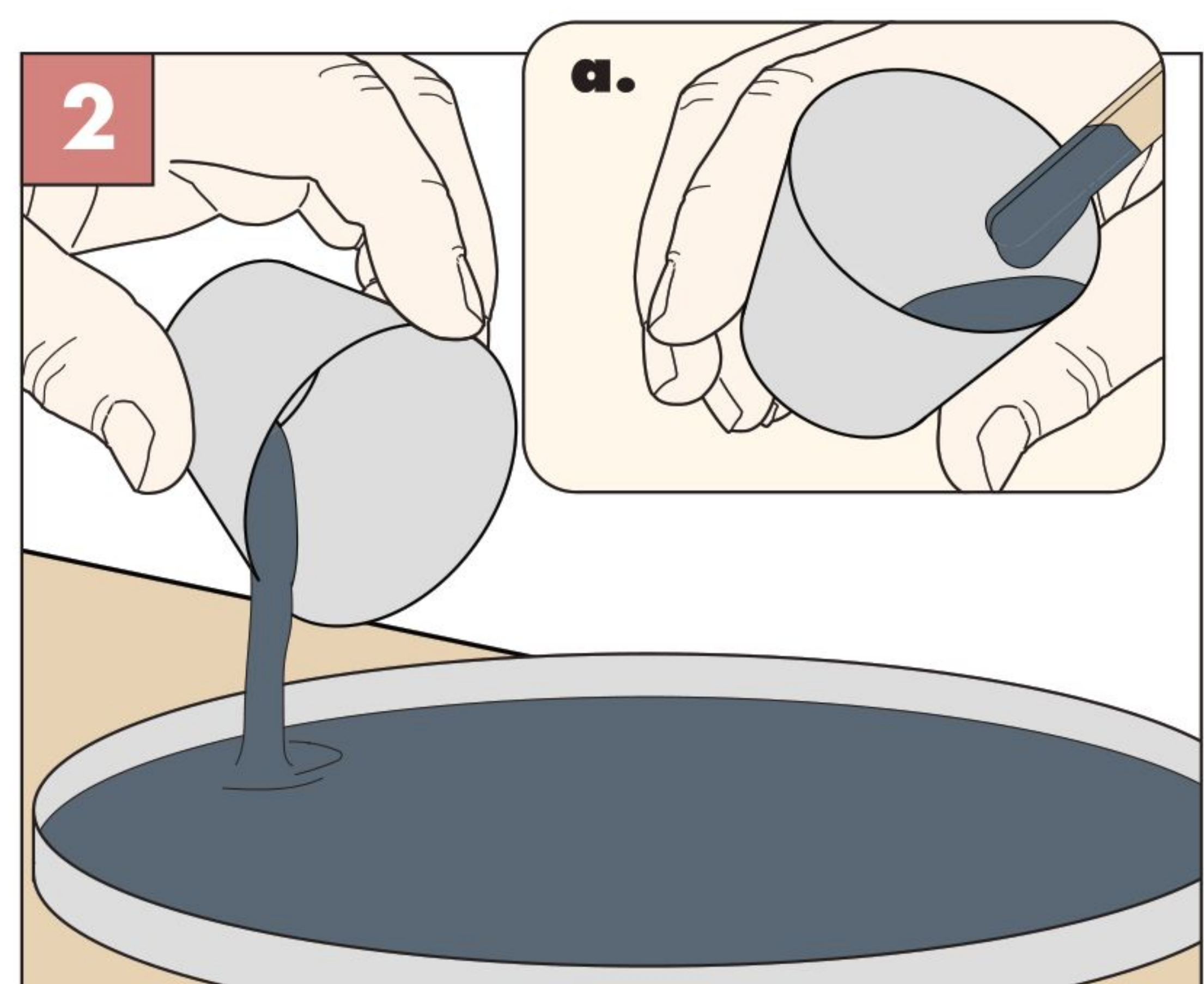
Align the outer edges of the three parts and glue them together with super glue. Hold the parts together for a few minutes like you see in Figure 6.

After the glue cures, you can install the glued-up medallion and fill in around it. Turn the page for those details.

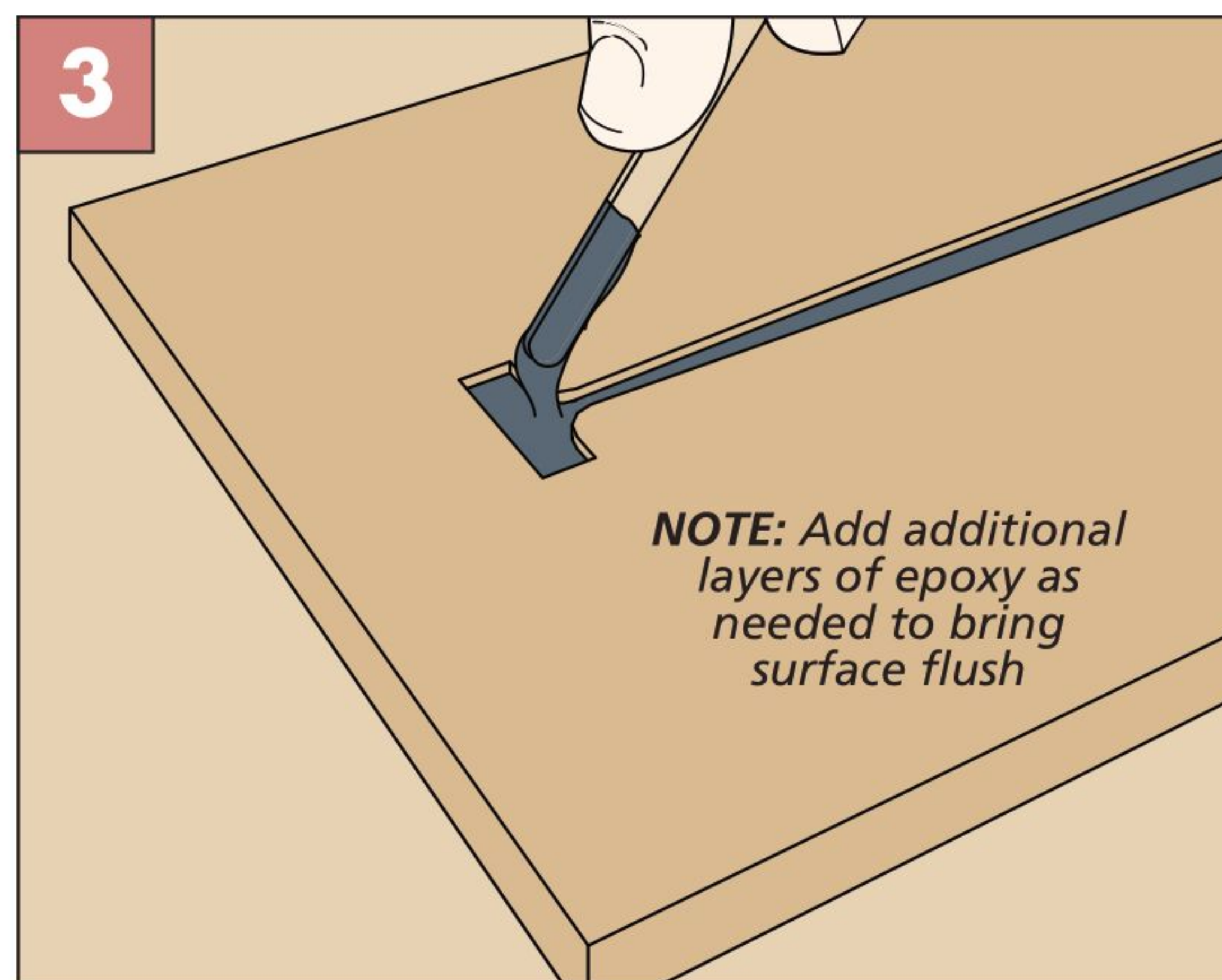
BRINGING IT ALL TOGETHER



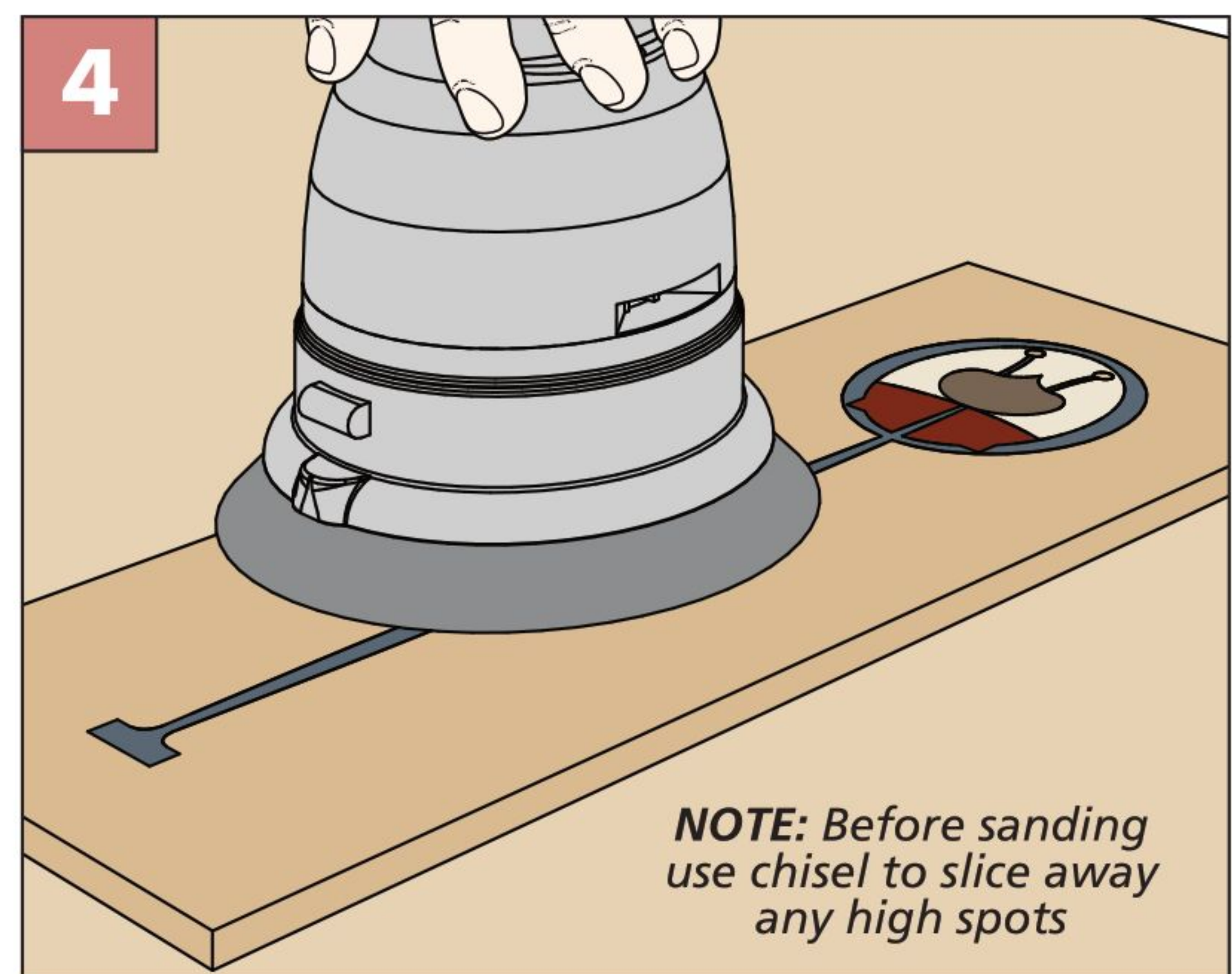
Place the Flower. The decorative corners are what you use to position the flower in the inlay. The paper spacers provide the proper gap.



Mix the Epoxy. Mix the epoxy and the colorant in a small cup (detail 'a'). To prevent the epoxy from accelerating, pour it in a wide shallow pan.



Patience is a Virtue. A wooden stick (a popsicle stick, or a chop stick works nicely) is an ideal tool for transferring the epoxy to the inlay opening.



Sanding Flush. The final step is to sand the inlay flush along with any irregularities in the surface. Be careful not to round the edges of the panel.



For a full-size floral pattern, go to:

Woodsmith.com/259

Now that the glue holding the floral medallion together has cured (super glue sets fast) you're almost ready to attach it to the panel. First, you want to make sure they fit together, so a dry run is in order.

FIT & FINISH. Here's what you want to check out before gluing the medallion in place. First, set the flower in the opening to ensure that it has full contact with the panel. If it rocks or wobbles at all, you'll want to resolve that problem.

It might mean some gentle sanding to the back side of the

medallion to smooth out any imperfections. If the flower has a slight bow from the assembly you'll want to make note of where to apply pressure when gluing it to the panel.

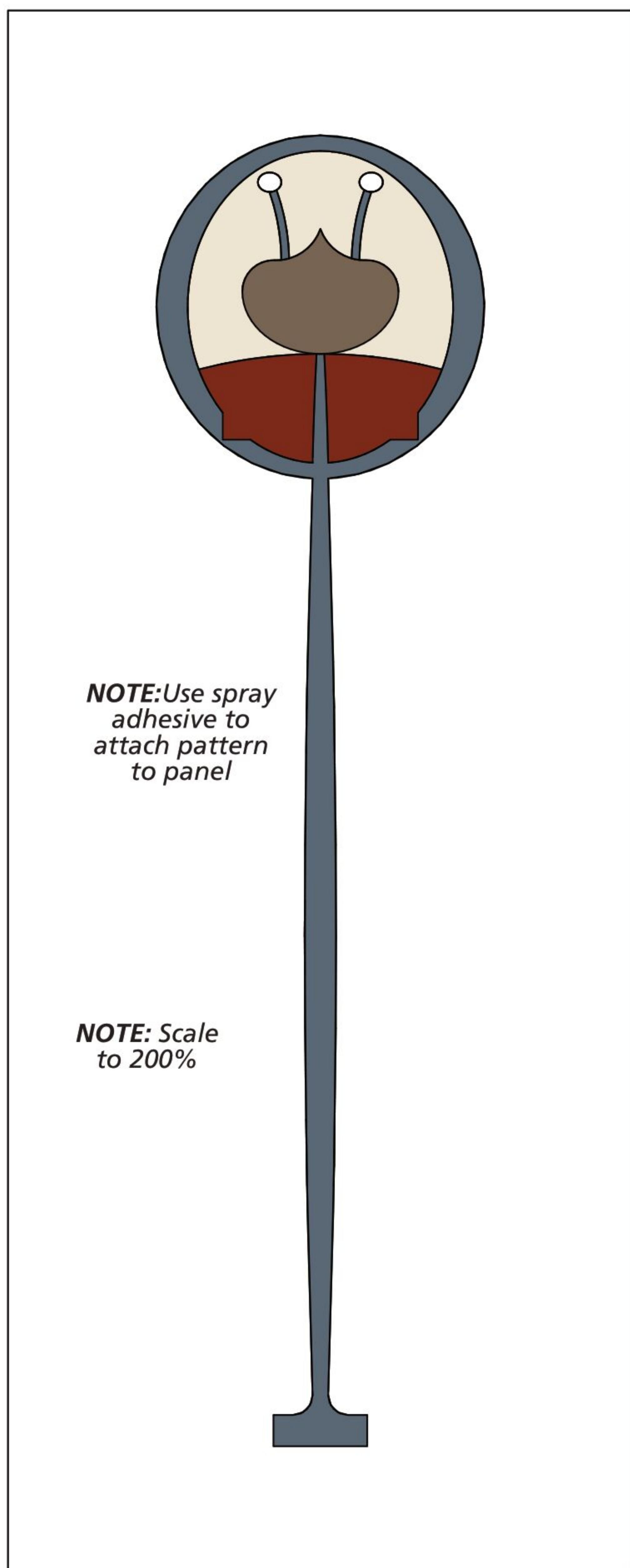
The other thing to check is the alignment of the flower to the stem in the panel. When I was satisfied with its position, I made two reference marks like you see in Figure 1a.

GLUE UP. Now you're ready to rock and roll, so apply glue to the back and position the flower in the opening with the points of the medallion almost touching

the edges of the flower profile, Figure 1 shows this. When the glue has cured, you can start filling around the flower.

BEFORE EPOXY. The anthers (the two dots in the flower) are the first items to be filled. But not with epoxy. To add another layer of contrast, I used a mix of cherry sawdust and glue.

Before filling the anthers with the paste, I created a dam in the stem with some rolled up masking tape. Just overfill slightly so you can sand it smooth. When the paste is dry, remove the tape and trim the anther base.



EPOXY

Now you can mix epoxy with the added colorant in a cup as shown in the detail of Figure 2. The colorant is a mixture of two powdered pigments from *Pearl Ex* (Macro Pearl 652 and Silver 663). To keep the mix from setting too quickly while in use, pour it in a shallow pan or plate that spreads it thinly (Figure 2).

To transfer the epoxy to the stem and around the flower, you can load it on a popsicle stick, dull pencil, or even a wooden

chop stick. Figure 3 this step in action. Take your time filling the voids around the flower and down the stem. It's okay to overfill the flower slightly. Sometimes this process will require more than one layer of epoxy.

SAND SMOOTH. As you see in Figure 4, use a random orbit sander with a range grits from 150 to 220 or finer until you get that appealing sheen. Now that you've finished this inlaid jewel, you can get back to work on the organizer. **W**

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A Router Table Motor & More



▲ What's in the box? What you see here. The motor, two off-set wrenches, two very nice standard sized collets, and a collet nut.

Back in the day, router tables were cobbled together without much thought to longevity. A piece of plywood with a hole cut in it and the router base bolted to the underside and you were in business. It got the job done.

Also in those days there was a show on PBS called *The Router Workshop* which showcased the versatility of what you can do with a router. Their dedication and enthusiasm was infectious and can be credited with a lot of the growth of the tool we call the router table. It's not as powerful or as expensive as a shaper, but it works fine for your everyday woodshop.

Over time the tables got fancier, and the routers bigger. Then router lifts came along, followed by routers that were designed specifically for the router table — and here we are.

SPINRITE ROUTER MOTOR

The router you see here doesn't come with a base; it's designed to live in a router table, or a CNC machine. To me the biggest difference between motors that come with a base, and ones designed for a table, is the little stud on the motor body that lets you twirl the motor in and out of the base to control the depth of cut. Maybe there's more to it than that, but for now, let's look over this motor.

The photo at the bottom of the previous page shows what comes in the box. The 3 $\frac{1}{4}$ hp motor is a polished and well-designed machine.

At the heart of the operation is a precisely machined shaft that pairs with high-quality ER20 collets. The photos to the right shows what they look like. "ER" is a proprietary name. The number "20" following it is the series number, which is the opening diameter of the tapered receptacle, in millimeters. All of

this is important if you want to control run-out. Run-out is basically how much a bit might wobble due to the machining of the shaft, collet and collet nut. It's not a big deal if you're doing roundovers or chamfers. But if you're using mating bits, like the cope and stick set shown below, to make window sashes (photo below right) you want to have as little run-out as possible.

INSTALLATION. As you see in the main photo on the previous page, the router is designed to fit in any lift that can hold a 4.2" diameter motor, which most router lifts will accommodate. We installed the *SpinRite* in one of the router tables in our shop. It has the *Kreg PRS5000* lift that we've used for a long time. The motor fit — but it took some persuasion and a helping

hand from a fellow shop rat. Otherwise, the motor integrated smoothly into shop duties.

Being the owner of old *Porter Cable 690* routers that won't wear out, I envy the soft start function, and how quiet this big motor is. This is not a cheap router (\$280). But it certainly is one that will last a lifetime. It can be found at [#1015420](http://woodpeck.com).



▲ The collets ($\frac{1}{4}$ ", $\frac{1}{2}$ ") that come in the *SpinRite* kit are top notch and easy to work with. They clip in and out of the collet nut with little effort.



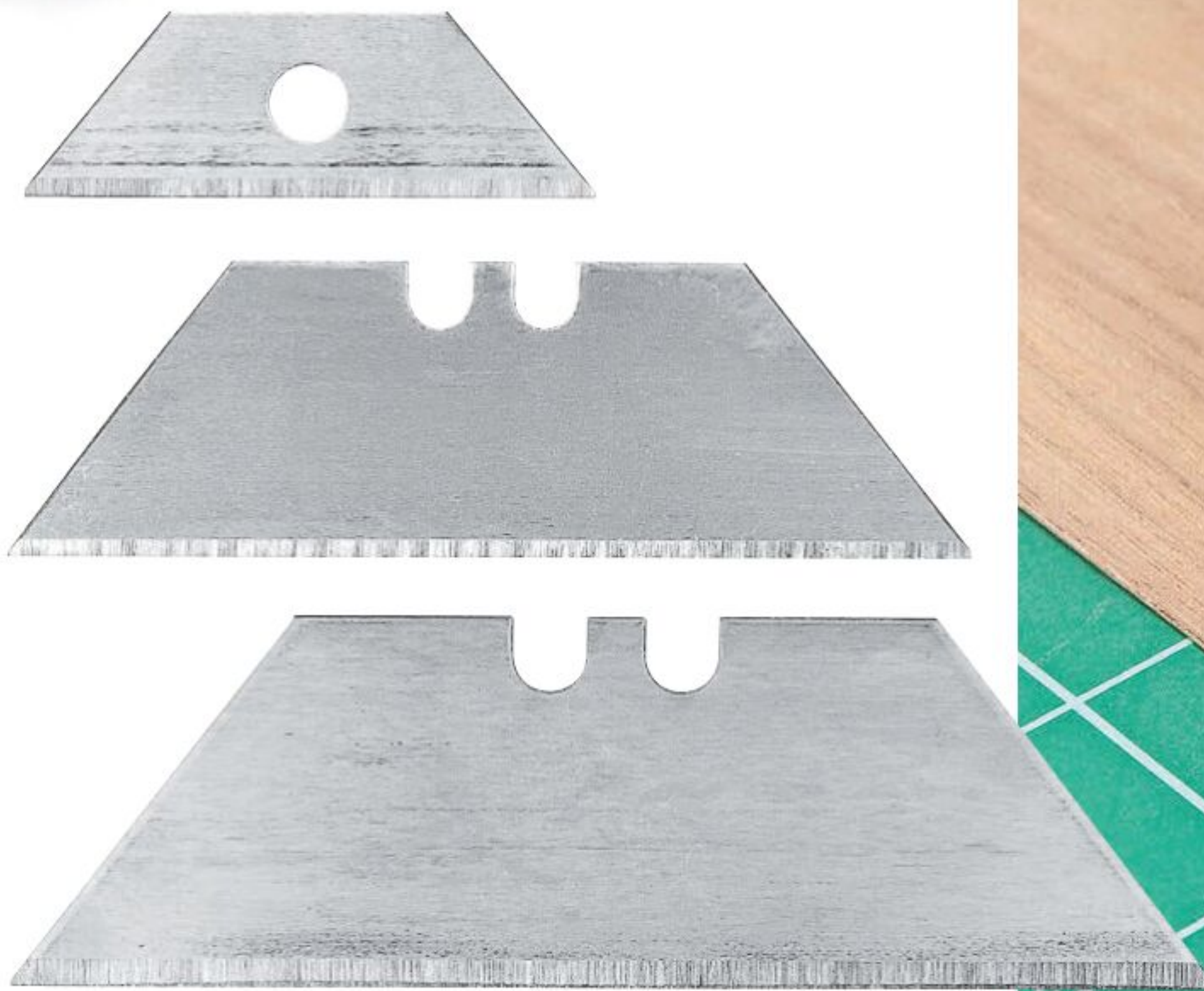
▲ Woodpeckers have put a lot of emphasis on minimizing run-out (how much wobble there is in the router shaft and collet). That's a critical thing when you're using cope and stick bits to make sashes like the one to the right.





▲ The *Kobalt Compact Lockback* knife is a tiny but mighty tool to have around.

► Blades now come in multiple sizes to meet the needs on many tasks.



NOT YOUR DAD'S UTILITY KNIVES

I've had the same old *Stanley* utility knife for decades. It's served me well over the years. But that old knife was getting a little beat up, so I headed out to look for a replacement. You might be surprised at the variety of knife styles available. I want to show you two of them, plus talk about ways you can upgrade your old utility knife.

▲ The *Irwin* knife sports options like a quick blade release, a finger notch in the high impact case, and a notch for stripping wire.

LIKE A POCKET KNIFE. One of the first things you'll notice about both of these utility knives is the basic design. Instead of the traditional type of knife with a blade that retracts into the handle, these new styles fold like a pocket knife. The blade locks open to prevent it from closing accidentally. The next thing to consider is the size of the knives.

KOBALT LOCKBACK. The *Kobalt Compact Lockback* is a utility knife that punches above its weight. And as you see in the photos above, it's a handsome little devil (if that counts for anything).



Wire stripper

UPGRADED BLADES

Metal Types. Stepping up to any of the high-quality blades you see to the right can greatly reduce the number of blade changes. A few of the options include titanium coating (top), bi-metal (middle) and the long-lived carbide (bottom). Are they more expensive? Of course, but often worth the cost.



Tips & Serrated Edges. A serrated blade (top) stays sharper longer to slice easily through a variety of materials. Blades with rounded corners are designed to safely open cardboard packages.



Special Hooks. On the surface hooked blades might seem like a one-trick pony, but not so. They make cutting roofing material like shingles and felt underlayment an easy task. They also work great for cutting through carpeting.

When it's folded, it's small size and thin profile makes it almost disappear in your pocket. The *Kobalt Compact Lockback #58976* is available at *Lowe's* stores, and at *Lowes.com*.

IRWIN FOLDING KNIFE. The knife you see in the photos in the center of the previous page fires on all the cylinders of what you need a utility knife for. It's a durable tool that allows quick and safe blade changes. And that little notch for stripping wires is brilliant. You can find this at *Amazon.com* (2089100).

Speaking of blades and brilliant uses, the box at the bottom of the previous page gives you information on blades that are up to any task. All good reasons to retire the old utility knife.

IMPACT DRIVER BITS

When I bought my first impact driver, I used the same old driver bits I had on hand. I soon discovered they weren't designed to withstand the unique forces an impact driver places on a bit. They would deform or break after a short period of use.

▲ Having choices for your impact driver like these two sets from *Irwin* make working in the shop a lot easier.

And replacing them got expensive. If you own an impact driver, you'll want to invest in driver and drill bits specifically designed for it. (You can also use your impact driver to drill holes.) Most tool manufacturers offer a selection of bits designed for impact drivers. You can see a couple sets from *Irwin* in the photo above.

Impact bits fit the 1/4" hex chuck on your driver. They're designed to drive fasteners or drill holes easily without deforming or breaking the bit. *Irwin* uses hardened steel and thinner shafts

to withstand the sudden twisting motion that impact drivers employ during use.

The great thing is, you can put these bits to use in a regular driver. They can be found at *Lowes.com* (688845).

TAMING CORDS

Organization is the key to efficient work in my shop. And I do my best to keep tools where I have quick access to them. Sometimes though, it's the little things that get lost and searching slows down my workflow.

Rockler's new *Magnetic Cord Keepers* are simple in design but may just be the answer for keeping items like pencils, chuck keys or, as the name implies, power cords within reach. Their magnetic base is strong enough to hold heavy cords securely, yet easy to remove as necessary. And the hard plastic won't scratch the surface of your tools. That's always a good thing. You'll find these dandies at *Rockler.com* (42388). **W**



Cords and pencils are held securely



▲ The *Cord Keeper* from *Rockler* is a multi-tasking accessory that is handy to have in many places around the shop.



Grooves & Slots

For some, talking about routing grooves and slots has all the appeal of advice to eat your vegetables or to get enough sleep. I think this line of thinking stems from the familiarity of these joints and the idea that they are “basics” when we want to focus on the cool stuff.

In my shop, I come back to these joints with a more “focus on the fundamentals” sort of mindset. Well-fit grooves and slots sit at the heart of all kinds of projects from heirloom masterpieces to shop cabinets. Upon closer examination then, we’ll find that grooves and slots have a wide

range of applications as well as opportunities to get better results, if you put in the time.

The terms grooves and slots are interchangeable. They define a channel cut into a workpiece that runs in the same direction as the grain. In plywood, a groove is parallel to the grain of the face veneer. Where I see slots differ is when the detail is across the end of a workpiece or a miter joint. Through slots are also used for adjustments in shop jigs or to create a hand hold. To sum up, there’s a lot to cover and we won’t quibble over phraseology.

ROUTER TABLE. I’m going to concentrate on creating grooves and slots at the router table. I have a couple reasons for this. First, it’s my favorite approach. Router bits like the ones shown at left create flat, smooth joints with consistent sizes.

The other reason is that a router table offers a straightforward, intuitive setup process (as we’ll see). It’s also versatile enough to tackle stopped grooves and through slots without adding a lot of complication.



◀ Rout grooves and slots using slot cutters, straight bits or spiral bits. All give you crisp, flat-bottomed cuts.

THE BITS. Grooves are easy to form with straight bits. However, I prefer to use a slot cutter, if at all possible. Slot cutters have a more efficient cutting action that reduces burning and chatter. It's also faster, too.

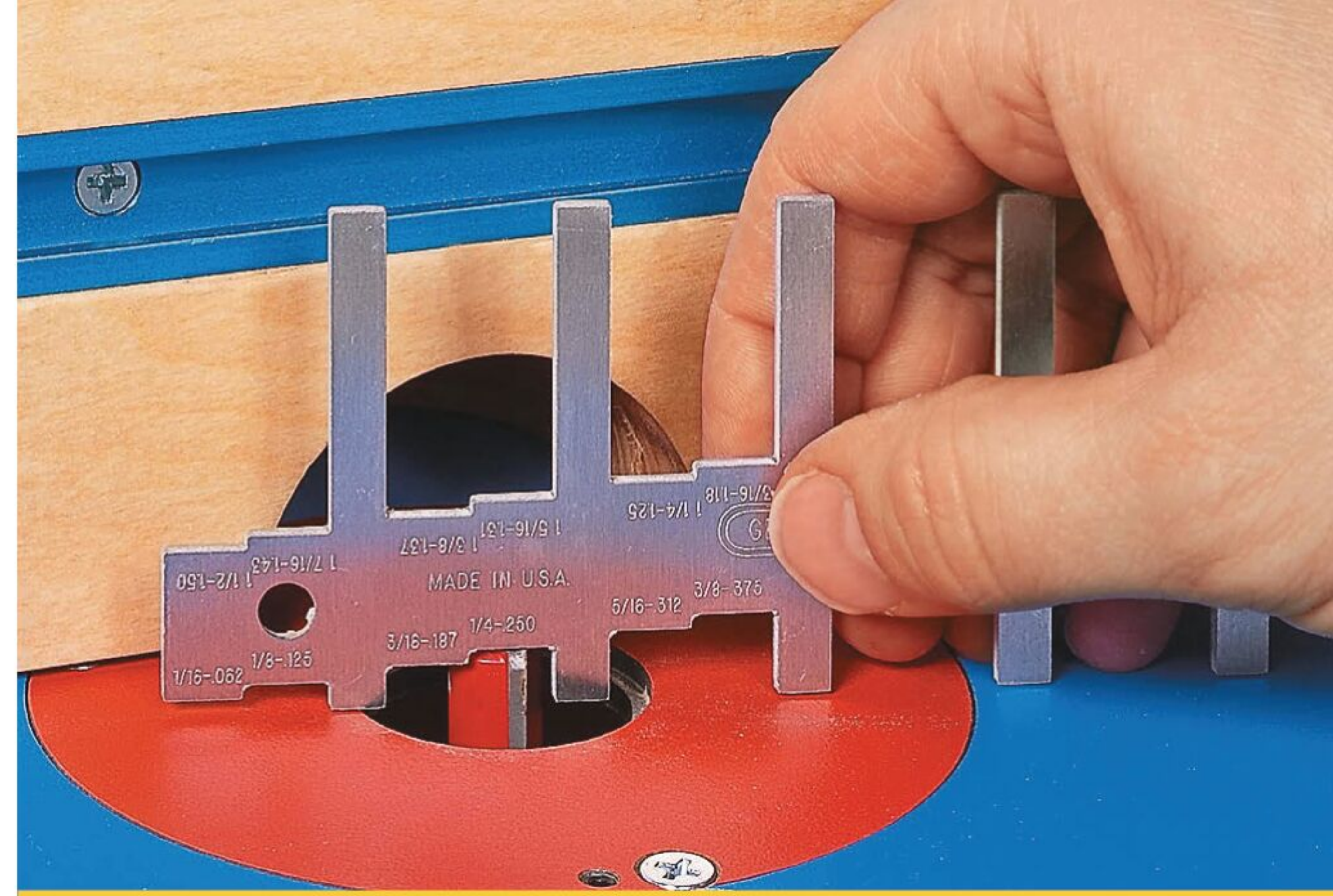
What about spiral bits? I have a few and only use those if the cut is going to be fairly deep. Then an upcut bit's ability to clear chips shines.

BASIC GROOVES. The most common type of groove is one that runs along the face or edge of a workpiece from end to end. There are two items to keep your eye on. Fence setting and bit height. I prefer using positive references for the setup rather than squinting at a ruler. The photos above show the way.

My typical approach is to size the groove to match the size of a



▲ Skip the ruler when setting up a straight bit for grooves. Setup blocks handle fence position.

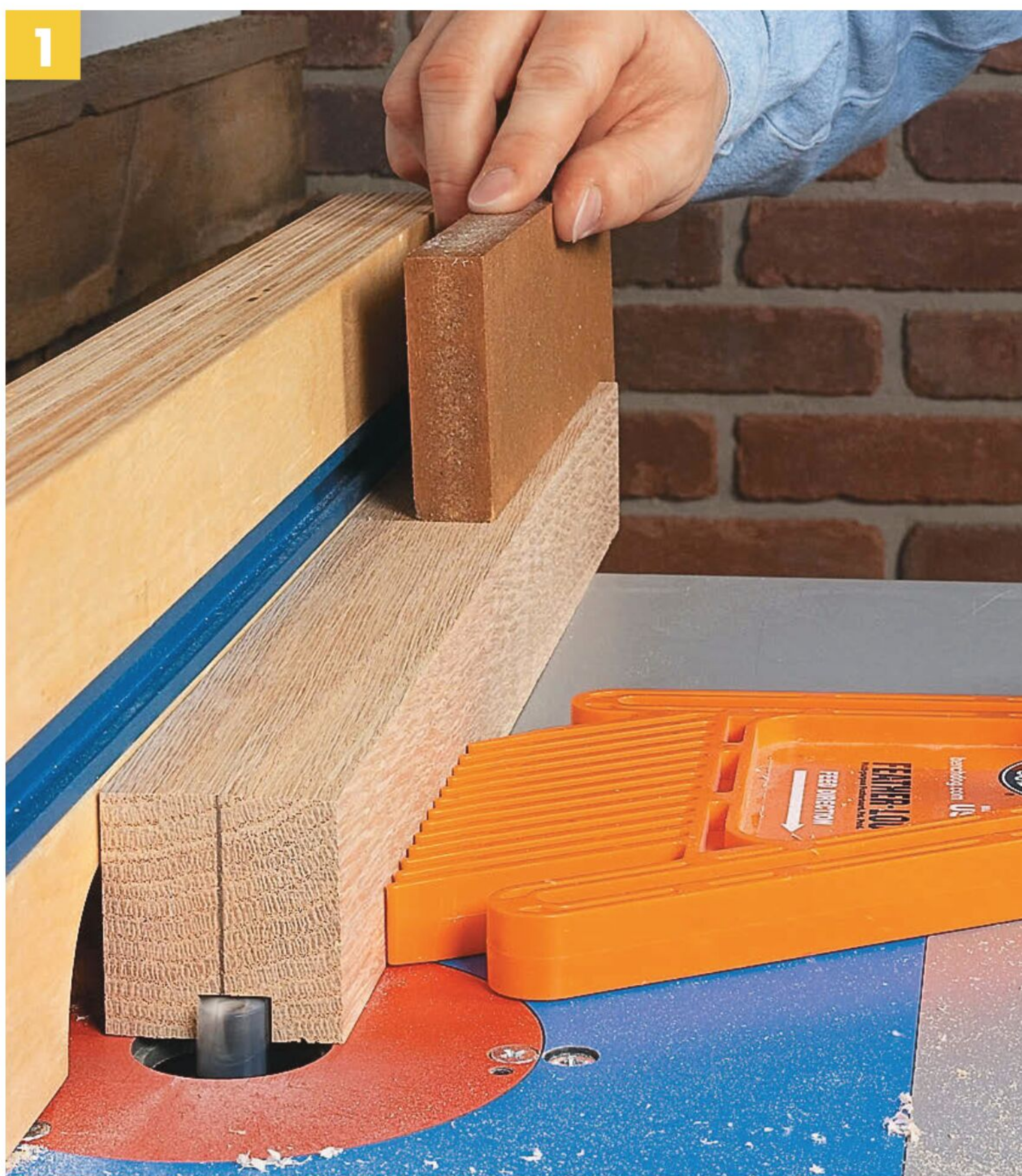


▲ For accurate bit heights, you can still use setup blocks. Another option is a height/depth gauge like this one. Graduated steps provide a positive reference surface.

router bit. This way, there's only one fence setting and the grooves are more consistent.

Deep, heavy cuts aren't a good idea. There's too much stress on the router and too much heat generated at the bit. I step up the height in several passes increasing the height in 1/4" increments.

When a custom width, centered groove is called for, you can follow the steps below. What's important is to work against the rotation of the bit to avoid the bit grabbing. This means that to increase the size of the groove, you should move the fence away from the bit.



▲ You can widen and center a groove in one go by making two passes. For the first pass set the fence so that the bit is on the "outside" of the centerline of your workpiece. This arrangement avoids a dangerous backrouting situation.



▲ Flip the workpiece end for end on the second pass. The amount of waste removed is smaller so the cut can be made quicker.

STOPPED GROOVES

Grooves seem to follow an 80/20 rule. On 80% of the grooves, you'll make through cuts. The groove runs from one end of the workpiece to the other.

The remaining 20% of the grooves are stopped at one or both ends. The process for routing a stopped groove follows along the lines we've already discussed. What makes it different is figuring out where to start and stop the cut since the workpiece is covering the bit.

PENCIL MARKS. The solution is a sharp pencil — or a mechanical pencil, .7mm for me. You make two sets of marks. One is on the workpiece and indicates the starting point and end of the groove. The key is making those marks so you can see them when you're routing. This is shown in Step 1 below.

The other set of marks goes on

the router table. These two marks indicate front and back of the router bit. Step 2 shows the marks placed on the tabletop. But you could also mark the fence, too. It all depends on the orientation and size of the workpiece.

This is all the information you need to get started. Fire up the router and align the start mark on the workpiece with the far bit mark. Lower the workpiece onto the bit and slide it across the table until the other two marks align. Then you can tilt the piece off the bit.

Another option is to turn off the router and wait until the bit stops before removing the workpiece. It all depends on your comfort factor.

STOP BLOCKS. Based on Steps 3-5 below, you may be thinking I got ahead of myself in the explanation. What I just described is how I usually tackle stopped

grooves. Some projects require multiple, identical cuts. When that's the case, adding a couple stop blocks to the setup process makes sense.

You get benefits of improved efficiency by using stop blocks and you know the grooves will be located identically from piece to piece. If you use stop blocks, then you only need to mark one part in order to set up the blocks. The others can be routed without marks knowing the stop blocks are taking care of business.

CAVEATS. Stop blocks only work if the workpiece and length of cut all fall within the length of your router table fence. Since stopped cuts aren't usually visible, precise groove placement isn't a big deal for me.

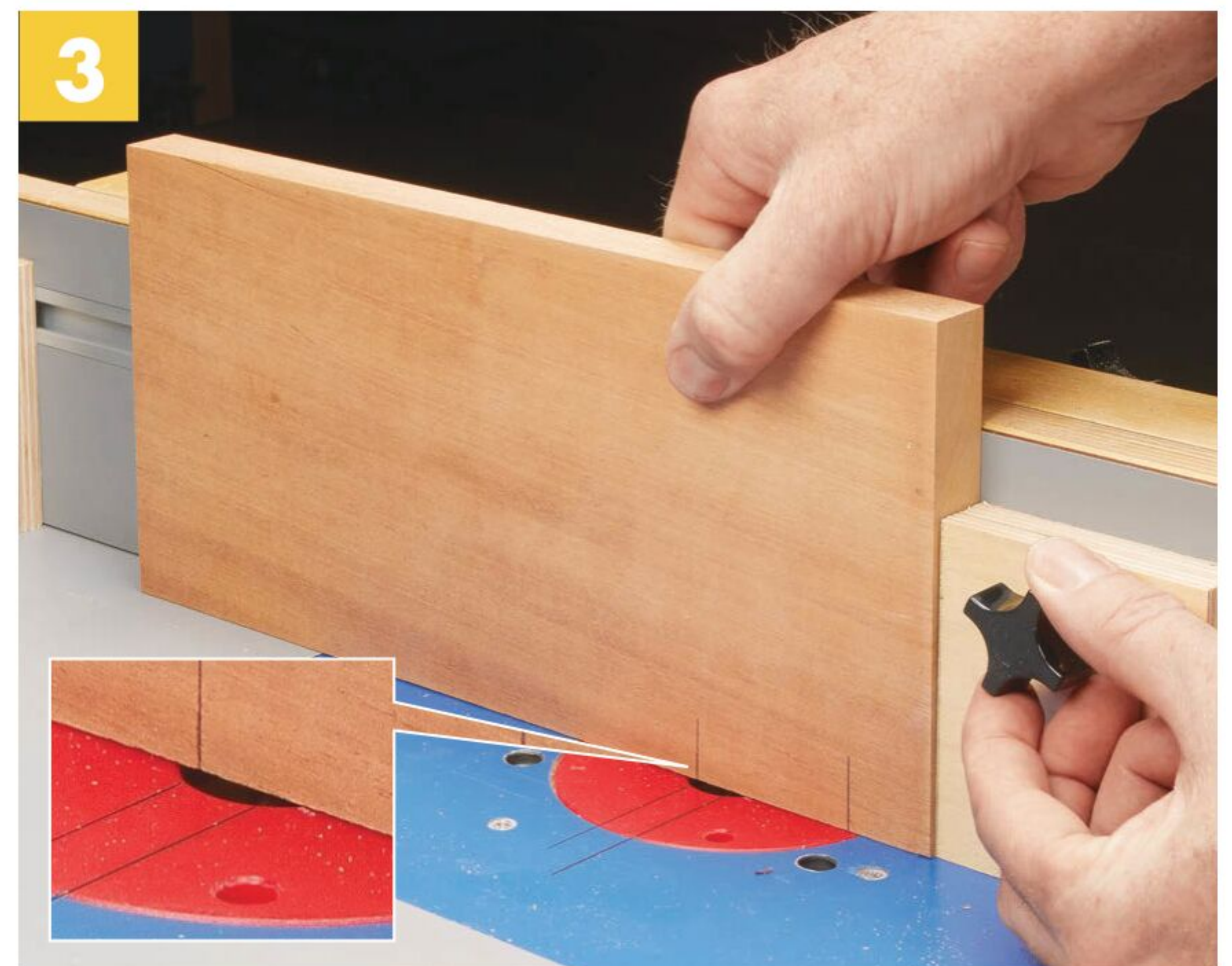
One final stopped groove point: don't be surprised to see a little burning at the ends. It won't affect the function of the joints.



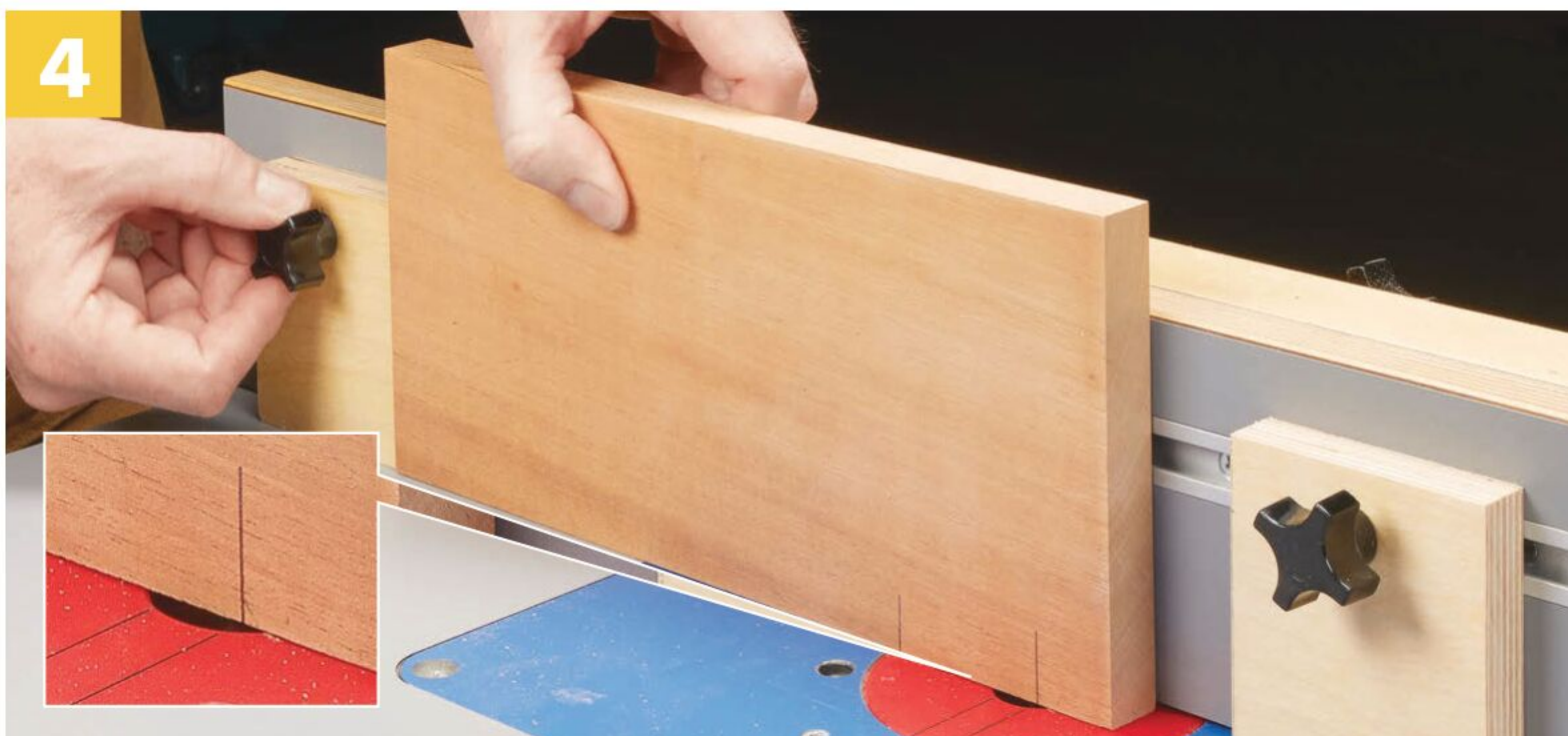
▲ Transfer the ends of the grooves onto the face of the workpiece to see what you're doing.



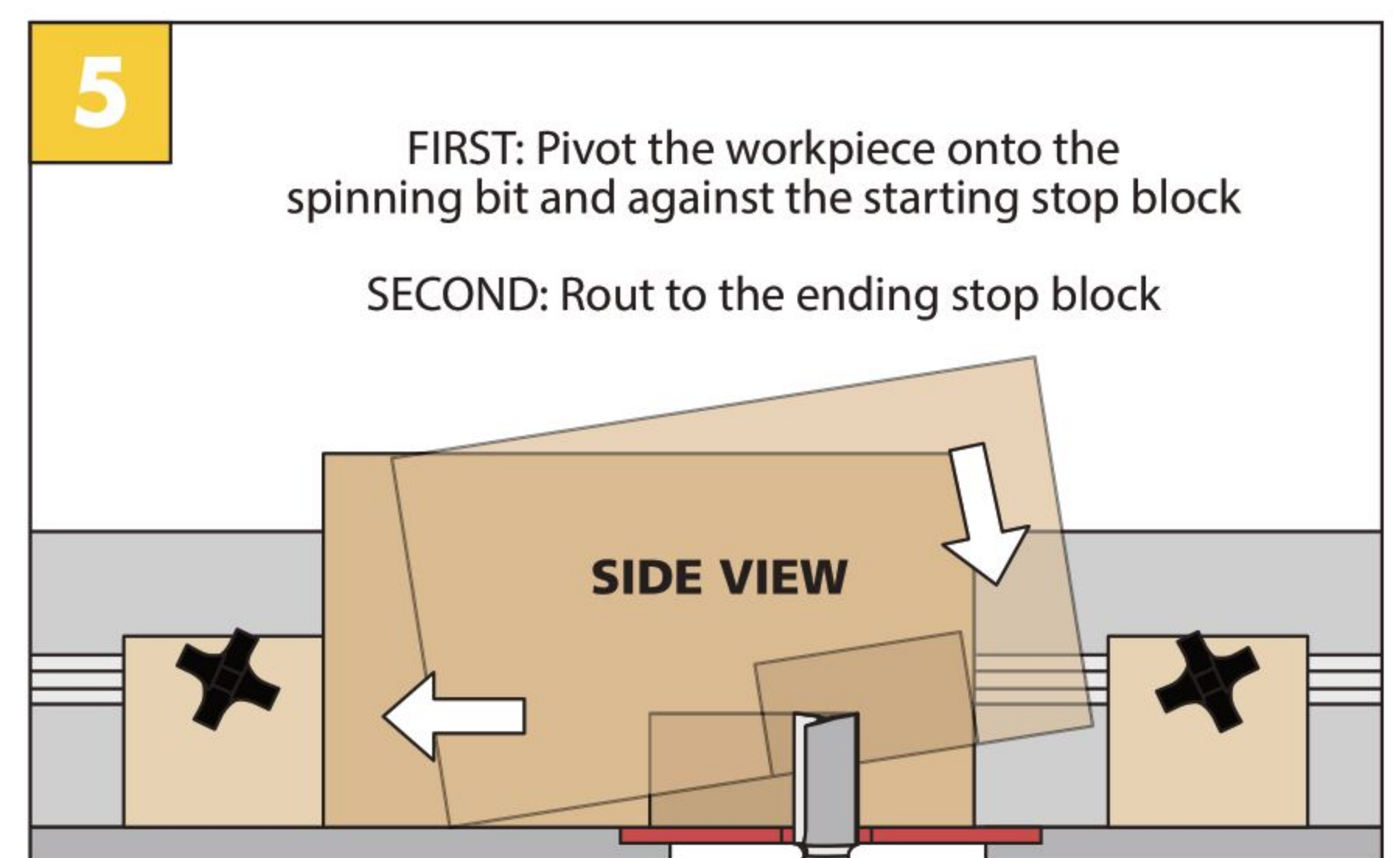
▲ Use a drafting triangle to mark the edges of the router bit on the tabletop (or fence).



▲ Setting stop blocks isn't required. But if you're routing multiple pieces, consistency is built into the process. The rear block determines the starting position.



▲ Align the marks on your workpiece and the router table for the end of the cut to determine where the second stop block should be positioned along the router table fence.





▲ Drilling out the ends of a through slot helps you set up the router table fence accurately. The holes also give you a safe way to lower the workpiece onto the bit and raise it at the end of the cut.

THROUGH SLOTS

Let's add a variant to our stopped groove-routing scenario. If we carry the groove completely through the thickness of the workpiece, we enter slot territory.

By adding a few more passes, you could use the process we just highlighted and go on your merry way. But working from

both faces presents an opportunity for a different approach.

STARTER HOLES. The main difference is using drilled end holes rather than pencil marks to guide the routing. So after marking the slot's location, head to the drill press.

Use a bit that matches the width of the slot to drill a hole at each end, as shown in the

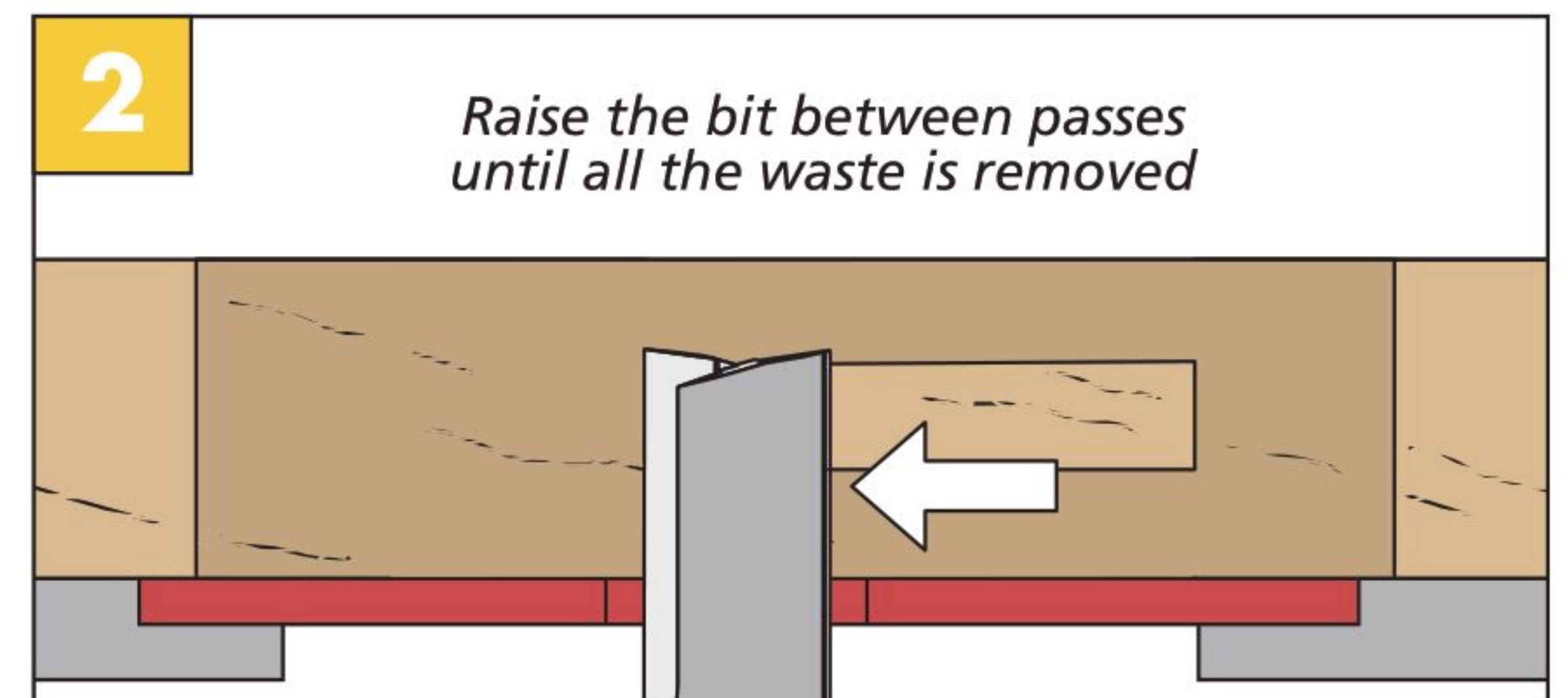
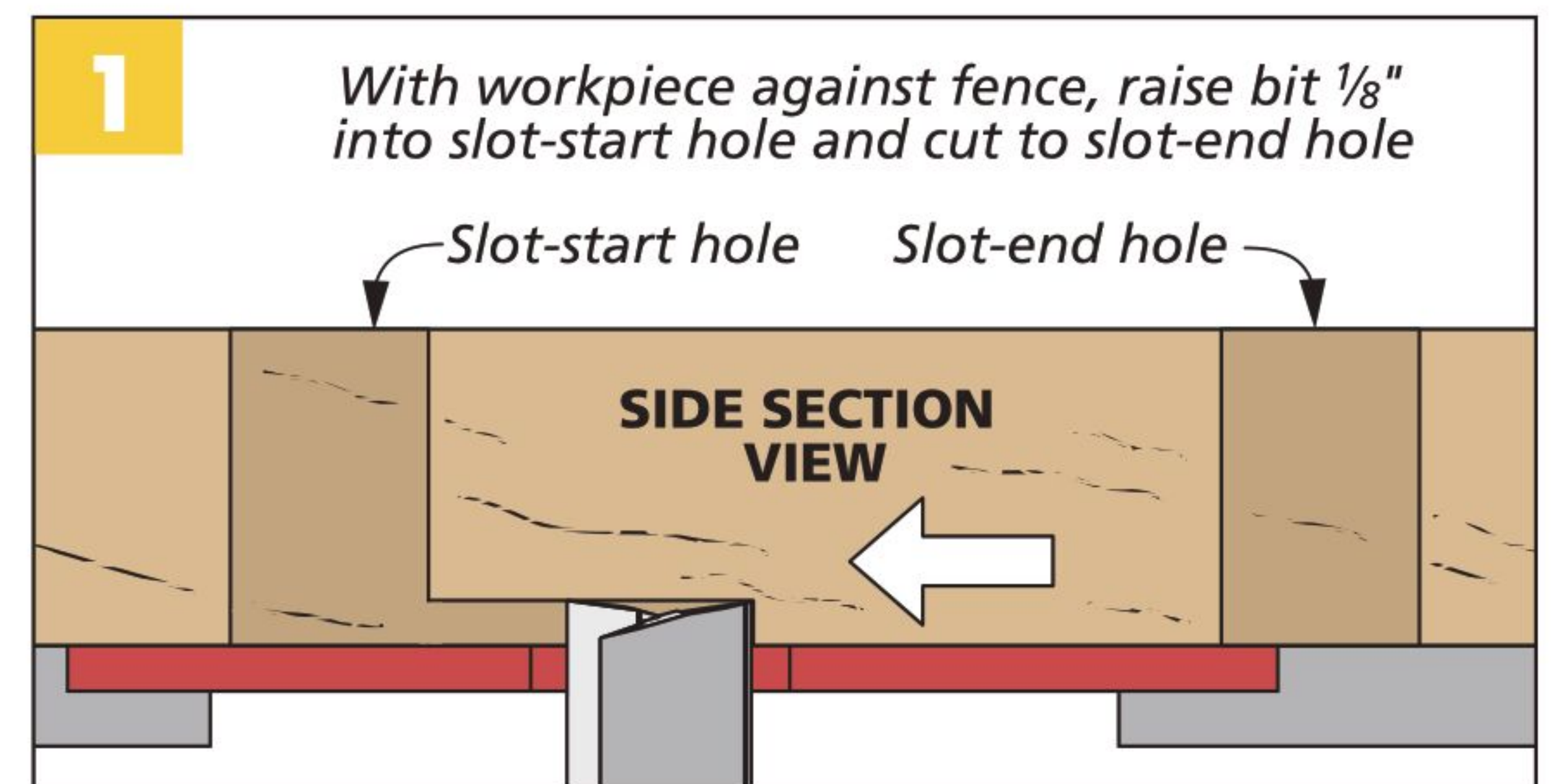


photo above. Back at the router table, slip one of those holes over the bit and bring the router table fence up to the edge of the workpiece and lock it down.

Figure 1 above picks up the story. Turn on the router and lower the workpiece over the bit. This time you have the starter hole to help guide you.

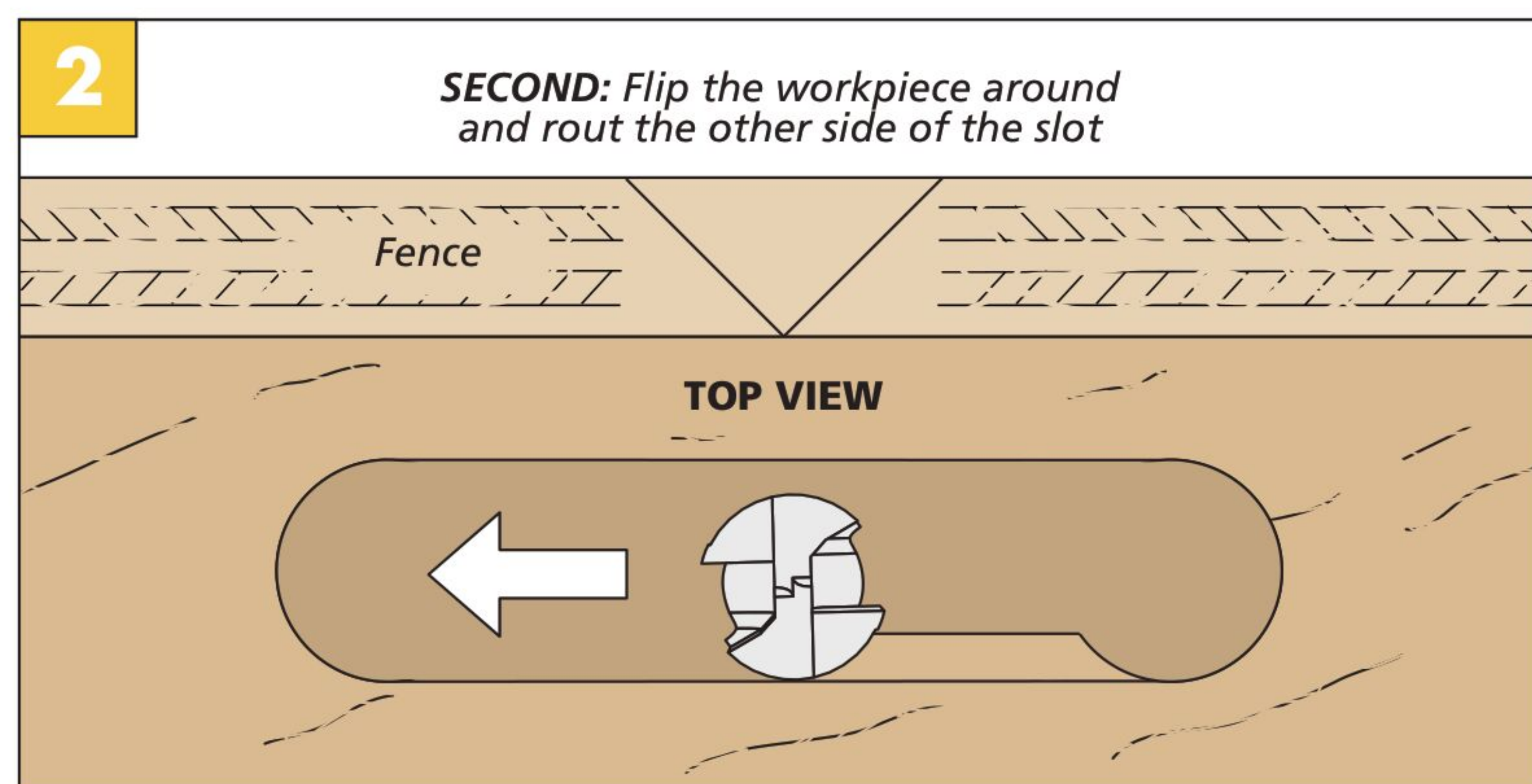
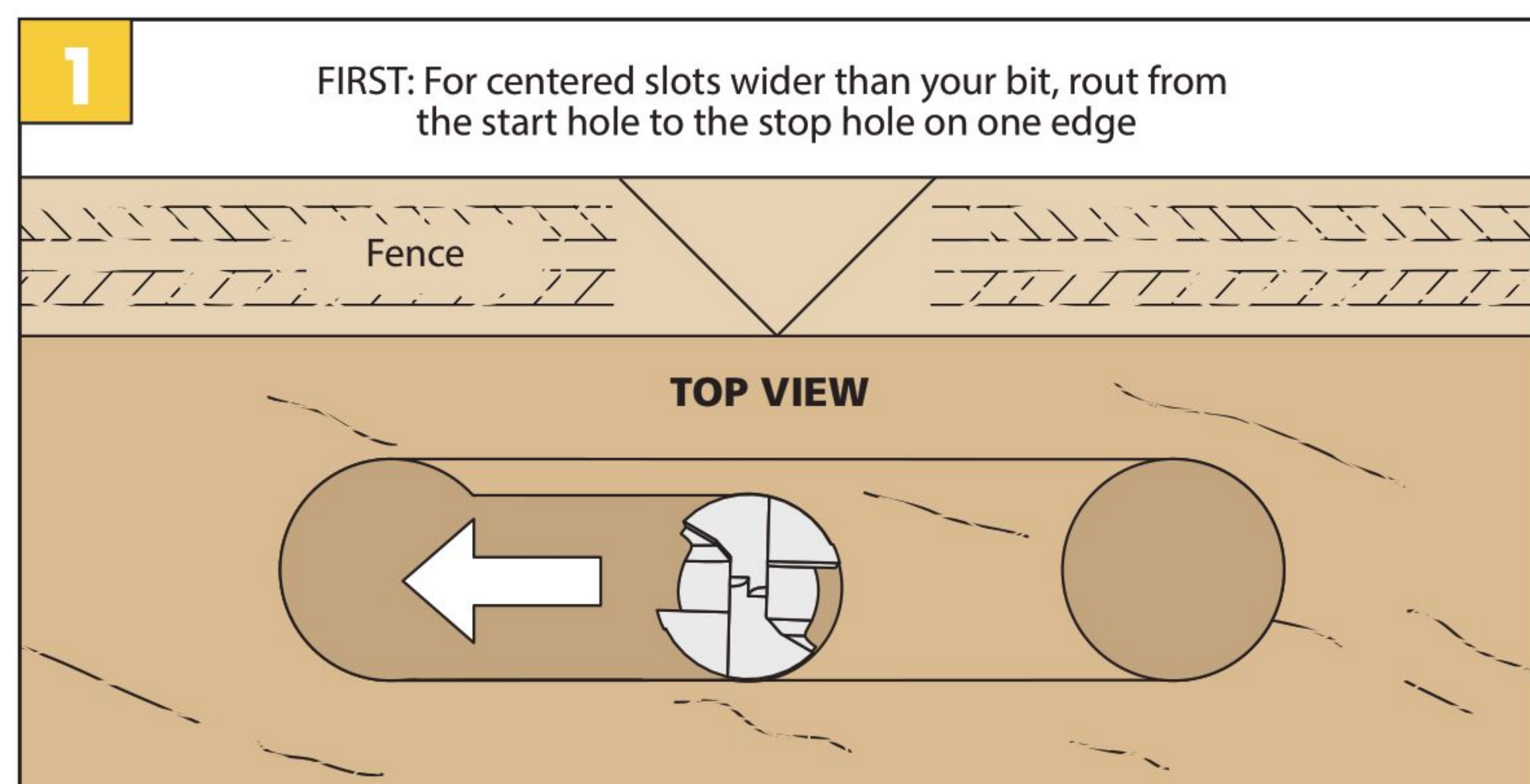
Slide the workpiece along until you hear the bit exit into the end hole. Without making any changes, flip the workpiece over (using the same reference edge against the fence) and make a second pass.

To complete the slot, raise the bit slightly and make another pair of cuts. This is shown in Figure 2. That should do it unless the workpiece is pretty thick.

WIDE SLOTS. The final slot to discuss is a bit of a unicorn. It doesn't come up often. But it's handy to know what to do.

Drill out the end holes, just like an ordinary slot. To position the fence, line up the outside edge of the bit with the outside edge of the slot, as in Figure 1 at left.

For centered slots, you can simply flip the piece around, and run the opposite edge against the fence for a second pass (Figure 2). Otherwise you may need to adjust the fence as well. **W**



Wide Slots. To avoid backrouting, the waste you're removing should be on the side of the bit that's opposite to the fence. This keeps the operation against the the rotation of the bit.

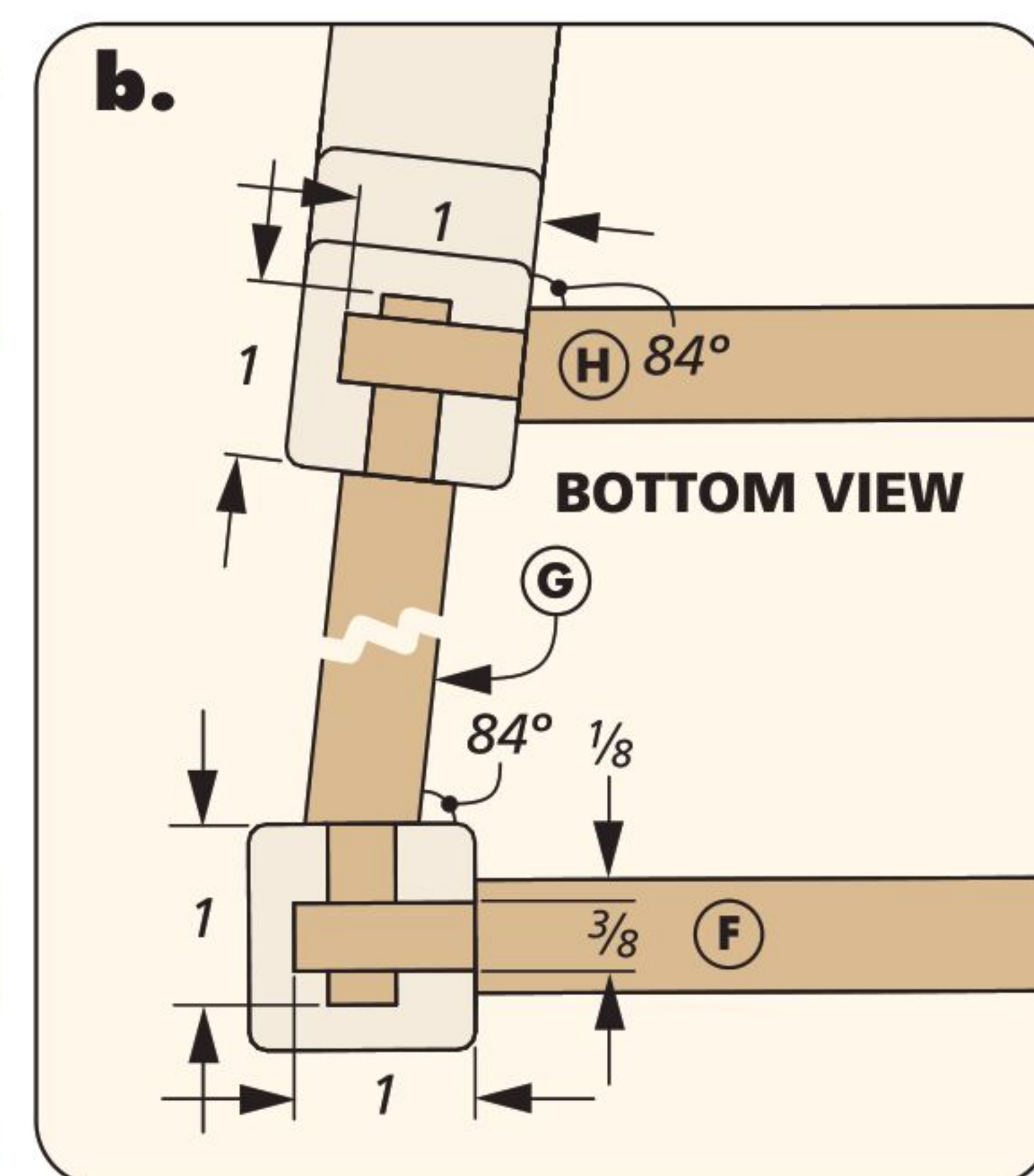
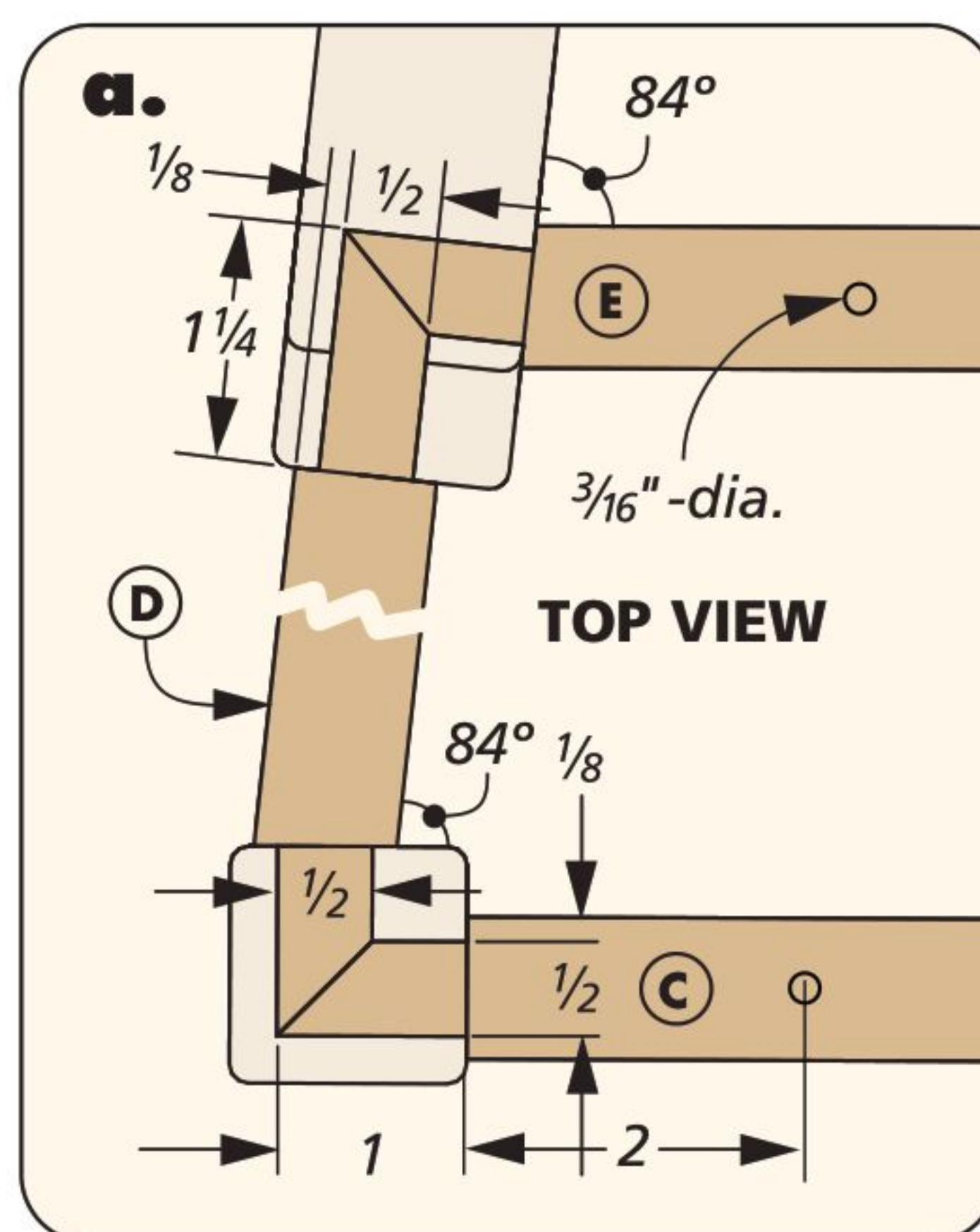
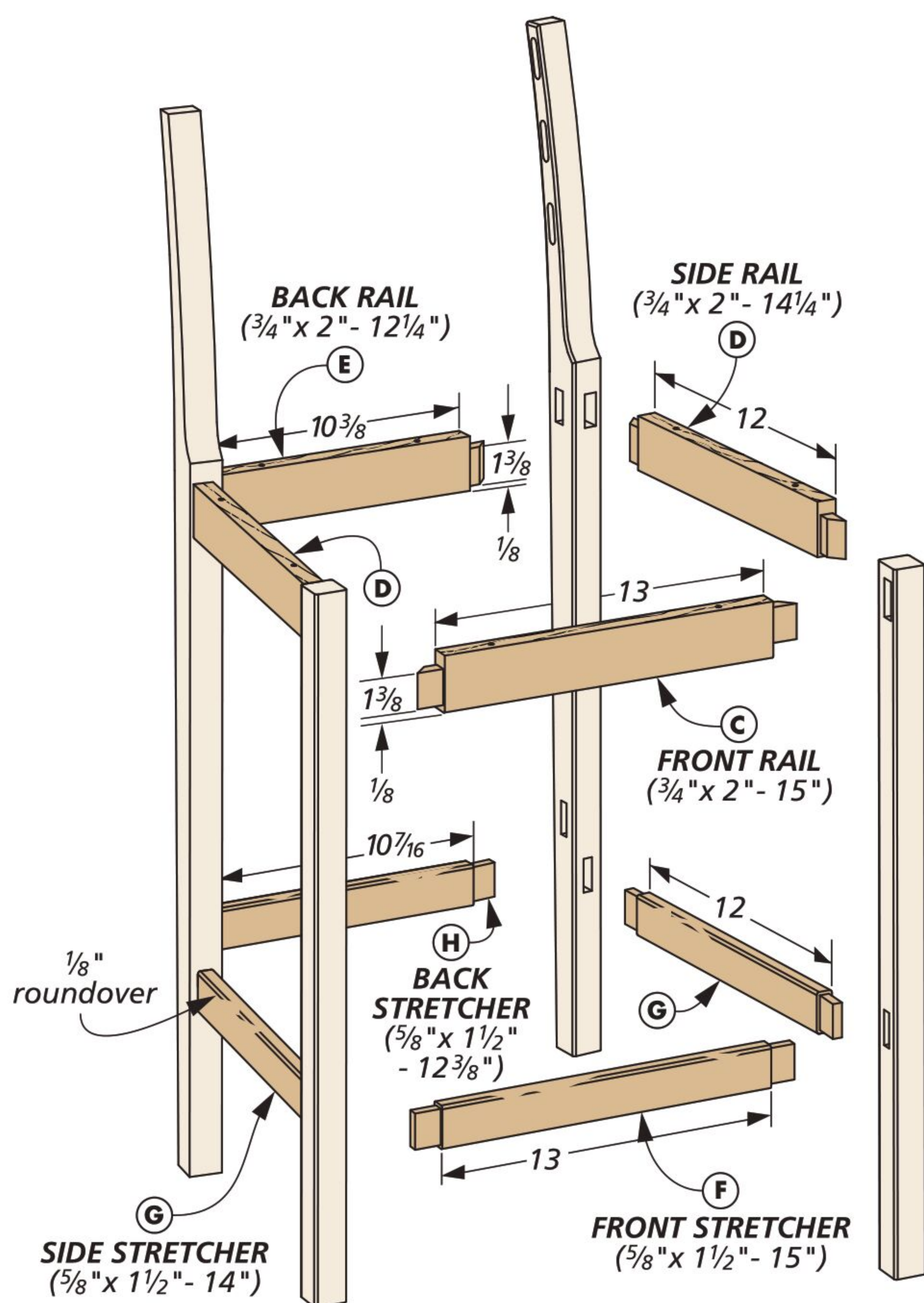
Counter-Height Stools

This elegant set of seats works to accent any style of kitchen without competing for the spotlight.



▲ Making the frame from ash and the seat from walnut provides a pleasant yet subtle contrast of color.





for the tenons before going to the table saw.

TENONS. The straight tenons are fairly simple. I took care of all the tenons for the front leg mortises using a dado blade on the table saw.

As for the angled tenons, that's where this project starts to get interesting. I kicked off the angled tenons by cutting the shoulders. To do this,

the cheeks. Next I put a flat-top blade in my table saw. Because the top of the blade will define the shoulder, a flat cut is vital to prevent any gaps between the shoulder and the leg.

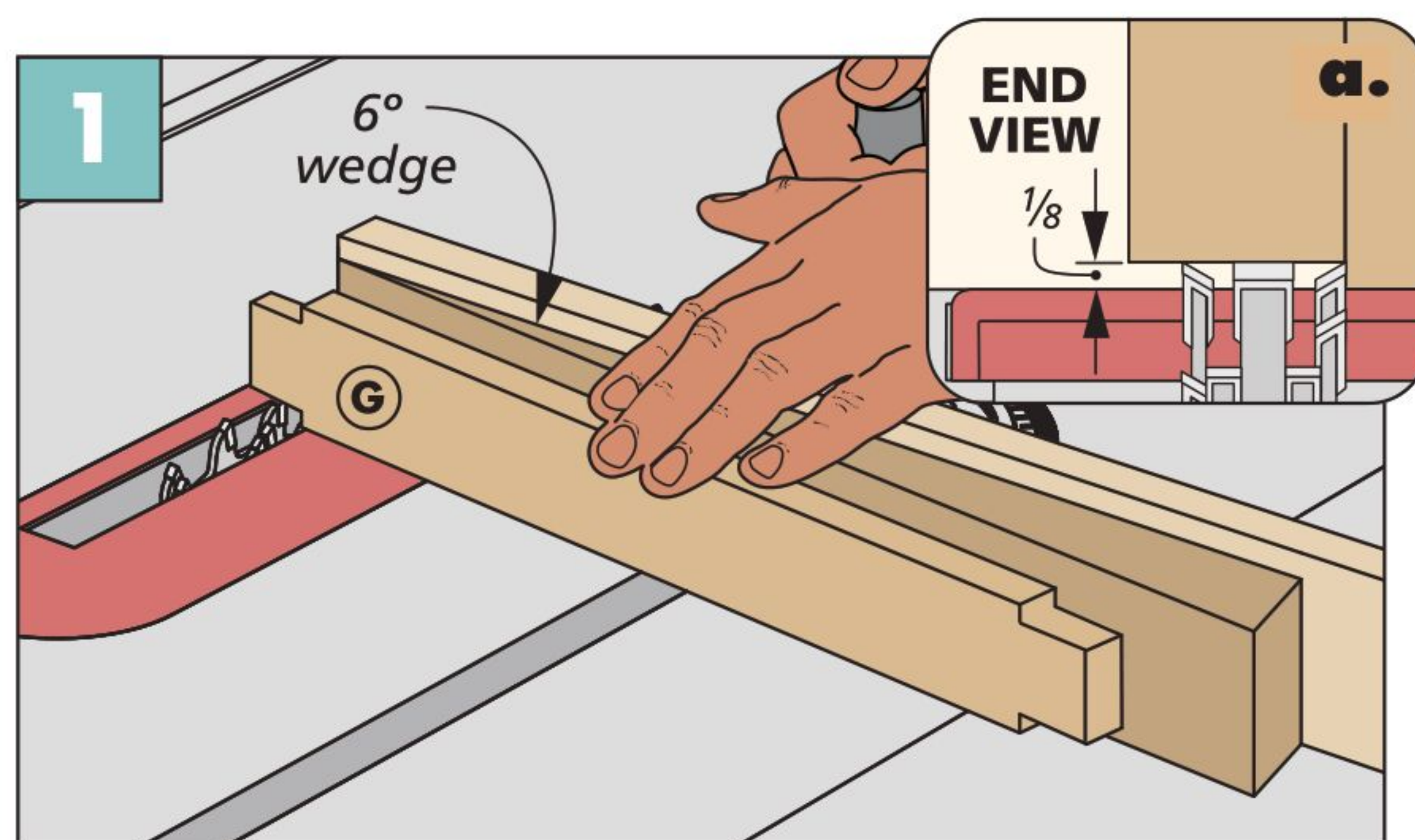
FINAL TOUCHES. There are just a few things left on these pieces. Take the rails over to the drill press and drill the pilot holes for attaching the seat. Next, move to the miter saw. Because the rails will meet each other in the mortises, they'll need to be mitered to make room (detail 'a'). The straight tenons will need to be cut at a 45° while the angled tenons will need to be cut at either 39° or 51° depending on which way they're facing. Lastly, the stretchers and rails also need to be rounded over.

Rails, Stretchers & SLATS, OH MY

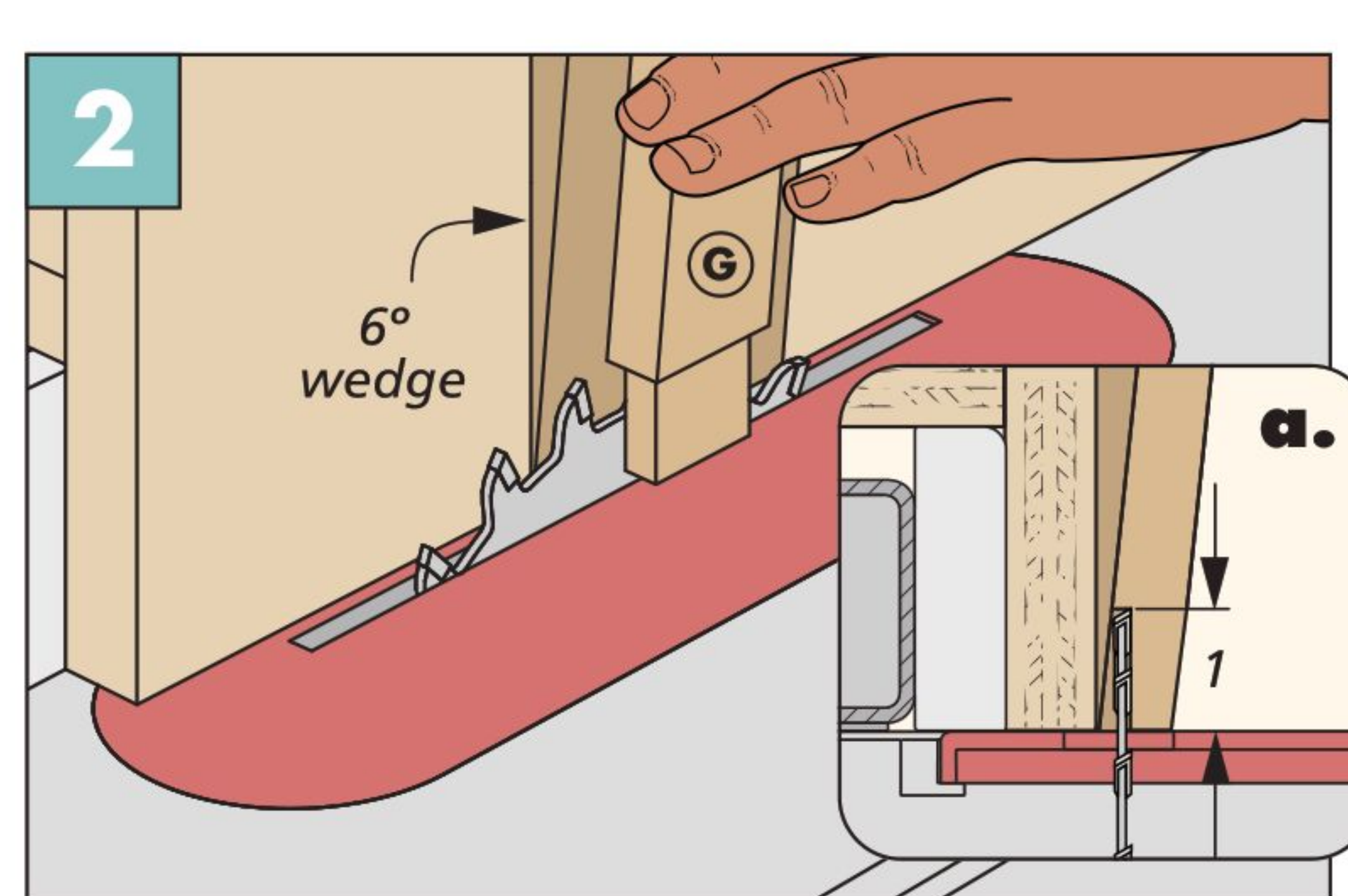
With the legs done, it's time for some tenoning fun. It can be tricky to keep all the angles at work here in order, so once all my pieces were cut to size, I labeled them and drew the layout lines

stay at the table saw with your dado blade in. I used a table saw sled jig, which you can find online at Woodsmith.com/259. Once the sides of the shoulders were done, I set up the jig to cut

ANGLING THE TENONS



Edges. When set up to cut the edges, the jig holds the piece at a 6° angle. This is where layout lines and labeling are vital.

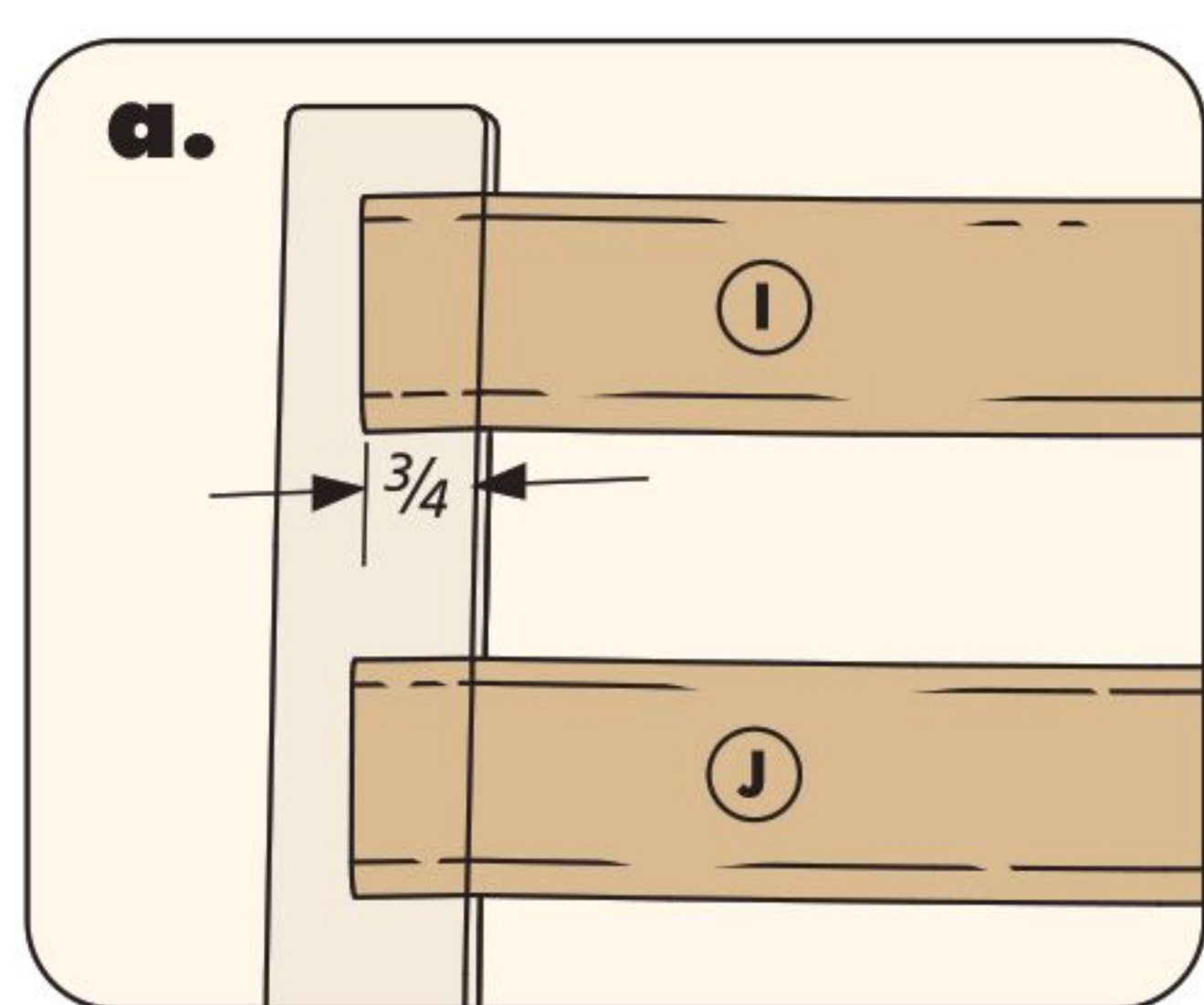


Cheeks. Next the jig is set up to cut the cheeks, holding the piece at an 84° angle relative to the blade to match the edges.

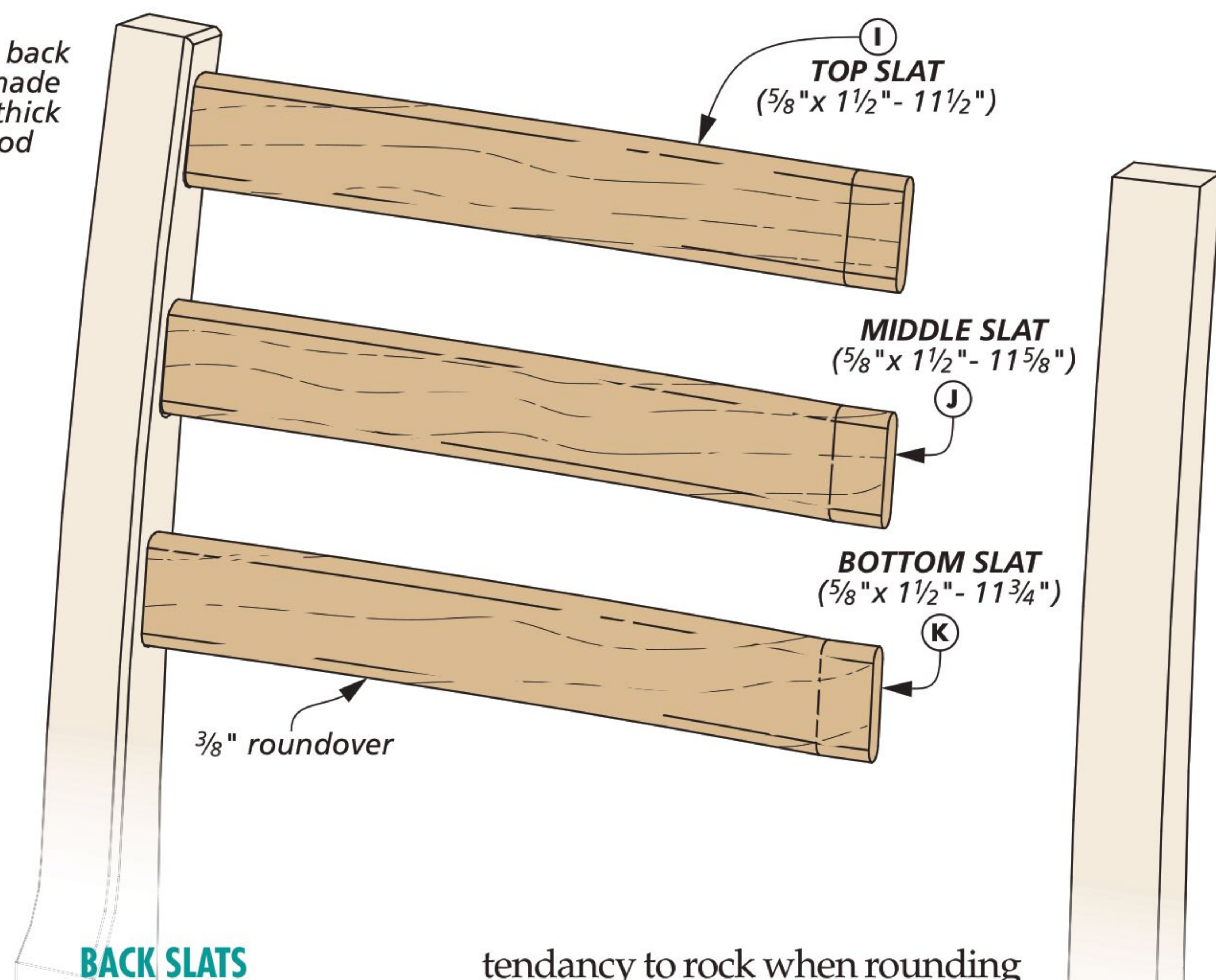
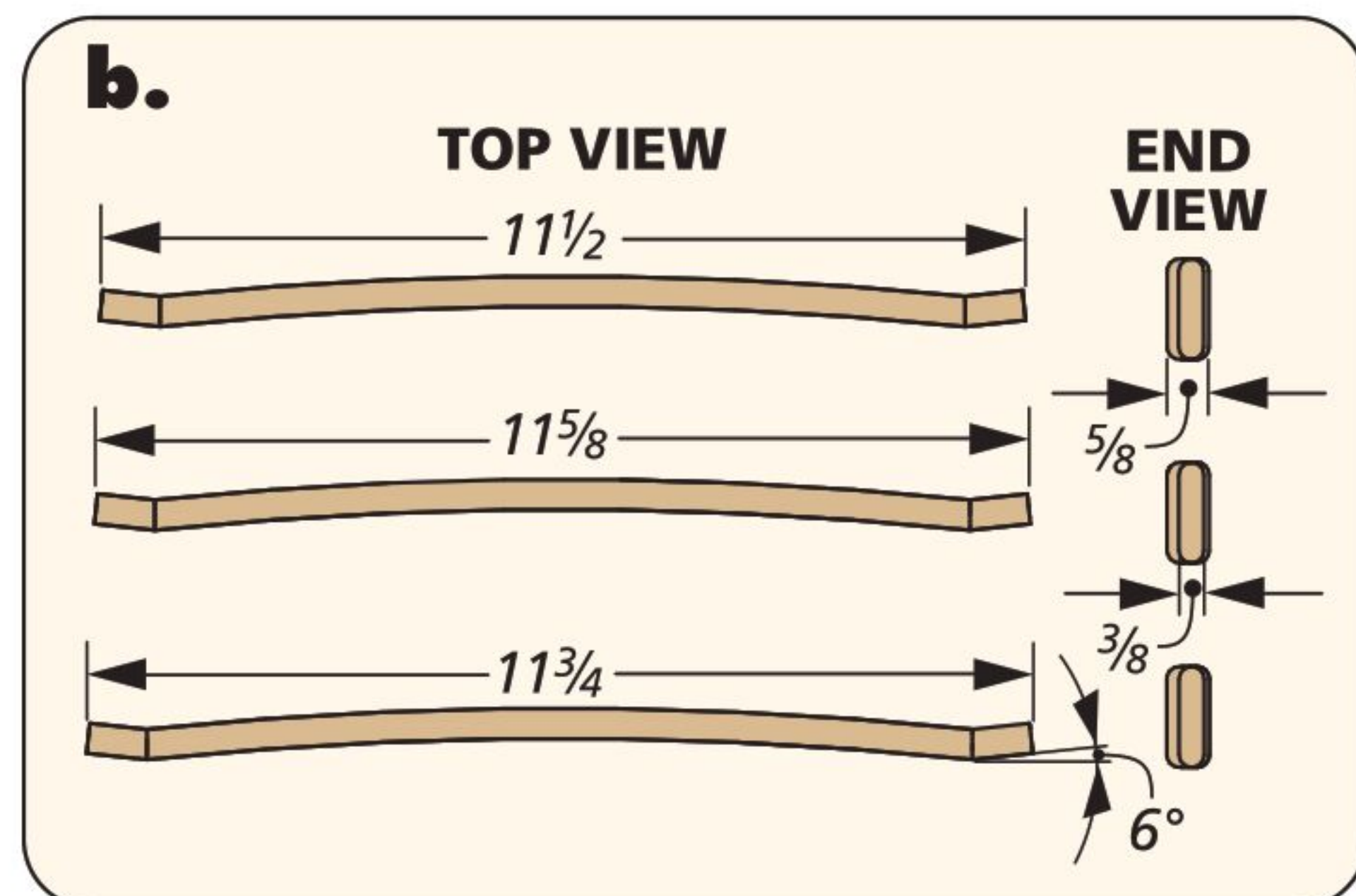


For additional details on this table saw jig, visit:

Woodsmith.com/259



NOTE: The back slats are made from $\frac{5}{8}$ "-thick hardwood



BACK SLATS

SIDE ASSEMBLY. With the stretchers, rails, and legs made, it's time to do a little assembly. Fit the side stretchers and rails into the leg mortises with a bit of glue. I used hide glue for its slow set time, giving me a chance to make sure everything was square before committing and clamping it all in place. Because of the angle of the back legs, I found it best to put the clamps on the outer side of the assemblies, using a few small pieces of scrap to keep the clamps from biting in when I tightened them down.

After cutting the back slats to their overall size, I printed out the full-size patterns, which are found online. After attaching the patterns, I took the pieces over to the band saw to cut them to rough shape, staying on the waste side of the line. The spindle sander and edge sander worked them down to their final shapes. Because there's no shoulders on these slats, precision here is key.

Next, round the slats over. I did this at the router table, but there is one safety note I'd like to mention. Thin pieces have a

tendency to rock when rounding them over. To solve this, I glued a few pieces of scrap that were equal width to the slats to either end of the pieces. This would keep them from rocking out of my grasp while routing. Once finished, I cut off the blocks and rounded over the ends as well, using the fence to stay straight.

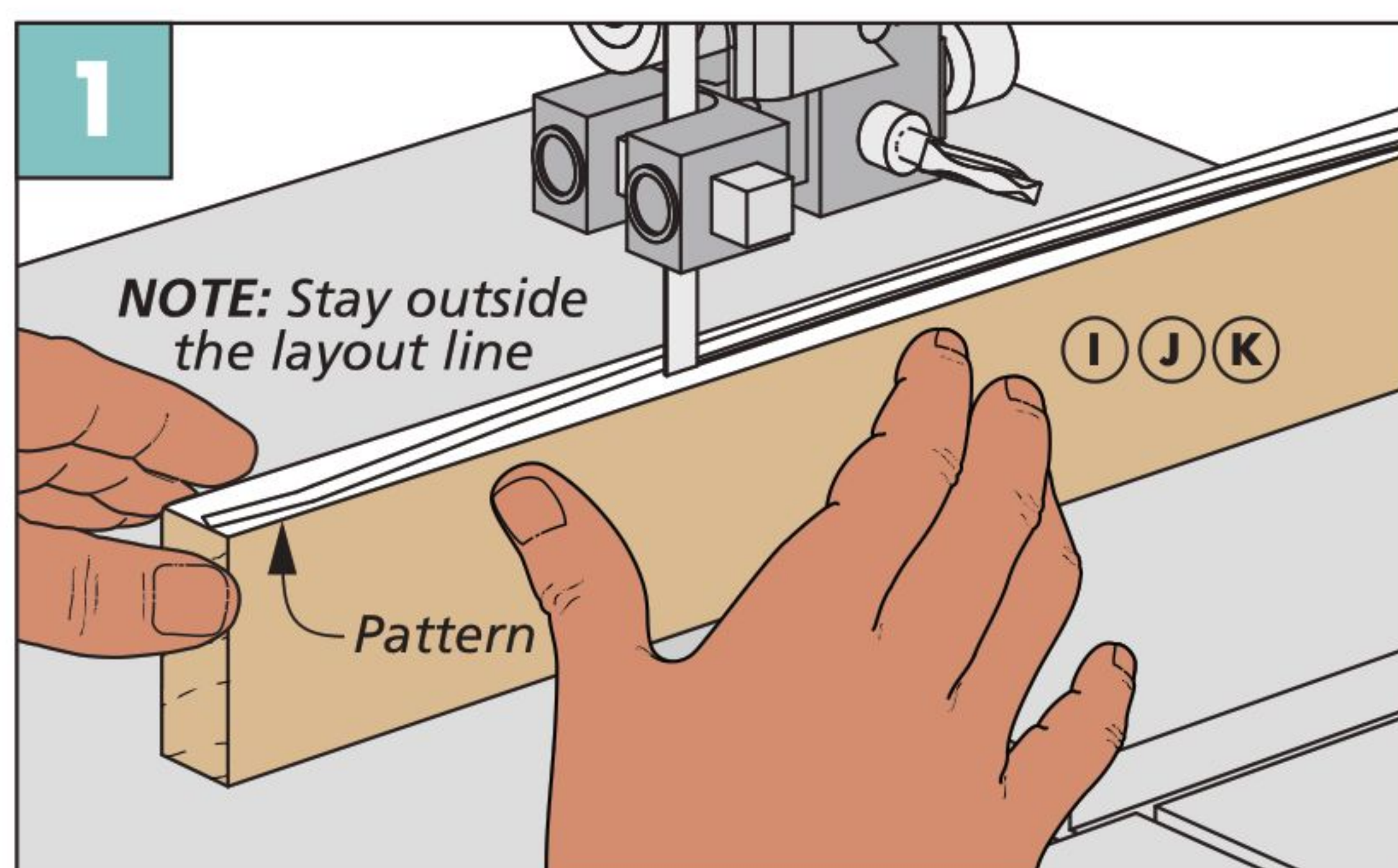
With the back slats shaped and rounded, it's time to join the two sides with the stretchers, rails, and back slats. Once it's all squared up and clamped in place, it's time to let the frame dry and get to work on the seat.



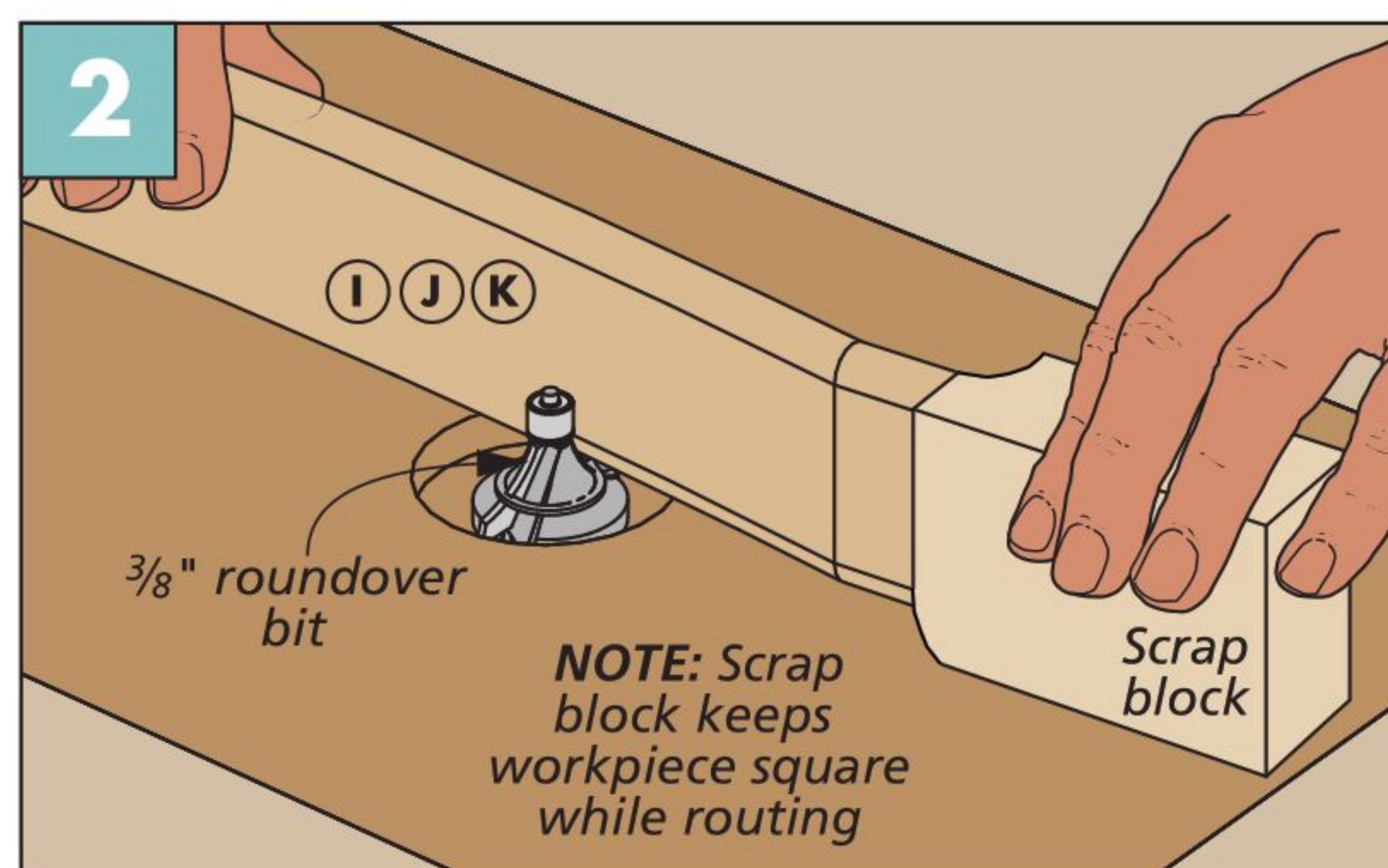
For full-sized patterns of the slats, visit our website:

Woodsmith.com/259

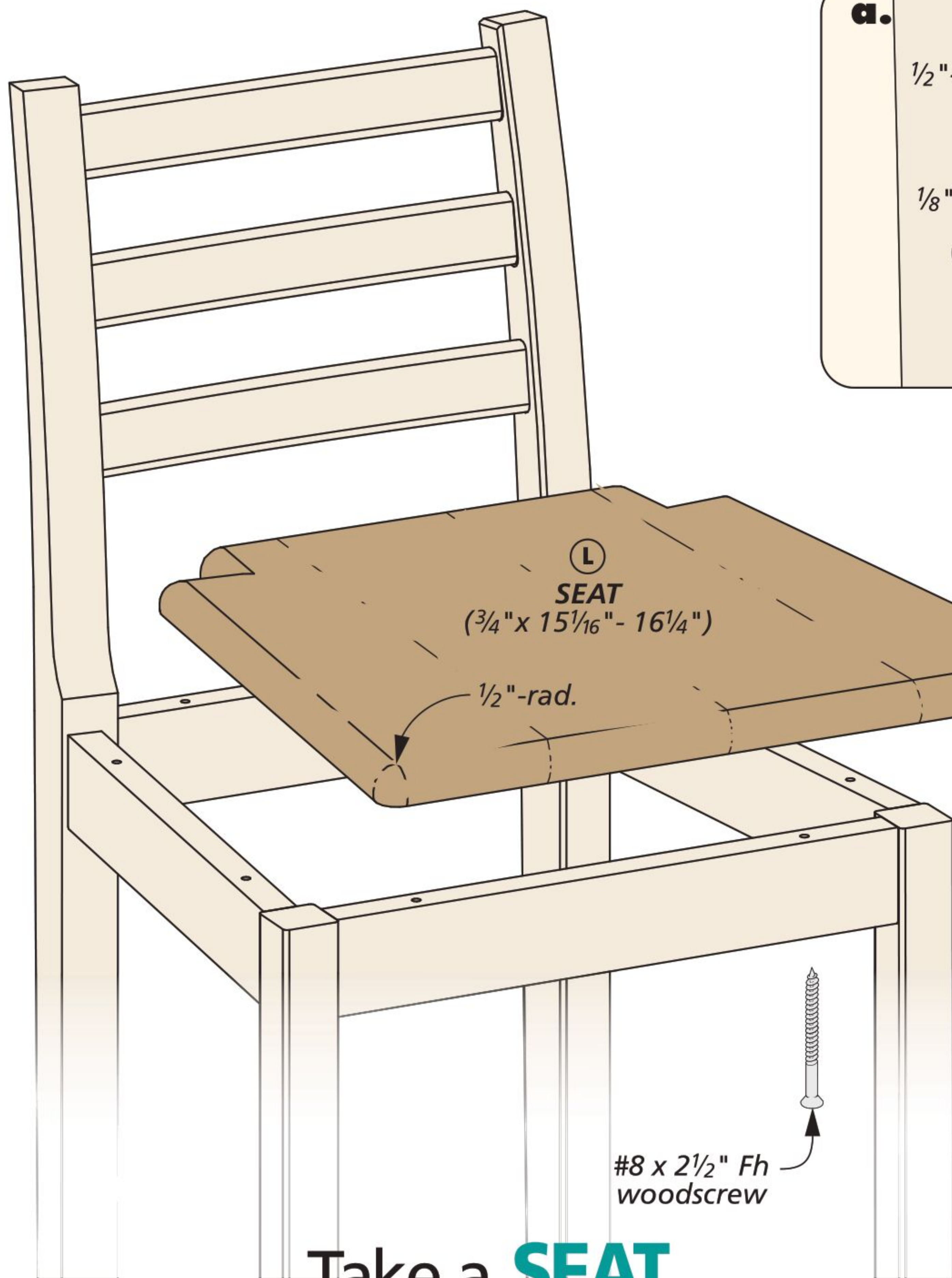
SHAPING THE SLATS



Shaping. Using the patterns, cut the back slats to rough shape on the band saw. Finish shaping at the spindle sander and edge sander.

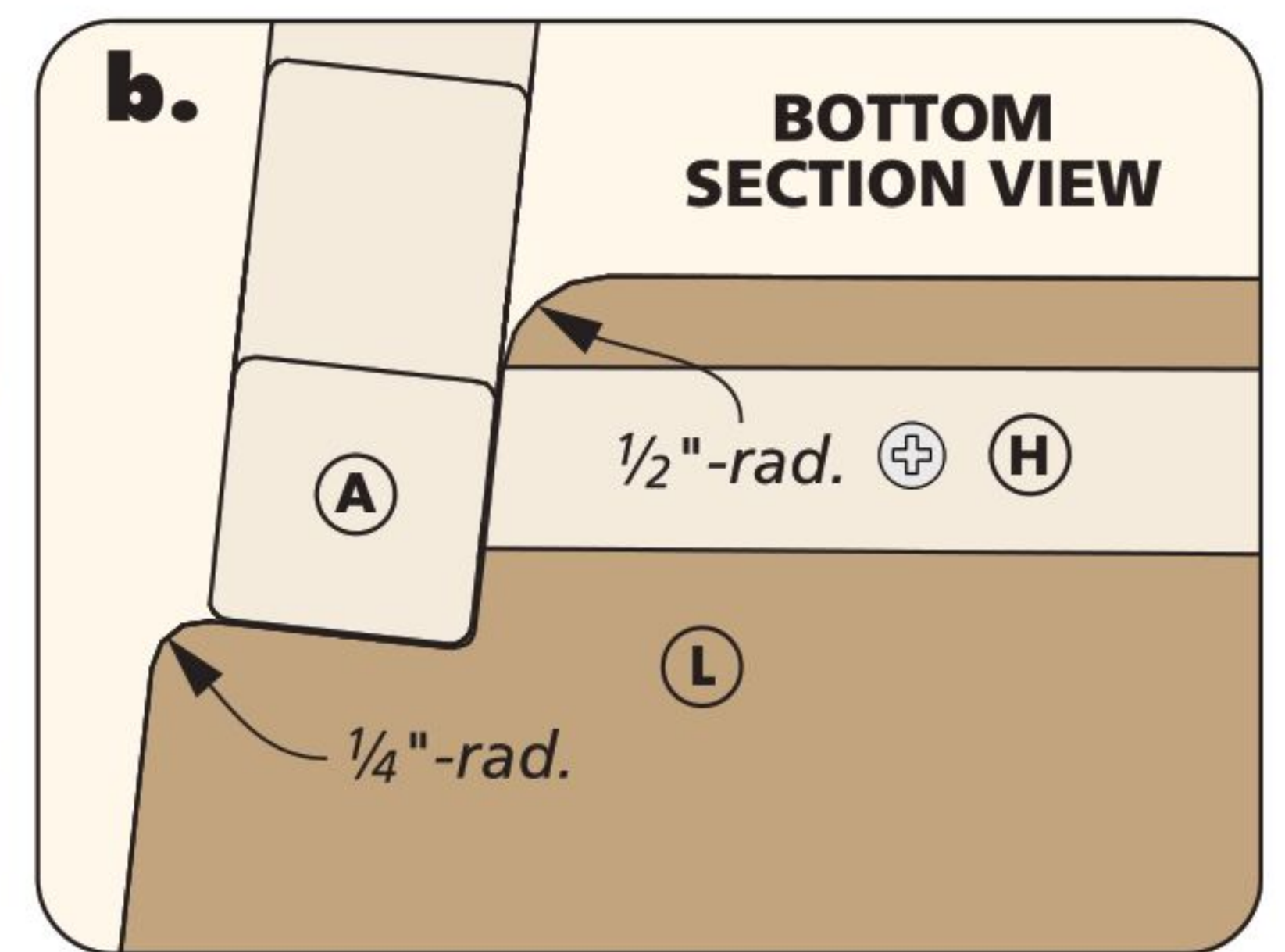
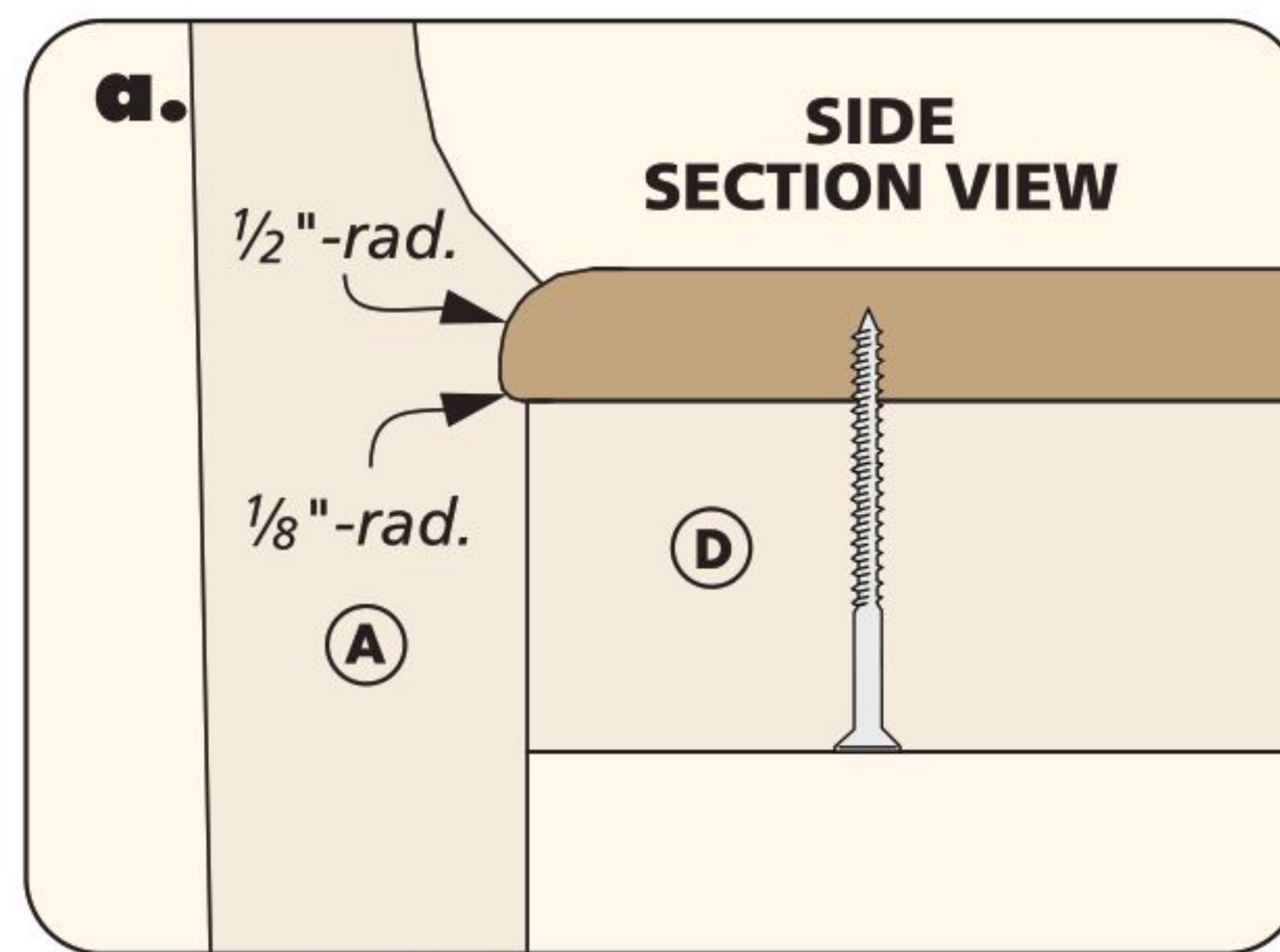


Router Table. When rounding over the slats, I glued a piece of scrap to either end to keep it from rocking during the cut.



Take a SEAT

With the frame done, it's time to make the seat. There are plenty of angles and joints at work in this stool, and there will likely be some adjustments you'll need to make to the seat. Don't fret though, this won't be an



issue at all. Rather than making the seat to fit certain specifications, you'll be building it to fit the frame you've put together so far. Custom fitting the seat to the frame will get you the best fit possible, and all it takes is scribing out a few lines to guide your cuts.

SCRIBING THE NOTCHES. To start the seat, I glued up several pieces of walnut, but I made sure to oversize the blank so I had plenty

of material to work with. Next, I centered the blank over my frame and grabbed myself a couple of rulers. I wanted a $\frac{1}{16}$ " gap between the seat and the back legs to allow for some seasonal movement, so I put two of

my $\frac{1}{32}$ "-thick rulers together as spacers while scribing out the lines for the back legs to fit into.

To scribe the front-to-back lines, I simply drew along the rulers, as in Step 1 below. To get the side-to-side, I measured the width of the back legs where they meet the seat (which in my case was $1\frac{5}{8}$ "), then I added a $\frac{1}{16}$ " to that for the gap (making it $1\frac{11}{16}$ "). I laid one ruler along the previous line, the end aligned with the edge of the stool, then I set the other ruler perpendicular at the $1\frac{11}{16}$ " mark to lay out the side-to-side line (Step 2).

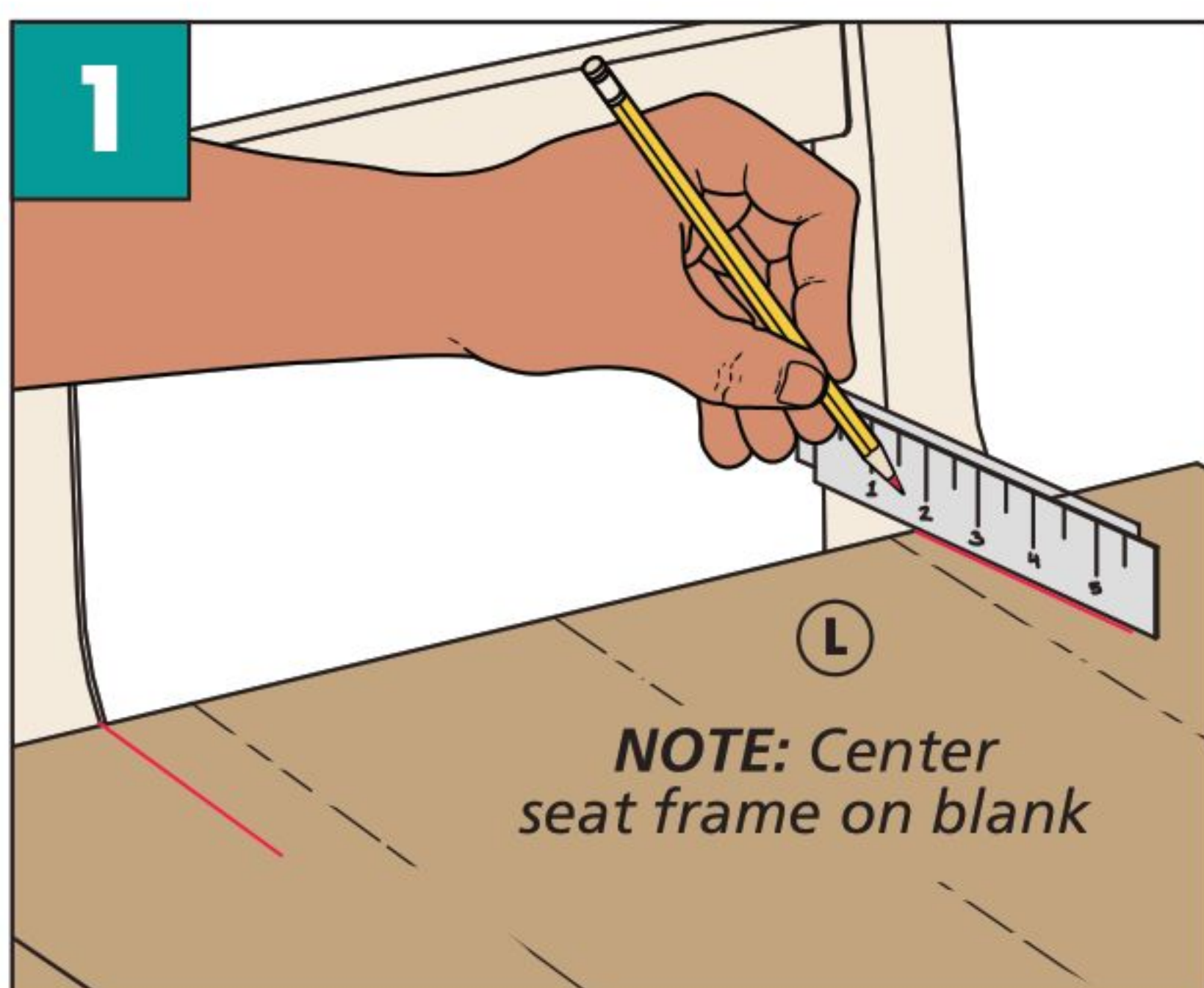
Now I had custom notches sized with my desired gap. With the lines scribed, I cut out the curved notches for the seat, which wrap around the back legs (as shown in Step 1 and Step 2 on the next page).

THE REVEAL. Next, I marked out the reveal for the seat (Step 3 on the next page). The seat should overhang the legs by $\frac{3}{8}$ " on the front and sides. Once it's cut to shape, take it over to the router table and round over all edges that require it. Keep in mind that there are several different sizes of roundover at work here (details 'a' and 'b' above).

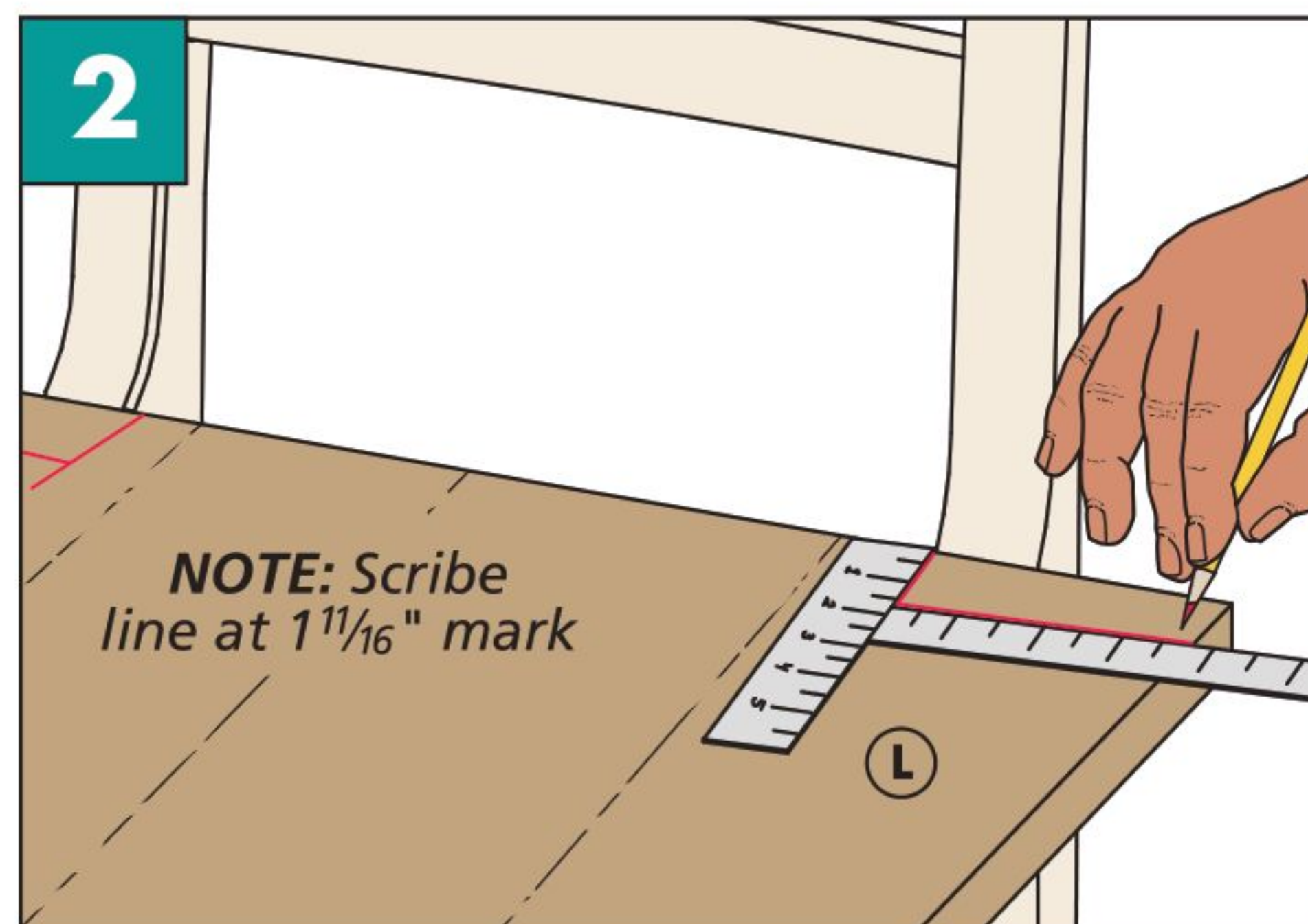
Now it's time to attach the seat. Clamp it in place to the frame, then get out your drill bits. Drill through the previous pilot holes you made in the rails, down to the seat, then drive in the screws to keep it in place.

After finishing, there's only one thing left to do: put the stools beside your counter and enjoy the newest seat in the house. **W**

SCRIBING OUT THE SEAT

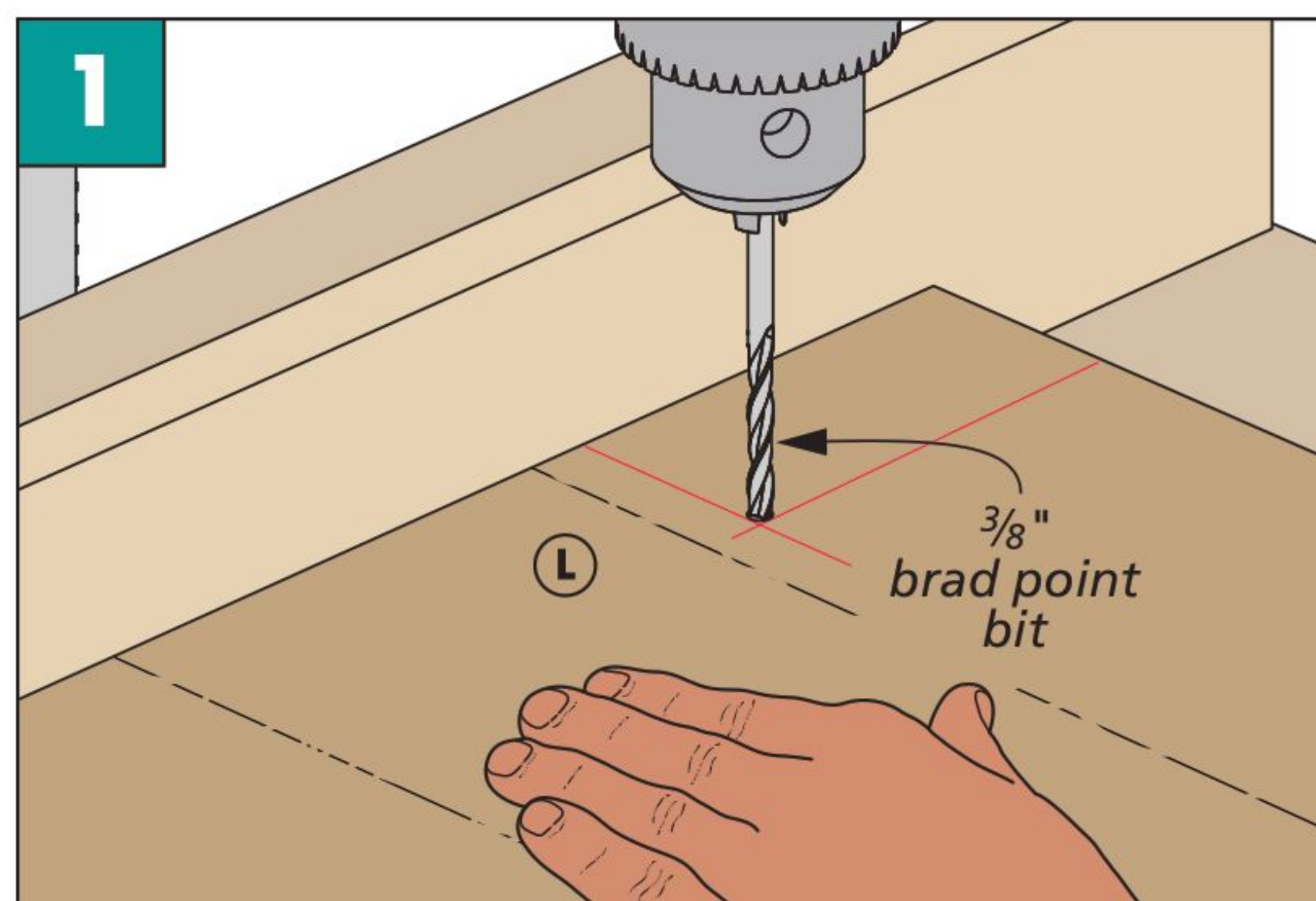
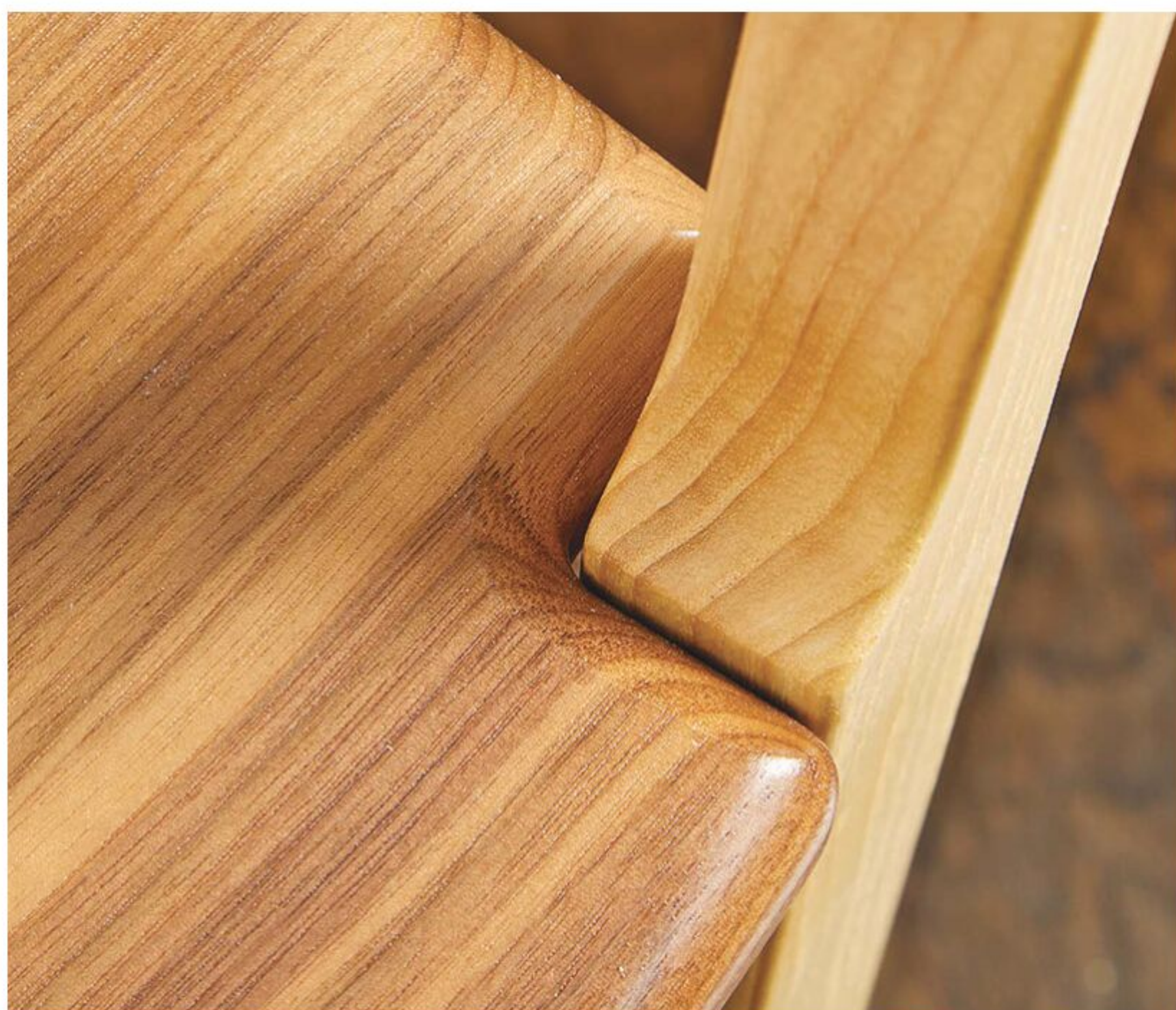


Longitudinal. When scribing the front-to-back lines, I used two $\frac{1}{32}$ "-thick rulers to create a $\frac{1}{16}$ " gap.

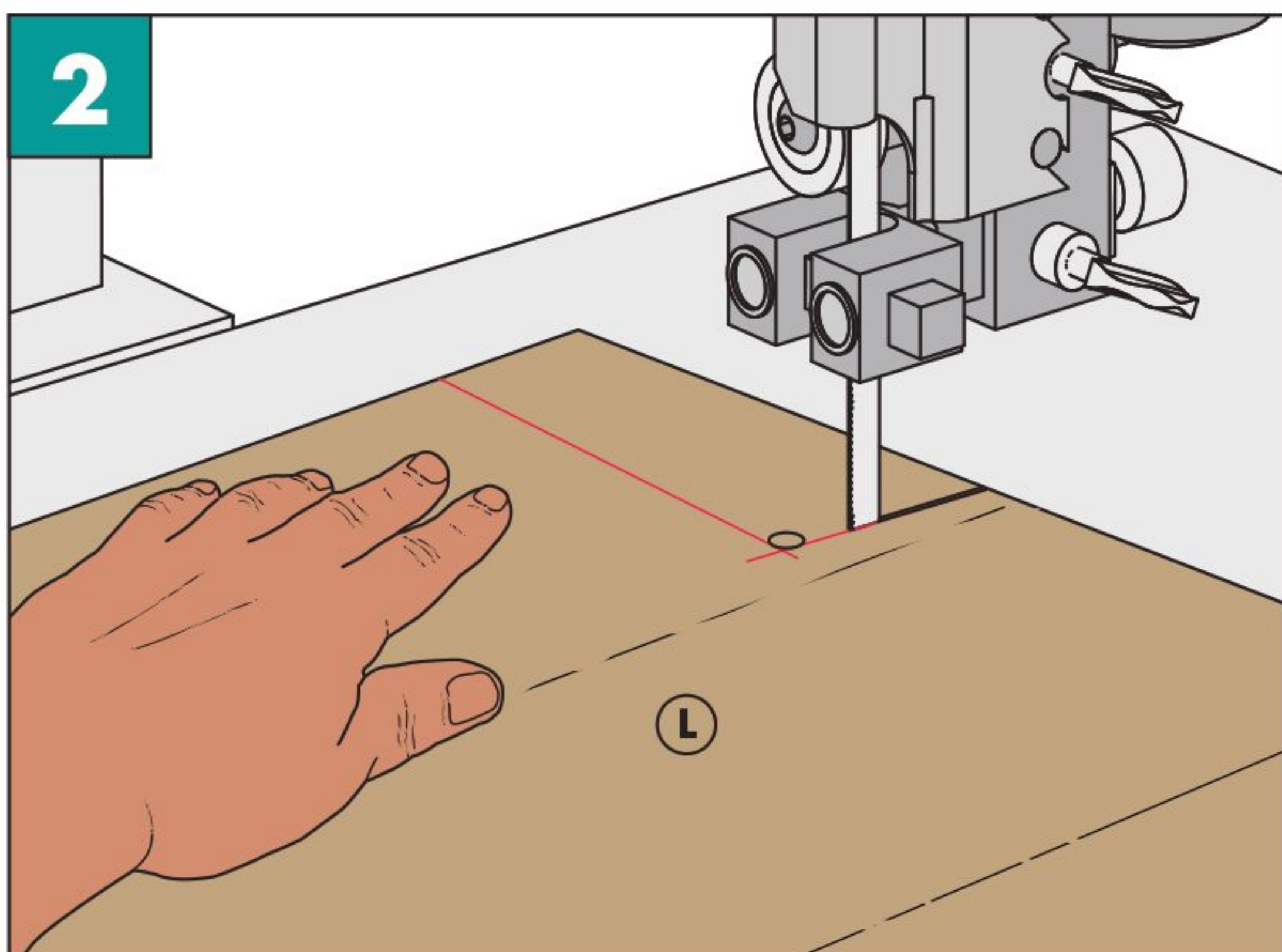


Lateral. For the side-to-side lines, measure the thickness of the back leg and use the previously drawn line as a reference.

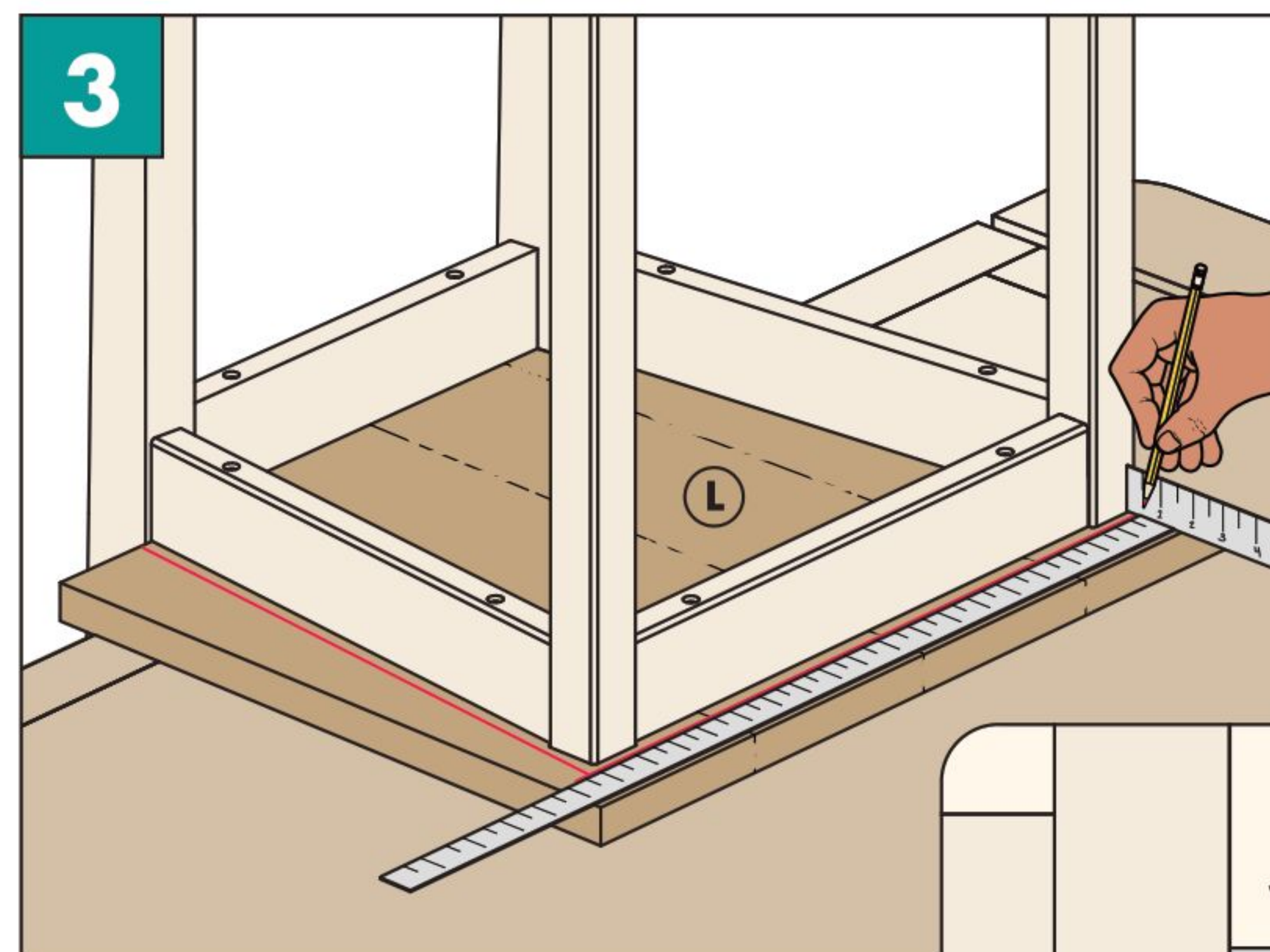
SHAPING THE SEAT FOR FINAL FIT



Corner. Use the drill bit to establish the radius at the corner of the notch by drilling just inside of where the two scribed lines meet.



Take out the Waste. Follow the layout lines with the band saw, meeting at the corner hole. Sand the cut to remove blade marks.



Reveal. Lay the seat on your bench and set the frame upside-down atop it to mark the reveal.

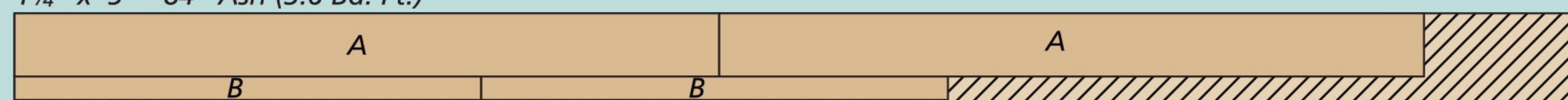
Materials, Supplies & Cutting Diagram (1 Stool)

A Back Legs (2)	$1\frac{1}{4} \times 3\frac{3}{8} - 37\frac{3}{4}$	F Front Stretcher (1)	$\frac{5}{8} \times 1\frac{1}{2} - 15$	K Bottom Slat (1)	$\frac{5}{8} \times 1\frac{1}{2} - 11\frac{3}{4}$
B Front Legs (2)	$1\frac{1}{4} \times 1\frac{1}{4} - 25$	G Side Stretchers (2)	$\frac{5}{8} \times 1\frac{1}{2} - 14$	L Seat (1)	$\frac{3}{4} \times 15\frac{1}{16} - 16\frac{1}{4}$
C Front Rail (1)	$\frac{3}{4} \times 2 - 15$	H Back Stretcher (1)	$\frac{5}{8} \times 1\frac{1}{2} - 12\frac{3}{8}$	• (8) #8 x 2½" FH Woodscrews	
D Side Rails (2)	$\frac{3}{4} \times 2 - 14\frac{1}{4}$	I Top Slat (1)	$\frac{5}{8} \times 1\frac{1}{2} - 11\frac{1}{2}$		
E Back Rail (1)	$\frac{3}{4} \times 2 - 12\frac{1}{4}$	J Middle Slat (1)	$\frac{5}{8} \times 1\frac{1}{2} - 11\frac{5}{8}$		

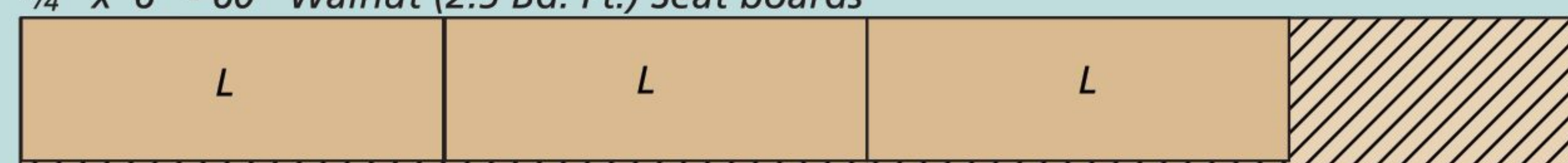
$\frac{3}{4}" \times 3\frac{1}{2}" - 96"$ Ash (2.3 Bd. Ft.)



$1\frac{1}{4}" \times 5" - 84"$ Ash (3.6 Bd. Ft.)



$\frac{3}{4}" \times 6" - 60"$ Walnut (2.5 Bd. Ft.) Seat boards



HEIRLOOM Project



Harvey Ellis Organizer

Who wouldn't be up for recreating this winsome piece of fine furniture. From top to bottom this alluring desk offers beauty and practicality that's hard to resist.

Furniture is just a collection of boards and hardware that are milled, cut, and fashioned in a manner that then can be joined together to serve a specific task. Unfortunately, a lot of furniture is just as boring as that description. But that's not true of the piece you see in these photos. Just looking at this organizer (it also can serve as a desk) you know an artist that cared was involved in its design. His name is Harvey Ellis.

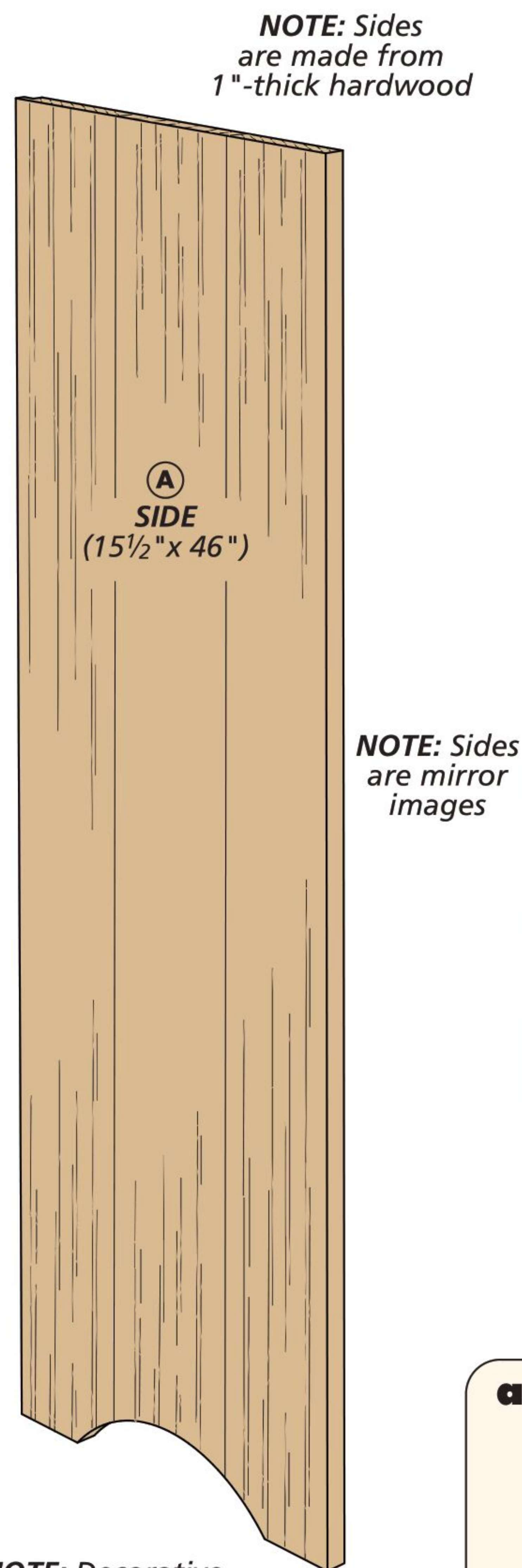
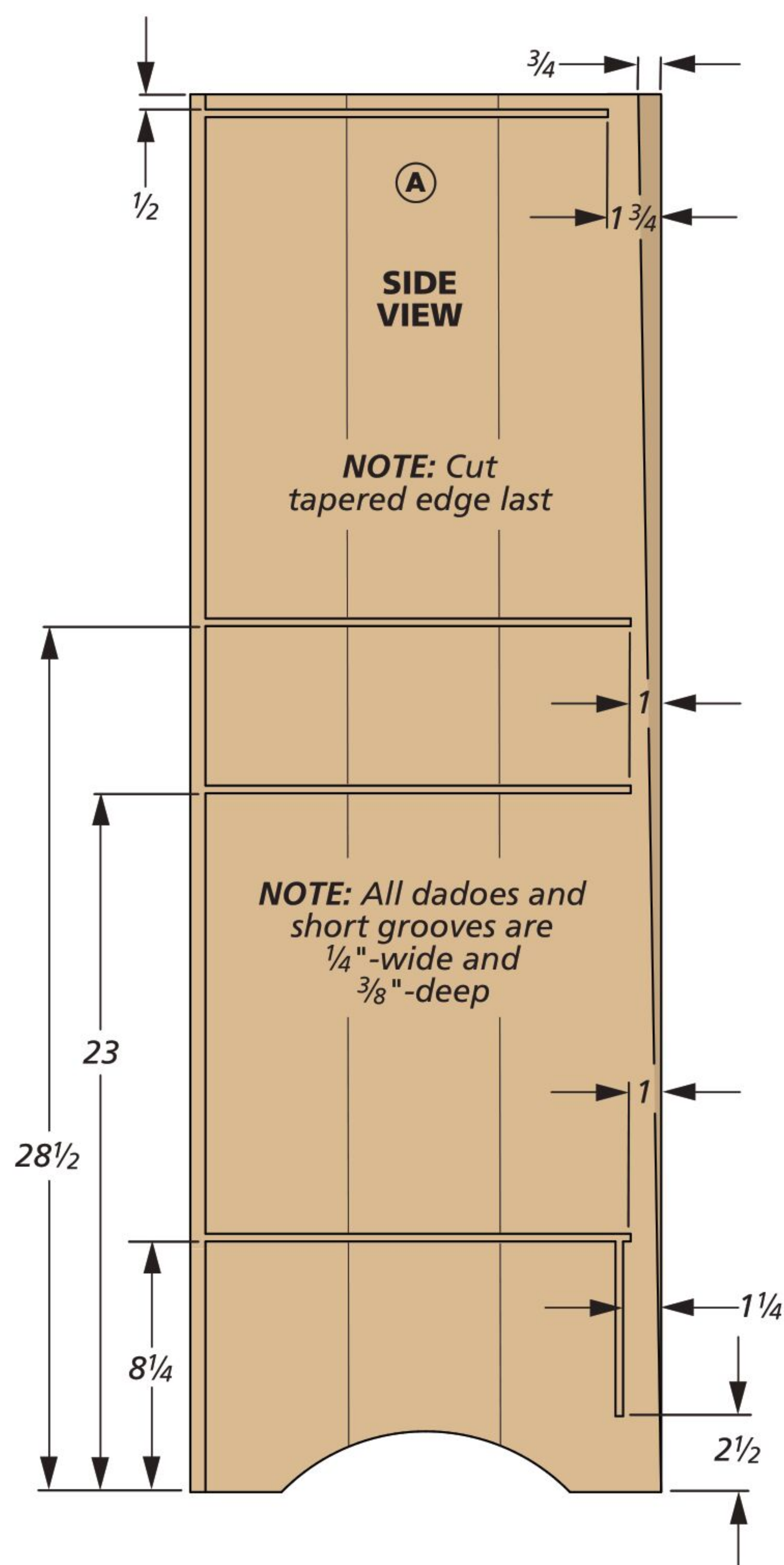
Harvey Ellis was an architect and artist from Rochester, New York. His artistic drive took him to Minnesota and Missouri, but ultimately he ended up back in New York working for Gustav Stickley. He didn't work long for Stickley (about seven months), but long enough that the influence of his artistic interpretation of furniture became one of the quintessential families of Arts and Crafts furniture that bears his name. Good for him.

And good for us as well. We get to spend some shop time milling and massaging all this warm, lovely cherry. But there are some challenging tasks here — stepped mortises for the locks and hinges. And the inlay work is a reward all its own that just might inspire other creative projects. Let's go have some fun.

▲ When the door of the organizer is closed you get to feast your eyes on some inlay artistry that's the succulent signature of many Harvey Ellis furniture pieces. A tasty meal indeed.

▼ Simple, yet sturdy hardware such as the lid door stay (photo below right) works well with this desk. Notice below how that theme continues with the strong locking rabbet drawer joinery. And the shop-built drawer guide setup couldn't be simpler.



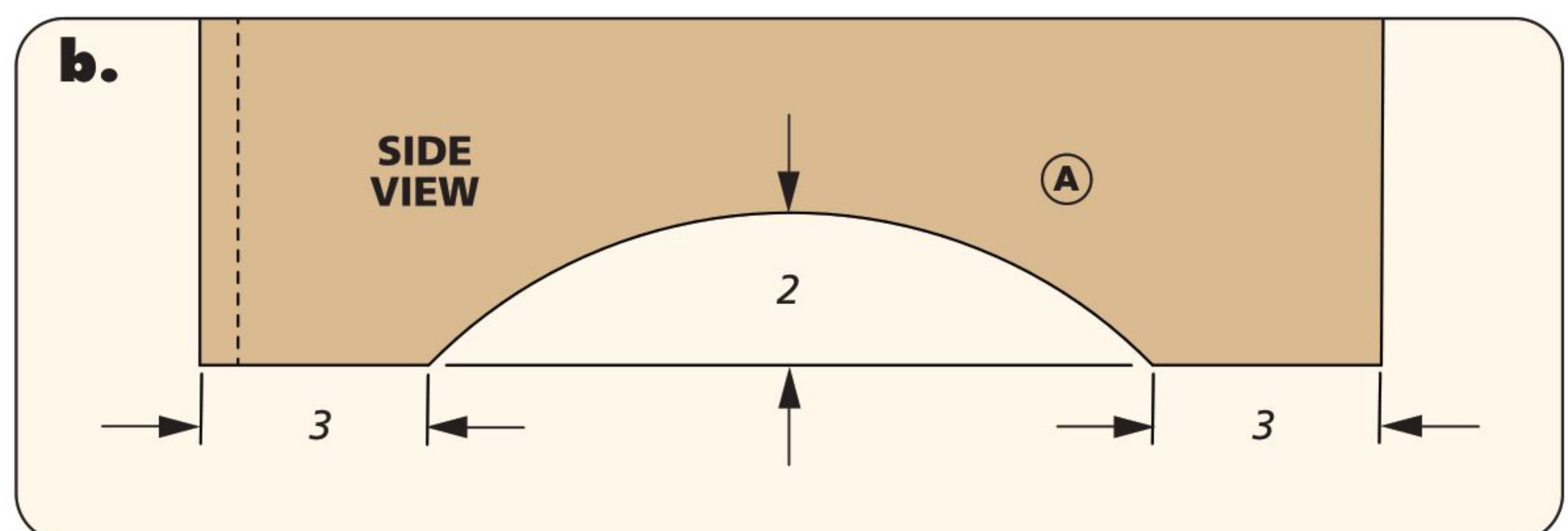


Simple, sturdy **SIDES**

The sides you see in the drawings above (and all the wood parts in this project) are made from cherry. I love working with cherry. Years ago I was a trim carpenter and spent most of my days working with red oak or poplar. When the builder I worked for built his own house, we trimmed it in cherry. The delight of working with that wood has carried over to my woodworking projects as well.

Now that I'm done with the nostalgic moment, we can start with wood selection for the sides. I always take my time picking the best boards for the big, upfront surfaces of a project. Once the boards are selected, plane and trim them as needed, then glue up the blanks.

NOTE: Decorative arcs are done first. Then dados, grooves, and rabbets are cut. The taper is done last

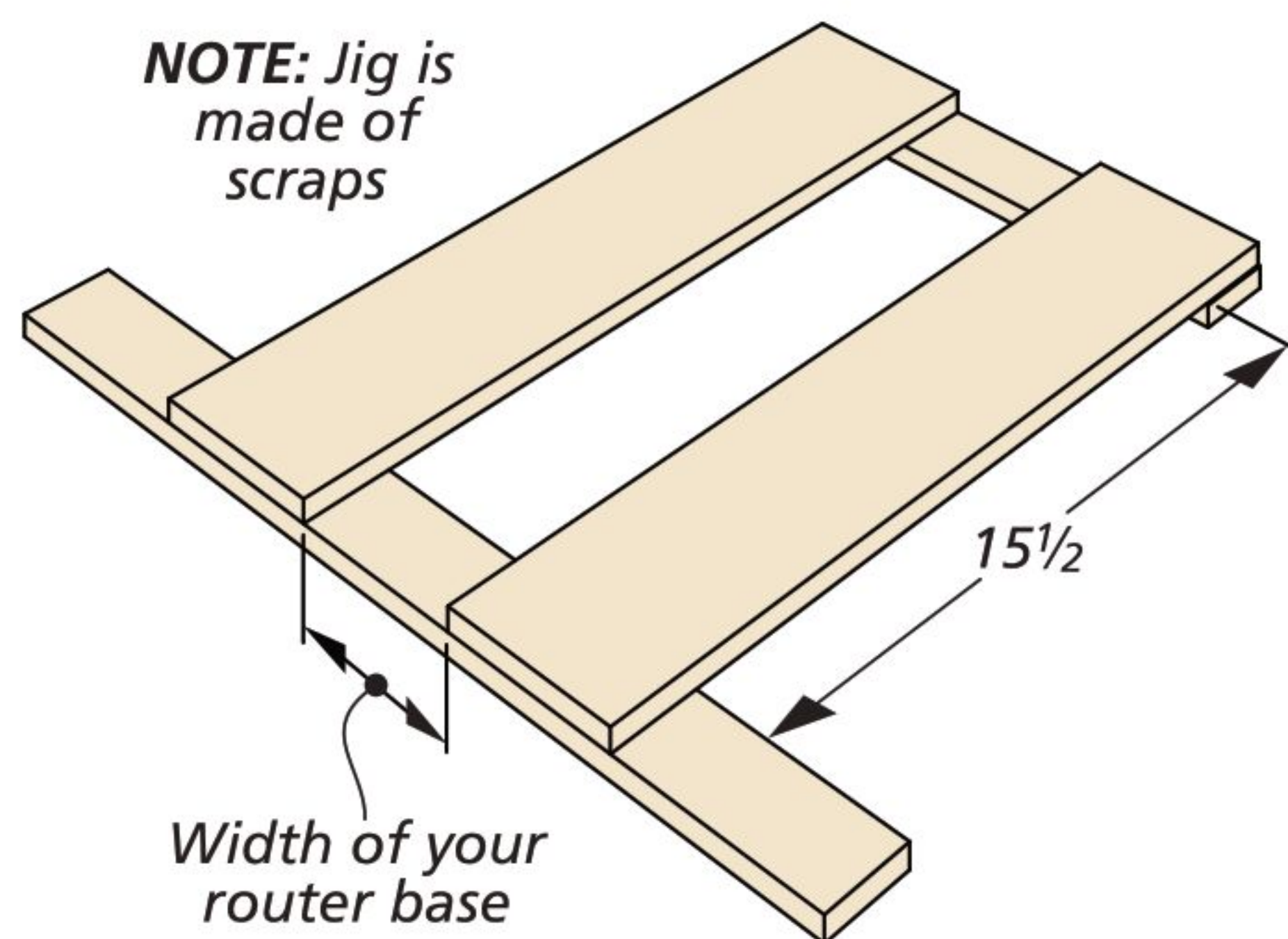


DECORATIVE DETAILS. There are two things I want to bring to your attention up front: the arc in the bottom edge of the sides (detail 'b'). And the subtle taper on the front edge of the sides. We'll do the taper later, let's do the arc now. After laying out the arc, cut out the profile to the waste

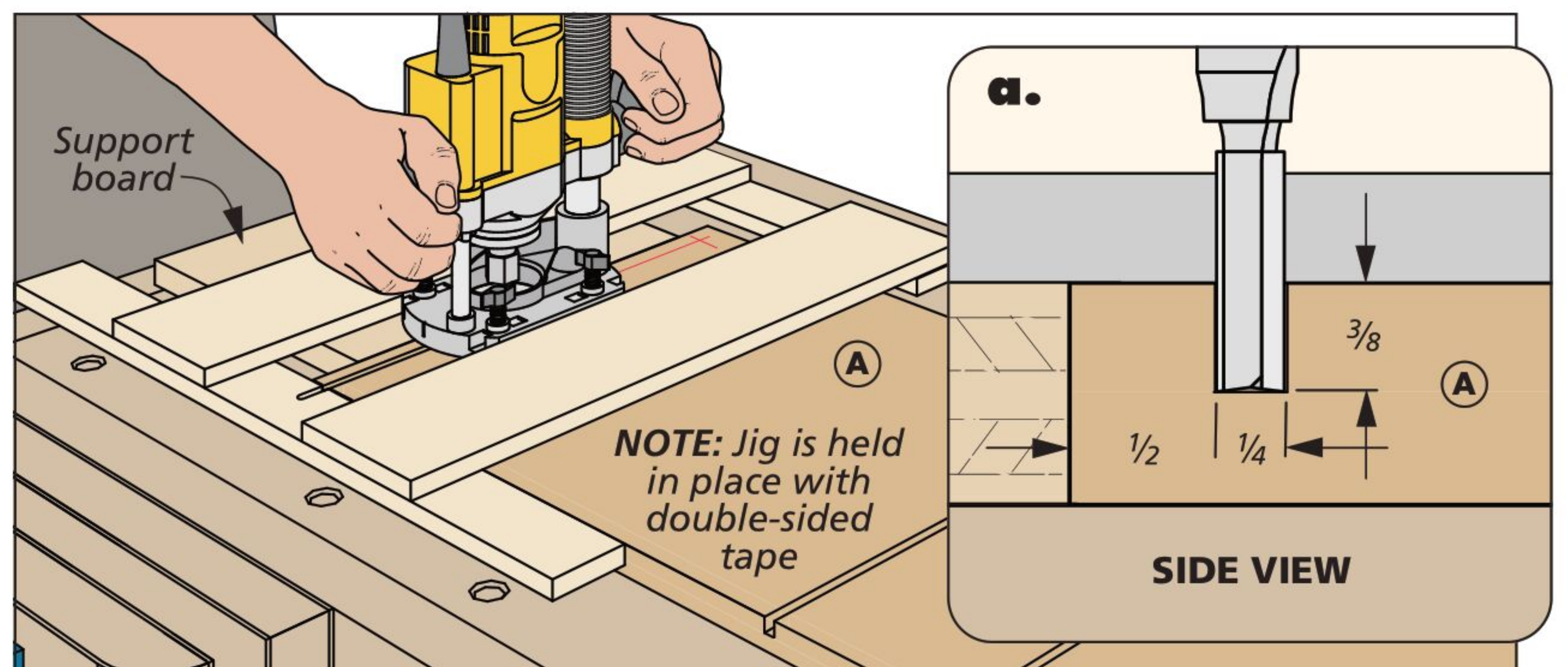
side of the line using a jig saw. Now you can sand it smooth with a sanding drum attached to your drill.

DADOES NEXT. The next task involves laying out the location of the dados on the sides. The side view drawing above gives you the dimensions.

STOPPED DADO JIG



A Simple Jig. The jig you see above is designed to partner with your router to make the grooves in the sides that will hold the dividers.



A Supporting Role. When it comes time to make the dado for the top divider, you'll have to support the outside of the jig with the additional board you see above. The board butts against the top edge of the side.

The box you see above shows you an easy way to cut the dados. It involves making a jig for your plunge router. In the drawing above right you see the jig in action cutting the dado for the top divider.

There are two things to note here. First, since the dado is so close to the end of side, the jig will need the support of an additional board on its outer edge. Second, notice that the dado for the top is shorter than the others.

You're just a few steps away from completing the sides.

What's left is to make a short groove in the sides, rabbet the back, and cut the tapers I was talking about earlier.

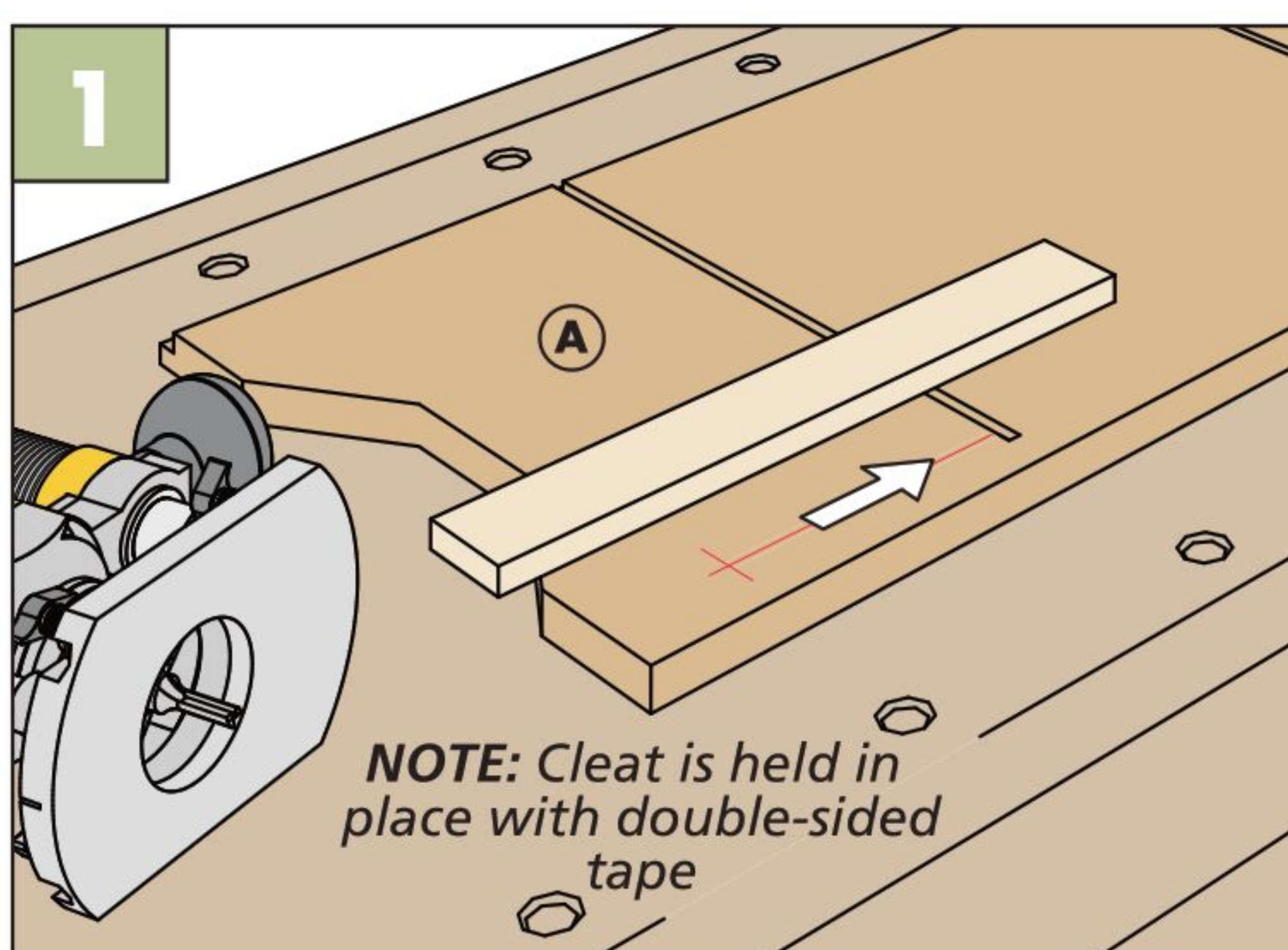
A SHORT GROOVE. If you take a gander at the Side View drawing on the previous page, you'll see there's a groove below the bottom dado. This groove is for the tongue of an apron that runs across the bottom of the case. Figure 1 in the box below shows you an easy way to rout the groove. The cleat that the router rides against is held in place with double-sided tape.

RABBET FOR BACK. Silly me, I forgot to mention that you need to cut a rabbet in the rear inner edge of the sides for the plywood back (detail 'a' previous page). The easiest way to do this is with a dado blade buried in the fence of your table saw.

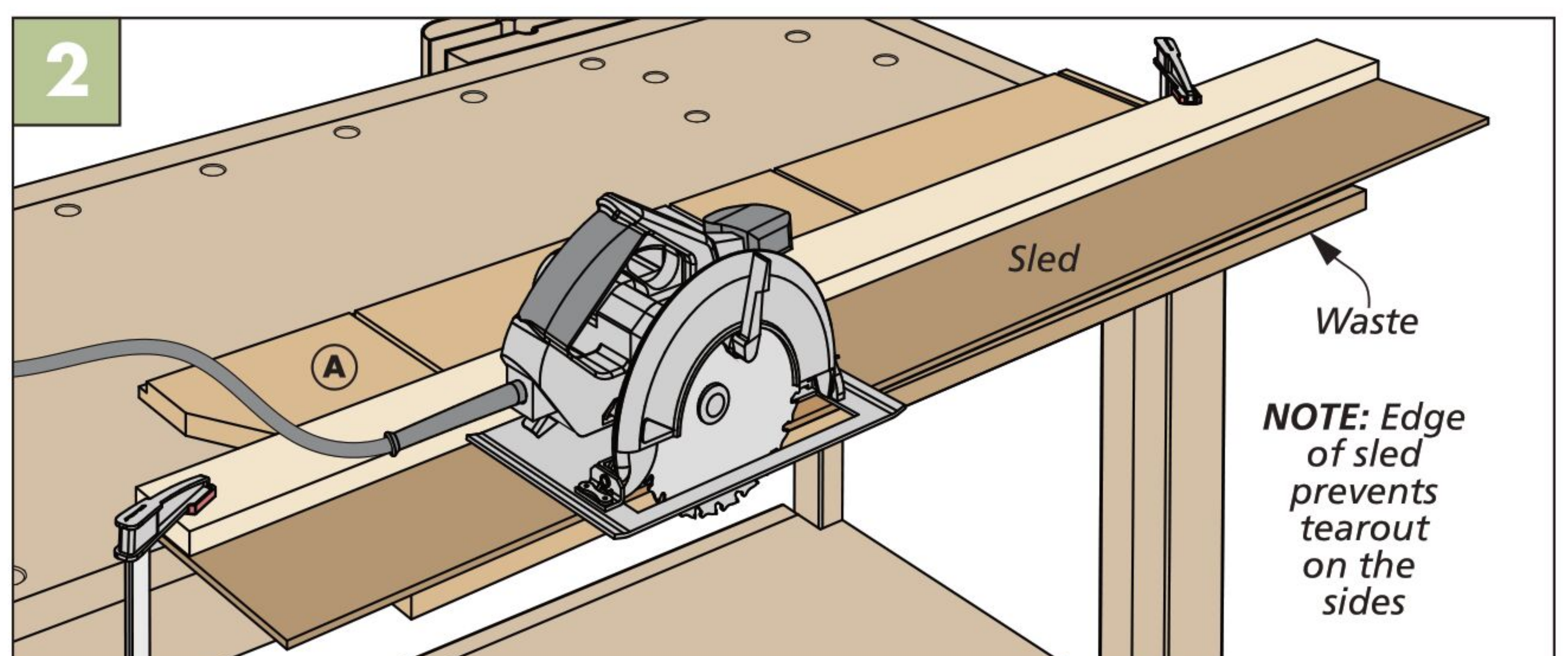
Now you can add the taper to the front of the sides (Figure 2 below) and smooth the edge afterwards, of course.

Next up is making the parts that bring the sides together, some dividers and an apron. Turn the page and get after it.

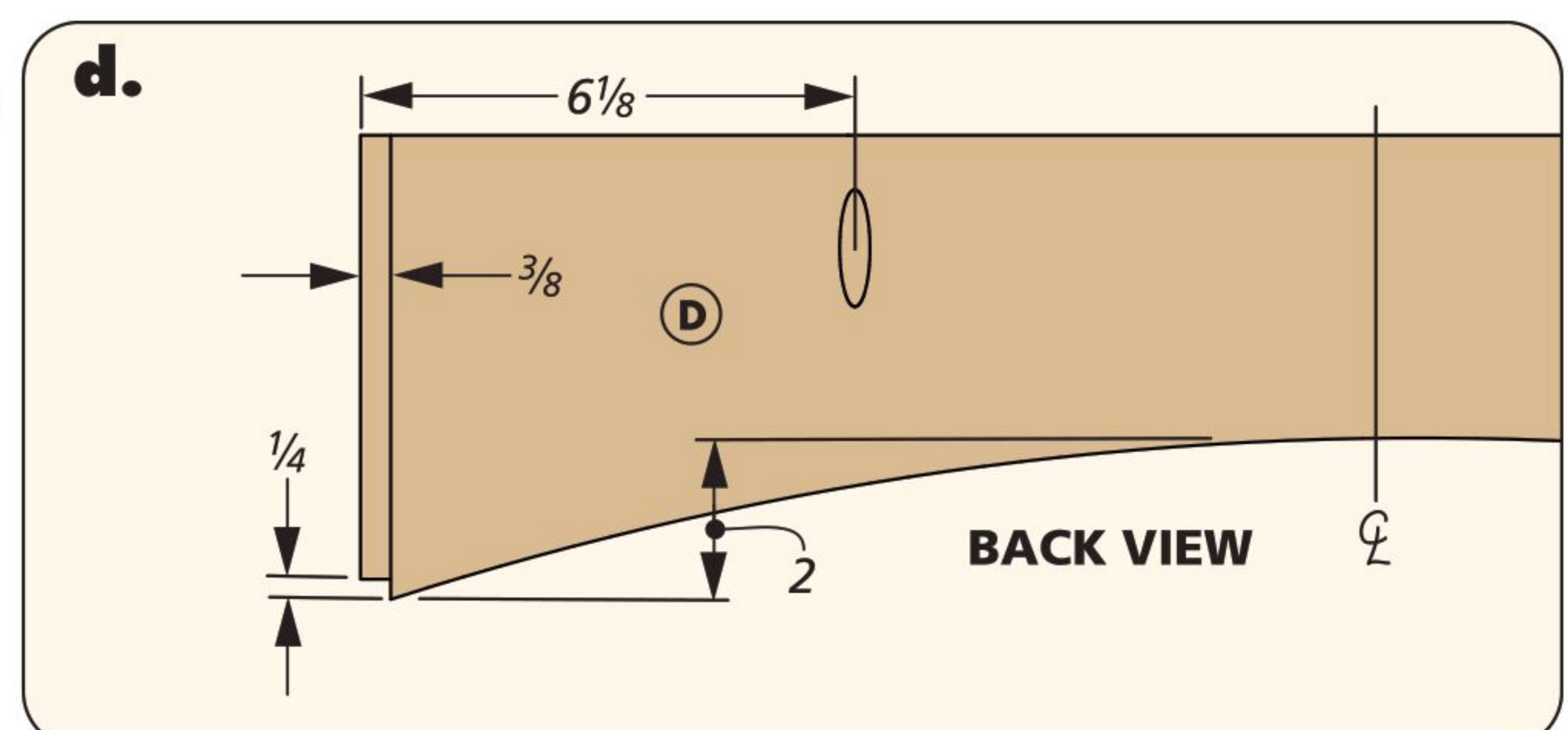
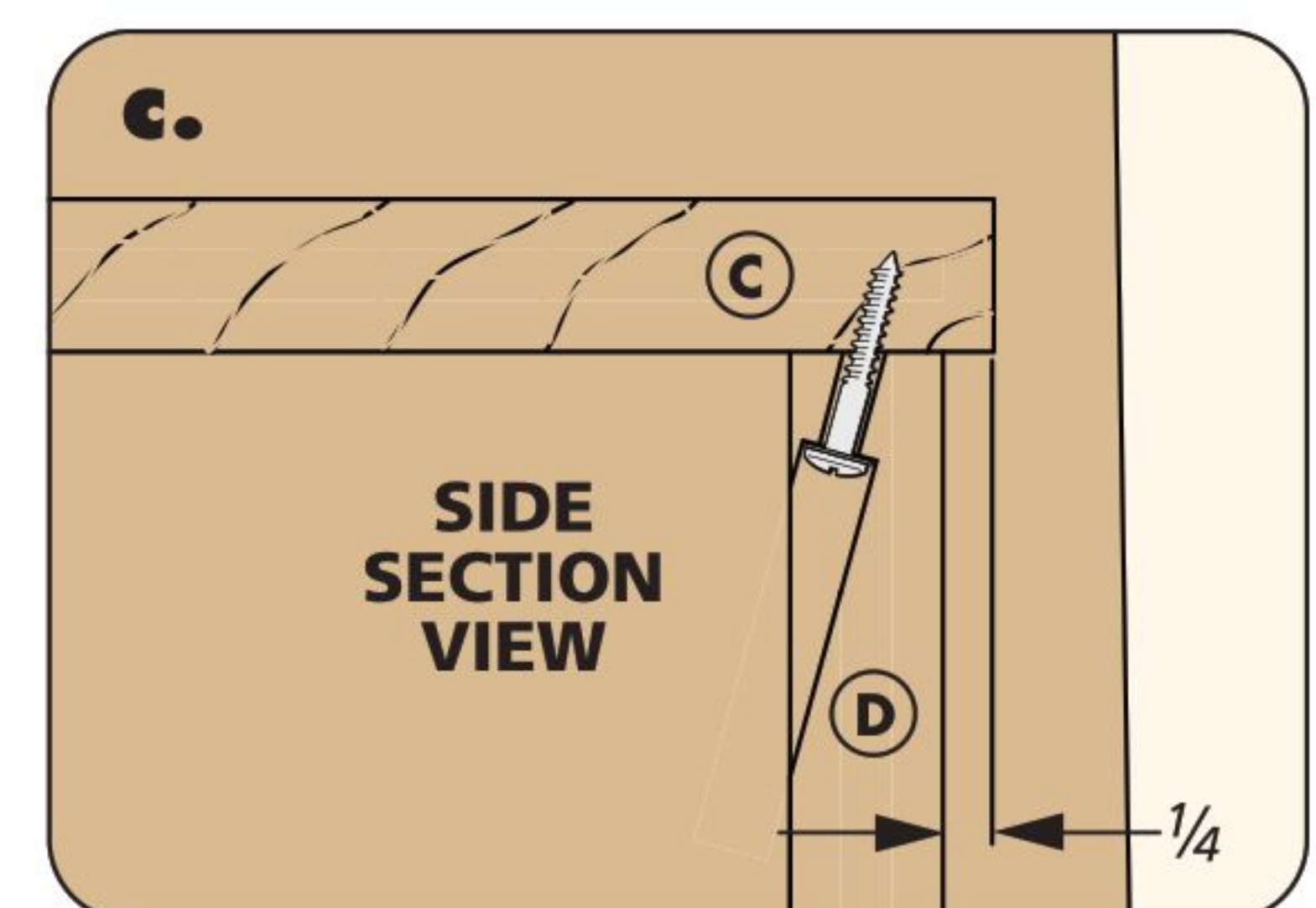
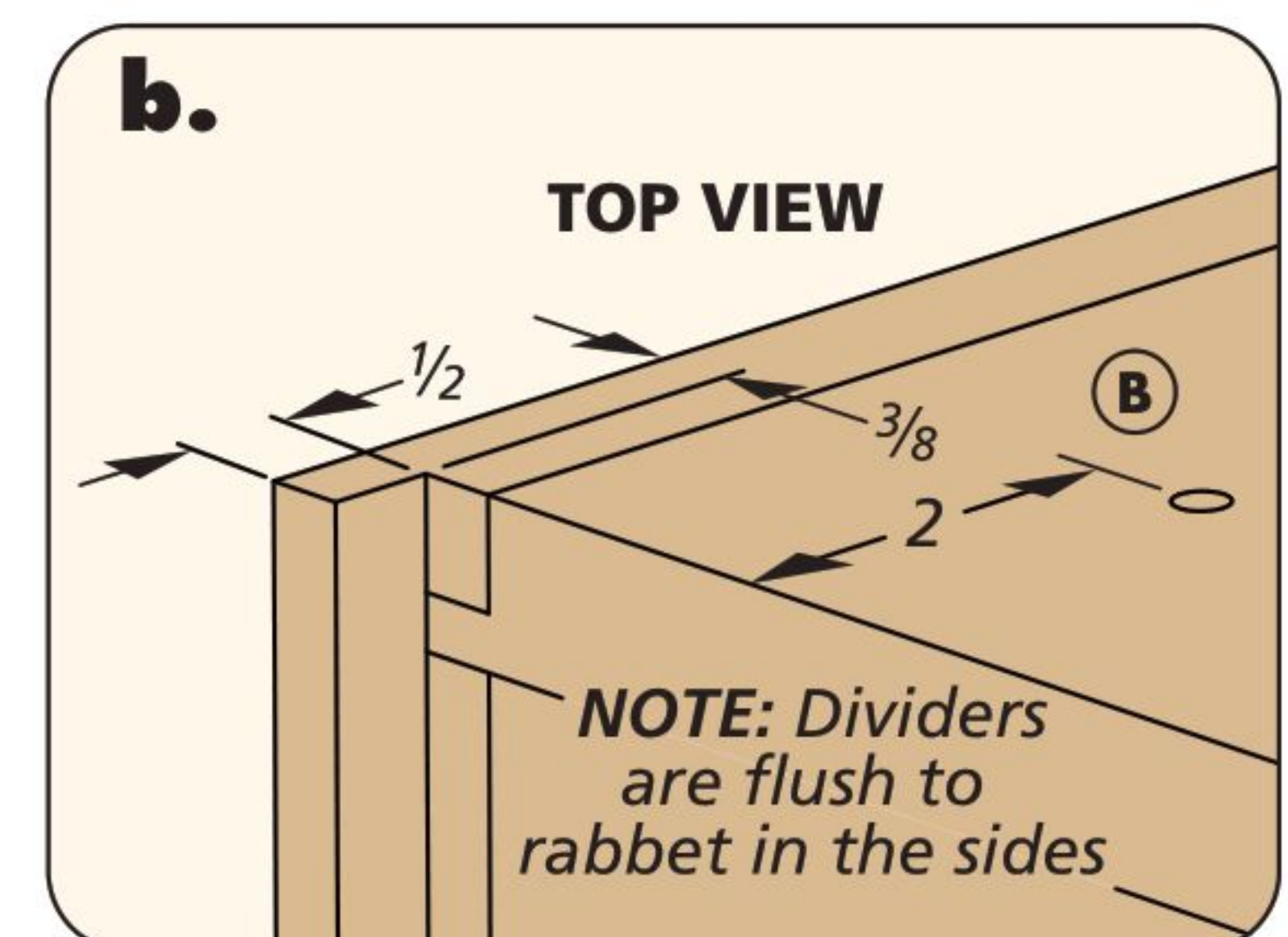
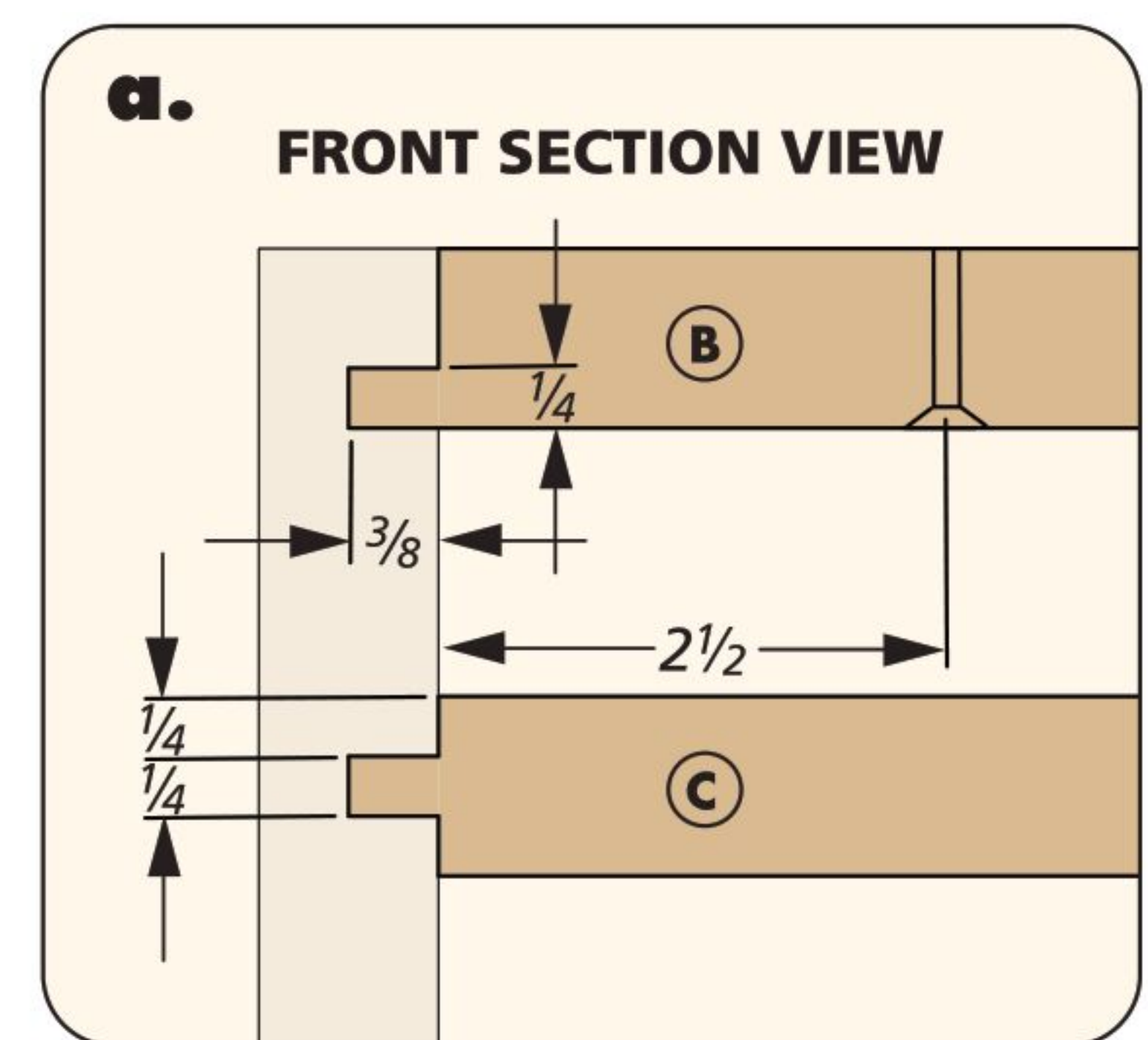
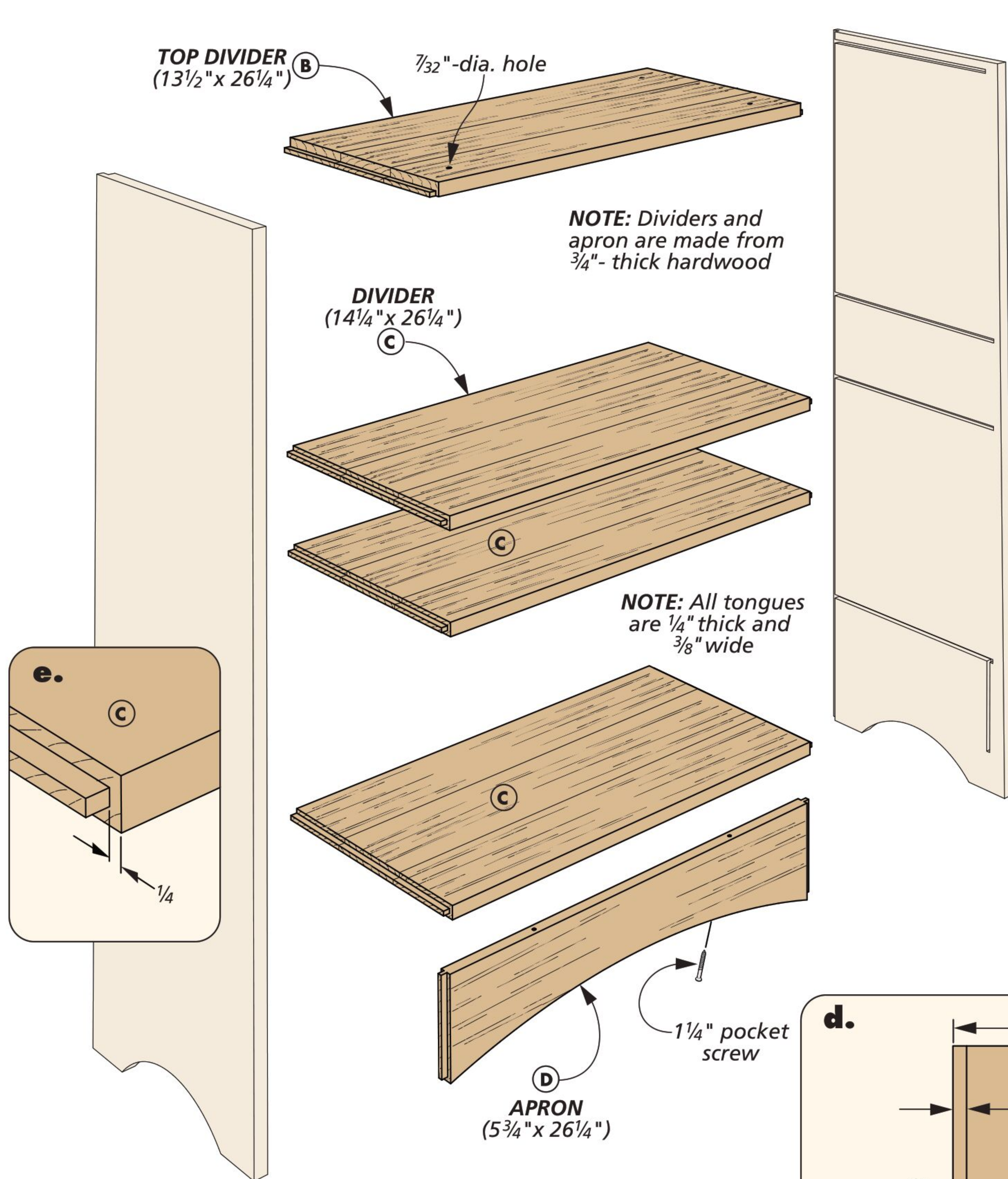
TWO MORE SIDE DETAILS



A Short Groove. The groove that you need for the apron is done easily with a cleat for your router to run against.



A Long Taper. The sled in combination with a circular saw is ideal for making the taper on the sides. Draw the line for the taper first, then align the edge of the sled to it. After making the cut, smooth the edge with your plane.



Working on the **INSIDE PARTS**

At this point, we're going to make the dividers and apron that you see in the drawings above. They'll connect the sides you just finished making.

But wait — there's more. Notice on the next page, there's a case to make for the inside of the desk that will hold two drawers. Mind you, the case is optional, but it looks really good and adds some diverse storage options to the organizer. Let's get to work on the dividers.

CALL OF DUTY. The duty of each divider is as follows: the top divider is what holds the finished top you'll add later to the

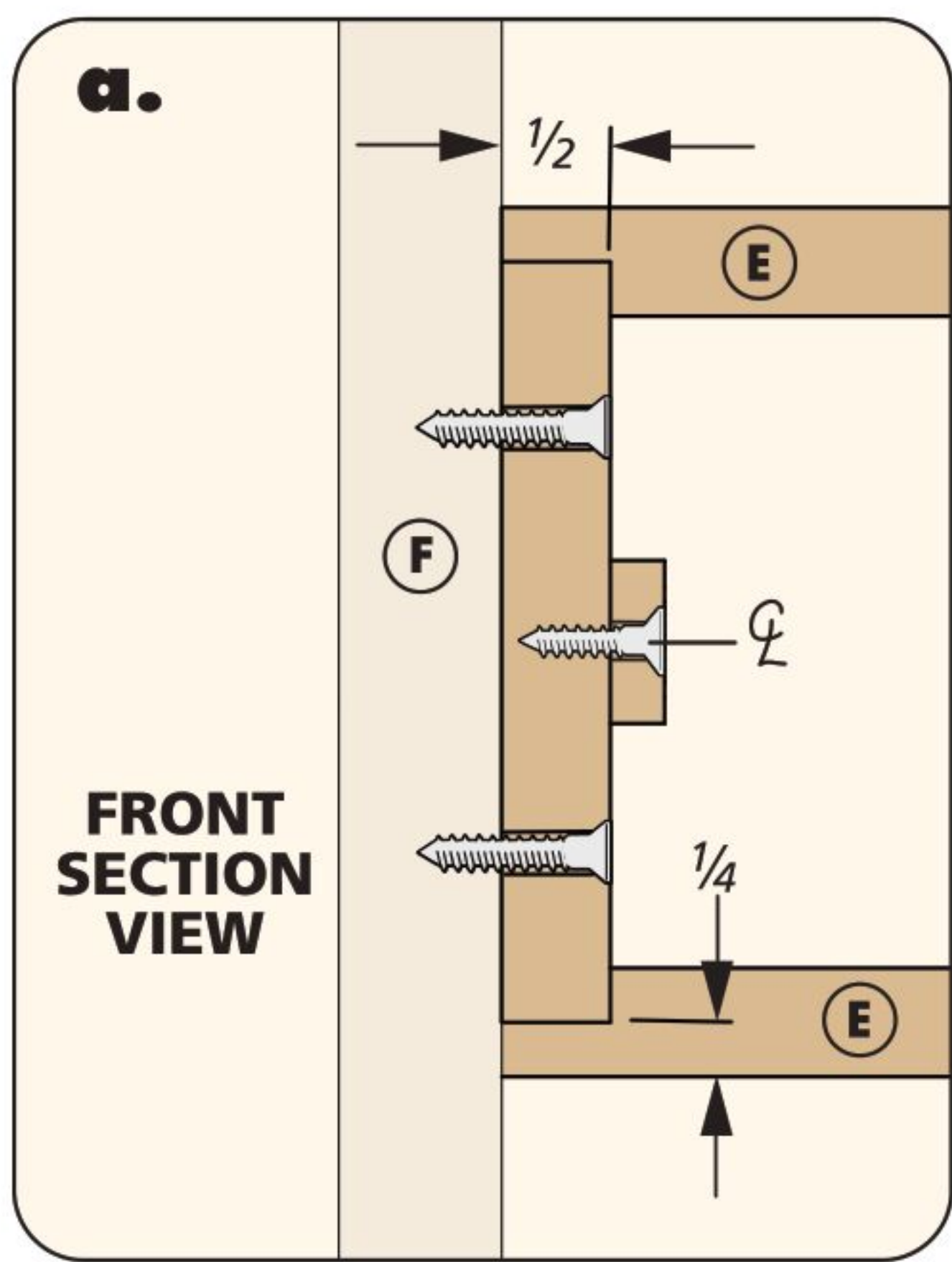
organizer. The two dividers in the center of the case make the cavity for a large drawer you'll add later. The bottom divider is identical to the two dividers I just talked about. Notice in the main drawing and detail 'c' that the apron is screwed to the underside of the bottom divider.

I tell you all of this because it gives you the latitude to pick the best wood for the surface that you see when the organizer is open, and use any less desirable material for the hidden parts. When those decisions are sorted out, glue up all the panels.

After the clamps are stowed and the panels cleaned up, cut them to final size. Then set up your table saw to make the tongues on the ends.

TONGUES. Notice that the tongue on the top divider is along the bottom edge (detail 'a'). This is to match the dado in the side. Lowering the top dado leaves more material above the tongue of the top divider, making a stronger joint overall.

All the other tongues are centered. The length of the tongue is the same on all four parts. So I set the fence to act as a stop.



I cut the tongue in the top first with the divider upside down. Then I lowered the blade and made some test cuts on a scrap before committing to the tongues on the remaining dividers.

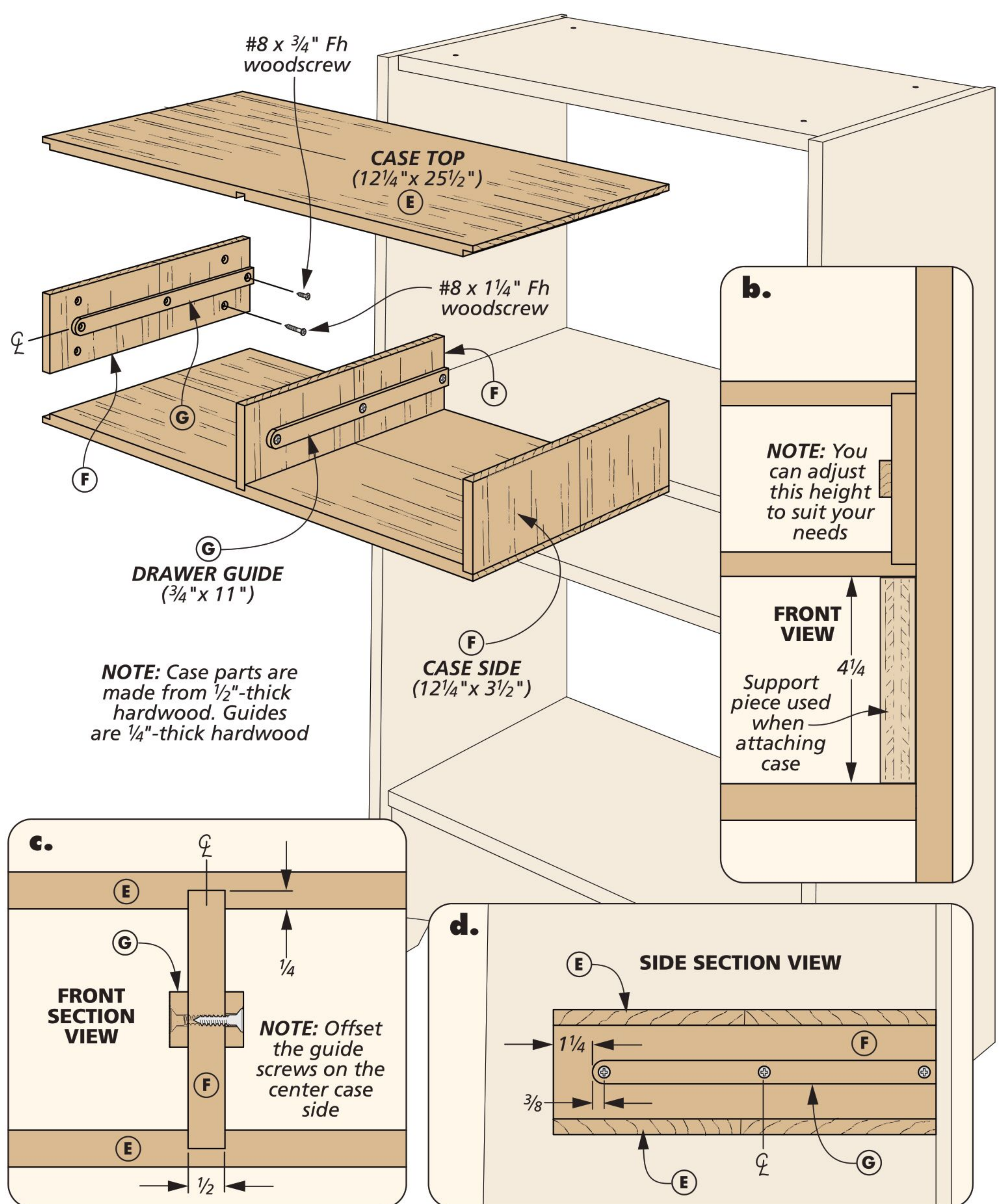
With the big panels out of the way, you need to make the apron. The tongue on the apron is identical to the one on the three dividers. So cut those tongues before changing the saw setup.

The arc along the bottom edge is made the same way you made the arcs in the sides. I hand cut the shoulders on the fronts of the divider and bottom of the apron (detail 'e' on the previous page).

DRILLING DETAILS. Now you can drill the oversized holes in the top divider. And drill the pocket holes in the back side of the apron. Now you're ready to assemble the case.

ASSEMBLE THE CASE. With slow set glue, pre-gapped clamps, clean-up rags, and some warm water close at hand, you're ready to glue up the case. Start by laying one side flat on some two-bys with the inside facing up. Glue in the dividers using clamping squares to hold them in place. Add the apron as well.

Then bring in the other side and clamp up the assembly. To ensure a tight bond I used clamping cauls across the drawer dividers. Before the glue is set, screw the apron to the bottom divider. Now it's time to build a case to fit in the organizer.



ADDITIONAL STORAGE

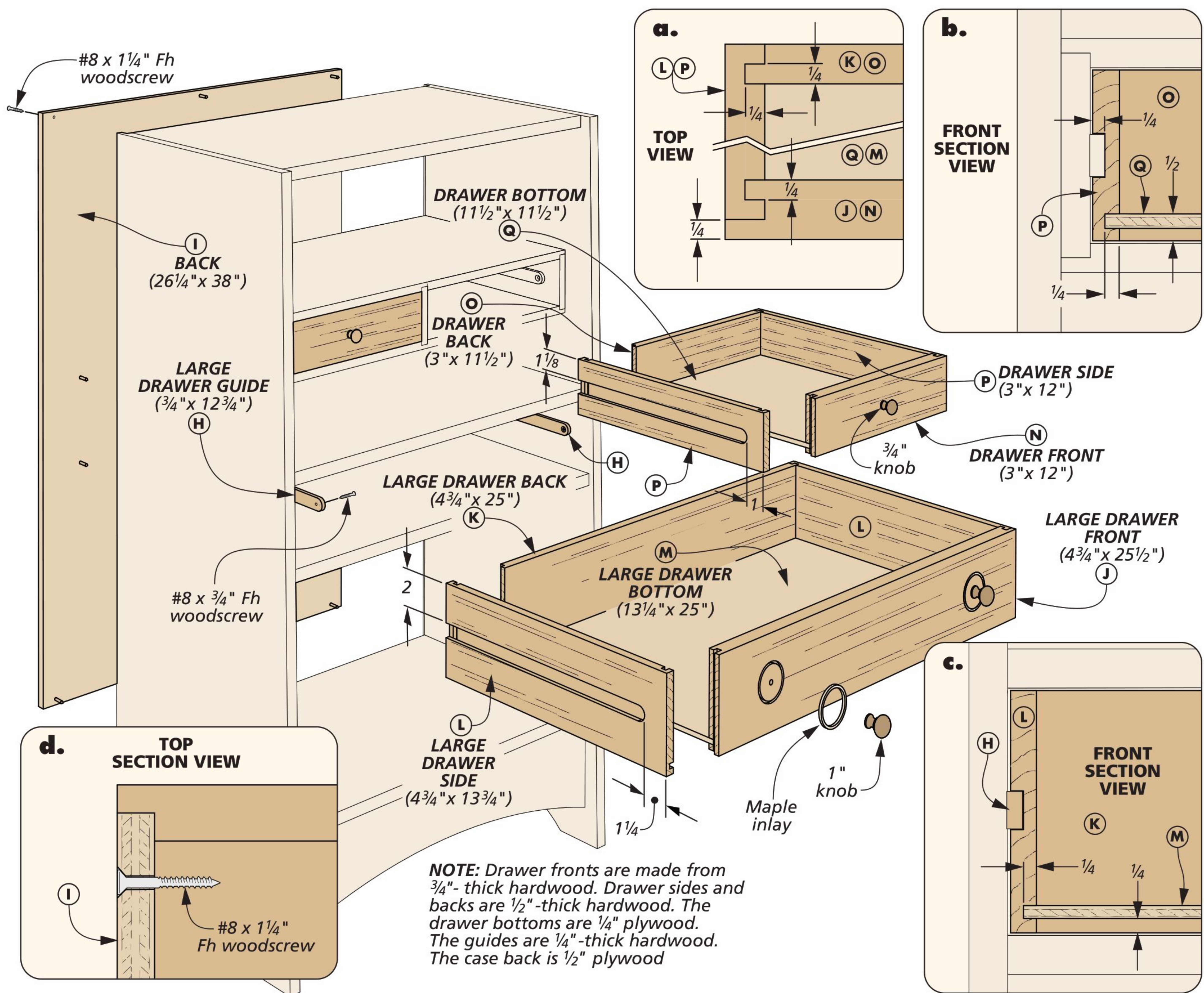
If you want more storage options check out the case that's featured above. It holds two small drawers for handy organization. Notice in the main drawing above that the case is made of 1/2"-thick material. Structurally there's no reason to use material any thicker. And visually it looks much lighter.

GLUE UP & ASSEMBLY. Glue up the panels for the top and bottom of the case. Make sure these thinner panels stay flat as you apply clamping pressure. Once they're trimmed to size, cut the rabbets on the ends (detail 'a'), and the

dadoes in the center (detail 'c'). One of the sides serves as a divider in the center of the case, so after cutting all three of them, you can glue up the case.

To guide the drawers in and out of the case, you'll make and install the guides you see in details 'a', 'c' and 'd.' They're screwed to the sides and the middle divider.

The easy way to attach the case to the sides is shown in detail 'a.' A scrap of plywood under each end holds it in place while you screw them together (detail 'b'). Next you'll make the drawers that fit in the case and organizer.

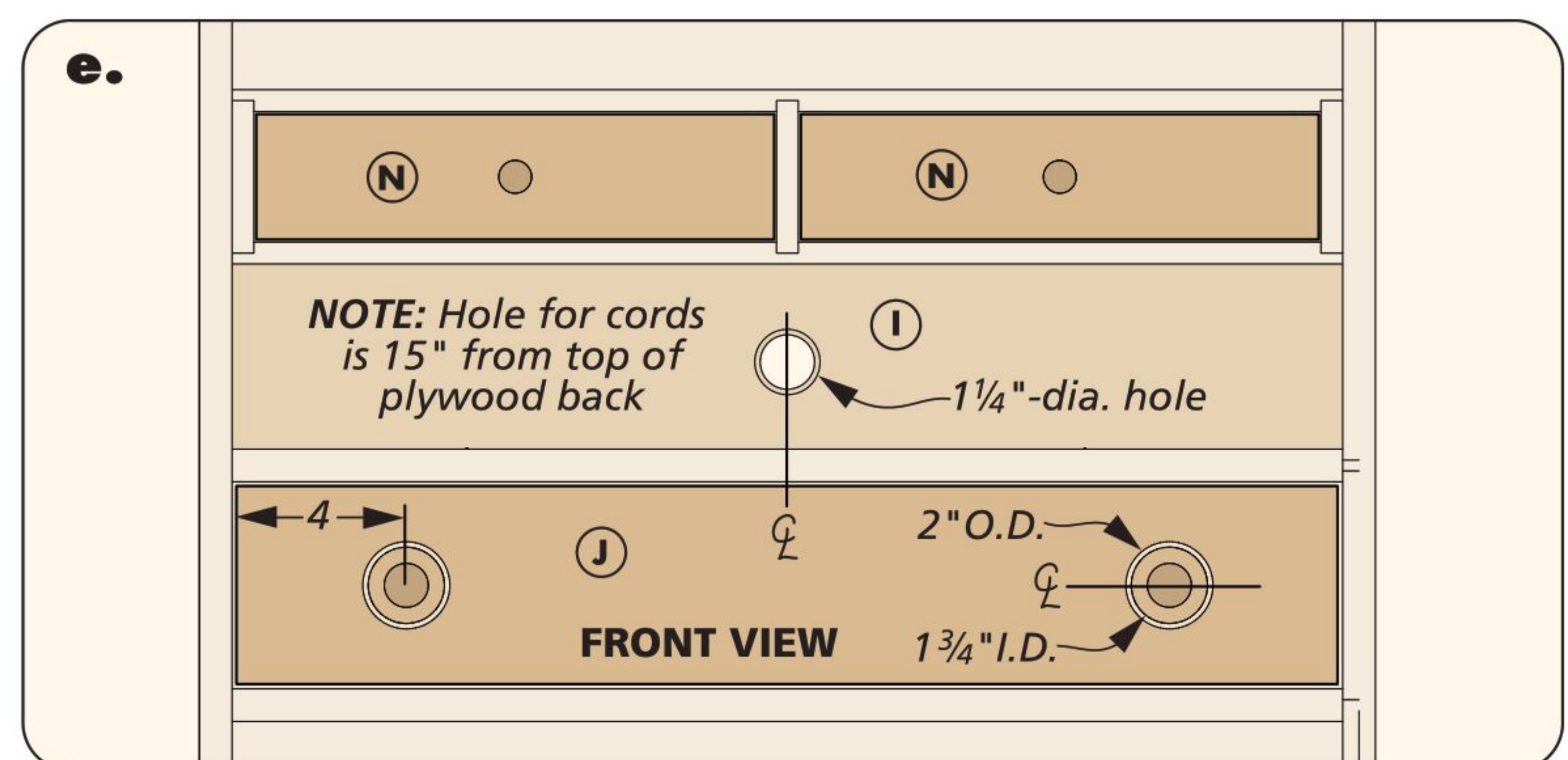


Adding good-looking DRAWERS

Before working on the drawers there are a couple of things you have to attend to. First the drawer guides (detail 'c'), then the plywood back.

The guides are for the large drawers. They're just a little longer than the ones you made earlier. Once the guides are installed, there's the back to deal with. The back has a hole for a cords to pass through (detail 'e'). After the hole is drilled, screw the back in place (detail 'd').

In the drawing above you see a large drawer that fits between the dividers in the middle of the



organizer. Also, above the large drawer there are two smaller drawers that occupy the small storage case you just finished. The joinery is the same on both drawers. The size of the parts and the inlay around the pulls in the large drawer are the only differences between them. Start

by cutting to size the parts for the all three drawers.

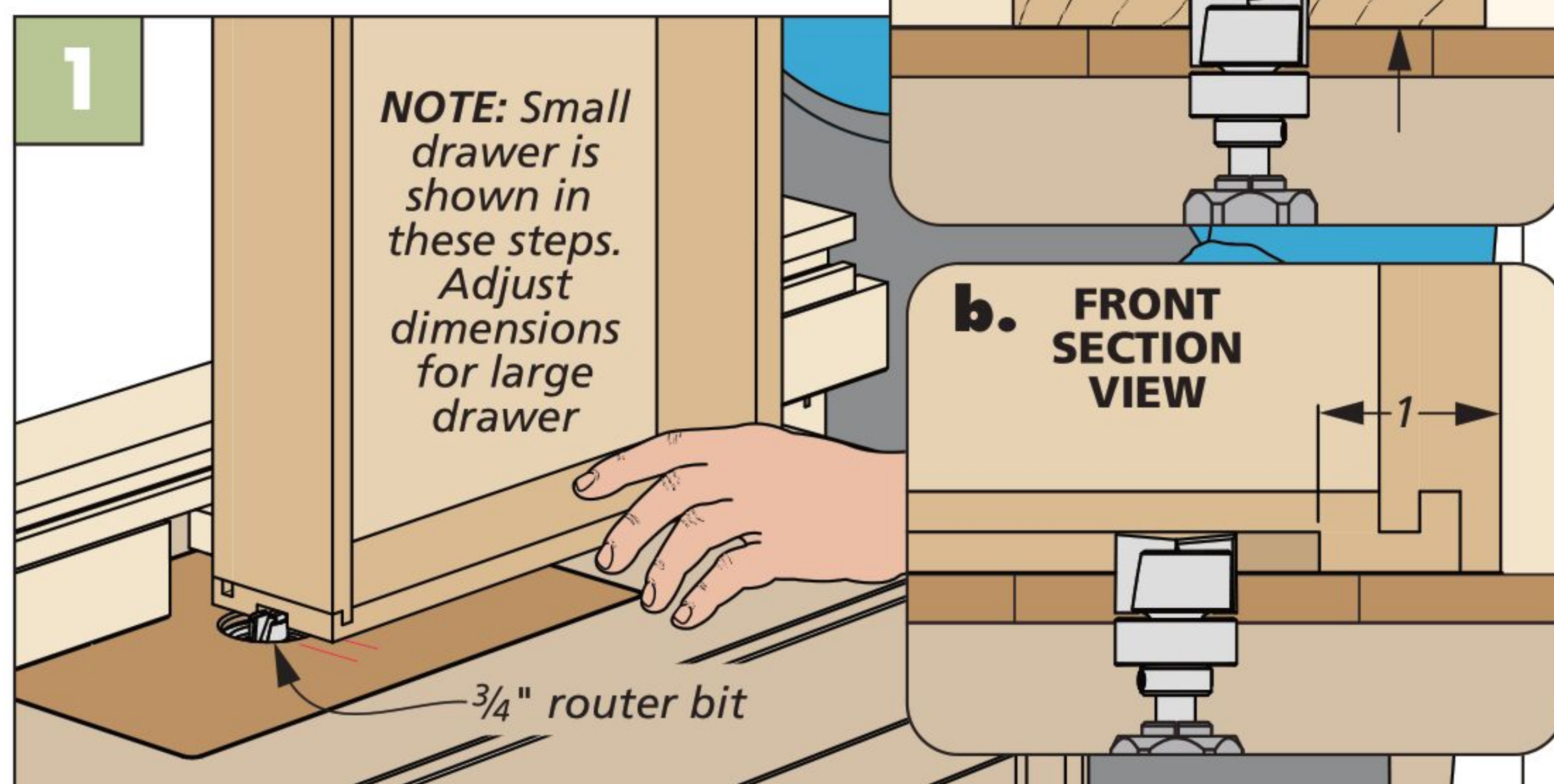
JOINERY. The locking rabbet you see in detail 'a' above is an efficient and strong joint designed to take the stress of the daily duties a drawer endures. Once that set of cuts is made in the drawer fronts, you can cut the



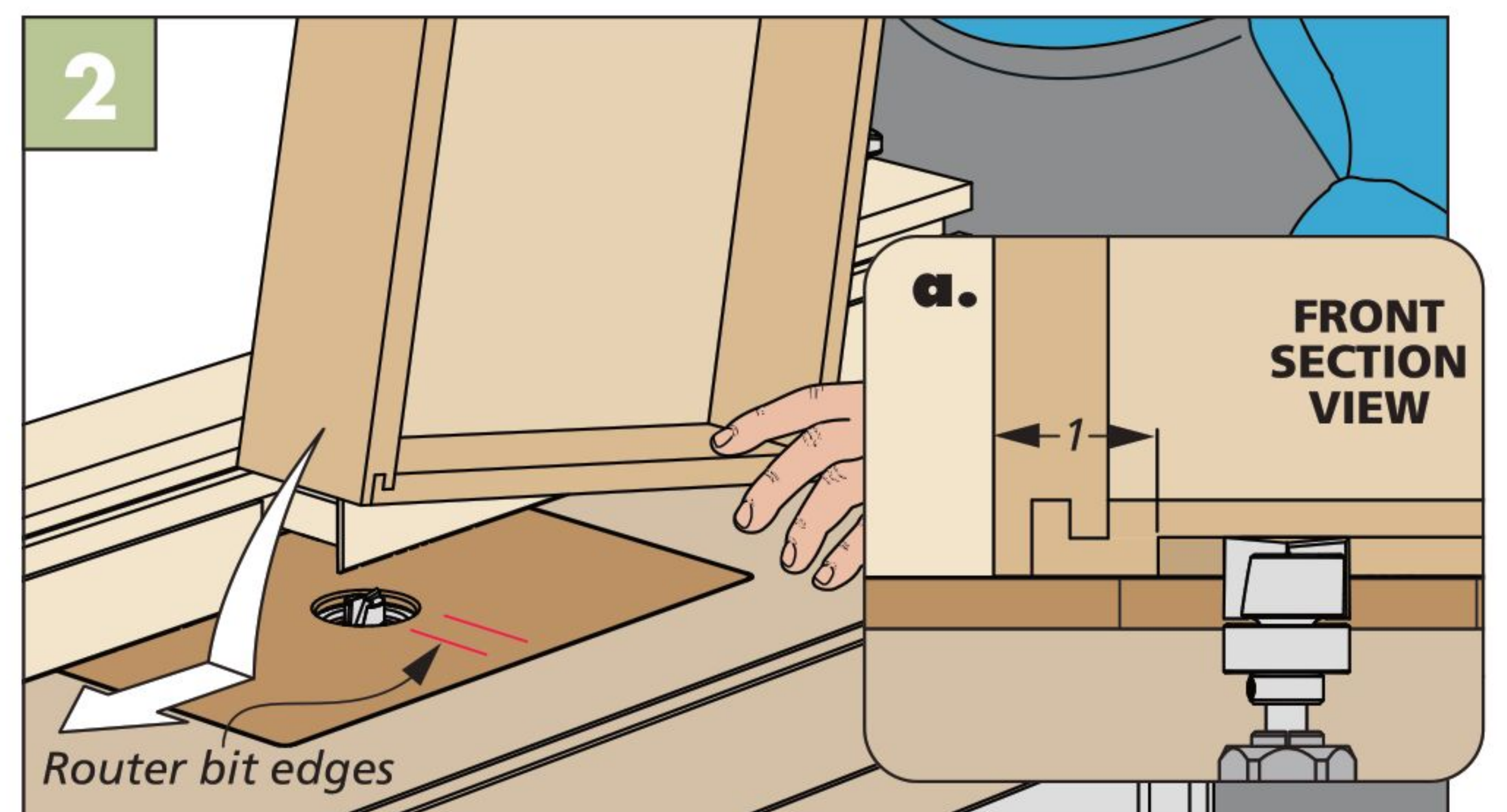
For drawer front groove router templates and making the inlay, go to:

Woodsmith.com/259

RUNNER GROOVE



Drawer Groove. On the left side of the drawers you simply feed the drawer into the bit. Stop at the line on the router table that represents the lead cutting edge of the bit.



Start with a Drop. On the right side of the drawers you have to lower the drawer on to the bit. Start shy of the mark that is the back of the bit. Then sneak up on it.

dadoes in the sides that will join them to the front. The dado in the back of the sides accepts the tongue cut on the drawer back. The last thing to do is cut the groove for the bottom of all these parts (detail 'b'). Now set aside all the parts but the large drawer front. Creating the ring for the inlay is next.

INTRO TO INLAY. Applying inlaid wood to any project has a magical effect on the whole. So, the thought of performing such magic is intimidating. But if you follow the steps shown here,

you'll be the life of the project party. (In your shop at least.)

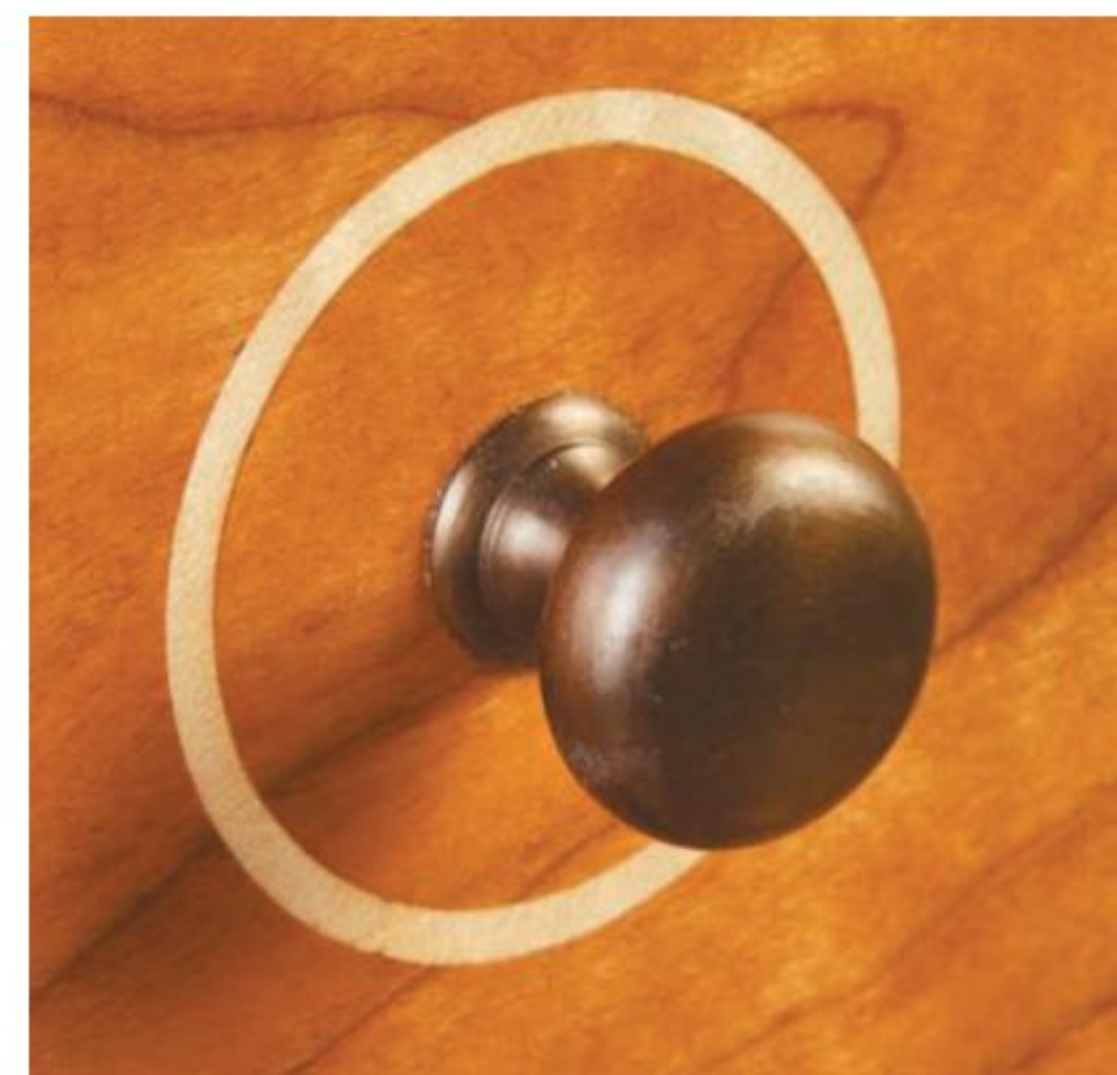
First, lay out the location of the hole for the drawer knob screw on the drawer front (detail 'e,' previous page). Once those holes are drilled, the box below walks you through the rest.

INLAY PART TWO. Now that you have the drawer ready for the inlay, you have to make the inlay. Doing that job requires two more tiny trammels, some thin maple, and a sacrificial board with a hole in it. The process and the rest of the details

for making the inlay can be found at Woodsmith.com/259.

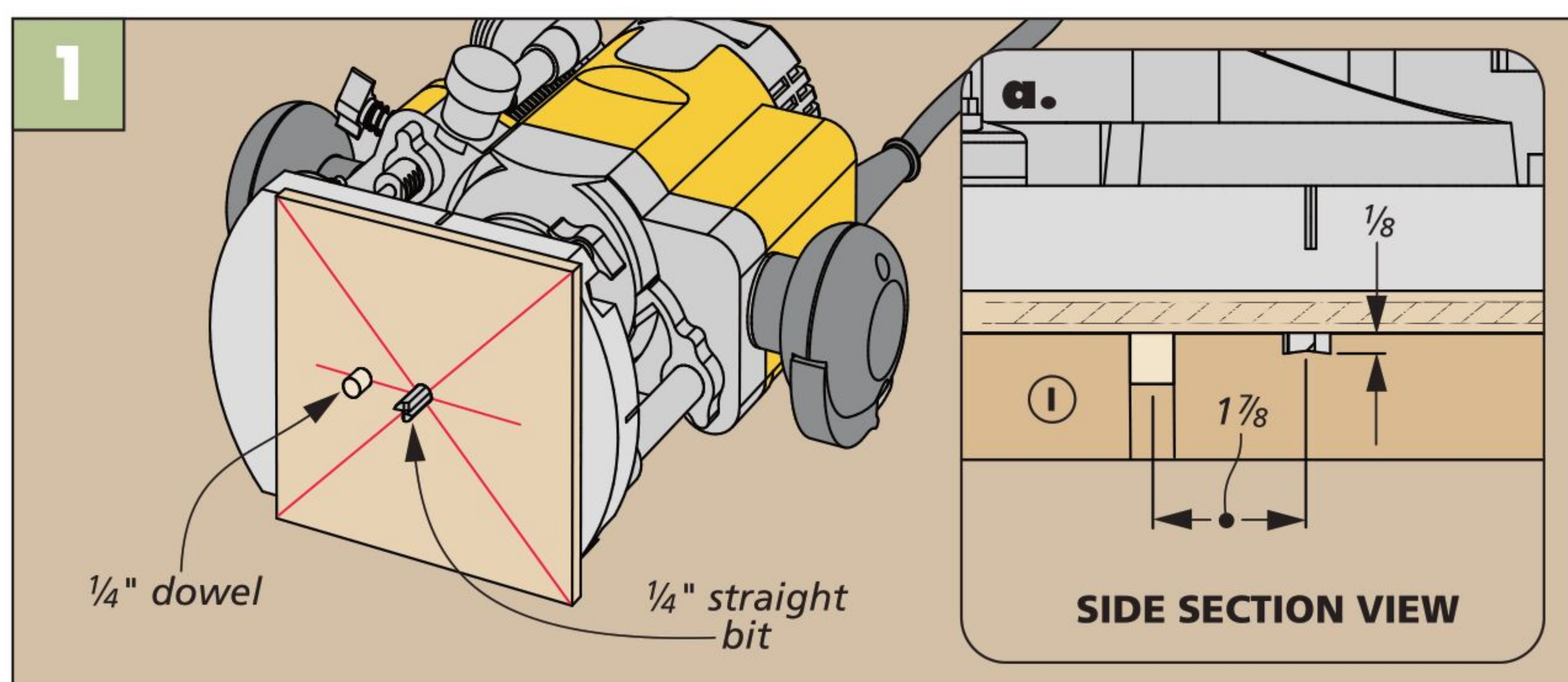
ASSEMBLE THE DRAWER. With the inlay work complete you can glue up the drawers. After you've tidied up from that step, you'll need to cut some grooves in the sides for the guides.

The box above shows you the steps for making the grooves in the sides of the drawers. The grooves allow the drawers to ride along the guides. Now it's time to top off the desk and present the closing arguments for a beautiful door.

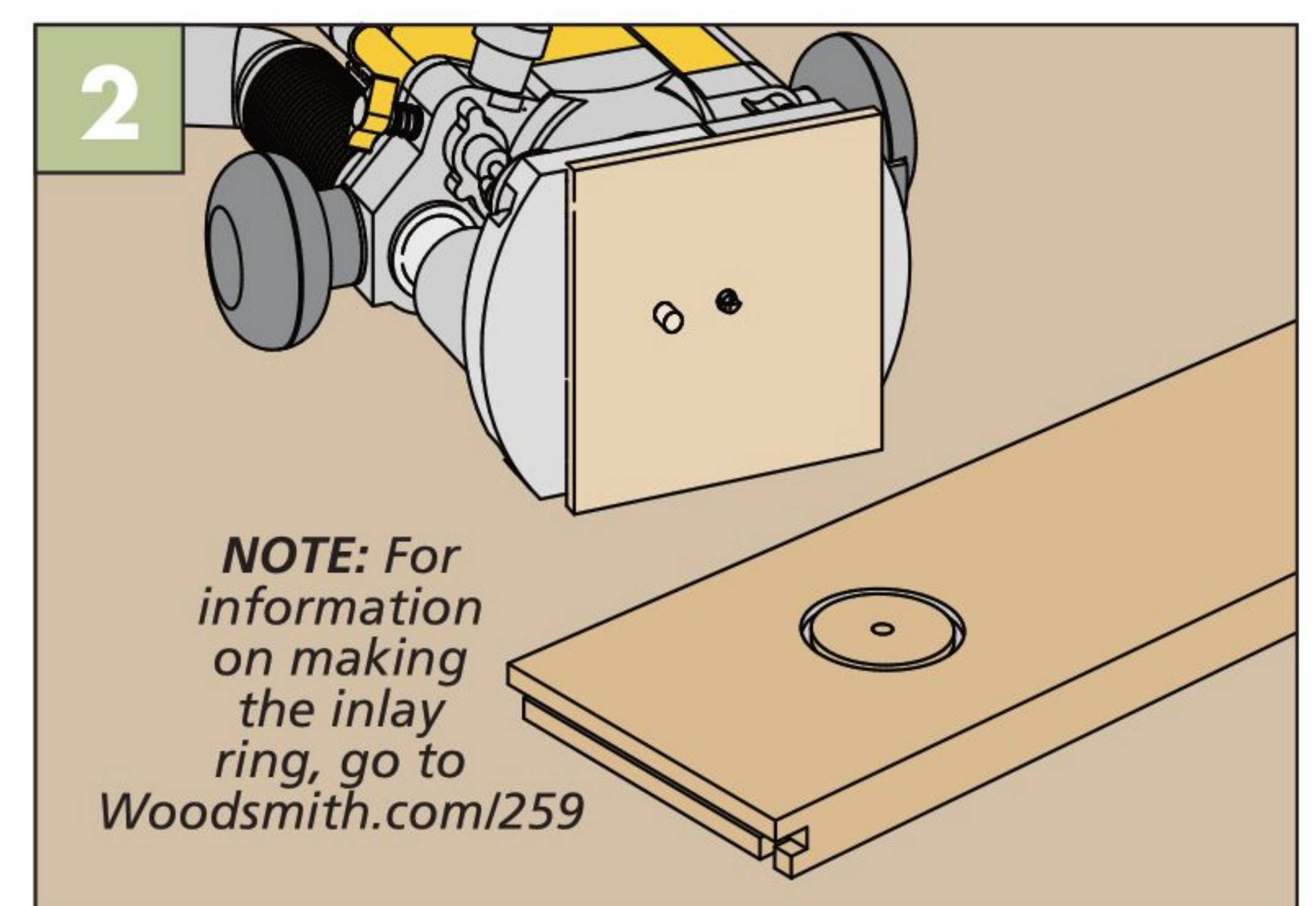


▲ The look of the inlaid ring around the large drawer pulls is well worth the effort.

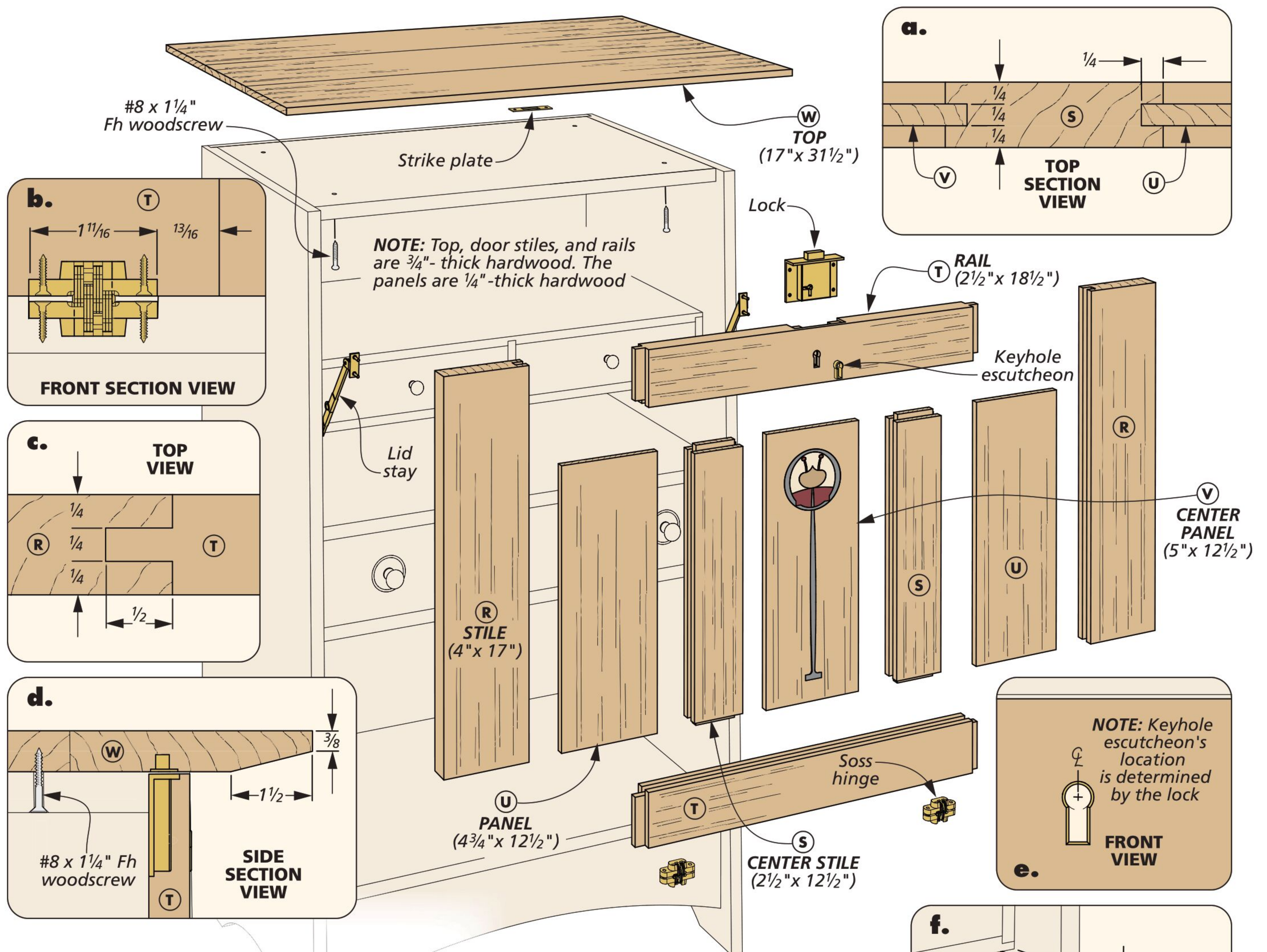
DRAWER HANDLE INLAY GROOVE



A Tiny Trammel. The sub base is attached to the router with double-sided tape. The base has a dowel that fits into the knob hole of the drawer front. The dowel is the pivot point for the trammel.



Drawer Ring. Set the plunge on your router to the thickness of your inlay. This is a tight turn, so test it out on a scrap first.



Making a handsome **DOOR & TOP**

The door and the top are the remaining parts of the project. You'll need to make and install the door first so that you can locate the position of the strike plate on the underside of the top (detail 'd'). So let's get to work on the door.

The frame and panel door is made using stub tenon and groove joinery (details 'a' and 'c'). The center panel features a decorative inlay that you can learn to do on page 12. Then you can pick back up here and integrate it into the door-building process. When those steps are done, you can deal with the top.

GROOVES & TENONS. After sizing all the parts for the door, start out

with making the grooves at the table saw. The grooves are centered on the inside edges of the stiles and rails. The center stiles have grooves on both sides (detail 'a'). After adjusting the setup on the table saw, cut the tenons on the ends of the rails and middle stiles. Now you can gather all the parts and glue up the door.

FITTING THE DOOR. Confirm the gap around the door is even in the opening ($\frac{1}{16}$ "). When you're comfortable with the fit, you can focus on the hinges and the lock.

Adding the hinges and the locking mechanism to the door requires stepped mortises for both. If needed, there are

in-depth instructions for both online at Woodsmith.com/259. To summarize, install the Soss hinges in the door rail first (detail 'b'). Then transfer their location to the desk surface and drill the stepped mortises there.

Before attaching the door to the organizer, add the lock that's centered in the top rail. This includes installing the keyhole escutcheon (detail 'e').

THE TOP. The top is a glued



For more on hinge and lock mortises, along with the desk insert, go to:

Woodsmith.com/259

up panel. After beveling and smoothing the underside of the front and sides (detail 'd'), temporarily attach it to the case.

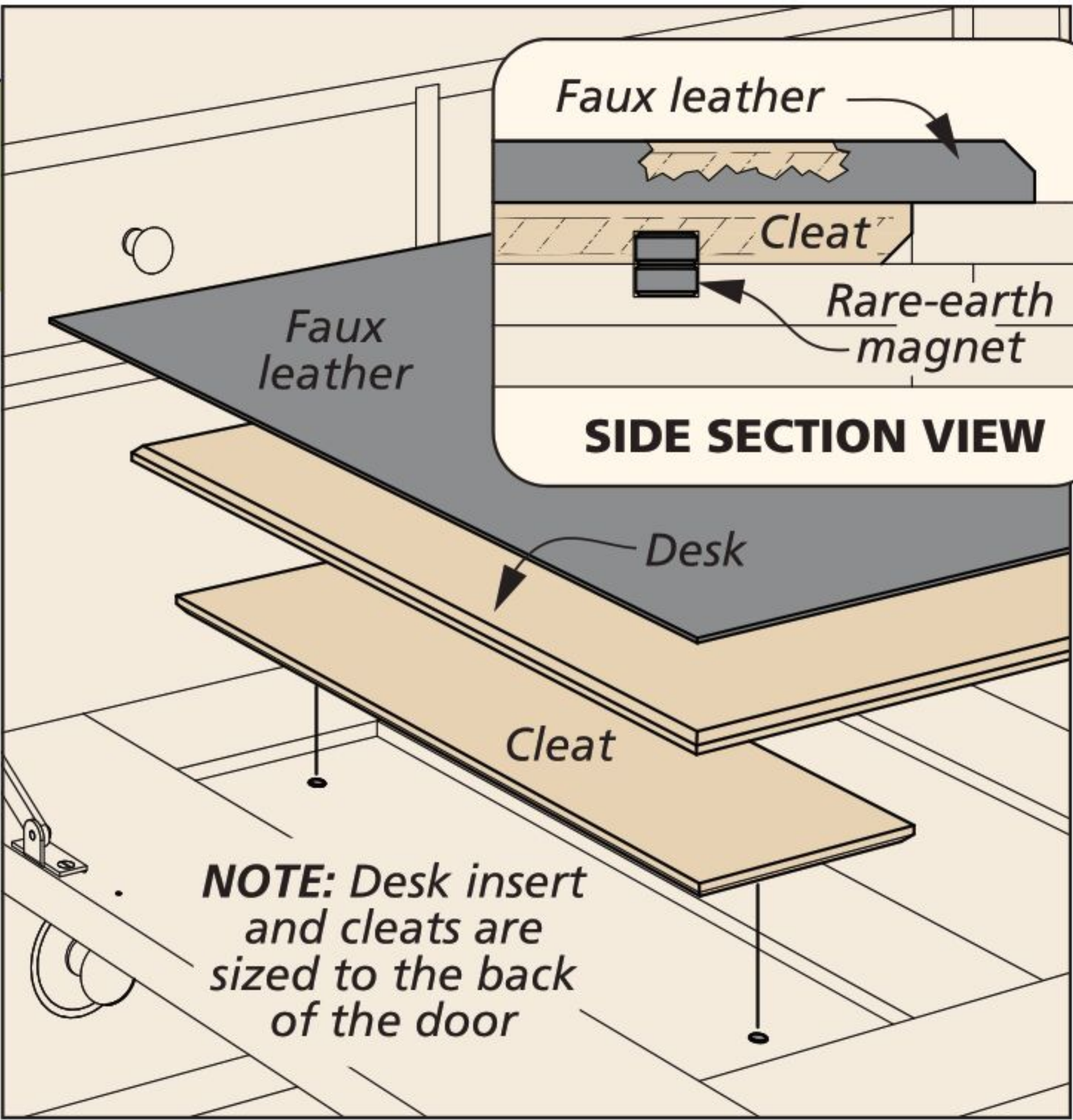
To locate the strike plate on the top, rub some graphite on the bolt of the lock and use the key to press it into the surface of the top. Then remove the top and rout a deep mortise for the bolt of the lock, and a shallow one for the strike plate itself. Now you can permanently attach the top.

The desk insert you see to the right can be added if you like. However you use the organizer, it's sure to impress **W**

DESK INSERT



▲ For comfort and ease of use, create a level writing surface with this padded insert .



The Layers. Rare-earth magnets hold the cleats that are glued to the desk panel.

Materials, Supplies & Cutting Diagram

A Sides (2)	$\frac{3}{4}$ x 15 $\frac{1}{2}$ - 46	L Large Drawer Sides (2)	$\frac{1}{2}$ x 4 $\frac{3}{4}$ - 13 $\frac{3}{4}$	W Top (1)	$\frac{3}{4}$ x 17 - 31 $\frac{1}{2}$
B Top Divider (1)	$\frac{3}{4}$ x 13 $\frac{1}{2}$ - 26 $\frac{1}{4}$	M Large Drawer Btm. (1)	$\frac{1}{4}$ ply. - 13 $\frac{1}{4}$ x 25	• (2) 1$\frac{1}{4}$" Pocket Hole Screws • (18) #8 x $\frac{3}{4}$" Fh Woodscrews • (16) #8 x 1$\frac{1}{4}$" Fh Woodscrews • (2) $\frac{1}{8}$" x 6 -6 Maple for Inlay Rings • (2) $\frac{3}{4}$" Drawer Knobs • (2) 1" Drawer Knobs • (1) Keyhole Escutcheon • (1) Cabinet Lock & Strike Plate • (2) Soss Hinges • (2) 4" Lid Stays	
C Dividers (3)	$\frac{3}{4}$ x 14 $\frac{1}{4}$ - 26 $\frac{1}{4}$	N Drawer Fronts (2)	$\frac{3}{4}$ x 3 - 12		
D Apron (1)	$\frac{3}{4}$ x 5 $\frac{3}{4}$ - 26 $\frac{1}{4}$	O Drawer Backs (2)	$\frac{1}{2}$ x 3 - 11 $\frac{1}{2}$		
E Case Top/Bottom (2)	$\frac{1}{2}$ x 12 $\frac{1}{4}$ - 25 $\frac{1}{2}$	P Drawer Sides (4)	$\frac{1}{2}$ x 3 - 12		
F Case Sides/Divider (3)	$\frac{1}{2}$ x 12 $\frac{1}{4}$ - 3 $\frac{1}{2}$	Q Drawer Bottoms (2)	$\frac{1}{4}$ ply. - 11 $\frac{1}{2}$ x 11 $\frac{1}{2}$		
G Drawer Guides (4)	$\frac{1}{4}$ x $\frac{3}{4}$ - 11	R Stiles (2)	$\frac{3}{4}$ x 4 - 17		
H Large Drawer Guides (2)	$\frac{1}{4}$ x $\frac{3}{4}$ - 12 $\frac{3}{4}$	S Center Stiles (2)	$\frac{3}{4}$ x 2 $\frac{1}{2}$ - 12 $\frac{1}{2}$		
I Back (1)	$\frac{1}{2}$ ply. - 26 $\frac{1}{4}$ x 38	T Rails (2)	$\frac{3}{4}$ x 2 $\frac{1}{2}$ - 18 $\frac{1}{2}$		
J Large Drawer Front (1)	$\frac{3}{4}$ x 4 $\frac{3}{4}$ - 25 $\frac{1}{2}$	U Panels (2)	$\frac{1}{4}$ x 4 $\frac{3}{4}$ - 12 $\frac{1}{2}$		
K Large Drawer Back (1)	$\frac{1}{2}$ x 4 $\frac{3}{4}$ - 25	V Center Panel (1)	$\frac{1}{4}$ x 5 - 12 $\frac{1}{2}$		

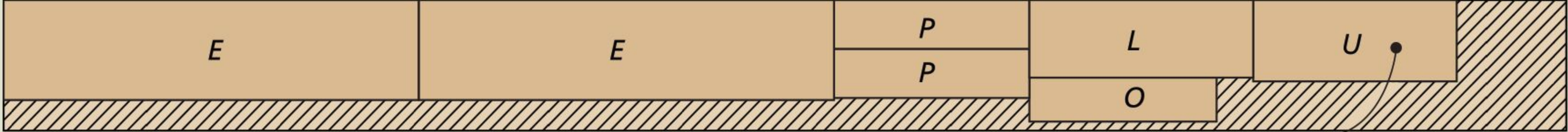
$\frac{3}{4}$ " x 6" - 96" Cherry (Three Boards @ 4.0 Bd. Ft. Each)



$\frac{3}{4}$ " x 6" - 96" Cherry (4.0 Bd. Ft.)



$\frac{1}{2}$ " x 8" - 96" Cherry (Two Boards @ 5.3 Sq. Ft. Each)

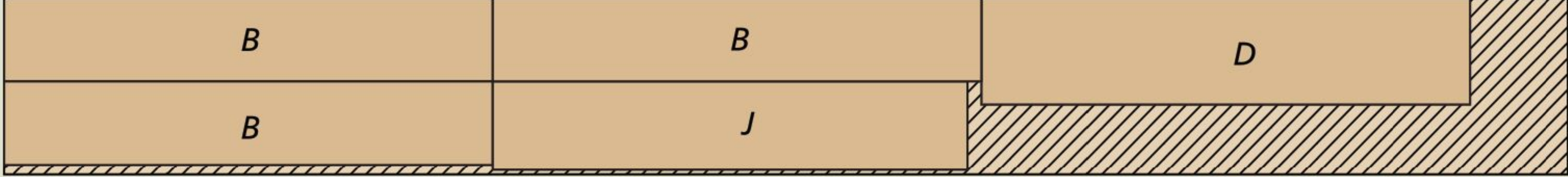


$\frac{3}{4}$ " x 5" - 84" Cherry (Three Boards @ 2.9 Bd. Ft. Each)

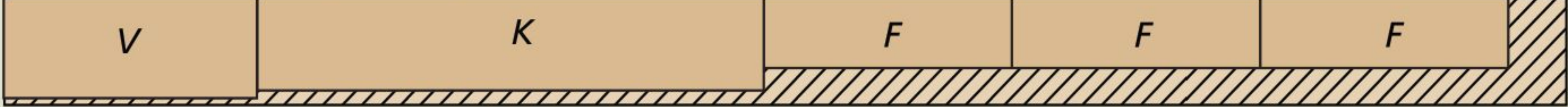


Resawn to 2, $\frac{1}{4}$ "-thick boards

$\frac{3}{4}$ " x 9 $\frac{1}{2}$ " - 84" Cherry (5.5 Bd. Ft.)



$\frac{1}{2}$ " x 5 $\frac{1}{2}$ " - 78" Cherry (3.0 Sq. Ft.)



$\frac{3}{4}$ " x 4 $\frac{1}{2}$ " - 66" Cherry (Two Boards @ 2.1 Bd. Ft. Each)



ALSO NEEDED: One 48" x 48" Sheet of $\frac{1}{4}$ " Cherry Plywood, One 48" x 48" Sheet of $\frac{1}{2}$ " Cherry Plywood

Laminated End Table

Here's a refreshing break from a traditional project. This end table has you sculpting wood in a way that's more like pottery than woodworking.



For full-size
base patterns and
other templates,
go to:
Woodsmith.com/259

The end table you see above was inspired by the work of Wendell Castle. To many he was known as the father of the art furniture movement. At the core of most all of his projects are layers of wood strategically laminated together then shaped into organic, liquid-like pieces that seem to defy gravity.

This end table is not quite that ambitious. But the base has the same laminated DNA as it's fancier siblings, so making those layers is where you'll start.

1"-thick walnut sized from 5/4 boards make up the 23 layers of the body of the end table base. You'll need eight templates to shape the layers of the base. The full-size patterns are online at Woodsmith.com/259.

MASTER TEMPLATE. To make the whole base uniform in shape, you want the outer profile of each layer of the lamination to match perfectly. To ensure that outcome, you'll make the largest template first, then use it to make the others. So, after you

print out all the patterns, focus on the master template.

The box at the bottom of the next page shows the first step of making the template (Figure 1). A belt or disc sander brings the template to its final shape. After making the other templates, you can start to work on shaping the blanks for each layer.

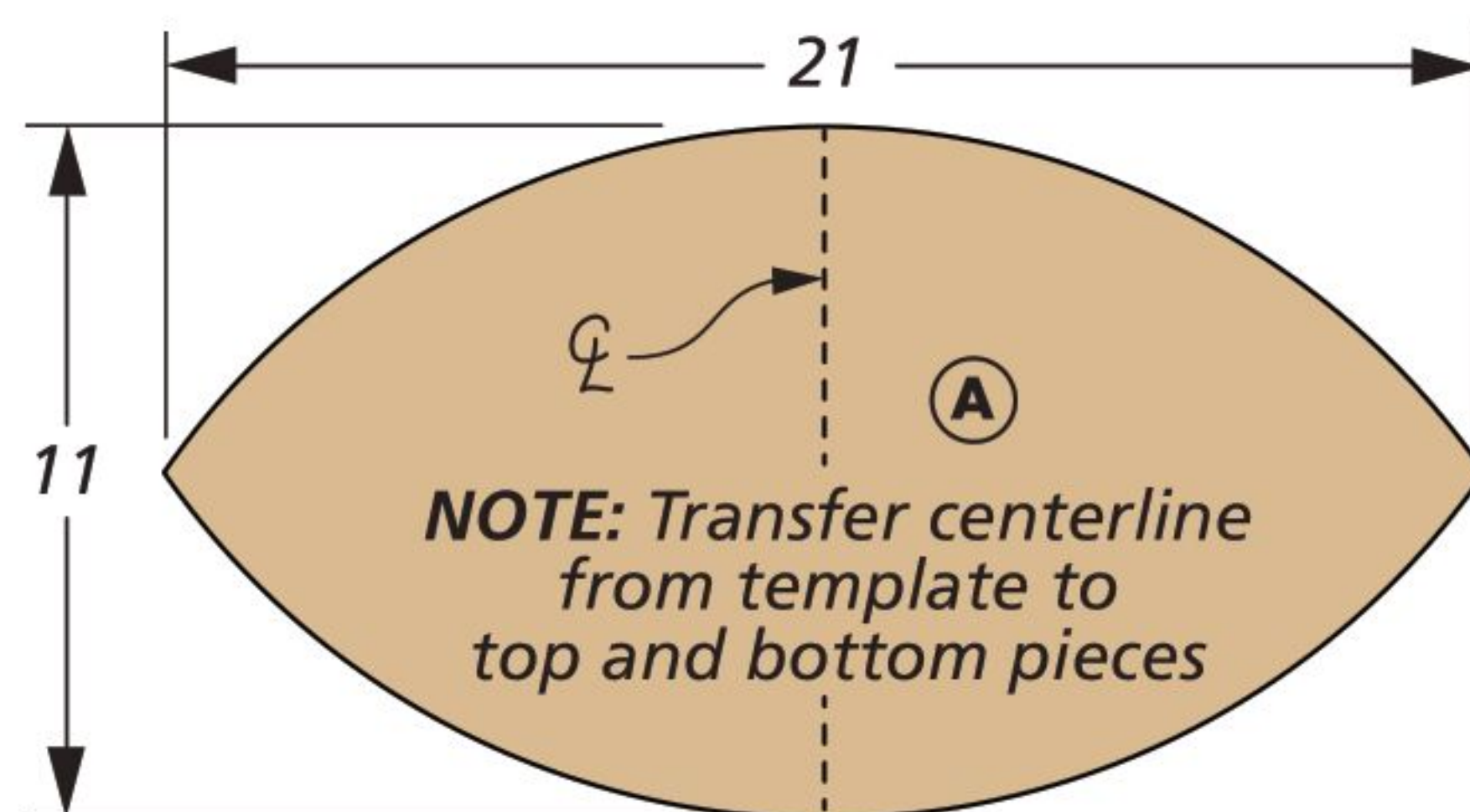
WIDE WALNUT. I started with boards that are the full width of the templates. The reasoning here is to avoid having joint lines in any of the layers. It's a

subtle thing, but the vertical lines from a glued-up board can be surprisingly distracting. Finding boards this wide means you're going to have some sap wood showing in the base. I'm okay with that. As you see in the main photo on the previous page it adds nice contrast and visual interest to the project.

LAYING OUT THE PARTS. Use the templates and a standard sized permanent marker to trace the shapes on the boards. Be mindful of grain direction as you go along. To go easy on your budget, fill in the boards with the smaller pieces between the larger ones where you can. There are a lot of parts involved in the making of the base, so it's wise to label and number each part along the way.

ROUGHING OUT. Before moving to the band saw, I cut each part free with a jig saw. Then, cut out each piece to the outer edge of the marker line (Figure 2, below). Now it's time to head to the router table to make the final shapes.

Double-sided tape holds the template to the blanks. To make a really smooth edge, I used a three-fluted $\frac{1}{2}$ " by $1\frac{1}{2}$ "



NOTE: All of the templates used to make the end table derive from the shape you see above

flush-trim bit in the router table to shape the parts (Figure 3 below). Repeat the process for all the parts.

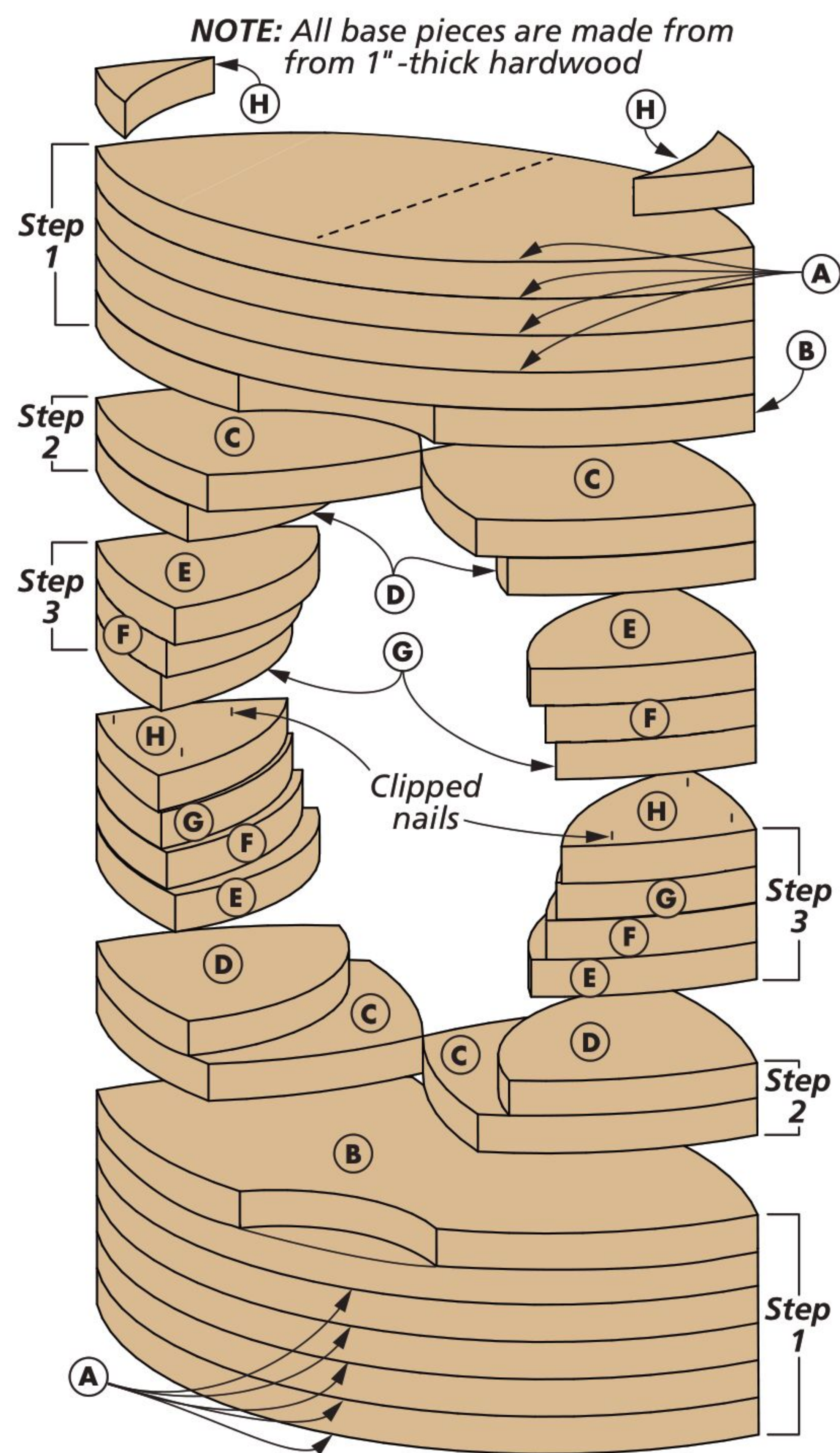
GLUE UP SEQUENCE.

The drawing to the right shows how to bring the base together. First the two halves are assembled in three steps. Step one is the solid pieces at the top and bottom of the base. Apply glue around the perimeter of each piece and pin nail them one at a time with 18# $1\frac{1}{2}$ " pin nails. Then clamp up the section.

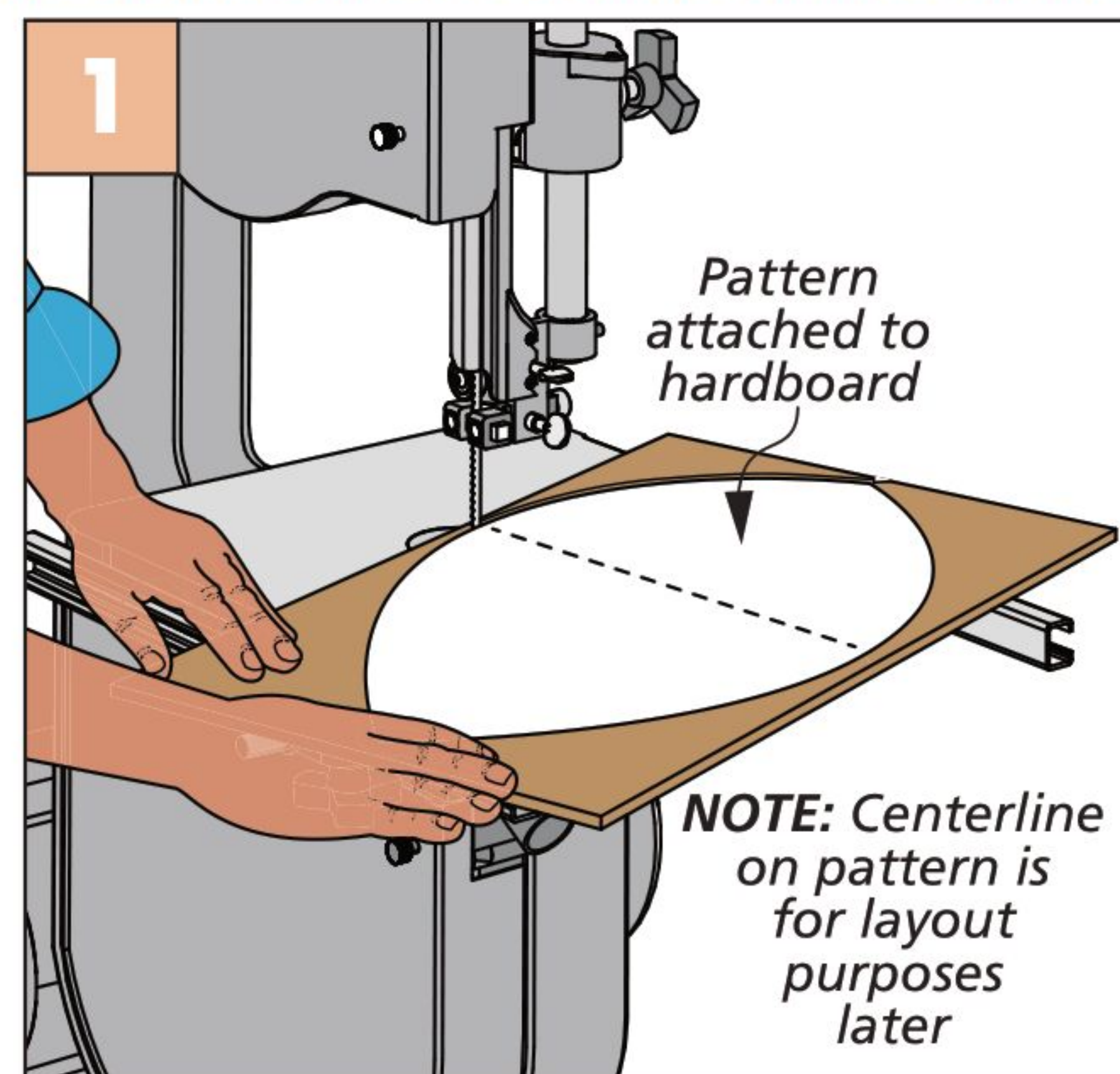
Now add to each of those sections the pieces bracketed in step two. Then repeat the process with the pieces in step three.

When each half is complete, you're ready to bring them together. One trick I've learned to help prevent headaches during a

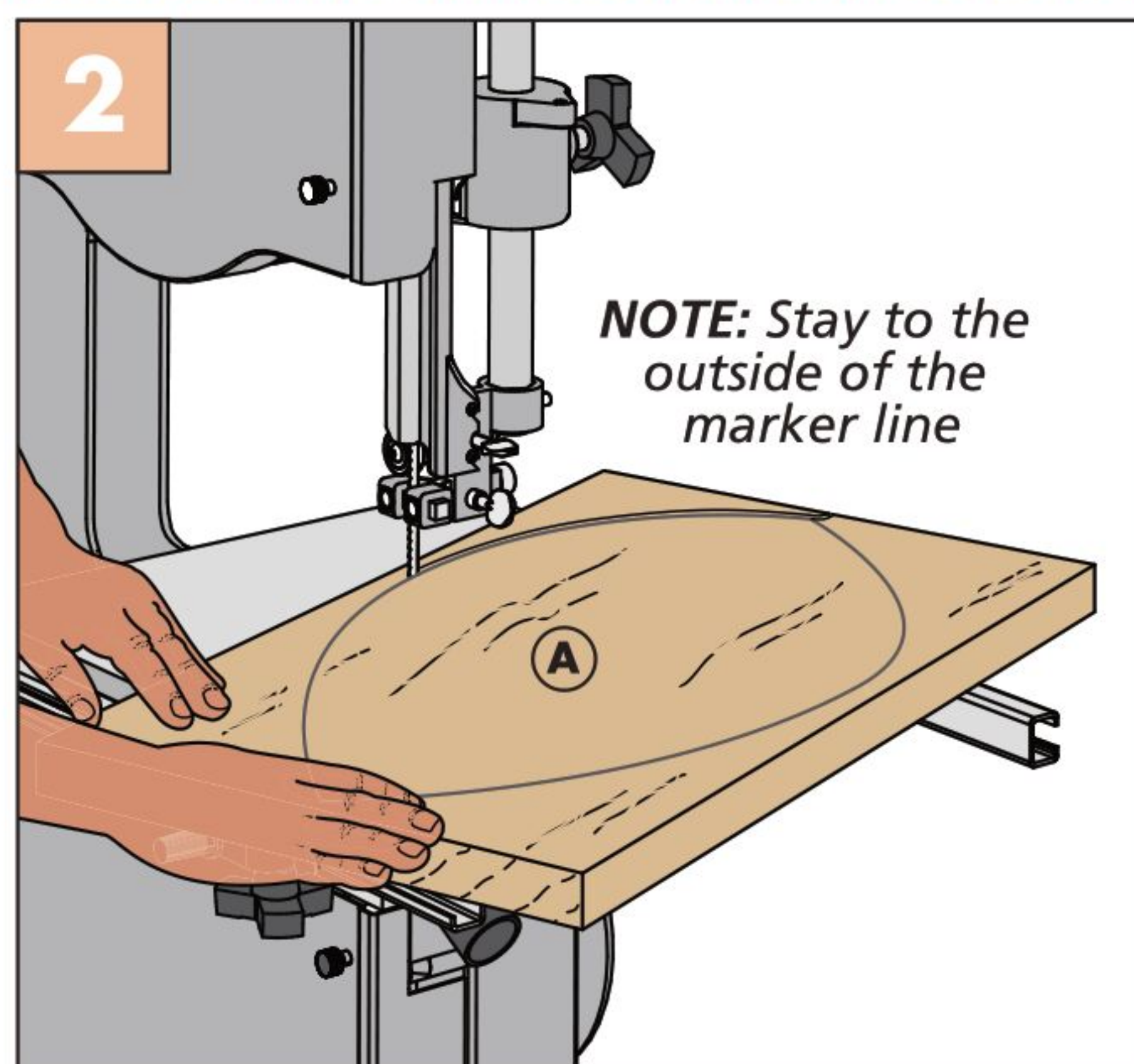
glue up is to use a clipped pin nail or brad in one of the halves. This prevents them from shifting apart while you're clamping them together. Now you're ready to do some carving.



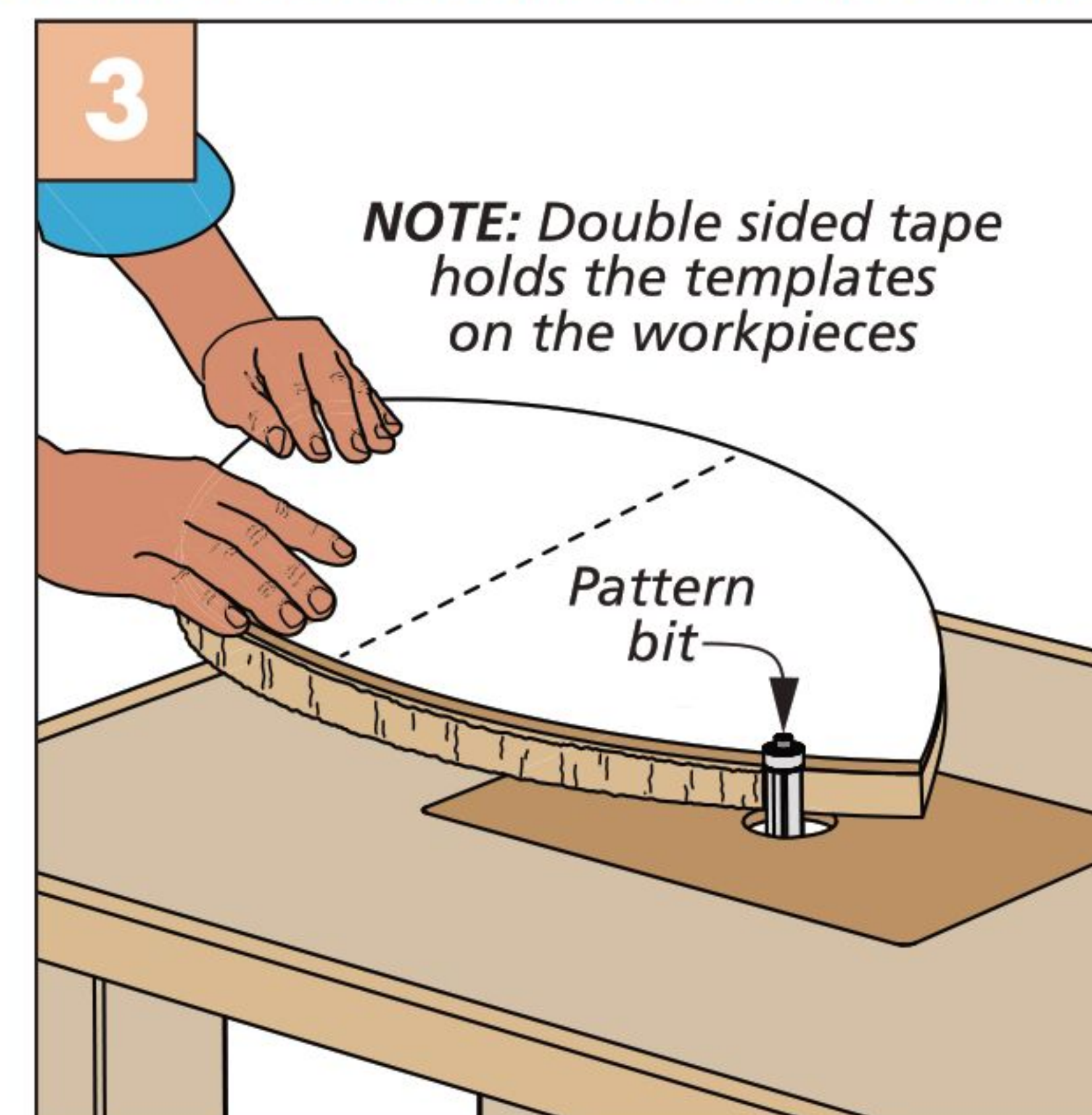
MAKING THE TEMPLATE & BASE LAYERS



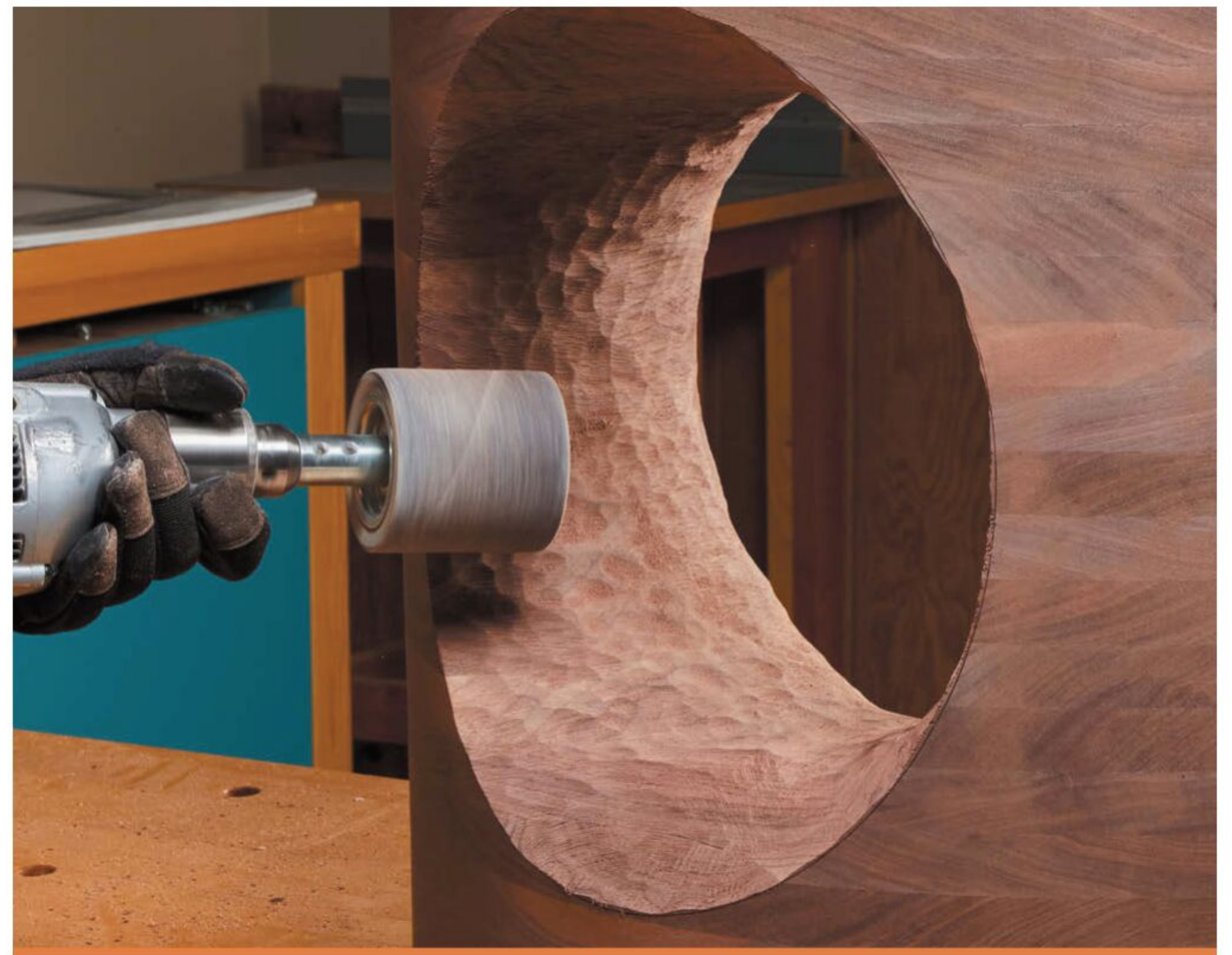
Master Template. The master template is roughed out at the band saw. Then the edges are sanded smooth.



Rough Cuts. After tracing the shape on the blank, cut it out at the band saw, staying on the waste side of the line.



The Finished Shape. Attach the template to the blank and make the final shape at the router table.



▲ The shaping of the base starts by knocking down the edges of each layer. As you see above, work from the outside in on each quadrant of the opening. Rotate and flip the base as you go.

▲ A sanding drum with an aggressive grade of paper (80 grit) attached to a large drill works well. When the ribs of the layered boards are removed, all that's left is some hand sanding.

A power carving disc works best in the beginning



Shaping the **BASE**

After packing away the clamps and cleaning up the mess of putting the base together, you're ready to make a brand new mess. This mess starts with sanding the exterior of the base smooth. If your glue-up went well this should be a breeze.

To prevent flat spots, sand in the direction of the arc of the base from side to side. For best results, sand with a progression of grits from 100 to 220.

After vacuuming the surface clean, it's time to draw centerlines in both directions on the sides of the base, as shown in the box below. To locate the

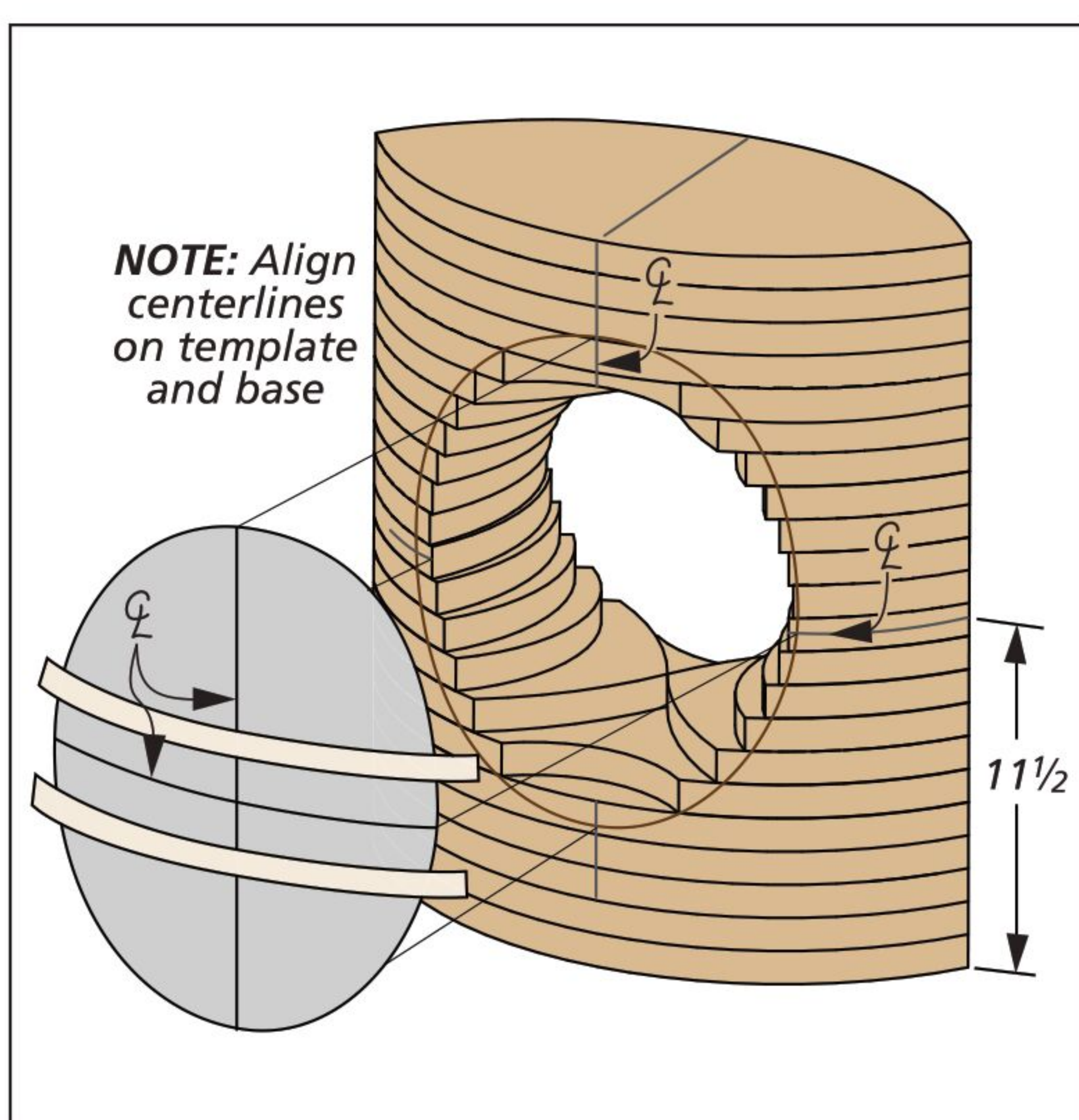
horizontal centerline, just measure up from the bottom. The vertical centerline is established by the marks you transfer from the master template. That will guarantee the ovals on either side of the base line up.

THREE TEMPLATES. It takes three templates to hone the look of the base (two of them are shown in the box to the left). The large outer template defines the edge of the oval that is centered on the surface of the base. The narrow curve template shown in the upper right drawing is used at the top of the base. To stiffen the templates, I used spray adhesive and attached them to poster board, then cut them to their final shape. Use a fine point brown marker to trace the outlines on to the base.

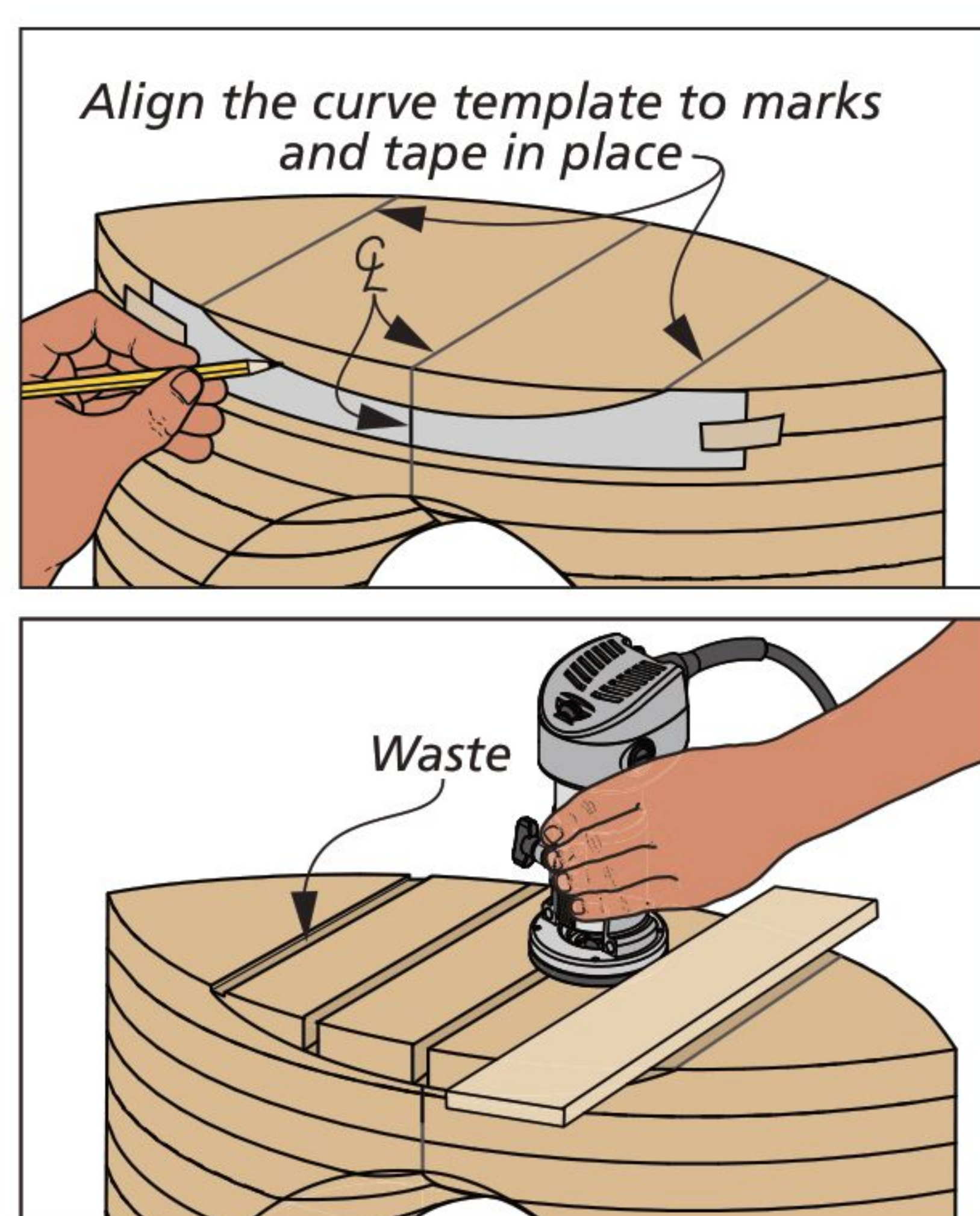
IT'S A GRIND. The photo above left shows how the shaping process starts. Use a grinder to create the rough shape from inside out one quadrant at a time.

Now is where the third template comes into play (see, I didn't forget it). It's a smaller variation of the big oval. You'll want to glue to a piece of $\frac{1}{2}$ " plywood that has finger holes. You use it as a loose guide to shape

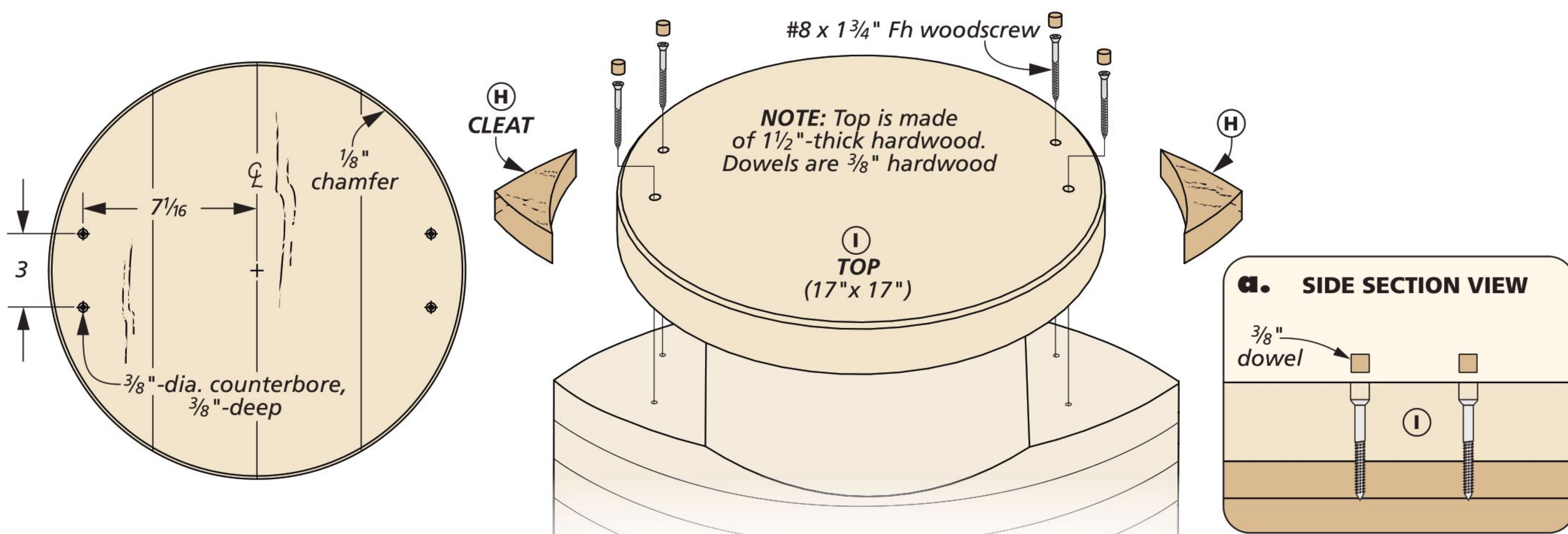
SHAPING WITH TEMPLATES



Attach the Oval. Tape holds the large oval template in place while you trace its profile onto the faces of the end table base.



Cut the Curve. The curve template is taped to the top of the base. Use your router and a straight bit to make grooves for carving depth guides.



the small opening in the center of the base. This step is firmly in the camp of artistic license.

After the grinding is done, use the sanding drum as the photo on the right shows. Then hand sand the interior the same way you did the outer surface.

CREATE THE CURVE. Creating the curve for the top is shown in the two smaller drawings on the previous page. The grooves you make in the bottom drawing are the landmarks that roughly guide the grinding depth. Then use the sanding drum and the sandpaper process to complete the base. At this point, it's time to make the top for the end table.

THE TOP
To make the top, start by gluing up four 8/4 boards. Use a router trammel and straight bit on half of the circle shape. Then finish with a pattern bit that follows the work done by the trammel. Ease the top edge and drill the counterbored shank holes you see in detail 'a' above. Now you're ready to fit and shape the cleats.

CLEATS. The cleats that nestle up to the top are a custom fit that involves the top. The box below walks you through the steps. When the cleats are shaped, glue them in place on the base. Next it's time to attach the top to the base. First, set the top in

place between the cleats and drill pilot holes in the base. But don't attach the top quite yet.

FINISHING PROCESS. It would be difficult to apply finish in the narrow gap between the base and the top if they were attached. To avoid all that frustration, I applied oil (seal-a-cell) to the base and the underside of top. When that was dry, I sprayed both parts with two coats of lacquer.

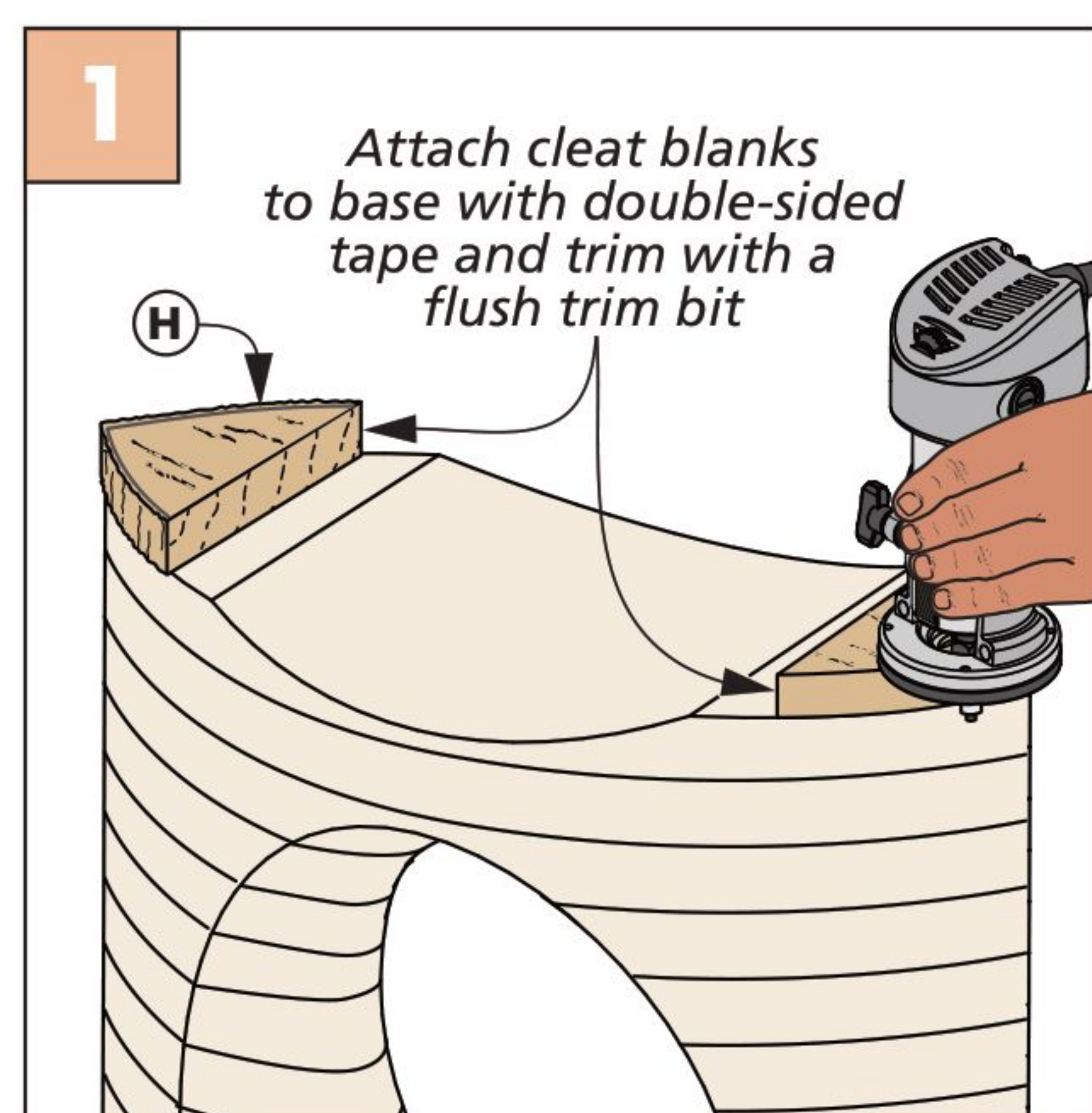
Now it's time to screw the top to the base and glue walnut plugs in place. After sanding them smooth, oil and lacquer the top. There you have it — an end table with an artistic soul. **W**



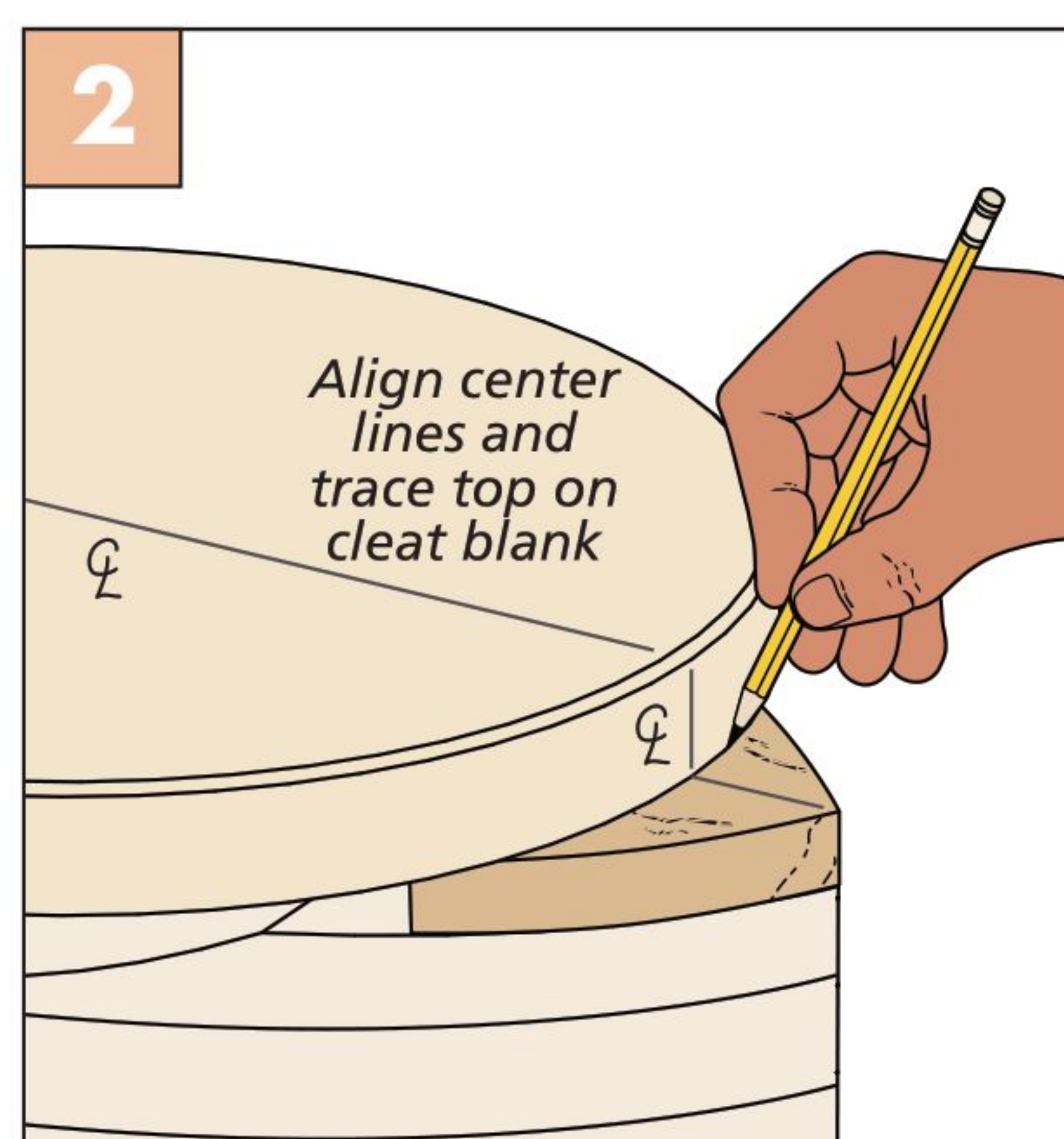
For cutting diagram for this end table, go to:

Woodsmith.com/259

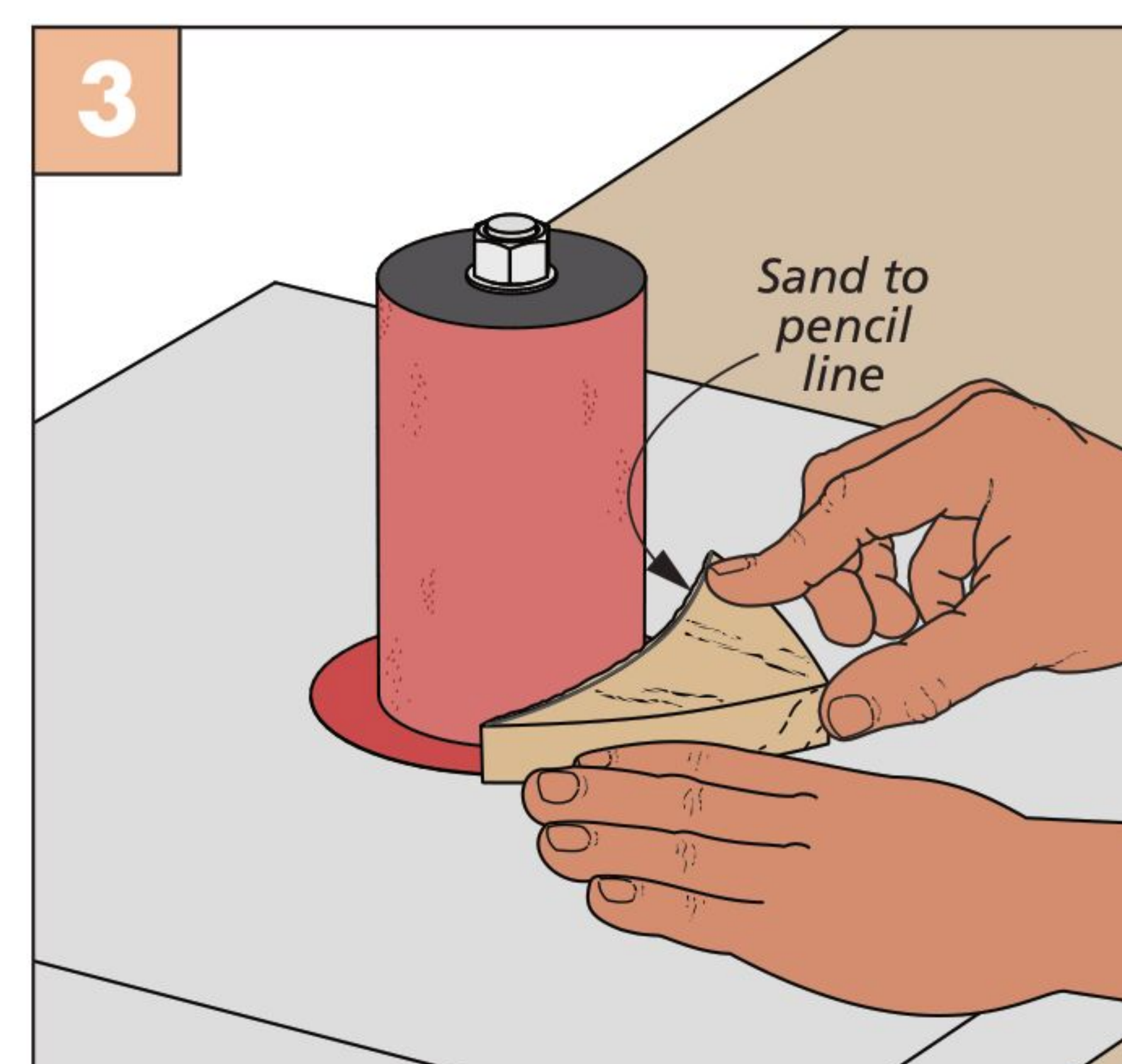
FITTING THE CLEATS



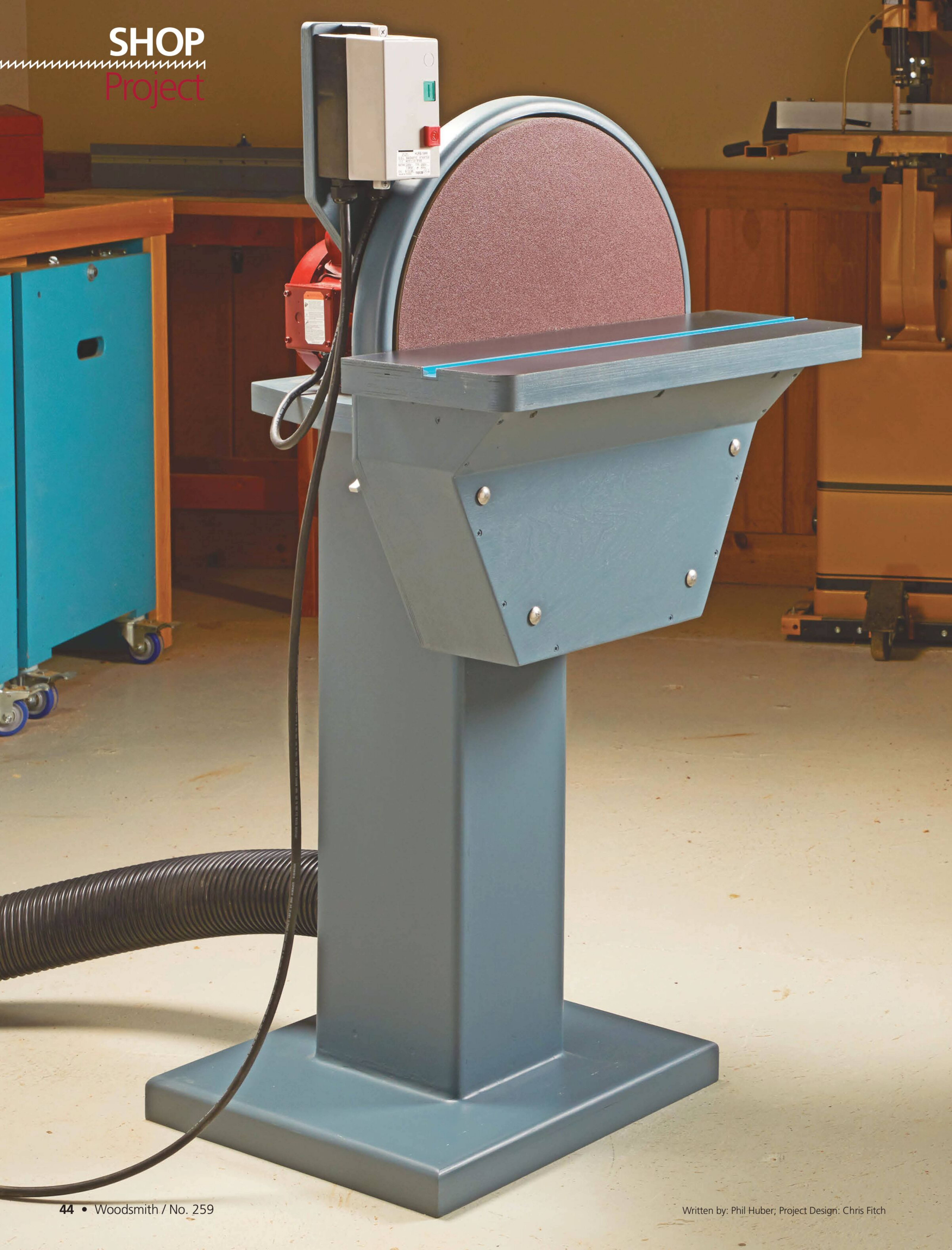
Outer Edges First. Temporarily attach the cleats to the top to shape their outer edges.



Inside Edge. First, set the top in place on the cleats. Then use a sharp pencil to trace the top's shape.



Inside Shape. A drum sander quickly shapes the inside edges of the cleats. Then glue the cleats to the base.



20" Disc Sander

This high-end, custom power tool pays big dividends in your workshop. All it takes is a small investment in shop time and common materials.

Top-of-the-line tools exert a strong attraction to woodworkers. Especially when combined in equal parts with can-do enthusiasm, and a sense of thriftiness. For evidence, take a look at any of the “old-iron” restorations you can find online.

A few years ago, *ShopNotes* featured a floor-standing 12" disc sander that proved pretty popular. Chris Fitch offered an upgrade: How about a 20" model? Other than one-upmanship, the reason to feature this project is that 12" commercial sanders are easier (and cheaper) to come by. But building your own 20" model allows you to maximize the savings potential.

This sander offers a study of contrasts: a 20" disc is larger than you can typically find, but doesn't take up much more space than a common 12" machine. Modestly priced building materials work together to create a sander that runs like vintage cast-iron brutes.

Perhaps the biggest contrast is that while the big disc is capable of removing a lot of wood in a hurry, this tool excels at fine details and finessing project parts. The rigid disc allows you to adjust a miter for a perfect fit. You can also create a flat, square edge on a workpiece or even flatten the bottom of boxes and other assemblies.

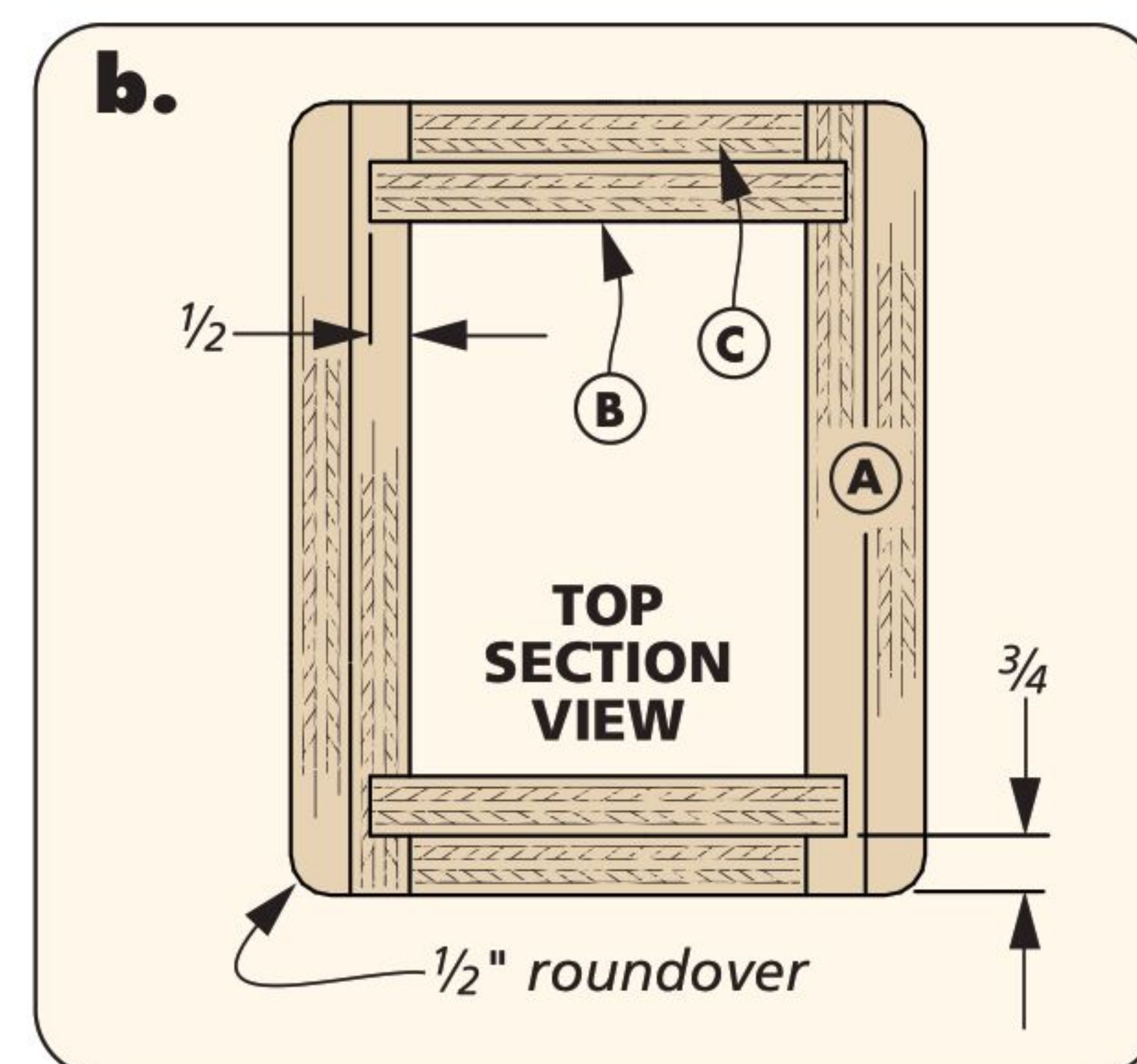
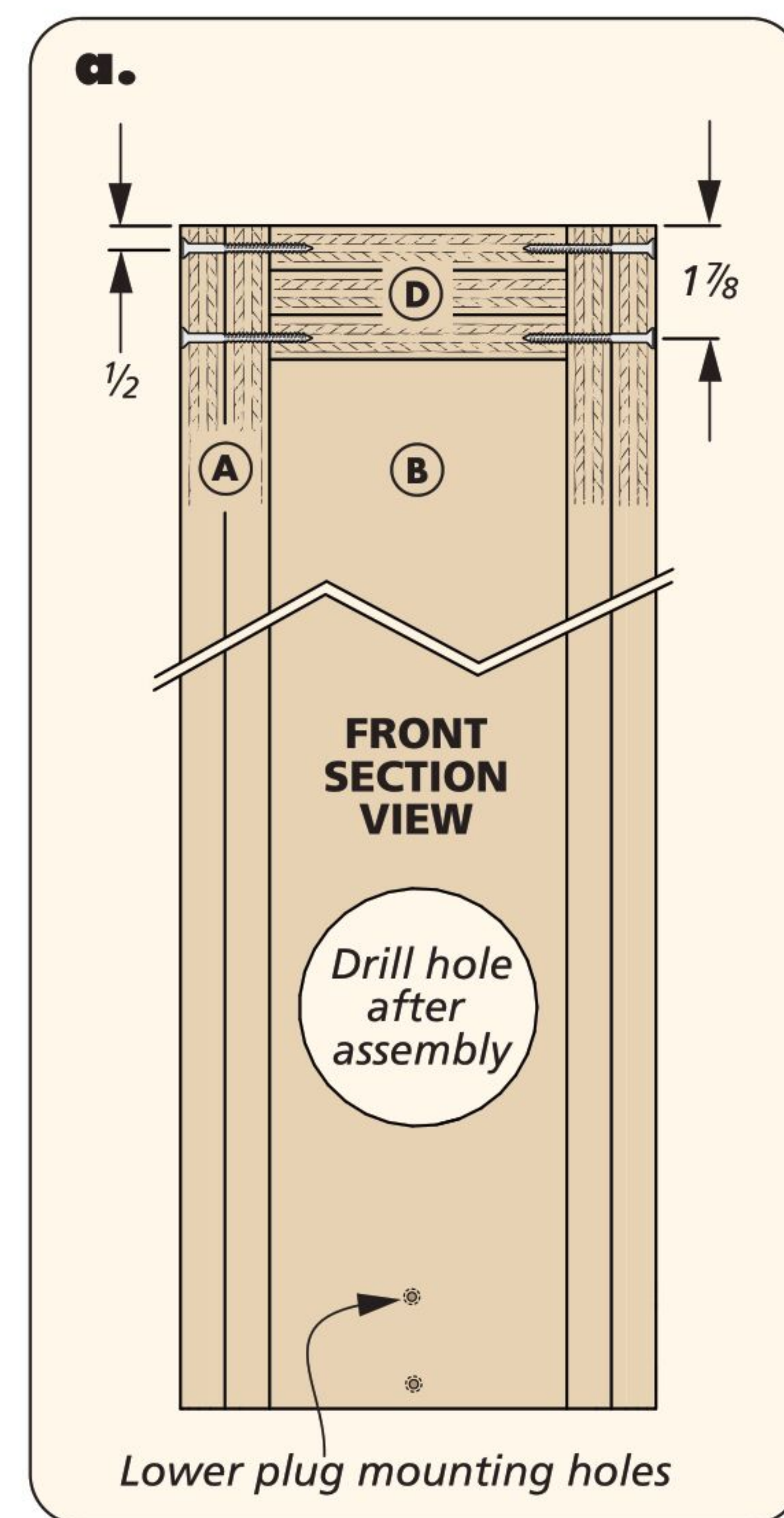
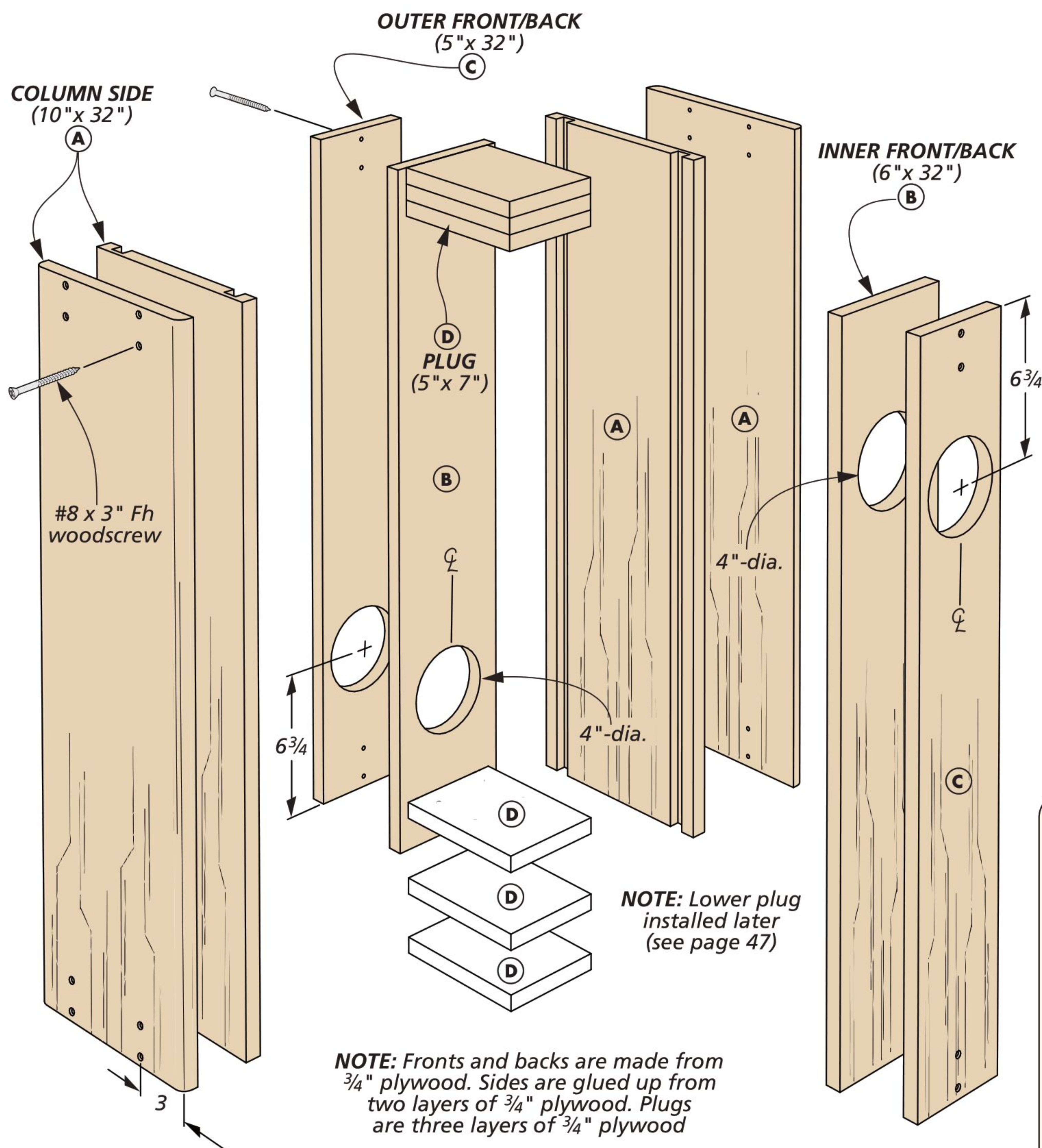
In the spirit of full disclosure, we splurged on a 220V motor to provide the oomph to keep the disc from bogging down. It's the priciest part of the project, but you're still coming out ahead over an industrial machine. If you're ready to build a hot-rod of a power tool, let's dive in.



▲ Plastic laminate covering the table offers a durable worksurface. A miter gauge track increases control for fine-tuning project parts.

▼ A big 220V (or 221 — whatever it takes) motor drives the disc for efficient stock removal. Spending a little extra money here makes this a better shop-made tool.





A strong CENTER COLUMN

The structure of the sander as a woodworking project breaks down into four primary components: the column, the hood, the disc, and the table. This focuses the construction. All of the sections feature straightforward cut and paste assemblies that keep the process moving along.

MATERIALS. Let's take a moment to talk about materials here. The goal is creating a stout tool that performs well. At the same time, we want to save some money, too. So sheet materials like MDF and plywood make up the bulk of the project parts.

In many cases, it doesn't

matter which you choose (or even if you go with a mix and match approach to maximize the yield from your scrap bin). A coat of paint unifies the look of the whole thing.

Inexpensive MDF is flat and heavy which helps absorb vibrations. Plywood on the other hand, offers greater strength.

If you go the plywood route, take care to select sheets that are flat. We've also had some plywood in the shop that weighed a lot less than similar sheets. What at first seemed like an advantage, turned into a drawback. These flimsy sheets didn't hold up well to screws or simple joinery. In other words, beware.

COLUMN CONSTRUCTION. The drawing above shows how to start putting your newly purchased sheets to good use. The column is a hollow assembly made up of two layers.

Grooves cut into the sides of the inner layer register the parts and add glue strength, as shown in detail 'b.' The grooves are located to accept a second layer while creating a flush surface.

The second layer can then be cut and glued in place. This is a good time to employ a brad nailer, if you have one. It can keep you working without waiting for glue to dry.

SIMPLE DETAILS. Sure this is a shop tool, but it can still have a little

class. I routed a roundover along the edges of the column.

The next step is to drill holes on opposing faces of the column for dust collection. The hollow column serves as a plenum to channel dust collected at the table down to a port on the back side.

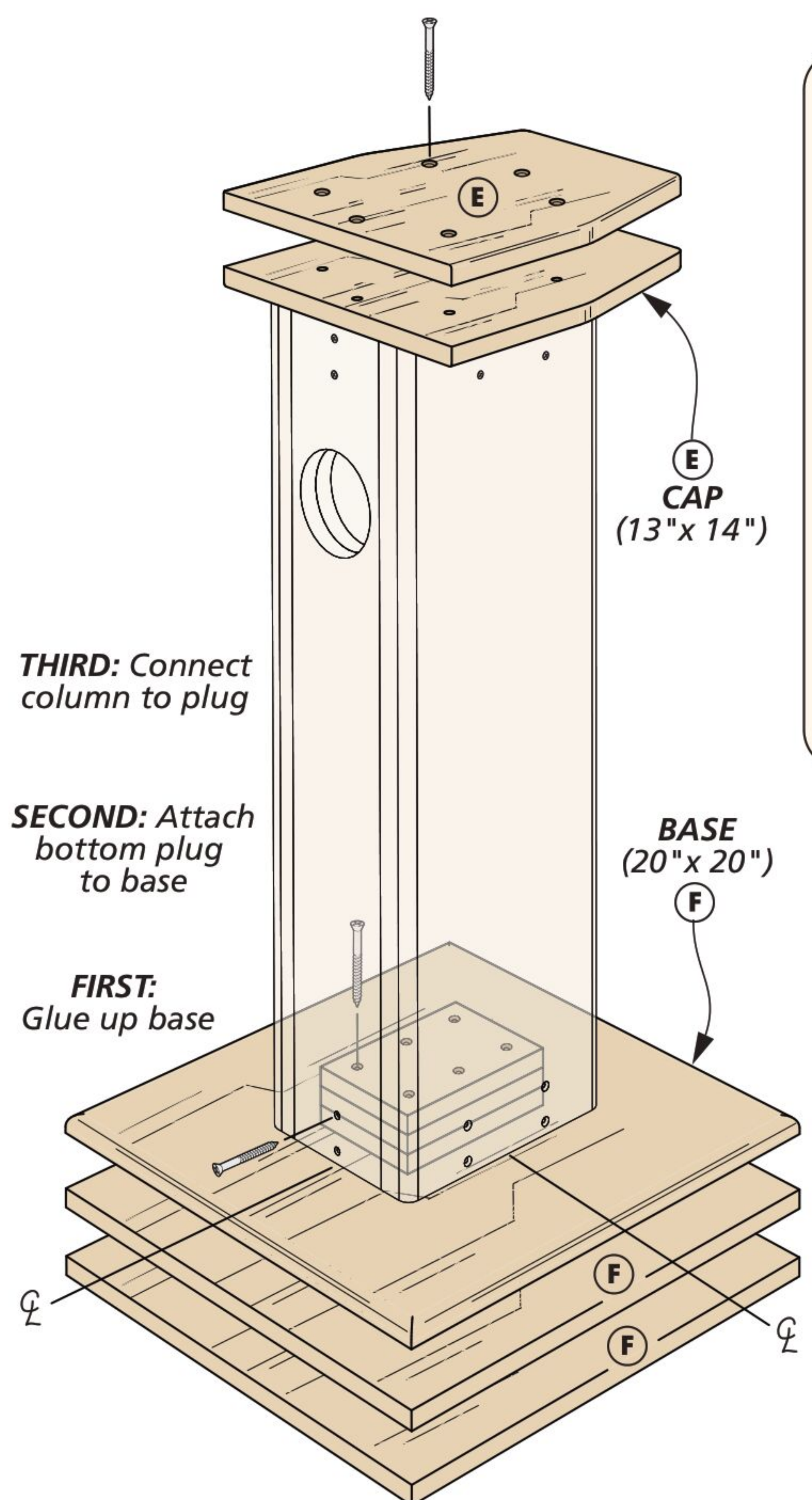
PLUGS. Three-layer plugs are the next items on the to-do list. These serve as anchor points in the top and bottom. Size them for a slip fit. The upper one can be glued and screwed in place now. Hold off on the bottom one.

CAP & BASE

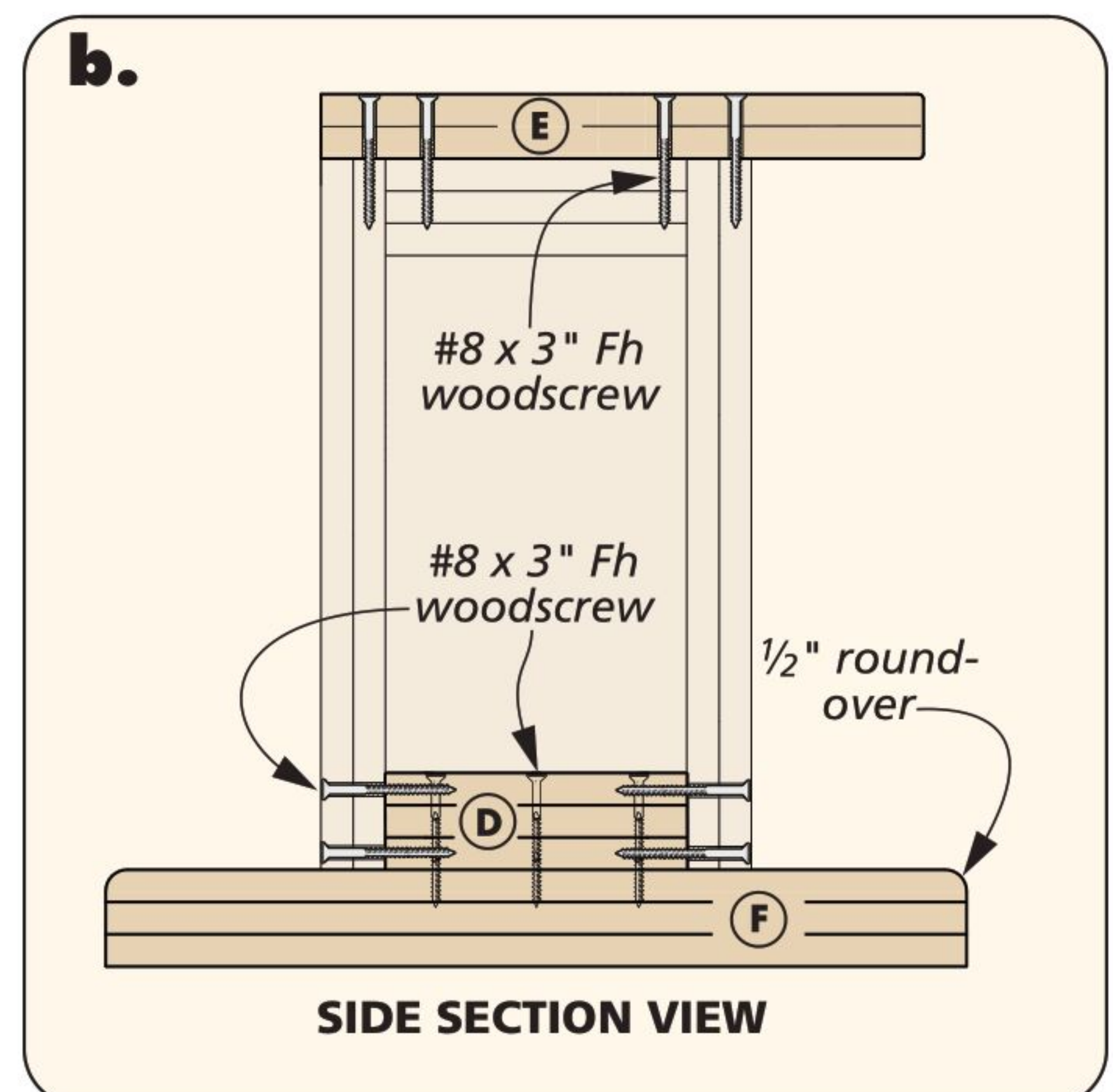
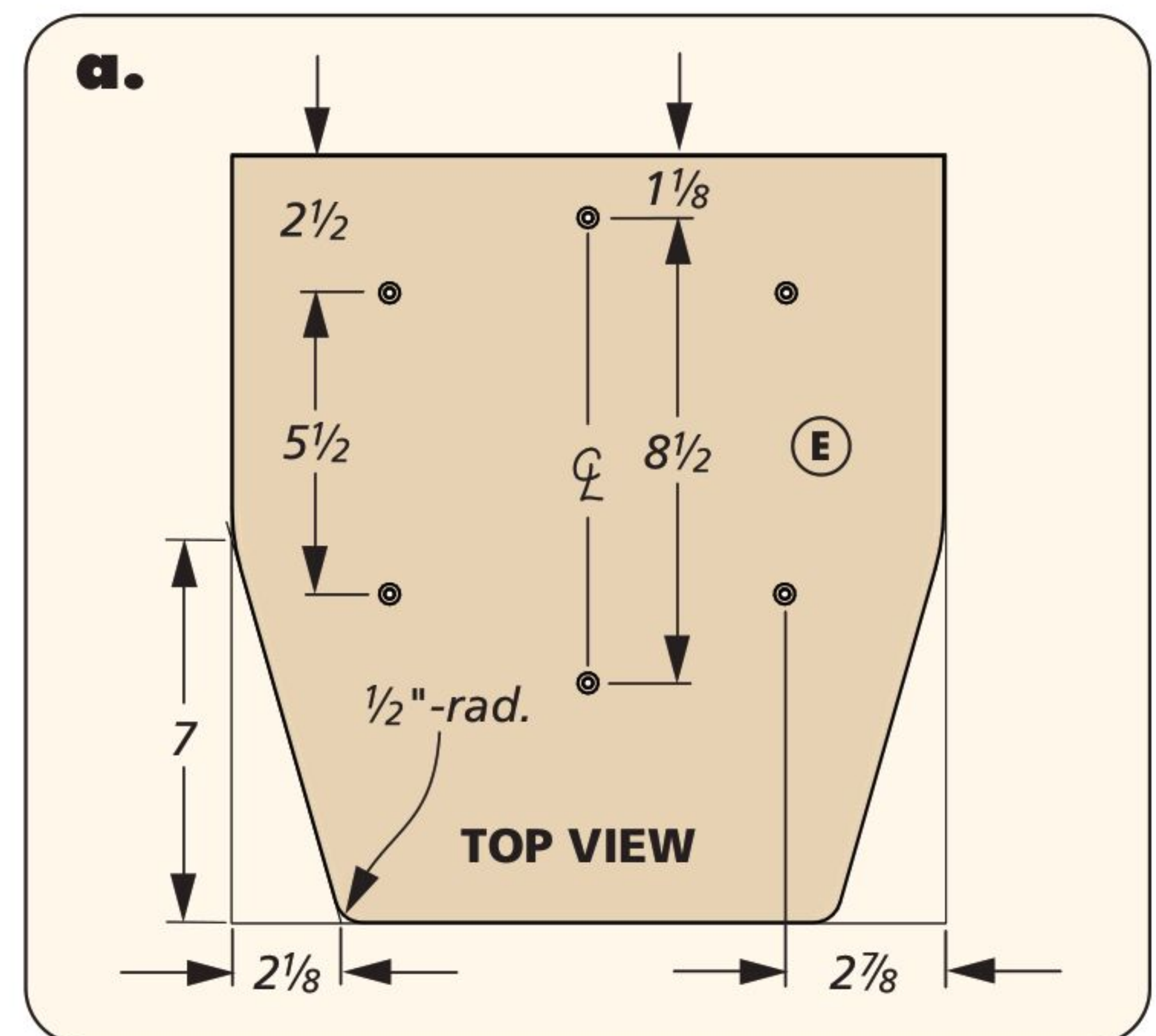
Do you notice that there's a theme developing in this project? Many of the pieces are made by doubling (or tripling) layers of plywood. The added mass increases rigidity even if it does add weight — not necessarily a bad thing. Just something to keep in mind as we go along.

CAP. I've been thinking of the column as the trunk of a tree. Up at the top, a thick cap forms a perch for our power supply. Detail 'a' has the numbers you need to cut it to size. Long woodscrews join it to the column, flush at the front.

BASE. The roots of the tree are formed by a thick base piece. In this case, three layers of



NOTE: Cap is made from two layers of $\frac{3}{4}$ " plywood. Base is three layers of $\frac{3}{4}$ " plywood



plywood. After trimming it to size, the upper edge is eased with a roundover.

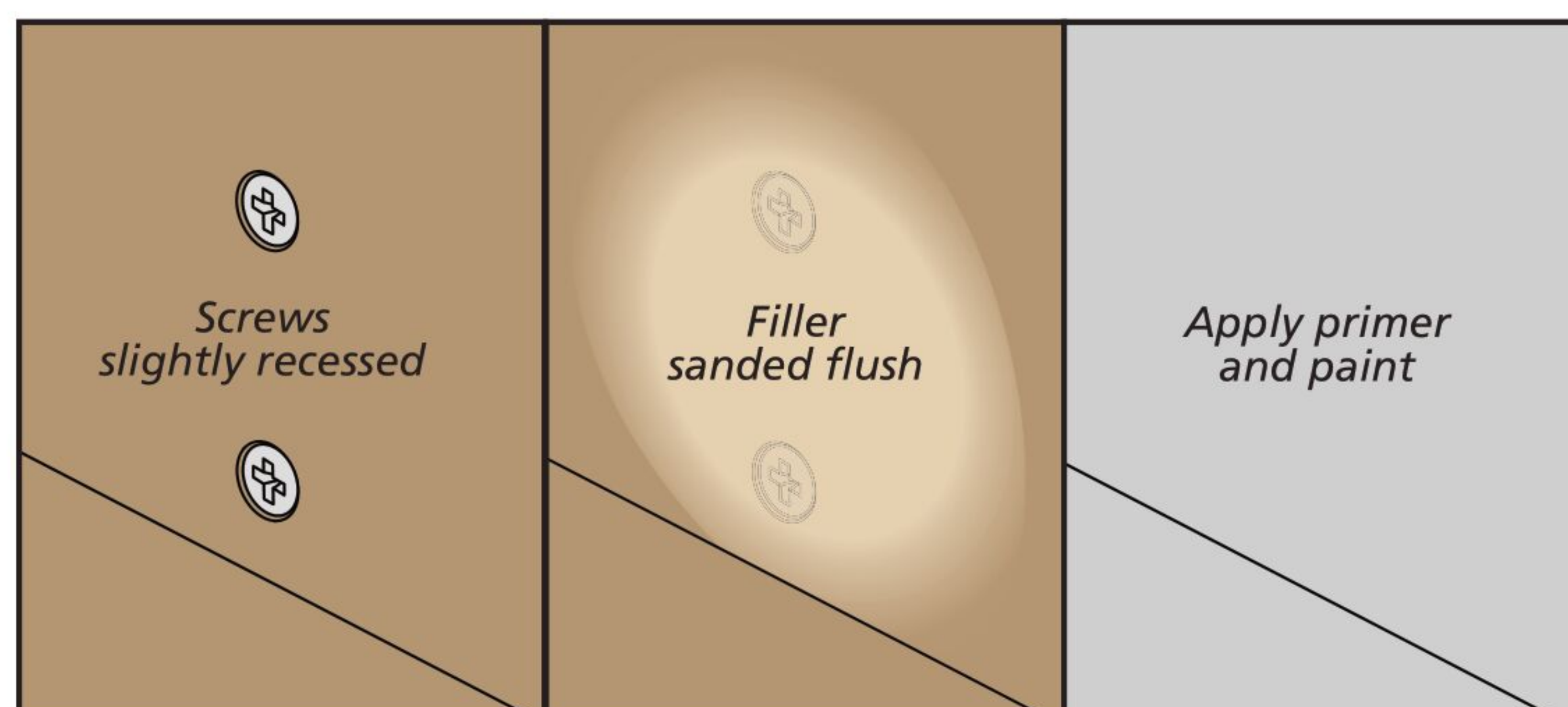
Now's the time to bring the parts together. Step one is to center the lower plug (remember

where you put it?) on the base with glue and long screws.

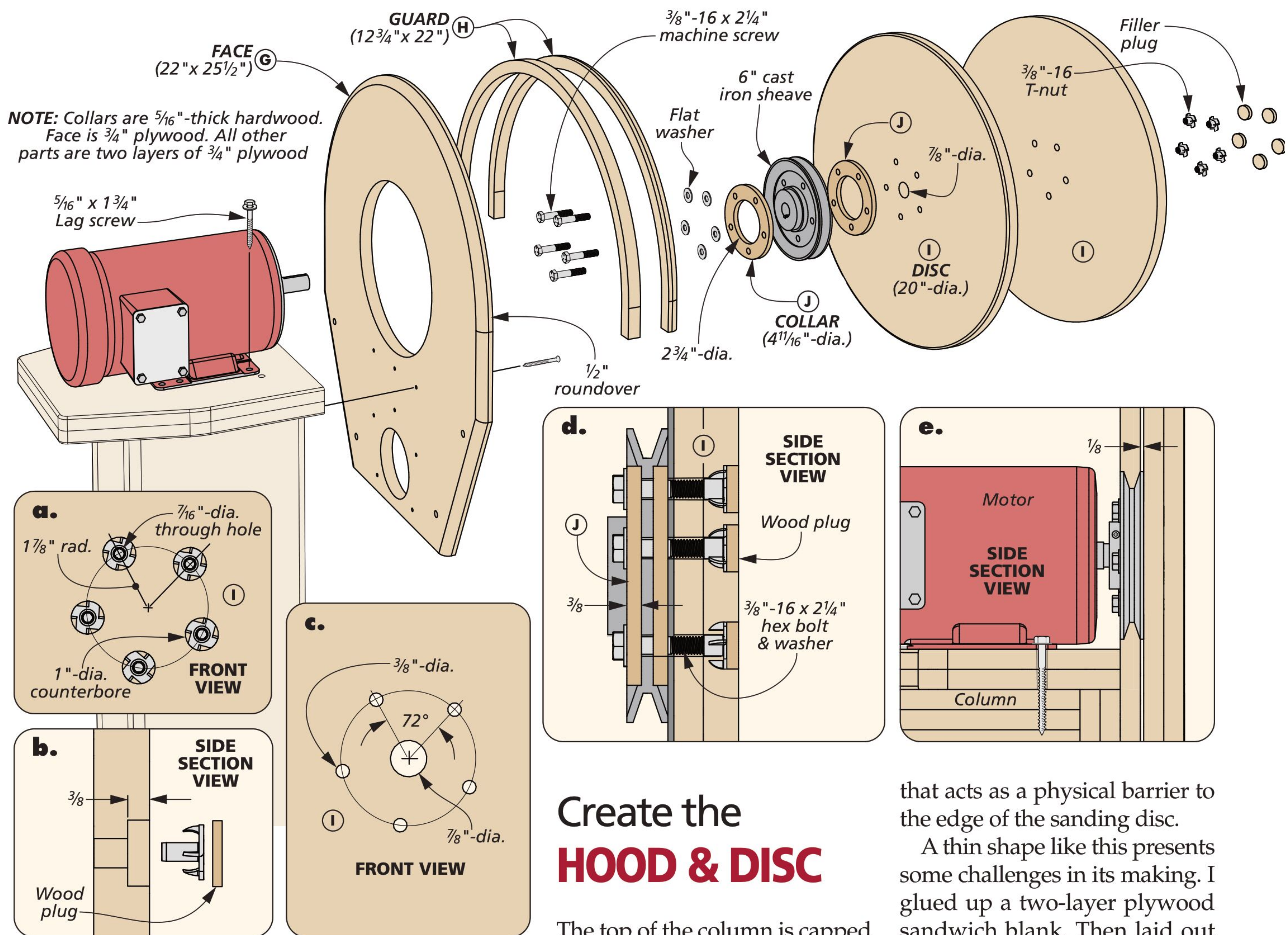
Step two is to slip the column over the plug. All the mass makes gravity your ally here. But make sure the column is square and tight to the base. Then close the deal by driving screws into the plug from all four sides, as shown in detail 'b.' Overkill? Perhaps. But I'll get over it.

PREP FOR PAINT. I love it when one of our shop-built tools gets confused with a manufactured model. A key part of that is a good paint job. Filling screw holes (box at left) and filling plywood end grain with spackle are all jobs to enhance the effect. One other detail project builder Steve Johnson snuck in was to add a fillet of thickened epoxy to ease the transition from the column to the base. This makes the base more cast iron in looks.

CONCEALING SCREW HOLES



▲ In a painted project like this, wood filler, or spackle can be used to cover screw heads. Make sure the screws are recessed slightly and overfill the holes. Sand the filler flush (middle) before applying primer and paint.



Create the HOOD & DISC

The top of the column is capped with the hood assembly. This serves a couple purposes. First, the hood forms a shroud that envelops the sanding disc. The second job of the hood is to serve as an anchor point for the table.

FACE. The large face is the place to begin this work. The drawings above and at left provide the groundwork for its role.

Starting from a rectangular blank, cut the opening for the motor and drill the dust collection hole near the bottom. The remaining holes are used to attach the face to the column as well as mounting the table. Then the face can be cut to its final shape. Rout a roundover on the back of the face to soften the sharp edges.

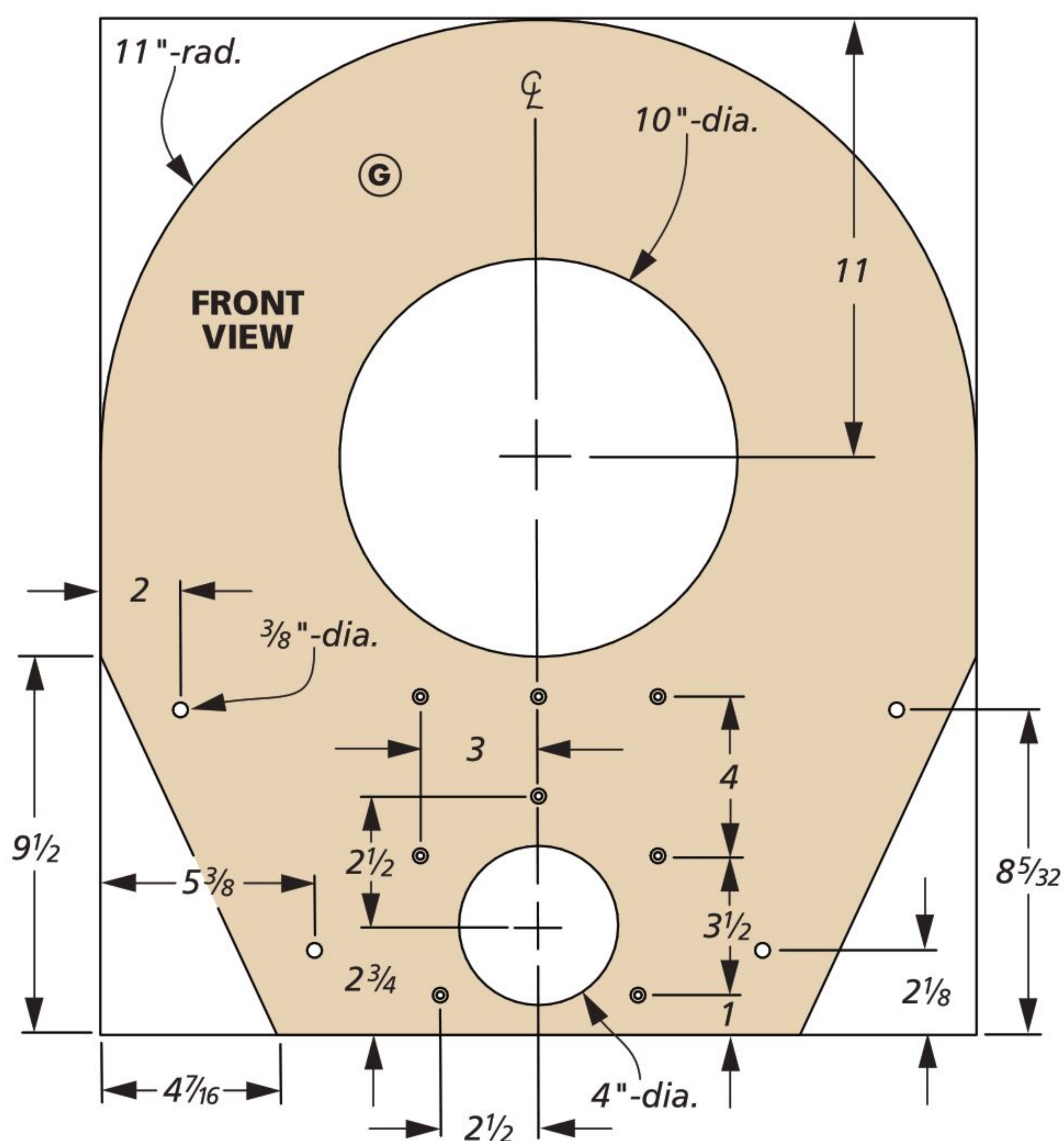
DISC GUARD. Attached to the front of the face is a two-layer rim

that acts as a physical barrier to the edge of the sanding disc.

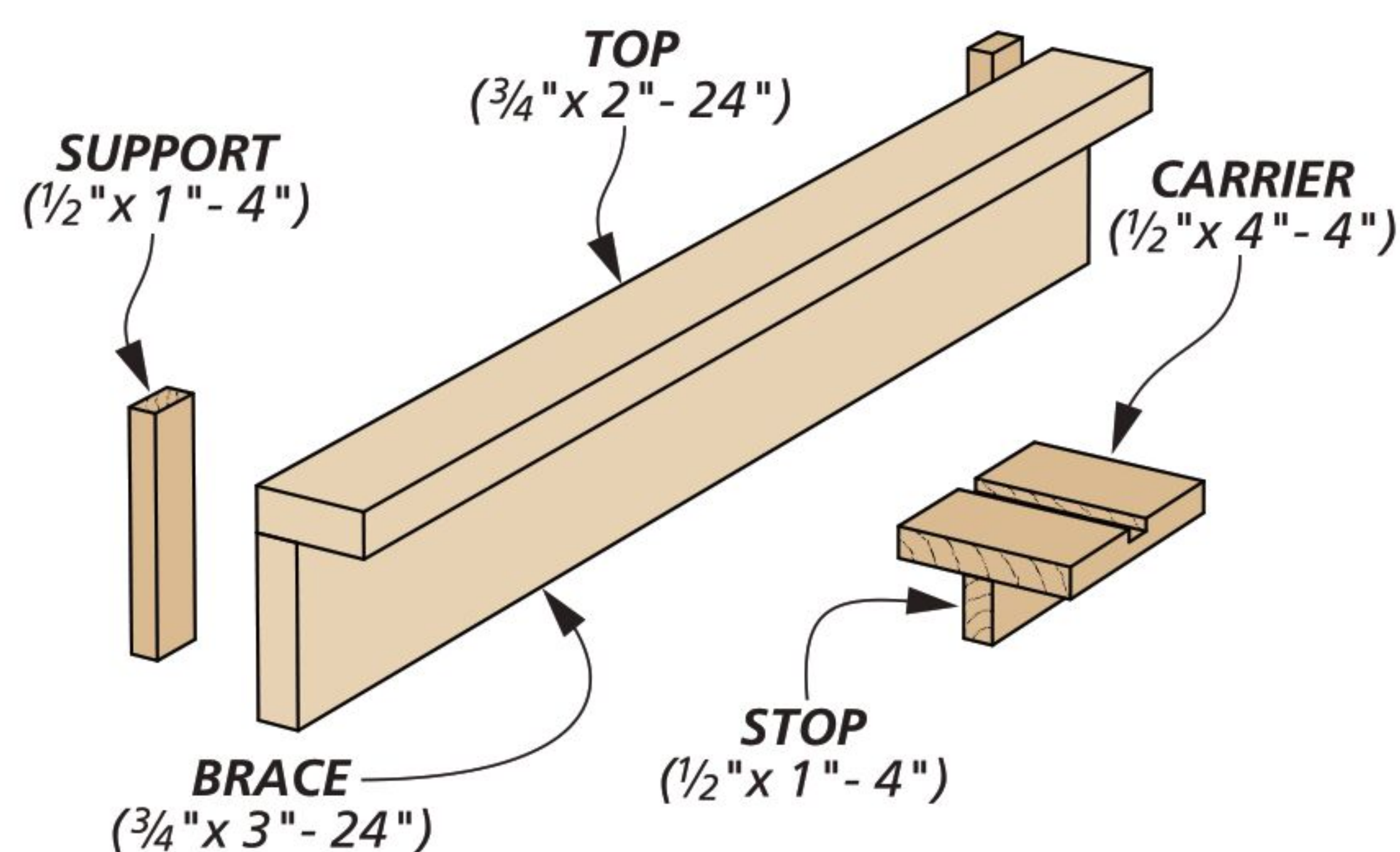
A thin shape like this presents some challenges in its making. I glued up a two-layer plywood sandwich blank. Then laid out the inner and outer radii. At this point, the inner curve is the most important. Rough cut along the lines with either a jig saw or at the band saw. Spend some time smoothing the profile with a sanding drum, rasp, and file to create a smooth, flowing shape.

For the outer curve, all you need to do is rough it free from the blank and glue the guard to the face. You can clean up this curve with a hand-held router equipped with a pattern bit. Wrap it up with a matching roundover, then the face can be attached to the column with screws, making sure the dust holes are aligned.

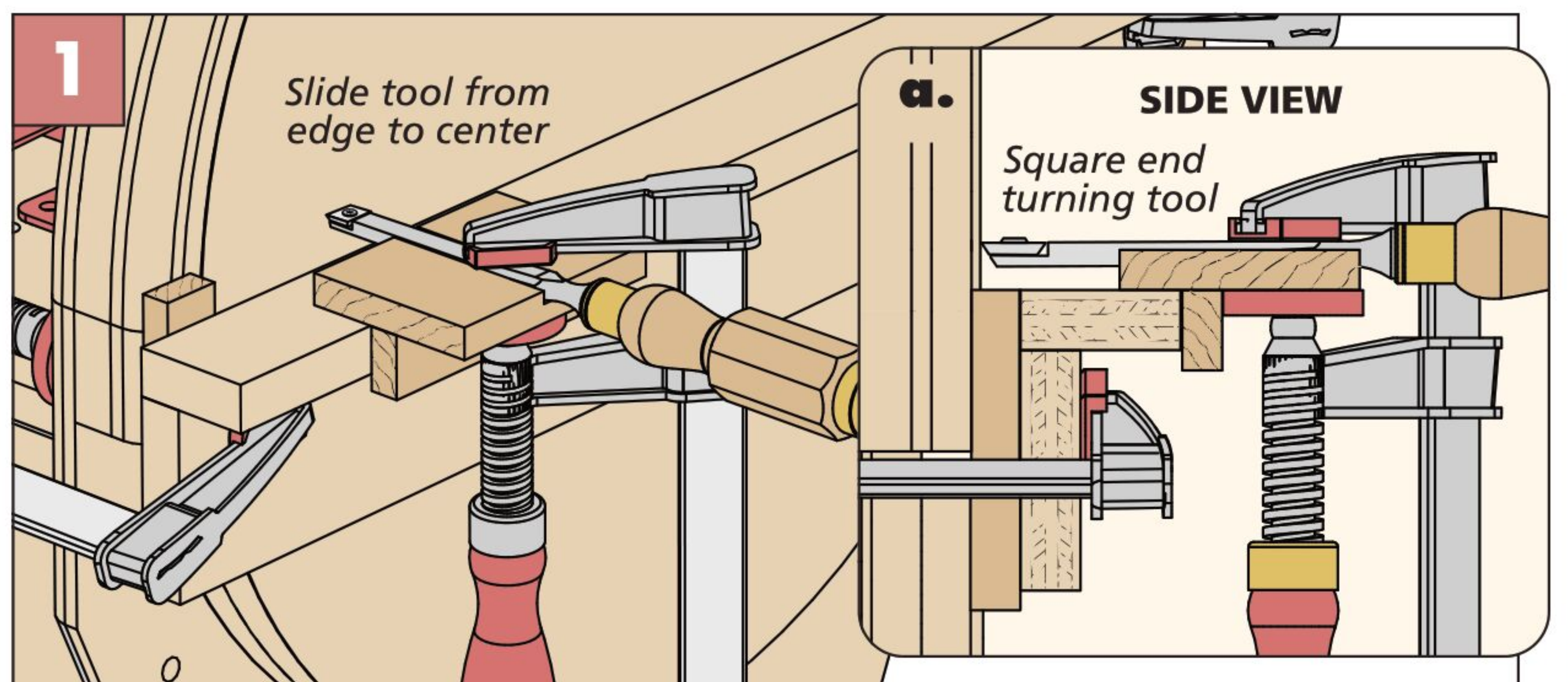
THE SANDING DISC. Now we can focus on making the disc for a bit. Check out the drawing above to get your bearings.



TRUING THE SANDING DISC



A Tool Rest & Holder. An L-shaped tool rest guides a holder to efficiently true up the face of the disc.



In Use. Clamp the tool rest to the face. Then clamp a carbide turning scraper to the tool holder. Ease the scraper into the spinning disc to shave down the high points of the disc. Take light cuts to avoid vibration.

The business end of the disc is a two-layer plywood platter. There are a couple critical details as you proceed. First, the disc needs to be perfectly flat.

The disc also needs to be mounted to the motor concentrically so it spins true. To do this, I used a router trammel to cut out the disc from a large blank. The pivot point of the trammel is a 7/8"-diameter dowel. The reason for choosing this large of a pivot is that it matches the bore hole of the sheave used to attach the disc to the motor.

MOUNTING HOLES. The sheave is bolted to the disc. You'll need to drill the mounting holes in the sheave at the drill press. Drilling cast iron is simpler than you might think.

Use the holes as a guide to drill out a pair of hardwood collars that sandwich the sheave. These look like large washers to fit the recesses of the sheave

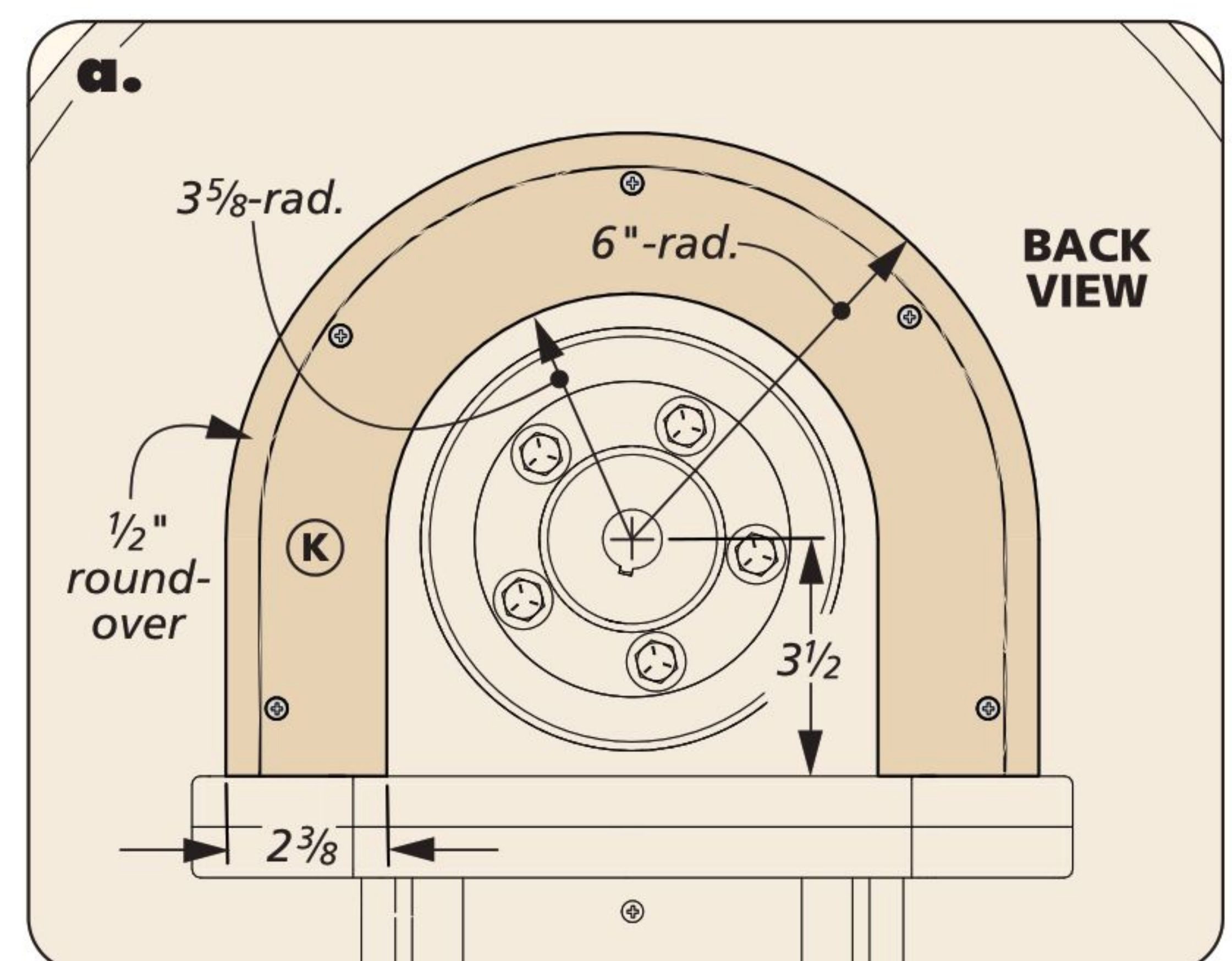
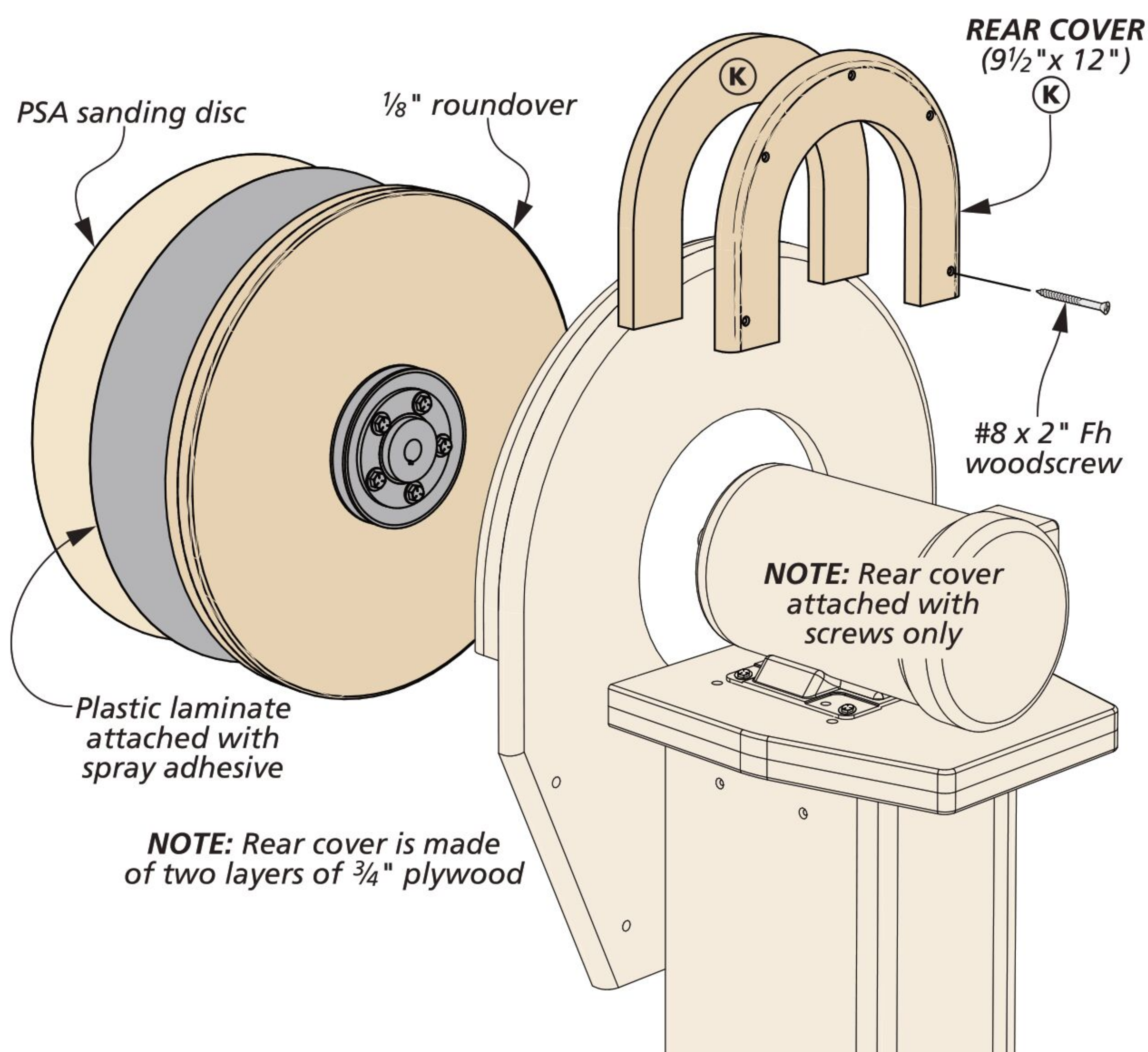
With a small section of dowel, register the sheave with the disc. Then drill the counterbored holes in the disc that houses the T-nuts. This is shown in details 'a,' 'b,'

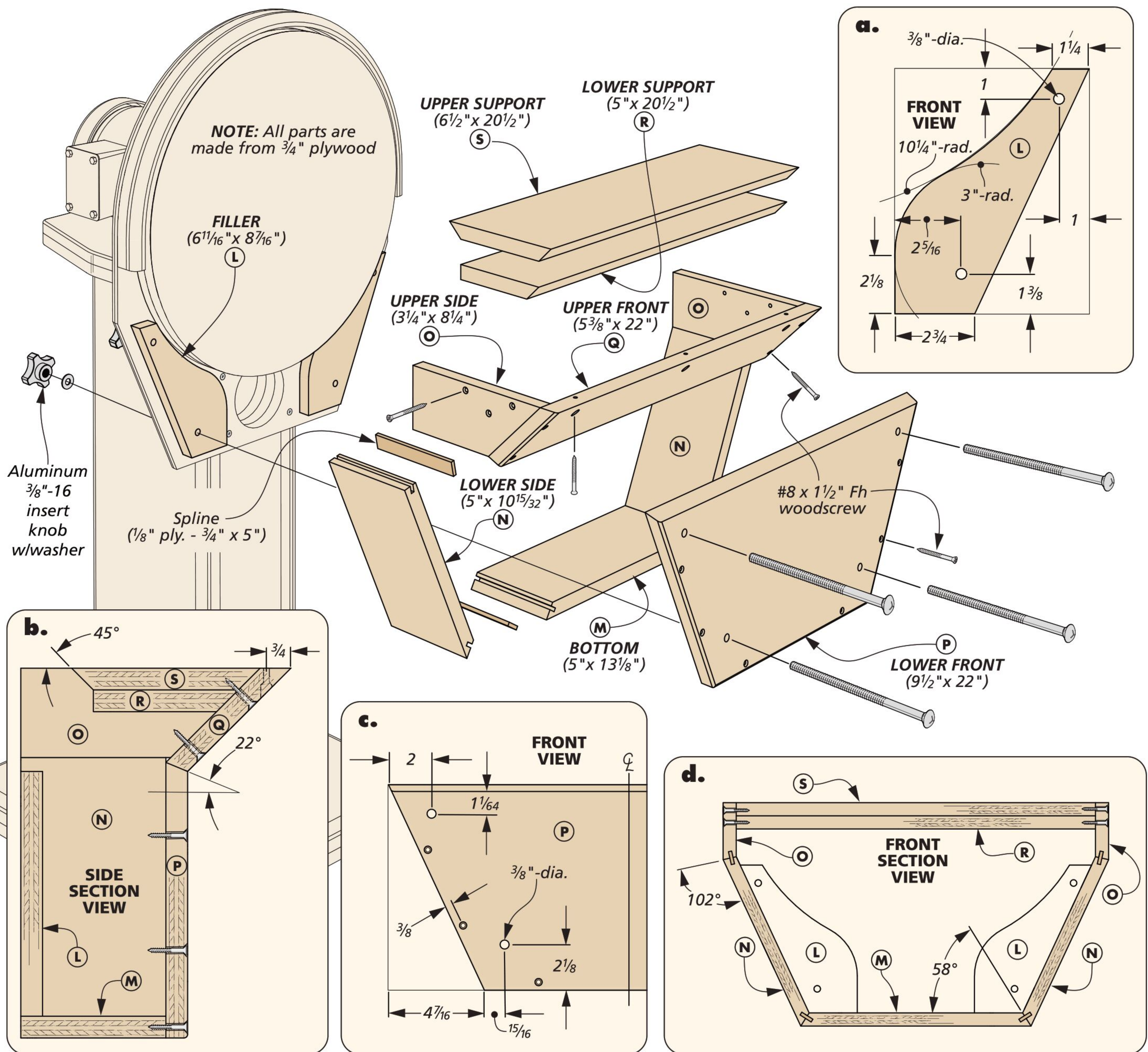
and 'c.' (I capped the T-nuts with wood plugs.) Once the sheave is attached to the disc, remove the dowel so you can install the assembly to the motor. Detail 'e' on the previous page shows how to install the motor so there's a little clearance between the disc and the face. Then it's time to fire up the motor and check how true the face of the disc is (box above).

LAMINATE & REAR COVER

Once trued, plastic laminate is added to the face of the disc, as in the drawing below. It creates a durable surface for attaching (and removing) the sanding disc.

Around back, you can complete the hood by making the rear cover. It's screwed in place so you can still access the motor.





Dust-collecting TABLE SHROUD

The final component of the sander, the table, is the most involved — so best for last. The simplicity of the table's role belies its complexity. The main purpose is to support a workpiece and present it to the sanding disc at a right angle. Secondly, the table plays a role in dust collection. All this sounds easy enough. What makes it tricky is that the table has

to do its job while avoiding the spinning disc. That's where the shroud assembly you see in the drawing above comes into play.

Let's throw one more curveball into the mix. The table on most disc sanders is an obstacle to changing the disc. However, this table is designed for easy removal to avoid this trouble.

FILLERS. Kick things off by making a pair of fillers, as shown in detail 'a' above. These odd-shaped parts register the shroud

on the face of the sander. The outer edge is angled to match the table shape. The inner edge is curved to wrap around the disc. This helps guide dust down to the opening in the face.

A STRANGE BOX. Make the shroud by starting with the bottom and lower side pieces, as in details 'b' and 'd.' This U-shaped assembly is joined to a pair of upper side pieces. There are a lot of angles to cut here. So joining the parts could be problematic.

The solution is to add splines to both register the parts and increase the joint strength.

In order to do that, you need to cut a slot across all joint faces. And with all the angles involved, supporting all the pieces at the correct angle becomes an issue.

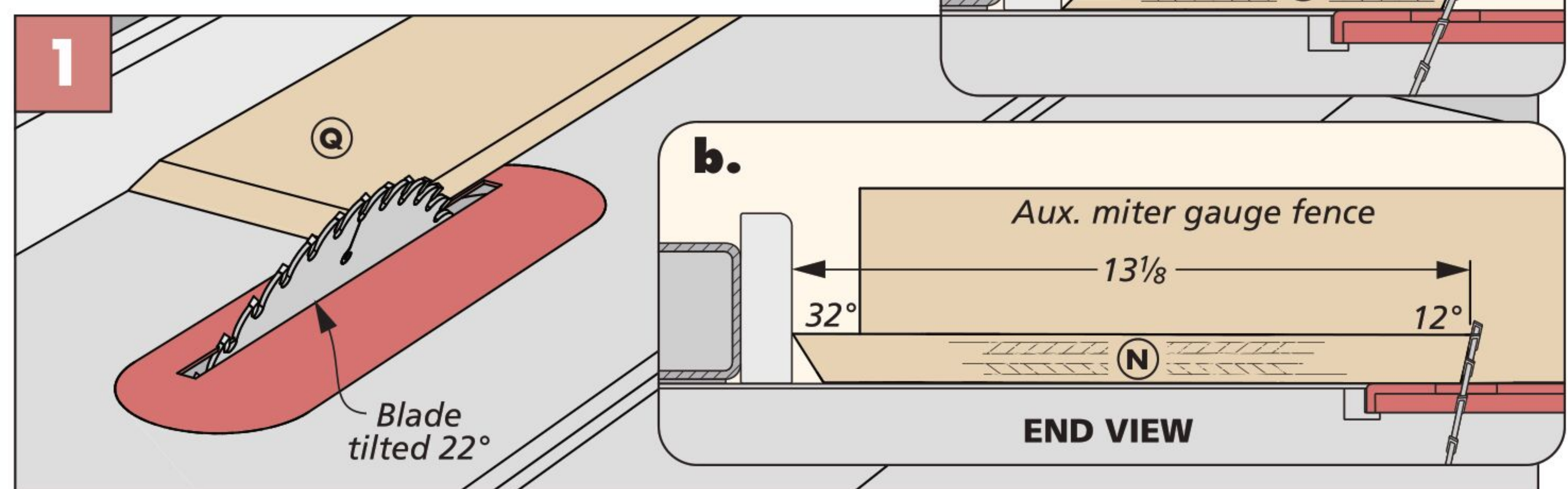
One solution is to use an old-school cast iron tenoning jig at the table saw. (See, you kept it for a reason.) If you don't have a tenoning jig like that, then take a look at the shop-made jig in the box below.

TOP OF THE BOX. The upper side pieces flare outward creating a hopper-like shape, as shown in detail 'b.' Once these pieces are formed, you can assemble the framework of the shroud with glue and splines.

The splines are made from $\frac{1}{8}$ " hardboard or plywood. I cut the splines a hair narrow so that the joints close fully at assembly.

A pair of panels enclose the front of the shroud. The lower one is shaped to follow the profile of the lower part of the shroud, as you can see in detail 'c.' Take note that the upper

MITERS & BEVELS



Trimming. In order to make many of the parts for the table shroud, you're going to give your table saw angle setting a workout. Several parts even require a bevel cut on the long edges and miters cut on the ends. Test cuts are the order of the day.

edge is beveled to mate with the upper front piece (refer again to detail 'b'). These parts can then be attached with glue and screws to the front of the shroud.

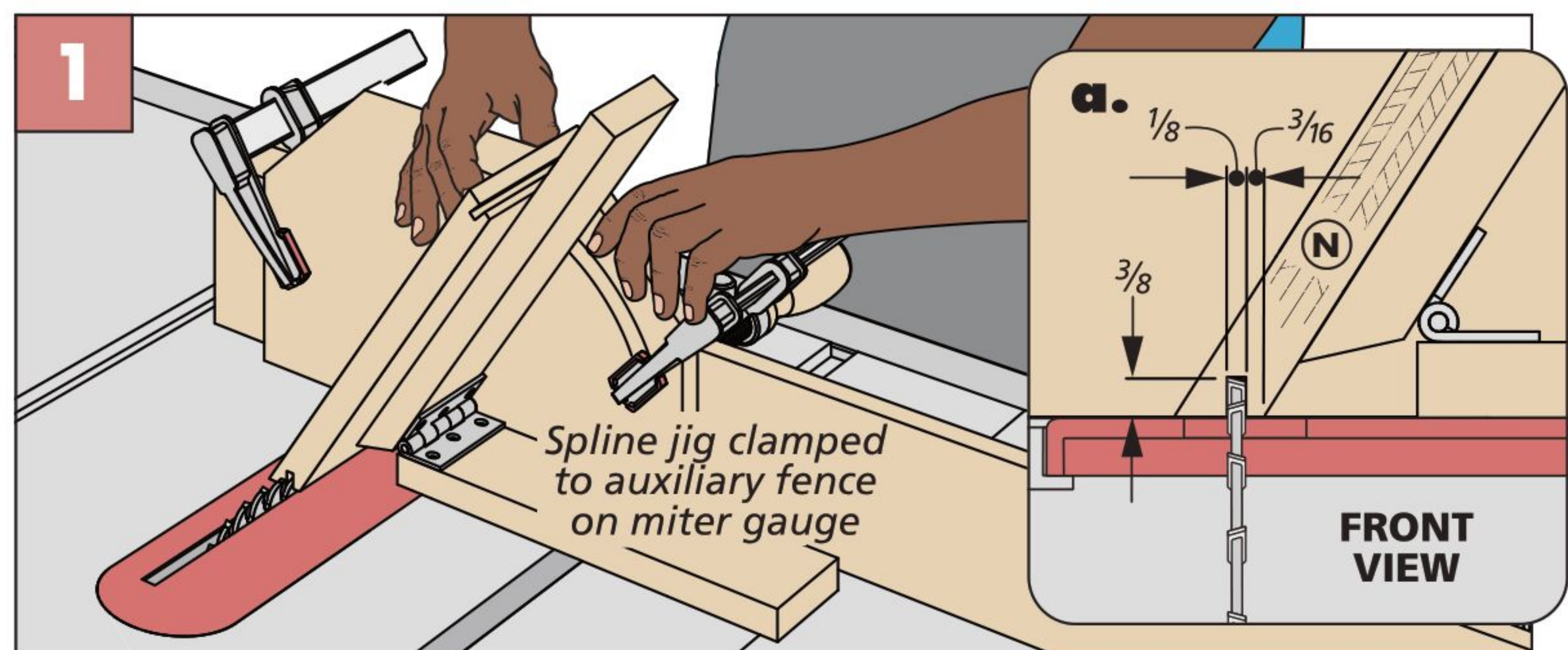
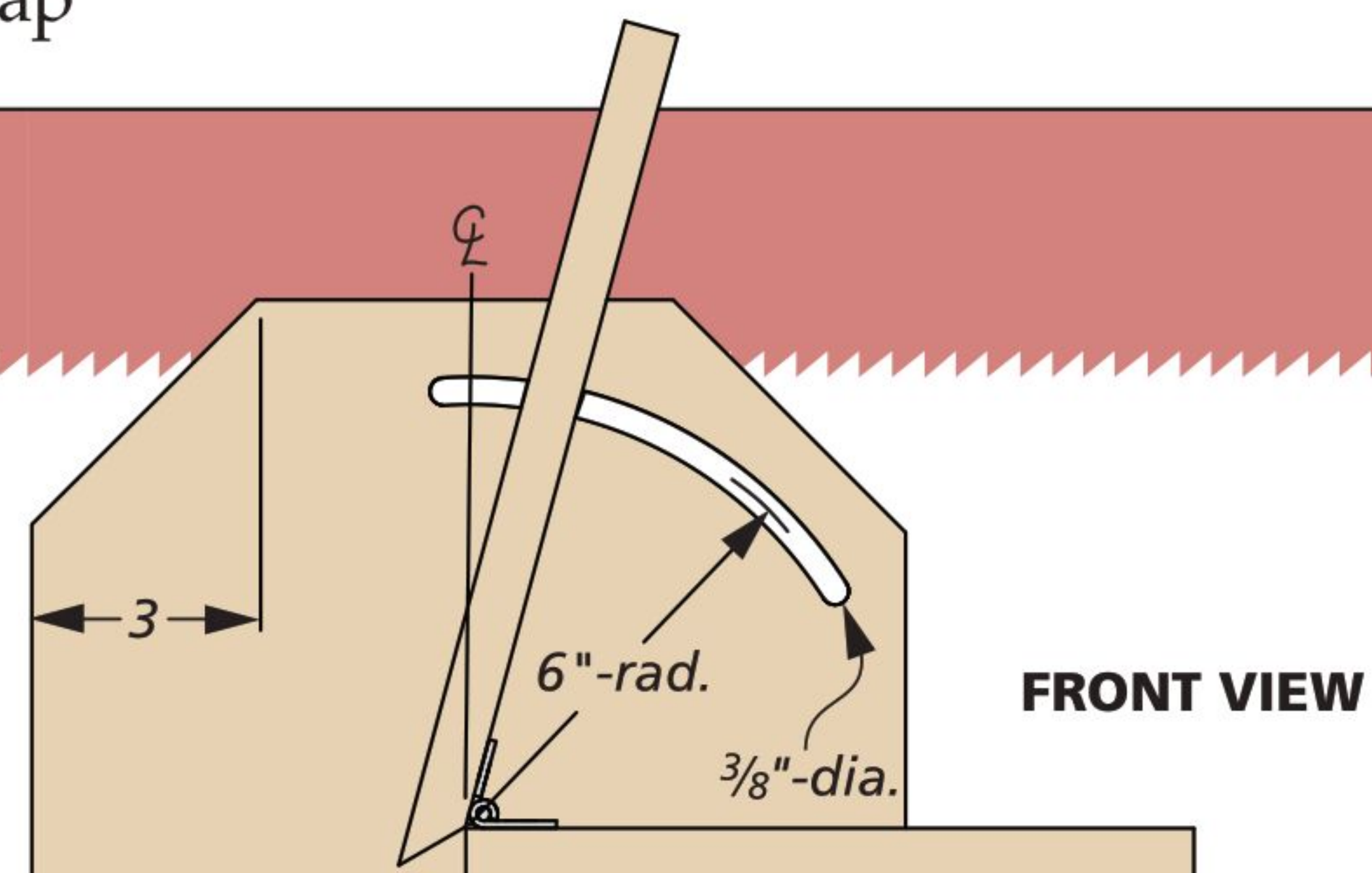
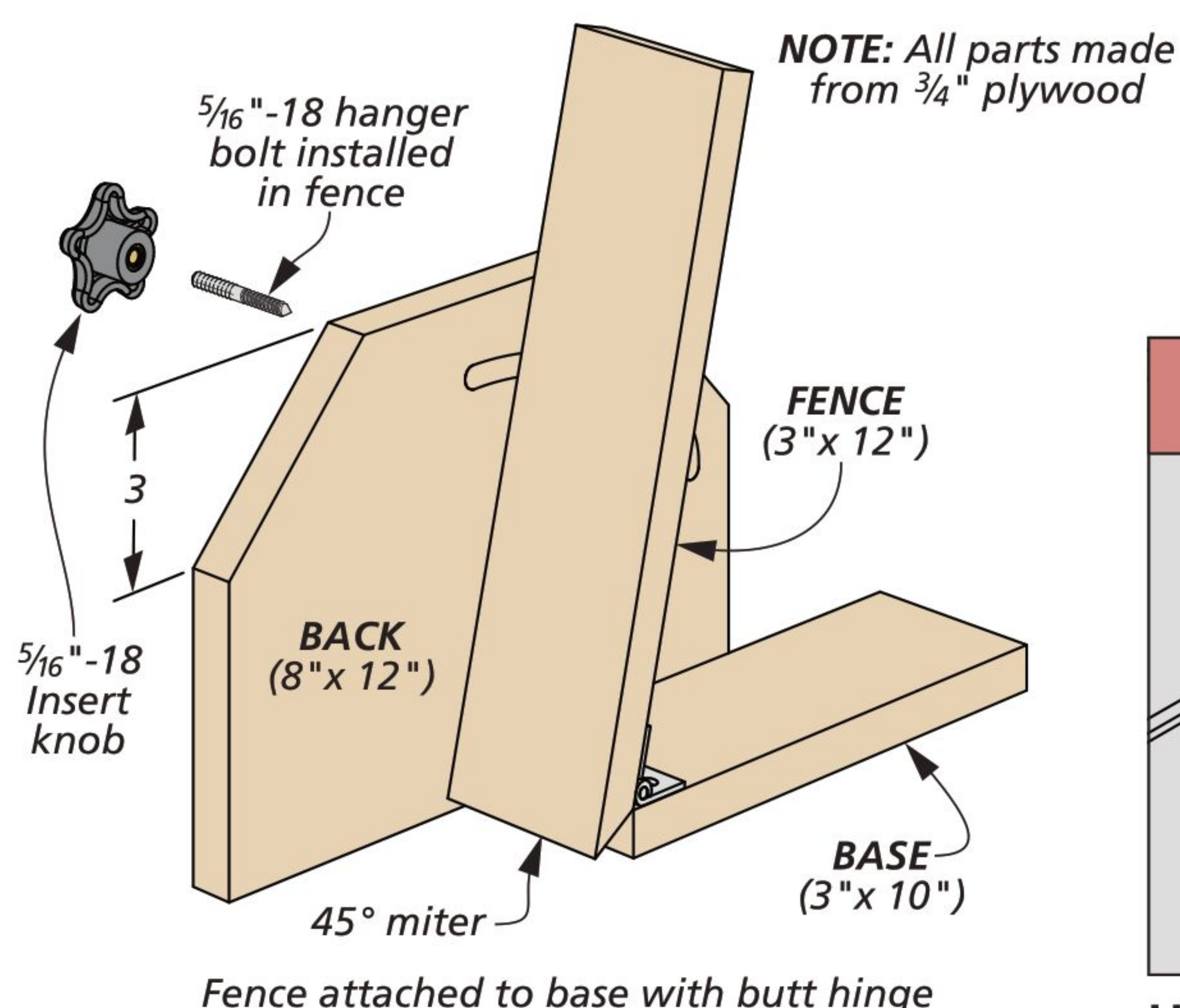
Take a moment here to clamp the shroud in place in order to transfer the locations and drill mounting holes that secure the table to the column. You'll need some long carriage bolts for this.

SHROUD FILLERS. There are two pieces left to make for the shroud portion of the table. These cap

the shroud and form a platform for attaching the worksurface of the table that we'll tackle next. The goal here is for the top pieces to be flush with the top of the shroud parts (details 'b' and 'd'). So take your time trimming these parts to size.

After shaping, the pieces are glued together then glued and screwed into place. After all of the odd miters and bevels, the rest project is a coast.

ADJUSTABLE SPLINE SLOTTING JIG



Using the Jig. Position the hinged support so the end of the workpiece rests flat on the saw table. Lock it in place to make a cut.

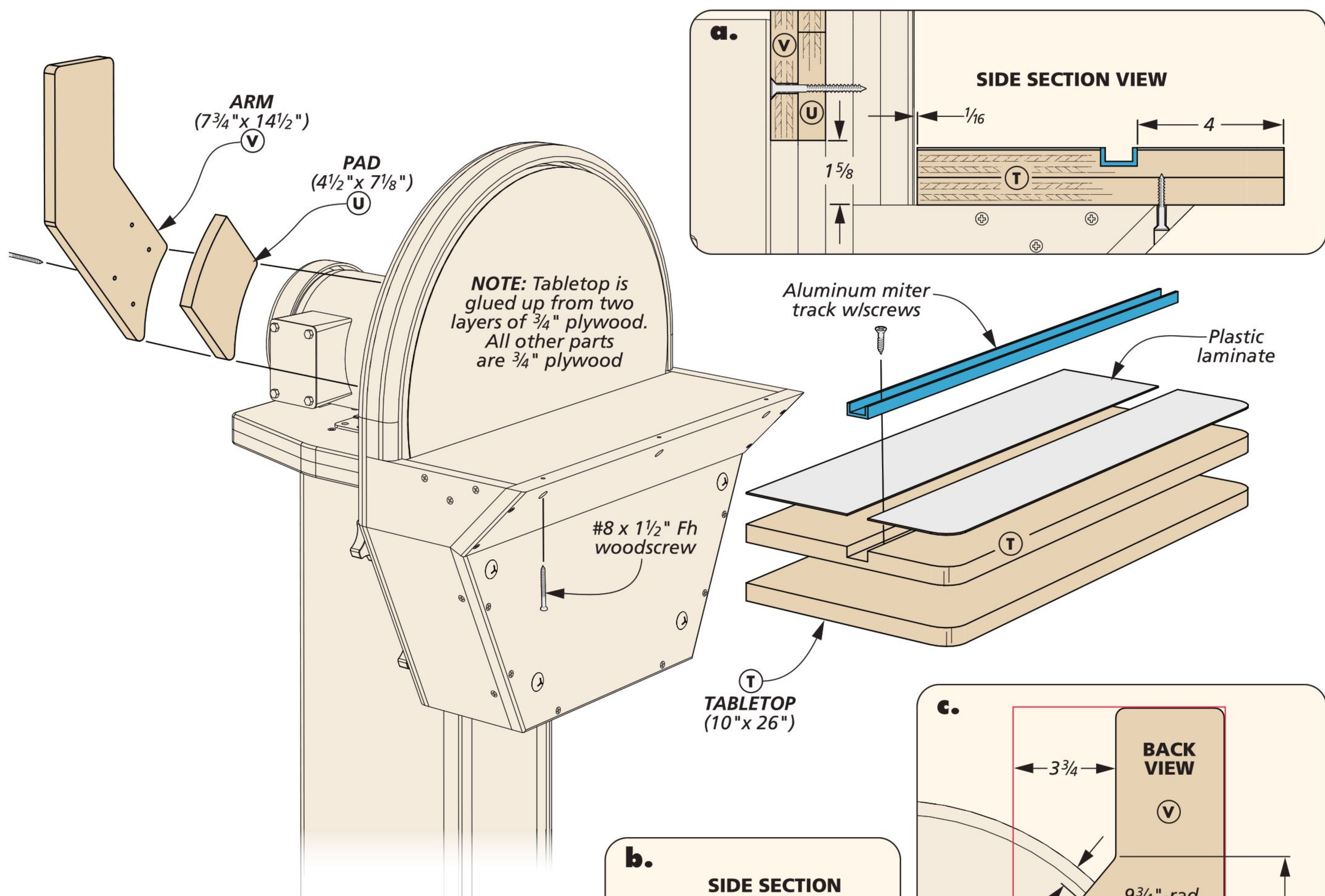


Table surface & CONTROL ARM

The punch list on the disc sander is short. We need to wrap up the table. Finally, you install a power switch to control the tool.

WORKSURFACE. All that remains on the table is the worksurface part. This consists of a two-layer top. A radius softens the outer corners. Then a layer of plastic laminate increases durability and allows a workpiece to slide along it smoothly.

Though optional, installing a miter track is a good idea, as shown in details 'a' and 'b.' One great application for a disc sander is to use its flat surface to fine-tune ends of a workpiece. This is handy for miters as well as square cut parts.

The tabletop is attached to the shroud with screws, as you

can see in the main drawing. As simple as it sounds, there are some critical considerations. For the sander to be accurate, the miter slot in the table needs to be parallel with the disc surface, as in detail 'a.' You can use a combination square to verify the alignment as you drive the screws into place.

Another thing to check is that the surface of the table is square to the face of the disc. If necessary, insert shims between the tabletop and shroud top to square up the table.

RAISED CONTROL ARM. The final

woodworking parts of the sander make up the control arm. This high-fiving arm (detail 'c') raises the power switch up to a convenient and safe position while working. I cut the pad first, then attached it to the arm blank for final shaping. Attach the arm with glue and screws.

WIRING THE SWITCH. If you're using a 220V motor for the sander, then you'll need to make sure the switch (sometimes called a starter) will work for that voltage as well. Most motors are labeled well for installing the cord set that runs to the switch.

Before going any further, I need to offer the usual litany of precautions. If electrical work isn't your cup of tea, it's a good idea to consult with an electrician to get the juice flowing safely.

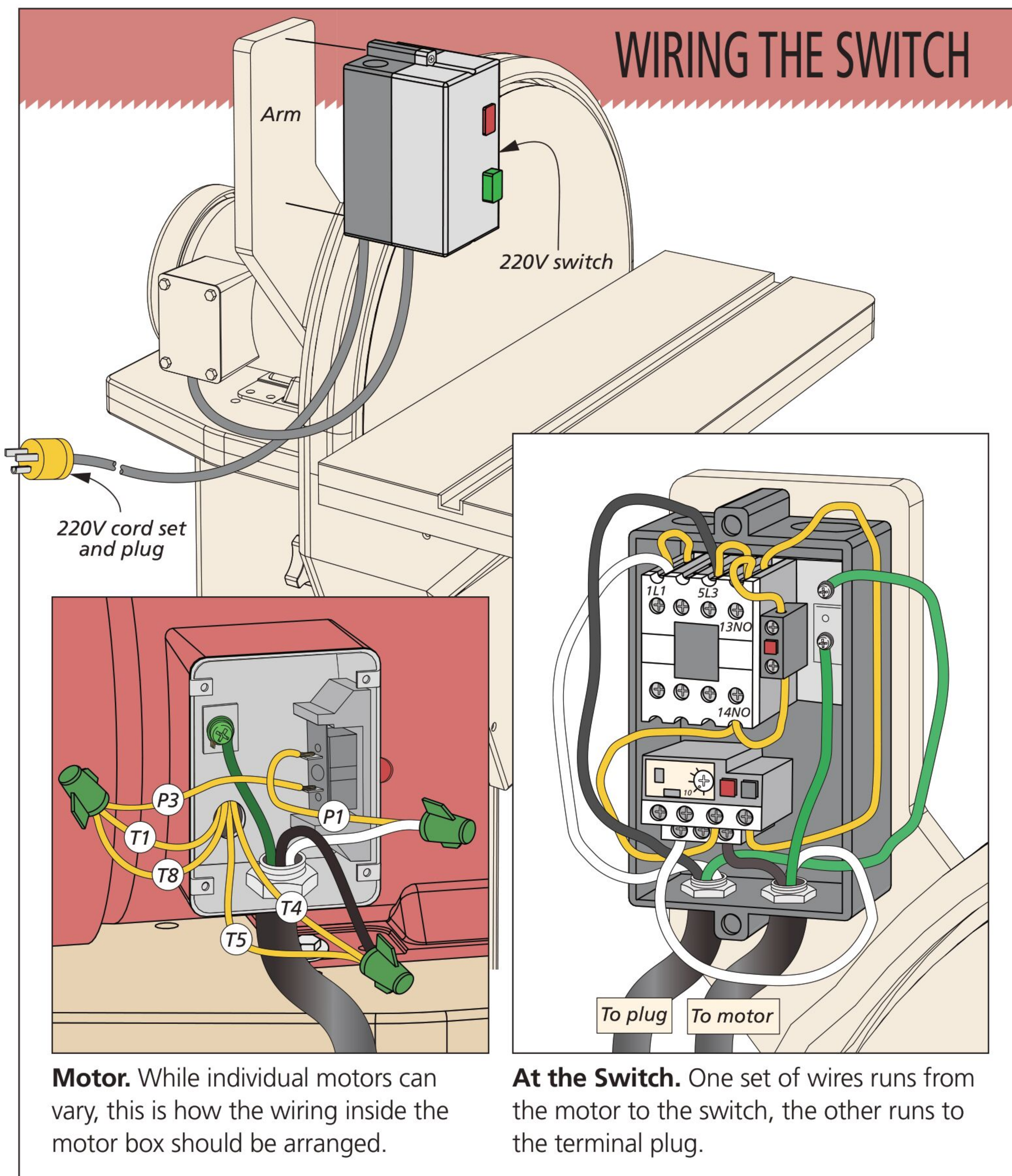
If you're unfamiliar with wiring, you can be forgiven thinking this stage feels a little like disarming a bomb in a spy movie. It's no good to put in the effort in construction if you fall down here. I found an electrical manual from a used bookstore that's been invaluable in helping me plan out work like this.

The drawings at right decode the connections that need to be made at the motor as well as inside the switch housing.

BODY WORK. Ideally, you've been keeping up with all the screw filling, patching, and priming as you go along. So that by this point, all that remains is a final coat or two of paint.

If not, well you're more like me than you know. As I said earlier, the more time and effort you put into this part of the construction, the better looking your sander will be.

All that remains is to find a home in your shop for your new tool. Then wait for someone to confuse it for a high-priced rig. **W**



Materials & Supplies

A Column Sides (2)	1½ ply. - 10 x 32
B Inside Front/Back (2)	¾ ply. - 5 x 32
C Outer Front/Back (2)	¾ ply. - 6 x 32
D Plugs (2)	2¼ ply. - 5 x 7
E Cap (1)	1½ ply. - 13 x 14
F Base (1)	2¼ ply. - 20 x 20
G Face (1)	¾ ply. - 22 x 25½
H Guard (1)	1½ ply. - 12¾ x 22
I Disc (1)	1½ ply. - 20 x 20
J Collars (2)	5/16 x 4 11/16 - 4 11/16
K Rear Cover (1)	1½ ply. - 9½ x 12
L Fillers (2)	¾ ply. - 6 11/16 x 8 7/16
M Bottom (1)	¾ ply. - 5 x 13 1/8
N Lower Sides (2)	¾ ply. - 5 x 10 15/32
O Upper Sides (2)	¾ ply. - 3¼ x 8¼
P Lower Front (1)	¾ ply. - 9½ x 22

Q Upper Front (1)	¾ ply. - 5 3/8 x 22
R Lower Support (1)	¾ ply. - 5 x 20 1/2
S Upper Support (1)	¾ ply. - 6 1/2 x 20 1/2
T Tabletop (1)	1½ ply. - 10 x 26
U Pad (1)	¾ ply. - 4½ x 7 1/8
V Arm (1)	¾ ply. - 7¾ x 14½

- (25) #8 x 1½" Fh Woodscrews
- (9) #8 X 2" Fh Woodscrews
- (40) #8 x 3" Fh Woodscrews
- (4) 1/8" x 3/4" - 5" Hardboard Splines
- (1) 2HP 1725 RPM Electric Motor
- (1) Single Phase 2HP Magnetic Switch
- (1) 12 gauge 3 wire x 25 ft. Electric Cord
- (1) 3-Blade Nema 6-20 Straight Plug
- (5) 3/8"-16 T-Nuts

- (4) 3/8"-16 x 7½" Carriage Bolts
- (5) 3/8"-16 x 2¼" Hex Bolts
- (9) 3/8" Flat Washers
- (4) 5/16" x 2½" Lag Screws
- (4) 5/16" Flat Washers
- (4) 3/8"-16 Aluminum Four Arm Knobs
- (1) 6¼" O.D. 7/8" shaft V-Belt Sheave,
- (2) .38" x .5" Cord Grips
- (1) 36" Miter Track w/Screws

ALSO NEEDED: Two 48" x 96" sheets of ¾" Birch plywood and one 30" x 30" sheet of Baltic birch plywood (for the disc)

Modular Wall Unit

This versatile piece of furniture has great mid-century vibes, and can conform to fit any space. Customize it to be exactly what you need.

The sleek lines and rich walnut of this modular wall unit create a piece of furniture that's purpose is fairly flexible. What I mean by that is that I can see this wall unit fitting in a variety of spaces, and none of them seem out of place. Add a series of drawer units along the bottom, and all of a sudden, this becomes the perfect focal point of a bedroom. Add in the desk unit and it becomes a great workstation for the office, or an entertainment center. Like the idea of built-ins, but want something more trim? Perfect.

MID-CENTURY VIBES. Now, I'll be one to tell you that mid-century isn't my jam. For some reason, it reminds me of my elementary school's principal's office. Of course, I was never in there. But, I think designer, John Doyle, hit the perfect notes here and I love it. The subtle roundover on the front edge, the sleek brackets. And talk about that walnut. To me, it's the perfect hint of mid-century without leaving a bad taste in my mouth.

SIMPLE, CLASSIC CONSTRUCTION. Looking at the photo to the right, you may think that there's a lot of walnut here. However, this build takes a level-headed approach. Edged walnut plywood simplifies construction, and also softens the blow to your wallet. The actual woodworking is straightforward and is a great example of no-nonsense building techniques. So, let's get into the shop and get this project started.

▼ The uprights allow for quick and easy customizing. Machine screws and keyhole hangers allow the different units to be hung in a variety of configurations.

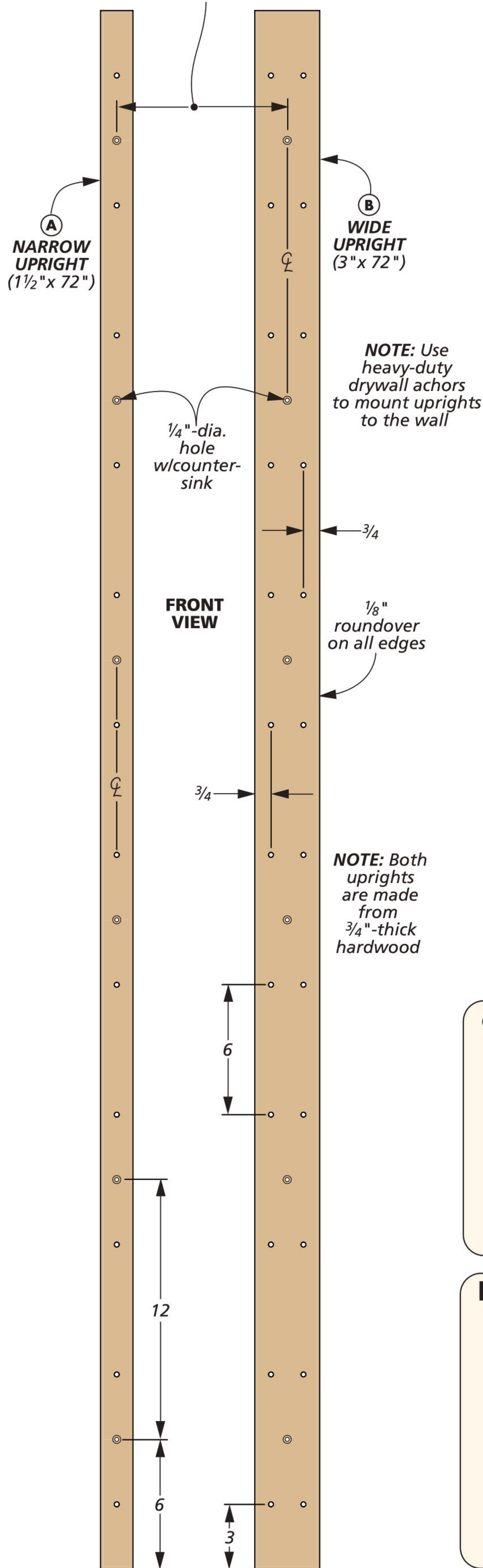


▼ The drawer unit houses three drawers. It combines simple box construction with full extension slides for compact, yet surprisingly roomy, storage options.





NOTE: Uprights are installed 31¼" from center to center



NOTE: Uprights are installed 6" above the floor

Start with the UPRIGHTS

One of the biggest attractions of this wall unit, at least to me, is the fact that the entire thing floats on the wall. It adds a clean look, and makes getting under it to clean pretty easy. (That may be the most "adult" statement I've ever made.) The mounting point for the entire unit is a series of uprights. Narrow uprights are located on the outsides of the unit, while the wider pair supports the interior parts.

LOTS & LOTS OF HOLES. For the configuration of our wall unit, we used two wide uprights and two narrow ones. If you make yours wider or narrower, you can adjust the number of each. Start by sizing your stock for the uprights. Then, pull up a chair to your drill press, because it's time to drill a lot of holes.

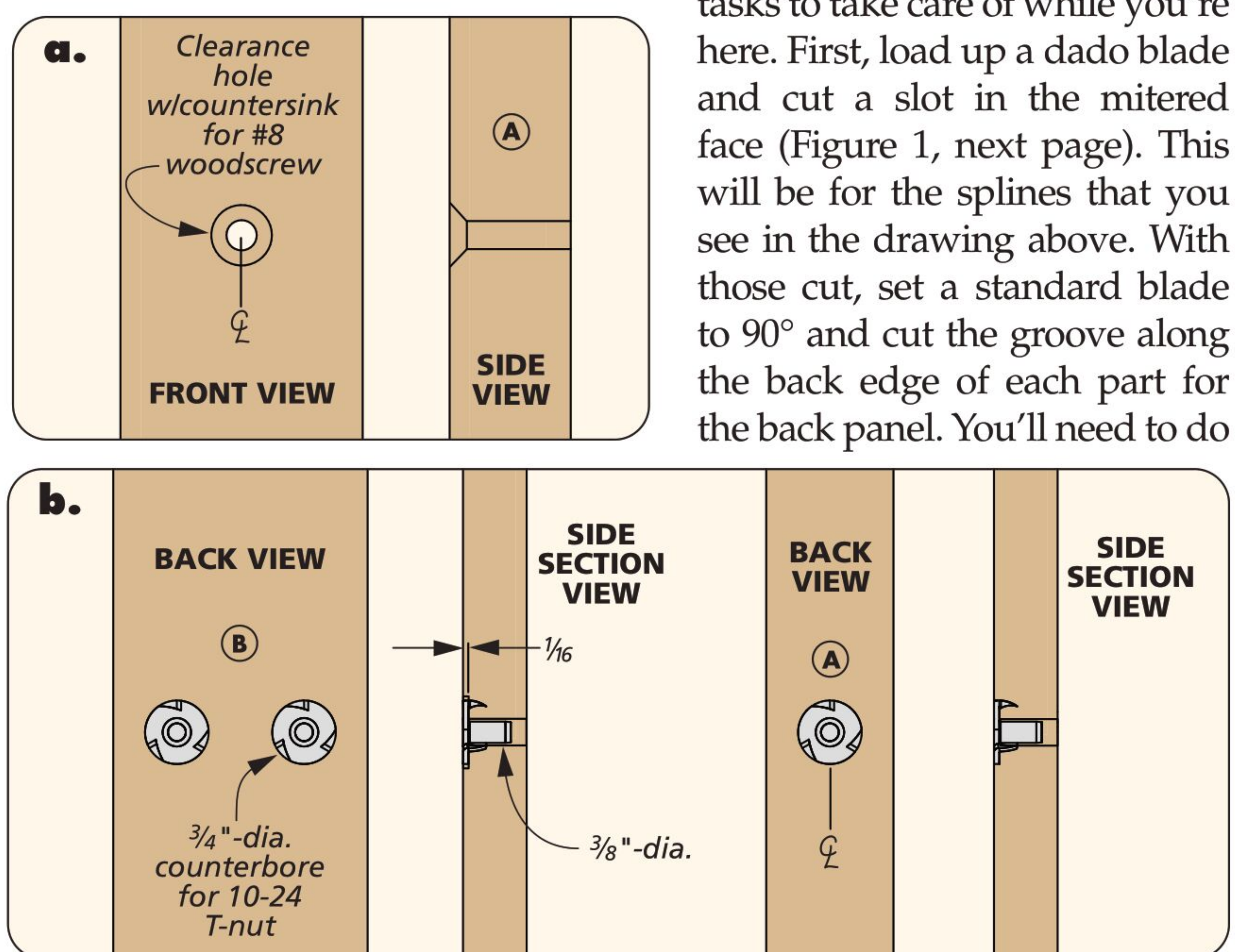
Each upright has two different types of holes. First, there are countersunk holes for mounting the uprights to the wall. These can be drilled with a counter-sink bit, centered on the uprights. Next are the holes that are used hang the various components. As you can see in detail 'b', these are

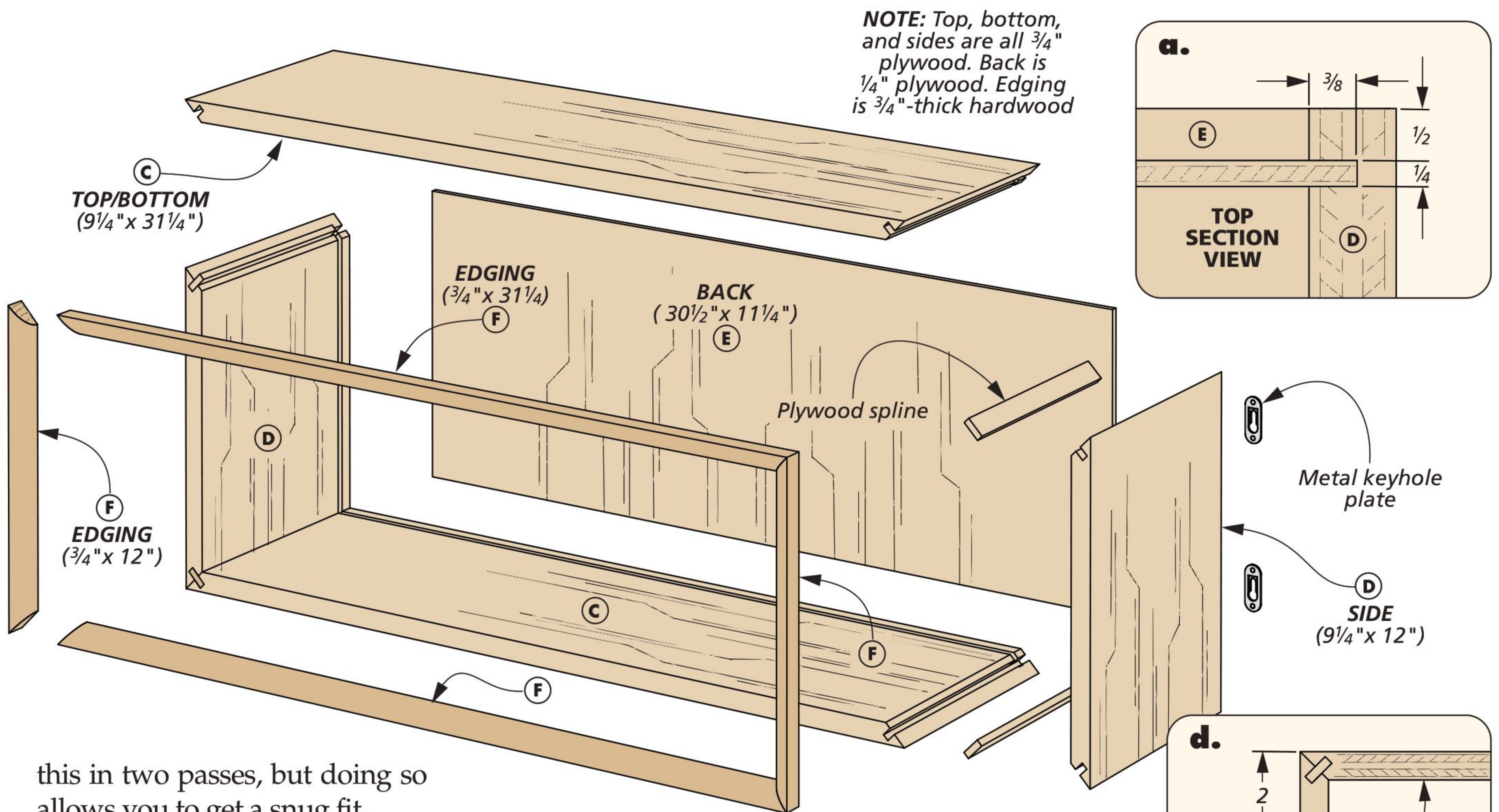
counterbored to accept a T-nut. This is a three-step process. Start by marking the hole locations with an awl and drilling an 1/8" pilot hole. The pilot hole helps locate the counterbore (drilled from the back with a Forstner bit) and also the through hole. Make sure to drill the through hole from the front to avoid chipout. Finish the uprights off by hammering a T-nut into the counterbore.

OPEN CASES NEXT

With the framework set, it's time to start building out your wall unit how you'd like. First thing up are the open cases, like you see on the next page. These make great, mid- to high-level storage.

PSSST, YOUR PLYS ARE SHOWING. First thing's first. The parts of this case consists of walnut plywood with hardwood edging. Start by heading over to the table saw and cut the miters on the ends of the panels. A sled helps get accurate cuts here — use a stop block to ensure that opposing parts stay the same length. With the miters cut, you have two other tasks to take care of while you're here. First, load up a dado blade and cut a slot in the mitered face (Figure 1, next page). This will be for the splines that you see in the drawing above. With those cut, set a standard blade to 90° and cut the groove along the back edge of each part for the back panel. You'll need to do



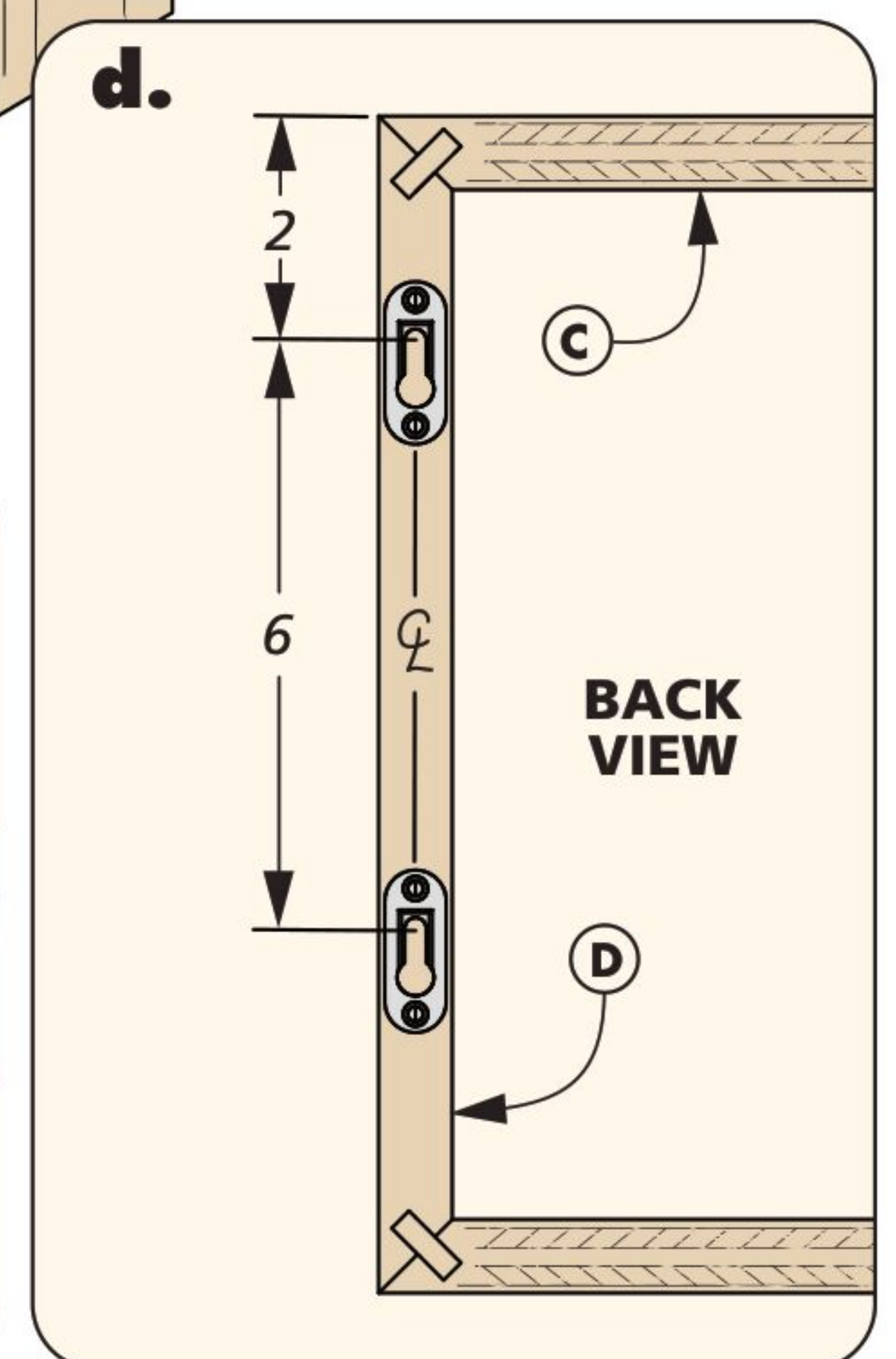
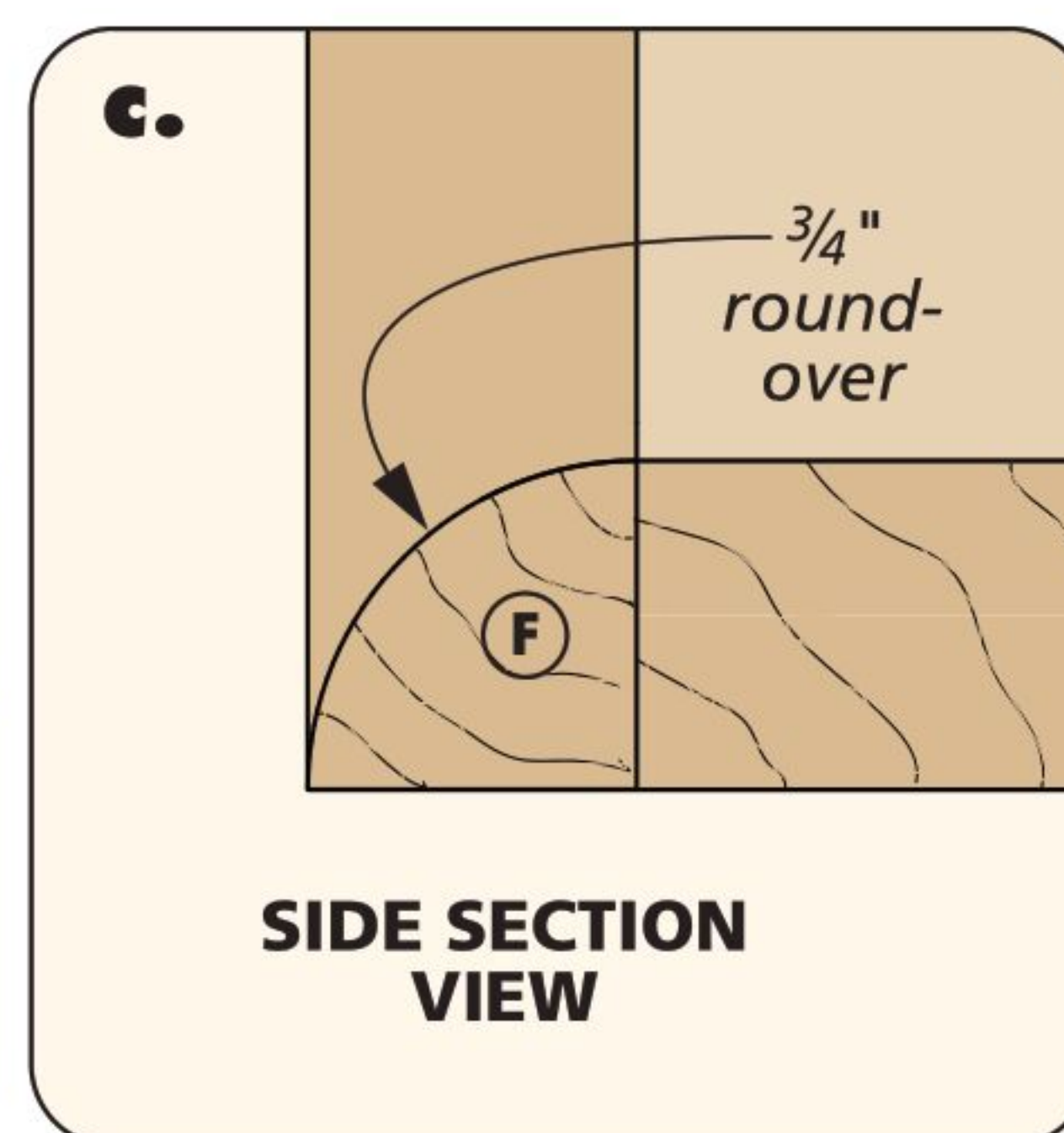
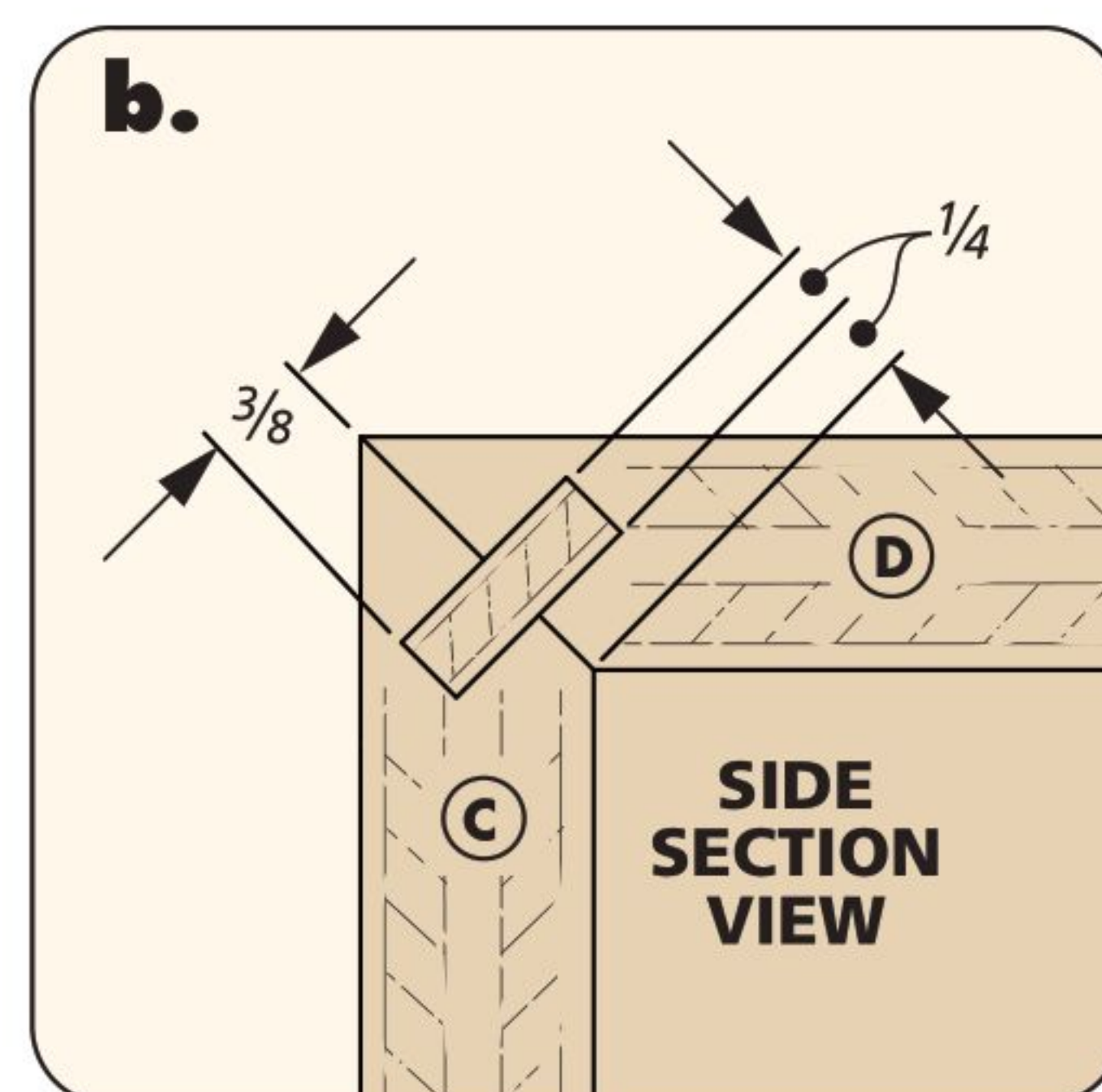


this in two passes, but doing so allows you to get a snug fit.

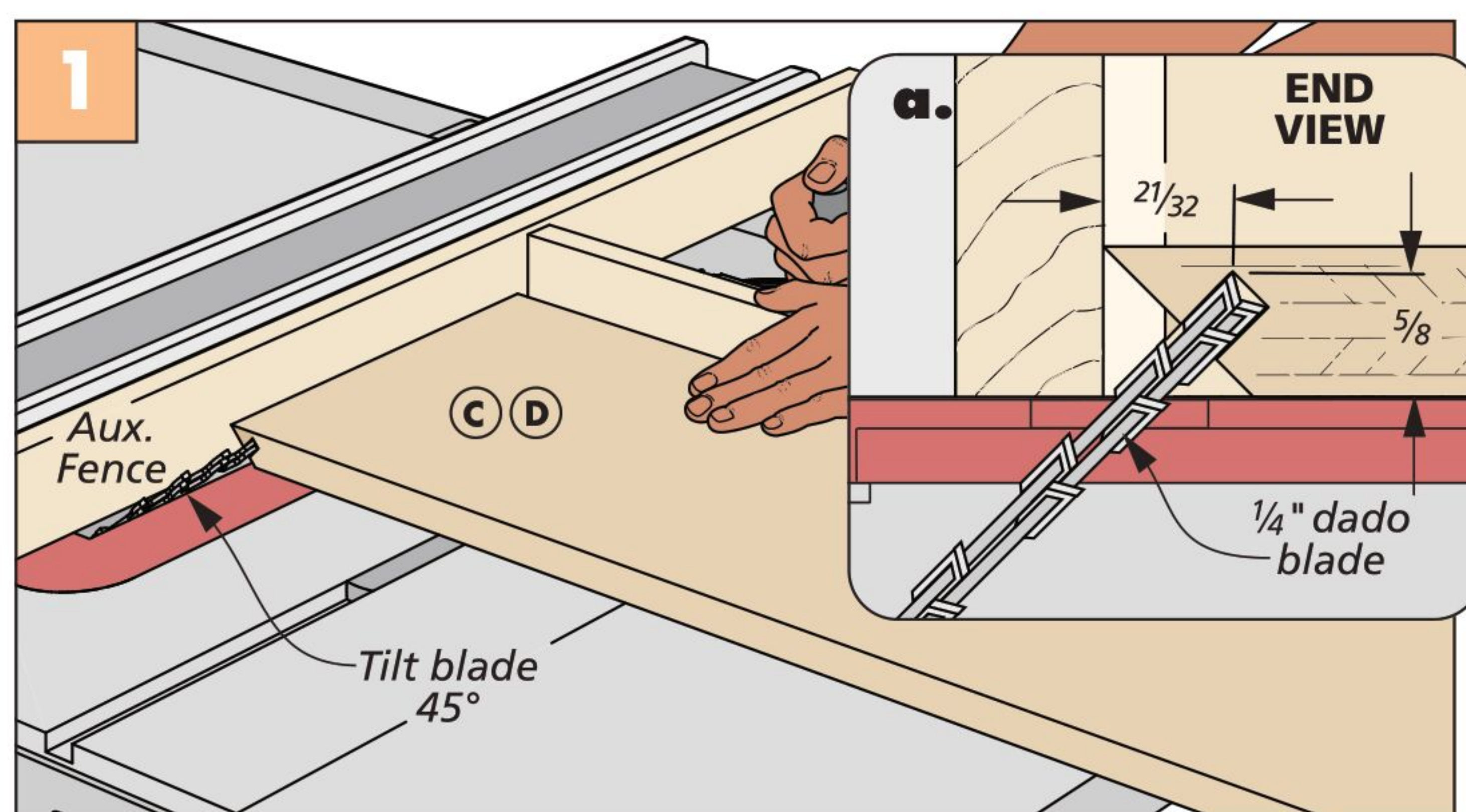
Now, we can cover up that nasty exposed plywood edge. This is done by cutting some hardwood and glue it in place along the front edge. Personally, I leave it a little long and use a block plane to flush it to the mitered ends.

ROUT & ASSEMBLE. Before slinging glue and clamps like John Wayne in a woodshop showdown, spend a few minutes at the router table putting a large roundover on the hardwood edging. The roundover adds to the mid-century feel and creates some nice shadow lines. Once that's done, assemble the case. The splines help with alignment, as well as add strength to the miters. Don't forget to slip the back into the groove before adding the top.

HANGABILITY? As I mentioned before, all of these units hang through those T-nuts. To accept the head of the screws, you'll want to accurately rout in some key hole hangers. You can see this process online at Woodsmith.com/259. After installing the hangers, the open case is ready to have finish applied.

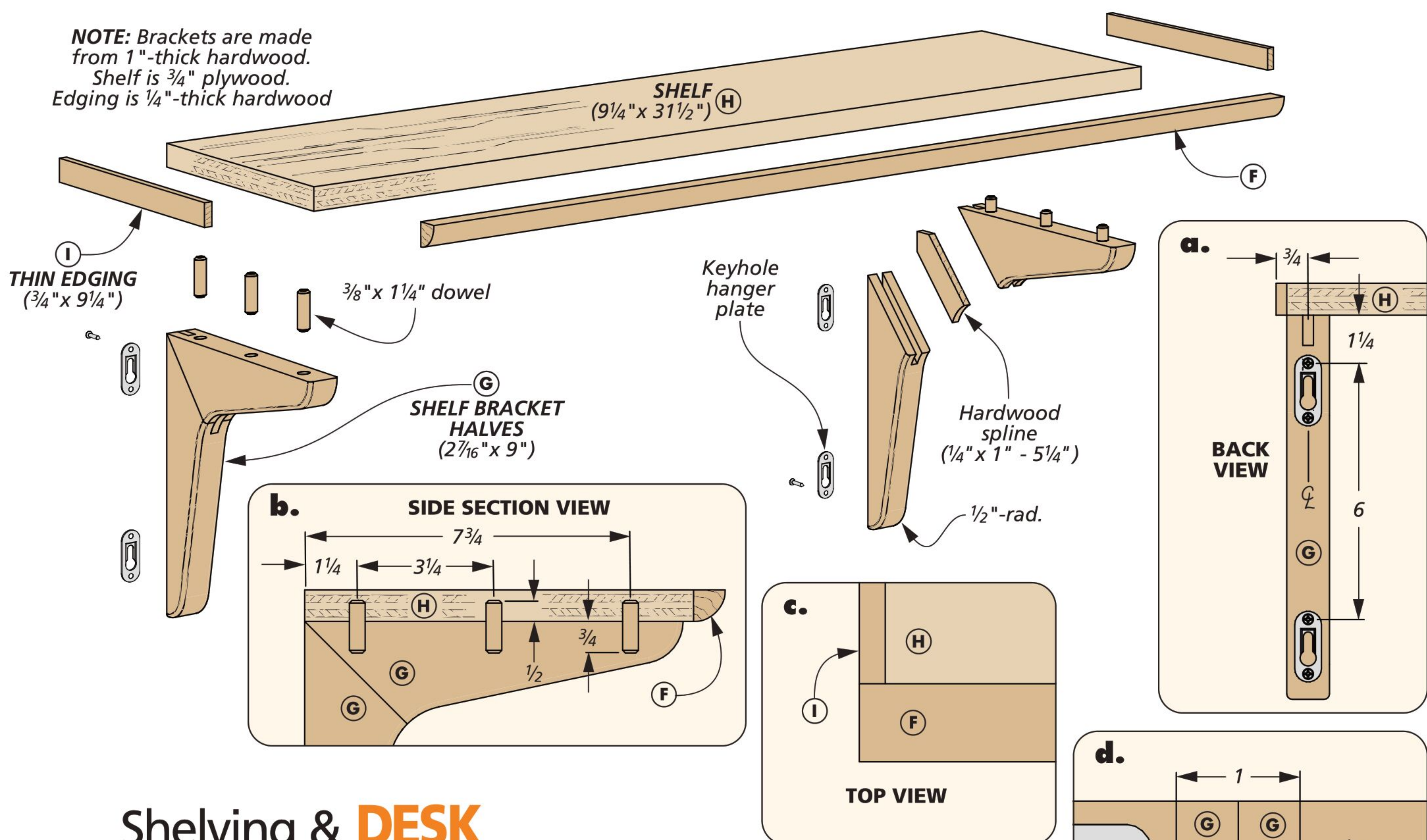


ANGLED SLOTS



Spline Slots. At the table saw, load up a dado blade and tilt it to 45°. Use an auxiliary fence to set the workpiece position, and a miter gauge to guide the workpiece through the cut.





Shelving & **DESK**

The next two items to tackle are the adjustable shelves and desk portion of the wall unit. While they have different dimensions, their function and construction are identical. Let's start with the surfaces first.

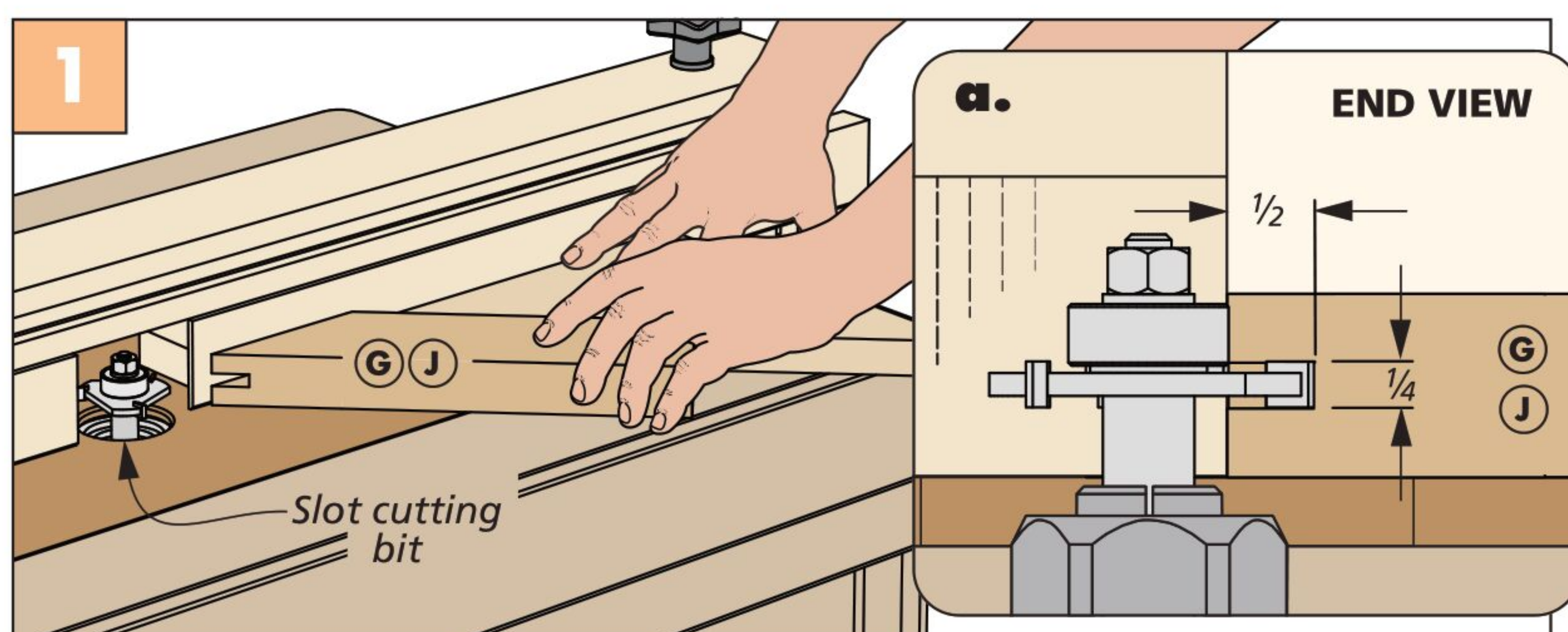
PLYWOOD PANELS. As with the rest of the wall shelf parts, the surfaces are plywood panels. Here, the same rounded

edging is applied to the front of the shelf, but the ends receive thin, flat edging. Apply the side edging first, followed by the front edging. Sand the end of the front edging flush with the sides and rout the roundover.

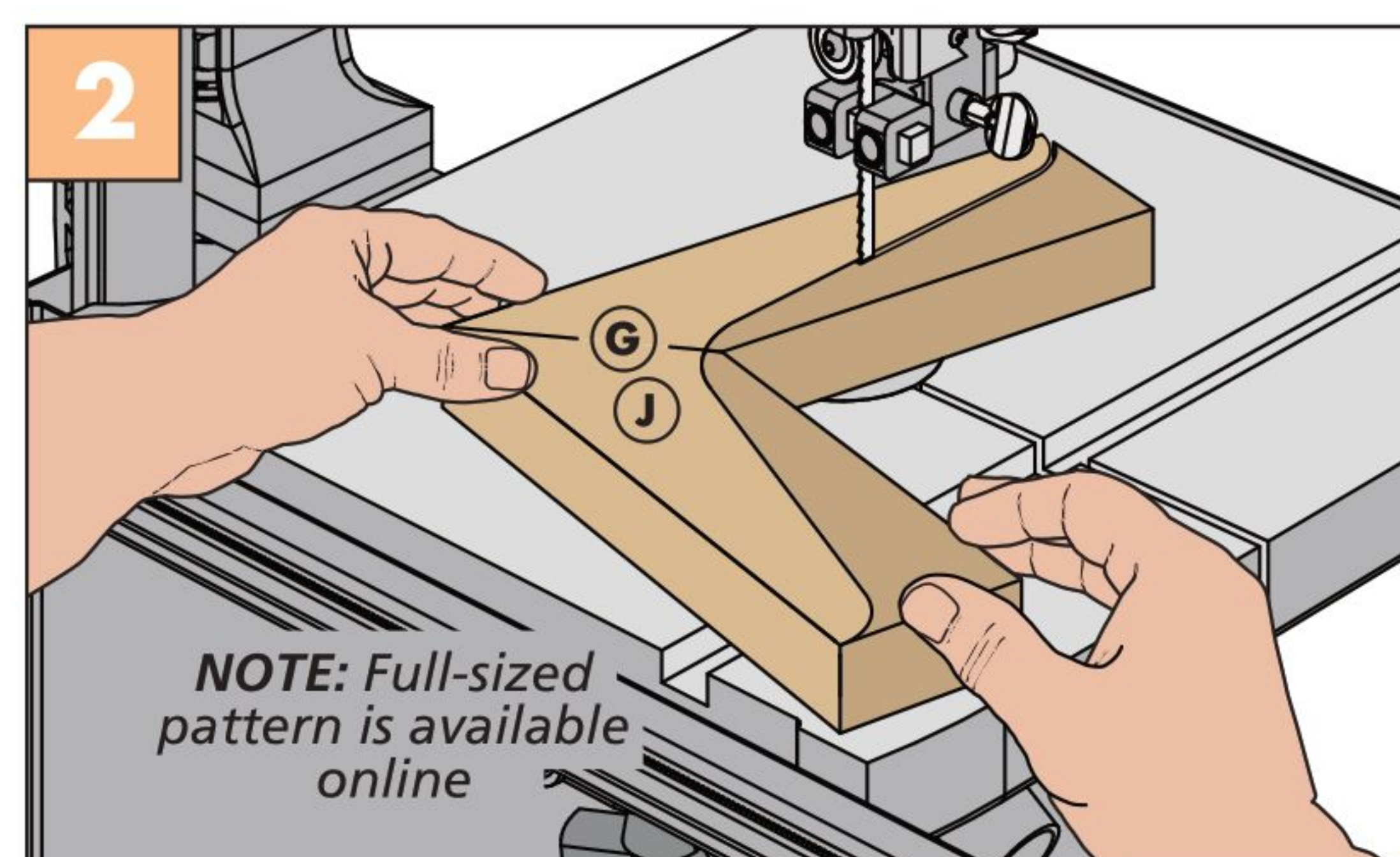
SHAPELY BRACKETS. The brackets that support the desk and shelves are made of two pieces,

connected with a miter joint. Like the case we just made, these are reinforced with a spline. The brackets start off as mitered blanks. At the router table, use a slot cutting bit

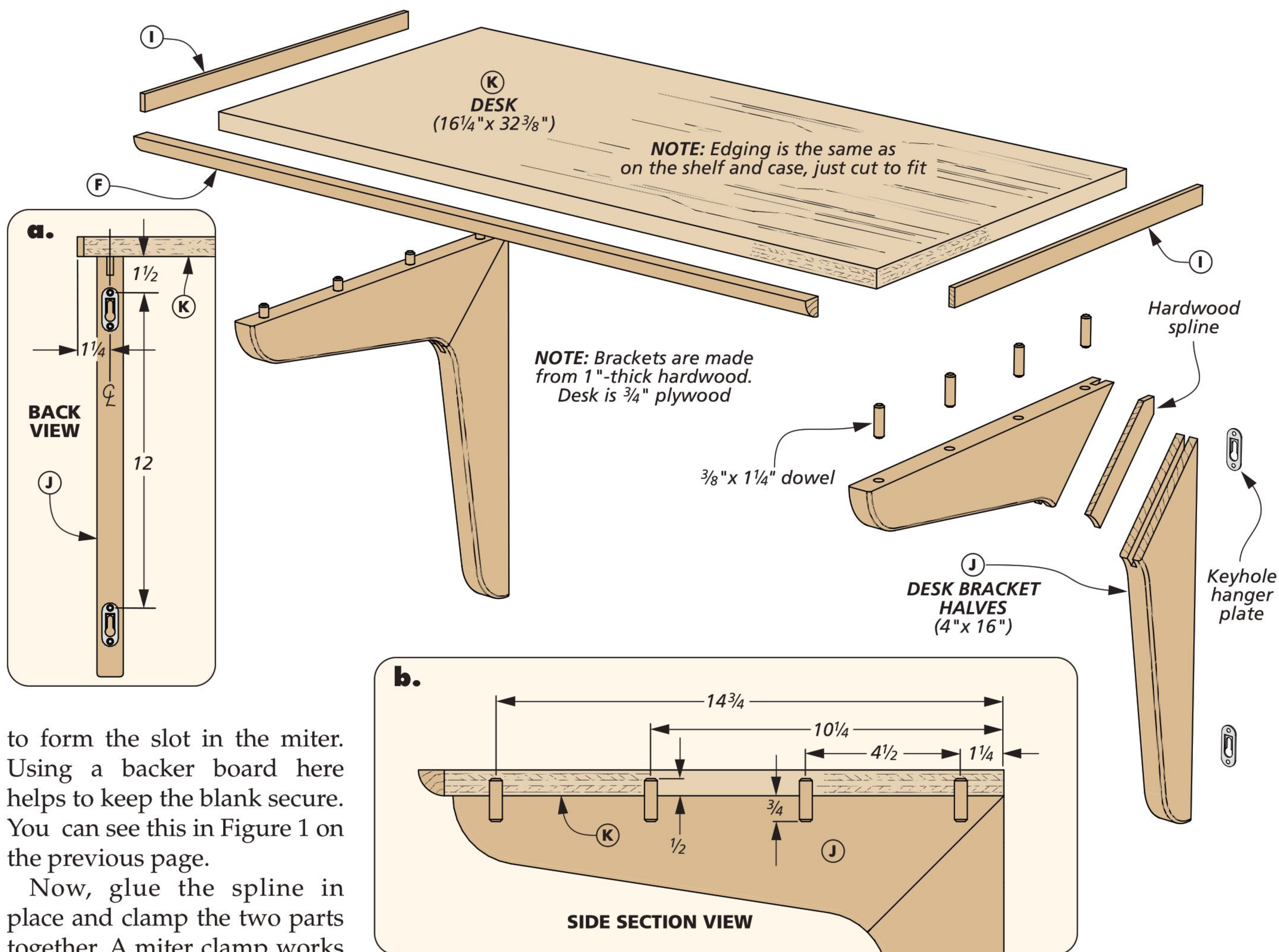
MAKING THE BRACKETS



Slot Cutter. At the router table, load up a slot cutter. Use a triangle shaped backer board to back up the shelf bracket halves as you feed them through the slot cutter, creating the slot for the splines.



Shape The Bracket. After the brackets are glued together, shape them at the band saw. Clean them up with rasps and sandpaper.



to form the slot in the miter. Using a backer board here helps to keep the blank secure. You can see this in Figure 1 on the previous page.

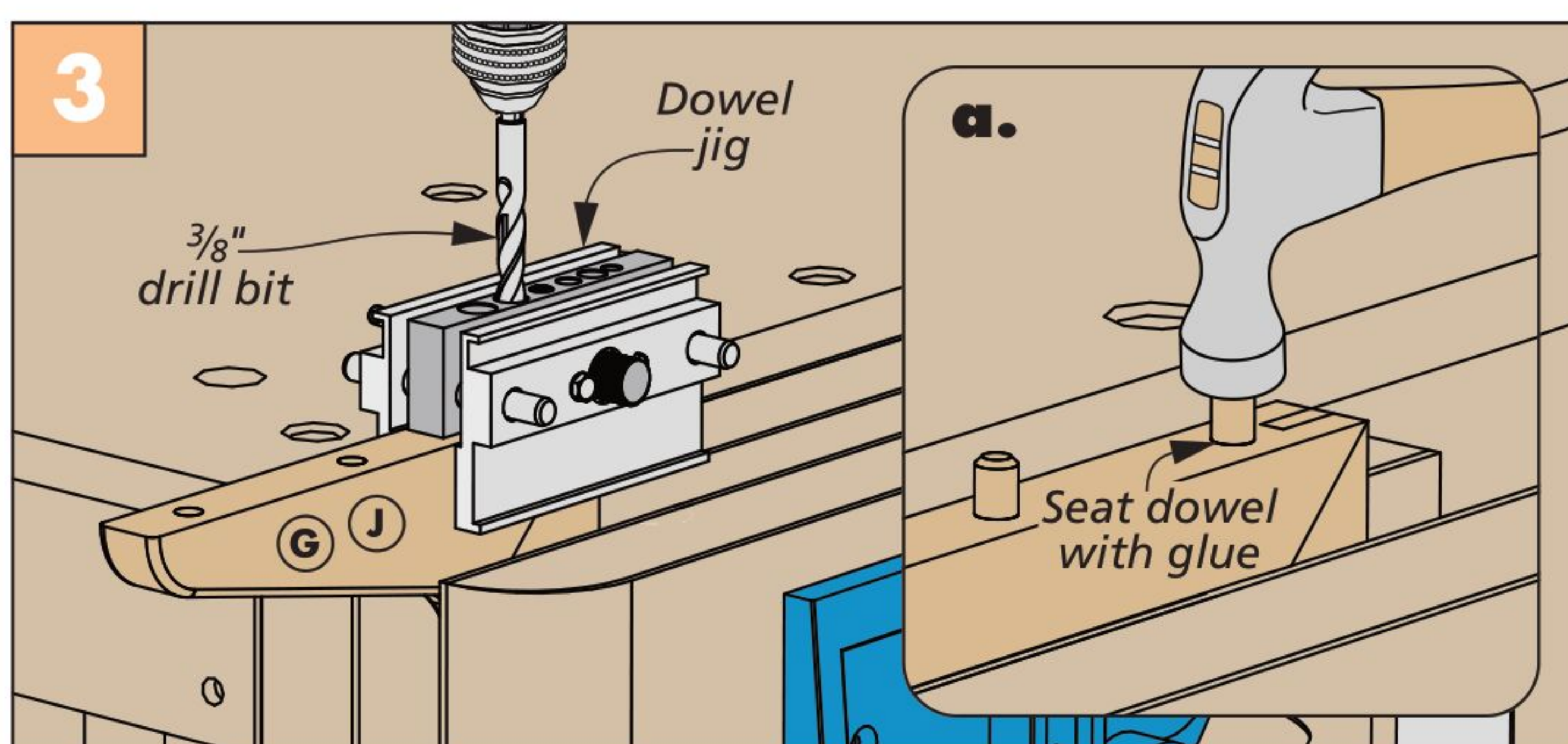
Now, glue the spline in place and clamp the two parts together. A miter clamp works wonders here, but a couple of bar clamps spanning the parts will work as well. Once the glue is dry, print off a pattern (available on Woodsmith.com/259) and cut the bracket to shape at

the band saw (Figure 2). After smoothing the profile out with a rasp and sandpaper, round over the front edges with a round-over bit at the router table.

DOWELS TO BIND THEM. To connect the shelf and desk to the brackets, we opted to use a series of dowels to lock the panels to the brackets.

As you can see in the drawings on the previous page and the one above, the shelves have three dowels while the desk has four. Use a doweling jig to drill the holes in the top edge of the brackets. A series of dowel centers placed in the brackets will allow you to mark the mating hole locations underneath the surfaces. Drill those holes at the drill press.

Finish up the shelves and desk by routing the pockets for the keyhole hangers. Now, you can drive dowels into the bracket and shelf holes with glue and install the keyhole hangers with a pair of screws.



Dowel Holes. After final shaping, lay out the locations for the holes that the dowels seat into. Use a simple, clamp-on style, doweling jig to position the drill bit.



For full size patterns of brackets, go to:

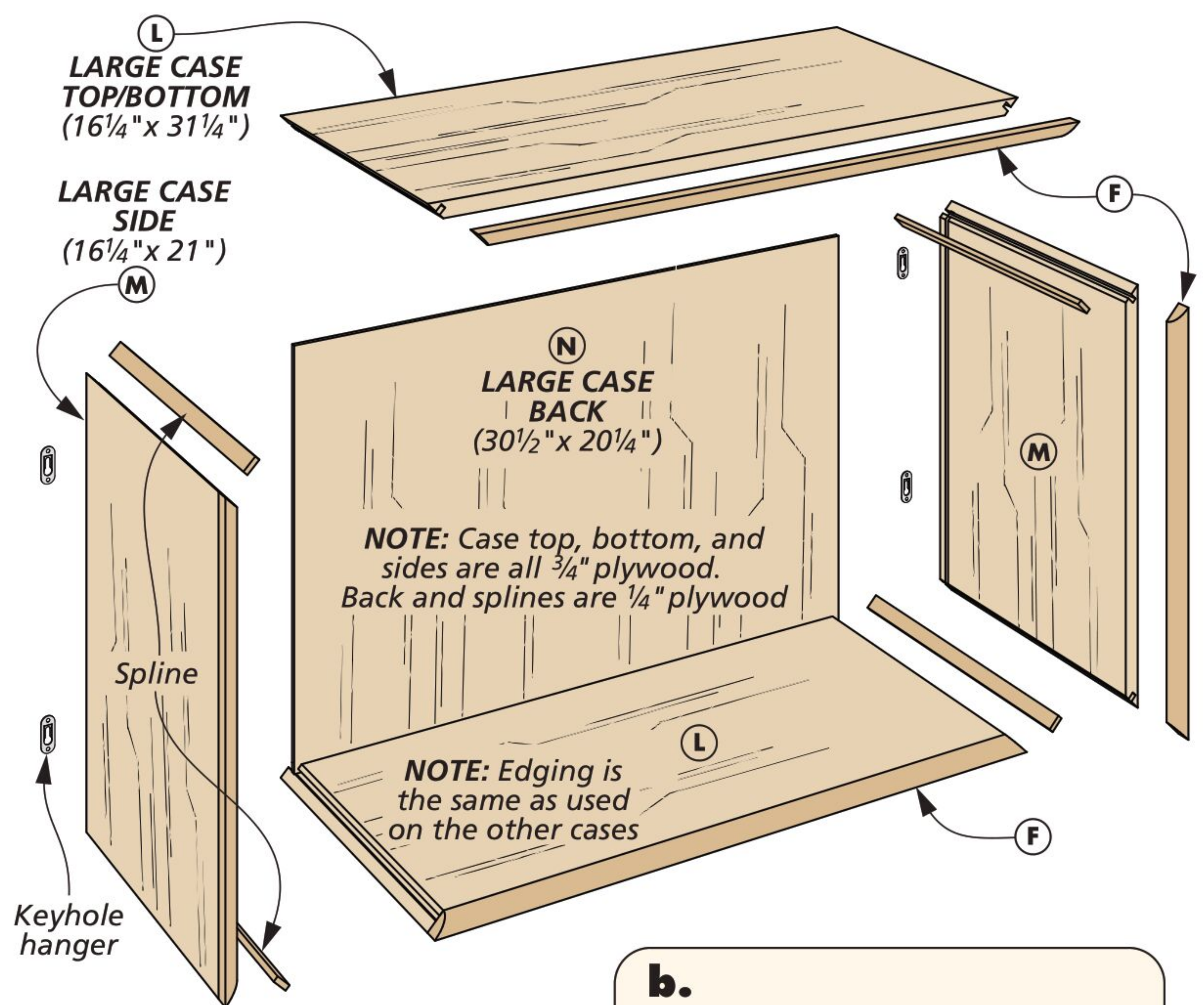
Woodsmith.com/259

Adding Larger STORAGE

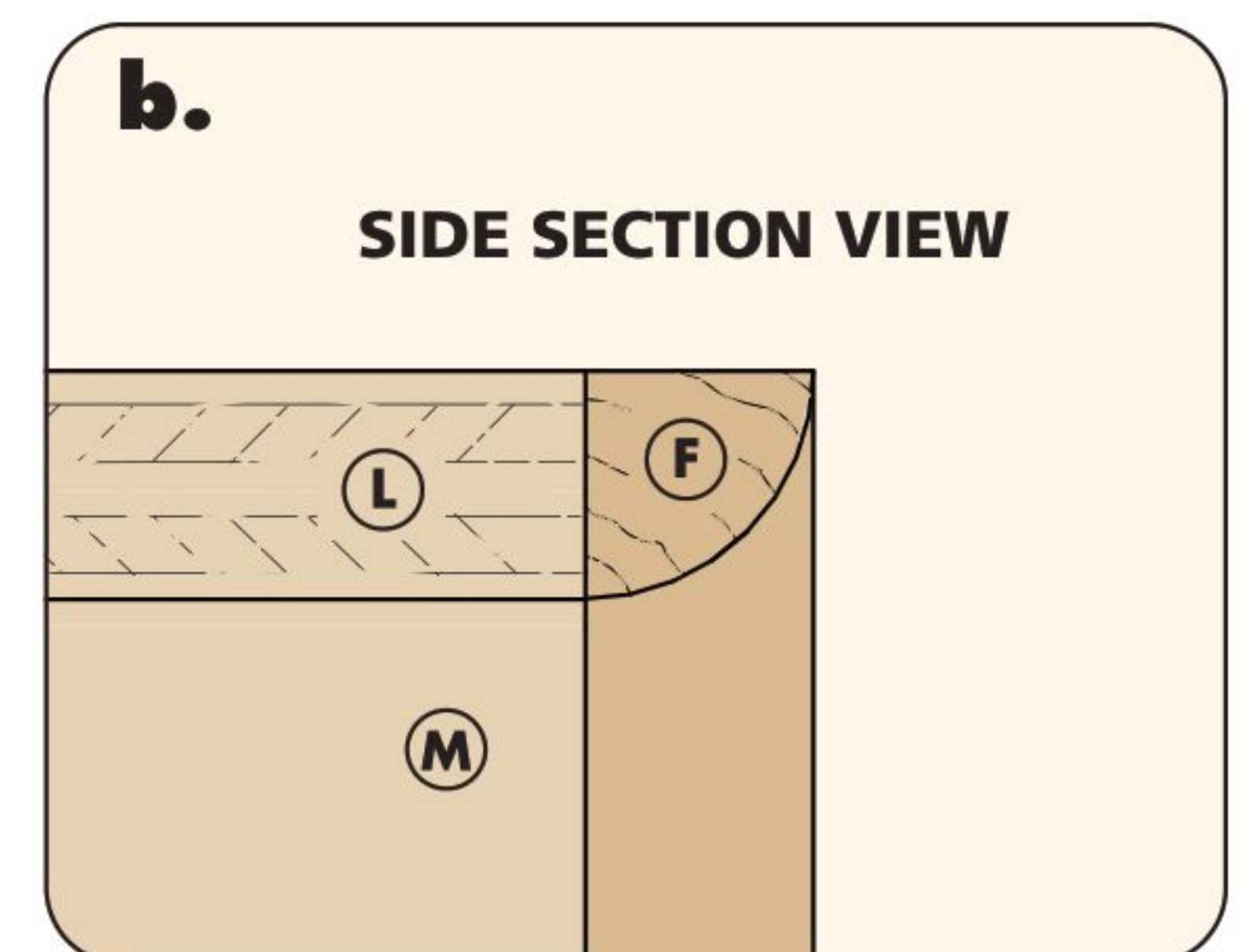
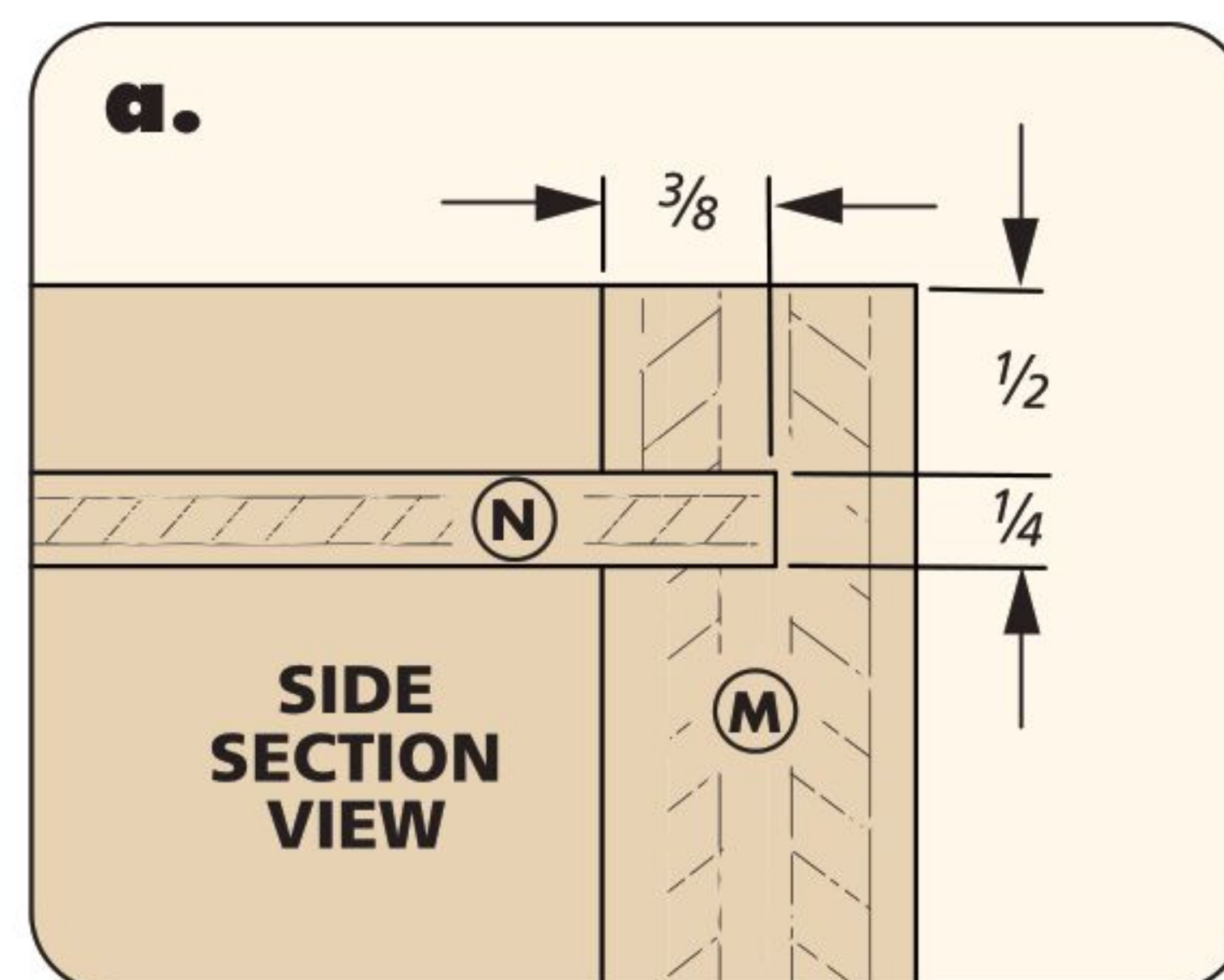
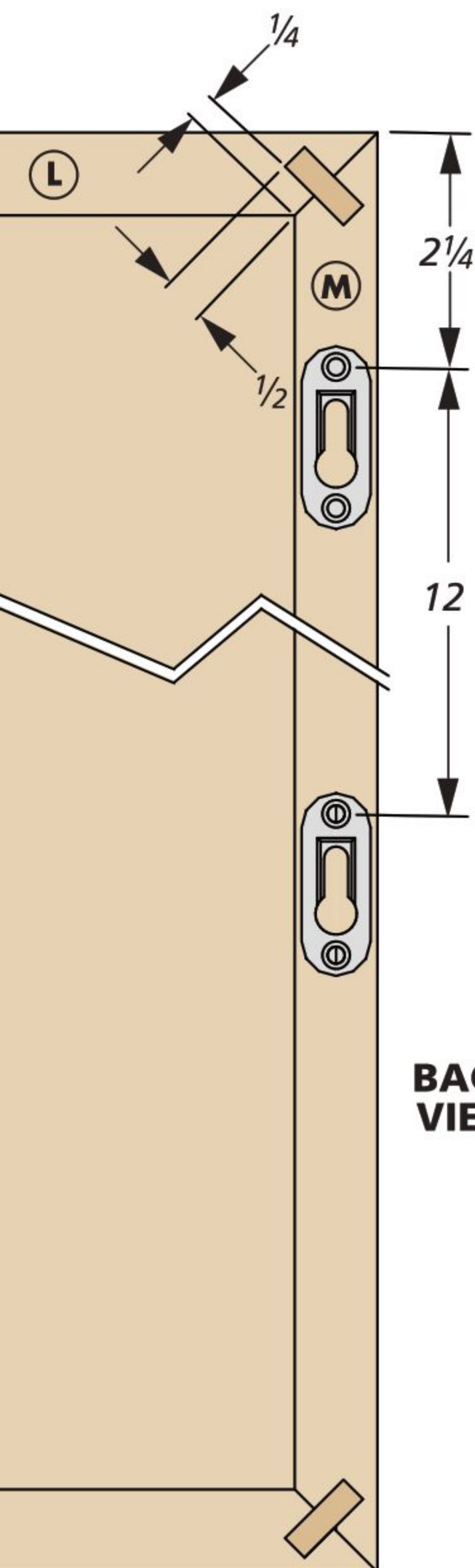
The final pieces of the wall unit are maybe the most important to the look and function of the piece. Those are the cabinet and drawer unit. Because you've already built the open case already, I won't go into much detail on building these — they're just sized a little different. Let's look at how you customize each one.

PAIR OF DOORS. If you look at the drawing to the right and below, you'll see what I'm calling the cabinet. The doors on the cabinet open to reveal one (or more) shelves to hold whatever you'd like. The doors are made from solid walnut, so you'll need to glue them up before hand. After cutting them to size, you can drill the hand hole. Do this by clamping a piece of scrap along the edge and using a Forstner bit in the drill press. The doors get installed with a pair of euro hinges. These mount into the cabinet and allow the doors to swing open without showing any visible hinge when closed.

ADJUSTABLE SHELF. On the inside of the case, you'll (maybe) want to add a shelf or two. Edged plywood is the ticket here.

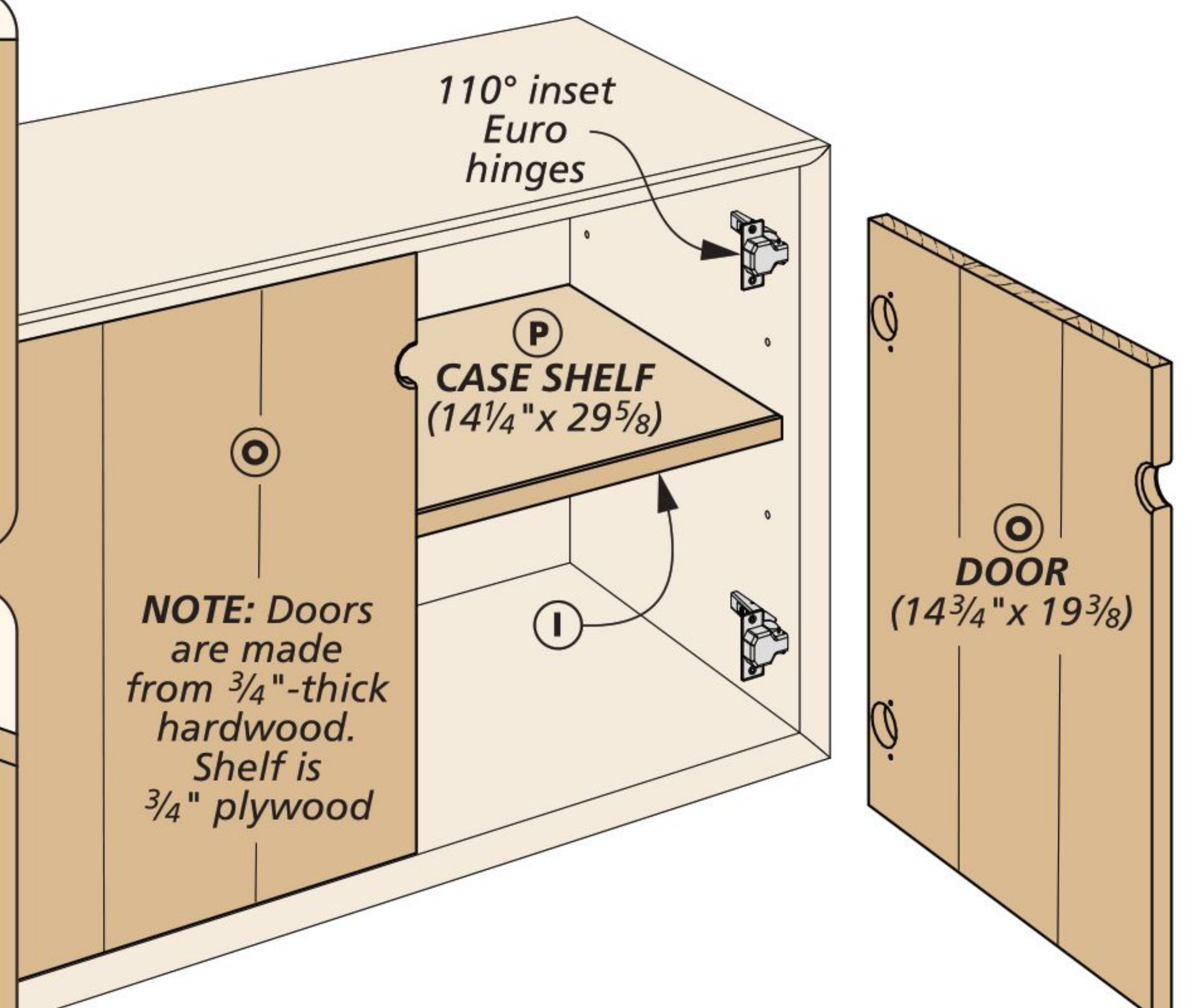
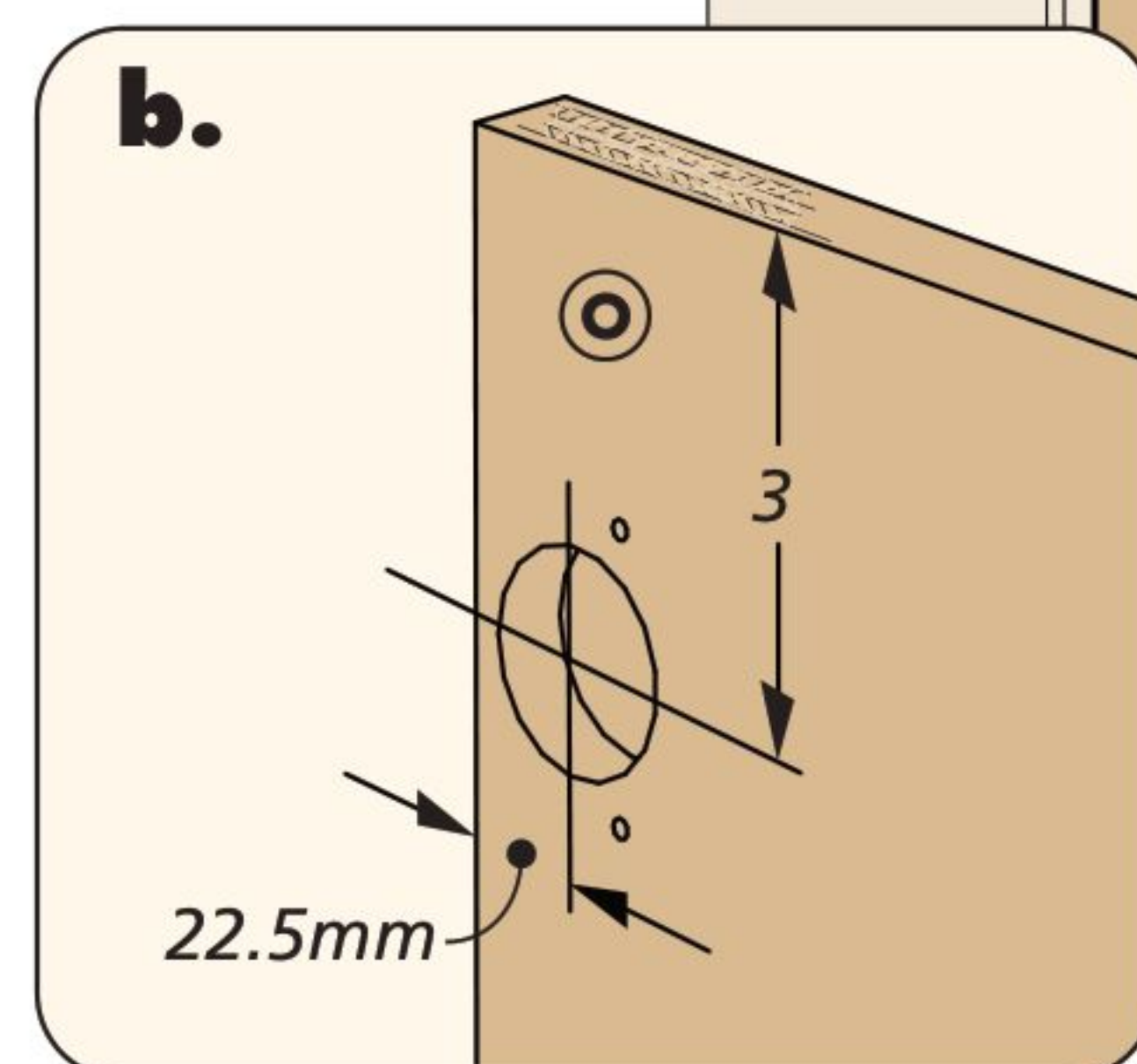
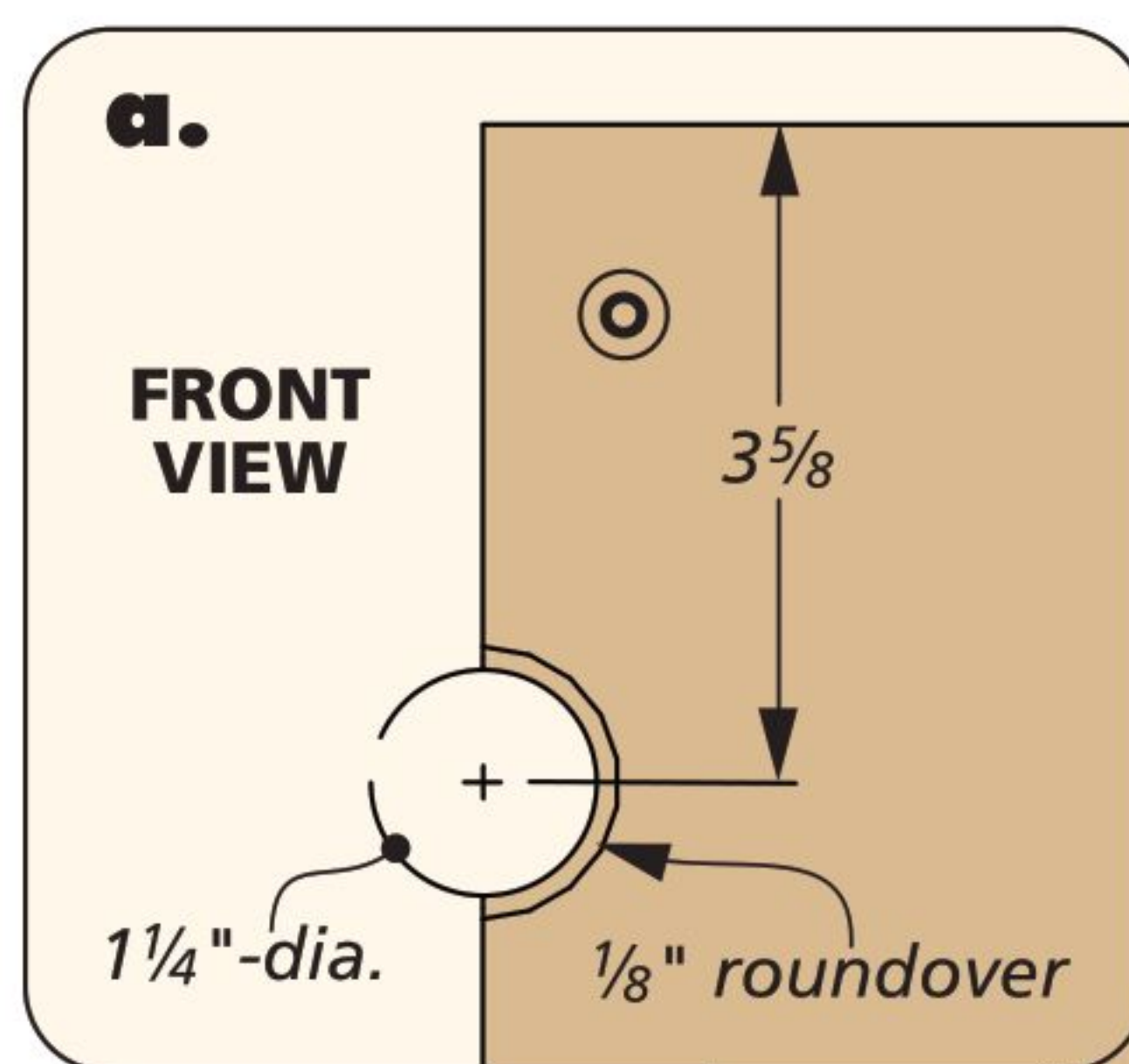
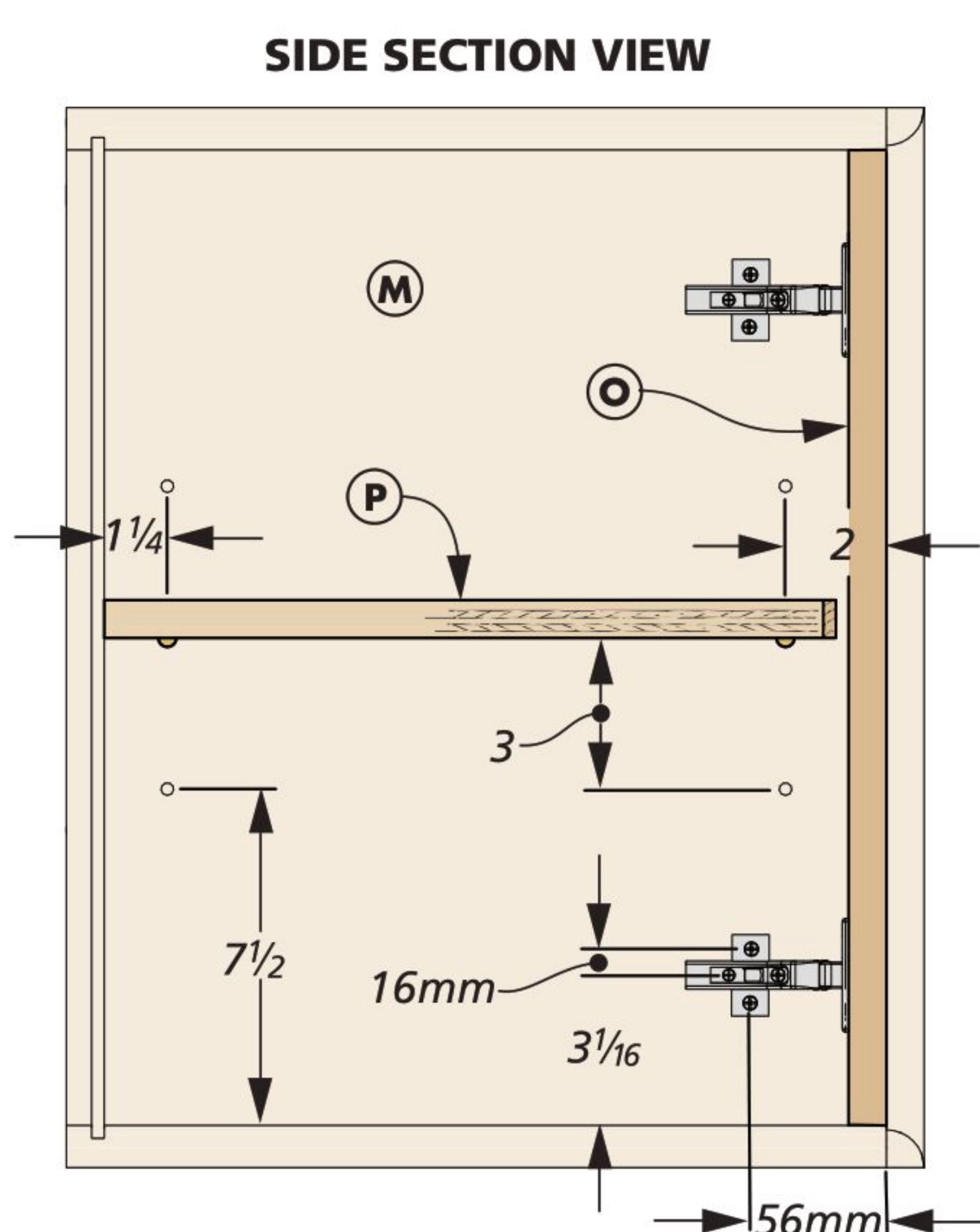


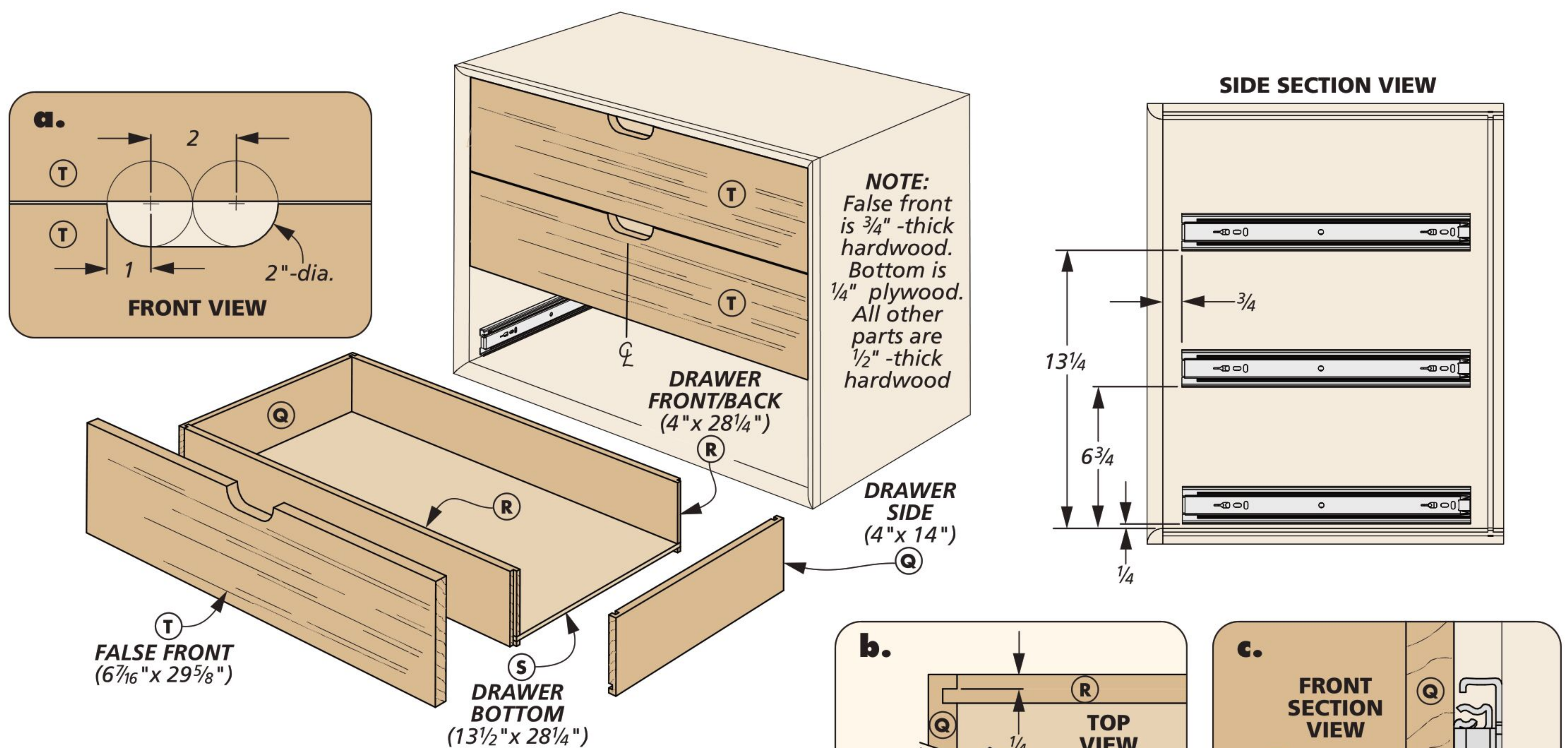
BACK VIEW



SET OF DRAWERS

If a cabinet with doors isn't your style, maybe consider adding a set of drawers, like you see on the next page. These three drawers mount inside the case with slides.





Building the drawer box is done with tongue and dado joinery. It's a simple way to build great-looking drawers that will last. Ours are made from maple, but you could use plywood as well. To match the rest of the wall unit, walnut false fronts are attached to the drawers.

The false front is a simple hardwood panel that has a finger notch cut out. For consistency's

sake, I rough cut it at the band saw, and used a template with a pattern bit to make sure all of the notches were the same. After attaching the false front to the drawer box, mount the boxes with drawer slides.

Once you've applied a few coats of your finish of choice (lacquer here), the wall unit's ready to hang. Start by

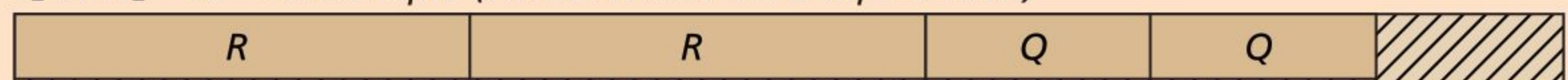
measuring out the upright positions and attaching them to the wall studs. Then, install machine screws where you'd like to hang each of your units, and slip them in place. **W**

Materials, Supplies & Cutting Diagram

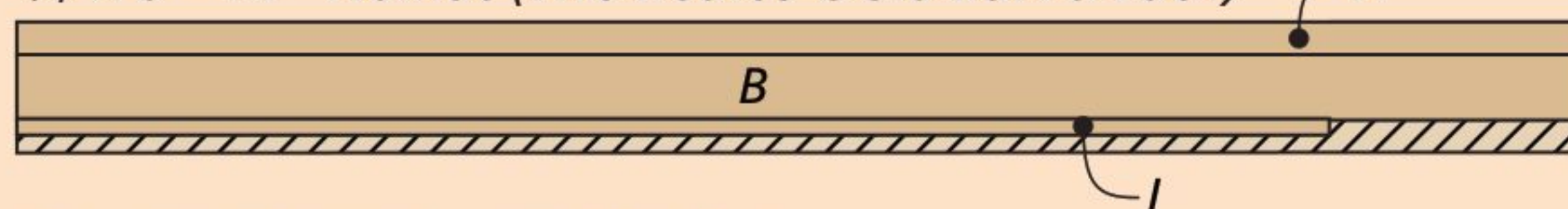
A Narrow Uprights (2)	$\frac{3}{4}$ " x $1\frac{1}{2}$ " - 72
B Wide Uprights (2)	$\frac{3}{4}$ " x 3" - 72
C Cubby Top/Bottom (2)	$\frac{3}{4}$ " ply. - $9\frac{1}{4}$ " x $31\frac{1}{4}$ "
D Cubby Sides (2)	$\frac{3}{4}$ " ply. - $9\frac{1}{4}$ " x 12"
E Cubby Back (1)	$\frac{1}{4}$ " ply. - $11\frac{1}{4}$ " x $30\frac{1}{2}$ "
F Qtr Rnd Edging (1)	$\frac{3}{4}$ " x $\frac{3}{4}$ " - 500 rgh.
G Shelf Bracket Halves (20)	1" x $2\frac{7}{16}$ " - 9
H Shelves (5)	$\frac{3}{4}$ " ply. - $9\frac{1}{4}$ " x $31\frac{1}{4}$ "
I Edging (1)	$\frac{1}{4}$ " x $\frac{3}{4}$ " - 90 rgh
J Desk Bracket Halves (4)	1" x 4" - 16
K Desk (1)	$\frac{3}{4}$ " ply. - $16\frac{1}{4}$ " x $32\frac{3}{8}$ "
L Large Case Top/Bottom (4)	$\frac{3}{4}$ " ply. - $16\frac{1}{4}$ " x $31\frac{1}{4}$ "
M Large Case Sides (4)	$\frac{3}{4}$ " ply. - $16\frac{1}{4}$ " x 21"
N Large Case Backs (2)	$\frac{1}{4}$ " ply. - $30\frac{1}{2}$ " x $20\frac{1}{4}$ "
O Doors (2)	$\frac{3}{4}$ " x $14\frac{3}{4}$ " - $19\frac{3}{4}$ "
P Case Shelf (1)	$\frac{3}{4}$ " ply. - $14\frac{1}{4}$ " x $29\frac{5}{9}$ "
Q Drawer Sides (6)	$\frac{1}{2}$ " x 4" - 14
R Drawer Fronts/Backs (6)	$\frac{1}{2}$ " x 4" - $28\frac{1}{4}$ "
S Drawer Bottoms (3)	$\frac{1}{4}$ " ply. - $13\frac{1}{2}$ " x $28\frac{1}{4}$ "
T False Fronts (3)	$\frac{3}{4}$ " x $6\frac{7}{16}$ " - $29\frac{5}{8}$ "

- (72) 10-24 T-Nuts
- (36) Keyhole Hangers with Screws
- (38) $\frac{3}{8}$ " x $1\frac{1}{4}$ " Dowels
- (2) Pairs of Blum Inset Hinges
- (4) $\frac{1}{4}$ " Shelf Pins
- (3) Pairs of 14" Full-Extension Drawer Slides
- (1) Misc $\frac{1}{4}$ "-thick hardwood and plywood scrap for spline material

$\frac{1}{2}$ " x $4\frac{1}{2}$ " - 96" Hard Maple (Three Boards @ 3.0 Sq. Ft. Each)



$\frac{3}{4}$ " x 6" - 72" Walnut (Two Boards @ 3.0 Bd. Ft. Each)



$\frac{3}{4}$ " x 7" - 72" Walnut (3.5 Bd. Ft.)



$\frac{3}{4}$ " x 6" - 96" Walnut (Three Boards @ 4.0 Bd. Ft. Each)

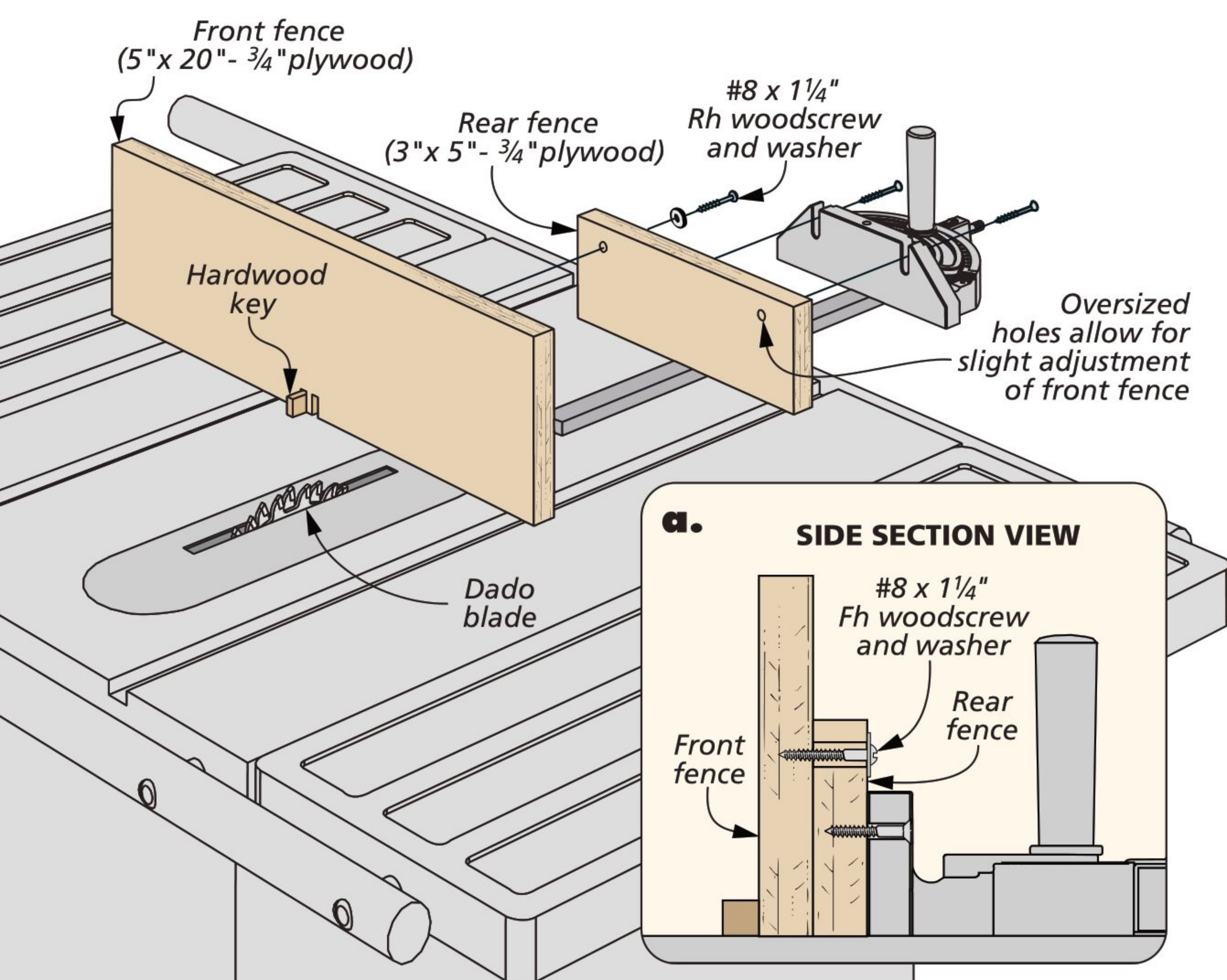


1" x $5\frac{1}{2}$ " - 84" Walnut (Two Boards @ 3.2 Bd. Ft. Each)



ALSO NEEDED: Two 48" x 96" Sheets of $\frac{3}{4}$ " Walnut Plywood, One 48" x 96" Sheet of $\frac{1}{4}$ " Walnut Plywood, and One 48" x 48" Sheet of $\frac{1}{4}$ " Maple Plywood

Perfect-Fitting Finger Joints

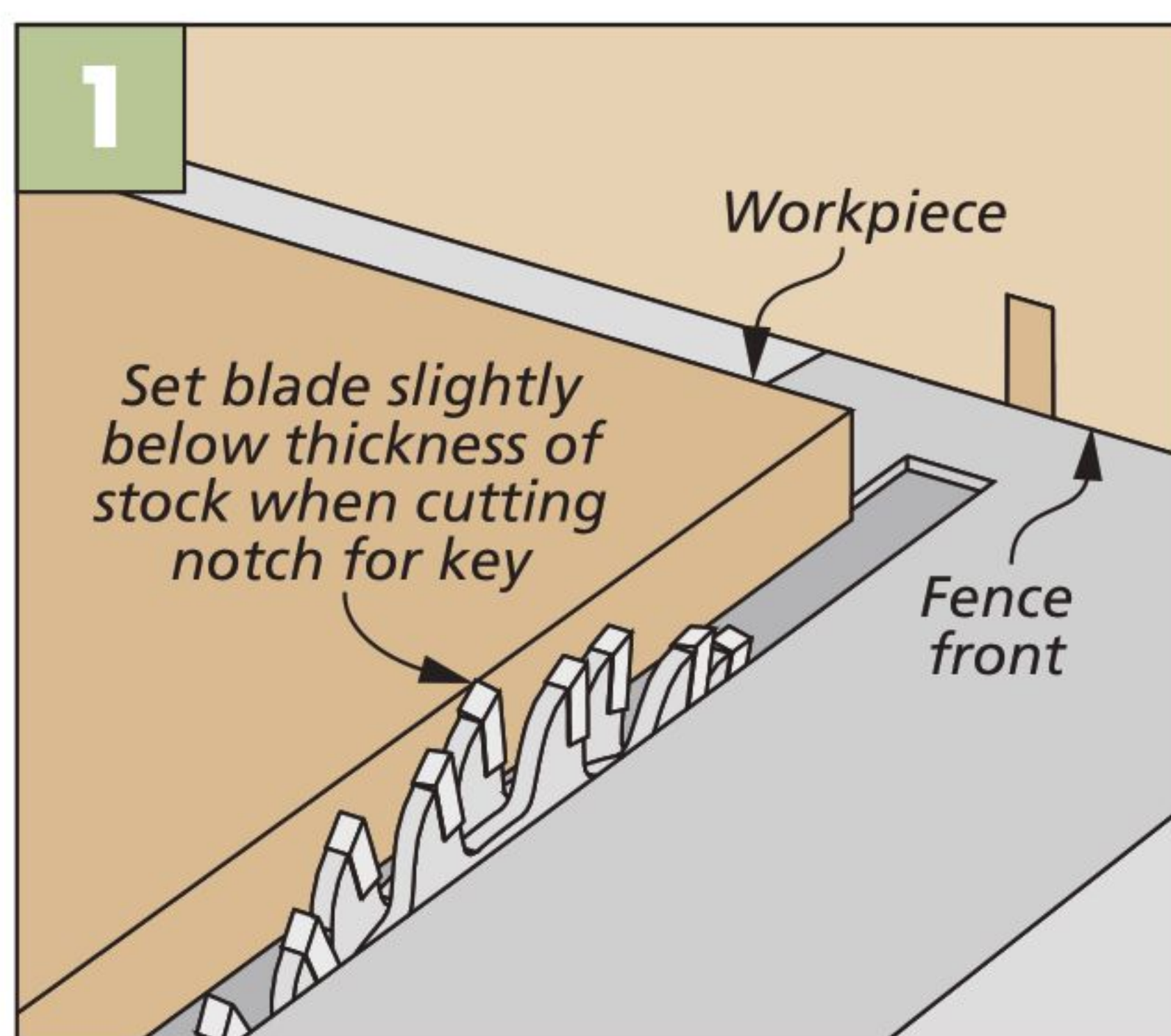


When I need to add some extra strength to a corner, my first choice is a finger joint. The interlocking pins offer more than enough glue surface to ensure a long-lasting joint, and the patterned corner of the joint is a great aesthetic addition to many projects. However, my favorite thing about the joint is that I can make the perfectly mated parts entirely on the table saw with just a simple, shop-made jig.

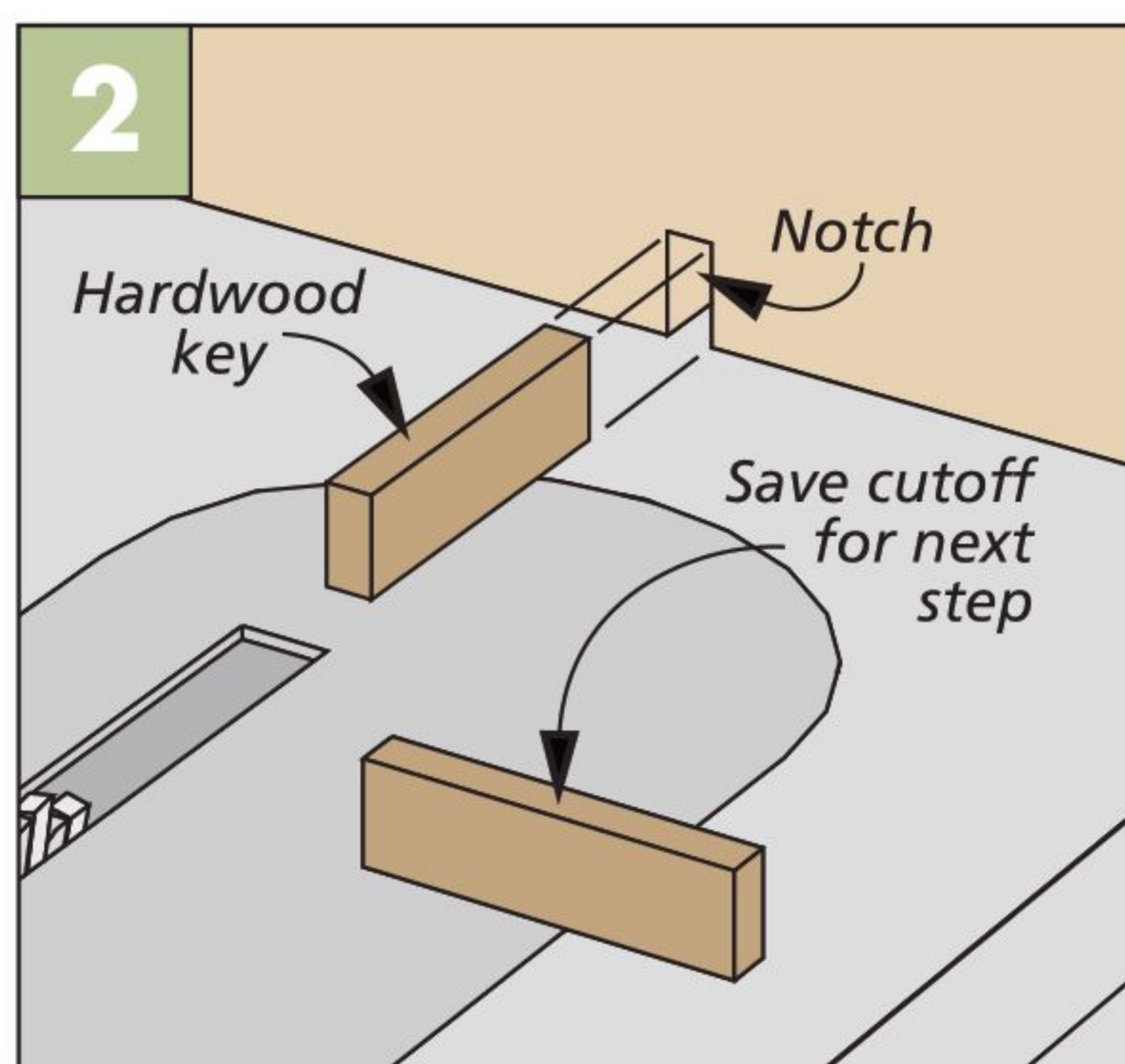
Of course, for the joint to be effective, the pieces must fit perfectly. That level of accuracy usually means some careful setup, but by building a little adjustability into this jig fine-tuning the fit becomes much simpler. The key is how you make the jig and attach it to your miter gauge.

THE DESIGN. This jig consists of a pair of fences, with the rear fence mounted to the miter gauge, using slightly oversized shank holes to attach the front fence. These holes allow easy side-to-side “tweaking” of the spaces in between the cuts.

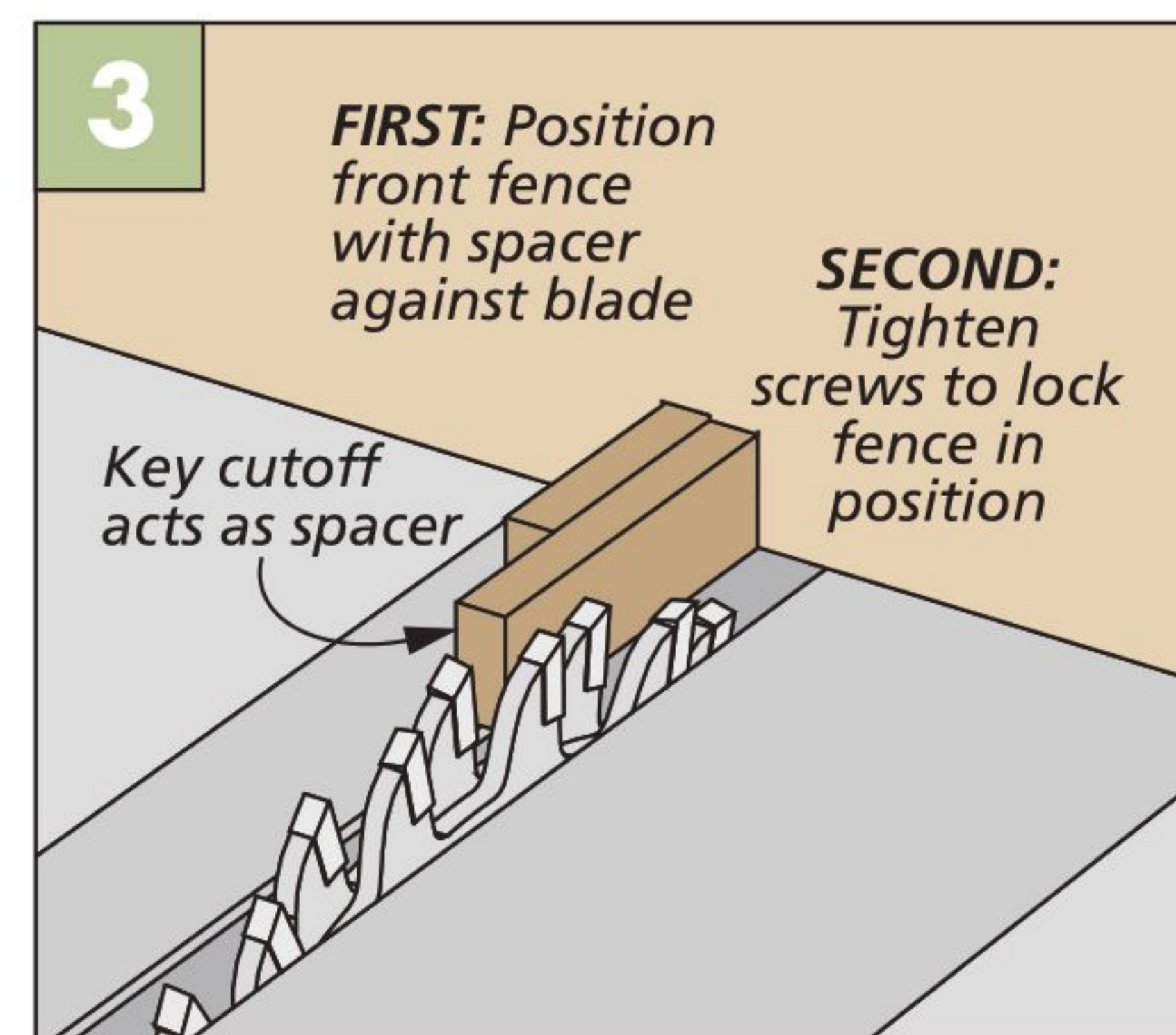
The front fence holds a hardwood indexing key offset from the blade by exactly the width of the cut



First Notch. When cutting the initial notch, set the blade height to just below the thickness of your piece.



Key & Spacer. Make the piece for the key extra long so the cutoff can be used as a spacer.



Second Notch. With the key in place, use the cutoff to space the cut for the second notch.

to control the spacing of the pins. It also backs up the workpiece to prevent tearout during the cuts. The jig is simple enough that I've thrown together several of them, ranging from fine fingers to bulkier box joints.

FENCES. You can start building the jig by selecting straight, flat material (I prefer Baltic birch plywood) for the front fence. The rear fence can be a piece of plywood as well, also flat and straight. To allow for easy adjustment, drill

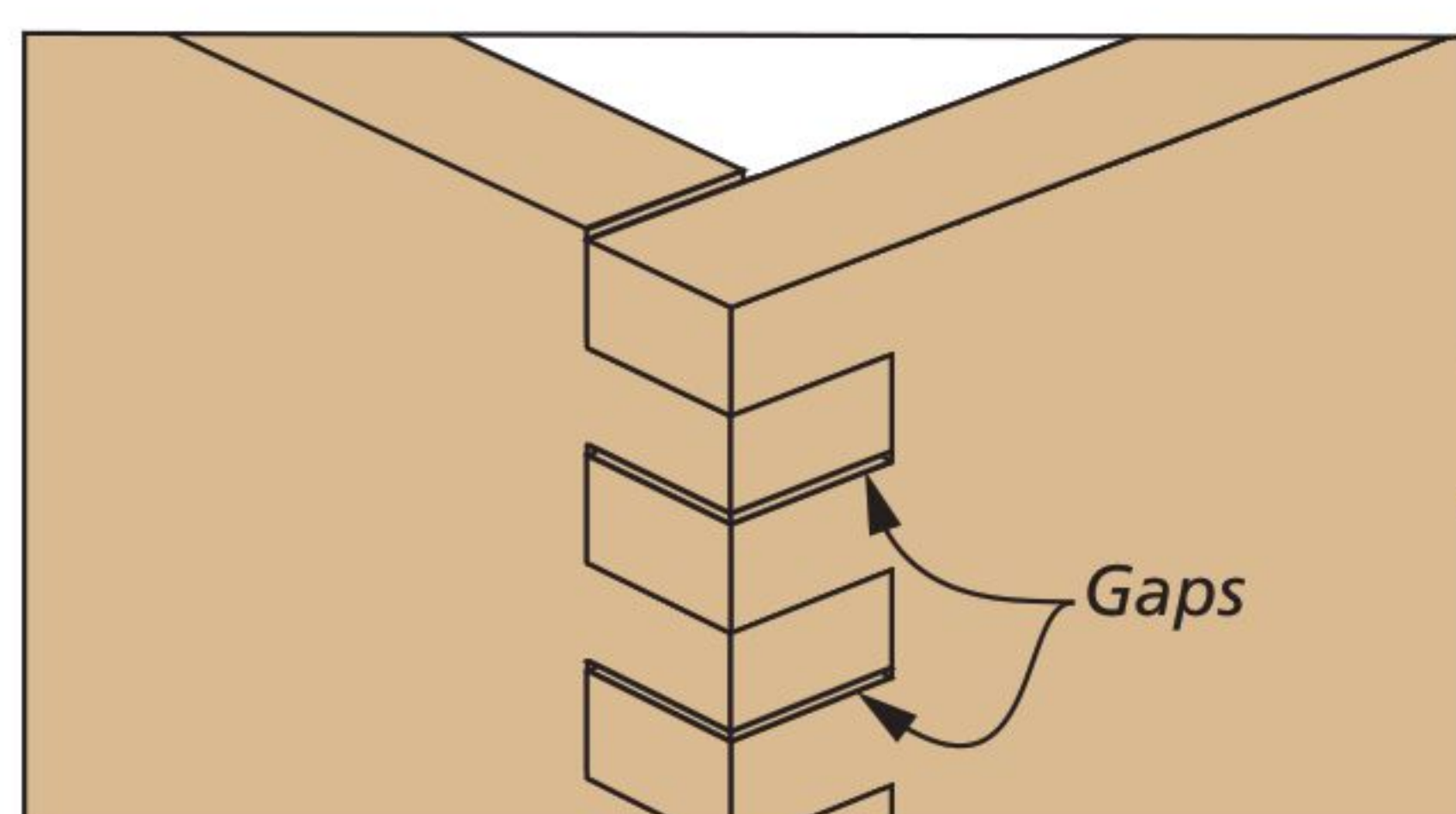
oversized holes in the rear fence using a larger diameter bit than the screws you'll use to attach the front fence.

KERF & KEY. Install a dado blade set to match the width of the pins for your project. Set the blade height just below the thickness of the workpiece (as in Figure 1 above). Hold the front fence in position (don't attach it with screws yet) and make a cut through the fence. Now you'll need to cut a small piece

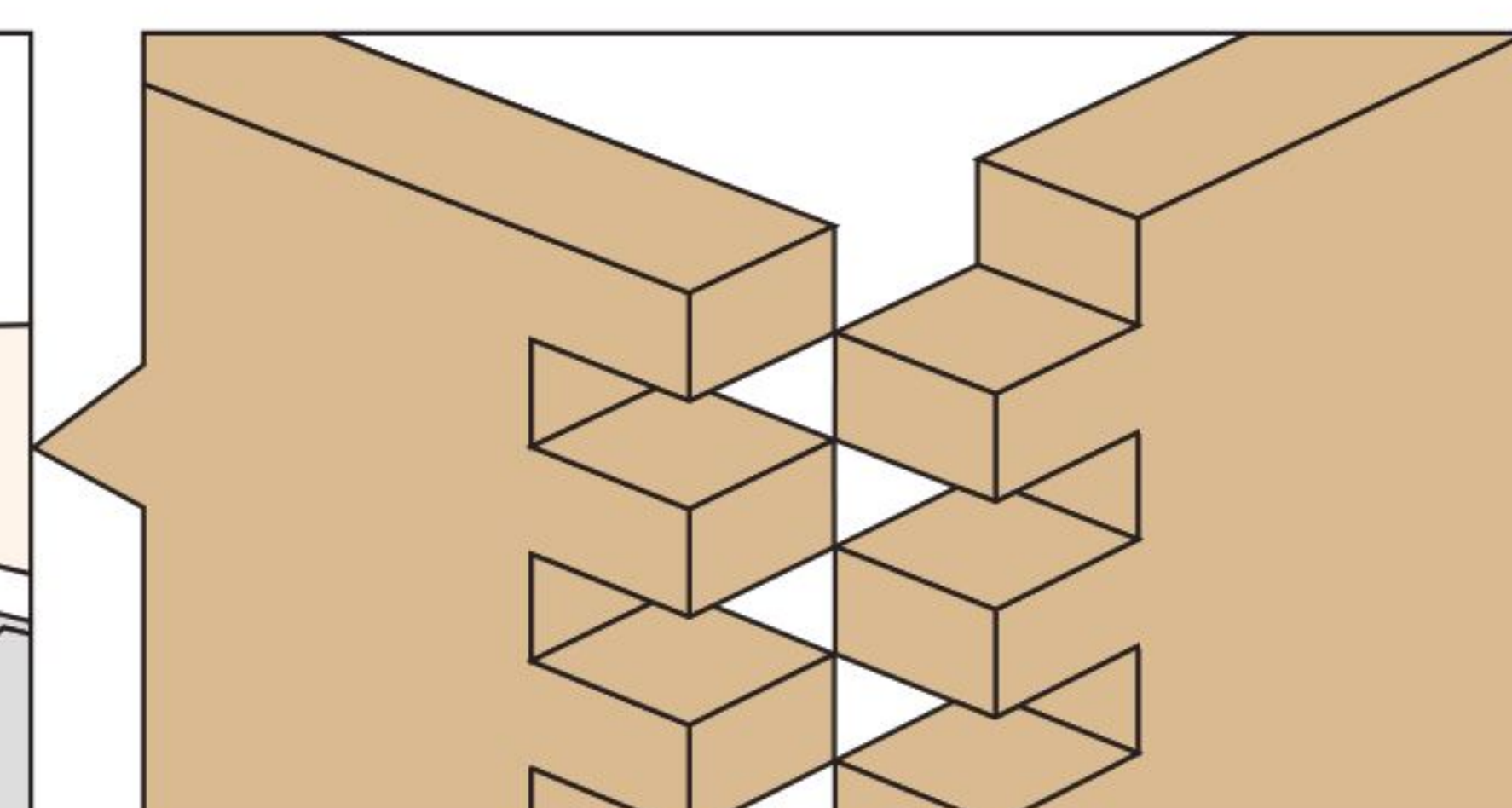
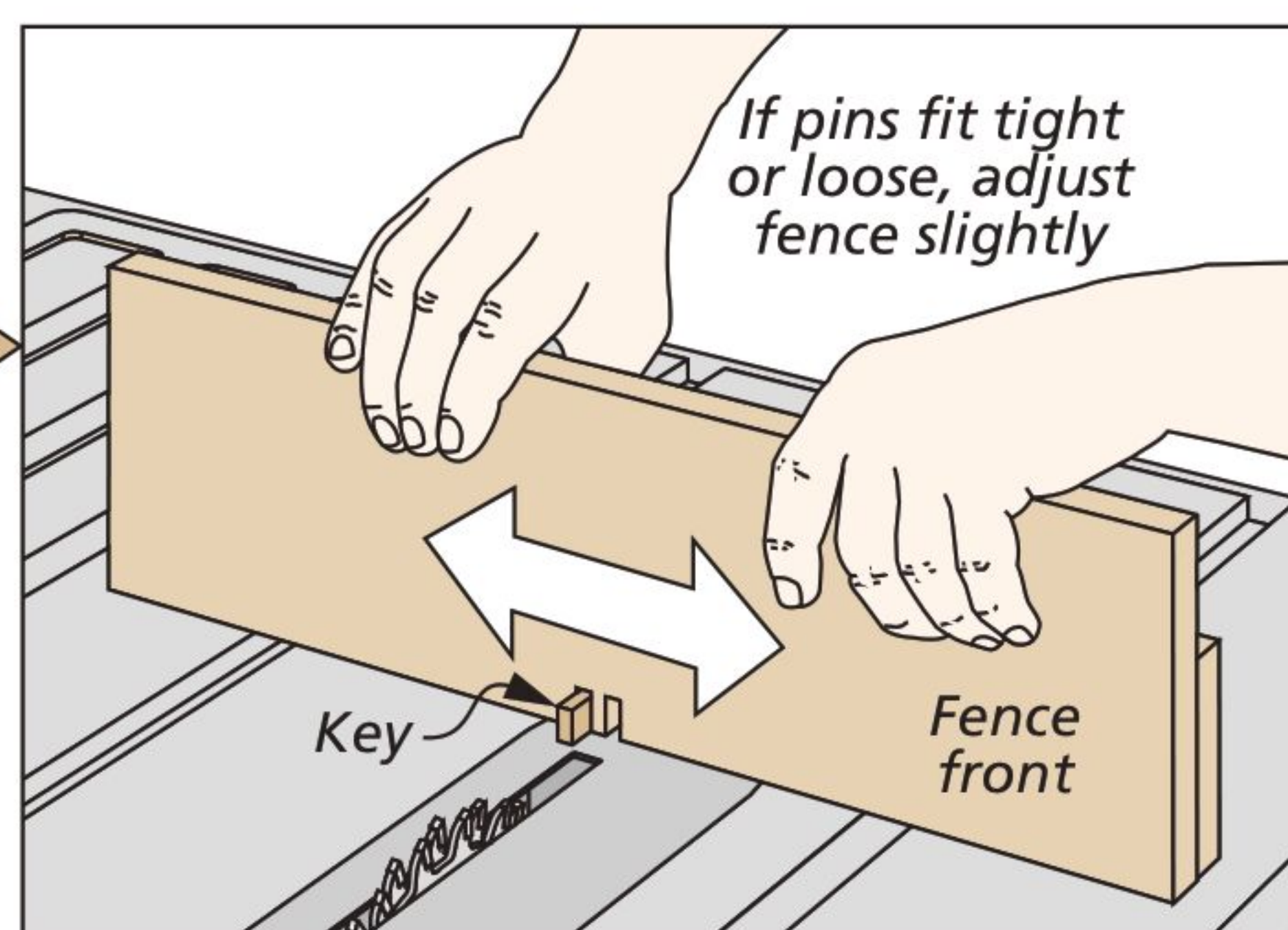
of hardwood for the key. Be sure the piece for the key is long enough for you to trim a bit off to use as a spacer. Slide the jig up to the dado blade and put the spacer between the outside teeth of the blade and the key (Figure 3). Once you've cut the second kerf, you can now attach it to the rear fence with screws.

The next step in cutting the finger joints is making the test cuts, and from there it's all about fine-tuning the fit.

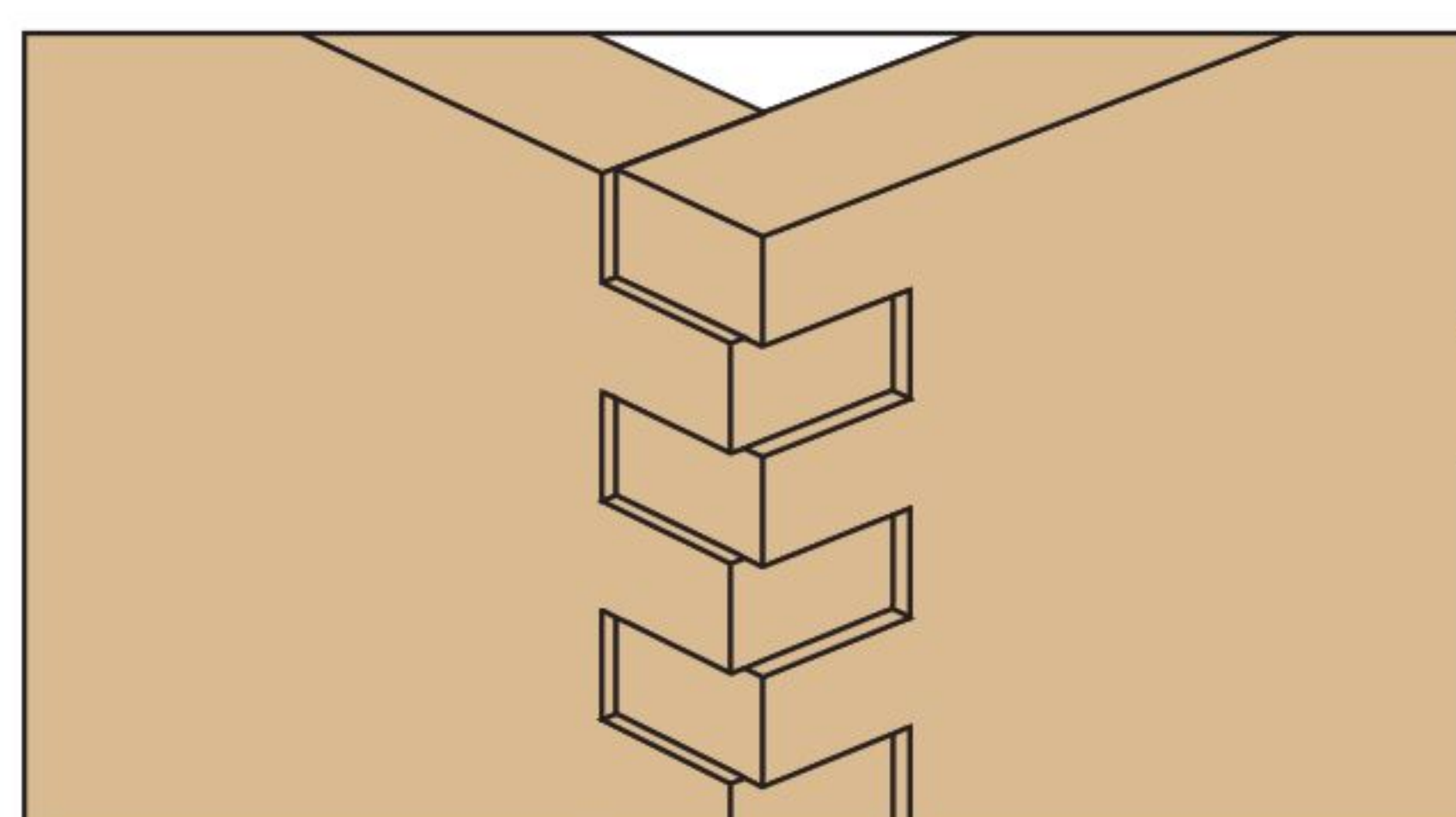
FINE-TUNE THE FIT



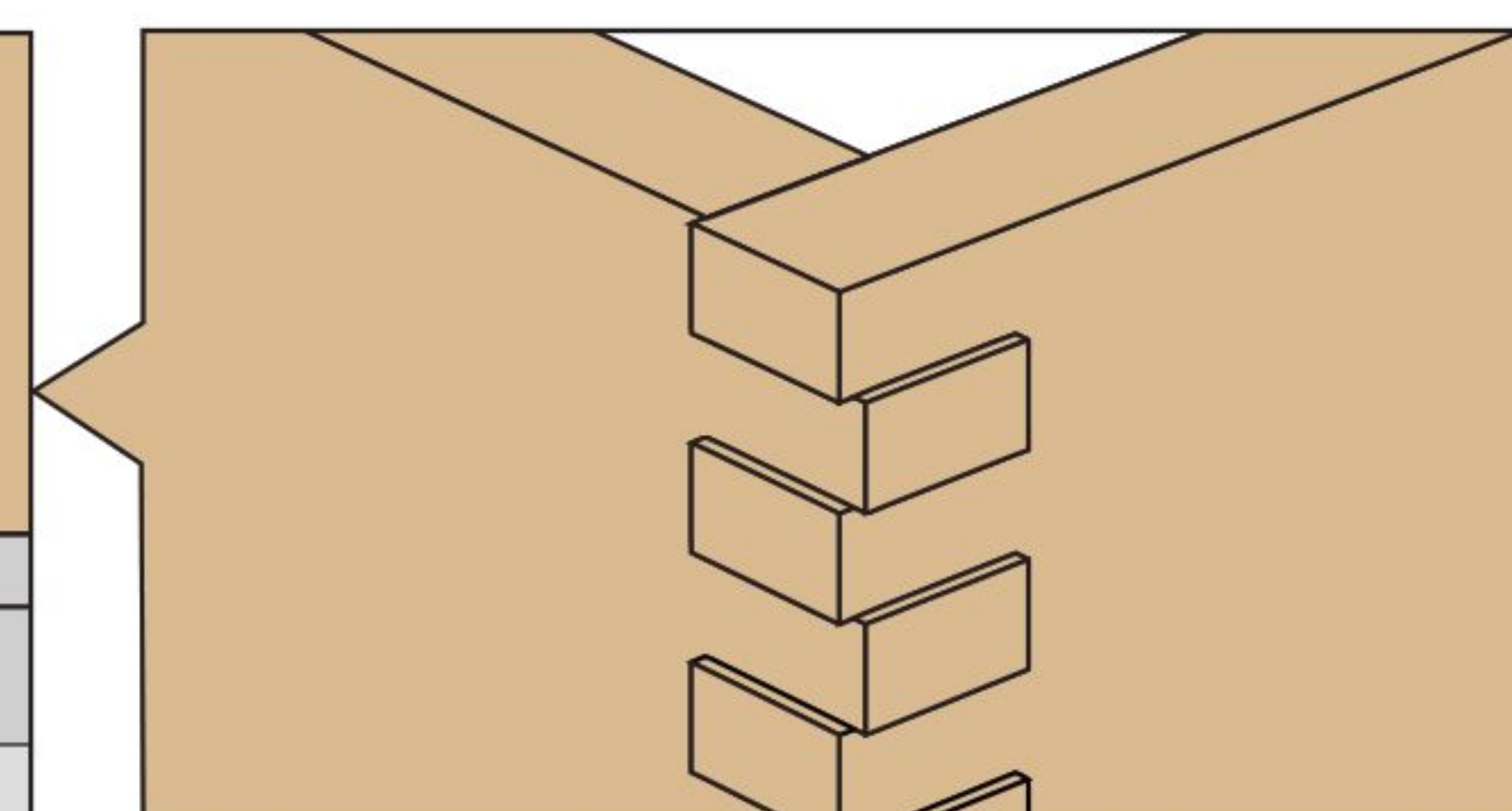
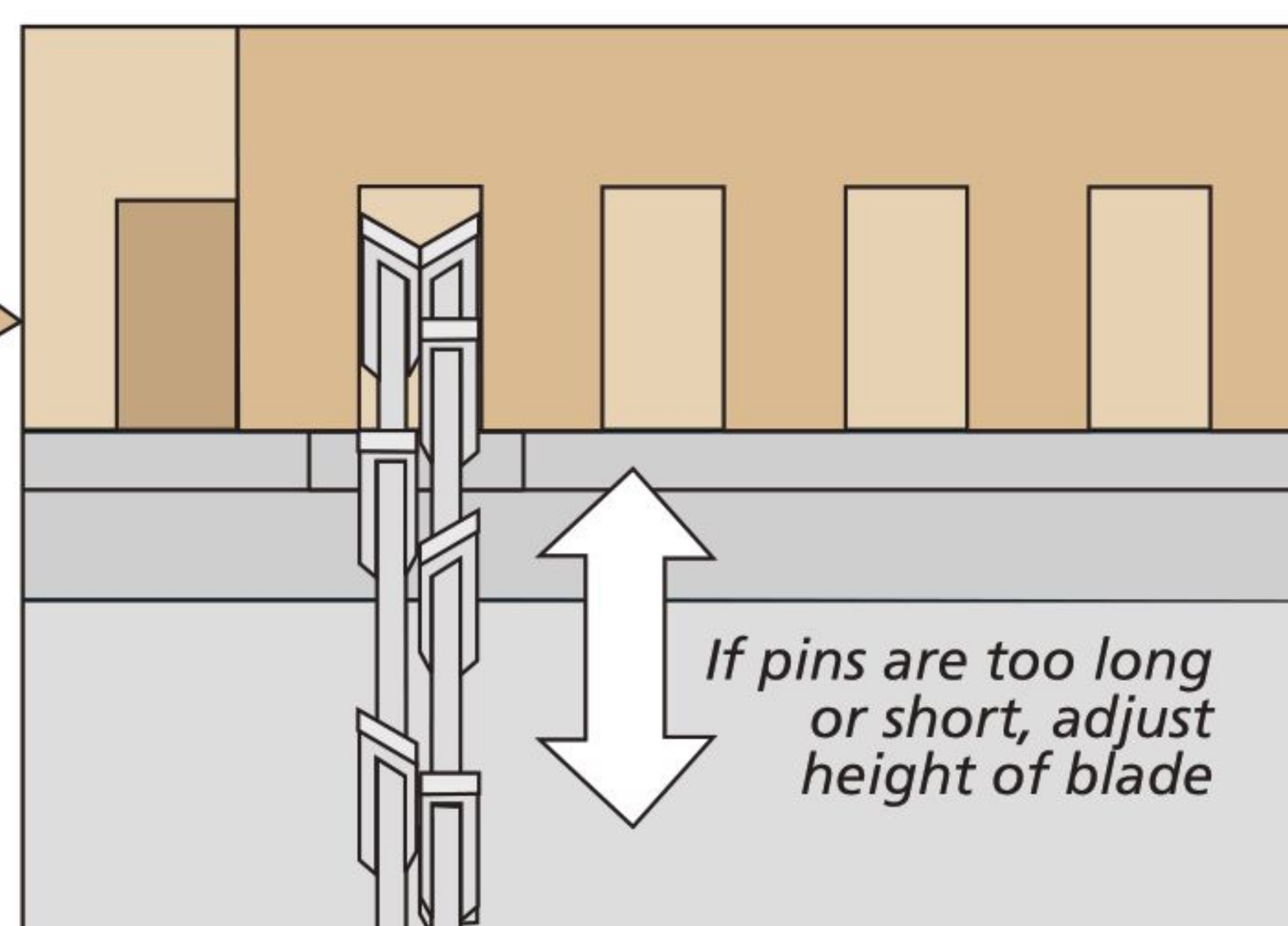
Too Loose. If the joint has gaps between the pins, adjust the fence to move the key away from the blade.



Too Tight. If the joint requires too much force, or won't go together at all, move the key toward the blade.



Short Pins. Short pins are the result of the blade being too low. Simply raising the blade will correct this.



Long Pins. If the pins protrude too far (more than $\frac{1}{32}$ "), you'll need to lower the blade for subsequent cuts.

TEST CUTS. With the jig made, it's time to give it a trial run. Using a couple of test pieces milled to the same thickness and width as your workpieces, make the first cut with one edge against the key (as in Figure 1 below), then make each successive cut by placing the freshly cut slot over the key (Figure 2). Once you've cut all the notches, flip the workpiece around and use the first pin as a spacer. Butt the mating workpiece against it and continue cutting (Figure 3). I prefer a good fit, but not one that requires more than a light tap to seat properly.

TROUBLESHOOTING. The box on the previous page should be able to guide your adjustments, but there is one other thing to watch out for when cutting these test pieces. You may find your pins beginning to drift at some point. If the spacing of your pins starts off

good, but slowly becomes offset, then a few things could be at work.

First, it could be the key. It's important to get the key to the precise thickness. Any play in between the key and the slots in your pieces will cause your cuts to slowly shift off course.

Second, there could be some play between the miter gauge and the slot in your table saw. If there's any jiggle when you push the miter gauge side-to-side, then this could be the issue. The best fix I found for this is applying aluminum foil tape to the miter gauge for a slop-free fit.

Finally, you may find a bit of play between the piece and the jig itself. As with the miter gauge, consistency is key in this case. When holding the workpiece, apply pressure as close to directly over the key as you can, pressing back against the fence and down against the table. This

should help to maintain the most important relationship in this jig during the cut: that between the key and the blade.

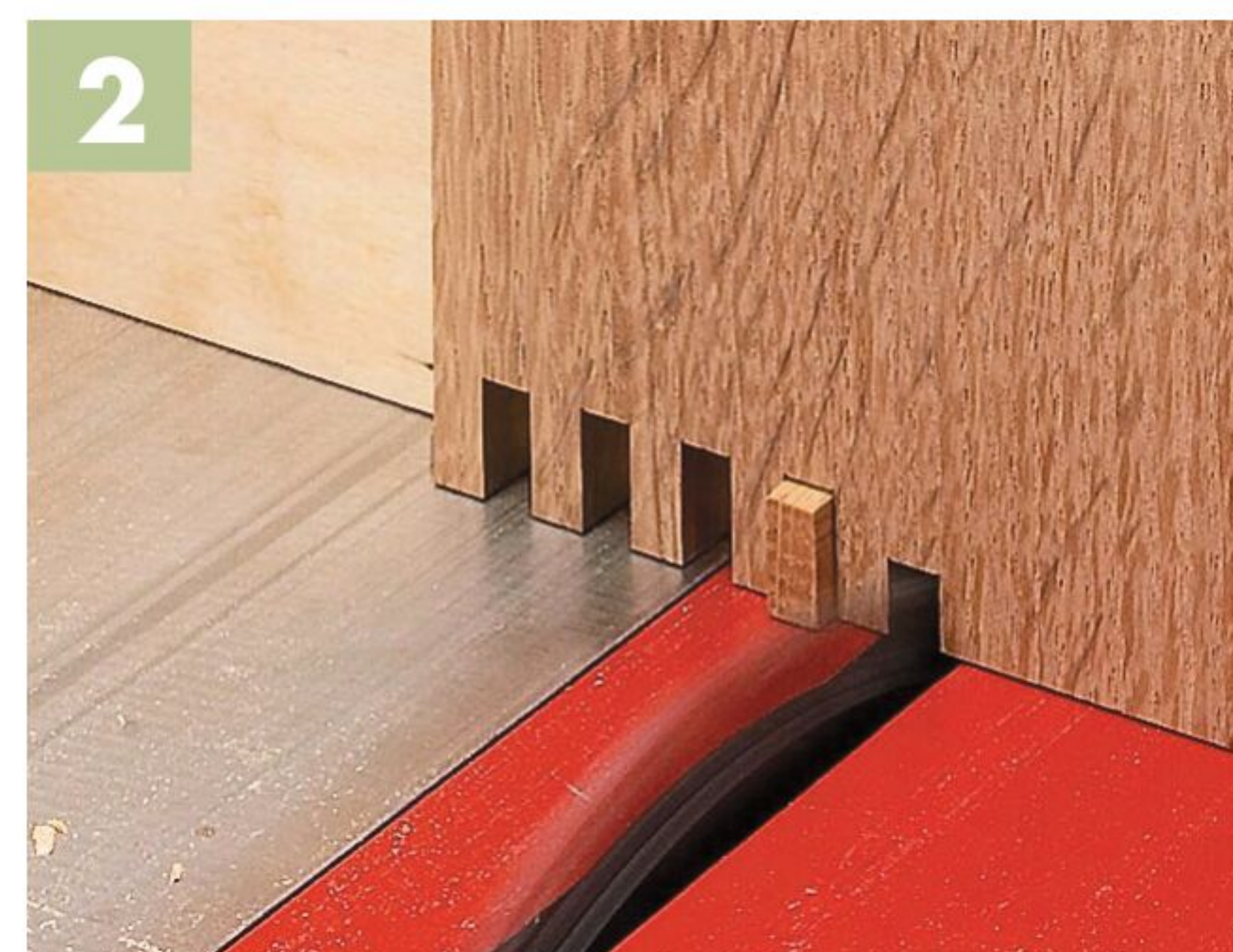
CUTTING THE FINGERS. Once you've adjusted the jig for a good fit, you're ready to move on to cutting the project workpieces. There are a couple of things to keep in mind while making the joinery cuts. First, hold the workpiece tight against the fence at all times. In the case of larger projects, particularly those that have wide and tall parts made of $\frac{3}{4}$ "-thick stock, you might want to clamp the workpiece to the fence for added safety and accuracy. The second thing to keep an eye on is making sure the end of the workpiece stays flat against the table for each cut. It's frustrating to have all the pieces cut only to find out one of the pins wasn't cut deep enough once you start dry fitting them together. Keeping those things in mind, the rest



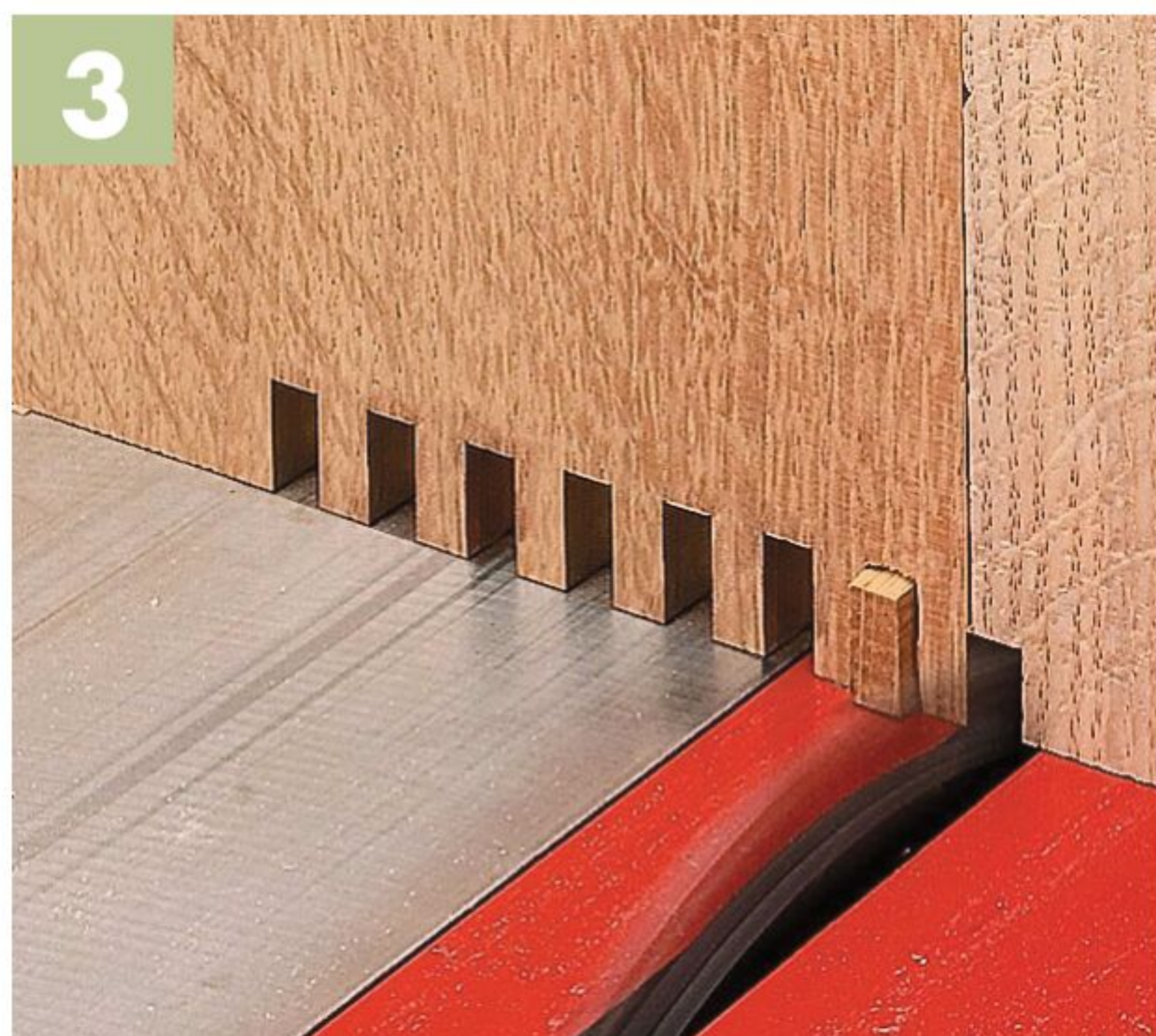
Jig ensures evenly spaced pins for a perfect joint



▲ **First Cut.** Maintain a firm grip to keep the workpiece squarely in position against the fence and tight against the key.



▲ **Cut & Repeat.** As you move the workpiece after each cut, make sure the bottom edge stays flat on the table saw.



▲ **Cutting the Partner.** Flip the workpiece around to space the initial notch in the second piece.



▲ **Finishing the Pair.** Cut the second piece in the same manner as the first, using steady speed and force.



▲ **Trim to Fit.** If needed, trim the workpieces so that each one ends with a full pin or notch for a more finished look.



▲ **Brush On.** A small brush makes spreading glue a breeze, while applying painter's tape on the edge of the joint helps control squeezeout during assembly.



▲ **Square Up.** Clamping a three-sided assembly can be difficult to do while keeping the joint square, so I used a couple pieces of plywood to keep things in proper shape.

is just a matter of getting to work and cutting the parts. I find it quite helpful to mark the workpieces to make sure I'm starting the cuts from the same edge each time. I also stop after each matching set and make sure I'm getting a good fit, and that the jig hasn't drifted out of position. It only takes a minute to check, and an ounce of prevention is certainly worth a pound of cure here.

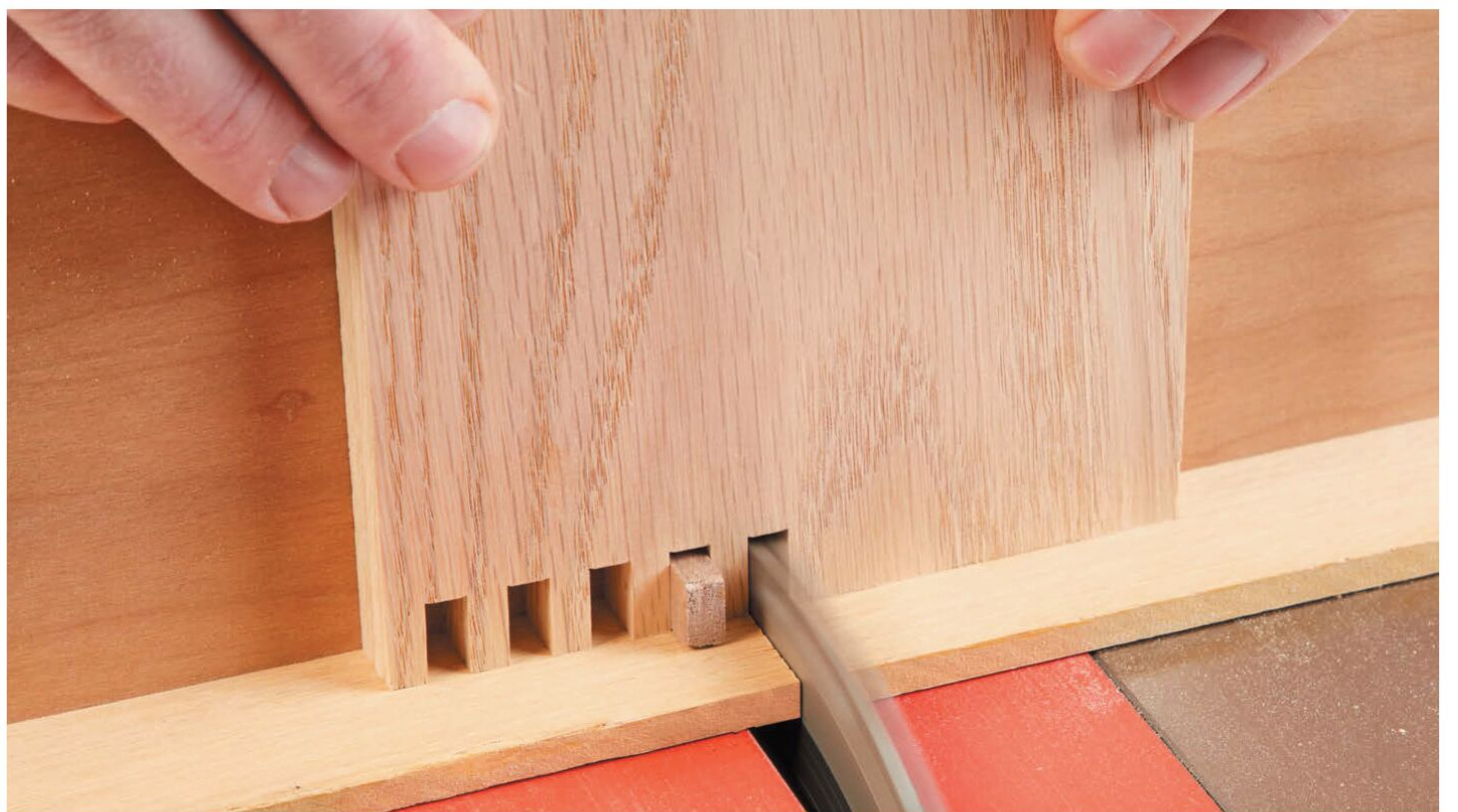
ASSEMBLING THE FINGERS. After you've completed the cuts, you can move on to assembling the

project. If you've established a good setup, this is where you'll see a great payoff. Properly cut finger joints are easy to assemble while staying square. I find the biggest challenge is to work quickly enough to have the joint assembled before the glue tacks up. For this reason a slow-setting glue can be a boon. A small brush makes spreading a thin coat of glue on all the mating surfaces a little easier, but it can still be a scramble to get things together, so it's best to start the

assembly well-prepared. Once the glue is spread, all you need to do is tap the joints together and clamp them up. Fitting a couple of plywood spacers inside keeps the assembly square as you apply clamping pressure to pull the joints tight. You can fully seat the sides with a few taps on the ends, then tighten up the clamps and clean any squeezeout. Clamping blocks can come in handy too, as they disperse the pressure evenly across all the fingers. **W**

DECKING OUT THE JIG

Jig Deck. To get even better quality finger joints, I added a strip to the bottom of the front fence, acting as a deck. While it isn't a necessary addition for the jig, it does help to keep pieces more stable during the cut by providing a platform for them to ride on, and it allows you to set the spacer directly between the key and the blade when adjusting the jig. Use a 1/4"-thick, 2 1/2"-wide strip of hardboard or veneered MDF, gluing it to the bottom of the front fence after placing the key, but before screwing the rear fence onto the front.



▲ A thin strip of MDF or hardboard acts as a deck for your workpiece, giving you a smoother cut. The deck also allows you to set your spacer on it and align the blade and key without having to worry about dropping the small piece into the saw.

Sources

Most of the materials and supplies you'll need to build the projects are available at hardware stores or home centers. For specific products or hard-to-find items, take a look at the sources listed here. You'll find each part number listed by the company name. See the left margin for contact information.

MAIL ORDER SOURCES

Project supplies may be ordered from the following companies:

Woodsmith Store
800-444-7527
store.woodsmith.com

amazon.com

General Finishes
800-783-6050
generalfinishes.com

Grizzly
800-523-4777
grizzly.com

Horton Brasses
860-635-4400
horton-brasses.com

McMaster-Carr
630-833-0300
mcmaster.com

Rockler
800-279-4441
rockler.com

White Chapel-Ltd
800-468-5534
whitechapel-ltd.com

Woodcraft
800-225-1153
woodcraft.com

COUNTER STOOLS (p.24)

The counter stools were finished with a coat of *General Finishes'* Seal-a-Cell, then two coats of spray lacquer.

H. ELLIS ORGANIZER (p.30)

• Horton Brasses

Large KnobK-12 1"
KnobK-12 3/4"
Escutcheon H-39
Cabinet Lock LK-8
Strike Plate SP-2

• Rockler

3/8" Invisible Hinge 26518

• White Chapel-Ltd

4" Folding Stay 202FS5
A coat of Seal-a-Cell oil from *General Finishes*, followed by two coats of lacquer will protect

this handsome organizer for a long time..

LAMINATED END TABLE (p.40)

• Woodcraft

Holy Galahad Disc149993
The end table is finished in two stages, each with a coat of Seal-a-Cell oil from *General Finishes*. Apply two coats of lacquer for long-term protection.

DISC SANDER (p.44)

• Amazon

220V MotorB0009WSREK

• Grizzly

Magnetic Switch G4572

• McMaster-Carr

12 gauge Cord 7082K24
3-blade Straight Plug . 7196K33

Four Arm Knobs 61135K35

V-Belt Pulley..... 6204K334

Cord Grip 7529K422

• Rockler

36" Miter Track 48037

The disc sander was painted with *Benjamin Moore's* Regal Matte in "Nocturnal Gray" (2135-30).

WALL SHELF UNIT (p.54)

• Rockler

Keyhole Hanger Plate ... 28837

14" Full Extension Slides 44506

• Amazon

110° Blum Hinge. B077VXL77C

All the parts of the wall shelf were finished with several coats of spray lacquer.

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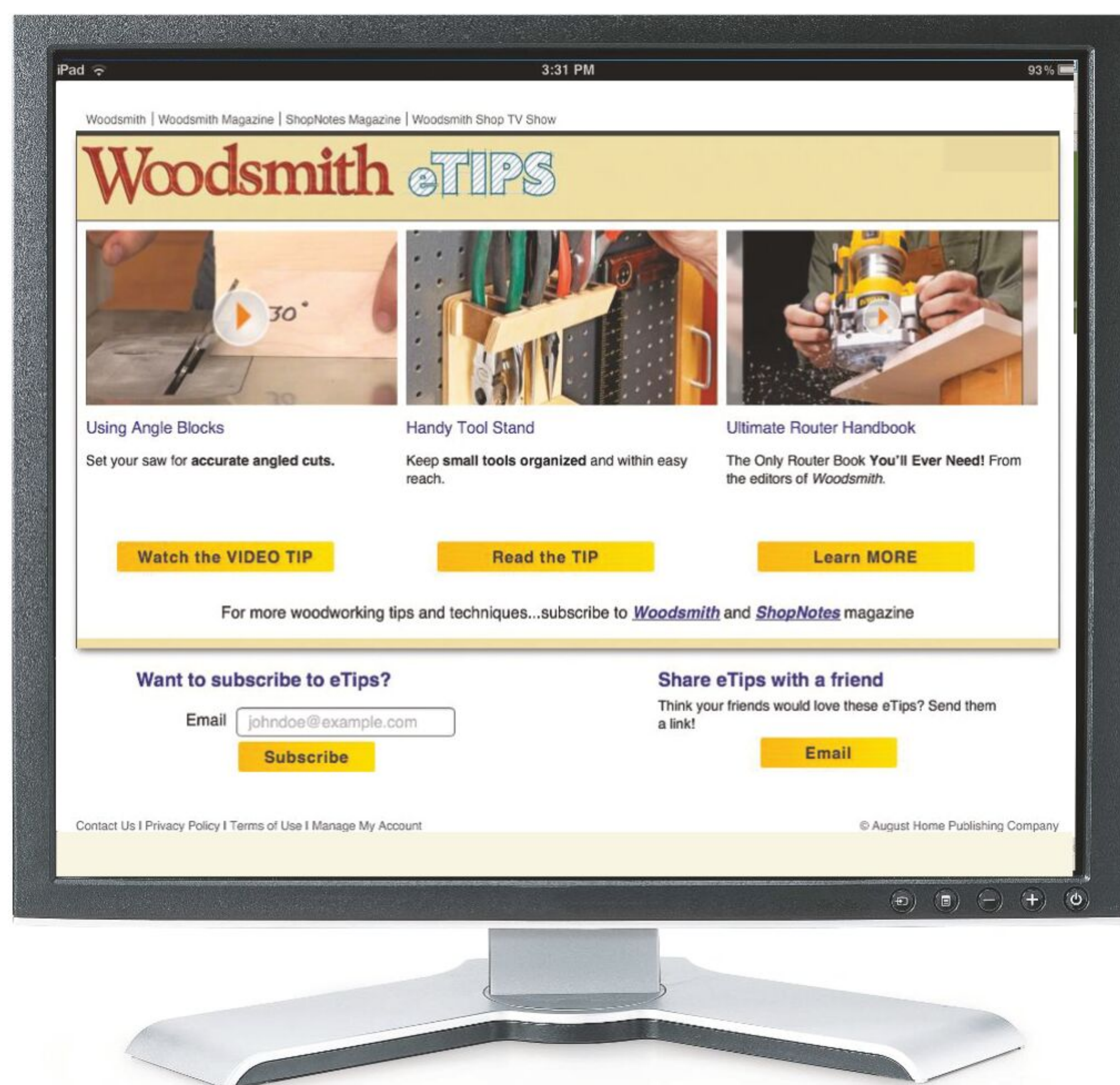
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