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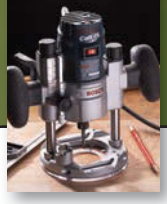

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April 2013 ■ #203

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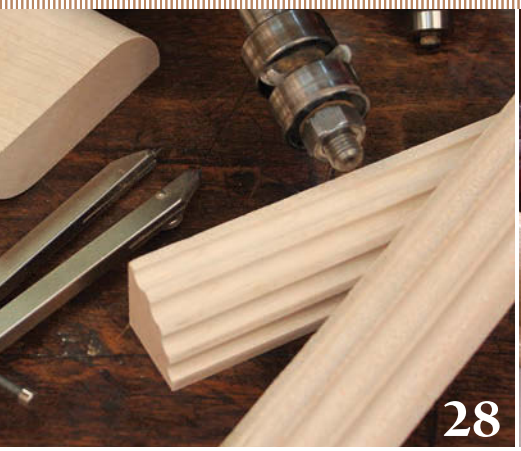

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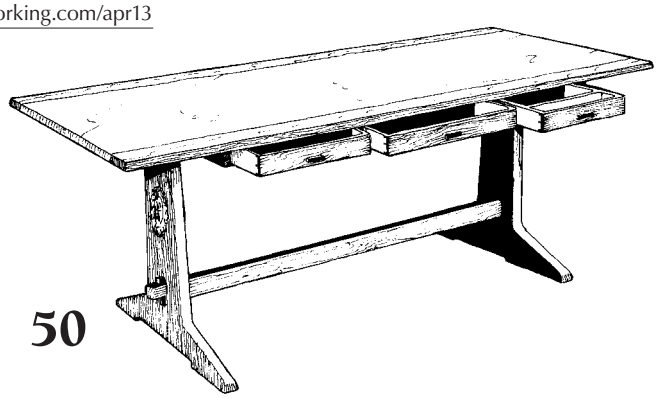

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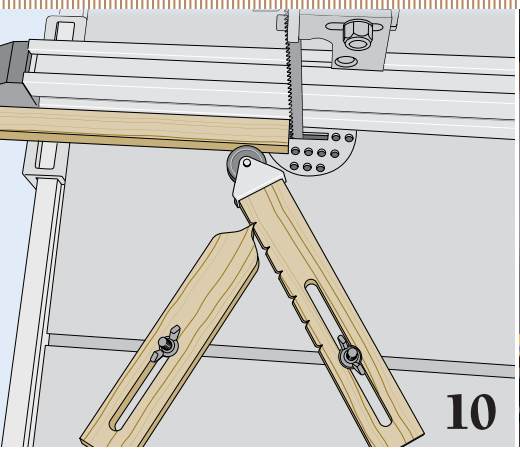

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ILLUSTRATION BY MARY JANE FAVORITE; BAND SAW PHOTO BY AL PARRISH; MEASURING PHOTO BY ROBERT W. LANG; FOOTSTOOL PHOTO BY PETER FRANKS

Square Up Your Projects

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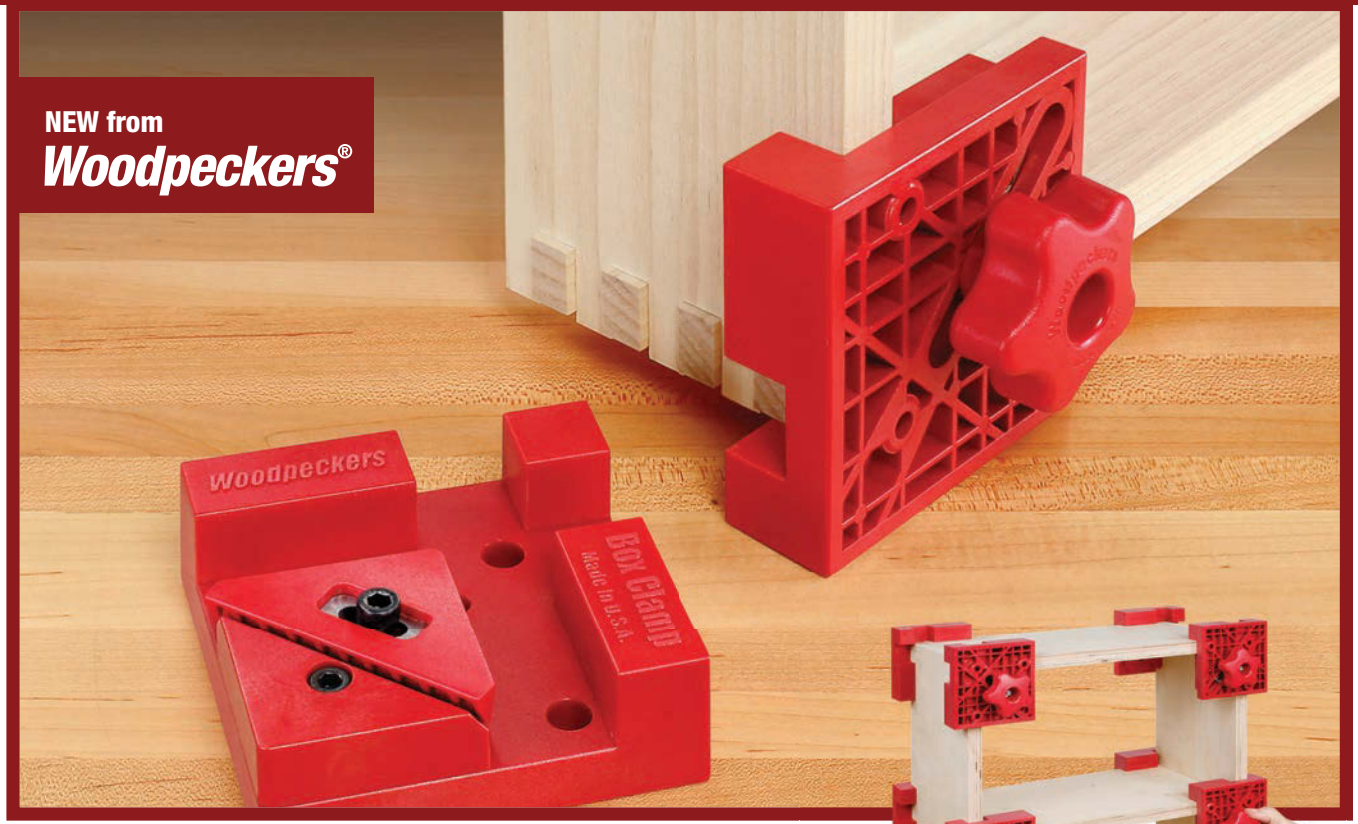

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Back to the Bench

Not everyone is lucky enough to love what they do. But I've always had a soft spot for magazines, good writing and, obviously, woodworking. Somehow I've managed to combine all of those things, and I have spent the last 20 years writing and editing books and magazines while operating a small furniture business based out of various basements and finally a backyard shop.

Just before joining *Popular Woodworking* I was running a small chair company and writing for several magazines on furniture making, homebuilding and design. Some days, anything you rely on for a livelihood becomes a job, but I know how lucky I've been; the good days have always outnumbered the bad.

During my time with the magazine, we have grown the readership, given the magazine a slightly different look and tried to pack in even more interesting and useful information for others who love furniture and woodworking as much as we do. I'm proud of the work we've done here and thankful I had the chance to do it.

With the talents in and behind the scenes of these pages, I have no doubt that you can continue to turn to *Popular Woodworking Magazine* for reliable woodworking information. But, lured by another opportunity, I'm leaving the helm of the magazine; this will be the last issue with me serving as editor.

I will miss not only the people at the magazine, but also the voices of you, the readers. I have learned as much from you as you have from these pages.

The woodworking community is a tight-knit bunch and without it, *Popular Woodworking* in all its iterations – this magazine, our videos and books, popularwoodworking.com – would not exist. I urge you to stay involved and be an active part of the community we love.

A love of the craft is what led me here in the first place. And that hasn't changed. I'll continue to write and publish about the craft I love, and I suspect you'll still see my bald head in these pages from time to time. I'm not going away, just going on.

Matthew Teague

From the Publisher:

While we're all sorry to see Matthew leave, I'm pleased to announce we've found a highly qualified replacement right here in our office. Megan Fitzpatrick, our executive editor, is jumping into the newly expanded role of editor and content director for Popular Woodworking Magazine *in print and online.*

If you've followed PWM over the last eight years, you know that Megan has been a key contributor to our success. Her projects, articles, blog posts and workshops are favorites. And you'll be hard-pressed to find a stronger advocate for hand-tool woodworking. (OK, maybe Christopher Schwarz and Roy Underhill could dispute that claim.)

Megan brings a passion for woodworking and a love of language to her new job. I can't imagine someone better to lead the magazine. **PWM**

Kevin Ireland

POPULAR Woodworking MAGAZINE

APRIL 2013, VOL. 33, NO. 2
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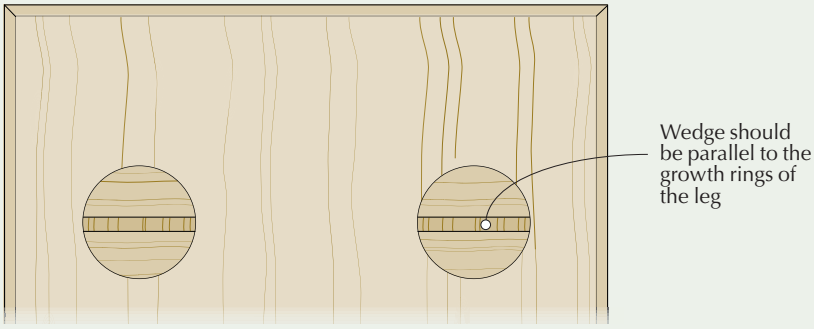
Grain Direction for Wedged-tenon Legs



I enjoyed the Moravian stool article in the December 2012 issue (#201) of *Popular Woodworking Magazine*, but I have a question about the legs.

Did you orient the grain of the legs parallel to or perpendicular to the grain of the seat?

I'm sure I'm overthinking this, but I can see a case for both ways – from the wedge splitting the leg in the perpendicular version to the leg splitting the seat in the parallel version.

Stefan Karfakis,
Brooklyn, New York

Stefan,

What your question is really getting at is this: What is the optimal arrangement of the grain direction in both the legs and seat? That answer begins with the placement of the wedge.

The wedge needs to be driven in perpendicular to the grain of the seat so that you don't split the seat when you drive the wedges in.

When you wedge any round tenon, the optimal way is to drive in the wedge so that it is parallel to the growth rings in the round tenon. Why? It makes a somewhat stronger joint. Wood shrinks more along the growth rings than across the growth rings. So by wedging the legs in line with the growth rings there is a smaller chance of the tenon shrinking and becoming loose.

Christopher Schwarz,
contributing editor

Shiplapped Backs

What is the traditional orientation of the boards in shiplapped or tongue-and-groove backs on formal open cabinets and shelves? Should they be perpendicular to the shelves? Diagonal for maximum strength? Horizontal so items do not catch on the back as they are moved along the shelf? Or was the traditional orientation selected to maximize the length of the boards and minimize the number of nails? I have not seen enough cabinets without plywood backs to anticipate what will look "right."

Ian Jay,
Logansport, Indiana

Ian,

I've seen a lot of open-backed antique pieces with solid-wood backboards that show either arrangement. In other words, I don't think there is any one "right" way to arrange them – though in pieces I'd consider "formal," I've more often seen them arranged vertically.

I have never, however, seen a period piece with the backboards arranged on the diagonal (which is not to say that one doesn't exist).

I suspect that (as it is for me) the period decision was a combination of the stock at hand and aesthetic choice. Vertical backboards will draw the eye up and make the piece look taller; horizontal backboards will make it appear wider and more anchored to the ground – and impart the same illusion to the room in which the piece sits.

Megan Fitzpatrick, executive editor

Parquetry Edging Correction

I am having a hard time wrapping my head around a part of the "Parquetry Tabletop" article by Heather Trosdahl (issue #201), wherein she describes the addition of a solid-wood edge to the substrate. It instructs you to cut 3/8" off the size making it 21 5/8" square, then says to cut edging 3/8" thick. When applied wouldn't this make the square 22 3/8" square? Also, wouldn't the 22 1/8" length of the edging be inadequate?

Ken Scott,
via e-mail

Ken,

You are correct, those dimensions do not add up. This section should read as follows:

If you choose this method, cut your plywood substrate square 3/4" smaller than your final tabletop dimensions: so, 21 1/4" x 21 1/4".

When the banding is applied this would make the substrate 22" square, then the 22 1/8" length of the banding would be adequate.

I apologize for the confusion.

Heather Trosdahl, contributor

Do Angled Stool Legs Fit Flush to the Seat?

There's something I don't get about the legs for the Moravian Stool (issue #201). I understand how to make them and how to turn the tenon, but what I don't see is how they will fit flush at the edges at 16°.

If I look underneath the seat of Christopher Schwarz's finished stool, will I see one edge of the octagon flush

CONTINUED ON PAGE 8

ILLUSTRATION BY MARY JANE FAVORITE

CONTINUED FROM PAGE 6

and the others not? I know I'm being picky, but I'm curious.

Ken Scott,
via e-mail

Ken,
The shoulder of the tenon touches the seat only at one point. That's a traditional way to make a stick chair or stool. I've seen this joint still solid in chairs that are 300 years old.

Christopher Schwarz, contributing editor

Masters' Mistakes a Comfort

I just read Robert Lang's "Past Imperfect" in the December 2012 issue (#201). I, along with any other "honest" woodworker, can totally relate to the content. I am a 70-year-old active woodworker and cannot tell you how many times this has happened to me. It is somewhat comforting to know that this experience was shared with the masters of the 20th century. Thank you.

J. Dale Thompson,
Johnstown, Pennsylvania

Protective Topcoat for a Table

Our new kitchen table is almost complete and will need a protective topcoat. It is made of air-dried quartersawn pin oak and is finished with Minwax Early American stain.

My usual topcoat is water-based polyurethane – but because this table will be constantly subjected to spills and cleanup with a damp washcloth, as well as pen/pencil pressure from doing homework, I'm wondering if there's a better choice.

Bill Law,
Cincinnati, Ohio

Bill,
A water-based finish will be hard, but it won't be as resistant to heat, spills and skin (body oils) contact as oil-based polyurethane. Water-based polyurethane also won't be resistant to an alcohol wipe if you need to remove marks from permanent markers.

If you are brushing, I suggest an oil-based polyurethane. Apply the number of coats to get the look you want. The thicker the finish, the better the protection against liquids, but the more it will look like plastic. Three coats will probably be best.

If you are spraying, you could use a catalyzed lacquer finish. The advantage is that it will dry much faster than oil-based polyurethane. It will be similarly durable.

No matter what finish you apply, it could still be dented by pressure from pens. Try to keep your kids from pressing down on a single sheet of paper that is directly on the surface. Actually, in this case, the thinner the build, the more resistant the finish will be to showing dents – but I'd still go with at least three coats for a kitchen table.

Bob Flexner, contributing editor

Tool Chest Rabbet Locations

In "Tommy Mac's Toolbox" (issue #201), there is a slight error on page 26 in the caption under the topmost photo; the stopped rabbets should not be milled in the case sides, but in the top and bottom.

John Kahler,
West Chester, Ohio

John,
You are correct, and the same reversal-of-parts error was made in the text on the same page, under the sub-heading "Dados & Rabbets." As you note, the stopped rabbets are milled in the case top and bottom. The through rabbets and dados are milled in the case sides. **PWM**

Megan Fitzpatrick, executive editor

ONLINE EXTRAS

Letters & Comments

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Highly Recommended

I'm no Japanese tool junkie. And I didn't buy this pair of garnish awls from Garrett Wade because I thought they'd be superior to others. I just liked their look and that they're small enough to travel easily. But there's something about them that outshines others: They fit perfectly in my palm so using them feels like making an indentation with my finger. They also come to a finer point and taper more gradually than other awls, so I can make tiny, precise holes or lean a little harder if I need to start a screw or twist drill ($32.50/pair at garrettwade.com).

—Matthew Teague

POPULAR WOODWORKING MAGAZINE

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Safety Note

Safety is your responsibility. Manufacturers place safety devices on their equipment for a reason. In many photos you see in *Popular Woodworking Magazine*, these have been removed to provide clarity. In some cases we'll use an awkward body position so you can better see what's being demonstrated. Don't copy us. Think about each procedure you're going to perform beforehand.

THE WINNER:

Press Stock to Fence With Wheel Board

I use this inexpensive and easy-to-make jig to press a workpiece against the fence of a band saw, but it would also be useful on a table saw or router table. The design consists of some scrap wood, a furniture wheel, two screws, two washers and two wing nuts; it is secured in the miter slot.

I used a furniture wheel (in this case from a sofa) because it is designed to handle a heavy load. A toy wheel might be too weak.

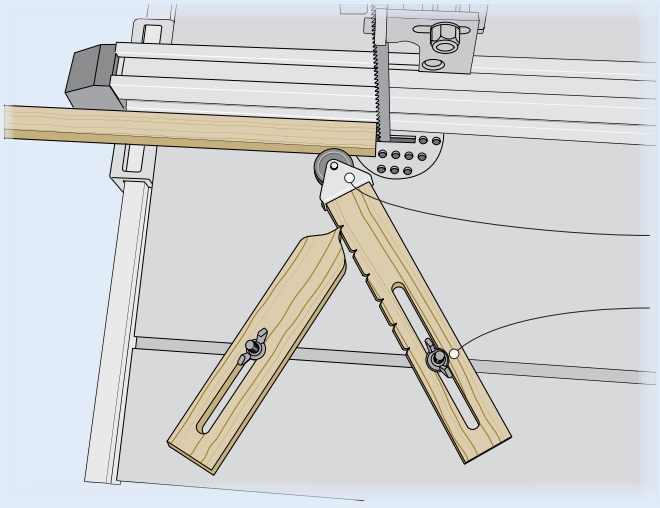
The two arms of the jig use a loose joint consisting of a point on one part and a notch (or a series of notches) on the other. This loose joint guarantees that the forces are evenly distributed on the two arms.

The screws have hexagonal heads that fit reasonably well in the miter slot – the fit does not have to be exact.

You don't need to worry about instability in the arrangement; the different forces balance well. But in the unlikely event one arm slips on the table, place a bit of folded sandpaper beneath it.

When you set up the jig to use it, make sure the angle at which the two arms meet isn't too open; if it is, one or both arms might slip.

Anders Gardo,
Skövde, Sweden



Sharpen Carbide Tooling

I was doing some turning late one evening and my carbide insert cutters were getting very dull. Without a new one on hand, I recalled an ad I saw about how diamond sharpening tools could sharpen carbide steel. I had a small diamond stone so I took the carbide insert, turned it upside down, then used a pencil eraser to grip the insert as I rubbed it around on the diamond abrasive. It dressed the cutter very nicely – almost as good as new in about a minute. I expect to get about five more sharpenings before the cutter is too thin to be any good.

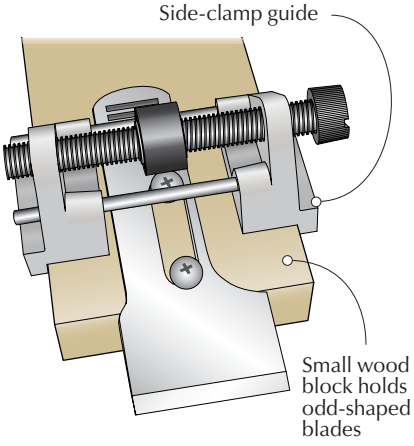
Larry Bagley,
Jefferson, Ohio

Shop Vacuum Multi-use Bag

I use my shop vacuum with all my power tools, and a set of bags is not cheap. I decided to economize.

Here's my solution: I cut open one end of a vacuum bag and attached self-adhesive Velcro closures to the opening then reinforced the end of the bag with duct tape. When the bag gets full, I simply open the Velcro closure and empty the collection bag into a large plastic garbage bag.

Bill Wells,
Olympia, Washington



Sharpen Odd-shaped Blades With a Side-clamp Guide

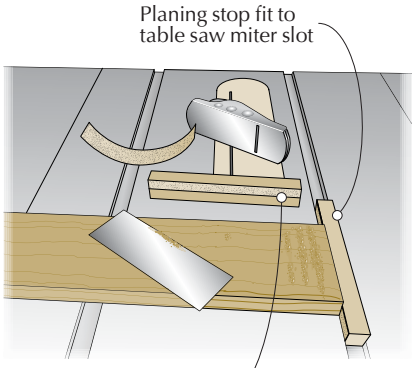
Side-clamping honing guides are very common. They are nice for chisels and plane irons, but not so good for short blades (such as spokeshaves) or irregular blades (such as the Stanley No. 78 rabbet plane blade). I came up with a simple solution.

I mount odd-shaped blades on a piece of wood using two round-head screws. Then I clamp the wood in the honing guide to do the sharpening.

With this trick, I can sharpen almost any blade without trouble. I used a protractor to measure the honing angles necessary for different blades, and built a stop-block accordingly. I get precise results every time.

Ethan Liou,
New Taipei, Taiwan

ILLUSTRATIONS BY MARY JANE FAVORITE



Miter Slot Planing Stop

Sometimes my workbench is used for assembly work, so when it's in use for that, I move my simple scraping and handplaning tasks to my table saw, where I use shop-made planing stops.

I cut them to fit the miter slot and attach adhesive-backed sandpaper to the faces for a better grip. I have two planing stops to cater to different thicknesses of workpieces.

Charles Mak,
Calgary, Alberta

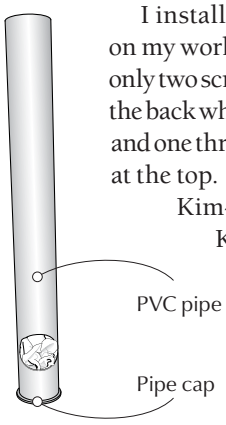
Handy Rag Dispenser

Often, I used to have to search for a rag or paper towel just when I needed it most – so I made this dispenser for my rags a few years ago. I don't remember where the original idea came from, but so far it has been one of the best workshop storage solutions I have ever found. You can buy a piece of PVC pipe and a cap from your local hardware store for just a few dollars. Any size is OK, as long as it suits your needs.

You can, of course, also use a cardboard pipe, but because PVC pipe is slippery, every time you draw one of your rags out from the pipe, the rest of the contents slide downward. I drilled the hole with a hole saw, but you could also use a keyhole saw.

I installed my dispenser on my workshop wall using only two screws: one through the back where the hole is cut and one through the opening at the top. **PWM**

Kim-Erik Haggblom,
Kalajoki, Finland



An Easy Method for Changing A Circular Saw Blade

I recently changed my circular saw blade and had the usual difficulty holding it still while using the wrench. I solved this by clamping the blade in my wood-faced vise.

Michael J. Harman,
Beavercreek, Ohio

New use for Spring Clamp

While building my workbench, I kept saying, "Gosh, I wish I had a workbench to do this on."

Faced with flattening the 16 sides of the 4x4 legs, I hit upon a way of holding them that was secure enough for handplaning but released them quickly for working the next side without loosening and tightening handscrews and F-style clamps.

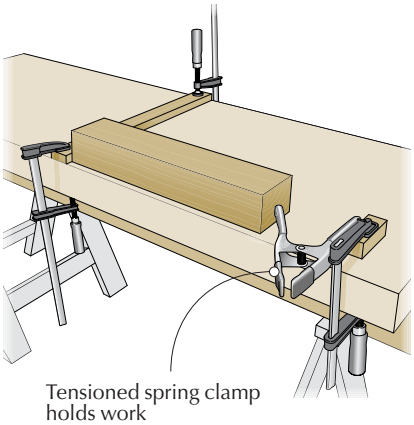
By simply clamping two blocks of wood to a flat worksurface and using a large spring clamp as a wedge at one end, I was popping the 4x4s in and out quickly and easily.

The only bit of fuss is to get the blocks far enough apart so the spring clamp exerts enough pressure to hold the workpiece – but not so much that it's difficult to put the workpiece in place.

For thinner stock, just put a slightly shorter spacer under the workpiece to elevate it so you don't hit the spring clamp or the F-style clamp with your plane.

The setup is so fast and works so well that it's better than some of the end vises I've used.

Peter A. McLaughlin,
Chicago, Illinois



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Powermatic PM1500 Band Saw

Just about every feature of this 15" band saw is impressive.

Powermatic's new 15" band saw is quite a package: good looking, heavy-duty in every way and packed with features.

The fit and finish make a strong first impression. The paintwork is excellent, parts fits well and the chromed handwheels and knobs say "quality." Upon closer inspection, you find a remarkably stout fence (more on that later), beefy trunnions supporting a large table and heavy cast iron wheels. The rock-solid guide post moves easily on rack-and-pinion gears and supports a heavy-duty blade guard.

The PM1500 has a large resaw capacity at 14" under the guides. Throat capacity is 14½". All that resaw capacity is supported by a 3-horsepower, 230-volt motor driving heavy cast wheels. I sliced 10¾" walnut with ease.

The cast iron table is 21½" long x 16" wide. It has two milled slots for the miter gauge (which is included). The table tilts 10° to the left and 45° right.

Now about that fence: It's a Biesemeyer-style design, is easy to adjust and it clamps firmly in position. The impressive extruded aluminum fence plate is easily changed from its 6½" high position to 7/16" in the low position by loosening two knobs on the fence back. The fence can also be easily fitted with a 6½"-long, 1½"-diameter steel pin for a single point of contact setup.

The PM1500 also features a magnetic switch and two unique electrical safety features. One is built into the blade-tensioning lever; a cut-out switch prevents the saw from powering up when the blade is not tensioned, which eliminates the risk of the blade jumping off the wheels when it's loose. The second unique feature is a magnetic "key" located just above the on/off switch; remove it and the switch is disabled.

***Beauty & a beast**. The new Powermatic 15" band saw is loaded with features and built like a battleship. The sturdy and versatile fence is especially noteworthy.*

Upper and lower blade guides are beefy and, thankfully, require no tool when adjusting. Each element of the guides – double roller-bearing side guides and a rear-thrust bearing – can be adjusted independently after loosening by simply turning the knurled knobs that hold them in place.

The PM1500 has two dust ports that do an outstanding job. Band saws are, after all, notoriously difficult from which to collect dust. The upper port is positioned behind the blade just below the lower guide bearings; it sucks up dust close to the source. A second port is positioned at the base of lower saw cabinet just below the upper port. I was surprised how little dust was inside the machine after giving it a workout. To further keep things tidy, two brushes are deployed in the lower cabinet. The first sweeps the blade clean while the other sweeps the tire clean.

A second pleasant surprise with the PM1500 came at the first startup – it's very quiet when running.

Was the band saw perfect out of the crate? Not exactly. The drift pin that levels the split table at the front of the saw was too long and prevented the fence from moving close to the blade. A call to Powermatic confirmed it was a tad too long and a fix was already in the works to correct it.

— Steve Shanesy

CONTINUED ON PAGE 14

Powermatic PM1500

Company Name ▪ powermatic.com or 800-274-6848

Street price ▪ $2,900

▪ **VIDEO** *Watch a demo of the PM1500: popularwoodworking.com/apr13.*

Price correct at time of publication.

PHOTOS BY AL PARRISH

CARD #35 or go to PWFREEINFO.COM

CARD #71 or go to PWFREEINFO.COM

CONTINUED FROM PAGE 12

Hock Tools Scratch Stock

A scratch stock is a simple tool – sort of a combination of a scraper and a moulding plane – for scratching in a profile (typically a bead or other simple shape). And while it's fairly easy to make a scratch stock out of scrap wood and a piece of thin steel (such as an old sawplate), Hock Tools offers a solid and relatively inexpensive alternative made out of tough bamboo plywood, with edges that are eased for comfort.

The ¾" x 1½" x 4¾" tool comes with two .05"-thick spring steel blades, one of which is a blank that can be cut, ground and filed for any profile; the other is a bead (shown in the photo) that was ready to use after I took just a few strokes with a needle file, then removed the burr with a slipstone. (Additional blade blanks are available in packs of four for $6.)

The tool can be used with the blade secured in one of two slots; in both, the stainless steel set screw locks it tightly in place. (I bore down hard in an attempt try to dislodge the blade, and while I was able to make it shift, I was applying far more pressure in that attempt than would ever reasonably be exerted in use.)

Insert the blade projecting from the side as shown (it can be inserted to cut on either side), and the stock serves as a fence to help you keep the blade in the cut as you pull it toward you, which – along with light cuts – produces better results. (You can also, of course, push it away from yourself when necessary.)

Insert the blade projecting from the end of the tool and you can work along curved edges.

The key is to produce light, fluffy shavings, working until the blade bottoms out in the cut. And, like any scratch stock, it performs best on hardwoods (for softwoods, a moulding plane is a better choice). — *Megan Fitzpatrick*

Hock Tools Scratch Stock

Company Name ▪ hocktools.com or 888-282-5233

Street price ▪ $30

▪ VIDEO *Watch our video on using the Hock scratch stock.*

Price correct at time of publication.

Bosch Trim Router Plunge Base

In 2005, Bosch introduced a new laminate trimmer that eventually became know as the Colt. Powerful and user-friendly, it quickly became a favorite in our shop and in shops across the country. At the time, I suggested to Bosch that they needed to make a plunge base for it.

Last summer, Bosch did indeed release a plunge base (PR011) that is well-designed and adds a new dimension to the Colt's capabilities. The overmolded handles are comfortable, and both the power switch and plunge lever are easily reached. Releasing the plunge lever keeps the motor in position.

Mounting the router in the base is a fast and tool-free process; a clamping lever holds the motor in position. The familiar turret-type depth stop has seven positions, two of which have adjustment screws for fine adjustments. The stop rod itself has a screw adjustment on the end, adding an additional way to tweak the depth setting.

The scale reads in both inches and millimeters, and the cursor slides on the stop, allowing the user to zero the scale. The base plate is transparent with a large opening that provides good visibility, and an optional attachment is available for use with Bosch template guides. The base is also bored to accept an optional edge guide, and a dust-collection attachment will be available in the Spring of 2013.

The plunge base is available as a standalone product, or as part of a two-base router kit (PR20EVSPK) that also includes a standard fixed base. Despite the fact that this trim router is limited to ¼"-shank bits, the plunge-base Colt is a powerful and versatile tool. The smaller format is easier and more comfortable to use for appropriate applications than larger plunge routers. **PWM**

— *Robert W. Lang*

Trim Router Plunge Base

Company Name ▪ boschtools.com or 877-267-2499

Street price ▪ from $100 (plunge base only) to $181 (two-base router kit)

▪ VIDEO *Watch our video on using the Bosch plunge base with the Colt router.*

Prices correct at time of publication.

A Chairmaker's Design Lessons

The Windsor form survives trial by fire.

The blaze started sometime after midnight. A weak spot in the chimney broke and glowing embers spilled out onto dry timbers. By the time the fire crew arrived and strung hoses from a nearby stream, it was all they could do to keep the adjoining barns and outbuildings from burning. A complete loss. The late Nancy Kalin's circa 1810 farmhouse, stuffed with splendid antiques and Americana, was now a pile of charred rubble.

Every piece of furniture in the house was an original period antique with one exception. Ten years earlier Nancy had acquired a graceful 18th-century Rhode Island bowback Windsor chair and had commissioned Richard Grell, an accomplished Windsor chairmaker, to use that example as a model for a set of eight to grace her dining room.

Richard heard about the tragic fire and came by to find the remains of his chairs strewn in the wreckage. They were Windsor-like things, knocked about by the blast of fire hoses, their blackened spindles peeking up through smoldering timbers. Yellow plastic tape cordoned off the site, but a determined Nancy assured Richard she would rebuild as soon as the insurance settlement came through.

It took three years. Those burned Windsor skeletons sat as a bleak reminder of the fire, left naked to the elements in northern Ohio for three frigid winters and three hot summers. They endured a total of 121" of rain, snow and ice.

Trial by fire. *The Windsor chair epitomizes timeless function, beauty and strength; it can hold up to even the harshest of tests, as did this graceful bowback that endured a house fire and three years of exposure to weather.*

Surprising Discovery

The call finally came, and with it a plea to build a new set of chairs just like the old. Richard dropped by to retrieve what was left, in hopes that there were enough clues to bring Nancy's dream back to life. To his astonishment, the undercarriage of one chair remained intact. Curious, he tilted it up on one leg and pushed hard diagonally on the opposite leg, forcing it to rack. It was solid – not a creak, pop or squeak.

The durability of Windsor chairs is legendary, but few people would predict a chair could endure all this and remain solid – unless, that is, they happen to know what Richard Grell knows about Windsor chair design.

Perfecting his Craft

Richard became a full-time chairmaker in 1973 and has spent his adult life building and studying Windsors. This is foreign to our typical modern approach. Today, there is emphasis on creating new forms and novel ideas.

CONTINUED ON PAGE 18

PHOTOS BY THE AUTHOR

Popular Woodworking Magazine

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CONTINUED FROM PAGE 16

In contrast, Richard is a great example of a craftsman who has given himself to the study of an iconic form and, in the process of building thousands of chairs, has evolved his own signature Windsors. In this way, he's added another page to a rich legacy of chairmaking.

Although he's often sought after by collectors who desire museum-quality reproductions, he's also perfected Windsors that reflect his own voice and sensitive eye. Richard's attention to detail goes beyond his incredible knowledge of painted finishes and extends to a deep understanding of the best historic joinery practices. This mindset of building on the legacy of our furniture heritage offers great benefits for the modern builder.

Old school. *Richard Grell is a Windsor chairmaker who epitomizes the artisan tradition.*

Painted perfection. *Authentic-looking period painted finishes reflect Richard's attention to detail.*

Uncovered. *A pair of child-sized writing arm chairs "in the white" reveal some details of the joinery.*

Strength & Beauty Combined

Richard combines an engineer's grasp of the technical side of building, and a musician's feel for harmony. He explains that the Windsor chair form derives its strength much like a suspension bridge.

The legs and braces under the seat are designed to bring the whole assembly into tension, forming strong mechanical joints that don't rely on glue for holding power as the legs are driven home into the seat. The assembly is so robust that there's no turning back after the final step, when wedges are driven to pin the legs into the seat. Those wedges act like the rivets that hold together the steel beams in a bridge, and create a sturdy platform.

When pressed to explain what sets a chair design apart, Richard shared a few nuggets. Be aware of sight lines. Just picture imaginary lines extending into space from the ends of elements such as back spindles and legs. It makes a subtle difference when the back spindles seem to flow to a single point below the seat as though they sprout organically. Curves are shaped to harmonize with other curved parts nearby.

That's easy to say, but not easy to accomplish. Start by realizing that a curve never stands by itself, but instead plays off neighboring curves. As you walk around a chair and view it from different angles, the curve on the top rail should interplay and complement the flowing lines of the seat as well as the turnings on the legs. Richard's current version of a continuous-arm Windsor is the result of hundreds of minor tweaks to achieve just such a harmony.

Solid joinery is a quiet bulwark behind function and beauty, and sometimes it's called upon to support beauty and function that's tried by fire. **PWM**

Making tradition his own. *Richard's version of a continuous-arm Windsor embodies both tradition and his own practiced eye. While it's clearly a traditional Windsor beginning with the crisp turnings on the legs, each curve is thoughtfully composed to create layers of visual music. It's the result of decades of refinement that stamp it as the maker's own.*

George is the author of two design DVDs (Lie-Nielsen Toolworks) and co-author (with Jim Tolpin) of "By Hand & By Eye" (Lost Art Press).

ONLINE EXTRAS

For links to all these online extras, go to:

- **popularwoodworking.com/apr13**

BLOG: *Read more from George R. Walker.*

WEB SITE: *See more of Richard Grell's work, and find out about his chairmaking and finishing classes.*

IN OUR STORE: *George R. Walker's DVDs.*

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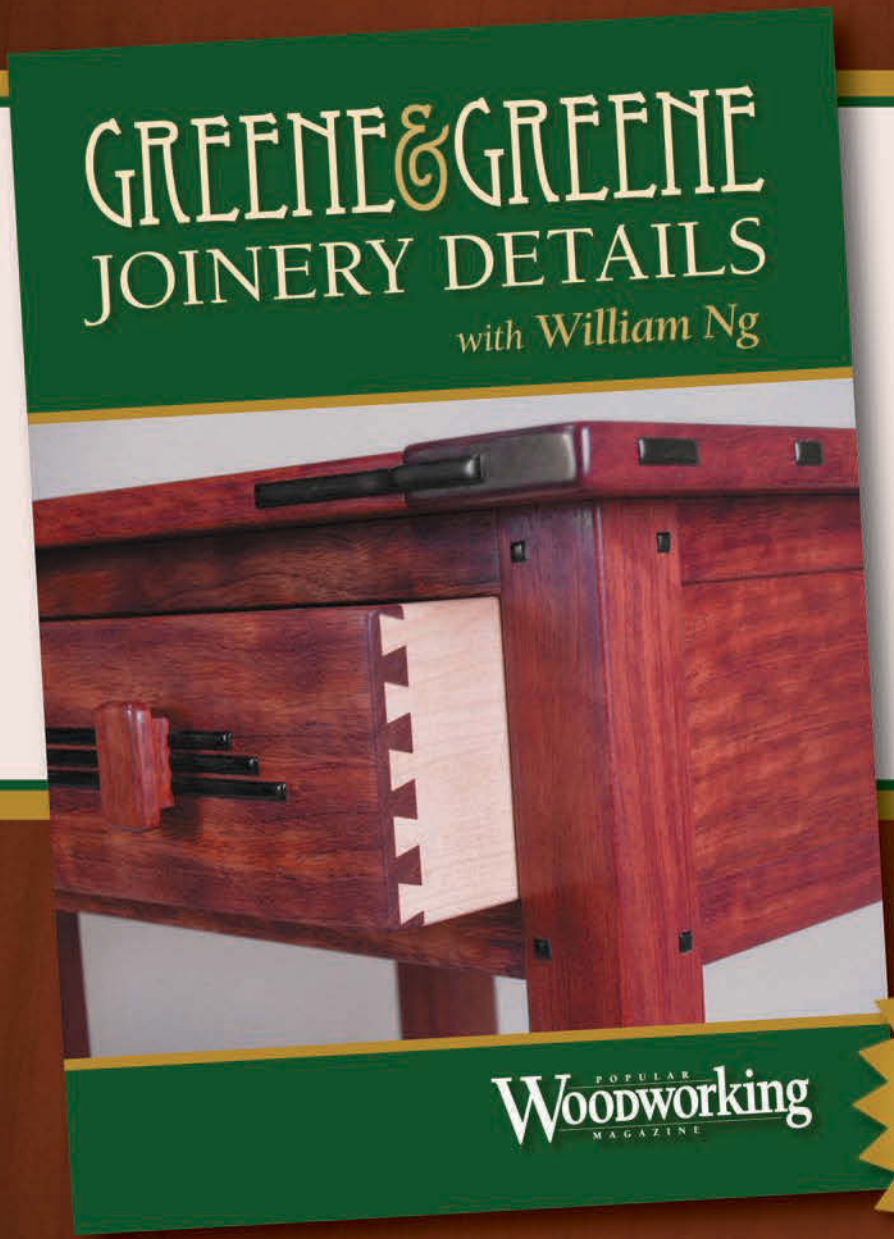
About This Column

Design Matters

Design Matters dives into the basics of proportions, forms, contrast and composition to give you the skill to tackle furniture design challenges with confidence.

It's all in the DETAILS.



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City Sideboard

BY MARIO RODRIGUEZ

Contemporary details and materials update this classic form.

Apartments in the Philadelphia area where I live are in demand and rents are high. The same is true for urban areas all over the country. So for someone who insists on living in town, one solution is to "go small." The city sideboard is the perfect piece for tight urban spaces and it's versatile, too. Measuring around 35" wide and only 16" deep, it can work as a dining room sideboard, an entry table (with storage) or an office credenza.

The spare design and clean lines of the sideboard suggest an updated Shaker piece, with a bit of a nod to the work of James Krenov. The wood is soft maple, which is a little "warmer" than hard maple and often features subtle curl. The door panels are bookmatched ambrosia maple, a species with unusual colors and grain patterns similar to those found in spalted maple.

The case, partitions and shelves of this piece are of cabinet-grade ¾"-thick maple veneer plywood. This cuts down significantly on labor and construction time without sacrificing appearance. The top, doors and base are solid maple.

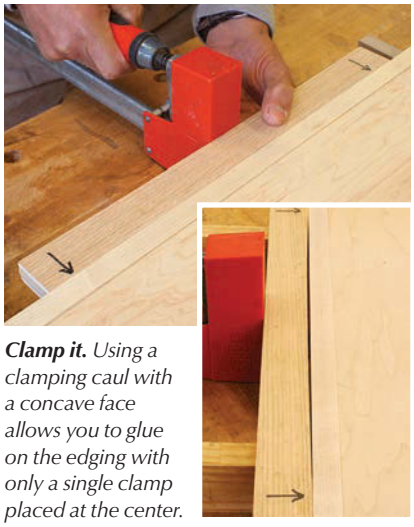
The flat-panel doors are installed with offset knife hinges for a clean, modern appearance and feature custom-turned knobs.

Why Plywood?

Cabinet-grade plywood provides a beautiful, uniform and blemish-free surface in a consistent thickness, and it's available as a 48"-wide panel. You just rip your panel width from the sheet and you're good to go. There is, however one problem: What do you do about the exposed plywood edges? I edged much of the case with ¾"-thick solid soft maple, which provided needed protection and covered the unattractive

PHOTOS BY THE AUTHOR

HARDWOOD EDGING



Clamp it. *Using a clamping caul with a concave face allows you to glue on the edging with only a single clamp placed at the center.*

Trim it. *Use a block plane with the heel flush to the plywood. Stop before cutting the plywood and clean up with a card scraper.*

edges. But what is the best way to apply the solid edge with a strong bond and an inconspicuous seam?

After cutting my various plywood panels, partitions and shelves to length, I rummaged through my rough-sawn solid stock to find straight-grained, clean material of a color similar to the plywood. I chose several boards and milled them ¾" thick, then laid them alongside the plywood to check the color match. By applying denatured alcohol to both, I identified good matches and got a preview of what the color would be on the finished piece.

After selecting my stock, I ripped several strips to 13/16" thick, giving me a 1/32" overhang on each face of the plywood. When gluing up I centered the edging strip on the plywood thickness. In order to minimize the number of clamps required for a tight, continuous seam I used 16"-long curved plywood cauls made of scrap plywood, cut to a slight 1/8" hollow at their center. The concave edge of the caul is set against the workpiece and requires only a single clamp in the middle to get a tight seam along the length of the caul.

When the glue was dry, I planed the edging nearly flush with a block plane. In order to avoid nicking the thin plywood veneer, I set my plane with its heel on the plywood and its toe slightly elevated on the edging. Because the edging stood proud of the plywood, I could safely plane the solid edging until it was nearly flush with the plywood. Then, I reached for a card scraper. By referencing the majority of the scraper on the panel, I safely scraped the edging flush and then sanded with #220-grit.

The most critical and visible seams are on the sides of the carcase. I again checked the quality of the seam by applying denatured alcohol. Satisfied with the grain and color match, I cut the bottom and sides to length and width.

Web Frames Hold the Drawers

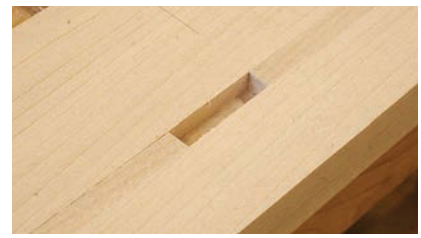
The cabinet has two identically sized web frames, one above the other, that sandwich the two drawers. Joining the frames is a center partition that separates the drawers. These frames consist of two latitudinal rails (front and rear) and three longitudinal rails (two side and one center). The frames

DRAWER WEB FRAMES

Simple frame joinery. *Deep grooves milled on the front and back members house stub tenons on the crossmembers.*

Drawer stops. *Grooves in the frame are later filled to create mortises – a quick solution for a detail that will never be seen.*

Partition grooves. *Clamp a length of plywood in place to guide your router as you mill grooves to house the partitions.*



Easy mortises. *Infill strips fill the groove in the front of the web frames to create mortises that later house drawer stops.*

Finished frame. *Assembly is simple if the frames are properly grooved for the partitions.*

CARCASE ASSEMBLY & GLUE-UP

Slide home. *Once the web frames are clamped to the ends, slide the partitions in place from the backside of the sideboard.*

Lock in. *Tongue cut on each partition slide into the grooves routed on the web frames.*

Add a little insurance. *Partition joinery is reinforced simply – with a single countersunk screw running through the web frame.*

are joined with 3/4"-long stub tenons. These are cut at the table saw and fit in grooves that run along the inside edges of the front and rear frame members.

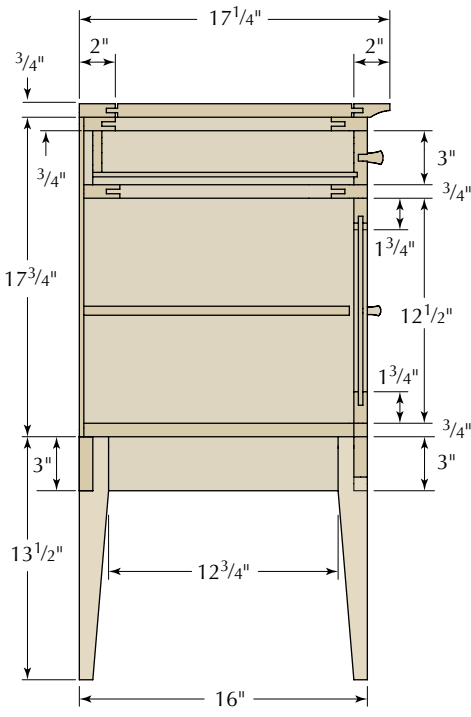
Near the front edge of the lower front rail, I cut a groove. Later, most of this groove will be filled, leaving four small mortises to house end-grain drawer stops.

Carcase Joinery

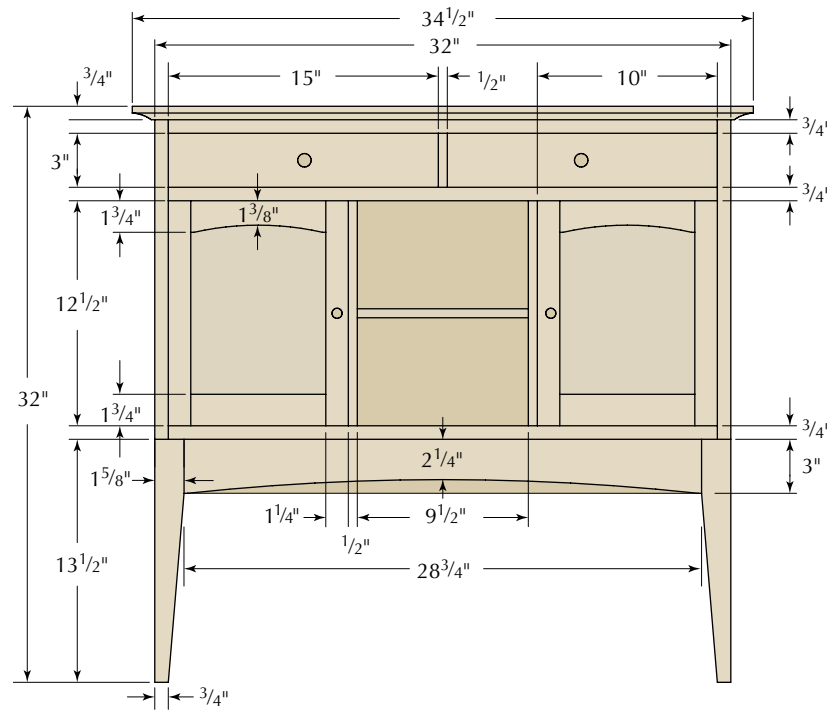
Because this is a small case, I thought biscuit joinery would be simple, quick and supply sufficient strength. To align the biscuits, I made a layout gauge from scrap. This simple jig enabled me to easily and exactly place all the biscuits.

To ensure the exact placement of the partition dados, I used a piece of plywood, against which I ran a router. This router spacing guide, registered against the ends of both frames and the bottom panel, produced dados that lined up perfectly for the insertion of the vertical partitions later on.

One reason to cut the partition dados before assembly is because the hinge mortises are more easily cut when the web frame and carcase bottom are exposed and accessible. Dados for the partitions are 1/4" x 1/4", stopped



SECTION VIEW



FRONT VIEW

1" from the front edge and milled to house 1/2"-thick partitions.

With the exact position of the partitions determined, I laid out the hinge mortises and cut them with a router. I eyeballed the stops, then checked the cut for location and depth with one of the knife hinges. The router left the cuts with rounded ends that I later squared with a chisel.

Glue Up the Case

This is an easy glue-up, but it has to go together dead square. After clamping up the case and inspecting the joints, I made and set up a simple "scissors brace" inside the cabinet. With each end placed in opposite corners of a case, the brace allows me to tweak the case in one direction or the other to get it perfectly square. (For more on this shop-made brace, see Online Extras.)

With the glue dry, I measured for the vertical partitions – one that separates the drawer web frames and two that divide the lower part of the case. The partitions are made from 1/2"-thick plywood and edged with solid maple. After cutting them to size, I shouldered the top and bottom edges of the partitions, leaving 1/4" x 1/4" tongues. Once the vertical partitions were set into place, I reinforced the partition joinery with countersunk screws.

Next, I cut the dados for the three fixed shelves, using another router spacing guide to precisely place them. This was easier and safer (in terms of accuracy) than attempting to cut them before the cabinet was assembled. To fit the shelves, I followed the same procedure as for the vertical partitions, stopping them 1" short of the front edge.

Build the Doors

The doors are a traditional frame-and-panel construction with a floating flat panel. I first milled the stock, preparing about 20 percent extra material; this allowed me to discard any that didn't look good in terms of color, grain or because of twist.

After ripping the material to width, I plowed a 1/4"-wide x 3/4"-deep groove along the inside edge of each door frame member. The shoulder cuts for the tenons on the rails were made on the table saw and the cheeks were cut on the band saw.

This method produces tenons that are clean, tight and flush at the shoulders and fit snugly into the 3/4"-deep groove with almost no adjustment required. A test-assembly produced frames that were both square and flat. Next, I cut an arch on the inside edge of the upper rails on the band saw and sanded the cut to a smooth curve.

The panels are made of ambrosia maple, a wood similar in appearance to spalted maple, with color variations ranging from warm pinks to smoky blues, highlighted with strong dark brown figure. Again, as with the door frames, I proceeded slowly to ensure that the resawn panels wouldn't twist or move after the doors were assembled.

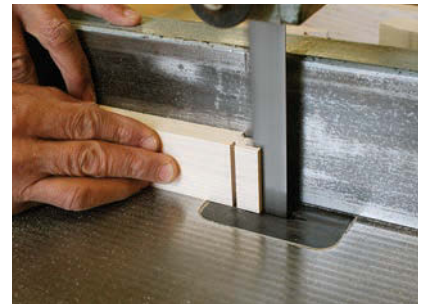
I started with a 1 1/8"-thick slab of

City Sideboard

NO.	ITEM	DIMENSIONS (INCHES) T	W	L	MATERIAL	COMMENTS
TOP						
❑ 1	Top panel	3/4	14	31 1/2	Maple	
❑ 2	Side rails	3/4	2	17 1/4	Maple	
❑ 1	Front rail	3/4	2	34 1/2	Maple	
❑ 1	Rear rail	3/4	2	31 1/2	Maple	1/2" TBE*
BASE						
❑ 4	Legs	1 5/8	1 5/8	13 1/2	Maple	Tapered on two sides
❑ 1	Front rail	3/4	3	30 1/4	Maple	3/4" TBE, curve on lower edge
❑ 1	Back rail	3/4	3	30 1/4	Maple	3/4" TBE
❑ 2	Side rails	3/4	3	14 1/4	Maple	3/4" TBE
DOORS						
❑ 2	Panels	1/4	8 3/4	10 1/2	Maple	Resawn & bookmatched
❑ 4	Stiles	3/4	1 1/4	12 5/8	Maple	Trim to fit opening
❑ 4	Rails	3/4	1 3/4	9	Maple	3/4" TBE
DRAWERS						
❑ 2	Fronts	3/4	3	15	Maple	
❑ 4	Sides	1/2	3	15 1/4	Poplar	
❑ 2	Backs	3/4	2 3/8	14 3/8	Poplar	Backs dadoed into sides
❑ 2	Bottoms	1/4	14 3/8	14 15/16	Maple Ply	
CARCASE						
❑ 2	Sides	3/4	15 1/4	17 3/4	Maple ply	Plus solid-maple edge**
❑ 1	Bottom	3/4	15	30 1/2	Maple ply	Plus solid-maple edge**
❑ 2	Shelves	1/2	14 1/4	10 1/4	Maple ply	Plus solid-maple edge†
❑ 1	Open shelf	1/2	14 1/4	9 3/4	Maple ply	Plus solid-maple edge†
❑ 2	Partitions	1/2	15 1/4	13	Maple ply	Plus solid-maple edge†
❑ 1	Back	1/4	17 3/4	31 1/4	Maple ply	
DRAWER FRAMES						
❑ 2	Front rails	3/4	2	30 1/2	Maple	
❑ 2	Rear rails	3/4	2	30 1/2	Poplar	
❑ 6	Crossmembers	3/4	2	13 1/4	Poplar	3/4" TBE
❑ 1	Partition	1/2	3 1/2	15 1/4	Maple ply	Plus solid-maple edge†
❑ 2	Drawer knobs	3/4	3/4	1 3/8	Maple	May be turned or purchased
❑ 2	Door knobs	3/4	3/4	1 3/8	Maple	May be turned or purchased

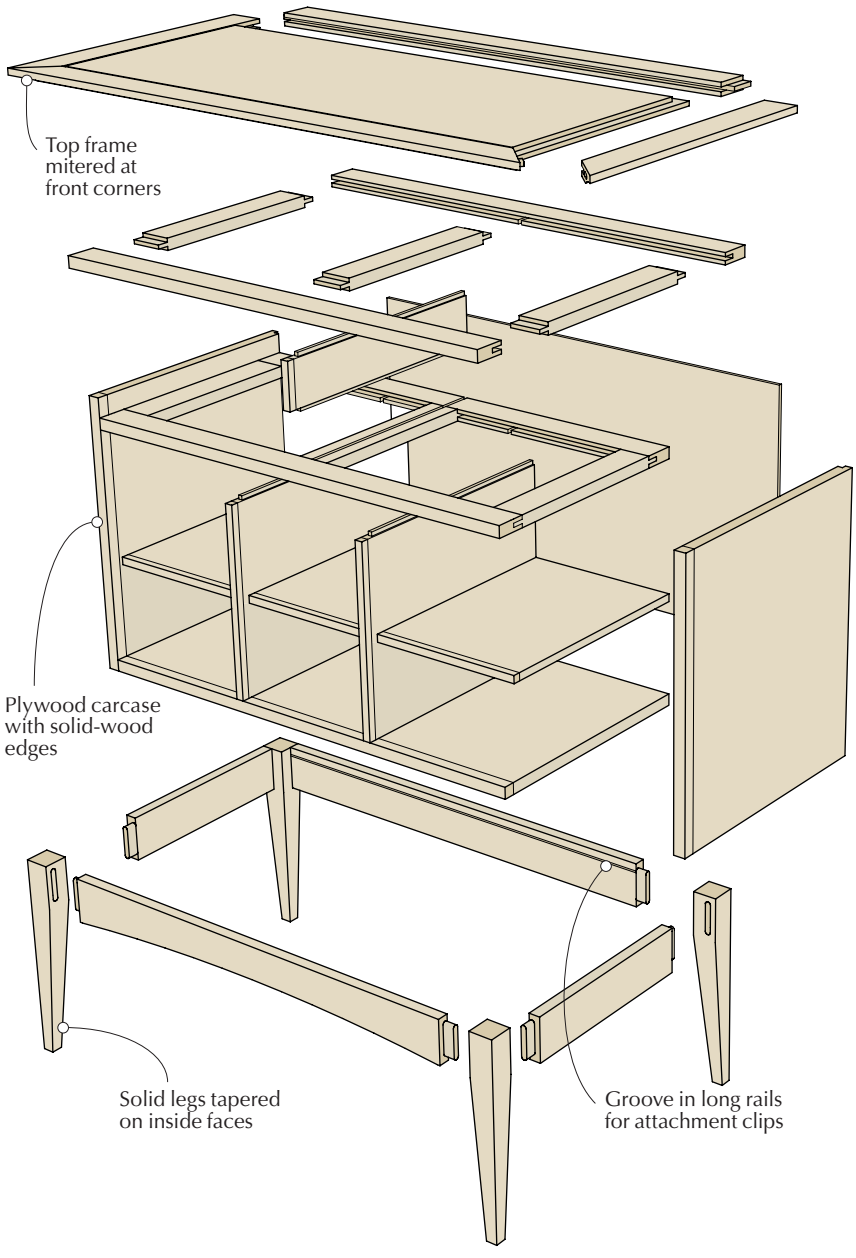
*TBE = Tenon Both Ends **3/4" x 13/16" solid-maple edge †1/2" x 9/16" solid-maple edge

Shoulders. *Once the panel grooves are cut in the rails and stiles, use both the miter gauge and the fence to cut the tenon shoulders.*



Cheeks. *Cut perfectly centered tenons at the band saw by running both faces against the fence to cut the cheeks.*

Joinery first. *Rail grooves are cut before the top rail is shaped, and are deep enough to house the rectangular panel.*



EXPLODED VIEW

ambrosia maple that was long enough to produce two sets of panels, and cut it down the center on the band saw. This produced two 1/2"-thick rough-sawn panels. After letting them settle for a day, I jointed the face sides of each panel and thicknessed them to 3/8". I let them rest overnight and finally took them down to 1/4" thick. The next day, I sanded them with #220 grit, inserted them into the frames and glued up the doors.

To make the knobs I chucked a 1"-square blank between lathe centers and turned the tenon portions of the knobs (1/4" for the door knobs and 3/8" for the drawer knobs), checking the diameter with an open wrench. Once the tenons were sized, I cut the piece in two, and chucked the tenon into a collet chuck to give me easy access to the body of the knob. That way, I could turn the pattern, sand and spray a coat of finish, while the knob turned on the lathe.

Build the Top

The top is a simple frame-and-panel construction, mitered at the front corners and tenoned at the back. I plowed a 1/4"-wide x 1/2"-deep groove centered on the inside edges of the frame members. I cut a 1/2"-long tongue on the long edges and a 5/8"-longue tongue on the ends; when I assembled the top, I left a 1/8"-wide reveal around the panel.

The front miters were cut on the miter saw and dressed lightly with a block plane for a perfect fit. To line up the miters, I cut a short, shallow mortise on the miter faces. These mortises were located so as not to interfere with subsequent shaping of the top's edge.

On the lower edge of the top, I wanted a smooth and wide cove that is wider than deep. I didn't have the specific router or shaper cutter for the desired profile. Instead I employed a variation on a technique widely used to cut cove moulding on the table saw.

I marked out the shape of my cut on a scrap piece of maple and laid a fence across the blade, exposing only a small portion. My technique calls for gradually raising the blade and passing the top's edge along the fence and across the spinning blade. After making several trial pieces, I adjusted the blade height to 1/8" and ran the three edges of the top along the fence and across the blade. After inspecting the initial results, I raised the blade in small increments and repeated the operation. The last pass was a very light cut to clean and smooth any roughness from previous passes.

After the initial shaping on the table saw, I sanded the cove smooth with sandpaper wrapped around a 3"-diameter sanding block. (For more on this process, see Gary Rogowski's "Cove Cuts on the Table Saw," page 46.)

Build the Drawers

How a drawer is made and how it glides into place reveals a lot about the maker. A drawer should be well made and sturdy, yet lightweight and not bulky. It should operate smoothly

DOVETAIL JIG TIPS

At the Philadelphia Furniture Workshop we often use machine-cut half-blind dovetails. The jig I'm using here is the Porter-Cable 4212, but there are similar models available from many manufactures. This type of jig cuts a single configuration of dovetails; the angle of the dovetails, their spacing and their height cannot be easily changed when working with this type of jig. Plan the location of the groove for your drawer bottom to land in the middle of a tail.

Simple dovetail jig. *Easy to use, these jigs cut dovetails of a single size and rout both tails and pins at the same time.*

These dovetails can appear a bit monotonous and out of place on a fine piece, but for certain utilitarian pieces such as vanities, kitchen cabinets, casual pieces and office furniture, machine-cut dovetails are perfect. They're strong, clean and bestow a traditional touch to a piece – plus they're fast and easy to produce.

The jig is easy enough to set up and use – if you closely follow the manufacturer's instructions. Below are some critical and additional adjustments to help you achieve impeccable gap-free results:

1. Material thickness should be ½" for drawer sides and ¾" for the fronts. Parts that are of uneven thickness can shift during the routing operation.
2. Material should be milled square; parallel edges and square ends are critical for accurate drawer boxes.
3. Router bits should be sharp. Dull bits can cause excessive tear-out and burning.
4. Adjust the height of the template to match the thickness of the drawer front. The router rides on this template, so it must sit directly on the drawer front.
5. The ends of the workpieces should butt snugly, without any gaps, when set in the jig prior to routing.
6. Pressure (hold-down) bars should be carefully set for the thickness of the material. If they are unevenly set or exert insufficient pressure, the parts won't register correctly or can shift during routing.
7. Routing should always be done by moving the router from left to right.
8. Carefully follow the contour of the template with the rub collar. A hasty "straight-in, straight-out" cut usually results in too-tight dovetails.
9. When preparing to cut, set the router flat onto the template and engage the left-most finger before starting the router. And let the router stop completely before removing it from the jig.
10. Cut trial pieces – at least one for each side of the drawer, using the same material to be used on the actual drawers.

— MR

Half-blinds in a snap. *Rounded tails fit snug into the rounded shoulders of the pins.*

A tight fit. *The assembled joint is mechanically sound and ready to assemble in a fraction of the time it would take to hand cut the joint.*

SUPPLIES

Lee Valley
leevalley.com or 800-871-8158

1 ▪ Symmetric Drawing Bow, #05N55.01, $28.50

Brusso
brusso.com or 212-337-8510

2 pr. ▪ Offset knife hinges 1 3/4" x 3/8" x 1/8" #L-37, $30/pair

Prices correct at time of publication.

year-round and display a neat, even reveal all around the front.

The drawers have 1/2"-thick poplar sides half-blind dovetailed into 3/4"-thick maple fronts. The poplar back is dadoed into the sides to a depth of 3/16", forming the drawer box. A 1/4"-thick plywood bottom is slipped underneath the back and into a 3/16"-deep groove that runs along the sides and front. This design provides strength, good looks and ease of construction.

Feel free to build the drawers in whatever manner you prefer – whether it's hand-cut dovetails or with simple rabbets. For this piece I opted for somewhere in between and made machine-cut dovetails using a router and Porter-Cable jig. For more on the process, see "Dovetail Jig Tips" on page 25.

Building the Base

The 13 1/2"-long legs are tapered on only the inside faces. This two-sided technique slims down the leg, but retains a strict vertical orientation when the piece is assembled. Before tapering the legs I routed shallow mortises for the rails. The rail tenons were cut in the same fashion as the door rail tenons (shoulders on the table saw, cheeks on the band saw). I shaped the edges of the tenons with a rasp to fit the rounded ends of the mortises.

The side and back rails are straight; only the front rail is shaped to a gentle curve. To lay out the curve, I used a drawing bow (see Supplies) then cut the curve on the band saw and sanded it smooth.

Before assembling the base, I cut a 1/8"-wide x 1/4"-deep groove along the top inside edges of both long rails. This groove accepts the table clips later used to attach the base to the carcase.

I glued up the short rails and legs in pairs, positioning the clamps for both a tight joint and a square assembly. When the glue was dry, I glued and clamped them to the long rails, then checked the assembly for square.

When the base assembly was complete, I cut a very small rabbet along the outside top edge of the base on all four sides. This is a small base, so I performed the operation on the table saw. On a larger piece, this could be done with a router. This rabbet provides a reveal between the base and the carcase and masks any small problems at that joint.

ASSEMBLE THE BASE

Build the base. *Traditional mortise-and-tenon joinery is used to join the base. After assembly, a recessed cut along the top on all four sides adds an interesting reveal.*

Install the Doors

For a clean, contemporary look I chose offset knife hinges for the doors. Although a tiny bit fussy to install, they're unobtrusive and easy to operate. Before mortising for the hinges, I cut down the slightly oversized doors. First I ripped the doors allowing 1/16" from side-to-side. Next, I cut the doors to length, making the same allowance.

After making my cuts, I set the doors in place using small wedges. This allowed me to tweak the fit and make any allowances as needed in the case. When I was satisfied with the fit and spacing of each door, I milled the necessary grooves in the doors for the knife hinge leaf. After routing the straight grooves for the hinges, I marked out the doors for the protruding offset pivot. I made these cuts with a dovetail saw then pared to my lines. The tight fit of the hinges allowed me to set up everything and make any necessary adjustments

PREPARE THE TOP

Tenon the miter joints. *Loose tenons fit into mortises that are routed in the mitered ends of the frame members at the front corners.*

Cove the underside. *Lighten and refine the top by using a guide fence and slowly raising the table saw blade to cove the top's edges.*

before drilling holes for the hardware.

Next I drilled holes for the knobs on the front and a 1/4" hole at the upper corner, opposite the hinge, to house a small magnet.

With the mortises already roughed in on the case, I could transfer the exact location of the hinges onto the doors. I accomplished this with a carefully set marking gauge, transferring the settings directly from the cabinet. As with any exacting operation, prepare extra pieces for testing. When satisfied with my tests, I mortised the doors on the router table. The remaining cuts for the hinge offsets were performed at my bench with a sharp chisel. The hard part was laying out and mortising for the hinges. Once this was done, the installation was easy.

Fit the Drawers

I installed four end-grain drawer stops into the mortises at the front edge of the lower web frame. These little L-shaped blocks are milled to fit into a 1/4" mortise and leave a small short-grain block that is raised off the surface of the front rail for easy planing. After slipping a drawer in place, I could judge how much to take off the drawer stop with my tiny rabbet plane. It took only a few passes across the stop before my drawers sat flush with the edge of the case.

Make Magnetic Door Stops

After hanging the doors and checking for easy operation and an even gap, I installed a door-stop strip that has an embedded magnet that serves as a hidden door closer. In a 5/8"-square strip of maple, I cut a 1/8"-wide groove down one edge. Fill all but a 1/2" section of this groove with a maple strip and drop a small magnet into the remaining space. The end of the strip with the magnet should be set opposite the hinges against the underside of the lower drawer web frame, 3/4" from the front edge of the cabinet, and screwed into place. This "buried" magnet on the door stop strip will attract a similar magnet set into the back side of the door. When the closing door is within 1/2" of the cabinet, the magnetic attraction will close the door. A nice touch.

PWM

Mario has more than 30 years of woodworking experience, and now teaches at the Philadelphia Furniture Workshop (philadelphiafurnitureworkshop.com).

HINGE INSTALLATION

Chisel to fit. *Rout the long straight part of the mortise before assembly. After assembly, use a spacer to locate the hinge and then chisel out the opening for the hinge arm.*

Position the door. *Use spacers to establish an even reveal on all four sides of the door. Then mark out the hinge locations.*

Mortise the door. *Rout out the bulk of the waste and fine tune the hinge mortise until the leaf fits flush to the door.*

MAKE A DOOR STOP

Make your own magnetic catch. *A small mortise cut in the door stop houses a small rare-earth magnet.*

Magnetize the door. *Simply drill a hole on the inside face of the door and epoxy a small magnet in place.*

ONLINE EXTRAS

For links to all online extras, go to:

- popularwoodworking.com/apr13

BLOG: *Build a "scissors brace" to help square your casework.*

WEB SITE: *Take a class at the author's school, the Philadelphia Furniture Workshop.*

TO BUY: *"Building Cabinets, Bookcases and Shelves" a book featuring 29 projects.*

Our products are available online at:

- ShopWoodworking.com

Quarter Columns

BY CHARLES BENDER

Forget the lathe; a router table setup makes quick work of these striking architectural features.

If you want to add a little punch to your next traditional furniture project, try adding quarter columns. They help narrow the look of any piece by drawing your eye inward. This usually gives the piece the appearance of being more compact and vertical, and gives it a more powerful stance.

So you'd like to give quarter columns a try but you only have a benchtop mini lathe? In 35 years of making furniture, I've only turned quarter columns once – and I'll never do it again. I make my quarter columns at the router table.

Why? Well, the time-honored method for making quarter columns on the lathe has many drawbacks: You need to mill and accurately glue pieces together with paper between so you can easily

PHOTOS BY THE AUTHOR

Quarter columns the easy way. *All you need to make quarter columns is a router in a router table, a roundover bit, a fluting cutter, some layout tools and wood. This method can turn circles around the traditional lathe method.*

separate them once you've turned the columns. And if you don't get them precisely lined up in the gluing process, you need to start over or you won't end up with four equal columns.

Once you get the columns turned, you need an indexing head for your lathe to make the flutes. And once you've got that handled, you need to either make a scratch stock with a guide box or a router jig in order to cut the flutes into the freshly turned column. All of this can take from several hours to a couple of days. The process is time-consuming, messy and prone to errors.

With just a few simple setups on the router table, you can make fluted quarter columns in no time – without all the fuss. The best part is, if you don't like the layout or you make a mistake, it's easy to start over and get exactly what you want with very little time invested.

Time to Buy Some Tools

To make quarter columns on the router table you'll need only a few tools, some of which you probably already own. You'll need a router and a router table, neither of which needs to be very big or expensive. A 1-horsepower (hp) router and a shop-made table should do the trick. I have only 1 1/2-hp routers in my shop.

The next things you'll need are some flute-cutting router bits. I have sizes from 1/8" through about 3/8" in my collection. The bits can be with or without ball-bearing guides. Bits without ball-bearing guides give you a little more flexibility as to the depth of cut, but if you already own ones with bearings they'll work fine. If you're looking to buy only one bit, I'd go with a 1/4" flute cutter.

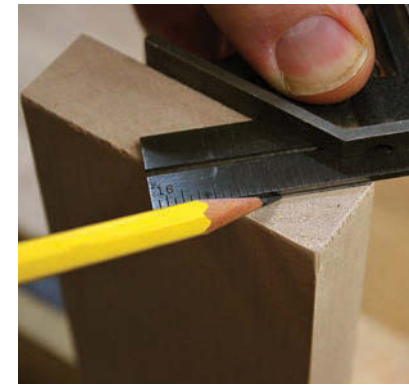
You'll also need some roundover bits. I try to make my quarter columns 1/8" smaller than the opening in which they'll be placed. So, for a 1"-square opening, you'll need a 7/8"-radius roundover bit for the column itself. I have sizes ranging from 3/4" through 1 1/2" in my collection, but the 7/8" and 1" roundover bits see the most use.

And that's about all the tooling you'll need to make quarter columns at your router table. Of course you'll also need some stock for the columns and a few pieces of scrap to help position the stock on the router table, as well as some basic layout tools, but not much more.

Materials Prep

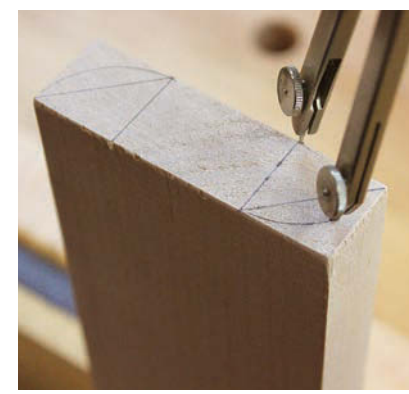
Let's begin by making a 1" quarter column that fits into a 1 1/8" opening. This means you need to mill a board to 1" thick. In order to get two quarter columns for a piece of furniture, mill the blank to approximately 3" wide.

COLUMN LAYOUT



Lay out the column. *On the end of the quarter-column stock, mark off a 45° angle to begin the layout process.*

Find the extremity. *At the point where the 45° line meets the face of the board, square a line across the thickness to define the largest point of the column.*

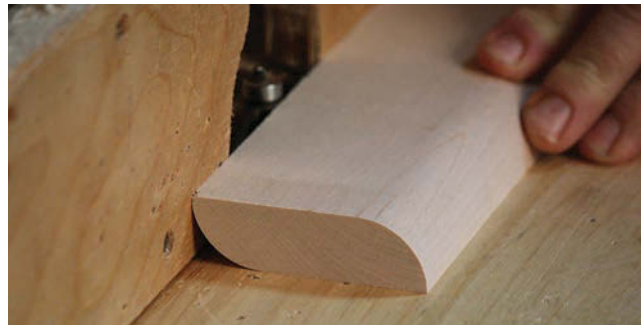


Draw the face. *Using a compass, set the point at the extremity then carefully strike the arc of the column face.*

"A man begins cutting his wisdom teeth the first time he bites off more than he can chew."

—Herb Caen (1916-1997), American newspaper columnist

ROUT THE COLUMN BLANK



Play it safe. *For added stability round over opposite corners of the quarter column blank.*

This allows for one quarter column along each long edge of the blank with some space between for a saw kerf to separate the columns from the blank. It also allows a little extra space in case the layout isn't perfect or you make a mistake in routing and need to trim back the edge and start over.

Install a 1"-radius roundover bit in the router table so it will round the edge of the blank without leaving a fillet behind on the edge or the face. You want a smooth curve from the corner of the blank to the theoretical corner of the column. It's good practice to lay out the 1" square of the quarter column on the blank to help set up the router table.

Now run the roundovers on the edges of the blank. I usually run the roundovers on opposite corners to give the blank more stability when running the flutes and when cutting off the columns on the table saw.

Layout & Setup

Now that the blanks are rounded over, it's time to decide how many flutes you want and the spacing between them. Using the layout line from the 1" square, begin by drawing a 45° angle from corner to corner of the column. Depending on how many flutes you want in the column, you'll need this line to help divide the rounded surface properly. (Adjustments can be made by eye if the mathematical results don't look quite right.)

For three flutes, the layout is simple. Begin by drawing a 45° angle from the corner of the quarter column through to the curved face of the column creating two quadrants. Then draw a 22½° angle from the corner of the column to divide each of the two quadrants into two additional quadrants that are equally divided. At this point you should have three lines that intersect the curved face of the column approximating the centers of the flutes.

Take the fluting bit you'll be using and trace the flute's shape by holding the bit at a tangent to the arc of the column face. This is where you'll place the flutes when you set up the router table.

For four flutes, the division becomes a little trickier. Because you're creating four flutes, there will be five spaces created (two along the outside edge of the column and three between the flutes). Divide 90° by five, and each flute is 18° apart. Set a bevel gauge at 18° and mark the two outermost flutes on the columns, then reset to 36° and mark the two innermost flutes.

If you are having trouble setting bevels to those degree marks, divide the curved face into five equal segments with dividers. You've just divided the column for four flutes. Trace the flute shape from the bit as before.

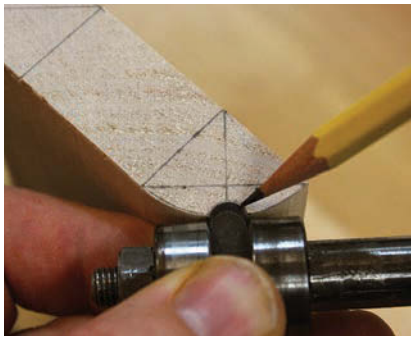
Five flutes function the same way as four, except the degree multiple is 15. So, each flute is 15° apart – one flute at 15°, one at 30°, one at 45°, one at 60° and one at 75°. You can divide the column using the alternative method above but you'll need to divide the curved face into six equal segments (two spaces along the edge of the column and four divisions between the flutes).

The degree angles are important to know because you'll need to make angled wedges on the table saw in order to flute the column blank. This means for three flutes you'll need a pair of 22½° wedges and one 45° wedge. For four flutes you'll need a pair of 18° and a pair of 36° wedges, and for five flutes you'll need a pair of 15° and 30° wedges and a single 45° wedge.

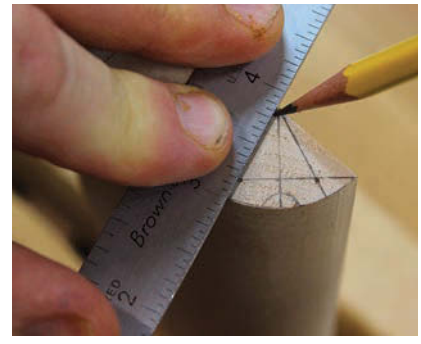
Time to Rout

With the end of the column blank marked out and the wedges made, it's time to set up for and run the flutes. The

FLUTE LAYOUT



Center flute. *Once the flute face is divided in half, use the fluting cutter to mark the center flute location.*



Divide again. *Once you have the rounded shape of the center flute drawn in, lay out the remaining flutes.*

Outer flutes. *Using the fluting cutter again as a template, draw in the outer flutes, adjusting as necessary to keep the fillets between even.*

ROUT THE FLUTES

Stick 'em down. *With the layout complete, use double-sided tape to attach the wedges to the router table and fence.*

Two flutes, one setup. *Run the first pass with the blank vertical against the wedge then run the second pass with the column blank horizontal to rout the other outermost flute.*

Choose your wedges. *On three- and five-flute columns, use the 45°-angle wedge and set up to rout the centermost flute first. On four-flute columns, use the 18° wedges and run the outermost flutes first.*

Fine-tuning. *You may need to juggle the placement of the wedges, the height of the cutter and the fence placement, but you should end up with equal-sized flutes and fillets.*

first thing to do is grab some double-sided tape and the appropriate wedges. Tape one wedge to the router table fence making sure to leave enough space for the router bit. Put the fluting bit into the router and, with the column blank held against the wedge and down to the table, adjust the bit to the proper flute. On a column where you'll be using a 45° wedge (for a flute in the middle of the column – that is, for a three-flute or five-flute column) line up the bit so it is centered on the column. On a four-flute column you'll line the bit up with the top-most outside flute. For the four-flute column, you'll then tape down the second wedge to the table. This way, you will run the two outside flutes first – one with the board raised along its long edge against the fence and the second pass with the board lying down flat on top of the wedge on the table.

Once you have the first round of flutes cut, remove the wedges from the table and the fence, then set the next set of wedges in place with the tape as you did with the first set. Adjust your router bit height and run one pass with the board on edge then another with the board laying flat.

It's always easiest to run the center flute on an oddly numbered column followed by the outermost flutes, then divide up the flutes in between evenly. On evenly divided columns, run the outside flutes first then the inner flutes. This way, if you have any variation of the spaces between the flats of the inner and outer flutes, it won't be as noticeable.

Most quarter columns in period furniture are separate from the capitals at the top and bottom of the column. You'll still have to glue up and turn the capitals, but running the fluted quarter columns on the router table is one way to speed up the process and achieve accuracy while keeping the process safe and simple. If you've ever tried to rig up a scratch box or router jig on the lathe, try this method. I'm sure you, like me, will never again go back to the "traditional" method of creating quarter columns. **PWM**

Charles is a renowned period furniture maker and the lead instructor at Acanthus Workshop (acanthusworkshop.com).

ONLINE EXTRAS

For links to all online extras, go to:
- **popularwoodworking.com/apr13**

BLOG: *Read the author's blog.*

IN OUR STORE: *"Carve a Ball & Claw Foot" a DVD by Charles Bender.*

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WEB SITE: *Visit the author's web site to view a gallery of his work.*

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Compound Dovetails

BY TOM CALISTO

Discover how to join oblique sides with through-dovetails.

As an avid sailor and full-time furniture maker, I've always wanted to make a proper sea chest replete with rope beckets and a compass rose inlay. The compound-angle dovetails are the only tricky aspect of the sea chest so I designed this little handled tote to practice oblique dovetails. This tote tray is useful around the house and fun to build. The angles of the oblique dovetails offer a challenge.

The first step in building the tote is to mill the lumber to thickness and width then rip the bevels on the top and bottom edge. Tight-fitting dovetails begin with accurate compound-angle butt joints. See the chart and drawing on page 33 to determine your layout. The tray in the opening photo has three tails, but for your first attempt, you may choose to make two tails as seen in the step photos.

When cutting the ends it's important to note that the bevel angle will be directed in the opposite way of what you might think. On a mitered box the angle will be directed toward the inside of the box. This is not the case for this project; the angle is directed toward the outside of the tray.

After cutting the four tray sides to length with the proper compound cuts on each end, make a "paring block."

"You can never learn less, you can only learn more."

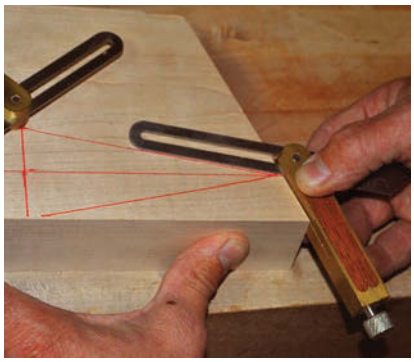
—R. Buckminster Fuller (1895-1983), American theorist, designer & inventor

The paring block is used to trim the dovetails to their baseline and it acts as a stable platform when transferring the tails to the pin board. The paring block should be made from a hard, closed-grain wood such as maple. Make the paring block from 8/4 stock that is roughly 8"-10" long and slightly wider than the sides of the tray. Each end of the paring block gets a compound-angle cut representing the left- and right-hand angles on the tray sides.

Lay Out & Cut the Dovetails

Mark the baseline on both the pin boards and tail boards. I recommend using a cutting gauge instead of a marking gauge for this. A cutting gauge produces a finer line and the blade can be adjusted to compensate for the beveled

OPENING PHOTO BY AL PARRISH; STEP PHOTOS BY THE AUTHOR; ILLUSTRATIONS BY ROBERT W. LANG FROM THE AUTHOR'S DRAWINGS.



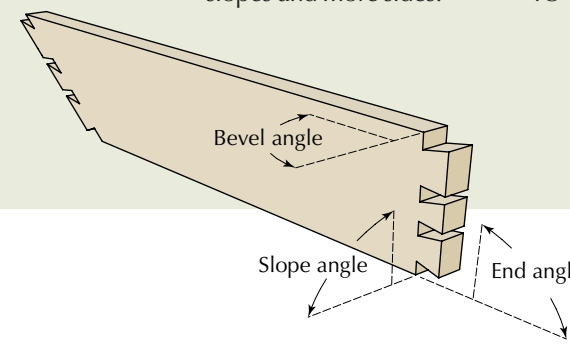
Paring block. *A thick block cut to the correct angles will help in paring the sockets after they are cut. It also serves to lay out the tail angles.*

Compound Angles

SLOPE OF SIDES	END ANGLE*	BEVEL ANGLE**
90	90	0
85	85	.4
80	80.1	1.7
75	75.5	3.8
70	71.1	6.7
65	67.1	10.3
60	63.4	14.5
55	60.2	19.2
50	57.3	24.4
45	54.7	30

This chart gives the necessary angles (in degrees) to make four-sided boxes with butt joints, the first step in cutting the parts to make oblique dovetails. The miter angle listed is the setting for the miter gauge on the table saw, and the bevel angle is the tilt of the table saw blade. There are calculators available online that will generate angles for other slopes and more sides. —TC

*Angle of miter gauge or miter box to crosscut ends
**Tilt of blade when cutting ends



ends. The baseline is referenced from the end cuts on the sides. The fence must be held tight against the end grain. Set the depth to a little over the thickness of the sides (around 1/32").

The dovetail angle in the step photos is a 1:5 slope. The dovetail angle is referenced along the grain of the wood and not the mitered ends. To set the bevel gauge to the proper dovetail angle, first lay out the angles on the paring block (above). Draw a line that is parallel to the bottom and approximately 1 1/2" up. Square a line from the bottom edge 5" in from one of the compound cuts.

On the perpendicular line measure up 1" and down 1" from the baseline and mark these offsets. Draw diagonal lines from where the baseline intersects the compound cut to the 1" offsets. Use these lines to set the sliding bevel gauges. Set up one for the lower edge of the dovetail angle. Set up another to the upper angle. It is easy to mix up the tools, so clearly mark each for its intended angle.

Lay out the tails on the face of the tail board with a half pin in each corner using the sliding bevels that were set for the upper and lower angles. Leave at least 1/4" between the tails. (If the spacing is too fine, it will be difficult to clear the waste.) Set another bevel to mark lines across the end grain that are parallel to the top and bottom edges of the tray (not square to the face).

Set this angle by lining up the blade with the top edge of a tray side and holding the body parallel to the angled end of the tray side. Check all the lines to confirm that they look right and then saw the sides of the tails to the baseline.

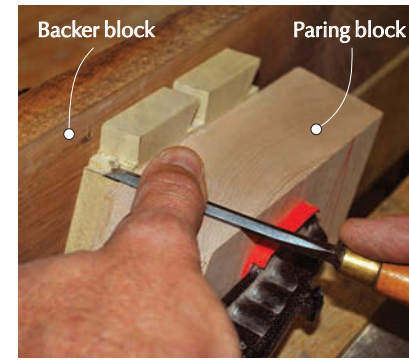
Remove the bulk of the waste with a coping saw. Match the end of the paring block with the angle on the side. With the paring block in the front, align its end with the baseline on the tail board so that the "ramp" is directed upward. This will allow you to more easily pare to the correct angle. Clamp the two pieces in a vise and add a backer block on the far side to avoid blowout.

Carefully pare to the baseline by nibbling away the waste. Then lay the chisel flat on the paring block for the final slices. Use one hand to keep your chisel flat on the paring block and use the other to push with. It is important to keep your fingers out of danger behind the cutting edge. All it takes is one slip with a sharp chisel to ruin your day.

Transfer the Tails

Arrange the sides to form the tray and mark each corner to maintain proper orientation. I recommend using the paring block to aid in the transfer of the tails to the pin board. It provides a

Tail end. *Lines across the end grain are parallel to the top and bottom of the sides and ends. Placing the piece in the vise with the cutlines vertical will aid in sawing the tails.*



Sandwich. *The side is clamped in the vise between a scrap and the paring block. Resting the back of the chisel on the paring block guides the cuts to the proper angle.*

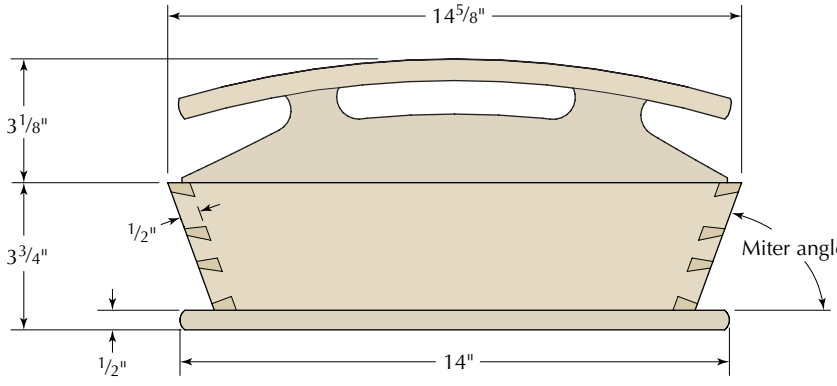
Maker's mark. *Align the two parts of each corner and mark the mating pieces before transferring the tails to the pin boards.*

Double duty. *The paring block is used to support the side while the socket locations are marked with a knife.*

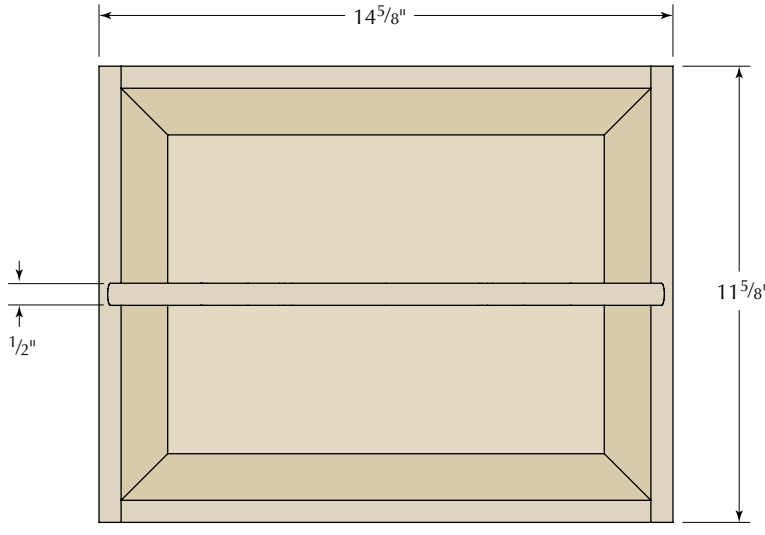
Parallel pins. *On the pin board, the lines across the end grain match the miter angle on the end of the board, parallel to the top and bottom edges.*

Oblique Dovetail Tray

NO.	ITEM	DIMENSIONS (INCHES) T	W	L	MATERIAL
❑ 2	Sides	1/2	3 3/4	14 5/8	Poplar
❑ 2	Ends	1/2	3 3/4	11 5/8	Poplar
❑ 1	Divider/handle	1/2	6 7/16	14 3/16	Poplar
❑ 1	Bottom	1/2	11	14	Poplar



SIDE VIEW



TOP VIEW

solid clamping surface that will align the corners when scribing the tails to the pins. Orient the paring block with the pin board so that the angled ends match and clamp the blocks in a vise. Place the tail board on top and align its baseline with the inside edge of the pin board. Transfer the tails to the pin board with a marking knife.

Set a sliding bevel to the end angle of the pin board and use that to transfer the lines down the face grain to define the sides of the pins. These lines are parallel to the top and bottom edges. Next, saw out the pins to the baseline. Saw directly on the waste side of the line. The goal is to avoid having to trim the joints because due to the angles, it is difficult to judge where the joints aren't going together.

A standard clamp will slide on the angled parts, so make some clamping cauls to pull the joints together. Angled blocks glued to each end of a piece of scrap plywood make a simple but use-

No slip. *These cauls keep the clamps from sliding on the sloped surfaces and keep clamp pressure in line with the joints.*

ful caul. The blocks should have the same compound angle as the ends of the sides. Cut four blocks with the left-hand angle and four with the right-hand angle. One end will have the compound angle and the other end will be cut at 90°. Make them roughly 1" long. The scrap plywood should match the shape of the sides and be approximately 1" shorter to ensure the caul does not interfere with the joints closing up.

Orient the blocks on the end of the plywood so the straight cuts are facing out. Firmly attach the blocks to the plywood to form a square clamping surface. I recommend a dry-fit before gluing to ensure that nothing interferes with the joints closing up. The cauls tend to shift when pressure is applied, so use small C-clamps to prevent that. If the dry-fit is successful, release the clamps and knock the joints about halfway open.

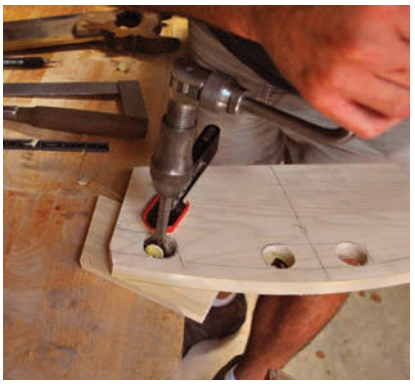
Apply a little slow-setting glue (such as liquid hide glue) to the outside of the joint and clamp it. With the mechanical nature of the dovetail joint, it is not necessary to use a lot of glue. Adding glue to the outside instead of the inside, will make it much easier to avoid squeeze-out on the inside of the tray where it is difficult to clean up. Allow the glue to cure overnight then clean up the joints with a block plane and level the top and bottom edges.

Tray Handle & Bottom

Start with a 1/2"-thick board that is a little longer than the width of the tray at the top and about 4" taller. The handle is housed in 1/8"-deep dados in the ends of the tray. Cut the dados with a backsaw and a chisel followed by a small router plane. (Be careful to keep your fingers out of the way of the chisel.)

Measure the length of the handle between the dados at the base of the tray. Cut each side and test the fit. If the handle does not make it all the way to the bottom, trim one of the ends. If it goes too deep, trim the lower edge after the handle is attached. After getting a good fit between the handle blank and the dovetailed tray, draw the curves for the top edge, handhold and the side reliefs.

Ahead of the curve. *Use a gauge to score lines parallel to the curved top of the vertical divider. The upper line defines the round portion and the lower line the edge of the cutouts.*



Begin at the end. *Bore holes to define the ends of the cutouts in the handle.*

Saw then shape. *Rough cut the ends with a back saw and use a coping saw to remove material in the center cutout. Then use a rasp to remove the saw marks.*

Carve then curve. *After defining the line at the bottom of the handle with a chisel, use a spokeshave to form the rounded surface.*

Bore holes to define the rounded ends of the cutouts, then saw to the edges of the holes. The end cuts can be made with a backsaw; the center cut can be made with a coping saw. Clean up the sawn edges with a rasp.

The dowel shape of the handle is formed by scoring the offset to define the diameter with a marking gauge. Follow up with scratch stocks, rasps, files and carving tools. With the round shape established, reduce the thickness under the "dowel" with a flat gouge or a wide chisel. You need only make the relief cuts deep enough to create a strong shadow line – about 1/16".

Cut the bottom to size and plane a bullnose profile on the edges. Work the end grain first then plane the long-grain sides. The handle and bottom are nailed on with 1" cut nails. When nailing on the bottom, place the nails toward the outside edges of the tray and angle them slightly so that they do not break through the tray sides. Apply a few coats of shellac and the tote is ready for storing mail, carrying a picnic or keeping the remote controls organized. PWM

Tom is a woodworker and toolmaker in Chapel Hill, N.C., and teaches at The Woodwright's School.

ONLINE EXTRAS

For links to all online extras, go to:
- popularwoodworking.com/apr13

WEB SITE: *Visit the author's web site to see more of his work.*

PATTERN: *Download a full-size PDF pattern for the tray divider/handle.*

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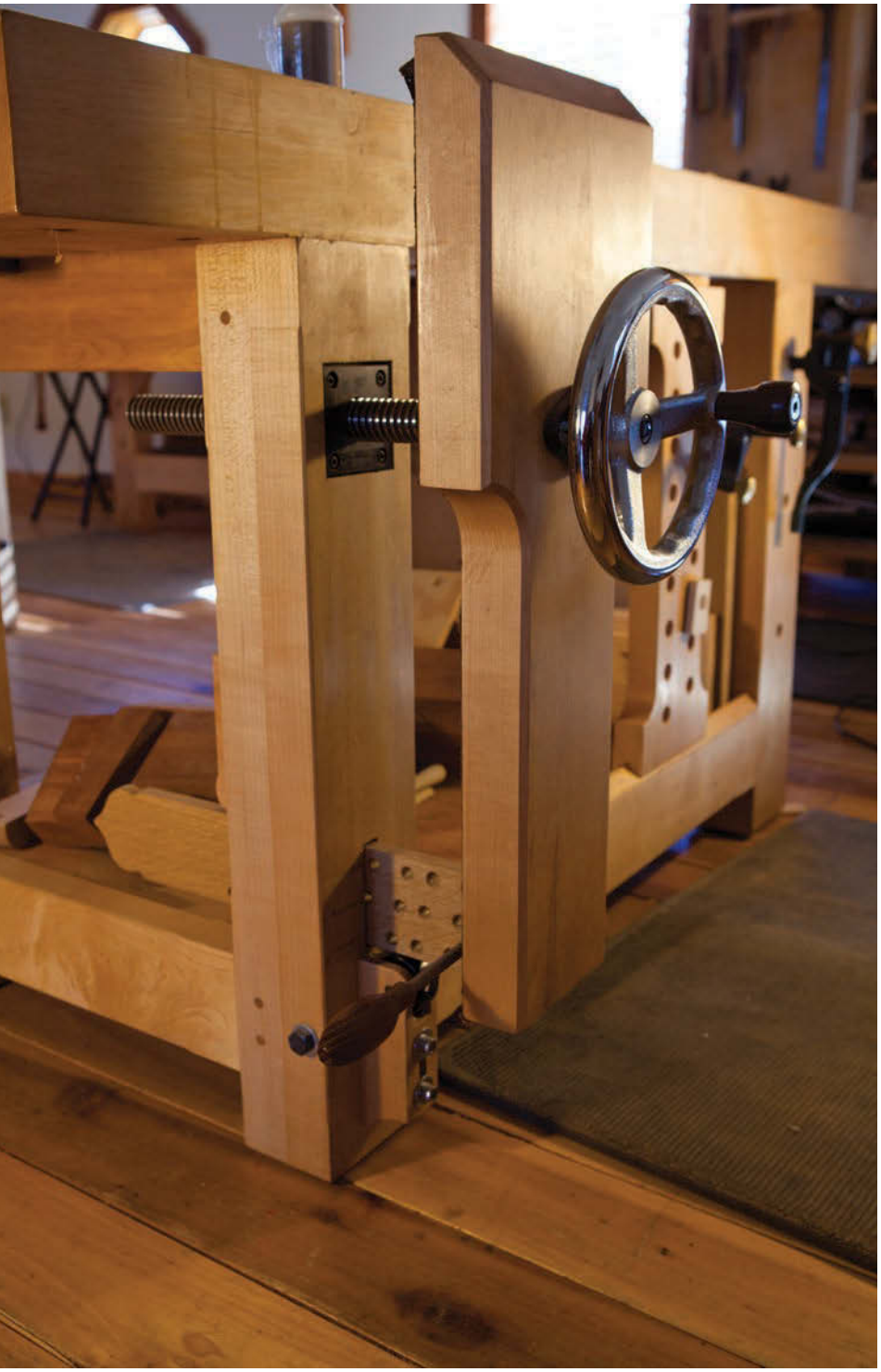
A Workholding RENAISSANCE



BY CHRISTOPHER SCHWARZ

After years of decline, the industry that makes vises and holdfasts for woodworkers has come roaring back.

In my first book, "Workbenches: From Design & Theory to Construction & Use" (Popular Woodworking Books), I urged fellow woodworkers to "fight progress" and "invent nothing" when it came to designing their workbenches.

Boy, am I glad that the tool manufacturers ignored me completely.

In the last eight years there has been an incredible rebirth in the manufacturing of vises and workholding. We have gone from having almost no choices to having so many that it's agonizing. If you are trying to select the right vises and holdfasts for your new workbench – or you are considering upgrading your equipment – keep reading. We're going to pick apart the latest gear so you can choose what suits your work.

Veritas & Lee Valley Tools

It would be folly to begin this article without discussing Veritas and Lee Valley Tools. Even in the darkest hours of workbench hardware, this Canadian company continued to manufacture

Benchcrafted Glide. *Leg vises are versatile, but most of them require some effort to adjust. The Glide from Benchcrafted, however, is as smooth as silk.*

ALL PHOTOS BY THE AUTHOR, EXCEPT FOR LIE-NIELSEN CHAIN-DRIVE (COURTESY OF LIE-NIELSEN) & CRISSCROSS (COURTESY OF BENCHCRAFTED)

Veritas Quick-Release Sliding Tail Vise. *This is the first tail vise I ever installed that doesn't sag. Add to that the fact that it offers quick-release and is simple to install and you'll know why it's one of my favorites.*

Veritas Hold-Down. *Traditional holdfasts might cinch down faster, but no other hold-down offers a 100-percent predictable (and adjustable) grip. This is still one of Veritas's best tools.*

and sell quality workbench equipment. Not all of the company's products are home runs, but Veritas makes bench stuff for everyone, from joiners to carvers to people who specialize in bent laminations. Here, in my opinion, are the company's best bench products.

At the top of my list are the Veritas Quick-Release Front Vise and Quick-Release Sliding Tail Vise. These remarkable vises give you the Old World look of a vise with a wooden jaw, yet they give you the modern convenience of quick-release. And, perhaps best of all, these vises don't rack or sag.

If you own a commercial European bench, then you probably have been fighting sagging, racking vises almost the entire time. Racking face vises refuse to hold the work. Sagging tail vises lift it off your benchtop. These Veritas vises are easy to install – like a metal quick-release vise – and can be bolted so they will never droop.

Critics of these vises scoff at the small-diameter screw that these vises use. Don't buy into it. These vises take a beating and stay smooth after thousands of cycles.

The other big winner in the Veritas stable is the venerable Veritas Hold-Down. This is the only surface clamp that works regardless of how thick your benchtop is. These have been around for years. They are expensive but are worth every cent.

As I said earlier, not everything Veritas offers is an undisputed champion. The company has developed a lot of hardware for people who don't want to install a tail vise: the Veritas Wonder Dog, Surface Vise and Inset Vise. These bits of hardware will allow you to quickly add a tail-vise-like mechanism to your bench. The downside to these bits of hardware is they don't work well with thin stock. If you work with stuff that's 3/4" thick or more, they're great. Otherwise, look elsewhere.

Benchcrafted

Another leader in the workholding revolution has been Benchcrafted, a small family business in Iowa. This company sells only three types of vises, but every one of them is a superb achievement of design and manufacturing.

SQUARE DOGS V. ROUND DOGS

Here are the real differences between square dogs and round dogs.

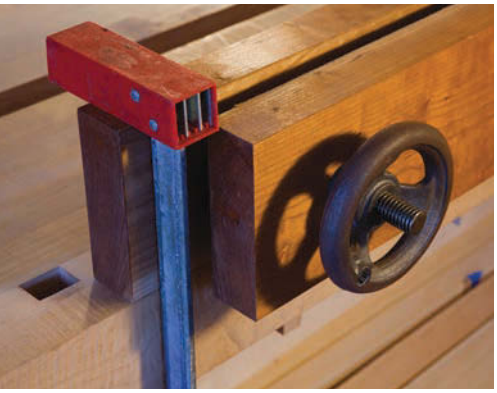
Round dogs holes are easier to install after the bench is built – just drill a hole. They can also accommodate holdfasts and a lot of aftermarket workbench equipment from Veritas. The downside? The jaws can rotate and slip when you are trying to grip curved work. Historical note: Round dogs are probably older than square dogs – you can see them in paintings from Pompeii.

Square dogs require more work to install. And it's a royal pain to try to put them in after the bench is built. However, their jaws never rotate, so they offer a more sure-fire grip with irregularly shaped pieces. — CS

No winner. *Both square and round dogs have advantages and disadvantages. Which you choose depends on your work – and your bench.*

What Benchcrafted does is take forms of vises that have disappeared and reinvent them with modern materials and high-tech manufacturing. The company's first vise, a tail vise, is actually a modern interpretation of the 19th-century wagon vise. This vise gives you more benchtop space to work than a traditional tail vise. And it is incredibly robust. I have one of the first ones on my workbench and it is still flawless.

Benchcrafted Tail Vise. *It doesn't look like much from the benchtop, but the engineering underneath this vise is impressive. I have this hardware on my bench and wouldn't trade it.*



Benchcrafted Moxon-style vise. *I don't dovetail every day. But when I do, I use this vise, which raises my work to a comfortable height. When I'm done, the vise is put away.*

Benchcrafted's second vise, the Glide (shown in the opening photo), takes the old leg-vise design and makes it almost frictionless. Your vise jaw floats on wheels and a bushing that keep it from sagging. And the large handwheel is less cumbersome than the traditional tommy bar.

And the company's third vise, the Moxon vise, updates a 17th-century design to make dovetailing much easier – no stooping. The vise raises your work about 8" off your benchtop and can be easily stowed away when not in use.

The company has other vises in the works, including a carver's vise. And at press time, I'm installing the company's Crisscross accessory (below), which you can add to any leg vise to eliminate the parallel guide at the floor and banish a lot of stooping in your shop.

If there is any downside to the Benchcrafted products, I'd have to say that they aren't fun to install on an already-assembled workbench. If you are building a new workbench, then it's simple to plan for the precise cavities these vises require. If you are retrofitting a workbench, the Benchcrafted vises require a lot of finicky handwork on your part.

However, when your vises are installed, you won't care about the labor. These vises look good and work like crazy.

Benchcrafted Crisscross. *This apparatus replaces a leg vise's parallel guide and pin. It's an old idea that has been revived and improved by Benchcrafted.*

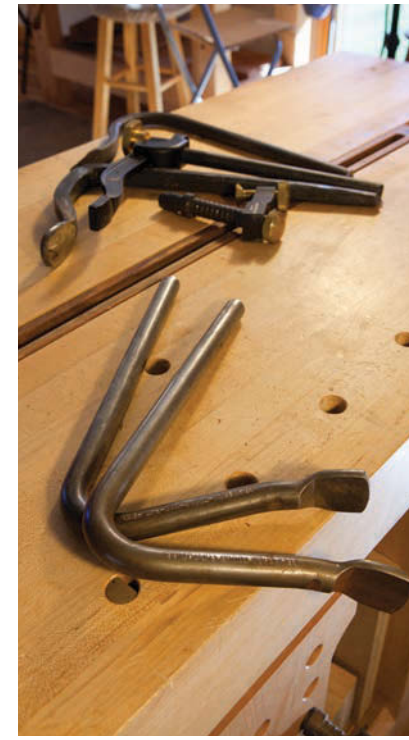
> "The faster a thing is created, the more fleeting its permanence."
>
> *— Friedensreich Hundertwasser (1928-2000) Austrian/New Zealander artist*

Gramercy Tools

Gramercy Tools, the tool-making label of Tools for Working Wood in Brooklyn, N.Y., made one of the biggest contributions to workholding with its patented holdfast. This wire-formed holdfast works as well as a blacksmith-made one but costs less than $35 – for a pair.

Thanks to that incredible price, these holdfasts have introduced many woodworkers to traditional benchwork. And I recommend them to almost every woodworker who is starting out.

Some people grouse about their



Gramercy Holdfast. *This wire-formed holdfast (foreground) is the least-expensive effective holdfast on the market.*

Lie-Nielsen Chain Drive Vise. *The chain is buried in the chop of this face vise, allowing a traditional look. The robust components allow you to grip your work with surprising force.*

Lie-Nielsen Holdfast. *The close-to-the-bench profile of this holdfast keeps it out of harm's when you are pushing your planes around the benchtop.*

modern appearance. I say you haven't hit them enough. After a few years of hard use they look right at home on a traditional bench. The only criticism I have of these holdfasts is they are not as effective in very thick (more than 4") benchtops. To make them grab in thick tops, I recommend you rough up the shaft with a file and then counterbore your holdfast's hole from the underside of your benchtop. This will reduce the effective thickness of your benchtop and fool the holdfast into working.

Lie-Nielsen Toolworks

When Thomas Lie-Nielsen started making workbenches in his Maine factory he installed European vise hardware, which was the best he could get at the time. But it wasn't good enough. Some of the tail vises sagged. All the vises needed some tuning. And the fit and finish didn't please Lie-Nielsen. So he started making his own hardware.

Today Lie-Nielsen makes hardware for every corner of a workbench, including tail vises, face vises, leg vises and even a Moxon-style vise. The two big contributions the company has made to workholding have been its improved tail-vise hardware and its chain-drive mechanism for face vises and leg vises.

The tail vise hardware, which I've installed, is designed so it cannot sag. And indeed, the stuff I have installed has stayed in place for more than a year. It's a bit trickier to install than the Veritas Quick-Release Sliding Tail Vise, but the Lie-Nielsen hardware looks a lot more traditional – if that's important to you.

As to the chain-drive mechanism, I was skeptical of it at first. I owned a Veritas Twin-screw Vise with a chain drive for many years and sheared off its mounting bolts a couple times and I had to fuss with its guts quite a bit.

The Lie-Nielsen chain-drive vise works (literally) like a Sherman tank. After a couple of years of using it, I have yet to encounter a single hiccup. It is the same mechanism as on the company's Moxon vise and leg vise. On the leg vise, the chain mechanism eliminates the parallel guide, similar to the Benchcrafted Crisscross.

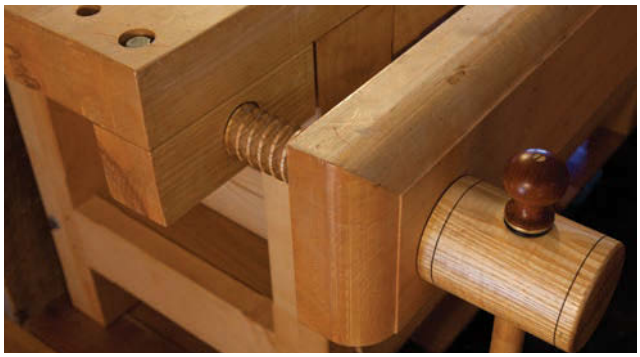
The latest bench accessory from Lie-Nielsen is its traditional holdfast. Made from ductile iron, the holdfast is flexible but indestructible. Thanks to its close manufacturing tolerances, it barely slides into a 3/4" hole in your bench. But that's a good thing – the holdfast works in thick benchtops quite well. Also a bonus, the Lie-Nielsen holdfast has a lower profile than the Gramercy, which can be an advantage when planing stock – you are less likely to slam into it with a tool.

The Hovarter Vise

Michigan engineer Len Hovarter has invented a versatile workbench mechanism that resembles magic. Instead of using a vise-screw mechanism – like a traditional vise – the Hovarter uses an ingenious clutch mechanism.

The result is that you have a quick-release vise that tightens by turning the vise's handle a short distance. This mechanism can be used in leg vises, twin-screws or even wagon vises. I've used them all at shows and at Kelly Mehler's School of Woodworking. They work brilliantly. Mehler likes his, though he says it needs occasional adjustment to work smoothly.

Hovarter Single Handle Face Vise. *This Hovarter twin-screw opens and closes with a push or a pull. And it locks by twisting the handle clockwise a bit. It's a remarkable piece of engineering.*



Big Wood Vise wooden screw. *Wooden screws are fast and strong, and they don't mark your work with grease. Plus, I think they look like sculpture.*

Lake Erie Toolworks tommy bar. *Caps on tommy bars tend to come off – no matter how many screws or nails you drive through them. Lake Erie has fixed this problem with a screwed-on cap.*

The hardware is beautifully made and looks especially good on a contemporary workbench. And the Hovarter is proof that there is still room for innovation in a centuries-old device.

Wooden Vise Screws

If you are true traditionalist (and welcome to the club), then you should investigate the companies that make wooden vise screws. These glorious triumphs of Archimedes work every bit as well as they did hundreds of years ago.

They are fast – usually faster than a metal-screw vise. The only thing faster is a quick-release mechanism. They don't require oil or grease for lubrication, which can mark your work. They look great. And they are strong.

As long as you don't allow a gorilla to use your bench, the screws are unlikely to ever crack. And if you do lose a few threads, you probably won't even notice the difference. I've used screws that looked like they shouldn't work, and they work just fine.

The wooden screw is a versatile mechanism. You can use it to make any sort of vise you can dream up. Yeah, they are a little expensive compared to metal screws, but I think their advantages are worth the difference.

Now there are three companies that make wooden vise screws: Big Wood Vise, Lake Erie Toolworks and Evans Wood Screw. All three small family companies make excellent products. I personally prefer the Lake Erie screw. Its fit and finish are tops, but that's not the sole reason I love it. The two ends of the tommy bar are threaded onto the bar. That sounds minor, but if you have built and used as many workbenches as me, then you know that this is a weak point of almost every vise design. The ends come off and the tommy bar falls to the floor. Lake Erie is the only company that has conquered this frustration.

How to Choose

I end up counseling a lot of woodworkers about choosing their workholding, so here are three final words of advice on picking out vises for your bench: Keep it simple.

With so many choices out there, some woodworkers opt to put a vise on every corner of their workbenches. This is an expensive and time-consuming compromise that I don't recommend (unless you have two people working at one workbench).

So try this: Pick out one tail vise and one face vise and install those on your workbench. Take your time and do it right. Don't call it done until every screw is rock solid and the vise moves as smooth as silk. Cover the jaws of your vises with leather to increase their grip. And then work with those two vises for a year before you buy any more vises or declare defeat with your current set.

After a year of work you'll know the strengths and weaknesses of your vises and be able to honestly compare them with other vises. But chances are you will forget to assess your vises because you'll be too busy building furniture at your bench, which was the goal in the first place. **PWM**

Christopher is the editor at Lost Art Press and the author of several books on woodworking, including "The Anarchist's Tool Chest."

SUPPLIES

Lee Valley Tools/Veritas
leevalley.com or 800-871-8158

Benchcrafted
benchcrafted.com

Tools for Working Wood/ Gramercy Tools
toolsforworkingwood.com or 800-426-4613

Lie-Nielsen Toolworks
lie-nielsen.com or 800-327-2520

Hovarter Custom Vise
hovartercustomvise.com or 810-545-6179

Big Wood Vise
bigwoodvise.com

Lake Erie Toolworks
lakeerietoolworks.com or 814-528-4337

Evans Wood Screw Co.
thetraditionalcarpenter.com or 317-560-3485

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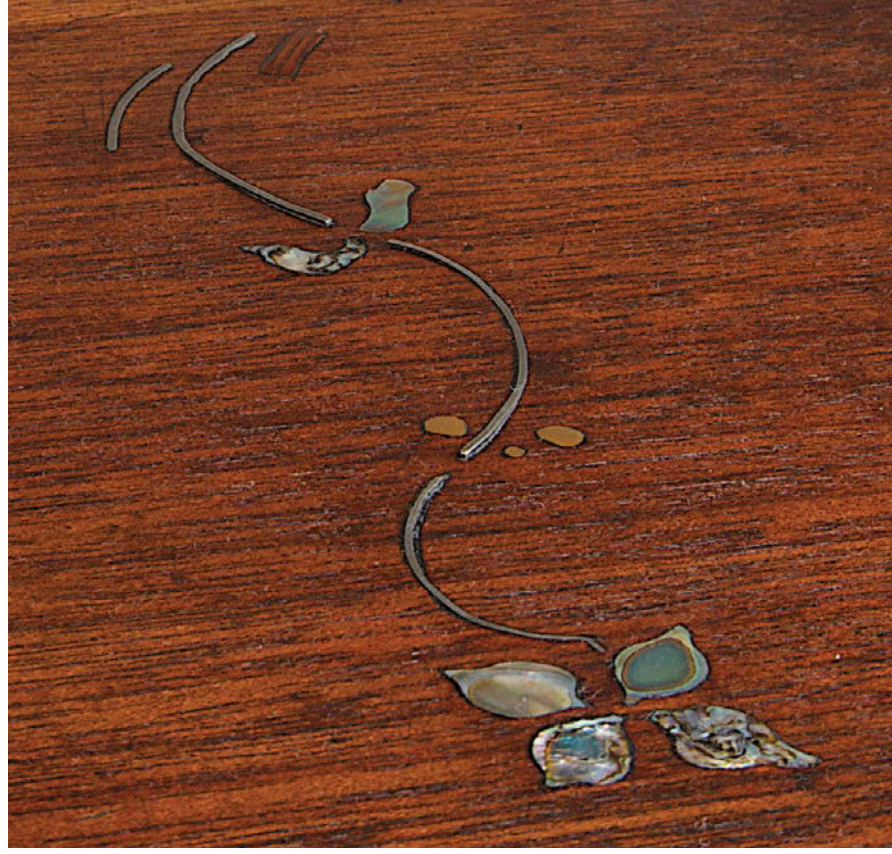

Blacker table inlay. *This simple flower motif is on the dining room table from the Blacker house.*

GREENE & GREENE INLAY

BY DAVID MATHIAS

Jewel-like details are the crowning touch on these masterpieces of American furniture.

Furniture designed by early 20th-century American architects Charles & Henry Greene is as rare as hen's teeth. The reason is simple: their pieces were never mass-produced or marketed. Every table, chair, bed and cabinet was designed to occupy a particular location in a particular house of the Greenes' design.

There is one—and only one—Gamble dining room table and it is, quite rightly, in the Gamble house dining room. You won't come across one in that out-of-the-way antiques shop where you hope to discover the rare underpriced gem that will put you on easy street. The days when one might encounter such a find, as in the infamous Blacker house yard sale six decades ago, are long gone.

In fact, Greene & Greene, together with John and Peter Hall and their team of craftsmen, designed and produced suites of furniture for a relatively small number of houses, approximately 10. In total, not many more than a few hundred pieces were created.

Numbers, of course, do not tell the whole tale, for that volume of work was concentrated within a brief period during which they also designed and oversaw construction of some of the most inspiring houses in the United States.

Nor can numbers relate the beauty and imagination evident in these pieces, beauty that has transcended a century and found many more admirers in the 21st century than the Greenes could have dreamed of early in the 20th.

The Greene & Greene design vocabulary is well recognized because it is quite distinctive. Cloudlifts, ebony pegs, finger joints and breadboard ends are all familiar to anyone with even a passing interest in their work. Combine this with the ability to marry disparate

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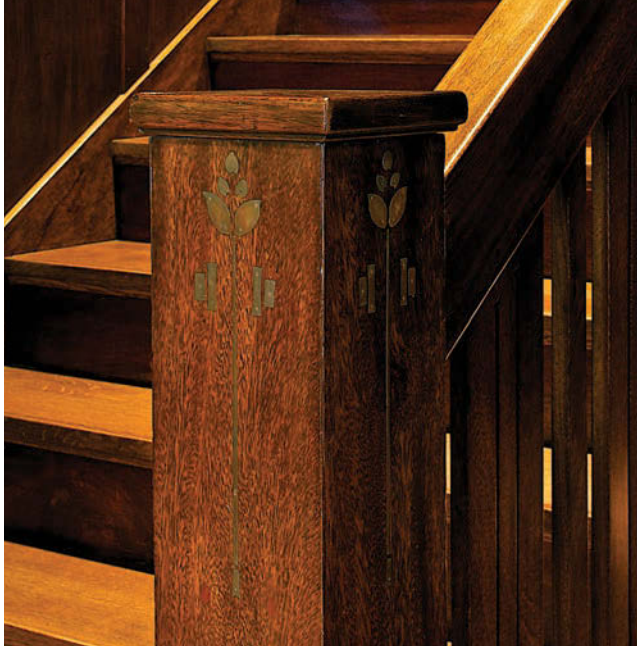
BLACKER TABLE INLAY PHOTO COURTESY OF THE DETROIT INSTITUTE OF ARTS



Libby newel post. *This newel post from the demolished Arthur Libby house demonstrates the decorative power of even a very simple inlay.*

Blacker bedroom desk. *This mahogany and ebony piece features inlay with fruitwood, mother-of-pearl, copper and silver (see below).*

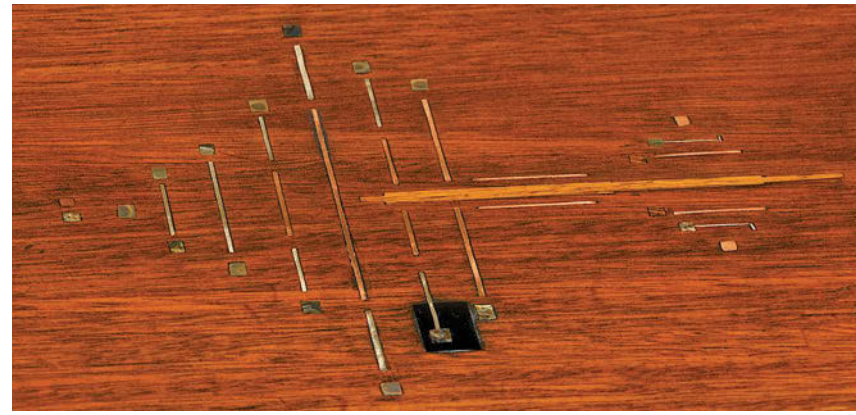
elements into an always-pleasing whole and with obsessive attention to even the smallest details, and it is little wonder that their furniture graces the collections of numerous American museums, including the Metropolitan Museum of Art in New York, Boston's Museum of Fine Arts and the Art Institute of Chicago.

Distinctive Details

In the context of their work as a whole, one form of detail stands out: the inlays that often grace tabletops, door panels and crest rails. While Greene & Greene inlays are distinct in some ways, they share at least one important attribute with other Arts & Crafts examples: they are inspired by and depict natural forms. This is also consistent with Japanese influences that were so significant to the Greenes' work.

Despite the common theme, Greene & Greene inlays are distinct from those by other Arts & Crafts designers. Consider the beautiful examples on pieces designed by Harvey Ellis for Gustav Stickley. Ellis's designs helped bring a new grace and delicateness to Stickley's offerings.

These inlays are typically highly stylized as are many other Arts & Crafts forms, such as the Dard Hunter rose. Inlays by Greene & Greene, on the other hand, are typically rather literal, certainly in comparison – though there are exceptions as we will see.



Desk detail. *The tree-of-life, as interpreted by Charles Greene, graces the circa 1908 Blacker bedroom writing desk.*

As with their furniture designs, the diversity displayed in the Greenes' inlays is impressive. While natural scenes stand as a unifying theme, techniques and materials vary greatly. From the simple inlay on a newel post from the Arthur Libby house to the incredible work of 3-dimensional art on the doors of the Gamble house living room letter box, the progression is stunning.

Most of their designs fall between these two in both time and complexity. Materials range from common metals and woods to precious metals, semi-precious stones and exotic woods. Greene & Greene inlays serve to enhance rather than overpower the furniture.

Greene & Greene are best known for their mature style. While head-over-heels devotees may know their earlier work, most people are familiar with the Blacker and Gamble houses and the furniture produced for them. The Greenes' best-known inlays are from these houses.

Not surprisingly, their inlay output was rich and varied. Some are rather classic, straightforward Arts & Crafts. A few can be categorized as stylized. Many of those in their later pieces could stand alone as works of art. By examining a variety of pieces, we can trace the creative arc traveled by the Greenes.

Off to a Good Start

In 1905, Greene & Greene designed a grand house for Dr. Arthur Libby. The few extant photos show an impressive structure that presaged features that would later form the foundation of their architectural vocabulary. Unfortunate-

LIBBY NEWEL POST PHOTO COURTESY OF THE HUNTINGTON LIBRARY, ART COLLECTIONS AND BOTANICAL GARDENS; BLACKER BEDROOM DESK & DETAIL PHOTOS COURTESY OF THE SAINT LOUIS ART MUSEUM, FRIENDS ENDOWMENT, THE MARJORIE WYMAN ENDOWMENT FUND, THE JOSEPH H. & ELIZABETH E. BASCOM TRUST, THE RICHARD BRUMBAUGH TRUST IN MEMORY OF RICHARD IRVING BRUMBAUGH & GRACE LISCHER BRUMBAUGH, FUNDS GIVEN BY AN ANONYMOUS DONOR & THE ALLEN P. AND JOSEPHINE B. GREEN FOUNDATION. 60:2001.

ly, photos are almost all that exist of the house; in 1968 it was demolished in the name of "progress." (Unfortunately, space doesn't permit a full examination of my thoughts on that topic.) A staircase from the house survives and is on display at the Huntington Library, Art Collections and Botanical Garden in San Marino, Calif.

The newel post of the Libby staircase includes an early Greene & Greene inlay that is simple yet wonderfully decorative (far left). Depicting a long-stemmed flower, the inlay consists of brass plates set into the wood and visibly pinned. One of the simplest inlays designed by the firm, and not yet bearing their signature style, this element is nonetheless consistent with the Greenes' holistic approach and attention to detail. Simple though it is, it significantly enhances the naturally beautiful wood of the post.

Another inlay design in keeping with the typical Arts & Crafts forms – abstracts inspired by nature – is found in the Blacker house. Though furniture designed for the Blacker house is among the Greenes' best, the inlays in that furniture are rather simple. This does not, however, preclude the depth of meaning and attention to detail that one expects from the Greenes.

In the owner's bedroom, the inlays depict, in stylized form, the tree-of-life (left). This theme, symbolic of the interconnectedness of all life forms, is consistent with Charles Greene's interest in Eastern philosophies, an interest he indulged later in life. The abstract design (circa 1908), implemented in copper, silver, mother-of-pearl and fruitwoods, appears on many pieces in the room; in some cases the tree trunk is several feet long, in others merely inches.

Beyond Wood

As the Blacker inlays illustrate, Greene & Greene used many materials beyond a wide variety of woods. In addition to copper, silver and mother-of-pearl, they used semi-precious stones and brass.

The effect created by some of these unexpected combinations of materials is both surprising and pleasing. One of the most beautiful and inventive inlays the Greenes created is found in the Gamble house. As the only Greene & Greene house regularly open to

Chiffonier detail. *The inlay on the chiffonier (right) is bold, creative and entirely in keeping with the main themes in the Gamble house.*

Gamble chiffonier. *Arts & Crafts and Asian influences are on display in the chiffonier from the Gamble house master bedroom (below). It is among the Greenes' most accomplished pieces.*

Bed detail. *Tsuba forms on the beds in David and Mary Gamble's bedroom perforate the footboards and headboards to create a wonderful detail. The implementation is, of course, flawless.*

GAMBLE CHIFFONIER, CHIFFONIER DETAIL & BED DETAIL PHOTOS COURTESY OF THE GAMBLE HOUSE, USC.

Gamble silver inlay. *It is not unusual for Greene & Greene houses to have themes limited to a single room. This silver inlay is unique to the Gamble house guest bedroom.*

the public, the Gamble house is the brothers' best-known work and one of the most magnificent. Visitors to the Gamble house are treated to a rare commodity: context. The house and furniture appear today largely as they did a century ago.

In David and Mary Gamble's bedroom, one finds an impressive suite of furniture consisting of twin beds, a night table, dresser, writing desk, rocking chairs, the famous chiffonier (page 43) and several other pieces. The primary wood is black walnut that now exhibits a beautiful golden-brown tone.

Inlays in this room share a common design. The subject matter is drawn from nature – wildflowers. The stems, foliage and buds are rendered in wood, as one would expect. In contrast, the blooms are semi-precious stones with wonderful hues of blue, green and off-white. Buds are punctuated with small semi-precious stones, giving just enough color to hint at the flower within.

Shape From the East

The most unusual aspect of these pieces are the ebony tsuba forms that appear, seemingly at random, in the inlays. The tsuba, a guard between the hilt and blade on ancient Japanese swords, is a recurring theme in the Gamble house. It lends its shape to, among other things, the dining room table, art glass elements, lighting fixtures, ebony pegs in a living room library table and switchplates throughout the house.

In the bedroom furniture, the form is familiar but unexpected. In this room, the tsuba elements are outlines of ebony, each affixed with 12 brass pins. The area within the tsuba forms in the headboards and footboards of the beds are cutouts, providing another unexpected detail (page 43).

In most Greene & Greene houses, individual rooms have a unique set of details. In the guest room of the Gamble house, silver is brought to life in forms depicting, once again, wildflowers (top, left). The spidery silver lines are accented with blooms of vermilion and ebony, and tiny leaves of silver.

The effect is surprisingly realistic, aided by variability in the width of the silver which lends a natural feel. Variations of this theme appear on sconces, chairs, a mirror and, most significantly, the letter box atop the room's writing desk. The motif also appears in the custom-made nickel-plated brass beds for the room.

Some Greene & Greene inlays are more realistic, as in the living room table (circa 1910) from the William

Thorsen table*. This table from the Thorsen house living room demonstrates the lightness of Greene & Greene designs relative to the furniture from many other Arts & Crafts designers.*

Table detail*. On the original drawing for this inlay from the Thorsen house living room table, Charles Greene called out the species of wood for every piece.*

GAMBLE SILVER INLAY, THORSEN TABLE & THORSEN TABLE DETAIL PHOTOS COURTESY OF THE GAMBLE HOUSE, USC.

***Gamble desk**. Completed circa 1914, which was well after other furniture for the Gamble house was made, the living room desk (above) demonstrates the dramatic increase of sophistication in Greene & Greene inlays.*

***Letter box Detail**. The inlaid panel (below), one of three on the Gamble living room letter box that sits atop the desk (at left), is an amazing accomplishment of both design and implementation.*

Thorsen house. The inlays in the form of long-stem roses, are quite lifelike (bottom left). The thorns appear ready to draw blood. Veins in the leaves are inlaid ebony, a remarkable achievement given their delicate dimensions and the brittle nature of the material.

Shading on the leaves is achieved by singeing the wood in hot sand, adding to the 3-dimensional quality. Flower petals are of vermilion – heartwood for darker petals and sapwood for lighter. The stems are primarily of koa, and the overall effect is quite spectacular.

Inlay You Can Feel

Most Greene & Greene inlays are in fact 3-dimensional. The inlaid elements stand proud of the field in which they are placed. These inlays convey a realism that would be otherwise impossible. Another benefit is a tactile quality that further summons fingers to surfaces that already beg to be touched due to the silky finish.

Such extraordinary results can arise only from a synergistic relationship between designer and craftsman. The craftsman needs the inspired design from which to begin, while the designer must rely on the skill and intuition of the craftsman. Clearly, both elements were present in the collaboration between the Greenes and those in the workshop of the Halls.

Not only did Charles Greene sketch the inlay for the Thorsen table, he specified the species of wood for each element. Even so, the success of the final result was largely dependent on decisions and execution at the bench by the craftsman. Inlays of this type are brought to life by appropriate stock selection and shaping. The best design cannot succeed except via these skills.

Another exceptional example of the designer/craftsman relationship appears in the living-room desk and letter box made for the Gamble House in 1914 that invokes one of Charles Greene's favorite motifs, birds in flight.

The inlays seemingly come to life due to extreme care in selecting stock that is sensitive to the intended effect. This is evident in the tree trunk that crashes through the 2-dimensional barrier to draw the viewer into the scene. The swirling grain of the background is also an important element – straight grain would have provided a less natural appearance. It is worth noting that these pieces were designed well after the other furniture for the house.

In the intervening years, Charles further developed, perhaps perfected, his inlay designs. In fact, this work bears a stronger resemblance to the inlay designs for the furniture for the Charles M. Pratt house than to any other pieces for the Gambles. The furniture for the Pratt house was built a few years after the completion of the Gamble house furniture. **PWM**

David is the author of "Greene & Greene Furniture: Poems of Wood & Light." His latest venture, photography of the Swiss Alps, can be viewed at his web site: thealps.wood-and-light.com/en.

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GAMBLE DESK & DETAIL PHOTOS COURTESY OF THE GAMBLE HOUSE, USC.

Cove Cuts on the Table Saw

BY GARY ROGOWSKI

Accurately set up for and safely make these versatile curved shapes.

It was the 1970s. I was a young, lost woodworker out cruising the West Coast in search of inspiration, mentors, cool old tools and furniture to study. I found legendary furniture maker Art Carpenter at his studio in Bolinas, Calif. He showed me two things. One was the first and loudest router table I ever saw: a router hanging under a piece of plywood perched atop a 55-gallon drum. He also showed me how to cut coves on the table saw. What the heck was this? Curved shapes cut on a table saw? I was mesmerized by this bit of woodworking wizardry.

Most people think of the table saw as a machine capable of cutting only in a straight line. Shove miles of wood through it to rip lumber to width, break down sheets of plywood, crosscut boards to length or make the occasional miter or angled cut. Noisy, loud, brutish. What is amazing to discover is that the saw can also make curved shapes if you know how to approach it.

Blade Geometry

Let's consider blade geometry first. You make a normal rip cut on the saw with the stock pushed straight into the blade. You cut a groove on the table saw with the grain but not through the full thickness of a board. Now imagine coming at the saw blade not straight on as usual, but at an angle with

Table saw coves. *The table saw can make coved shapes in endless sizes and varieties. It can even make parabolic shapes when the blade is tilted and an auxiliary fence is set at an angle to the blade.*

FINDING & MARKING OUT THE ANGLE

Open arms. *Use the parallel arms to set the width of the cove cut. After setting the blade height to the final depth of cut, use a 6" rule to set the arms to the desired width of the cove.*

Mark the angle. *The correct cove angle is achieved when the long sides of the parallel arms touch both the front and back of the saw blade. Mark that angle on the throat plate for reference.*

the blade set just barely sticking out of the table. If you can, imagine coming in at 90° to the blade. Keep imagining that, after raising the blade in a series of passes that take small cuts, you'll finish with the blade raised to its full height. A frightening thought, really – and one you shouldn't try.

But if you could make this cut, you would produce a profile that matched the arc of the blade projecting above the saw table. Well, back off this 90° angle and imagine your wood approaching the blade running against an auxiliary fence. You'll make a series of passes with the stock and raise the blade ever so slightly each time. This is how you make a cove cut. The shape you get depends entirely upon the angle that you set your auxiliary fence to the blade and the angle or tilt of the blade itself.

Set up the Cove Cut

Your first task is like many woodworking jobs; you can't move forward until you make a jig. This one, made from scrap wood, is simple to build. Make up a set of adjustable parallel arms that open to a width of about 6". The width you set with these parallel arms helps you find the correct feed angle to the blade. I make my parallel arms from two straight ½"-square sticks about 16" long. These are fastened to two 6" arms. The arms must open and close easily and remain parallel when adjusted.

Next, determine the width and the depth of the cove you want to make. Open your parallel arms to this width and raise the blade to your final height. Now use the parallel arms to set the width of the cove cut. Place the parallel arms on the table straddling the blade. Rotate the blade slowly, with the saw unplugged of course, and set one arm close to the tooth coming from below the table at the rear of the blade. It should just nick the rear arm. Then rotate the blade and move the parallel arms until a tooth at the front of the blade diving down into the table just touches the front arm.

During this setup procedure, make sure the arms stay locked-in at the desired width. Use a pencil to mark out the angle of the parallel arms on the throat insert or just onto the saw table. This is the correct angle to set your fence for the cove you want to cut.

Cove-cutting Fence

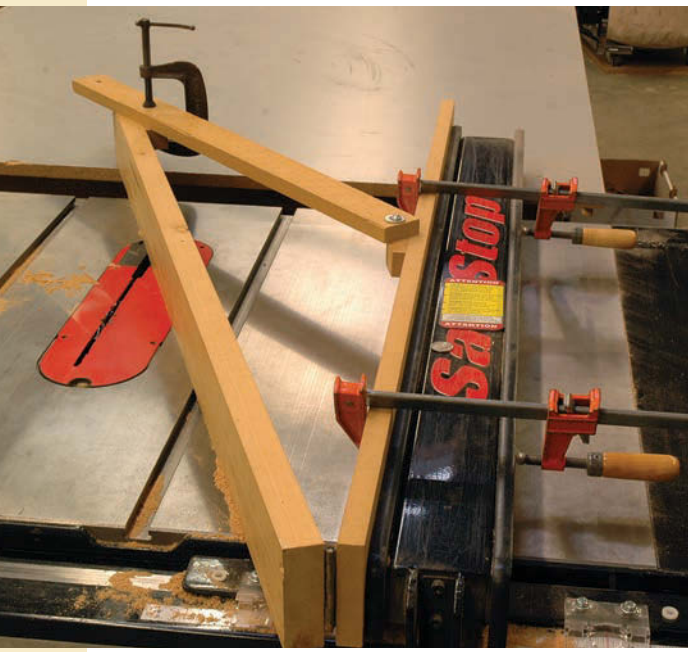
Most folks clamp a long board at the angle they want across the top of the table saw to use as a fence for their cove cuts. But you can have trouble clamping to some saw tables because of the casting ribs below the table surface. Plus, when you need to make multiple cove cuts side-by-side, it's hard to guarantee they'll be parallel. I once needed to do this for the custom table shown below. It features cove cuts every 2" across the

Multiple coves. *My table design calls for multiple 2"-wide coves equally spaced across the width of the end panels.*

PHOTOS BY THE AUTHOR

ADJUSTABLE COVING FENCE

My simple but effective coving fence has one adjustable arm hinged to another arm. These arms function like some tapering jigs except that the arms open away from instead of toward you. A stick screwed into the fixed arm can be clamped to the other arm to lock the angle in place. I find my cove cut angle, mark it on the saw table insert, adjust my coving fence, lock it in place with a spacer screwed or clamped on, then clamp the whole assembly to my regular table saw fence. This coving fence is usable for all the cove cuts I have ever wanted. —GR



full width of the table's end panels. To solve the problem I made an adjustable cove-cutting fence or jig (see above). I made each cove cut then repositioned the table saw fence for the next cove. My angle remained constant for each cut.

Simple Cove Cuts

There are some important things to pay attention to when making cove cuts. Use a flat-top-grind blade if you have one, because it will result in finer saw marks. Have push sticks at the ready for all your cuts. To make the series of cuts, push the stock along the fence and into the blade.

Start with a tiny cut – about 1/32" deep – to get the feel of it. Depending on your saw and the depth of your final cove, you may find your cut off center. On some newer table saws the blade rises straight up through the table. If your saw works like this and your initial cut isn't where you want it, make an adjustment to your fence position. If your saw blade rotates forward as it is raised, you'll have to rely on your initial setup unless it looks wildly off. After your first pass, raise the blade another 1/32". Continue making these small adjustments and taking passes until you reach the desired depth of cove.

Keep in mind that you build up a lot of heat with the sawdust that gets trapped in the cove and you put a lot of stress on the blade by coming at it sideways, so take your time. Also, by slowing the feed rate your cut will be smoother. Do yourself a favor and go slow; otherwise, you'll cause yourself extra work later to clean up the saw marks.

> "The three hardest things to make in your shop are time, space and money."
>
> — *Buz Buskirk*
> *from Oldtools listserv, August 2007*

CLEAN UP

Round bottoms. *This round-bottomed plane has a high blade angle, so it can work in any direction to clean up saw marks. Because of its scraping cut, there is less danger of tear-out.*

Remove Saw Marks

This is the juncture of this marvelous exercise in geometry and ingenuity where all the cleverness comes crashing back to reality: cleanup. The saw marks left behind are onerous and many. There is a ton of work to do in removing them and there's no sander I know of that can do it with the precision to match the profile you just produced with your cuts.

If you have the time to make a dedicated handplane, that's the best choice. I would make one with a high-angle blade to use like a scraping plane, much like a violin bow maker uses. This high-angle round-bottomed plane cleans up coving marks working in any direction. Because of its scraping cut, there is less danger of tear-out.

If you don't have a round-bottomed plane, you have two other options. One is to take out that goose-necked scraper you never use and sharpen it. The process is the same as sharpening a straight-edged scraper except that you're constantly working around the tool's curved edges. Polish the faces, file the edges by holding the scraper against a file held in a vise, then turn over a burr with a burnisher.

Good for the goose. *A properly sharpened goose-neck scraper can effectively remove the many pesky saw marks left behind from the table saw blade. The shape of the scraper provides many curved shapes to fit the cove you're cleaning up.*

Sand if you must. *You can easily make a custom sanding block from thick insulating foam. The shape is made by fitting coarse sandpaper face-up in your cove, then rubbing the foam over it until it conforms to the curve. Then use the foam as you would any sanding block.*

Work the scraper both with and across the grain to remove the saw marks. You'll start to generate some heat while scraping; use the whole edge of the tool so you don't burn your fingers.

The second option is hand-sanding. The best approach is to make a curved sanding pad from thick, rigid foam insulation. Place a piece of #60- or #80-grit sandpaper down in the cove and run your insulation against it until you create the cove shape. Then wrap your sandpaper around that pad and go to work. How hard the chore is depends on the hardness of your wood, the amount that you have to sand and your supply of elbow grease. Clean up your coarse sanding marks with progressively finer grits up to #220. Lastly, raise the grain with a damp cloth then clean up the resulting fuzz with another light sanding of #220 grit. Don't skip this step – it's worth it.

Compound Cove Cuts

We have just started to unlock the possibilities of the cove cut. Consider what happens when you change the blade angle from 0° and come at your workpiece from an angle of 5° to 10°. Then, you'll no longer have cuts that are close to the arc of a circle. With changes in the blade angle, you'll get cuts are more parabolic in shape and produce some surprising results.

The other interesting thing to consider is how the blade makes these cuts – two cuts are actually being made. First you cut the shape on the front of the blade, and as you move through the cut, the back of the blade makes a second cut. This technique produces a little ridge (that you'll want to sand down) near the middle of the resulting cove.

A cove can be used on drawer fronts, cabinet panels or table parts. You can make drawer pulls with a cove shape in them or create a variety of interesting mouldings. It's geometry and woodworking and it's fascinating. Give it a try, and expand the usefulness of your table saw. **PWM**

Gary is a furniture maker, teacher and author of numerous woodworking books and magazine articles. He also operates the Northwest Woodworking Studio, a school for woodworkers, in Portland, Ore. (NorthwestWoodworking.com).

No matter what shape. *Here are just a few examples of cove cuts made on the table saw. The two top left-most pieces were cut using an angled fence and the saw blade tilted off 90°.*

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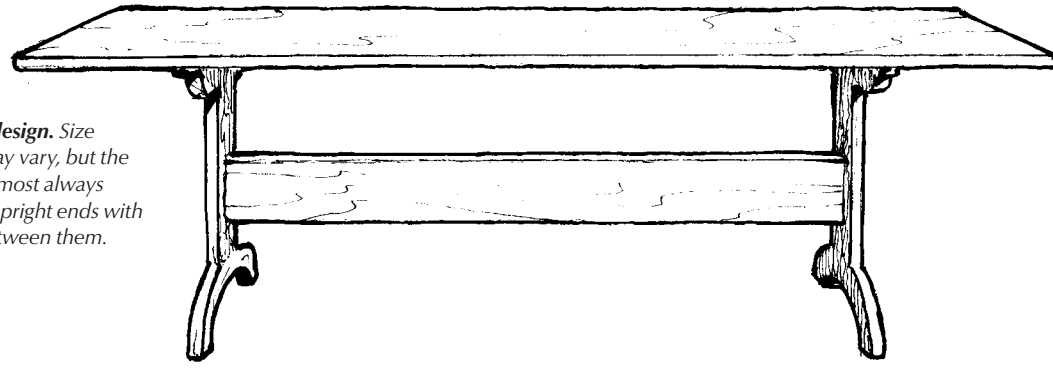


Basic trestle design. *Size and details may vary, but the trestle form almost always features two upright ends with a stretcher between them.*

Design a Trestle Table

BY GRAHAM BLACKBURN

Choose your own styles and techniques: simple, advanced, or somewhere in-between.

In furniture, the term "trestle" historically referred to a pair of diverging legs wide enough to be self-supporting, and joined at their upper end, sometimes by hinges. Two or more such trestles that support a wide board form a table, which can be easily folded up and moved.

The trestle table has a long history. Six hundred years ago in Europe, when only the rich had valuable furniture and carried it around with them from one castle to the next, portability was of prime importance. Large and relatively immobile tables would have been out of the question. Times may be more secure now, but given the rate at which many people change addresses, an easily disassembled and transported table remains an idea whose day is far from over.

Today, however, the term "trestle table" usually implies something more sophisticated than the original design, and most commonly describes a table that is supported not by a pair of trestles, nor by the usual arrangement of four corner legs, but by two pieces connected by a horizontal beam or stretcher, often secured in place by wedged mortises. That base assembly supports the actual tabletop.

In this article I discuss two different trestle table designs – one small and very basic; the other large and more advanced. The first could serve well as a side or entry table. The larger would make a fitting dining table or, if outfitted with drawers, a desk. As you design and build your own, feel free to mix and match the two to design a table that suits your needs.

TOP PHOTO & ILLUSTRATIONS BY THE AUTHOR; BOTTOM PHOTO BY WOODY PACKARD

"Great things are not done by impulse, but a series of small things brought together."

—Vincent Van Gogh (1853-1890), Dutch post-Impressionist painter

BASIC TRESTLE SIDE TABLE

Build a Basic Trestle Table

The trestle table form is adaptable for tables from small to large. All that is really necessary are two uprights, a stretcher and a tabletop. The uprights must, of course, be tall enough to support the tabletop at the required height, broad enough at the base to provide sufficient stability for the size desired and wide enough at the top to provide adequate connection for the tabletop.

If you wish to preserve the knock-down function of a true trestle table, the stretcher connecting the two supports should be removable, but fixed stretchers such as described in this first example are by no means uncommon.

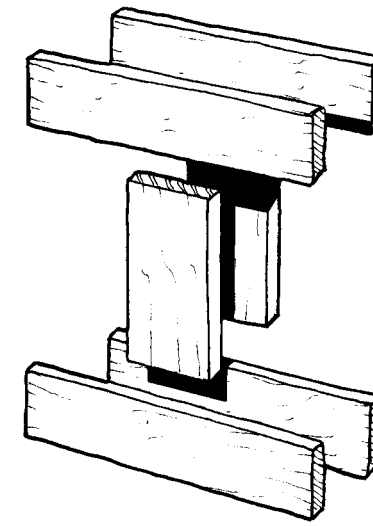
Build From the Top Down

This top can be made from a single board or from several pieces glued together with edge joints. The gently curved ends of the top shown above at right echo the curved shape of the foot part of the uprights. Because the material used for this table is 1¼" thick, the lower edge of the top has been beveled to leave a ¾"-thick face all around in order to lighten the look.

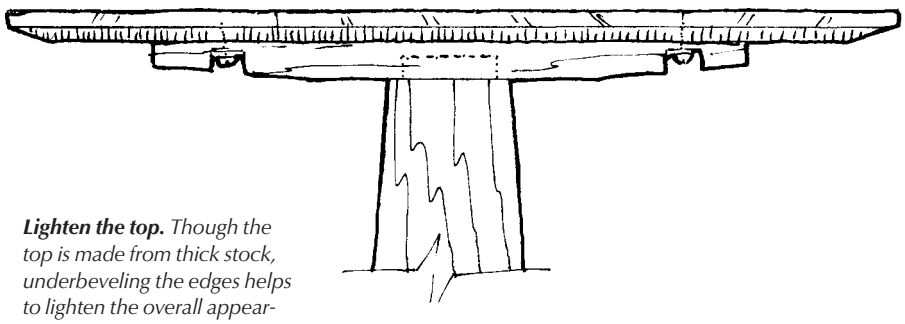
The uprights consist of three parts. The central part is gently tapered toward the top, where it is tenoned into a 1½"-wide piece cut a little shorter than the width of the top. The bottom end of the upright is similarly tenoned into a curved foot piece, which is also a little narrower than the width of the top.

Join the two uprights with a stretcher that has a tenon cut at each end. This will be sturdier if the joint is a through-mortise-and-tenon, with wedges driven from the outside of the uprights.

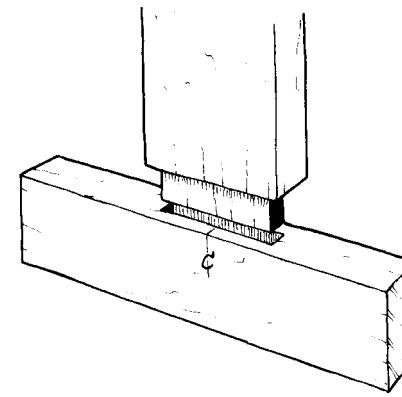
On any table it is important to attach the top so that it will remain flat while allowing it to shrink or expand across its width with any changes in ambient moisture content – otherwise, checks and cracks will surely result. All that is needed with this simple design are screws secured through slots cut at each end of both top crossmembers and into the underside of the tabletop (as shown in the illustration below).



Start simple. *Though you may shape them to your liking, the basic from of the "trestle" is nothing more that three boards joined together.*

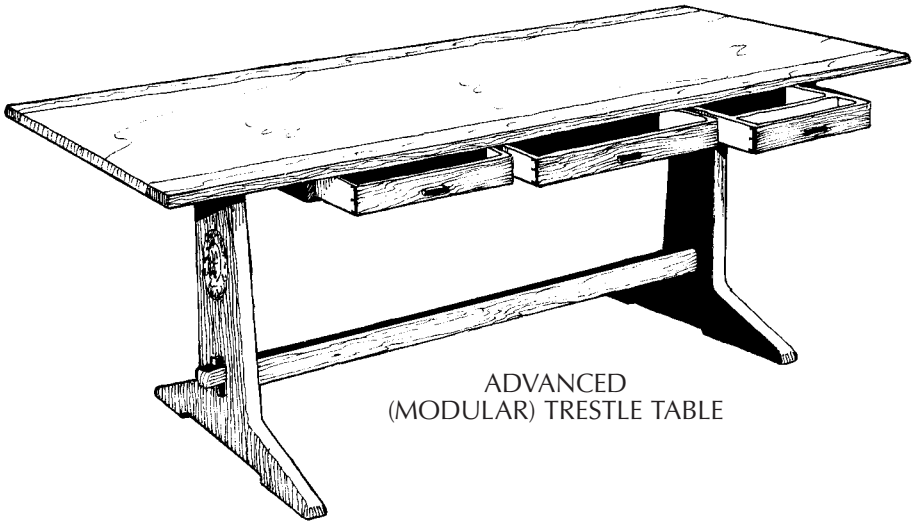


Lighten the top. *Though the top is made from thick stock, underbeveling the edges helps to lighten the overall appearance of the table.*



Build a strong joint. *It is easiest to cut the mortise-and-tenon joinery on the ends while the stock is rectilinear.*

Build a More Advanced Model



ADVANCED
(MODULAR) TRESTLE TABLE

Trestle tables may be thought of as modular, and as such may be built with differently sized parts to fit different areas. The same trestle may be used to support tops of different sizes, and parts of the trestle may be built to different measurements depending on your needs.

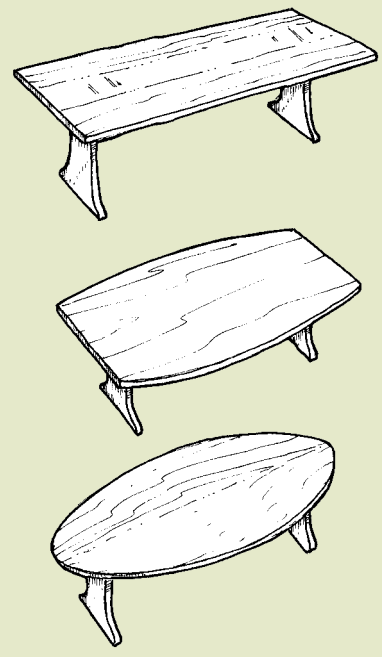
A table is, of course, subject to certain functional limitations: The top should be around 29"-30" high if it is to be used for dining or writing, and a few inches lower if a keyboard is to be accommodated.

Any construction attached to the underside of the top should allow sufficient knee room for someone sitting on an average 18"-high chair, which means a lower limit of around 24". And the width of the top, if intended as a dining table for facing diners, should be at least 30" wide.

START WITH THE TOP

In lieu of other givens and requirements, the top is a good place to start your design because it is the most visible. It is also the part most easily varied. A straight-sided top can have advantages if the piece is to be placed against a wall, but there is no reason why some other shape might not be used.

To give the top a fatter look, finish the edges with an upward-facing bevel. If, on the other hand, the top looks too thick, a downward-facing bevel will achieve the opposite effect, making it appear thinner. If the top is just right, consider other edge treatments, from perfectly square to rounded over or moulded into quarter-rounds, thumbnails or ogees. —GB



A shapely top. *Size and materials may obviously vary, but choosing a particular shape for the top is another easy way to give the table a different look.*

Assemble the Trestle

The rest of the table consists of two ends, a stretcher held in the ends by removable wedges and an additional substructure framework connecting the tops of the two ends. This is a shallow framework holding three drawers. The drawers may be omitted, but the basic framework of the substructure is the key to the table's integrity and rigidity when assembled.

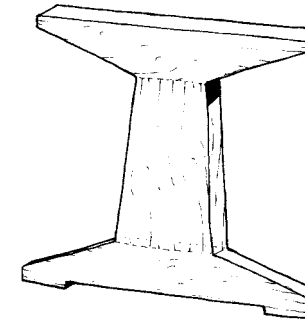
Make the ends first. Each end consists of three pieces: a top horizontal piece, a bottom horizontal piece and a vertical piece. The idea is to make the top piece a couple of inches or so shorter than the width of the top, thereby providing the support necessary to keep the top flat. The bottom piece should be an inch or so wider than the top crossmember to preserve the proportions of the ends and guarantee stability.

Prepare the joints for the end pieces, and after a dry assembly of both ends, trace the finished shape from a template made of cardboard, Masonite or paper to produce the required profile.

Cut the traced outline with bowsaw or band saw, and smooth the resultant curves with files and spokeshaves, rounding all arrises except those that will abut the underside of the top.

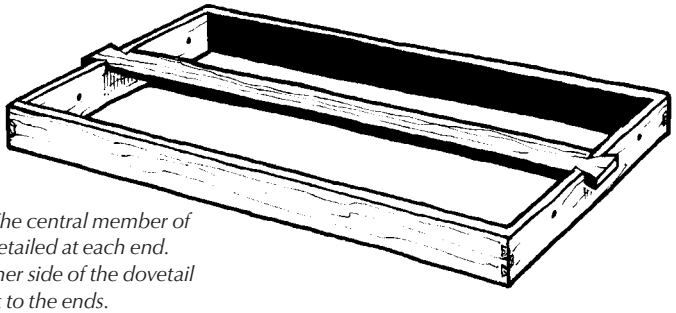
A Stretcher Spans the Trestle

The lower stretcher is a single piece, with a long tenon on both ends that fits

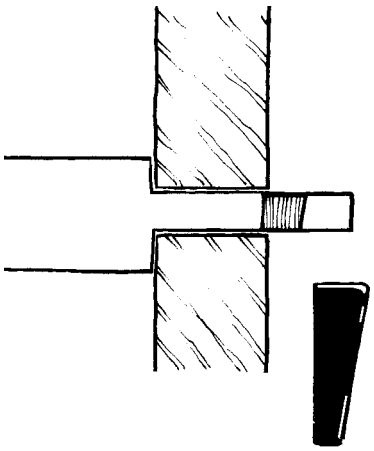


Shape the ends. *Make a single template from a stiff material such as Masonite and use it to cut the trestle ends to identical shapes.*

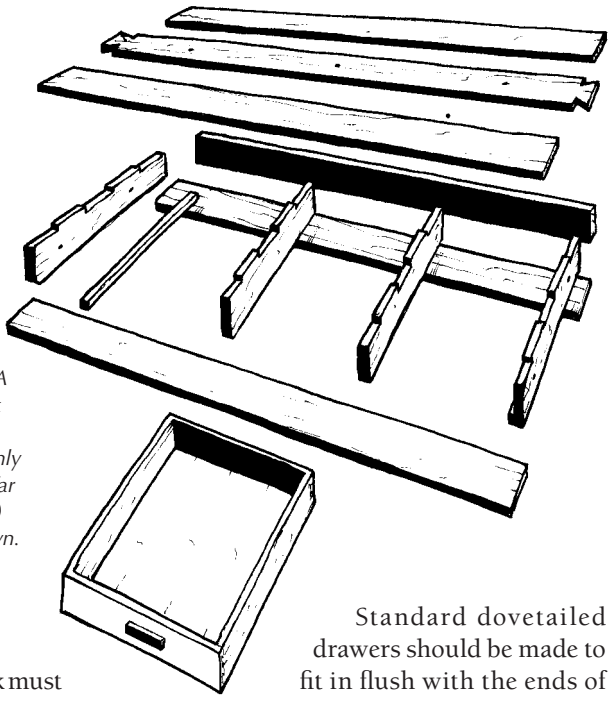
Span the gap. *A single stretcher runs between the two trestle ends and is locked into place using tusk tenons.*



Solid substructure. *The central member of the framework is dovetailed at each end. Screws placed on either side of the dovetail attach the framework to the ends.*



Wedge the stretcher. *The tenoned stretcher runs all the way through the trestle ends and is mortised to accept an angled wedge. Note that the inside edge of the wedge mortise is inside the outside face of the end. The joint tightens as the wedge is tapped into place.*



Simple drawer framework. *A solid substructure can be left open on one or both sides to house drawers. For clarity, only two runners (unattached at far left, and attached at far right) and a single drawer are shown.*

through mortises in the end pieces. After assembly of the stretcher and ends, mark the location of the wedge mortises on the stretcher's tenons.

A few tips are worth bearing in mind. First, the location of the stretcher must be carefully considered. If it is too low, it is liable to get in the way of your feet when sitting at the table; too high, and it will be uncomfortable to rest your feet on. The lower the stretcher, the greater stability it provides – but make sure the stretcher doesn't interfere with the joints that connect the upright and bottom parts of the ends.

The inner edge of the wedge mortise (the flat face) must be slightly behind the outer face of the trestle. Once the wedge is driven, this creates a clamping effect that holds the stretcher firmly in place to the ends, even if the wood should shrink.

The Substructure Framework

When the lower part of the trestle assembly is complete, make the top part (the substructure) to match. The overall length of this framework must equal the distance between the tenon shoulders on the stretcher. The framework is shallow, no more than 3" deep, and narrower than the width of the top.

In addition to being fixed through slot-screw mortises in the upper parts of the end pieces, the tabletop is also secured by three screws inserted up through the central member. This has the advantage of ensuring that the substructure cannot sag should it be fitted with heavily loaded drawers.

The illustrated version has three drawers that fit flush with the front of the framework. These are carefully made to slide on small runners fixed to the sides of the four main front-to-back members of the substructure. At the back of the framework, fix a single piece to cover the backs of the drawer compartments. When viewed from the backside, the table will appear to have a normal skirt.

Standard dovetailed drawers should be made to fit in flush with the ends of the crossmembers, to which runners of $1/2$"-square maple or some other hardwood should be fitted, flush with their bottom edges. **PWM**

Graham is the author and illustrator of numerous books of fiction, furnituremaking and general woodworking; visit blackburnbooks.com for more information. Graham writes in the south of France, dances in Buenos Aires and maintains a shop in Woodstock, N.Y.

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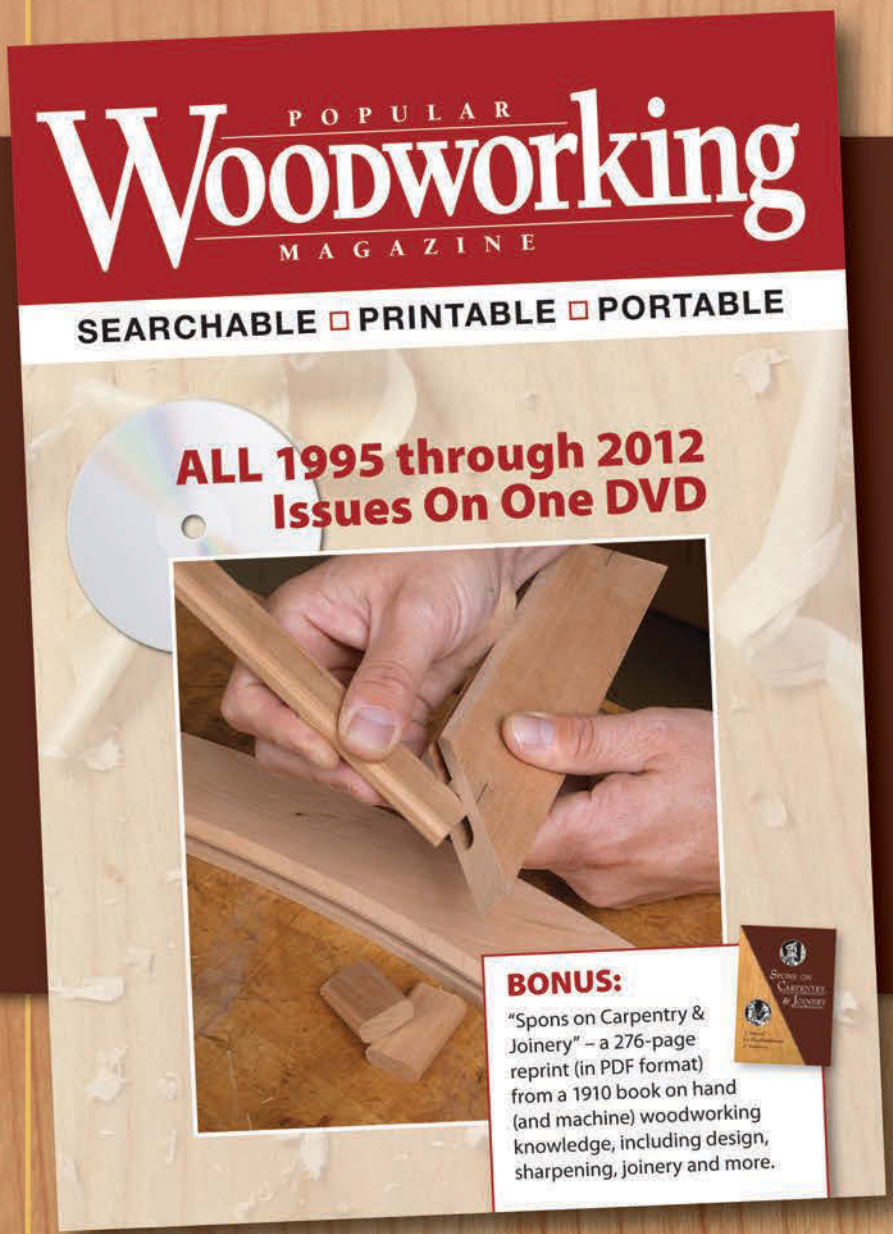

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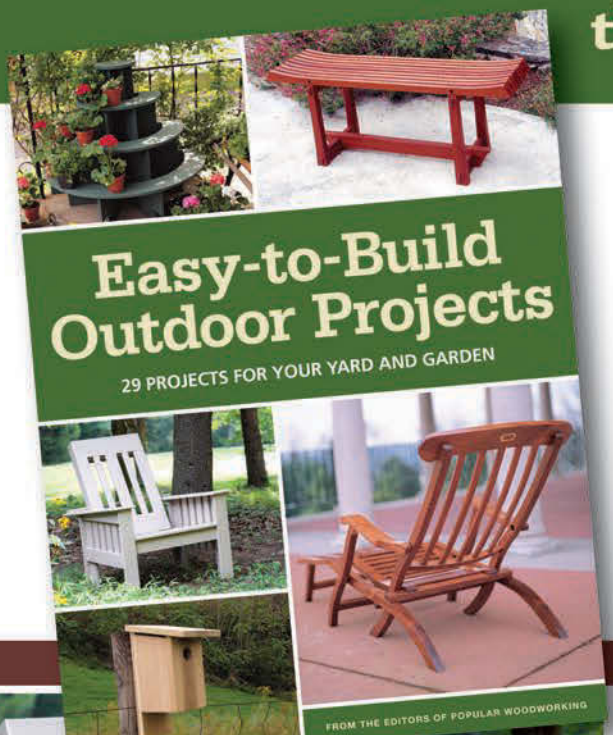

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Measure, Mark & Lay Out

Double-check your tools, your technique and your thinking.

Firm foundation. *A successful project begins with accurate measurement and layout work. These tasks require good tools along with the practice and development of skills.*

One of the most important skills in woodworking is rarely discussed or considered as a thing that needs to be learned or practiced. The basic skills of measuring and its close cousin, layout, are essential to produce quality work. As a bonus, mastery of these basics reduces frustration during the building process.

But things aren't always what they appear to be – measuring is a risky business. To be successful, you need to know what can be trusted and what is likely to lead you astray. Any measurement is only an approximation; no matter how precise you think you are, someone can come along with a better device and a finer unit.

Measuring in fine increments has diminishing returns when it comes to making things, and there are swampy areas on the road to precision that can make fitting one part to another more difficult. The goal in woodworking is to have pieces that fit each other and look nice when finished. That goal may or may not require hitting every desired dimension exactly.

The difference between a tenon that fits nicely and one that rattles around in the mortise is quite small, whether you refer to that difference by a decimal point followed by a few zeros, or as a "smidgen." Instead of declaring one method or another as absolutely right, let's look at where and how things can go horribly wrong – and how to keep on the right track.

Don't Agree to Disagree

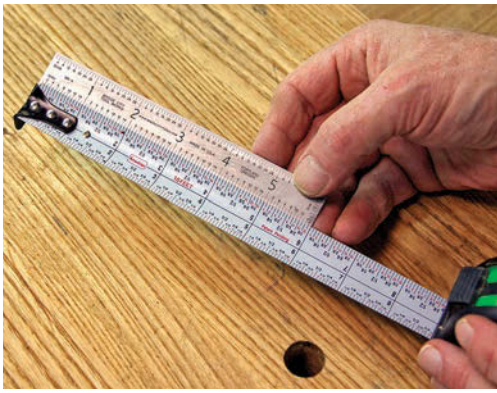
An easy way to get in trouble is to assume that a piece of wood is square, straight or the correct dimension. It doesn't matter if it's a piece of 1x purchased S4S, or a piece that you milled from rough lumber. You need to prove things, but you also need to prove that the tools you use are accurate.

The common suggestion is to use one measuring device throughout a project – but if one device was suitable for all measurements, there would be no need for small precision rules, calipers or folding rules. Different tasks demand different tools. The better approach is to check all of your measuring tools for consistency and get rid of the ones that disagree (see picture below). If you measure twice with the same tool and method, the odds are you'll repeat a mistake instead of catching it.

Proving a square is simple; all you need is a straightedge and a sharp pencil. Draw a line against your square, then flip the square over and draw another line. If the lines coincide or are parallel, all is right with the world. If there is a gap at either end of the two lines, the distance between the lines is twice the actual error.

Take a Good Look

After you eliminate the risk of an inaccurate tool leading you astray, make sure that your own vision won't do you in. You may need to add some light to your work area, and you may need some



Match is a must. *Compare your measuring tools, and get rid of any that don't agree with one another. Establish a standard and stick with it.*

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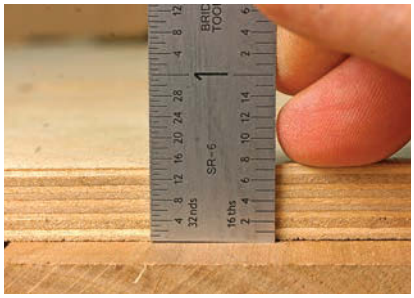


Get in line. *An accurate measurement comes from a good point of view; your eye, the thing you're measuring and the marks on the rule need to be in one line.*

Parallax problem: *A point of view from an angle makes it difficult (if not impossible) to get an accurate reading from the rule, no matter how precise.*

Soft surface. *Where you measure from is as important as where you measure to. The end of the rule needs a firm reference.*

Good start. *A block of scrap against the edge or a solid surface allows you to register the end of the rule at a definite place.*

magnification as well. Most important is to find a point of view where your eye, the object you are measuring and the lines on your rule are all in line (top left). If you observe from an angle, an error of parallax can lead to an inaccurate reading (top right).

If you're using a tape measure, keep the tape parallel to the distance you want to measure. It is also important to ensure that you are certain where you are measuring from. You will be more accurate if you don't line up the starting point by eye or with a finger. Use a block of wood or a known flat surface instead (above right).

The next-best thing is to start with a line on your rule or tape instead of the end. Many woodworkers measure from the 1" mark, but it's easy to forget about that and make the "one-inch mistake." It is just as easy to start from the 10" mark. Mistakes are still possible, but far easier to recognize.

One of my favorite layout tools is a steel square with a rule marked in 8ths of an inch (shown in the opening photo). The stock of the square is a definite starting point and the larger divisions make it easier to find the increments I'm looking for.

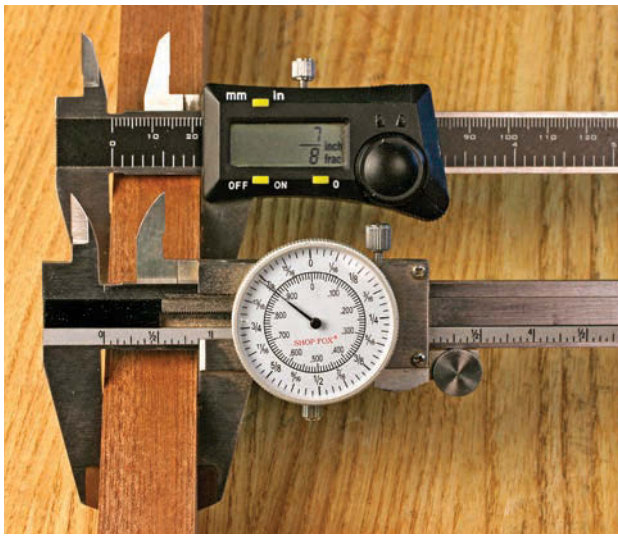
When measurements get smaller, it's easy to get confused. A lot of people give up when they get to 32nds or 64ths of an inch. One method is to refer to the closest 16th, but to add a descriptive term: "$^{9}/_{16}$" plus" is the equivalent of $^{19}/_{32}$" and "$^{9}/_{16}$" heavy" is equivalent to $^{37}/_{64}$". Going the other direction, "minus" means $^{1}/_{32}$" less, and "light" means $^{1}/_{64}$" less than the nearest $^{1}/_{16}$".

You Need Calipers

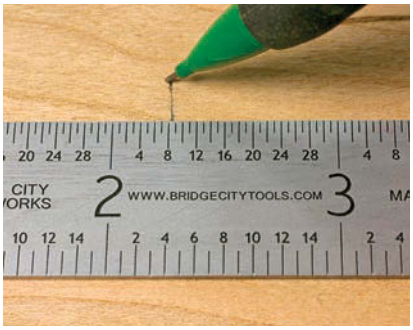
When you need to deal with small increments, the shortcomings of rules become obvious. A pair of dial calipers will speed the process and improve accuracy. Avoid the temptations of decimals and digital devices. If you start to use 1,000ths of an inch instead of fractions, you'll spend a lot of time translating from fractions to decimals and back again. With digital calipers, you can waste half a day watching the display bounce back and forth between .253" and .254".

The problem with electronic calipers that read in fractions is that there is a significant rounding error; $^{1}/_{64}$" is slightly less than .016" (below). The display will round off to the nearest $^{1}/_{64}$", so what you read can easily be off by .008". With analog fractional calipers, you can see (and judge) how far from the mark you really are.

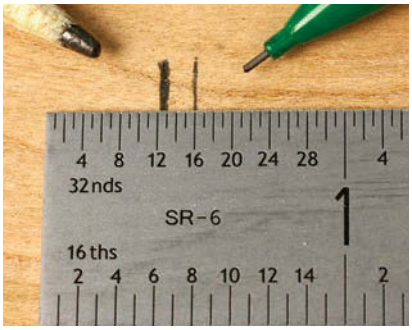
Digital devices for measuring angles are even worse, even though the stated accuracy of one 10th of a degree sounds impressive. But make a square, mitered frame with 12"-long sides and the angles cut at 45.1° instead of 45°, and you'll have a gap $^{1}/_{8}$" wide when you're done.



Digital doubt. *Any numerical measurement is an approximation. In this case, the digital calipers leave plenty of room for doubt.*



Split the difference. *With practice, you can mark and measure to the visual center between marks on a rule.*



Get to the point. *Your own marks can lead to errors. A wide pencil line can't define an accurate location if it is wider than the tolerances of the work.*

Direct reference. *Marking one piece from another is far more accurate (and faster) than measuring the first piece, then duplicating that measurement on the second.*

Accuracy vs. Numbers

You can work accurately to twice the resolution of the finest mark on the measuring tool. With a little practice, most people can divide a given space into two equal parts (top, left). Your little brother could do it with a peanut butter and jelly sandwich, and you can do it with the marks on your rule or tape measure.

You need a sharp pencil or a knife to do that, and .5mm mechanical pencils make a much sharper line than a good old No. 2 pencil. If you use a soft pencil, the lines you make can be wider than the tolerances you need for quality work (top center).

Developing good techniques for measuring is worthwhile, but the introduction of rules and numbers to the building process can slow things down and actually increase the chances of making a mistake or of making parts that don't quite fit.

If there is a way to mark one piece directly from another, you won't have to work as hard or think as much. If you can line up your tools directly to the mark you made, you can come closer than you possibly could by measuring, marking and measuring again (top, right).

If you put all the important dimensions from a plan on a piece of wood (a story stick) and use that as a reference for marking all your workpieces, the project will fit better, and layout and marking will be faster.

Gauge distances from parts whenever you can. Use a combination square, calipers or the material you will be using to make your layout marks rather than measuring. Your work will be more accurate and won't it take nearly as long.

When it comes time to make a cut with a router, table saw or miter saw, find a way to line up your marks with the exact path of the blade or cutter. A zero-clearance insert on the table saw or fence of the miter saw (if it's fresh and the slot from the blade isn't ragged) will be easier to use for alignment than the blade itself. With router jigs, use the path of the cutter or a bearing-guided bit to line up your layout marks.

No doubt. *This dado jig includes the path of the router bit. Line that up to the mark for precision without fuss.*

Trust Your Judgement

Only you can decide the degree of accuracy to which you want to work. With experience, you'll find that accuracy is a moving target. Sometimes a small number is crucial, as when fitting a joint or avoiding a gap at a joint. At other times no one will ever know, care or be able to tell if a dimension is "correct" or not – consider a round tabletop that measures 17¾" instead of a specified 18"; it's a difference that would be undetectable by eye.

As with most skills in woodworking, accurate work comes down to enough practice with the proper tools to arrive at a place where you can trust your own skill and judgment. It also comes down to the discovery of what works for you. Finding that is far more important than any specific system, tool or technique. **PWM**

Bob is the author of several books and the executive editor of Popular Woodworking Magazine.

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5 Tricks for a Silky-smooth Finish

Achieve great results with the least amount of work.

Think about it: What's the first thing you do when judging someone else's woodwork? You run your hand over it, of course. If it feels really smooth, you admire the work. If it feels rough, you aren't as impressed – even though the woodworking may be spectacular.

The way to get the smoothest and best-feeling finish is to "rub out" the last coat using sandpaper and abrasive compounds. Methods of doing this are written about often. It's a mechanical procedure that doesn't differ all that much from sanding the wood.

Begin with coarse enough abrasives to remove the problems efficiently without creating unnecessarily large scratches. Then work up through the abrasive grits until you get the sheen (shine) and look you want.

But rubbing out is a lot of work. You might be willing to do it on a critical high-end tabletop, but it's not likely you'd want to go to the trouble on a set of kitchen cabinets, for example.

So how do you get the smoothest results possible without having to go through the rubbing-out process? Here are five methods of achieving a smooth finish with the least amount of work.

Vacuum. *The best method of removing sanding dust is with a vacuum. Brushing spreads the dust into the air, and you'll need to wait until it settles before beginning to finish. Tack cloths don't get into recesses well, and they leave a residue that hinders the bonding of water-based finishes.*

Strain. *To ensure previously opened cans of finish are dust- and dirt-free, strain the finish before using. Always strain water-based finish because clumps can form.*

Wipe. *Just before beginning to brush or spray the finish, wipe your hand over the surface to check that it is clean and to remove any minute amount of dust that may have settled since vacuuming.*

Step by Step

You can't get a room entirely dust-free, nor can you get your finish or application tools totally dust-free. But you can come close. So the first trick is getting everything as dust-free as possible. Here are some easy-to-do suggestions:

1. Wait several hours after sanding a surface before you begin finishing to let the dust settle.

2. Remove settled dust from the surface, ideally with a vacuum. Tack cloths also work well on flat surfaces but shouldn't be used under a water-based finish because the sticky residue hinders bonding. Don't brush off the dust or you'll need to let it settle again.

3. Strain the finish unless you have just opened the can. Always strain water-based finish.

4. Be sure your cloth, brush or spray gun is clean. Clean it if it isn't.

5. Just before beginning to apply the finish to a horizontal surface, wipe over it with your hand to check for cleanliness and to remove any small dust particles that may have settled.

Waiting for dust to settle and then removing it from your project also applies when sanding between coats.

Sand the First Coat

The most important thing you can do to achieve smooth results is to sand the first coat smooth. With the exception of there being a lot of dust and dirt in the air when you're doing your finishing, the main cause, by far, of rough-feeling results is not sanding the first coat smooth.

PHOTOS BY THE AUTHOR

Sand. *After the first "sealer" coat has dried, sand it smooth using very fine sandpaper. Not doing this is probably the single most common cause of finishes not feeling smooth after all coats have been applied.*

Paper bag. *There's always some dust in the air that settles on the drying finish and sticks. You can usually remove the rough feel without causing scratches by rubbing the dried surface with a folded brown paper bag.*

The first coat, called the "sealer" coat, of any finish raises the grain of the wood and locks it in place. If you don't sand this coat smooth, the roughness will telegraph through all coats and cause the final finish to feel rough.

The reason it's best to sand the first coat, rather than a subsequent coat, is that it's thin. The thinner the finish, the easier it is to sand without gumming up the sandpaper.

Use a grit of sandpaper that removes the roughness efficiently without creating larger-than-necessary scratches. Usually this means #320 or #400 grit. Both of these grits are available as stearated (dry lubricated), which resists clogging better than non-stearated. Sand lightly if the sealer coat is very thin and there is a stain underneath so you don't sand through and remove some of the color.

Water-based finishes raise the grain more than solvent-based, so you'll probably need a coarser grit to be efficient. I suggest starting with #220 grit and see how it works. You can move finer or coarser from there. As long as the finish is totally dry, non-stearated sandpaper usually works well without clogging.

On turned and other non-flat surfaces, foam-backed abrasive pads can be helpful. They conform well to curved surfaces. Using mechanized sanding tools will take some practice during which you will probably experience some sand-throughs while you're learning. I always sand the first coat by hand for the best control.

All that's necessary when sanding the first coat, or sanding between coats for that matter, is to make the surface feel smooth. It doesn't have to look perfect. In fact, it rarely does. You just want the next coat to go on to a level surface.

Sand Next-to-last Coat

If you are applying more than two coats total, you may find it helpful to sand the next-to-last coat smooth before applying the last coat, whether by spray or brush.

Sanding roughens the surface, which causes the next coat of finish to level better. (Think of water beading on glossy automobile or tabletop surfaces compared to water leveling on concrete.) So orange peel and brush marks will be lessened.

Thin the Last Coat

The thinner the finish, meaning the lower the viscosity, the better it levels so brush marks and orange peel are reduced. You don't necessarily feel these flaws, but they do look bad in reflected light.

You don't have to thin much to have a significant effect, usually just 5 or 10 percent. But, except for water-based finishes, which may not flow well if you add too much water, you can thin as much as you want without having any negative effect on the finish.

The reason some instructions on solvent-based products say not to thin is to comply with VOC regulations in the more restrictive areas of the country. Thinning is not harmful to the finish.

Rub with a Brown Paper Bag

This trick is quite effective for removing small dust nibs without leaving scratches in the finish. It's not effective, however, at smoothing a surface on which the sealer coat wasn't sanded smooth.

Fold a small brown paper bag from a supermarket and rub it over the finish after it has dried well. Finishes harden at different rates, and temperature affects the rate significantly. So you may have to experiment a little to find the earliest time when the finish has hardened enough so that the bag doesn't leave scratches.

The paper bag is coarse enough to level most dust nibs. Leveling these nibs is not the same as totally removing them. You may still see flaws in a reflected light, but the finish should feel significantly smoother. **PWM**

Bob is author of "Understanding Wood Finishing," "Flexner on Finishing" and "Wood Finishing 101."

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A Woodworking Disorder

Most of us share this pathological habit that's hard to break.

'Thanks, but look at the gaps!' *Sure, this footstool built by the author looks good – but you'll notice the gaps in the joinery. Because he can't help but point them out.*

I have a problem. A compulsion, really. It's not as serious as, say, alcoholism, a food addiction or an unhealthy fascination with Megan Fox. But it's a problem.

Fortunately, most people are too polite to point it out. Or they don't even notice. But I do. And it's bad. If I were a professional woodworker, it's the sort of thing that could lose me customers. But here's the thing: I'm betting you have the same problem.

What is it? I refer to it as Compulsive Mistake Identification, or CMI. Oh sure – it sounds innocuous. But trust me: it's seriously pathological.

Here's how it works. First, you build something. Something beautiful, something functional – a piece of furniture, a jewelry box, a cutting board. Then someone comes over and admires it. The first words out of your mouth? "Thanks. But if you look here, you can see where the router bit slipped when I was going around the corner."

Why? Why did you say that? Your friend/relative/spouse didn't need to know that you screwed up! They didn't need to have the tiny blemish pointed out to them. Now they – like you – will see it every time they look at your piece! Why, oh why did you have to tell them?

Here are some CMI moments I've had. I know you're already thinking of your own.

I spent months making a beautiful bed. The first time I showed it off, I had to point out that the headboard didn't lie flat against its supports, because I hadn't drilled the holes in the supports properly. Nobody – especially a non-woodworker – would ever notice. Now you will, every time you come to my house.

I made a table for some friends. As I was making a leg, a knot fell out. I filled the knot hole with wood filler and used Sharpie markers to make it look like wood grain. No one would ever notice. Right? Right. Not, at least, until I was compelled to point it out.

My beautiful, dovetailed shoe cabinet. It sits by our front door. If you've visited my house, then you already know how one of the sides was put in upside down.

How do you know this? Because I told you. It's otherwise invisible, except for a tiny offset that only a seriously anal woodworker (such as myself) would ever notice. Heck, the dovetails are light-tight. Did you really need to know that one side was upside down? I. Just. Can't. Help. Myself.

Why? Why did I tell you? What compelled me to overlook all the beauty of my creations, and show you that one little flaw?

And the worst thing you can do for woodworkers with CMI? Point out a flaw – real or perceived – that they hadn't noticed. It's like giving free access to online medical sites to a hypochondriac. Now they will obsess about new "mistakes." See it every time they look at the piece. Stare at it surreptitiously, pretending not to notice. Oh, but they do … they do. It becomes an obsession.

No, I don't think the legs on my beautiful cherry bar stools are too thin. Are they? Hmmm. Maybe they are. No – no they're not! Are they? Well, maybe a little. I never would have noticed if So-and-so hadn't pointed it out. The jerk.

Is there a cure for CMI? I don't know. I'm working on it. I bite my tongue when I'm showing a piece to someone. I try to let the viewer enjoy its beauty without sullying the experience by pointing out the spot where I had to glue the chip back in.

But it's hard. So hard! **PWM**

In his non-woodworking life, Peter is a professor of biological oceanography at the Scripps Institution of Oceanography at the University of California, San Diego.

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