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JUNE 2010 ■ #183

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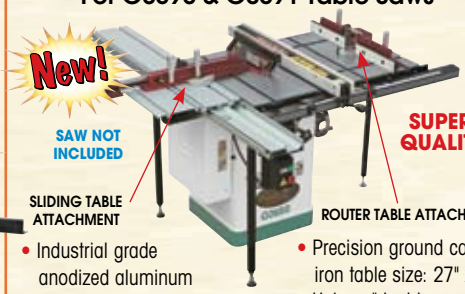

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- Max. cutting width: 15"
- Max. cutting height: 6"
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- Min. stock length: 17"
- Max. planer cutting depth: 3⁄32"
- Feed rate: 11 FPM & 22 FPM
- Cutterhead dia.: 3 15⁄64"
- Cutterhead speed: 5500 RPM
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- Approx. shipping weight: 181 lbs.

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15" Planer

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- Max. stock thickness: 8"
- Min. stock thickness: 3⁄16"
- Min. stock length: 8"
- Max. cutting depth: ⅛"
- Feed rate: 16 & 30 FPM
- Cutterhead dia.: 3"
- Number of knives: 3
- Knife size: 15" x 1" x ⅛"
- Cutterhead speed: 5000 RPM
- Table size: 15" x 20"
- Approx. shipping weight: 675 lbs.

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20" Planers

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- Max. stock thickness: 8"
- Min. stock thickness: 3⁄16"
- Min. stock length: 7½"
- Max. cutting depth: ⅛"
- Cutterhead speed: 5000 RPM
- Feed rate: 16 & 20 FPM
- Approx. shipping weight: 920 lbs.

PRECISION GROUND CAST IRON BED & INFEED OUTFEED TABLES

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- Swing: 14"
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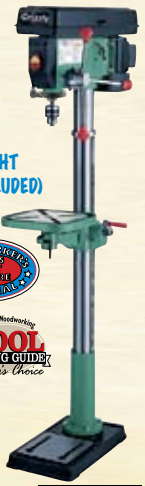
- Drilling capacity: ¾" steel
- Spindle taper: MT #2
- Spindle travel: 3¼"
- Collar size: 2.595"
- Approx. shipping weight: 171 lbs.

INCLUDES BUILT-IN LIGHT (BULB NOT INCLUDED)



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- Motor: 2 HP, 110V, single-phase
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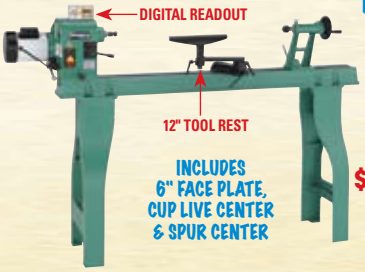
- Swing over bed: 16" • Spindle bore: ⅜"
- Spindle & tailstock tapers: MT#2
- 10 speeds: 600- 2400 RPM
- Approx. shipping weight: 372 lbs.

HEADSTOCK SWIVELS FOR OUTBOARD TURNING



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G0462

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2 HP Dust Collector w/2.5 Micron Bag

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- Static pressure: 11"
- Bag capacity: 5.7 cu. ft.
- Impeller: 12¾" balanced steel, radial fin
- Height w/bags inflated 78"
- Portable base: 21¼" x 33½"
- Approx. shipping weight: 126 lbs.

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This period reproduction is "high style" on the outside, but the interior work is quite simple – and the trifid feet are easy to carve, too.

BY GLEN D. HUEY

ONLINE ▸ Cabriole Legs

In this free video, you'll discover how easy it is to make perfect cabriole legs using the band saw and a rasp – keep your hot-melt glue handy.

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34 Arts & Crafts Through-tenons

Accurate work depends on location – and this simple plywood jig will help you make perfectly placed through-tenons every time.

BY DALE BARNARD

ONLINE ▸ Modern Masters

Find out more about Barnard and his work in an HGTV episode of "Modern Masters."

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38 White Water Shaker Table

Some details on the original of this walnut side table are atypical for a Shaker piece – and some are just downright strange.

BY CHRISTOPHER SCHWARZ

ONLINE ▸ Tour White Water

Take a behind-the-scenes video tour of this almost-forgotten Shaker community in Southwest Ohio.

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42 Scraper Planes

Discover how to tune up and use one of the best weapons in the war against tear-out.

BY DAVID CHARLESWORTH

ONLINE ▸ The Ruler Trick

Radically reduce the time it takes to sharpen a plane iron with the help of a $5 steel ruler.

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46 Inlay for Curves

Banding around a curved edge imparts impressive adornment. Simple hose clamps are a clever way to get ahead of the learning curve.

BY ROB MILLARD

ONLINE ▸ Applying Inlay

Once you have your curved inlay made, this free video from the author will show you how to integrate it into your piece.

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50 Taming the Top-Heavy Router

Replace your router's base with a shop-made version that's oversized, stable and inexpensive.

BY ROBERT W. LANG

ONLINE ▸ Balanced Baseplate

Watch Lang demonstrate the advantages of this offset router baseplate in our free video.

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COVER PHOTO BY AL PARRISH, SHOT ON LOCATION AT THE KATE SCUDDER HOUSE, COURTESY OF THE BAKER HUNT ART & CULTURAL CENTER, COVINGTON, KY;
SHAKER TABLE & THROUGH-TENON PHOTOS BY AL PARRISH, SHOT ON LOCATION AT WHITE WATER SHAKER VILLAGE; INLAY PHOTO BY ROB MILLARD; SCRAPER PLANE PHOTO BY ROBERT SEYMOUR

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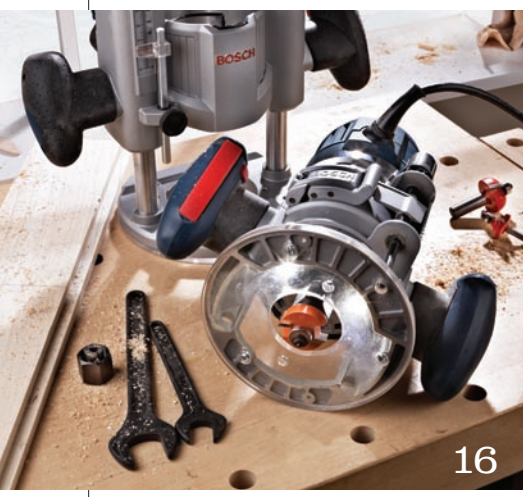

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POPULAR WOODWORKING MAGAZINE

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ROUTER & PICNIC TABLE PHOTOS BY AL PARRISH; MOULDINGS PHOTO BY GEORGE R. WALKER; TOOLS PHOTO BY PETER FOLLANSBEE

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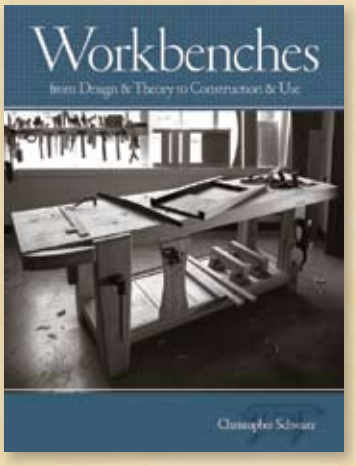

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CONTRIBUTORS

David Charlesworth
"Scraper Planes," page 42.

David Charlesworth has been a professional cabinetmaker since 1973, and is the author of three woodworking books ("Furniture-Making Techniques" volumes 1 and 2, and "A Guide to Hand Tools and Methods") and many DVDs including his latest, "Furniture Making Techniques: Five Topics" (Lie-Nielsen). Since 1977, David has specialized in helping others learn the craft at the Harton Manor Workshops in Devon, England. He is a member of the Devon Guild of Craftsmen, and his work is included in the British Crafts Council slide library.

David worked in English and exotic hardwoods and is renowned for his attention to detail and fine craftsmanship. His furniture took its design inspiration from many different sources.

To read more about David and his workshops, and to link to his blog, visit davidcharlesworth.co.uk.

Peter Follansbee
"A 1600s Joiner's Kit," page 22.

Peter Follansbee began learning traditional woodworking in 1980 when he attended a John D. Alexander chairmaking course at Drew Langsner's Country Workshops in Marshall, N.C. He went on to take many courses at Country Workshops and gave away his power tools in the mid-1980s.

About 1988, Peter began an informal apprenticeship with Alexander as they investigated 17th-century-style joinery, which has since become Peter's sole woodworking focus. He's been employed as the joiner at Plimoth Plantation in Plymouth, Mass., since 1994, and his work is seen in museums including the Museum of Fine Arts in Boston and the Chipstone Foundation's collection at the Milwaukee Art Museum.

He and Alexander are currently at work on "An Introduction to Joinery," a book on making joined stools.

To read more about Peter, visit his blog at http://pfollansbee.wordpress.com.

Dale Barnard
"Arts & Crafts Through-tenons," page 34.

Dale Barnard is a third-generation woodworker who began learning his trade at 11 under his father's direction. After studying mathematics at Indiana University, Dale decided on woodworking as a career, and has since built houses from below the ground up. He specializes in built-in cabinetry and custom furniture pieces, predominantly in the Arts & Crafts style and Greene & Greene designs. Dale has been featured on HGTV's "Modern Masters" television show for a home he built in the Greene & Greene style. He is also the founder of the Barnard Woodworking School, in Paoli, Ind.

Dale has developed a simple and clever jig for making through-tenons (an integral part of the Arts & Crafts style), which he writes about in his first article for *Popular Woodworking Magazine*.

To read more about Dale and to link to a gallery of his work, visit the-cabinetmaker.com.

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BY CHRISTOPHER SCHWARZ, EDITOR

A Weekend of Gorging on Woodworking

My favorite weekend of the year is when we hold our Woodworking in America conference. It is, for lack of a more delicate term, an absolute bender of woodworking, tools, conversation and food. You get to meet and spend time with some amazing people, from Roy Underhill to Frank Klausz to every single attendee who is as excited about woodworking as you are.

And this year's conference is going to be an even bigger geek-fest. Why? Because we're holding it in our backyard from Oct. 1-3 in Cincinnati and Northern Kentucky.

As a result, we've got some special stuff planned. But before I spill the beans on that, let me say a few words about the program. Here they are: Dang, dang and dang.

This year we are expanding the orbit of the show a bit to incorporate some power-tool operations, some deep dives into furniture design and – of course – more hand-tool classes than you could possibly attend during the three days.

This year we have scheduled more classroom and hands-on time than any other Woodworking in America conference. We're offering 44 different classes taught by 12 instructors (plus assistants and volunteers) during the three days. We've signed up Roy Underhill, Frank Klausz, Marc Adams, Don Williams, Don Weber, George R. Walker, Jim Tolpin, Ron Herman and more, as well as our entire staff (me included), to teach lectures and lead hands-on seminars, with benches and wood for you to play with. (And don't worry about noise – all the power-tool stuff will be apart from the hand-tool stuff.)

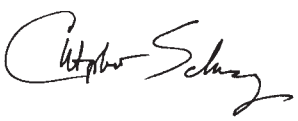
We've also found ways to streamline the program for you. All of the seminars will be held on one floor of one building. And each instructor will occupy the same bench space the entire weekend where they will offer lectures, question-and-answer sessions and hands-on training.

Plus there is the Marketplace, which is the single-best selling floor and demonstration area I've ever been to (apologies to the other woodworking shows). We have A-list vendors signed up – manufacturers and sellers who care about woodworking – and nobody selling magic brooms, rags or ladders.

Add to all that the fact that Woodworking in America is right down on the river in the Covington, Ky., historic district. You can walk to restaurants, pubs, your hotel and the conference in minutes. And speaking of the location, we're taking advantage of it.

Right now on the drawing board are a dinner and tour of our shop at the magazine with the toolmakers, a field trip and tour to the White Water Shaker Village (which isn't open to the public), a pub crawl in Covington's historic Main Strasse area and a special evening program where we will drop a very large bomb about some new research into early woodworking technology.

As always, space is limited in order to keep the classes intense and personal. We plan to open the registration before June, and you might want to hurry because space in the extra-curricular activities is definitely limited. For complete details (and to register) visit woodworkinginamerica.com. **PWM**



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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.

Highly Recommended

In a world of marking knives with turned handles, the Back Channel Marking Knife stands out as an excellent alternative with some great features.

The handle is a tapered octagon, which makes it easy to determine when the blade is square to the work. The knife has a sheath with a magnet embedded in it, so your blade will always be protected. But most of all, the knife is comfortable to use, extremely thin and reaches into the tightest spaces and largest dovetails. It is a fantastic tool and is available at Di legno Supply (dilegnosupply.com or 877-208-4298) for $49.95.

— Christopher Schwarz

PHOTO BY CHRISTOPHER SCHWARZ

Dovetails on Long Boards

I want to learn a way to cut dovetail or box joints in long boards. The design for the workbench I've been working on has the front and end skirts or aprons joined with a dovetail or box joint.

Is the answer as simple as holding the board in a vise horizontally and cutting them this way? This must be such a simple task because I have looked through probably hundreds of magazines and have not found an article on cutting such joints.

I made a temporary workbench and added the quick-release vise that will go on my permanent bench so that I would have something to build my workbench with.

I just retired and finally have time to spend building and using a full workshop so I am trying to make my new workbench meet all my needs.

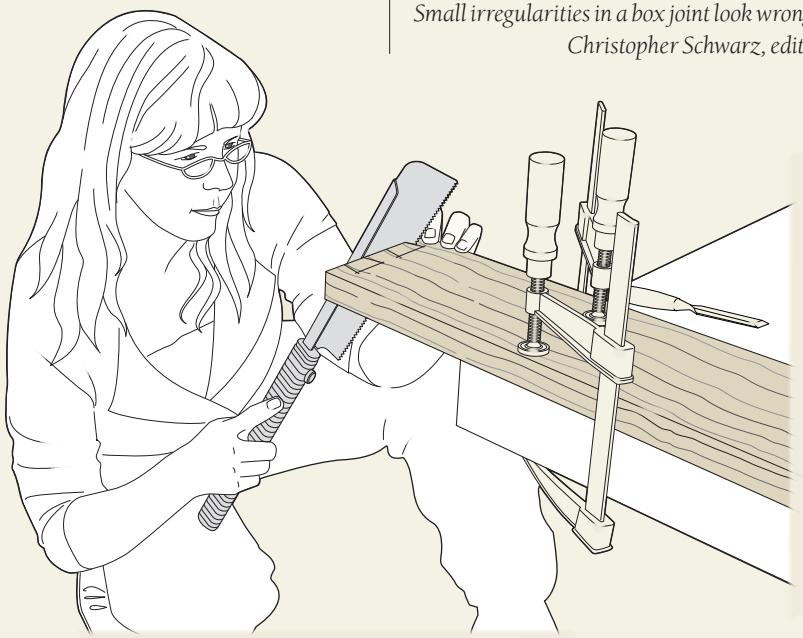
John Felicet
Rochester, Michigan

John,

Most people cut these joints, which are fairly rare in cabinetwork, by laying the work flat on the bench and clamping it down with about 5" hanging off the end of the bench. Some people will crouch or sit on a stool. It takes a couple practice joints to do it, but it's not terribly hard.

Cutting box joints is a machine operation, generally. It's actually easier to make nice-looking dovetail joints by hand than box joints by hand. Small irregularities in a dovetail look nice. Small irregularities in a box joint look wrong.

Christopher Schwarz, editor



Vise Location Conundrum

I have a well-made 30-year-old bench – but I think it has three flaws: It's too narrow, has standard vises and has a hamster trap (tool tray). Rather than make a new bench, I am going to extend the old one with a solid maple top and wide legs (flush with the front edge of the top) with a leg vise and a quick-release vise on the end, and dog holes that will align with those on the original bench for clamping wide panels. To align the end vises, the leg vise will have to be at the right end of the front of the extension. To me this is no problem, but everything I read talks about vise location in terms of planing a board. I am right-handed, so conventional wisdom says for me that the vise should be on the left side of the bench. I cannot see why it makes a difference. Yes, as a right-hander, I will plane from right to left. But what difference does it make whether the vise is on the left and bench stop on the right or vice-versa? Is there something I am not seeing here? Your advice before I commit a serious error in design would be much appreciated.

William Smith
Montreal, Quebec

Bill,

The reason the face vise is on the left side for right-handers is so that you are always planing toward the screws of the face vise. Because of the way the vise chop racks a bit when you cinch it down, planing toward the screws is ideal. As a result, every stroke tightens the grip of the vise.

If you plane the other way, every planing stroke will loosen the work. I've pulled boards out of face vises on left-handed benches.

That's the thinking, and I tend to agree with it.

Christopher Schwarz, editor

How Does One Select Good Card Scrapers?

I've been getting into hand tools during the last year or so, and have been finding your blog (blog.woodworking-magazine.com/blog) helpful. Can I put in a request for a review on card scrapers? I've found almost no information on scrapers in books or on the web. So many people sing their praises but useful information is hard to come by. For example:

1. How hard does the steel need to be, and can it be too hard?
2. What brands are good quality?
3. How do you determine what thickness of scraper to use for a given task?
4. How many scrapers do you really need for woodworking?

Daniel Sherman
via e-mail

Dan,

A review of scrapers would be good and we'll definitely keep it in mind. Here's what I've found:

Yes, the steel can be too hard. Then it's hard to sharpen the tool. And it can be too soft. The steel used for saw blades is about the right hardness – usually Rc 50-52. Old scrapers were in the 40s.

CONTINUED ON PAGE 12

ILLUSTRATIONS BY MARY JANE FAVORITE

CONTINUED FROM PAGE 10

Too soft, but that is why you could use a gouge to turn the burr. Some scrapers are in the 60s! Those are a bear to sharpen.

I've encountered lots of good brands. If you can find some of the old Sandvik scrapers, you'll be in heaven. Lie-Nielsen makes good scrapers, as does Two Cherries. The Two Cherries are nice because the faces are milled (or they used to be, it has been a while). That makes sharpening them easier.

Thin scrapers flex a lot, which makes them easy to use, but they also tend to follow bumps rather than flatten them out. I don't like to use scrapers on wood that has a big difference in density between latewood and earlywood, because then, scrapers seem to scoop out the soft parts and ride over the hard parts. Thick scrapers have more power to keep the wood flat, but they also require more work to bend. That's murder on your thumbs.

How many scrapers do you need? Enough to keep a fresh one around during all phases of a project. Probably four is enough. I own 30. But I'm weird.

Christopher Schwarz, editor

Is Walnut an OK Wood to Use for a Workbench Top?

My small apartment dictates that I make a bench somewhere around 5'-5 1/2' in length. I know that you have an affinity for Southern yellow pine, but I can purchase nice clear walnut for $3 per board foot and prefer the look of this wood. I am wondering if there may be qualities of walnut that make it a bad choice for a benchtop.

Nathan Charette
Williamsburg, Virginia

Nathan,

Walnut is a great hand-tool wood. The only downside to it as a workbench wood is its dark color. That makes it hard to sight the position of your plane iron coming out of the mouth. It also doesn't reflect light as nicely as a workbench made of light-colored wood.

Does that mean walnut is out? Not at all. I think you should build your bench using the species that is most available and inexpensive to you.

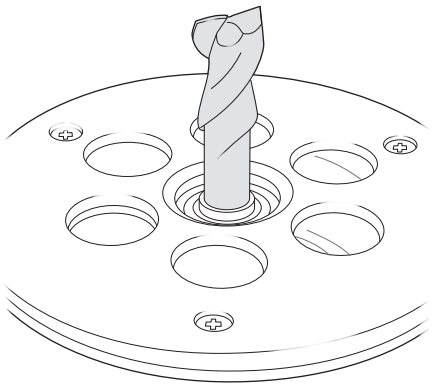
You'll just have to deal with its dark color (until it fades in the sunlight after 50 years). A sheet of typing paper on the bench can help you sight your plane irons.

Christopher Schwarz, editor

Where Can I Purchase 3/4" Upcut Spiral Router Bits?

In your video on making dog holes for your workbench top with a plunge router (popularwoodworking.com/jun10), you use a 3/4" upcut spiral router bit. I've been unable to locate such a bit with a 1/2" shank. Can you provide a manufacturer?

Paul Morris
Alamo, California



Paul,

For some reason these bits are hard to find. Try Lee Valley Tools or Woodcraft. The item number at leevalley.com is #86J01.42. At woodcraft.com, the item number is #03K53. Both of these stores carry Onsrud bits in the 3/4" size .

Glen D. Huey, senior editor

A Clever Way to Easily Fit Turned Tool Handles to Sockets

Thanks to Kevin Drake for his great article on making custom turned tool handles in the February 2010 issue of *Popular Woodworking* (#181).

I use modeling clay pressed down in the socket to give a pattern of the inside taper to fit the handle to the socket.

John Johnson
Church Hills, Tennessee

Why Not Eschew the Glue in a Benchtop and Just Use Screws?

Issue #181 (February 2010) has an inquiry from Jonathan Szczepanski about gluing together two pre-fabricated butcher-block countertops for a workbench. You recommend screwing them together from the bottom, then removing the screws when the glue is dry. Why not skip the glue and just screw them together?

Pat Lukas
Portage, Indiana

Pat,

You certainly can screw the two planks together.

I prefer not to have metal screws embedded in a benchtop. When you flatten it, your tools could hit the screws and seriously damage whatever tool you are using.

Plus, as a sometimes-cheapskate, I want to re-use those screws. PWM

Christopher Schwarz, editor

"The age of technology has both revived the use of writing and provided ever more reasons for its spiritual solace. E-mails are letters, after all, more lasting than phone calls, even if many of them r 2 cursory 4 u ..."

— Anna Quindlen (1952 -)
American author and
Pulitzer Prize-winning journalist

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EDITED BY KARI HULTMAN

THE WINNER:

Benchtop Tool Hook

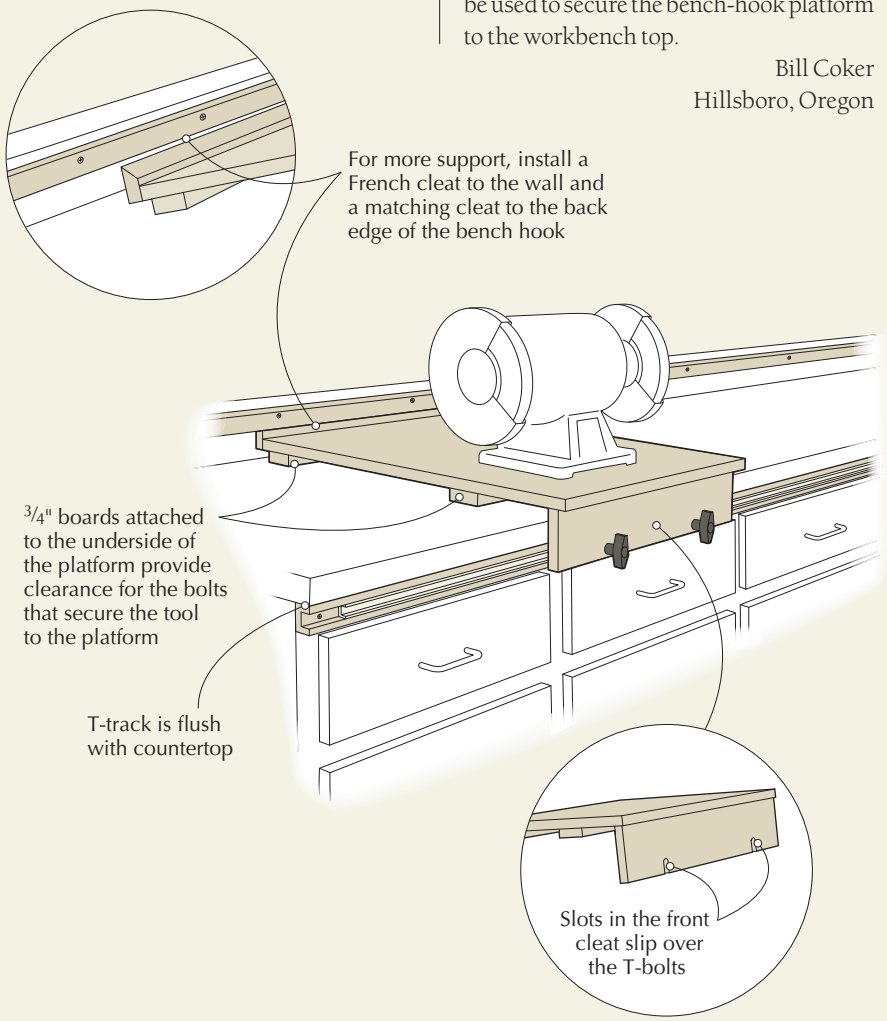
In my shop, cabinets are along one wall – the ideal area for many tasks, such as grinding and sharpening. The problem was, if benchtop tools were bolted to the countertop, work space would be lost, and tools couldn't be rearranged as needed.

So I devised a T-track attached to the cabinet face just below and flush with the front edge of the countertop. Benchtop tools are bolted to a platform whose front cleat reaches the bottom of the T-track but does not interfere with drawers and doors.

Slots in the front cleat slip over T-bolts in the T-track, and knobs are tightened to secure the bench hook. For tools that need more support, a French cleat is screwed to the cabinet top's backsplash, with a mating French cleat screwed to the back of the bench hook.

The system works with a variety of benchtop tools that can be stored in a cabinet or on a shelf when not needed, leaving the work surface free for other uses. Likewise, a T-track can be dadoed into the front edge of a workbench, and a hold-down can be used to secure the bench-hook platform to the workbench top.

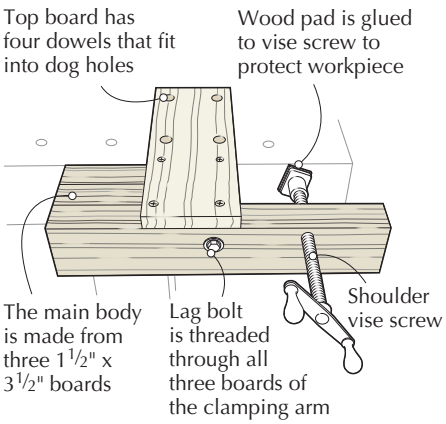
Bill Coker
Hillsboro, Oregon



A Better Burnisher

I use solid carbide 1/4"-diameter spiral router bits. When one gets too dull to use in the router, I make a handle for the bit and put the cutting end into the handle. To secure the router bit in the handle, I drill a slightly undersized hole and pound it in. This makes an excellent burnisher for your scrapers and requires no lubrication. Once you use a solid carbide burnisher you will wonder why you ever used steel ones!

Mike Siemsen,
Chisago City, Minnesota



Removable Shoulder Vise

Shoulder vises do one thing very well – they hold boards vertical when you're handsawing dovetails and finger joints. However, shoulder vises can get in the way because they stick out quite far from the bench, so I created a removable one.

The vise has a top board with four dowels that fit into mating dog holes in the workbench top. The main body of the vise fits tightly against the front edge of the workbench. The clamping arm needs to be fairly robust because it is subjected to a lot of force when clamping a board for dovetailing.

Mine is made from three glued-up 1 1/2"-thick hardwood scraps. The vise doesn't need to have a large clamping capacity if the boards you normally dovetail are not very big. The clamp screw is approximately 3" away from the main body of the vise, but this could be shortened to 2" in order to decrease the stress on the clamping screw.

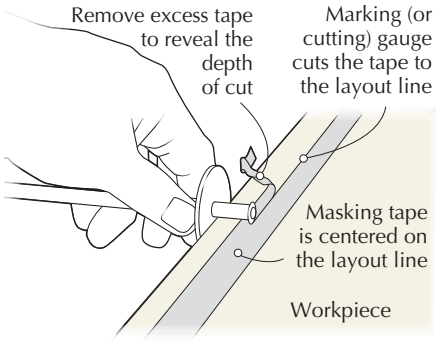
David Brown
Germantown, Maryland

ILLUSTRATIONS BY MARY JANE FAVORITE

Dovetail Tape Tip

Laying out dovetails in walnut can be difficult because it's hard to see a pencil or knife line. I tried a white charcoal pencil but the line wasn't fine enough, so I came up with an idea that uses masking tape. I centered the tape on top of where my marking line needed to be and struck the line with a marking gauge, cutting the tape. Then, I removed the excess tape to reveal a distinct reference line.

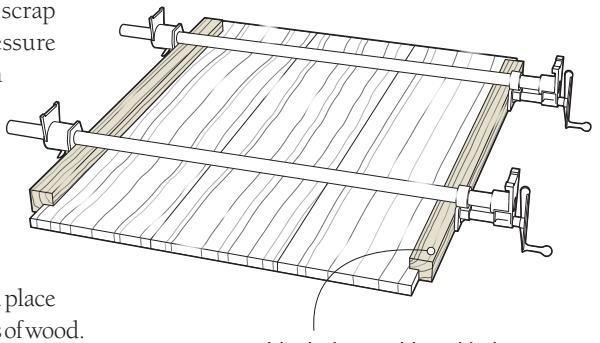
Richard Magbanua,
Indianapolis, Indiana



Easier Glue-ups

When edge-gluing boards, I use scrap wood to distribute clamping pressure and to prevent the clamps from denting the outside edges of the workpiece. Managing the scrap wood while tightening the clamps and keeping the boards properly aligned can be awkward, so I use scrap pieces with a rabbeted edge. They stay in place much more easily than solid blocks of wood. I wish I'd figured this out years ago.

Phil O'Rourke
Pittsfield, Massachusetts



Scrap blocks have rabbeted ledge that rests on top of the workpiece

Point Protection

In order to protect the points on my awls and the skin on my hands, I simply slide a plastic wall anchor onto the sharp end of the tool.

Stanley J. Krasovic
Honesdale, Pennsylvania

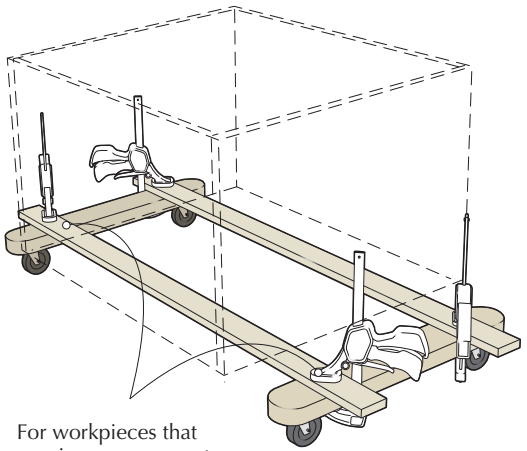
Assembly 'Bench' on Wheels

This is a simple, easy-to-make and easy-to-store assembly bench. My shop is in a two-car garage, with one half set up with permanent machinery and the other half requiring mobility to make room for one car. If your shop is pressed for space with no room for a dedicated assembly table, this "bench" is invaluable.

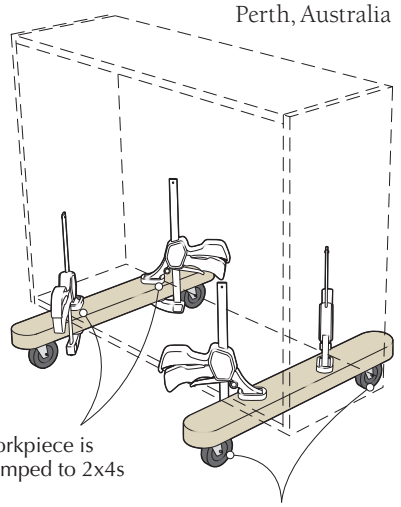
The assembly bench is comprised of two sets of wheels, each attached to a 2x4. I use lockable, rotating wheels that allow for movement in any direction and can be locked in position. The 2x4 ends are rounded to save the ankles. The bench can be used in a number of ways, all of which rely on a set of clamps (I use four quick-release types).

For furniture with a small footprint, the workpiece may be clamped directly to the 2x4s. For a more secure fixture to be used with larger pieces, clamp a couple stretchers to the 2x4s. The workpiece can then be rested on top. What I like about this assembly bench is that I can work on my project, then roll it out of the way when I need to bring in the car. When not in use, the components of the bench can be tucked away in a corner or on a shelf. PWM

Derek Cohen
Perth, Australia



For workpieces that require more support, clamp stretchers to 2x4s and lay workpiece on top of the assembly bench



Workpiece is clamped to 2x4s

Locking casters are attached to 2x4s

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BLOG: Tricks editor Kari Hultman writes about woodworking on her blog, The Village Carpenter.

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BY THE EDITORS

A New Track in Routers

Bosch's 'out of the box' thinking nets an innovative router design.

Motor switch. *The power source for Bosch's new combination router package swaps between bases. The design is right on track.*

Interlocking track. *The low-voltage track allows the on/off trigger to be located in the handles.*

What makes the Bosch MRC23EVSK combination kit different? For starters, this router has a low-voltage, trigger-control system where the on/off switch is in the router's handle. You're right: That's not new – except for the fact that Bosch fit this feature into a fixed-base router, and the motor swaps out to power a plunge base, too.

The key element is a 5-volt track connection where one half of the track is attached to the 15-amp, variable-speed motor, while the second half is mounted in the router's fixed base and plunge base. Align the motor to either base and slip the two track halves together to engage the controls. Without the track halves connected, the motor doesn't power up.

Along with the track connection are features that further enhance the tool. Gone are the wooden knobs; ergonomic handles are angled so your wrists are not strangely cocked as you work. Also, due to the motor-to-base connection, the cord is always facing away from the operator, and it's in a pivoting socket that keeps the cord out of your line of sight.

The track also changes the way you use the fixed-base tool. Instead of twisting the motor to make height adjustments, you change the cutting height as you would with a trim router. The fixed base has three notches for coarse-adjustment settings and has a range of $1\frac{5}{8}$" of fine-tune adjustment. It takes a little getting used to, but after you make a couple adjustments, the changes are simple and exact.

The plunge base is tight and accurate and the plunge action is smooth. One outstanding feature is how the plunge-lock lever operates. Release the lever with your thumb to make a quick adjustment. When you simply let go of the lever, the plunge action is sufficiently locked, even if the lever is not fully latched.

Fine adjustments are made after the router is locked, with just a quick turn of a knob. The movement is smooth and dead-on.

Interested in using this router in a table? Bosch suggests you use the fixed base in your setup; remove the clear polycarbonate sub-base and attach the base directly to your mounting plate. Included is a hex wrench for fine through-the-table adjustments.

The motor has two LEDs at the collet. The LEDs illuminate the work surface and indicate there's power to the tool.

The MRC23EVSK kit is a great design – it's now my "go to" router kit in the shop.

— Glen D. Huey

CONTINUED ON PAGE 18

PHOTOS BY AL PARRISH

Bosch MRC23EVSK

Bosch ▪ boschtools.com or 877-267-2499

Street price

- $299-319 MRC23EVSK – kit
- $219-239 MRF23EVS – fixed base
- $239-259 MRP23EVSK – plunge base

VIDEO: *Watch our free video at popularwoodworking.com/jun10 to see the lack of vibration in this router.*

CONTINUED FROM PAGE 16

Stanley's FatMax Coping Saw

The world would be a better place if we melted down almost all the modern coping saws and sent the slag to the ocean floor.

Vintage saws are better. Overall, quality vintage coping saws (usually pre-World War II) tension the blade better. The blade won't corkscrew. The handle is more comfortable.

Now Stanley makes a new coping saw that has some cool old-school qualities. And if the manufacturing quality of this saw were consistent, I'd call this tool a real winner.

FatMax Coping Saws

Stanley ▪ stanleytools.com or 800-262-2161

Street price ▪ $19

BLOG: *Read Christopher Schwarz's entries about coping saws at popularwoodworking.com/jun10.*

Here's the good news: The frame tensions the blade well. The handle isn't bad (though I prefer a wooden handle, duh). And on some of the models I tested the blade locks nicely thanks to detents in the frame (a forgotten feature on most modern saws). On the first FatMax saw I bought (the 15-106 model with a 6" throat), the detents worked perfectly. But on the smaller one I bought (the 15-104 model with a 4" throat), the detents didn't lock at all. The male part was too small. The female part wasn't deep enough. So the blade would corkscrew and I would curse.

So I went to the hardware store and disassembled all the ones on display. I discovered that about half of the examples had crisply made detents. The other half looked weak.

My advice is to either buy a vintage coping saw or endure the withering looks at your hardware store as you hunt and peck for a FatMax one that was made correctly.

It's good to see Stanley trying to revive these good features in a well-priced saw (both sizes are less than $20). Now they just have to fire the robot that makes the bad ones.

— Christopher Schwarz

Glue Spoon: A Traditional Hide-glue Tool

A glue spoon is a traditional method for quickly applying hot hide glue in a thin, controlled line – rather like what you'd get out of a squeeze bottle. Now this isn't the kind of spoon you'd use for soup; it has a sharp point at the business end that funnels the glue into a stream rather than a glop (the technical term).

The other traditional hide glue application method is a brush – but if you have a big panel glue up and you've used hot hide glue before, you know it can be tricky to brush on a sufficient amount before it starts to gel.

Glue Spoon

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

Street price ▪ $14.95

BLOG: *Read Joel Moskowitz's blog (owner of Tools for Working Wood) at popularwoodworking.com/jun10.*

But vintage spoons are hard to come by – even on the secondary market. As I write this, there's nary a one on eBay – probably because these tools were made of thin tin, and not very sturdy. They weren't built to last, and they didn't.

But now, Tools for Working Wood is offering new glue spoons that look and feel like what you'd find in an 18th- or 19th-century joiner's shop.

These spoons are handmade in the United States from sheet steel by a traditional craftsperson, and have a hollow handle that cuts down on the weight – and the cost. The seams are soldered, and after fabrication, each spoon is treated to a hot dip tin bath – the forerunner of electroplating. This protects the steel from rust.

It takes a few practice runs to figure out the speed at which one should move the spoon, and to get used to adjusting the angle as the quantity of glue in the bowl diminishes (the viscosity of the glue has an effect here; your technique may vary from use to use).

I left the used spoon sitting alongside the pot as I clamped up a panel, and the glue quickly gelled. But when I stuck the spoon back in the pot for a few minutes, the hardened stuff melted back into usable product. Still, I'd clean the spoon with hot water after each glue-up session; you don't want a stinky glue spoon. **PWM**

— Megan Fitzpatrick

BY GEORGE R. WALKER

Mouldings Emphasize A Form

Multiple surfaces show play of light and shadow.

Many mouldings. *Mouldings come in a wide array and play an important role in furniture design.*

Time was when I thought mouldings were handy for covering up mistakes at the workbench. I used a mallet and clamps to force ill-fitting joints together – then held my breath while I'd slathered glue, tightened screws and finally covered the unseemly mess with a run of mouldings. Those days are long gone. Complicated glue-ups can still be nerve-racking but my joinery skills have improved and pressing joints together with brute force is behind me now.

Still, nothing could be further from the truth than thinking of mouldings functioning as camouflage. It's true they often transition one element to another so they naturally cover gaps between cases and furniture parts.

Yet the real purpose of mouldings is to emphasize rather than hide. One of the definitions of emphasize is "sharpness or vividness of outline." In furniture design terms, this means mouldings function primarily to emphasize the underlying form that anchors a design. They accomplish this dramatically by exploiting the reflective properties of convex and concave surfaces to form a border element with strong parallel bands of light and shadow. This visual effect can help our eye take in a form from a distance whether it's a building seen from across a town square, a fireplace across a room or a cabinet gracing a study.

Mouldings are traditionally used to elevate an important focal point like a door, window or cabinet. Knowing that mouldings emphasize a form begs a few important questions. How much emphasis is needed? How much is too much? If you don't use enough, a design can look weak—like a wooden refrigerator or appliance. Too much and it can be overpowering and garish. Something as simple as a crown moulding can lend a presence to a design, giving it character and a voice.

Size a Crown Moulding

Let's size a crown moulding for a large cabinet that is 90" in height. When we are discussing emphasis, regardless of the actual moulding profiles selected, the overall height and extension will have the greatest impact on the look and feel, especially when viewed from a distance. For that reason, I like to establish that height envelope first. It also helps to consider the room setting the piece is intended for.

My goal is always to harmonize and complement the larger interior space. A room with modern or industrial decor may call for sleek uninterrupted surfaces that shy away from the

A statement. *The mouldings surrounding this door make it plain to all that it is an important entry.*

Attraction. *Mouldings help your eye take in a form from a distance. They work equally well on buildings and furniture.*

LEAD PHOTO & DOOR PHOTO BY LIE-NIELSEN TOOLWORKS; REMAINING PHOTOS & ILLUSTRATIONS BY THE AUTHOR

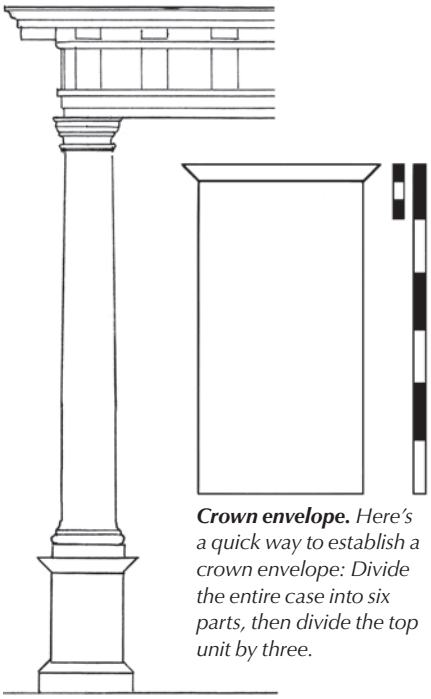
use of mouldings. But if you think of mouldings as emphasizing forms, a simple restrained application, even in a modern setting, can be stunning. If you cannot bring yourself to apply a crown moulding on a modern piece you may consider crowning your work with a border of contrasting color approximately the same height as a crown moulding. You still are using a border element to emphasize a form but are relying on color rather than light and shadow to achieve emphasis.

At the other end of the spectrum is a traditional space that may already have striking architectural mouldings in place on walls, windows and doors. That calls for a much bolder approach.

The Classic Orders as a Starting Point

Traditionally, artisans used the proportions from a classic order to size a crown moulding. A classic order is an architectural form used in the construction of temples in ancient Greece and Rome. An order consists of a column and the support structure above it called an entablature. At the top of the order is a cornice that corresponds with a crown moulding on a wall or cabinet. Proportionally, the cornice is linked to the overall height of the order.

A crown moulding should likewise be proportioned to the overall height of the cabinet below it. There are proportions associated with each order for sizing a crown moulding, but a quick way to get a generic envelope to start with is to divide the overall height of the case into six parts, then divide the top unit into three parts. That top third is your crown.

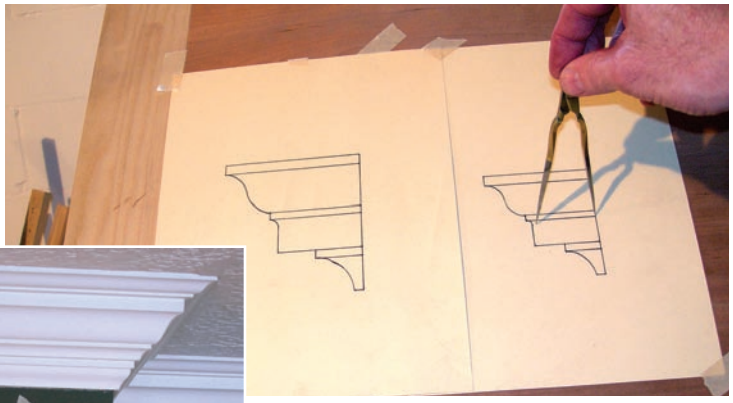


Crown envelope. *Here's a quick way to establish a crown envelope: Divide the entire case into six parts, then divide the top unit by three.*

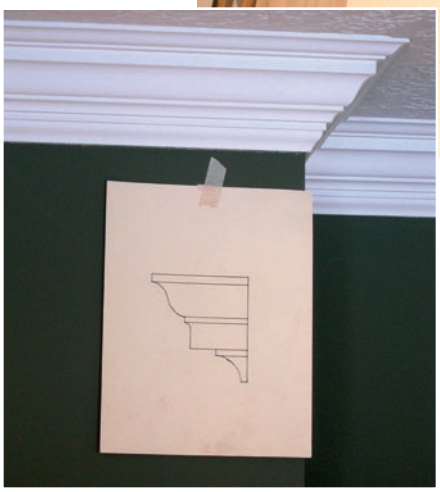
Classic roots. *The cornice on a classic order is the original inspiration for crown mouldings used on furniture.*

These divisions give you 1/18th of the overall height. In this instance, a 90"-tall case nets a 5"-tall crown. Think of this as the upper end of the range that will produce a very bold architectural feel. If you examine crown mouldings on historical work you often see them sized smaller than this upper range. An architect explained to me that I should think about it the same way you may vary your voice in different situations. We use a strong voice when addressing an audience in a large theater, and a much quieter voice when speaking one-on-one in a small room. Likewise, designers might use bolder mouldings on a building meant to be viewed from a distance and tone it down significantly when used on a cabinet in a dining room.

Work up your design using this upper end as a starting point. This is a good scale to work through possible combinations of shapes to arrive at the finished profile. Generally, you want a crown to have a dominant concave shape very near the top of the profile. A concave shape such as a cove or cyma recta places a shadow line next to the top, which emphasizes the border. Once you've settled on a profile, feel free to ratchet it down to suit your eye. It's helpful to reduce it by simple increments such as 1/4, 1/3, even 1/2.



Scale. *After you settle on a profile, feel free to scale it smaller, in this case by a fourth.*



Moulding swatch. *Tape your moulding profile on the wall like you might with a paint swatch – it's a great way to visualize the finished look.*

I'm not one for making full-scale drawings of furniture projects, but one practice I find helpful is to make some full-scale drawings of the crown moulding profiles then tape them to the wall at the height they will be located. My wife and I look at them for a few days to help decide on the scale that works for us.

Now that you have an idea about how a crown should be proportioned, take note of how the crown mouldings are sized on other furniture pieces. This can also help you develop your eye so you can tackle design tasks like this with greater confidence. **PWM**

George is the author of the DVDs "Unlocking the Secrets of Traditional Design" and "Unlocking the Secrets of Design: Moldings" both from Lie-Nielsen Toolworks (lie-nielsen.com).

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About This Column

If you have a thirst to hone your creative skills, Design Matters dives into the basics of proportions, forms, contrast and composition to give you the skill to tackle furniture design challenges with confidence.

BY PETER FOLLANSBEE

A 1600s Joiner's Tool Kit

Period inventories offer a tantalizing glimpse – but not the complete story.

A typical kit? *The few surviving period tool inventories don't tell the entire story, but here's what I think of as the core of a typical joiner's tool kit in the 1600s (clockwise from left): a set of gouges, a fore plane, smoothing plane, a mortise chisel, marking gauge and mallet, a hatchet, a holdfast and a square.*

Seventeenth-century joiners made furniture in a style quite different from what came later. Their work relied almost entirely on frame-and-panel construction featuring mortise-and-tenon joinery. Nails played a big part as well.

As their furniture is different from later-period work, so in some details are their tool kits. Eighteenth- and 19th-century cabinetmakers' shops and tool kits are relatively well-documented; A.J. Roubo, Denis Diderot, Peter Nicholson and others published works detailing the craft of their day. These periods are well-represented not only by these published works, but also by surviving tools. This is generally not the case for the 17th-century joiners' shops.

When I want to know what tools a 17th-century joiner had and/or used, there are several directions to turn. None of them tells the whole story, so they need to all be studied. The exercise becomes a multi-layered jigsaw puzzle, trying to fit all the pieces together from multiple sources. There are always gaps that I try to fill with educated guesses.

First, there are probate records that often itemize a person's belongings at the time of death. Ideally for my purposes, I want a joiner who died in the prime of life; older men sometimes had stopped their trade, and had already given away their tools to sons or apprentices.

John Scottow, Joiner

John Scottow of Boston seems a perfect example, having died in 1678 at age 34. Fully outfitted as joiner, he had a great deal of stylish furniture in his house and shop. His probate inventory also included: "Boards, planks, timber & Joyners tooles" valued at £20 6s 5d. Twenty pounds was a lot of money, close to a years' worth of wages. But what tools? Ahh, for details.

His father, Thomas Scottow, was also a joiner; he died in 1661 at age 46, so it's likely he was still working. His tools were itemized somewhat; in the cellar were a "lathe and six turning tooles" showing that the elder Scottow was equipped to perform his own turned work. In the yard he had "A prcell (parcel) of wood" at £2; "A prcll of bolts & pannells &c" worth £1. "Bolts" are split sections, ready for processing into stock. The shop contained the following tools:

25 plaines, £1 ?s; One long saw 3 hand sawes 12s; A paire of compasses 3s; 3 augers 3s; 2 hold fasts 5s; 3 benches 12s; 25 chissells, files, & other tooles 12s; 2 Axes & a frow 8s; 6 chissels & other working tooles & lumber 10s; Boards £1-10.

Not what you would call a fully equipped and inventoried shop.

But what about the phrases "other working tooles" and "Other tooles?" Even the term "lumber" could be tools; in this period "lumber" is random stuff, not piles of wood. The 25 planes are frustrating – if only a joiner had taken this inventory, and itemized the planes. To do joined work, one of them would have to be a plow plane, sometimes called a "grooving" plane. This tool cuts the grooves in the edges of the joined frames, into which the feathered panel is captured.

Carving. *Carved decoration is ubiquitous on 17th-century pieces, so we know the joiners had a set of carving gouges and mallets, also compasses, a square and an awl.*

PHOTOS BY THE AUTHOR

John Thorp, Carpenter

In Plymouth Colony, to the south of Boston, a carpenter named John Thorp died in 1633, not long after arriving in the New World. His tools were itemized and valued:

1 Great gouge, 6d; one gr brush & 1 little brush at 10d; 1 square 2s; one hatchet 2s; One Square 2s-6d; 1 short 2 handsaw 2s; A broade Axe 2s; An holdfast 1s6d; A handsaw 2s; 3 broade chisels 1s6d; 2 gowges & 2 narrow chisels 1s; 3 Augers Inch & ½ 1s; 1 great auger 1s4d; inboring plaines 4s; 1 Joynter plaine 1s6d; 1 foreplaine; A smoothing plaine; 1 halferound plaine 1s; An Addes 2s6d; a felling Axe.

It's the "inboring" planes in particular that are interesting to someone studying joinery. The value of these un-numbered planes exceeds any other listing in the inventory. Thorp had a fore plane, smoothing plane and jointer as well as a "half-round" plane (what we would now call a "round" plane, i.e. a moulding plane). The "inboring" planes are also moulding planes, sometimes called "creasing" planes in this period. If he was doing joined work, perhaps his plow plane was among these moulding planes.

Otherwise, Thorp is pretty well-equipped. He lacks a brace and bits, or "wimble" as it's called in that time. But saws, hatchets, chisels and gouges are all accounted for. The workbench is not listed, but a holdfast is. There's no need for a holdfast if you have no bench. Often things like benches and lathes don't get listed, being considered fixtures in the building.

Consider the Work as Evidence

The best place to see what tools a craftsman had is on the furniture he built. The tool marks evident on surviving 17th-century furniture reveal a lot about the work habits and tools of the joiner. He laid his mortise-and-tenon joints out with an awl, square and marking gauge or mortise gauge. The stock was riven, or split, from the log, thus he had wedges, a "beetle" (a large wooden maul, bound with iron rings at each end of the head to prevent splitting) and a froe to further split the stock. Add to that a hatchet and planes to work them after riving, and a plow plane to cut the grooves the bottom of the chest sits in. Saws, chisels and a mallet to cut joints, and a brace and bit for boring holes, round out the collection.

Even a finished surface has a lot to tell about the tools used to produce it. Carved decoration clearly requires a set of carving tools, but how large or small a set? Careful study of the shapes can often reveal the number of different gouges and chisels used to cut a design. Often you can see the layout lines, or sections of them, as well. These are struck with an awl, square, marking gauge and a "pair of compasses."

Riving. *Panels were riven, or split, from logs using wedges and a "beetle," then a froe struck with a club as shown above.*

Hewing. *Riven boards were further refined in thickness by hewing them with a hatchet. The tool marks are quite evident on period furniture.*

A Small Pool of Printed Evidence

Another avenue to tread is the printed works on joinery. This is a short road. Joseph Moxon's "Mechanick Exercises or the Doctrine of Handyworks" (1678-1683) is perhaps the best-known. I always refer as well to Randle Holme's "Academy of Armory and Blazon" (1688). Holme's work is less well-known, but covers a much wider swath of woodworking than Moxon does. Both men probably had seen or even had a copy of Andres Felebien's "Principles des Architecture" (Paris, 1676). A translation of Felebien's work has not been published, but his plates are sometimes seen in comparison to Moxon's. (This often does not play well for Moxon, but it's unfair to judge him by modern standards regarding plagiarism.)

Surviving tools that are datable to the 17th century are rare. There is a collection of tools in Skokloster castle in Sweden. Included are lathes and turning tools and also a large collection of Dutch planes; all of these were made for Carl Gustav Wrangel in the mid-1660s. These tools have been published a few times, but all in all are understudied, considering their importance. An earlier bookend of surviving tools is the collection of various carpenter's tools from the 1545 shipwreck *Mary Rose*, now housed in its own museum in Portsmouth, England. These are extremely useful for studying early forms of planes, braces, chalkline reels, etc.

But I have yet to find the Rosetta Stone of 17th-century joiner tools, if there is one. The story of these joiners' tool kits must be unraveled bit-by-bit, and worked piecemeal from many directions.

For practical reasons, my shop is outfitted with a mixture of handmade tools and 19th- and 20th-century examples. The tools include wedges and a froe, measuring and marking tools such as gauges, squares, ruler and awl. Bench fittings are few – just some holdfasts and a bench hook.

A joiner's hatchet is followed by a fore plane, smooth plane, jointer and plow plane. A couple of saws, about half a dozen carving gouges, mortise and paring chisels, and a brace and bit round out the basic set of tools required. **PWM**

Peter is the joiner at Plimoth Plantation in Plymouth, Mass., a non-profit museum at which visitors can learn about the experiences of the Wampanoag people and the Colonial English community of the 1600s.

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BY LAURA ANN ARNOLD

A Picnic Of a Build

This simple table is at home in the dining room – or outdoors.

Urban chic. *This pine table is destined for the dining room – but throw on a coat of spar varnish or exterior paint (or use pressure-treated lumber), and it will serve well on the deck, too.*

This table is a picnic to build with dimensional lumber, screws and bolts.

I'm usually not intimidated by undertaking projects. We need some artwork for the new apartment? I can paint some vivid, abstract oil paintings. Hair is not the way I wanted it? I'll trim it. Not the right color? I'll dye it. Shirt too loose? Hand-stitch it. We need a dining room table? Well … I'll drive us to Ikea.

The odd thing was, I shouldn't have been intimidated about making something. I'm not a fan of measurements, but I can use them when necessary. Making a picnic table is a large project, true, but it wasn't the size – or the numbers – that was intimidating.

It was the saws. And the splinters. What if I cut off a finger? What if I drilled through my palm like some sort of nightmarish woodshop stigmata scene? After telling my irrational and oddly descriptive fears to step aside, my husband, David, and I stepped into the *Popular Woodworking Magazine* shop. We went over some safety tips, reviewed the design for the table and got to work.

Ends are the beginning. *Make the two end assemblies first. Then attach the top and diagonal braces.*

Spaced out. *Use shims to space out your top boards. When the top looks good, screw it down.*

The miter saw was the hardest thing for me to get over. Sure it looks innocent, but the idea of pulling the sharp, quickly rotating blade down and toward myself seemed foolish, if not downright dangerous. I discovered that the key was to go slow. Not only did this make it easier and give me more control, it also made for a much cleaner cut.

Making the Cuts

This picnic table is going to be our dining room table. After painting it black, I covered the tabletop with my favorite food and beer memorabilia I've collected as a food blogger, mostly six-pack covers. Then, to protect the stuff, we covered the tabletop with some thin Plexiglas. It looks great.

However, you might have different plans for your picnic table. Say, a picnic perhaps? In that case you'll want to purchase pressure-treated pine or a rot-resistant species, such as redwood (pricey!) or white oak (still pricey). We used white pine, which was cheap. You can use white pine as well, as long as you paint the table and maintain the paint job. Our table is going to live a long, cushy table life indoors.

The table requires about a dozen 2x6x8s, some $2\frac{1}{2}$" screws and some hex-head bolts,

LEAD PHOTO BY AL PARRISH; STEP PHOTOS BY CHRISTOPHER SCHWARZ; ILLUSTRATIONS BY ROBERT W. LANG

washers and matching nuts. Oh, and you'll need a long afternoon or a few friends. I brought the beer – for after the work was done. Don't drink and drill.

Odd Angle; Easy Cuts

To begin, pick out the six best 2x6s for the top and set them aside. Pick out the stock for your legs and set your miter saw's table to cut a 22.5° angle. Lock it there. Cut your legs to length (use a stop-block to make sure they're all the same size).

Design-wise, the table is better too short than too tall, especially if one of the members of your family is petite, like me. David is 6' plus and I'm 5'2" on a good day. It is easier for him adjust to a shorter table than for me to constantly strain upward. Now cut the bottom braces and top braces to length – they are identical and each end is cut at 22.5°.

After that, arrange each end assembly on your bench or garage floor. Place the legs so they touch at the top. Position the lower brace so the ends are flush to the legs and the legs touch at the top. Bolt the lower brace to the legs for each end assembly. Following that, place the top brace in place. Center it on legs and bolt it as well.

To make the narrower top cleats and diagonal braces, you'll need to rip one of your 2x6s. Once you rip it to width, cut the ends to 22.5° on the miter saw. Glue and screw one narrow cleat to the top of each leg assembly. You'll have two narrow cleats left.

Attach the Top

To attach the top pieces, balance your end assemblies on the floor and space them 63" apart. Put clamps on the feet to stabilize them. Space the top pieces out on top of the legs. When they look good, screw them down. Flip (easy now) the whole assembled thing over so the feet are sticking in the air like road kill.

Now cut your diagonal braces. These have a 45° angle on each end. Set your miter saw to 45° and cut them to length. Then fit them between the end assemblies and top. When they fit, screw the two narrower top cleats (remember those?) to the underside of the top. Then screw each diagonal brace to each narrow top cleat.

Two Bolts for Strength

To ensure your picnic table lasts, you should bolt the diagonal brace to the end assembly. We used 1/2" x 4" hex-head bolts with washers and nuts. Drill a 1/2" clearance hole through each lower brace and through the diagonal brace (have a friend hold the diagonal brace while you drill the hole).

Now you need to cut a square notch in the diagonal brace so the washer and bolt have a flat area to sit on. Cut the notch with a handsaw and tighten the bolts.

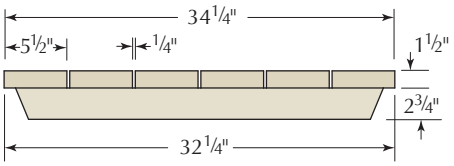
Dessert

Almost done! The last few steps are just sanding and finishing. Be sure to break all the sharp edges using #120-grit sandpaper. If you are painting the picnic table, you can sand the entire project up to #120-grit and call it a day. If you are going to add some sort of clear finish (such as a deck stain), go up to #150 grit.

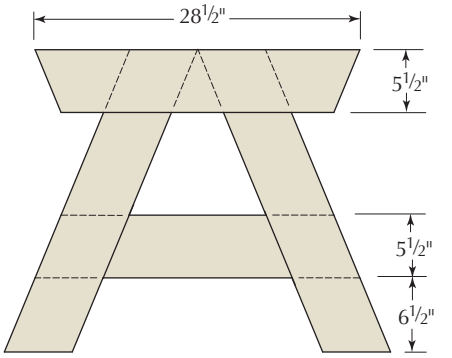
Though it was a big project, our rewards were great. I should not have been afraid of detatching any digits. In fact, the only injury I sustained throughout the entire project was a paper cut – from the wrapping on my chicken fingers when we broke for lunch.

Now we need some bookshelves for the apartment. I can do that! Let's get started. I'll man the miter saw. **PWM**

Laura (along with her husband, David) are the Cincinnati Nomerati – one of our favorite blogs in Cincinnati that covers food, beer and all other things tasty. Check it out at cincinnatinomerati.blogspot.com.



TOP PROFILE



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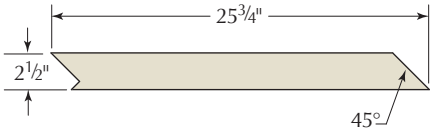

DIAGONAL BRACE

Supplies

- 2 ■ bolts, 1/2" x 4"
- 12 ■ bolts, 1/2" x 3"
- 14 ■ nuts, 1/2"
- 28 ■ washers, 1/2"
- 200 ■ screws, 2 1/2"

Picnic Table

	NO.	ITEM	DIMENSIONS (INCHES) T	W	L	COMMENTS
❑	6	Top pieces	1 1/2	5 1/2	8	
❑	4	Legs	1 1/2	5 1/2	28 11/16	22.5° ABE
❑	2	Upper braces	1 1/2	5 1/2	28 1/2	22.5° ABE
❑	4	Narrow upper cleats	1 1/2	2 3/4	32 1/4	22.5° ABE
❑	4	Lower braces	1 1/2	5 1/2	28 1/2	22.5° ABE
❑	2	Diagonal braces	1 1/2	2 1/2	25 3/4	45° ABE

* ABE: Angle Both Ends

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Queen Anne Dressing Table

BY GLEN D. HUEY

This period reproduction shouts 'high-style' on the outside, but the inside structure is all 'I Can Do That.'

Elegant and refined in appearance. *This dressing table speaks volumes of how furniture was built during the early 18th century. The lines are right, and the fit and finish is great, but that's all on the outside. The interior of the piece is quite different. Inside, it's simplistic, sparse and crude by today's standards. But it's also easy to reproduce and it works – at least the original has for nearly 250 years.*

At first glance, a novice woodworker might turn the page on this Philadelphia-style dressing table thinking that the craftsmanship is too difficult. But before you give up, scan these pages. The carcase is joined with mortise-and-tenon joinery and the interior is nailed together – exactly as it was done on the original.

And if you're a woodworker with more than a few projects under your belt, you'll be amazed at the quick-to-build, straightforward interior. In fact, you'll question how furniture was built in the past.

You've Got to be Kidding Me

When I first got a look at this dressing table (also known as a lowboy), the interior reminded me of a piece I had seen years before, a highboy from the estate of President John Adams.

With both pieces, I was amazed that such great-looking furniture could have so sparsely constructed interiors. How could they have survived for better than 250 years?

Many of the pieces from the 1700s had the outside surfaces built for show, but the hidden areas were often treated with less respect.

The highboy had drawer runners nailed to the case sides; one nail held the front in position while a second nail carried the load at the rear. This dressing table has an interior that's just as sparse. In all, 18 pieces make up the inside framework, and there isn't a mortise-and-tenon joint in the mix. Notches and nails are the joinery of choice, and it works.

Curvy Legs Without Lathes

Many cabriole legs have lathe-turned feet, but these legs have a trifid- or drake-foot design (the design resembles a three-toed, webbed foot). The legs are roughed out at a band saw, shaped with rasps and worked with carving tools, but the carving is minimal and can be accomplished with only two gouges.

To begin, produce a full-size copy of the leg pattern on a piece of Masonite – or anything stiff and able to withstand repeated uses.

Align your pattern to your leg stock, holding the back edge of the pattern flush with an edge of your stock. Trace the profile onto the stock. Rotate the leg 90°, keep the back edge of the pattern and the previous pattern aligned, then trace a profile onto the second face.

At the table saw, make a cut to define the knee/leg post transition point, then rough-cut the leg at the band saw. Begin at the foot and work your cut upward and into the table saw cut. Cut the back layout line, too.

Save the offcuts as you work. Then re-affixed them to the leg with hot-melt glue to facilitate cutting the second face.

When you're finished cutting the second face, the cabriole leg (after a couple quick hits with your mallet to break the glue bond)

LEAD PHOTO BY AL PARRISH, SHOT ON LOCATION AT THE KATE SCUDDER HOUSE, COURTESY OF THE BAKER HUNT ART & CULTURAL CENTER; REMAINING PHOTOS BY THE AUTHOR; ILLUSTRATIONS BY ROBERT W. LANG

springs from the leg stock ready to be shaped, smoothed and profiled.

A second band saw operation removes the waste material at the post area. Find the natural cutting angle for your saw and set a straight fence to that angle. Make the first cut with the knee against the band saw table and facing away from your fence. Then rotate your leg so the back two edges of the leg post are aligned in the fence-to-table corner.

Three Steps to a Perfect Profile

Handwork profiles the legs. A rasp is the best tool for the job. The first step is to round the ankle. As you work the ankle, wrap your index finger and thumb around it to evaluate the shape. When it feels round, move on.

The second step is to transition from a round at the ankle to a square at the lower edge of the knee. Work a flat area on one corner of the leg at a time while holding your rasp at a 45° angle to that corner. As you work from the knee toward the ankle, the flat area becomes wider until it blends into the ankle area. Roll the flat areas to the adjacent faces. Rounding is significant near the ankle and lighter as you reach the knee. Round the four leg faces.

The third step in shaping the legs is at the knee. The knee of this dressing table is quite rounded. Use your rasp held at a 45° angle to the front corner to flatten a 3/8" area as shown in the top right photo on the next page. Follow that by rounding the area to the adjacent faces as you did below the knee.

Shape the Trifid

To shape the foot, begin to flatten and roll the foot's top to flow into the ankle. This can be a lot of handwork, or it becomes quick work with the use of a spindle sander.

Work the top toe-first into the sander. Continue to level the point that remains from the band saw cuts and push back toward the ankle as you sand. After a gentle curve into the ankle is established, roll the foot, sanding from side to side. The resulting shape curves into the ankle as it gently rolls across the foot's top. Complete the foot-to-ankle transition by flowing the two elements together.

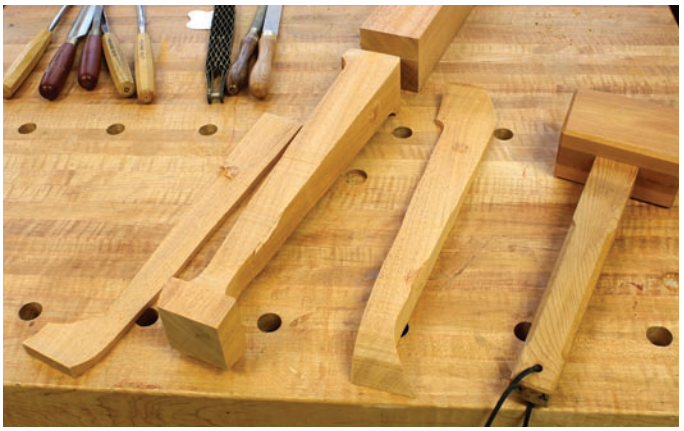
Trace the shape of the foot onto the foot's bottom. Point the toe toward the front with the rounded back at the heel. Use a rasp to remove any waste area around the outer edge, then use a carving gouge to create the two toes.

Where the foot layout meets the rounded foot profile, use a square to establish straight lines up the foot's edge. Carefully excavate the area between those lines with a #9 sweep, 10mm-wide gouge (or other similar tool) . As you carve, work with the grain. This might require a change in carving direction.

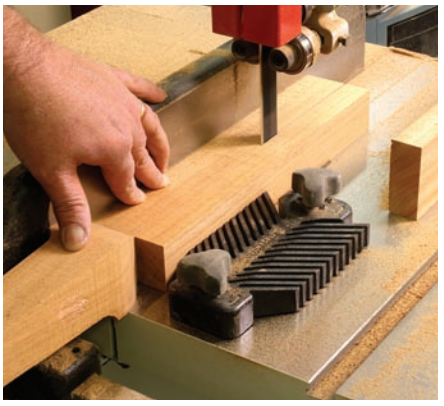
Many furniture legs had an unadorned trifid design, so the ankle flutes are optional.

Proper layout. *Keep the back edges of the pattern together for a properly sized post block and leg profile.*

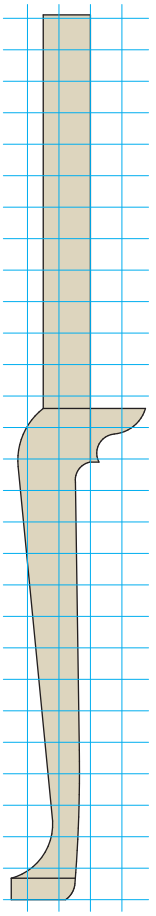
A defining time. *Set the blade height to reach the post block and cut to define the knee/post intersection. Rotate the piece 90° and cut again to define the second face.*



All squared up. *After the band saw operations are complete, knock the reattached pieces from the blank to expose the ready-to-shape cabriole leg.*



Keep the task easy. *Cutting in the proper sequence allows you to trim the waste from the post block without special setups or jigs.*

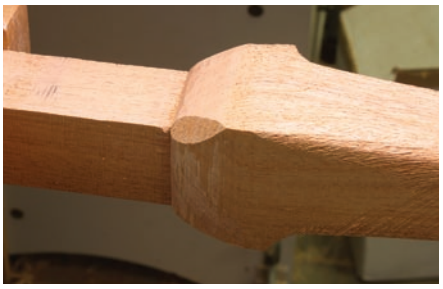


1 grid square = 1"

LEG PATTERN

Shaping begins. *After you establish a round ankle, shape the sharp corners of the leg for a smooth transition. Flatten the corners, then round the edges.*

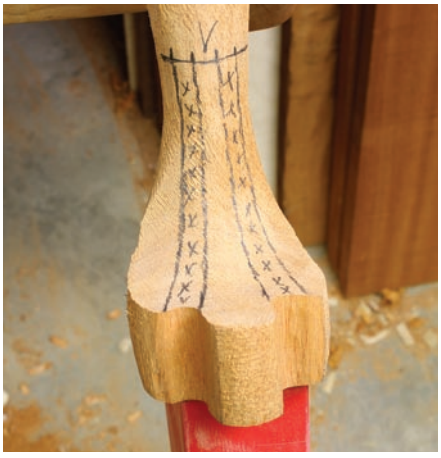
If you choose to flute your legs, mark a line on the ankle 3 1/2" up from the foot bottom. At the midpoint across the leg, center a 1/4" layout area that's flanked by two additional 1/4"-wide areas. As shown in the bottom left photo, sketch lines from those 1/4" spaces to the excavated toe area on the foot. This is the area to flute.



Soften the knee. *The top of the knee is also rounded. Rasp a 45° angle then transition the sides for a smoothed profile.*

A place for power. *Hand tools could shape the top of the foot, but you'll spend a lot of time working the end grain. A spindle sander quickens the work as you roll the area into the ankle.*

This little piggy. *A carving gouge allows you to easily form the trifid toes. A round file is another option.*



Best by eye. *Layout of the flute area is key. Bending a straightedge into the curve just doesn't work – the lines appear bent. The best way to get a pleasing layout is to rely on your eye.*

Crooked tool, not crooked lines. *A bent gouge provides leverage as you carve the flutes. And the curved portion closely matches the roll from the foot to the ankle.*

Hold your leg in a clamp that's secured in a vise. With the foot positioned closest to you, carve the flutes with a #8 sweep, 7mm-wide bent gouge. The flutes enter at the ankle then gradually deepen as they progress toward the foot. Because the grain on the top of the foot is end grain, it's best to carve upward from the foot, but some work will be from the ankle down. The flutes should match from foot to foot, so work to a consistent depth and width. And if you veer off course as you carve, don't panic. Further shaping of the foot and ankle, albeit very light shaping, can resolve small differences.

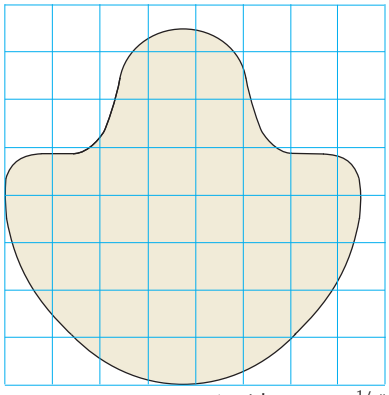
Is This Joinery Difficult?

The dressing table's most difficult joinery is how the rails and panels join to the legs, and it's very basic. Dovetails attach the top rail to the legs, and mortise-and-tenon joints complete the joinery. The construction and fit of the rails and apron are straightforward. However, you may find different techniques used with the panels. And how the intricate designs are developed should make you smile.

Lay out and cut the leg mortises for the panels, the middle rail and the front apron. The 1/4"-wide mortises are cut to a depth of 7/8". Plan for a 1/4" edge shoulder on the rail and apron. The panels have 1/2" edge shoulders with 1" of spacing between the three tenons.

The top rail is dovetailed on both ends to fit into sockets cut in the top of the front legs. Lay out the sockets (leave a 1/4" of material at the edges), define the area with a saw then hog out the bulk of the waste with a Forstner bit. What's left is easy to trim with chisels.

Use a marking gauge to set the length for the dovetail on your top rail. Invert a front leg and position it on the rail – make sure to orient the leg correctly. Reach deep into the dovetail



1 grid square = 1/4"

FOOT PATTERN

With a little support. *To mortise a leg, use a scrap to raise the knee off the table, locate the mortise from the inside of the post and leave the front material thick. It's better to bring the post surfaces flush to your panels.*

One long tongue. *A fence extension is a must with table-saw-cut tenons. Also make sure your saw's throat insert supports the material.*

A full strike. *Extend the layout lines fully across both faces of the apron, set the blade height above the apron thickness and use a square to locate where the cut begins on the fence. Rip your apron until the two lines meet. This prevents over-cutting the layout lines.*

socket to transfer the layout, then remove the waste and fit the tail into the socket. Repeat the process for the opposite leg.

Tenons for the back and side panels are made at a table saw. Set the blade height to 1/4" and set the fence to form a 3/4"-long tenon. Lay the panels flat to the table and pass them over the blade to make the face shoulder cuts – four passes for each panel. Create the rail and apron tenons with help from a miter gauge.

Next, raise the blade to 3/4", add a fence extension and adjust the fence to leave a 1/4"-thick tenon on the panel ends. Set the fence so the offcuts fall to the outside of your cut, as shown in the center photo above.

Complete the tenons on the rail and apron the same way, using a tenon jig as you cut. Form the tenons on the apron at full width. Trim the tenons as they are fit to the legs.

The apron is cut to create the 1 3/4" offset in the second bank of drawers. Draw lines across the entire width of the apron at the exact location of the offset – 9 1/4" centered in the apron. Adjust the blade height then use a miter gauge to cut just on the waste of your lines.

The second cut on the apron is a rip cut. Raise the blade beyond the thickness of your apron and use a square to mark where the cut begins as it moves below the table's top. Transfer that line to your fence and do not change the blade height.

Set the fence so there's 2 1/4" between the fence and blade. Cut the apron until the line on your workpiece aligns with the mark on the fence. At that point stop the cut, let the blade come to a stop and remove the apron. (The waste material is still attached to the apron.) Flip the apron end for end to make the second rip for the opposite drawer area. Use a handsaw or jigsaw to complete the cuts.

Complicated Designs Made Simple

Patterns and pattern bits make intricate designs a snap to shape. Reproduce the apron design (half the total pattern) and the side panel detail. Stick these patterns to Masonite and shape the designs using a band saw and a spindle sander for the rough work. Tighten up the designs with files and rasps. The final design transfers directly to your apron, so keep the designs crisp.

Work the designs on the side panels first – these are not as complicated as the apron, and you'll get a feel for the router and how to work.

Chuck a 1/2" pattern bit into your router – it's best to use a trim router because of its small size – and set the bearing to rub against your pattern. Use standard routing operations (cut left to right) to shape the left-hand portion leading to the center drop and when cutting the right side of the drop design. The left side of the drop should be routed with a climb cut, as should the right-hand sweeping curve.

The apron profile is a bit more complicated, but is routed the same way. It's best to work slowly and cautiously even if you burn the profile. It's easier to clean the finished edge than it is to produce a second apron.

Before removing the patterns, use a chisel to shape the fine details into the apron. Your pattern guides the chisel as you tighten up the design.

"When you do common things in life in an uncommon way, you will command the attention of the world."

— George Washington Carver (1864 – 1943)
educator, inventor, agricultural chemist

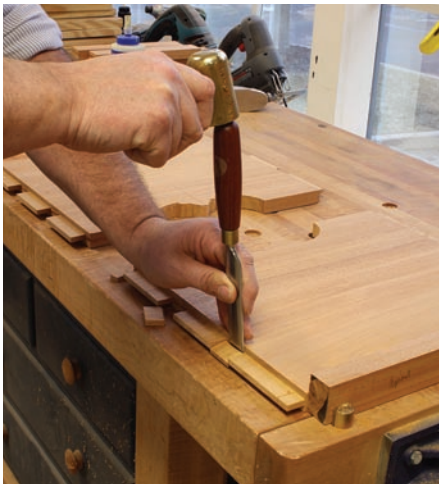
A Case Assembly Warning

Before the case is assembled, finish the tenons on the back and side panels. Position the panel to the leg while holding the top edge of the panels flush with the top of the legs. Use a pencil to transfer the mortise locations onto the tenons, square the lines across the tenons and make the cuts with your handsaw.

You could remove the end and shoulder waste with a saw, but I find it better to remove

Three easy steps. *To create the design on the apron and side panels, trace the profile onto the workpiece and band saw away the waste material. Attach the pattern with double-stick tape before routing. Pay attention to grain direction and work downhill.*

No-frills accuracy. *The most accurate way to locate the tenons on the panels is to mark directly from the leg mortises.*



Easy extrication. *After the tenon edges are sawn, removal of the waste material is simple with your chisel. A 2° back-cut ensures there's nothing to impede the joint fit.*

Fragile work area. *Prior to the addition of the vertical dividers, the apron is weak and prone to break during a high-spirited case assembly. Take precautions.*

this and the waste between the tenons with a chisel. Work from both faces to meet at the middle, and with a slight back-cut to ensure that your joints close tightly.

Clean up the inside of the panels and the leg post area, apply glue in the mortises and on the tenons then assemble the sides of the dressing table. Add clamps and set the assemblies aside. Be sure to clean any interior glue squeeze-out – dried glue interferes with the installation of the drawer runners.

After the glue dries, complete the case assembly. There is a specific order that needs to be followed: Work with one side assembly at a time; the last rail installed is the top rail as the tails slide into the sockets.

Brush glue in the mortises then slide the back, middle rail and apron into position after a thin layer of glue is applied to the tenons. With one side installed, repeat the glue work and position the second side assembly.

And here is the warning: Clamping the back is routine, but when you clamp the front, if the pressure of the clamp is severe, it's possible for the short grain area of the apron – the area just at the offset for the drawers – to snap. Take a look at the bottom left photo. Not only can you see the problem area, you'll see how to fend off the problem. Cut two pieces of scrap that fit the drawer openings exactly then position them into the openings as you clamp the front. Stick the top rail in place, check for square and clean up any excess glue.

The two vertical dividers are cut from one block of material that's $1\frac{1}{2}$" thick and $6\frac{3}{4}$" long. The block should be at least $2\frac{1}{2}$" wide.

The idea is to notch the two ends and leave a 3" section that fits between the middle rail and apron. The fingers, formed as the pieces are notched, lip onto the rail and apron. Screws through the fingers connect the dividers.

Divide the divider. *Use a tenon jig to expose the fingers of the divider before you slice the block into two pieces. It's important to keep the center portion sized to accurately fit the drawer opening.*

Easy, peasy. *Mark the notches for the runners right off the case. It's precise and trouble-free.*

Nailed in place. *A pilot hole helps to prevent a split in the runners as the nails are driven.*

Absorb the blow. *A second hammer placed directly behind the nail allows you to attach the runners to the dividers without problems.*

The notches are made in a two-step process at the table saw – one cut with the piece flat to the table and a second with the piece held in a tenon jig. Each notch requires a different setup.

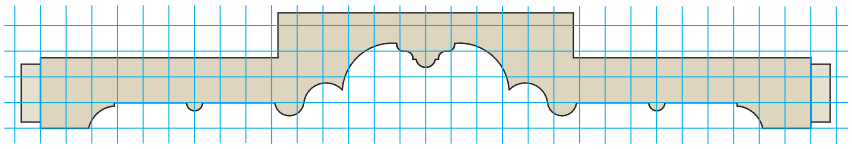
Add glue to the notches and clamp the vertical divider into position. After the glue dries, there's less of a chance for the wood to split as you install the screws to secure the dividers. Use three #8 x 1¼" woodscrews per divider.

Drawer Support: Notches & Nails

The interior workings of this dressing table are so easy. The vertical dividers support the drawer runners at the front; the support at the back are blocks that mirror the dividers. Use a framing square and a combination square to locate the blocks then glue and screw the pieces to the back panel.

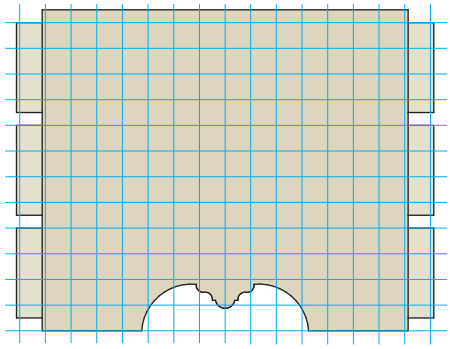
All eight of the drawer runners are the same length. The notches at the ends of the runners all match as well. So making the drawer runners is a breeze. For the length of the runners, measure the distance from the inside face of your apron to the inside face of the case back.

The runners have a ¾" surface on which the drawers ride. To determine the notch size, position a runner in the case and mark where



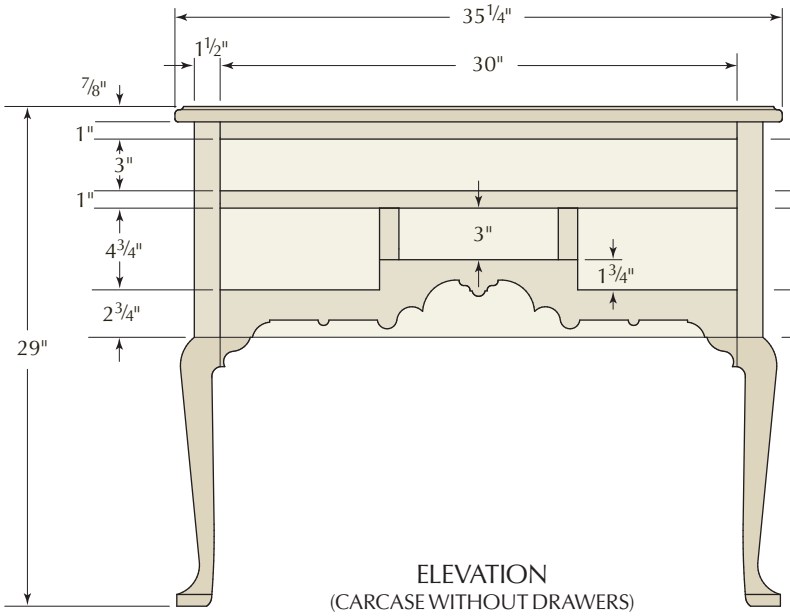
1 grid square = 1"

FRONT APRON PATTERN

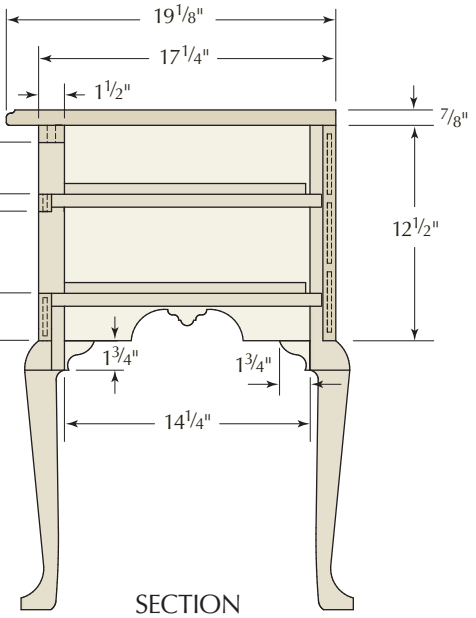


1 grid square = 1"

SIDE PANEL PATTERN



ELEVATION
(CARCASE WITHOUT DRAWERS)



SECTION

Work completed. *The interior workings of the lowboy wrap up with the drawer guides. Due to the confined area, spring clamps are the best option to hold the pieces as the glue dries.*

the runner meets the back edge of both the front and rear leg post.

Cut the notches then nail the runners in place. Hold the runners flush with the drawer openings at the front then use a square against the case front to level the pieces at the rear.

Drill pilot holes for the nails through the runner ends and orient the widest section of the nail with the grain direction.

While nailing into the legs is no worry, driving nails into the vertical dividers and the rear runner supports could be problematic. To drive those nails without trouble, use a second hammer opposite of where the blow is to strike to act as a backer for support. This, coupled with the glue and screws holding the pieces to the case, does the trick.

To wrap up the interior framework, install the drawer guides. Place a straightedge from leg to leg, or from divider to support, then strike a line along its edge. Cut the guides to size, add a thin bead of glue then position the pieces so they just cover your lines. Use spring clamps to hold the pieces until the glue sets, or secure the pieces with a couple 23-gauge pins.

Could the interior work be any easier?

Odds & Ends

Before moving on to the drawers, the dressing tabletop is milled to length and width, then the front corners are rounded to a 1" radius. The top edge is profiled with a classic ogee router bit. The bottom edge is profiled with a 3/16" roundover bit. The top is attached to the case with 7/8"-wide wooden clips notched to leave a 1/4" x 1/2" tongue.

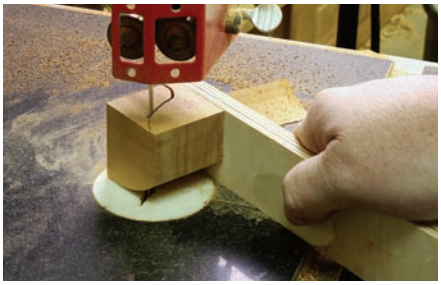
Cut 1/4" slots along the perimeter of the case. Cut two slots in each end, three along the back and three in the top rail. The slots are 1/2" down from the top edge of the case. I like a plate joiner for this step, but a 1/4" slot cutter works, as well. The tongue of each wooden clip fits into the slots and is screwed to the underside of the top through piloted and countersunk holes.

The knee blocks are milled to 1 3/4" square. Place a squared end against the underside of the apron or side and mark the cutoff point (just below the flat portion of the leg), then trace the knee profile onto the block. Remove the waste at the band saw, cutting to your line.

Trace the knee block profile on the back of the block, then cut the profile.

Smooth the knee block using a spindle sander. Work the lower edge of the block so that the curve in the leg continues into the block. When shaped, glue the block to the leg and secure the piece with spring clamps as the glue dries. After the clamps come off, trim the face with a chisel and smooth the transition with files and sandpaper.

Shapely transitions. *Knee blocks – profiled in a two-step process – smooth the transition from the legs to the apron or sides.*



Keep things safe. *Attach a knee block to a scrap piece – keep the screw out of the cut area – then cut the profile at your band saw.*

Distinctively English Drawers

Drawer slips are not a common feature found on American-built furniture, but they were used on the original dressing table.

Queen Anne Dressing Table

	NO.	ITEM	DIMENSIONS (INCHES) T	W	L	MATERIAL	COMMENTS
❑	4	Legs	2 1/4	2 1/4	28 1/4	Mahogany	
❑	1	Back panel	3/4	12 1/2	31 1/2	Yellow pine	3/4" tenon both ends
❑	2	Side panels	3/4	12 1/2	15 3/4	Mahogany	3/4" tenon both ends
❑	1	Top rail	1	1 1/2	31 1/2	Mahogany	3/4" dovetail both ends
❑	1	Middle rail	3/4	1	31 1/2	Mahogany	3/4" tenon both ends
❑	1	Apron	3/4	4 1/2	31 1/2	Mahogany	3/4" tenon both ends
❑	1	Vertical divider	1 1/2	2 1/2	6 3/4	Mahogany	Two pieces 1 1/8" wide
❑	2	Rear runner supports	3/4	1 1/8	6 3/4	Yellow pine	
❑	8	Drawer runners	3/4	1 3/8	15 3/4	Yellow pine	
❑	8	Drawer guides	5/8	5/8	14	Yellow pine	
❑	1	Top	7/8	19 1/8	35 1/4	Mahogany	
❑	6	Knee blocks	1 3/4	1 3/4	1 3/4	Mahogany	
❑	8	Drawer slips	3/4	3/4	16	Yellow pine	
❑	1	Center support slip	3/4	2	16	Yellow pine	
❑	10	Wood clips	3/4	7/8	2 1/4	Yellow pine	
DRAWER FRONTS							
❑	1	Top	3/4	3 1/4	30 5/8	Mahogany	3/8" lip three sides
❑	1	Center	3/4	3 1/4	9 7/8	Mahogany	3/8" lip three sides
❑	2	End	3/4	5	9 7/8	Mahogany	3/8" lip three sides

Supplies

Horton Brass Inc.
horton-brasses.com or 800-754-9127

- 5 ▸ Queen Anne chased brass pulls #HCH-41, call for pricing
- 1 ▸ escutcheon #HCH-41E, call for pricing
- 1 ▸ 1/4-lb. box of clout or shingle nails #N-7, call for pricing

What are drawer slips? Slips are an English drawer technique that craftsmen brought to the new world. The technique was not widely followed. The rational for slips is two-fold: to provide adequate support for drawer bottoms – which allows the maker to use thinner drawer sides – and to widen the drawer-to-runner bearing surface to slow the effects of wear.

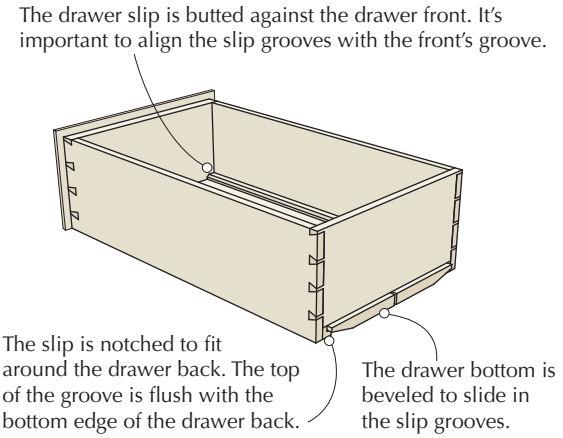
The lowboy drawer boxes are constructed with 18th-century techniques: half-blind dovetails at the front and through-dovetails at the back. Your half-blind dovetail joints should begin with a half tail at the bottom edge of the drawer front (a half-pin makes it difficult to cut the groove for the drawer bottom without partially slicing into the pins, which is seen in a completed drawer).

The slips are U-shaped channels attached to the interior bottom edge of the drawer sides. Instead of grooves in the sides for drawer bottoms, the bottoms slide into the slips. These slips run the entire length of the sides and are butted to the drawer fronts (although you may find examples with a slip attached to the drawer front). Also, the slips are notched to fit under the drawer back – the top of the groove is flush with the bottom edge of the drawer back.

Mill your slips to 3/4" square and make them slightly longer than the drawer sides. Plow a 1/4"-wide centered groove that runs the entire length. You could use a dado stack, but with only eight pieces to make it's easier to run two passes with a full-kerf blade.

The depth of your groove should be at least 1/4". Also, slips have the top edge beveled – the edge that's seen inside the drawer as it's opened. (This may be for looks, but I'm told it makes dusting the drawers easy.) Create the bevel with a router setup, at your table saw, or with a handplane, then cut one end square.

A surprise finding. *Use of drawer slips brought about an unexpected result. Along with the ability to use thinner drawer sides and an increased bearing surface, slips produce a very stout drawer box.*



With your drawer boxes assembled (don't forget the groove in the drawer front), position a slip to the drawer. Align the groove in the slip with the groove in the front and mark where the slip meets the back edge of the drawer back. That's your cut line. If your drawer sides are equal in length, all the slips can be batch cut, but if the drawers are significantly different, each slip should be measured in place then cut.

With the slips cut to length, the back ends need notches. This is best done accurately at a table saw. Set the blade height to 1/4", position the fence to remove the thickness of the drawer back then nibble away an end. Keep the fit to the drawer box snug. Glue the slip in place and use spring clamps to hold things until the glue sets.

With drawer slips, the drawer bottoms are quite thin. To keep the bottom rigid in a wide drawer, a center slip is used. That slip is profiled on both edges and tenoned into the groove in the drawer front. It's then notched for and nailed to the drawer back.

The drawer bottoms are milled to 7/16" in thickness with the grain running from side to side, and are cut to fit into the slip grooves. On the underside of the bottom, the two ends and the front edge are beveled. A single nail holds the bottoms to the drawer backs.

The finish on the lowboy is Moser's Early American Cherry aniline dye and shellac. A coat of boiled linseed oil separates the two and one coat of dull-rubbed effect lacquer is applied on top of the shellac.

The chased hardware is period in design and a close copy to what's on the original.

You have to admit that most woodworkers, novice or experienced, can build this piece. In fact, in 250 years, woodworkers could be praising your lowboy while commenting on the simplistic construction techniques found on furniture built at the beginning of the 21st century. **PWM**

Glen is a senior editor of Popular Woodworking Magazine, *a published author, and teaches woodworking classes and seminars. Contact him at 513-531-2690 x11293 or glen.huey@fwmedia.com.*

Center support. *Due to the drawer bottoms being thin to fit into the slipped drawer boxes, furniture makers found it necessary to install added support in wide drawers.*

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VIDEO: *Glen explains a bit of history about drawer slips, and how they work.*

VIDEO: *Discover how to turn a block of wood into a Cabriole leg.*

BLOG: *Read more about shaping trifid feet.*

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Arts & Crafts Through-tenons

BY DALE BARNARD

Accurate work depends on three things: location, location and location.

One of my favorite Arts & Crafts details is the through-tenon at the top of a table, bookcase or chair. When I was considering adding a joinery class to my curriculum at the Barnard Woodworking School, I thought of this joint. I prefer teaching joinery techniques while making a simple project rather than practicing on scrap wood.

Most of the through-tenons in antique furniture are in chair arms where the wood movement isn't an issue because there is only one tenon in the board. It's when there are two tenons with side grain between them that it becomes an issue. If you look at a magazine stand or music stand you will see the sides of the cabinet have vertical grain, and the sides can be simply glued to the legs, long grain to long grain.

Another application of the through-tenons on legs is the "round top tabouret" or tea table, seen in the photo at right. Some versions of the original antiques didn't have the through-tenons on the top because they had hidden rails locking the tops of the legs in place.

I prefer to add the through-tenons to the top because it adds visual interest and communicates the satisfaction I get out of performing the feat. When I make these, I eliminate the hidden top rails; the bottom rails are sufficient to make the table strong and the legs will flex enough to allow the tenons to move with the top.

If you look at an old reproduction catalog of the Arts & Crafts furniture of the early 1900s you will see the through-tenon like this mainly on chair arms; the venerable Morris chair, many dining room arm chairs and several rocking chairs as well. We build a Grove Park

Arts & Crafts hallmark. *Four through-tenons in a single board is a joinery challenge. The small stool at right is a great way to practice with the two simple jigs and careful work needed to meet the challenge.*

LEAD PHOTOS BY AL PARRISH; STEP PHOTOS BY THE AUTHOR

Inn rocking chair in a class and it didn't have the through-tenon on its arms, until now. I added that feature to make the chair more interesting, and to add a challenge and a new technique for most students in the class.

A Project for Practice

I decided that a small stepstool with four through-tenons in the same board would be a bit of a challenge (and through-tenons are a common skill needed for more complex furniture), and it's a handy thing to have around your house – or to give away as a gift. I had some spalted quartered sycamore I'd been saving for something special, and this was it.

First, make a stable plywood jig with a square hole in the center the exact size of the square tenons, in this case 1¼". This jig will be used to accurately size the through-tenons and to duplicate the square holes or mortises in the top. One nice-fitting through-tenon is a challenge; four of them in the same board is a real test of workmanship.

Make up 1"-thick plywood by laminating two pieces of scrap ½" plywood together. Next, rip a 1¼"-wide strip out of the center. Take the strip and cut a 2" block from the approximate center, being careful to cut it square both ways. Now glue the plywood back together, turning the 2" block sideways so it spaces the distance between the two 1¼" strips at the same 1¼". This technique ensures the hole is the same size in both directions.

It is not illegal to edge-glue plywood because half of the plies are long-grain-to-long-grain. Now, while the plywood is drying, I'll tell you how I make my tenons for the legs.

These legs are 2" square. The 2" size is not critical. What is critical is that both measurements be the exact same size, and that they are square to one another. You may notice the quartersawn grain is on all four sides. I achieve this by gluing three pieces of 11/16"-thick lumber, then applying ⅛" veneer to the sides to cover the flat grain and the glue lines.

"... The impulse of the true craftsman is to love and properly treat the materials which lie nearest to his hand since they possess for him the endearing qualities of old and familiar acquaintanceship."

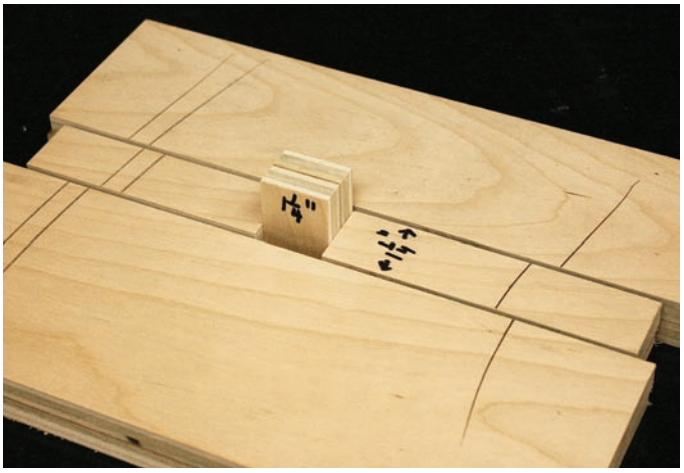
— Gustav Stickley (1858-1942)
craftsman

This is all done oversize to allow for jointing, planing and squaring, followed by a final planing. I use the same thickness setting on the planer for the final passes to ensure the uniform dimensions on the legs.

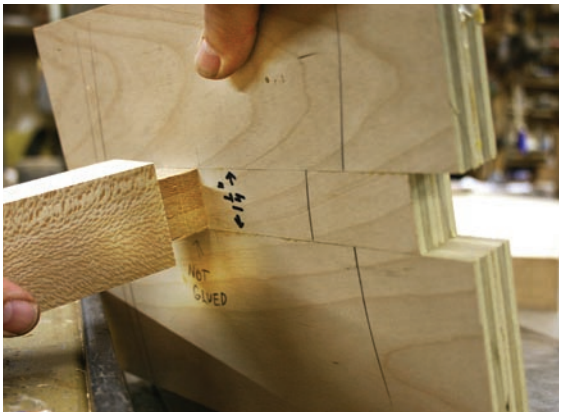
I usually make tenons on a table saw with a stack dado set and a crosscut jig. I set the fence to determine the length of the tenon at approximately ¼" longer than the thickness of the top. Making light cuts across all four sides, I slowly sneak up on the final size. Don't rely on measuring the square tenon; test-fit the tenon into the plywood jig.

Raise the dado stack in small amounts when you get close. Don't forget the amount you are trimming is actually doubled each time. When the tenon fits into the plywood jig nice and snug on all four sides, then go ahead and dado the tenons on the other three legs. All four should fit tightly into the plywood "mortise." This is not the only use for this jig, so don't toss it. It will be used later to guide the chisel when cutting the mortises (more information on this later).

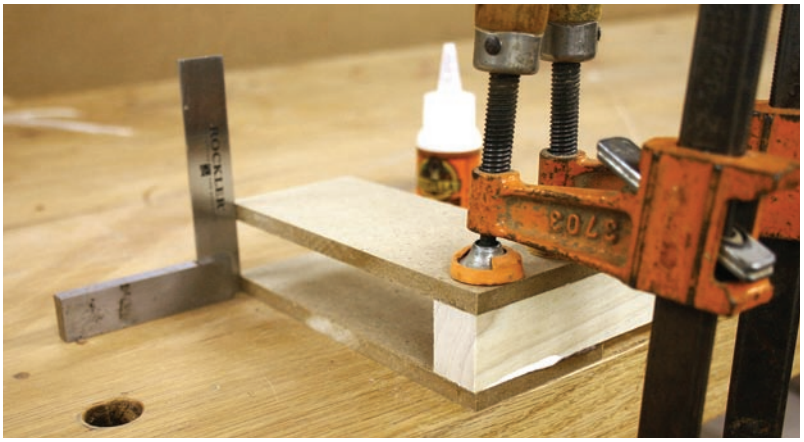
To cut the leg mortises for the through-tenons on the aprons of the stool, lay out the locations and mortise each one halfway through from each side, being careful to line



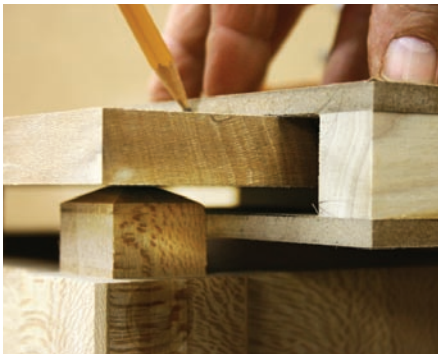
Cheap insurance. *The small block turned sideways fixes the same distance between the center strips as the width of the strips. Be sure not to glue the spacer block in place– but leave it there until the glue dries.*



Sneak up on it. *Slowly trim the tenon on the table saw until it just fits into the mortise pattern jig with slight hand pressure. Get this right because the final mortise in the top will fit exactly the same as the tenon fits into the jig.*



Both sides the same. *When gluing the marking jig it is critical that the sides are square and parallel to one another. After the glue dries I always check them and true them up on my edge sander, if needed.*



From here to there. *When marking the mortise location be sure the bottom "finger" is touching the tenon all along its side and mark all four sides on all four mortises, making sure that the top doesn't move.*

up the ends of each mortise. I make the tenons on aprons in a similar manner as above – at the table saw with a stack dado set.

The two shorter aprons of the stool have the grain running vertically. This is so the cross-grain wood movement matches the top, and the top can be glued in place. The long grain of the apron is against the long grain of the legs, so I simply edge glue them together.

Better Than Measuring

After gluing all the legs to their aprons we will deal with locating the four mortises into the top. Sometimes accurate measuring is sufficient; however in this case there are too many possibilities for mistakes (please don't ask me how I know this). I've designed a simple marking jig that will eliminate all measuring and most of the mistakes – provided it is made accurately.

Take two 1/4"-thick MDF or plywood pieces about 2 1/2" x 6" and a piece of hardwood 3/4" x 1" and about 5" long. Glue the MDF pieces on both sides of the hardwood so you have a U-shaped marking jig with a 1" space between the two legs of the U. Be careful to make all sides square and parallel to each other. Let the glue dry overnight before using the marking jig.

When the jig is ready, clamp the top board to the stepstool so that the clamps don't interfere with the marking jig. Slide the jig onto the top so the MDF is on the top and the bottom with an edge of the bottom piece snug against the side of the tenon. The MDF on the top is in the same plane as the bottom.

Use a sharp pencil to mark the top line. Repeat this process on all four sides of each tenon. Make sure the clamps don't allow the top to move at all, or you'll be sorry.

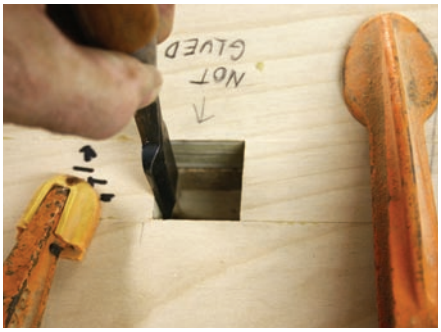
Before you take the top off, mark a corner so the top goes back in the same orientation as it was when marked. Use a mortise machine or a Forstner bit in a drill press to hog out the waste between the marks, staying about 1/32" or 1/16" to the inside. If you use drill bits to hog it out, go ahead and chisel out the mortise within 1/16" of the inside of your marks.

Same Jig, Different Function

Now for the fun part – put a piece of plywood or MDF on your bench to protect it. On top of this place the stepstool top with its rough mortises. On the top of that, place the 1"-thick plywood mortise pattern jig. You will need a light to see into the mortise and line up the jig with all four lines for the mortise.

Line up the square hole inside the 1" plywood pattern with the marks on the top as close as possible and clamp this whole assembly to the bench, using several clamps. They need to be tight enough to prevent the top from moving when pounding. Now, use a very sharp 3/4" chisel and hold the flat back of the chisel tight against the 1" plywood and snug

Get a good look. *Using a light to see into the hole ensures that the jig is exactly lined up with the four lines around the mortise. Re-check after clamping the jig to see if anything slipped.*



Wide guide. *When paring down the sides of the mortise make sure the flat back of your chisel is snug against the plywood edge at the top and bottom. Here is where you will be glad that you took the time to make 1" thick plywood for your jig.*

Visual proof. *Here we see the completed mortise. The pencil lines show how accurately we aligned everything.*

into the corner, then tap with your mallet.

Go all around the jig, slowly and carefully. The back of the chisel should be tight against the jig. Take your time and be careful not to cut into the plywood jig (so you can use it later on other projects). It is much better and safer to make many light cuts than just a few heavy ones, and remember to be careful when placing the chisel into position. Also, I usually hone the chisel after each mortise. It doesn't take long and it ensures a nice, clean-cut mortise.

You will end up with an accurate mortise, in the right place, that is square and parallel. A slight back bevel, especially on the end grain, will make it easier to install and remove the legs when you dry-fit. Repeat this process on the other three mortises and see if all four legs fit tight on all sides. If you are very careful and precise in all the steps, it will fit on your first try. This is a great project to test your skills on and the jig concepts can be adapted for use in other projects.

When you design through-tenons on a solid wood top like this small stool or in other applications, you have to allow for seasonal wood movement. This stool has unconventional vertical grain rails on the two short sides between the legs. There is a practical reason for this arrangement.

The legs and aprons will shrink and swell the same way that the top moves because all the grain is oriented in the same direction. Usually, the top will shrink in the winter and expand in the summer. If the legs were permanently locked in their position by conventional horizontal-grain rails, the top would crack when it shrinks, and as I tell my students, "that's not good."

To Top it all Off

When you consider the design of the top of the square through-tenon, there are several possibilities. When I first made these I would cut a 110° bevel on all four sides yielding a four-sided pyramid look. I was quite contented until I happened upon an old "V" back Stickley chair, No. 354½A. This chair had square through-tenons in the arms that are 1½" square and about ¼" proud of the arms. Instead of the four flat pyramidal angle cuts they are rounded, much like a small Greene & Greene ebony peg.

Another design possibility is to leave them mostly flat with a small 45° chamfer of about ¼" on all four sides – not my favorite. When I designed this foot stool I wanted to do something a bit different so I thought of a steeper pyramid. But I didn't like the way it looked so I simply cut the point off the top and came up with a "four-sided flat-top pyramidal-square through-tenon." If you don't like the look of it you have to love its name. If you hear that term someday in a country music song, remember – you heard it here first.

This design feature adds an extra element to any simple Arts & Crafts piece and showcases the skill of the maker. I hope from this article you can see how a few simple homemade tools and easy techniques can make a difficult project within the reach of most amateur woodworkers – and even a few seasoned professionals. **PWM**

Dale builds furniture and teaches woodworking in Paoli, Indiana. Information about his school is available from his web site: daleswoodshopclasses.com.

One is good. *Here is the joint, assembled on the first try.*

Four is better. *Fitting one mortise and tenon is not too difficult. But all four on the same top, on the first try? It doesn't get much better than that.*

Head of the class. *Here is the completed stool with the four through-tenons and the two simple jigs that make it so easy.*

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White Water Shaker Table

BY CHRISTOPHER SCHWARZ

We set out to reproduce a simple side table from the White Water Shaker community. We failed.

Simply unusual. *The original version of this table has some odd features, including its drawer joinery and the way the tabletop is attached to the base (glue and nails). Are these original features?*

The first time I encountered this table in the White Water Shaker collection, it was locked in a storeroom with more than a dozen other pieces. To my eye, there was something unusual about it.

Was it the size? It's 25" high – a bit shorter than typical. Was it the single drawer surrounded by a solid apron? That's atypical for Shakers. Or was it something else?

I put my fingers around the front knob and slid the drawer out. And that's when the mysteries really began. The craftsmanship on the table's base is impeccable. Tight joints. Neat pins. Clean tapers. And the maker chose excellent wood – the aprons are all quartersawn walnut.

But the drawer was a different story. The drawer had one giant dovetail at each corner, and the half-blind tails at the drawer's front left a scant $^{1}/_{16}$" of drawer front. Further, the groove that held the drawer bottom was visible on the ends of the drawer front. That's usually a no-no.

Bigger than most doves. *Here's a shot of the the original drawer. If the maker had planed the drawer front even a little more, the joint could no longer earn the name "blind."*

Then I turned my attention to the tabletop. Unlike the table's base, the top was flatsawn walnut and was thinner along its edges with an enormously wide rabbet on the underside. The top was glued and nailed to the base.

Several weeks later, I measured the table and all its details. I sat before it and stared for a long time, hoping that I would find the answers to the questions racing through my head.

Was the drawer original? Was it made by a different maker? Was the top a replacement? And what was this table used for? It's a little big for a side table. And it's too small and low for a typical worktable. But I liked it, and I resolved to build one to donate to the organization restoring the White Water village – Friends of White Water Shaker Village.

Even today, I don't have answers to any of these questions, but I do have clues. Senior Art Director Linda Watts visited the South Union Shaker village in Kentucky in 2009 and reported she saw a table like this being used as a washstand with a large washbowl on top. Could the original top of this White Water table have been ruined by water?

The Restoration

I decided to build this table so the wood selection and craftsmanship matched on all the components. That meant a quartersawn walnut top attached with wooden buttons and a more finely dovetailed drawer. This approach troubled me – I don't like to guess about these things. But as the table came together on my workbench, I convinced myself that I had made the right decision.

LEAD PHOTO BY AL PARRISH, SHOT ON LOCATION AT WHITE WATER SHAKER VILLAGE, COURTESY OF FRIENDS OF WHITE WATER SHAKER VILLAGE; STEP PHOTOS BY THE AUTHOR; ILLUSTRATIONS BY ROBERT W. LANG

On the first day of working on the project, I glued up the slab for the top from three quartersawn walnut boards and set it aside. Then I turned my attention to the aprons, especially the front one.

After inspecting the original, I suspect the drawer opening was cut from the front apron. I decided I wanted the drawer front's grain to match the apron. So I cut the drawer front from the apron.

Here's how I did it: I started with an apron piece that was a bit wider than needed. I ripped a 5/8" strip from the top of the front apron (this would later become the apron's top rail). Then I cut the drawer front free from the apron using a backsaw and then a plunge-cutting Japanese saw. Then I glued the 5/8" strip back on and I had an apron with a 3" x 10" drawer hole in it.

Short & Simple Legs

The legs are 1 11/16" square and taper to 1" at the floor on the two inside faces. The taper begins 1" below the apron. When selecting the stock for the legs, look for growth rings that run diagonally from corner to corner. This will ensure the legs look consistent on all four faces.

Mark out the 1/4"-wide x 1 1/4"-deep x 4"-long mortises on all four legs. Note that you want the aprons to be set back 1/32" from the front face of the legs, so be sure to include that detail in your layout. Excavate the mortises.

Then you can taper the legs. I cut the tapers using a band saw and cleaned up the cuts with a jointer plane (which is safer than most table saw jigs for this operation).

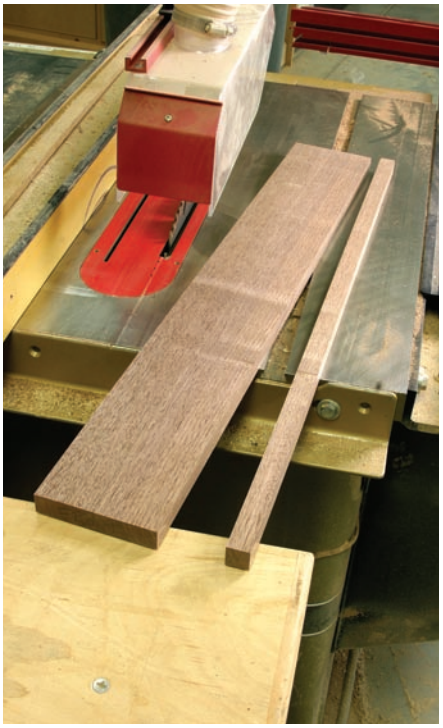
(Almost) Traditional Tenons

Then turn your attention to the matching 1 1/8"-long tenons. I sawed mine by hand. It's a challenge in wide stock such as this, but if you take your time your tenons can fit right from the saw.

I cut the face shoulders of my tenons using a Japanese flush-cutting saw and a block of wood as a guide. I simply clamped the guide on my knife line, pressed the saw against the guide and sawed a perfect shoulder.

"A chair is a very difficult object. A skyscraper is almost easier. That is why Chippendale is famous."

— Ludwig Mies van der Rohe (1886 - 1969) architect

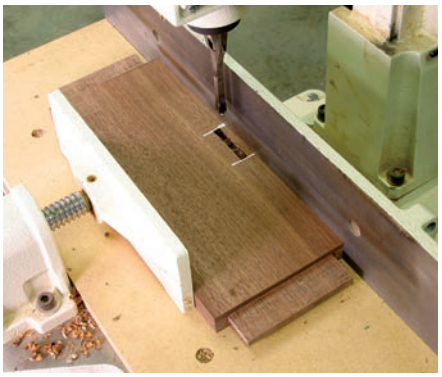


Rip the top rail. *I decided to cut my drawer front from the front apron. So I ripped a 5/8"-wide strip off the front apron. After cutting the drawer front from the apron, I glued this strip back on.*

Dive to the bottom. *An azebiki nokogiri is a Japanese saw with curved cutting blades (one for rips; the other for crosscuts). Used against a guide, you can start your cut in the middle of the apron and plunge through. This releases the drawer front from the apron.*

Chisel it clean. *To clean up the bottom of the drawer opening, clamp a guide to the apron and use a chisel with its flat face against the guide. Skew the tool to shear the wood and you'll find the work quite easy.*

A cheat from the East. *To cut the tenons' face shoulders you can use a scrap of wood to guide a flush-cutting saw. Just make sure the saw has no set and you've clamped the guide right on your knifed-in shoulder line.*



Mortises for buttons. *Before assembling the table's base, you should cut mortises for the buttons that will secure the tabletop to the base. I did these using a mortising machine. The mortises are 1/4" wide, 2" long and 1/2" deep. Poke one mortise in each end apron and two mortises in the front and back aprons.*

I couldn't bear to nail and glue the top to the table's base. So I cut mortises in the four aprons that would hold buttons – an excellent way to secure a tabletop to a table base and allow for seasonal movement.

Then I cleaned up the legs and aprons, and prepared them for finishing.

Gluing & Pegging

I usually glue up tables in two stages. First I glue the front legs to the front apron and the back legs to the rear apron. Then I peg those tenons and legs together. Next I glue the side

An error barrier. *A strip of painter's tape can protect your finished work from glue squeeze-out and from the teeth of the saw. After you cut the peg flush, remove the tape.*

White Water Shaker Table

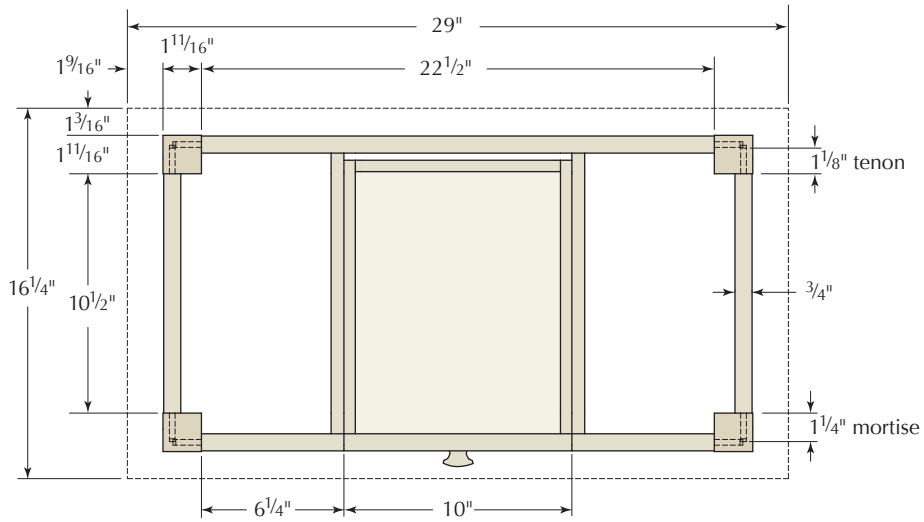
	NO.	ITEM	DIMENSIONS (INCHES) T	W	L	MATERIAL	COMMENTS
❑	4	Legs	1 11/16	1 11/16	24 15/16	Walnut	
❑	2	Long aprons	3/4	4 1/2	24 3/4	Walnut	1 1/8" tenon both ends
❑	2	Short aprons	3/4	4 1/2	12 3/4	Walnut	1 1/8" tenon both ends
❑	1	Top	3/4	16 1/4	29	Walnut	
❑	1	Drawer front	3/4	3	10	Walnut	Cut from front apron
❑	2	Drawer runners	1 5/8	1	12 5/16	Poplar	
❑	6	Buttons	1/2	1	1 1/2	Poplar	
❑	1	Knob	3/4	1 3/8 dia.		Walnut	

aprons to the front and rear assemblies, and I peg those joints.

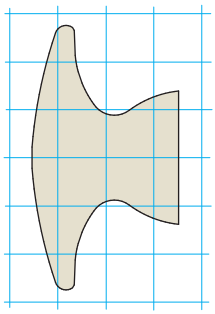
Pegging joints can be stressful. Here's how I do it. First I make sure that my pegs and drill bit will play together nicely by making a sample joint. Sometimes pegs can be undersized, which will leave an ugly gap behind.

Then I apply painter's tape over all my joints and lay out where I want my pegs to go on the tape. To drill the hole for the peg, I use a 1/4" brad-point bit and run the drill in reverse for a few rotations to score the perimeter of the hole. This little trick reduces tearing at the rim.

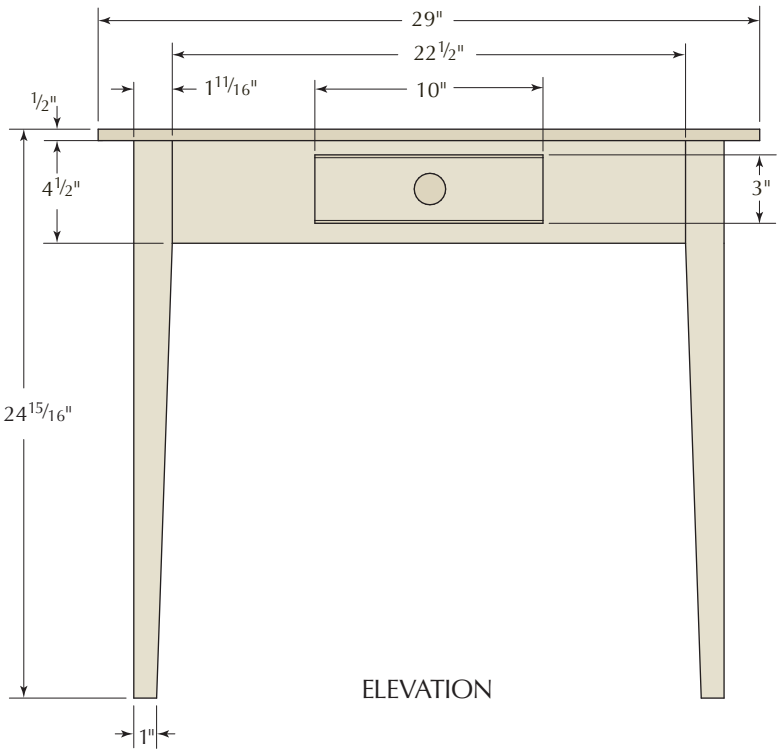
Then I drive the 1/4" peg in with some glue and cut it flush with a flush-cut saw. The tape protects the wood from the glue and from the occasional wayward saw stroke.



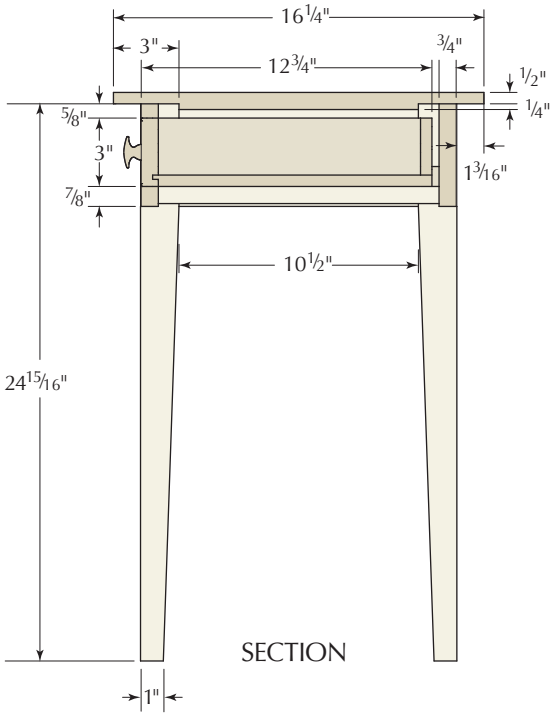
PLAN



KNOB PATTERN



ELEVATION



SECTION

Rabbets without fences. *Remove the fence from your rabbet plane and tip the corner of the tool into the kerf as shown. After a few strokes you will reach your finished depth. Stop.*

Tidy up the tabletop. *A block plane will remove most of the toolmarks from creating this large rabbet. This block plane is a rabbeting block, which allows the tool to get right into the corner.*

Align your drawer runners. *A combination square can help line up your drawer runners and the opening for the drawer. Once everything lines up, drill your pilot holes and nail the runners in place.*

A basic bead. *The only decorative detail on the table is a small bead at the top and bottom of the drawer front. You can make this with a moulding plane or scratch stock.*

The Raised-panel Tabletop

The tabletop is a bit like a raised panel. The edges are thinned down to 1/2" while the center field is left 3/4" thick. This wide and shallow rabbet (3" x 1/4") can be made on the table saw or router table, but it's also quick work with hand tools. Here's how.

First cut a kerf around the center field of the panel and use a cutting gauge to define the finished 1/2" thickness on all four edges. Take a rabbeting plane, tip it about 45° and run it in the kerf. Work the long edges of the tabletop first. After a few strokes, begin tilting the rabbeting plane with each stroke so it's eventually almost upright. This will create a wide "V." Work down until the "V" is 1/4" deep.

Then waste away most of the rest of the wood with a fore plane or a scrub plane. Clean up the results with a block plane. After you work the long edges of the tabletop down, work the short edges in the same manner.

Attach the tabletop using shopmade wooden buttons – mine were 1/2" x 1" x 1 1/2". The buttons have a 1/4" x 3/4" lip that reaches into the mortises in the aprons. When you screw the buttons to the tabletop, the top stays in place, yet it can move with the seasons. (Note: For the buttons in the long aprons, don't bottom them out in the mortises.)

Drawers & Their Runners

The table's two drawer runners are nailed to the front and rear aprons – from the outside of the table. To make the drawer runners, take a long length of 1" x 1 5/8" wood and cut a 1/2" x 7/8" rabbet in its long edge. Crosscut the two runners you need and fit them inside the table's base.

When you have them positioned in the right place, secure them with two cut nails (don't forget to drill pilot holes for your cut nails).

For the drawer, you can make it like the original, you can build it like I did (with three half-blind tails in the drawer's front) or build it so it suits you. I took a traditional path with my drawer. The two tails at the two back corners of the drawer are through-dovetails. The bottom is let into a 1/4" x 1/4" groove in the drawer sides and drawer front. The drawer bottom (like the tabletop) is also like a raised panel and slides in under the drawer's back, which is 1/2" narrower than the drawer sides.

The drawer is finished up with a 3/16" bead on the top and bottom edge of the front and a walnut knob. After the drawer slides smoothly, glue in a couple stops to the rear apron to make the drawer fit flush at front.

Finish & Final Thoughts

After breaking all the edges of the table with sandpaper, I added a simple and traditional finish: an oil and varnish blend. The oil gave the walnut warmth; the varnish gave it some protection. Five coats did the trick.

You can buy this finish off the shelf (Watco is one brand). Or you can make it by mixing equal parts alkyd varnish, boiled linseed oil and low-odor mineral spirits (paint thinner). Wipe on thin coats and sand away the dust nibs between coats with #320-grit sandpaper.

As a faithful reproduction, this table is a failure. I changed it too much, from the unusual original drawer to the unconventional way the top was attached on the original. But my changes were sympathetic to the time period (i.e. I didn't add Blum self-closing drawer slides). So though I can say this table wasn't the same as the one built in the early 19th century in southern Ohio, I can say that my version wouldn't look out of place there, either. **PWM**

Christopher is editor of this magazine and the author of "Handplane Essentials" and "Workbenches: From Design & Theory to Construction & Use," both available at woodworkersbookshop.com.

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Success With Scraper Planes

BY DAVID CHARLESWORTH

Understand and tune up one of the best weapons in the war against tearing.

Getting you out of a bad scrape. *Scraper planes are able to conquer unruly grain and maintain a flat surface. They are also ideal for dealing with veneer.*

Scraper planes are some of my favorite tools, excellent for avoiding or removing tear-out whilst maintaining a flat surface. Card scrapers will remove tear-out, but there is an overwhelming tendency to concentrate on the problem areas, which will become hollow. This does not usually become apparent until the finishing stage. In contrast, the sole of a scraper plane obliges us to take sets of shavings, maintaining a flatter surface.

Scraper planes also excel at smoothing veneered surfaces if sharpened with a hook. I used a Stanley No. 80 for many years. In the beginning I thought veneered surfaces could be planed, but soon discovered the error of my ways. If you encounter a small hollow blister where the glue has not taken, a chunk of veneer will be ripped out and probably lost on the floor. This does not happen with a sharp hook on a scraper plane.

Recently I was intrigued to watch Deneb Puchalski of Lie-Nielsen Toolworks demonstrating the company's scraper planes sharpened without a hook. Shavings were produced from difficult wood, but this is not the same shaving formation that we get with a hook. If you consult Bruce Hoadley's "Understanding Wood" (Taunton Press), a hook produces "Type 2" shavings (which are sheared from the wood), while the edge without a hook conforms to his description of "Type 3" scraping action (which compresses the wood and sometimes results in fuzzy grain). I think the hook will be more successful on delicate veneered surfaces and is a true cutting edge.

Now I am sure there are many woodworkers who own a scraper plane but have not had success with it. This is hardly surprising as there is conflicting advice on how to set one up and a number of steps where things can go badly wrong.

1. Blade not truly sharp.
2. Too much force used on the burnisher.
3. Unsuitable burnisher.
4. Final burnishing angle incorrect.
5. Angle of blade incorrect.
6. Too heavy a cut is set.
7. Sole not flat enough.

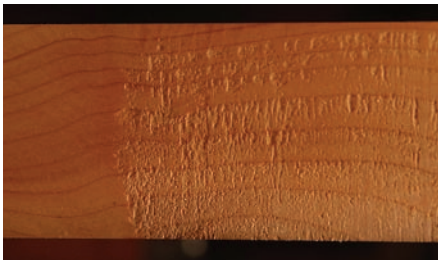
"Never trade skill for luck."

— Posted in a pilots' ready room on board an aircraft carrier

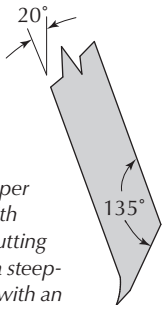
The sharpening recipe for the Stanley No. 80 always worked well for me, so I use the same parameters in the Stanley Nos. 112, 85 and 212. Unfortunately current models of the No. 80 are very badly made, and the blades have been reduced to a ludicrously short length, which makes them awkward to hold. I'm not sure if this is just plain meanness or some Health & Safety perversion.

Fitting a thicker ($1/16$") Hock replacement blade just about doubles the performance of

PHOTOS BY BOB SEYMOUR; ILLUSTRATIONS BY ROBERT W. LANG



Tear not. *Here you can see the kind of tear-out caused by a regular bench plane in this piece of English yew. It looks even worse when finish is applied.*



Cutting hook. *A beveled scraper plane blade with a hook has a cutting edge. It is like a steep-pitched blade with an ultra-close set, steep chipbreaker.*

A better blade helps. *The Stanley No. 80 at the bottom has the small stock blade. Above is a No. 80 with a replacement blade from Ron Hock.*

this tool and solves the length issue as well. Ron Hock also makes excellent blades for the Nos. 112, 12 and 81, so rescuing old tools with rusty blades is an attractive option.

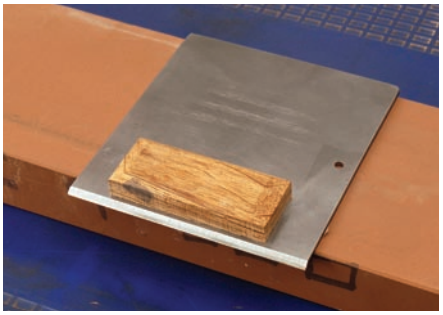
Prepare the Back, Sharpen the Blade

The back of the blade must be flattened and the deep manufacturer's grinding marks removed in the normal way. (The blade ends up just like a smoothing plane blade, only sharpened at 45°.) I like to affix a wooden handle just behind the heel of the bevel with double-sided tape. This allows a good grip when working on the back, without the risk of honing away my fingertips on the stones. Waterstones are deceptive. The cool water stops you from noticing that you are honing away layers of skin.

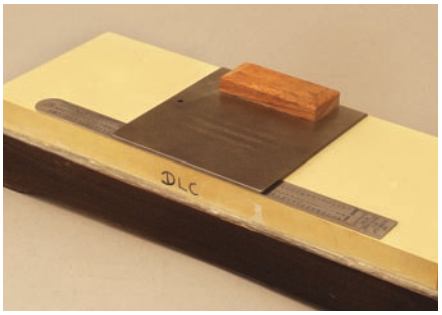
I use my usual strategy of "Movements 1 and 2" on an #800-grit King stone. See the "Glossary" on page 62 for details, or read my story on the "ruler trick" on the magazine's web site. (It's also on my first techniques DVD). In both cases, the idea is to keep the edge of the tool off the edge of the stone for 50 percent of the strokes. This avoids the stone wearing hollow. In fact, it encourages the stone to wear slightly convex, which is a good thing. I have seen far too many tool backs ruined by people who did not realize how quickly a waterstone wears hollow. Although Movements 1 and 2 are a great help, I still flatten the stone after 50 "to-and-fro" strokes on each edge.

The objective is to prepare the back surface right up to the cutting edge. There is no need to flatten the whole surface. A quarter inch of flat surface adjacent to the cutting edge is going to last a long time. The example shown in the photo at right is common. The blade is significantly hollow, but this allows the edges to be flattened quickly. The alternative shape with a belly is a nightmare.

I finish the back preparation by using the ruler trick on an #8,000- or #10,000-grit stone.



Improve your grip. *A small block of wood affixed to the scraper's cutter will make the tool easier (and safer) to prepare.*



A little tip is quicker. *By propping the blade on a thin ruler, the cutting edge of the blade will polish up quickly and save hours of arduous work.*

This will produce a narrow band of polish at the extreme edge, also shown below.

The Bevel Side

The Stanley instructions suggest filing and honing at 45°. With the thicker Hock blades, I prefer to grind at 30° to 35° on a Tormek. Then I use a honing guide at 43° on an #800-grit stone to get a wire edge and shape the blade. This edge is polished at 45° on your finest stone. It is fortunate that the common Taiwanese copy of the English Eclipse honing guide opens wide enough to take the massive ($2\frac{7}{8}$") width of the No. 112 blade; unfortunately the English versions do not.

Honing a Camber

I use a very slight camber on the blade edge, and this is created with point finger pressure on the #800-grit stone. This might seem unnecessary on a tool like the No. 80 where the blade is flexed to control the depth of cut, but it is very difficult to set up a straight blade so that the corners are not quite cutting. It is much easier to check the symmetry of the vanishing points of a blade with a slight curve.

I check the shape at the #800-grit stone stage by offering the edge up to a flat piece of black plastic or Ebony and sighting against a good light source. Once the shape is satisfactory, I polish the edge and repeat the ruler trick to hone away the wire edge. I should now have a razor-sharp 45° edge.

A belly is bad. *On this blade the face is hollow, which makes it easy to flatten. A bellied blade, on the other hand, is difficult to fix.*

Burnishing the Hook

All burnishers, or ticketters, are not created equal. They need to be very hard and well polished. My first one, from a reputable London tool supplier, was useless. Scraper edges bit into the steel, leaving deep score marks and ruining the sharp edges. I am dubious of those who say that any old screwdriver shaft or chisel back will do. Ron Hock makes an excellent burnisher, and I was recently sent a highly polished recycled carbide rod by a kind reader. Thank you, Tony!

Now one of the problems identified in the beginning was to turn the hook and finish at the correct angle. This is important as the

Stanley No. 80 and Lie-Nielsen No. 85 share a fixed bedding angle, which is 20° forward of vertical.

A Simple Aid Ensures Accurate Hook Angle Control

I used to burnish with an angle guide drawn on a piece of scrap in the background, but the results were not entirely consistent. A better way is to prepare a 75° edge on a piece of scrap. MDF, plywood or timber will all work fine. I suggest you end up with something like 3 1/2" by 6" by 7/8" thick, with one long edge beveled.

The blade can be clamped on top of the angle guide, at the edge or end of the bench. The corners of the sharp edge overhang the guide by 1/64" or so, and the guide overhangs the edge of the bench. This allows the burnisher to be stroked along the whole edge and pass smoothly onto the guide, ready for the return stroke. This gives a totally consistent stroke over the whole length of the edge. Some lubrication of the burnisher is necessary – oil or perhaps grease from the side of the nose.

For the burnishing itself, I use a surprisingly gentle touch, starting at 45°, progressively increasing the angle with each stroke and taking about 10 or 12 strokes to reach 75°. At this point the burnisher will be resting on the angled edge of the guide. If I try to go steeper the burnisher loses contact with the blade, so we have an almost foolproof method for finishing at the correct angle.

You may need to experiment a little with the force applied to the burnisher and the number of strokes used, but the 45° edge deforms much more easily than the square edge of a card scraper.

I do not consolidate the metal and work harden it by burnishing the flat back of the blade before turning the hook. This is said to extend the life of the edge and may be worth trying once the basics have been mastered. (I am doubtful, because a 45° edge has no support at its tip.)

Check the Sole of the No. 80

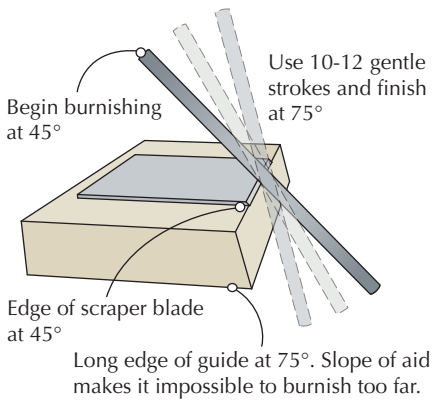
The scraper plane is a precision tool capable of taking super fine shavings off difficult veneered surfaces. Clearly this will not happen unless the sole is flat and smooth. Current United Kingdom Stanley No. 80s are abysmal, but they are relatively easy to flatten due to their small size. We work up through the grits (#60, #100, #150 and #240) stuck to a flat surface. I then scrub the sole with #0000 wire wool and metal polish, finishing with some wax.

Loading the Blade

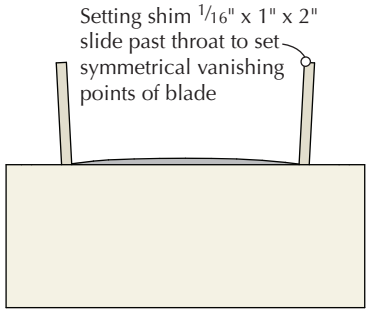
I like to insert the blade from below as there is no danger of damaging the hook. It's worth taking a moment to check that it is the right way round. The flat side leans forward.

Blade projection can be set by placing the tool on a flat piece of wood or even glass. The thumb screw in the center that flexes the blade must be backed off. The knurled screws at either side of the clamping plate are finger tightened with the blade and tool gently pressed down on the flat surface. Because we have a slightly cambered blade it is important to check that it is balanced or centered. I use the same setting shim as I do for bench planes. This is a very thin rectangle of wood about 1 1/4" by 1" by 1/16" thick. It is held firmly on edge and slid to and fro, right past the throat of the tool. I start at the edge of the sole and gradually move toward the center. When you reach the point where the blade begins to protrude, you will hear, see and feel a fine shaving being taken. This is very good for the more senior amongst us who do not see as well as we used to. The process is repeated from the other side; then I will be able to judge whether the setting is balanced or centered.

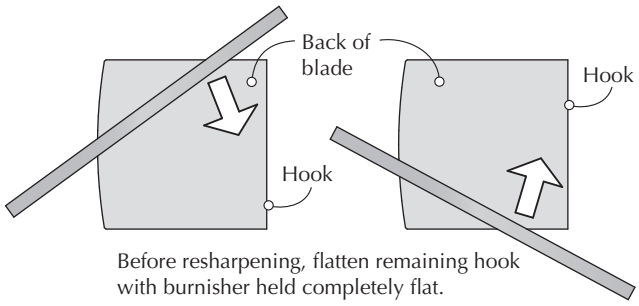
If it is not, some light taps with a small hammer may help with lateral adjustment, or perhaps the setting procedure will need to be started again. It can be a frustrating business, but when satisfied, tighten up those fixing screws with a screwdriver and test the cut. I like to do this on the edge of a board. I should get tissue-thin shavings. If they are too heavy the setting will have to be repeated. If too fine, the blade is simply flexed a little with the chromed thumbscrew. Note that very slight changes have a significant effect on the shaving thickness.



BURNISHING THE HOOK



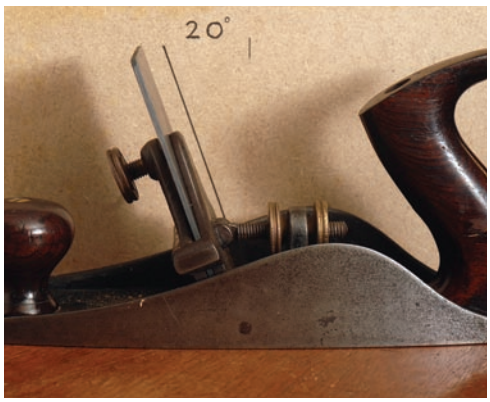
A BALANCED SETTING



REMOVING THE OLD HOOK BEFORE RESHARPENING

A good grip. *Control the No. 80 with your thumbs and forefingers. The pressure you apply is much like planing a board.*

A good paper cut. *A sheet of paper below the toe of this No. 85 scraper plane allows you to achieve a fine shaving.*



A familiar setting. *Some scraper planes allow for infinite adjustment. A good place to begin is at 20° forward of 90°.*

Use & Grip

The No. 80 has a wide throat so great care is needed when starting or finishing a cut. The handles are of little use and you will see (below left) that my thumbs and forefingers are doing most of the work. At the beginning of a cut, weight is applied with the forefingers to the front sole. At the end, the weight is transferred to the back sole by the thumbs. If you get this wrong, the tool will tip up and the blade will dig in to the work.

Alternate Skewing is Good

Both starting and finishing can be made easier by skewing the tool, and it is good practice to alternate the skewing direction for every stroke. This is a great help in avoiding chatter, although this is often caused by too heavy a shaving or too weak a grip on the tool.

Resharpening the Blade

When resharpening a blade, remember to "lay down" any remaining hook with the burnisher before honing. It is held firmly and completely flat against the back of the blade and moved from side to side, diagonal to the edge.

Stanley & Lie-Nielsen No. 85 Cabinetmaker's Scraper

This is a remarkable tool with tilting handles, a fixed bedding angle and a rabbet blade. I'm not sure what application there is for scraping in deep rabbets, where the tilting handles would protect the knuckles, but this is a versatile tool with great character. The fixed bedding angle is the same as the Stanley No. 80, so the burnishing angle is the same. If you wish to scrape into corners, a straight 45° edge would be prepared, and if you wanted to work on larger surfaces, a tiny camber would be appropriate.

There is no blade adjustment here so the setting strategy is to place a sheet of paper under the front sole with the tool on a flat setting surface. When the blade clamp is tightened, this gives a cut of approximately half the thickness of the sheet of paper. If you want very fine cuts try newspaper, which is about half the thickness of notepaper.

Stanley & Lie-Nielsen Nos. 112 & 212

The No. 112 is my favorite scraping plane as it's ideal for large veneered surfaces or tabletops. A chairmaking friend is very taken with its baby brother, the No. 212.

These planes have an adjustable bedding angle, which is where I feel that we could become seriously unstuck, without a clear plan. And of course I suggest that you follow the same regimen as I did for the No. 80.

The bed angle can be set by sighting the blade against a pencil line drawn on some scrap. The adjustable bed is controlled by a threaded bar and a pair of jam nuts that are situated on either side of a fixed post. There is no need to tighten these excessively as the mechanism is always in tension when the tool is in use. I just push the top of the blade firmly forward before starting.

The blade is prepared in exactly the same way as for the No.80, with a slight camber. Use a flat setting surface and check the blade for even cut or "balance" with the setting shim. I don't have to worry too much about the size of cut because small changes to the angle of the bed will alter the depth of cut, without affecting the overall cutting geometry.

The jam nuts take a bit of getting used to; both are rotated in the same direction to make an alteration, but you have to pick the correct nut to start with. When viewed from the back, clockwise reduces depth of cut and counter clockwise increases it. I find that as little as $1/16$ of a revolution has a significant effect. Bearing this in mind will help to avoid massive over-corrections in either direction.

Conclusion

To sum up, I think very good results will be had by following the simple instructions that come with the Stanley No. 80. This burnishing and sharpening geometry is directly transferable to the more sophisticated scrapers with variable bed angles. My burnishing aid will prevent over-turning the hook and a suitable burnisher used with very little force will produce a delicate hook for fine finishing.

I am not suggesting for a moment that these angles are the only ones that will work. If we think of chair scrapers, the blade is usually vertical. Variable bed angles allow for all sorts of other permutations. Square-edged blades with two hooks can be used; the possibilities are legion.

But for those starting out with scraping, I thoroughly recommend keeping things simple with the Stanley No. 80 setup. **PWM**

David's latest Lie-Nielsen DVD, "Five Topics," covers scraper planes, raised effective pitch and back bevels in standard bench planes. These are two other powerful methods of dealing with cranky grain. It also looks at tuning and use of shoulder planes, decorative bevels and planing round corners.

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Inlay for Curves

BY ROB MILLARD

A trip to the hardware store yields clamps that put the bend in inlay.

Inlaid bandings are a time-honored technique to embellish furniture, as are curves. Combining the two is surely a way to take your furniture to the next level. But to take straight sections of banding and curve them to fit isn't easy, nor is the outcome often successful. This is especially so when banding is fit in a rabbet at the edge of your project.

When you attempt to bend a banding into a groove, the task is made easier because the banding is somewhat restrained from springing back. Still, stiff bandings can be difficult to coax into a tight radius without fracturing or crushing the edges of the groove while the banding is being pressed into place.

Some years ago I made a Federal-period worktable that featured turret corners on which the perimeter was adorned with a moderately complex banding. By using heat, moisture and strategically placed kerfs, I successfully got the banding to conform to the turret. Despite that success, adding kerfs seemed a crude way to bend inlay. I decided to make the banding in a circular form in the future.

Get Curved Banding From a Straight Form

To make circular banding, begin by turning a form at the lathe. A uniform-diameter form is important, so after establishing the proper diameter with a cut-off tool and caliper at intervals along its length, a block plane smooths the form to its final size. This is more accurate and easier than using a skew chisel.

To my surprise, there is very little springback when banding is released from a form, but it is better to make the form 1/8" - 1/4" less than the finished diameter to compensate for any possible springback, and to avoid having to force the banding to a tighter radius during the inlay process. The length of the form should be 4" to keep your fingers safely away from the band saw blade as the rings are sawn free.

While not essential, I like to square one end of the form on the lathe to aid in planing a flat on the cylinder. This flat rides on the table of the band saw, providing a safe bearing surface while sawing the rings. Wrap the form with packing tape to ensure your banding won't stick to the form. Slice your pieces at the saw – bandings, tape and form.

"There's a fine line between hobby and mental illness."

— Dave Barry (1947 -)
American author and humorist

Striking additions. *Exquisite and detailed inlay, as on the turret of this Federal-period worktable, adds visual interest to furniture. To obtain a perfect fit, you'll have to follow a couple curves.*

PHOTOS BY THE AUTHOR

Assemble Your Pieces

The turret banding begins as a 2"-wide stack of six alternating layers of 1/16" maple and black-dyed veneer. Even simple bandings become difficult to make if too wide, so 2" is a good compromise between yield and ease of manufacture. The veneer layers are glued together and clamped between boards until dry. Make sure you have complete contact between the layers. When the glue has cured, joint one edge and square up the ends of the stack.

Making bandings requires tight tolerance work, necessitating the use of a dial caliper to measure the various components of the banding. Begin by measuring the thickness of the veneers that enclose the strips sawn from the stack. Those strips will be sawn to the difference between the thickness of the enclosing veneers and the finished thickness of the banding (here, the veneers measured .102" and the finished banding is 3/16" or .1875", rounded up to .188", thus we cut the strips at .086").

Eschew the skew. *A low-angle block plane makes short work of producing an accurately sized cylindrical form.*

Keep it safe. *A flat is planed on the form to provide stability as the inlay is later sawn at a band saw.*

The strips are sawn at the band saw using a .014"-thick blade to minimize waste. Setting the fence is an exercise in trial and error. I've found that setting the caliper to the required size and using it to eye the fence setting is amazingly accurate. So as to not waste the stack, the test cuts are made using a block on which the density is similar to the stack. The key is consistent hand and feed pressure.

The hand pushing from the side should apply only enough pressure to keep the stack in contact with the fence while the other hand, aided by a push block, feeds only fast enough to keep the blade cutting. Feeding too quickly or too slowly causes the blade to wander, but a happy medium is reached after a short learning curve. Approximately four or five strips can be sawn before the ends should be trued up at the shooting board. Measure each strip and discard those that don't meet a tolerance of .003". There may be some minor splintering on the strips that can be removed with fine sandpaper.

Dial it in. *Measuring the components for the banding demands tight tolerances and adequate addition skills.*

Keep a light touch. *Hand placement and feed pressure are the keys to accurate sawing.*

Sticky Trick Ensures Success

The banding is glued up in three stages. Use white glue (which allows more open time to position the pieces) to affix the strips onto a piece of maple veneer and pay attention that the pattern is maintained. Once the glue is

True your end. *After a few strips are cut, you need to square up the ends of the stack at your shooting board.*

Work fast. *Once the glue is brushed on, it starts to curl the veneer, making assembly frustrating.*

Who would have thought? *Hose clamps from a hardware store supply all the clamping pressure you need – and then some.*

Tailor-made veneer. *Using moisture and heat to bend the outer layer of black veneer is as easy as pressing a collar.*

A wee-bit thicker. *Individual rings are sawn oversized at the band saw, then planed, scraped and sanded flush.*

The eyes have it. *Where the curved inlay meets the straight run of inlay, mitered corners are best done by eye.*

applied, you have to work quickly before the veneer curls from the moisture.

Because the end-grain faces of the strips are glued, more glue is required – but not so much that the strips slip out of position. It's best to clamp the assembly between flat boards for a very short time. This adheres the strips to the veneer, but they are still flexible enough to then wrap around the form with the strips facing the form. Hose clamps supply the pressure as the glue dries. Because they are made from stainless steel, there is no danger of the clamps leaving iron stains on the wood.

The clamps are positioned close together and not skewed, with the worm screws placed at the flat of the form. There may be some minor cracking between the black and maple veneer as the clamps are tightened, but this won't be noticeable on the finished banding.

After the glue dries, the next layer of maple veneer is glued on the concave side. This time, add sufficient glue to the inside of the assembly, not the veneer itself. The veneer is carefully positioned to the stack, slid onto the form then the hose clamps are re-applied.

The final layer is $1/16$" black-dyed veneer applied to the outside of the ring. The dyed veneer is first bent around the form using a spray of water and the heat from a clothes iron. After your veneer cools, apply glue to the stack and position the dyed veneer. Again, the hose clamps provide the pressure while the glue dries.

With all the layers in place and the glue set, remove the clamps and trim the ends of the ring so the flat of the form bears fully on the table. Even with the accurately planed flat, a precise thickness is difficult to maintain, so the rings are sawn thicker than needed then planed flush after installation.

Compared to the process required to finesse a straight banding to follow a curve, installation of a pre-formed ring is a picnic. Place the ring on the turret and then miter the ends with a fresh razor blade. Your eye is the best layout tool.

The ring is glued in place with hot hide glue. It's best to use low-tack painter's tape as a clamp; it's quick and easy.

Another Curvy Application

Wider bandings and/or bandings made from difficult-to-bend woods can be made in a similar fashion. A recent project called for $3/16$"-wide triple-line satinwood and black-dyed veneer inlay to be bent to a $2\,1/8$" radius. Satinwood is a stiff and brittle species not known for its bending qualities, so bending it to a tight radius from a straight section would have been quite difficult. To have any hope of it bending, the sections would have to be about $1/4$" thick because it's difficult to bend any inlay that is wider than it is thick.

The satinwood was sawn slightly thicker than desired then sanded to the precise thickness at a spindle sander (or a sanding drum attachment mounted in a drill press). The strips are then steamed for 45 minutes (probably overkill, but satinwood is brittle).

The form is screwed to a board. A block is secured to the board just opposite the form's flat. The gap between the two is equal to the thickness of the two satinwood strips, a backing piece of brass shim stock and a hose clamp. The shim stock prevents the outer strip from breaking out by keeping the fibers in compression. Have the hose clamps, nut driver and brass close at hand, because once the wood is removed from the steamer it cools quickly. With gloves on, remove the strips from your steam setup and place them and the brass in the form while firmly and quickly bending the satinwood to the form. Tighten the hose clamps and leave the strips to dry for 24 hours.

The black-dyed veneer is not steamed because it is not as stiff as the satinwood, and the steam could cause the dye to leach out and discolor the surrounding wood. Instead, just as in our earlier example, a few squirts of water and the heat from an iron do the job.

The three bent strips are glued together with white glue and clamped with the hose clamps as before. The individual rings are sawn as before.

We're Not Done Yet

Hose clamps are also used when a banding runs around a leg. Here a groove is formed on the lathe. A thin strip of banding is sawn on the band saw. Depending on the species, the banding may need some dry heat from an iron or a heated rod/pipe of the proper diameter to relax it enough to bend around the leg. A backing piece of shim stock eases the bend and keeps any fracturing to a minimum. Brush some hot hide glue in the groove, slip the banding into place and apply the hose clamp.

The only difficulty is that the hose clamp obscures the inlay, so you have to be sure that it remains in your groove while clamping. Fortunately, hide glue gels quickly and can be easily reactivated with heat, so after a few minutes you can temporarily remove the clamp to inspect the positioning and make any necessary changes. The area of the leg where the banding fits is left slightly oversized, so when the glue has dried it is remounted at the lathe and turned to the finished diameter.

Techniques such as these are my favorites. Take a seemingly complex detail and make it simple – and all the while you're adding considerable visual interest to your furniture. PWM

Rob builds Federal period reproductions and has written for Popular Woodworking Magazine *and the* SAPFM Journal. *See more of his work and get information about his DVDs, scaled drawings and classes at americanfederalperiod.com.*

Doing the impossible. *Bending a wide satinwood banding to a tight radius would be quite difficult. But formed as a circle, installation is easy.*

Back-up plan. *A thin piece of shim stock compresses the wood fibers and takes the pressure off as you bend the inlay.*

Finished leg. *Even with a highly decorated leg, the curved banding adds visual interest.*

Stronghold for curves. *The ever-versatile hose clamp again proves its worth as banding is fit into a turned leg.*

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BLOG: *See how craft knives and a C-clamp replace a router when doing inlay.*

ARTICLE: *Build a Federal Inlay Table – free drawings and step photos (June 2004).*

ARTICLE: *"Precision Band Saw" techniques with David Charlesworth (April 2008).*

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Taming the Top-heavy Router

BY ROBERT W. LANG

Replace your router's base with one that is oversized and stable.

The router can be a great friend in the woodshop, but it's one of those friends with character traits that aren't welcome in all situations. Like the fraternity brother you want at your bachelor party but not necessarily at your wedding ceremony, the router is noisy, spews trash everywhere and is decidedly off balance. Lose control of it for a brief moment, and all kinds of damage can be done.

But the good things a router can do (that other tools can't) make it worthwhile to put up with some things you can't change, and look for ways to improve the situation. Put in your earplugs and put on your safety glasses because the noise and chips won't go away.

The problem. *Most routers are top heavy and likely to tip. The standard baseplate doesn't leave much room to hold on with two hands.*

Quick fix. *A custom-made baseplate provides a solid base for routing edges.*

But you can improve the stability of the beast. A router table is one way to do that, as is the addition of a custom base.

Adapt to the Situation

Custom router bases can be made in a short time out of simple and readily available material. Swapping the stock base for a custom one doesn't take long either, so there's no reason not to have a few dedicated to difficult tasks. If you struggle with holding your router steady and maintaining control, a larger base will overcome those issues.

The base shown here increases the surface area, and it provides a place for your off hand to hold the router down to the work. Commercial versions of this old standby are often in a teardrop shape, but we couldn't think of any good reason to do that, other than to make it look cooler. Keeping the shape a rectangle will speed fabrication, and leave you with useful reference edges for joinery.

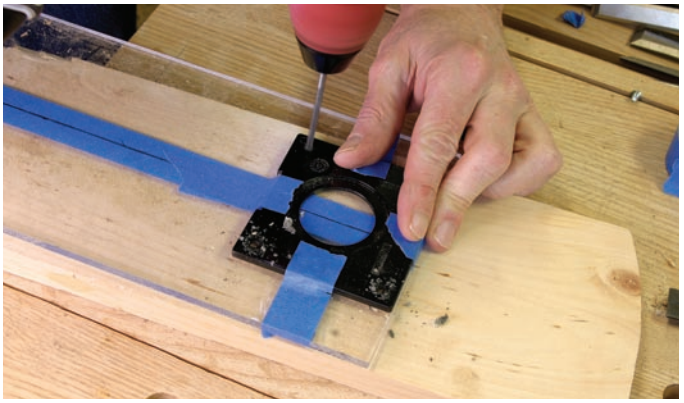
We used a piece of $\frac{1}{4}$"-thick Plexiglas we had in our shop. You can find this material at the home-improvement store, or if you're in a larger town you can get offcuts from a plastics fabricator. The clear plastic is nice, but the only advantage it has compared to other materials is that you can see through it. Any material that is thin and stiff, such as plywood or hardboard, will work as well.

Use the same tools you use to work with wood to cut the plastic to size and to drill the required holes. Carbide-tipped saw blades are preferred, but don't spend $150 on a triple-chip-grind, 80-tooth blade until you go into the plastics fabricating business. What you have will work fine for the few cuts you need

"Ideas are like rabbits. You get a couple and learn how to handle them, and pretty soon you have a dozen."

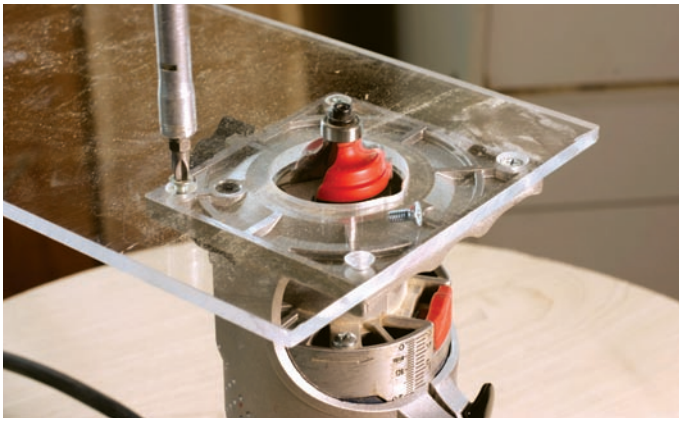
— John Steinbeck (1902 - 1968)
American author

LEAD PHOTO BY AL PARRISH; STEP PHOTOS BY THE AUTHOR



Almost like wood. *Plexiglas can be cut to size with standard carbide-tipped saw blades, and drilled with twist drill bits. Go slow and back up the work with a piece of scrap wood.*

Big bit, same story. *The larger bit clearance hole can be cut with a spade bit or a Forstner bit. A drill press is nice, but not necessary.*



On the level. *Countersink the holes so the screws are below the plate surface. You may need to make a trip to the hardware store for longer screws.*

The solution. *The extended base provides better control, eliminating the tendency of the router to tilt.*

to make. Wear a dust mask and safety glasses as you work with it.

Good old twist drill bits will handle the holes; just use a slow drill speed to keep the plastic from melting. If the plastic you have comes with a paper covering, leave it on while you work on it. Our Plexiglas lost its cover years ago, so I put some painter's tape down the center to make marking possible.

Front & Center

Before removing the existing baseplate from your router, take note of how the switch and handle are oriented in relation to it. You want your custom configuration to be suited to your task and easy to use. After the screws are out, tape the existing plate down to your plastic to use as a pattern.

Find a drill bit that matches the diameter of the holes for the mounting screws, and drill a hole at each location. If you have a drill press you should use it, but if you don't, drill through with a hand-held drill into a scrap of wood beneath the plastic. When all the holes are in, remove the stock baseplate and carefully countersink the screw heads below the surface.

Now drill the center hole for the router bit clearance. I had a Forstner bit that was close in size to the original center hole, so that's what I used, but a cheap spade bit works as well if not better. Use your drill press if you have one, or clamp the plastic down on top of a scrap of wood and guide the drill by hand.

Any rough edges from cutting or drilling can be removed with a few strokes of a file. The knob is a leftover cabinet knob, screwed to the plastic on the centerline. You can turn or whittle something fancier or more comfortable, or just attach a chunk of scrap wood.

Variations of the basic plate can be used for a variety of purposes. Increase the length and add a hole for a pivot pin to rout perfect circles or arcs. Attach a fence to the bottom to locate grooves or rabbets a set distance from an edge. Use a straight side of the baseplate against a straightedge to precisely guide the router to make dados.

Knowing how to use your tools includes knowing their limitations and discovering ways to overcome them. Most often the solution is simple, and waiting for you to uncover it and give it a try. **PWM**

Bob is the executive editor of
Popular Woodworking Magazine.

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BY ROBERT W. LANG

Shop-made Saw Vise

A must-have device for sharpening saws.

Hold it right there. *Scrap wood and clamps, along with an hour or two of your time, provide you with the means to hold your saw steady and quiet while you sharpen.*

One of the cardinal rules of woodworking is that the purchase of one tool begets the need for several others. Sawing by hand is both easier and more accurate than many people think, provided the saw is sharpened properly. Old saws can be an incredible bargain, and if you're a frugal sort you likely won't want to spend a lot on sharpening equipment.

There are three things you need: a triangular file to make the teeth sharp, a saw set to bend the teeth away from the body of the blade and a vise to hold the blade while you work. A file costs about $5 and a new saw set less than $20. But a new saw vise will set you back more than $120 – unless you make your own.

This was the problem we faced a couple years ago when we held a hands-on saw sharpening class at the 2008 Woodworking in America conference. We needed 50 saw vises and we didn't have a lot of time or money. So we looked at some vintage vises, consulted a saw guru and came up with this design.

Any hardwood will do; we used odds and ends we had in our shop of ash, poplar, cherry and oak. Most of the joinery is simple butt joints reinforced with yellow glue and #8 screws. The jaws sit in shallow rabbets in the two uprights, and should be held in place with screws only. You will likely want to modify the jaws at some point to accommodate a different saw, or tweak the way the jaws hold the saw blade.

A saw vise does two things: It puts the blade at a convenient height and the jaws keep the blade from vibrating as you file. Before you follow our plan, however, give some thought to the type and size of saws you plan on working with, and don't be afraid to change the size or shape of the jaws.

Lacking 50 bench vises at our conference location, we made the base so we could secure the saw vise to a workbench with a couple F-style clamps. The addition of a square block secured below the base will allow you to hold the saw vise easily in your bench vise.

The Great Debate

When the vise is assembled, there should be a slight gap between the two jaws, and a hollow should be planed in the middle of the jaw faces. When the uprights are clamped together, this hollow forces the ends of the jaws to close first. As the clamp is tightened, pressure is applied along the length of the jaws to hold the blade firmly.

There is an unsettled debate about whether or not the faces of the jaws should be parallel, or just meet at the top. One camp asserts that the faces of the jaws should be angled slightly in at the top to ensure that the gripping force is strongest directly below the saw teeth, thereby reducing vibration.

The opposition believes that parallel jaws increase the mass in the wood-to-steel contact area, thereby reducing vibration. Changing from one to the other takes only a few minutes of planing, so try both ways and decide which works best for you.

Three clamps. *Two F-style clamps hold the vise to the bench, the third tightens the jaws. Keep the handle of the third clamp away from you.*

LEAD PHOTO BY AL PARRISH; STEP PHOTOS & ILLUSTRATIONS BY THE AUTHOR

Ideally, the length of the jaws ought to match the length of the saw blade, so the entire length of the blade can be filed without repositioning. For backsaws, the height of the jaws should be reduced to provide room to grip the blade above the back.

First Things First

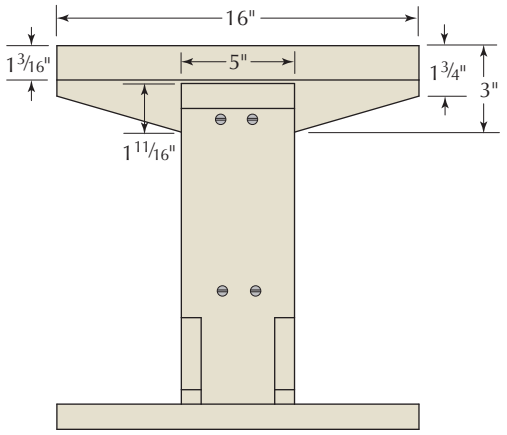
Make the two uprights and the two jaws first. Next, attach one of the uprights to the base with glue and screws, then insert the two corner braces. While the glue is drying, bevel two long corners of the 1½"-square fulcrum. The angle and size of the bevels aren't critical; you simply want to reduce the width of the attachment point on the movable upright. This makes it easier for the upright to bend slightly when you tighten the clamp to secure the jaws.

Attach the fulcrum to the uprights with a dab of glue and a couple screws from each side. Offset the screw locations in the uprights so they don't interfere with one another. Be careful to keep the uprights aligned when you attach the second one to the fulcrum.

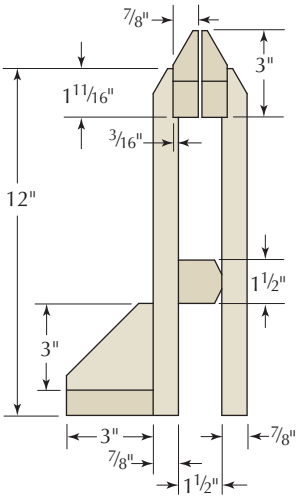
Spend some time preparing the jaws, and check them against one another as you work to ensure that they match. There should be a slight, bowed gap along the length of the jaws when viewed from above, and both ends should come tightly together when viewed from the end.

Fix the jaws to the uprights with screws only. The odds of getting the exact fit you want on the first try are slim, and this reversible connection lets you easily remove them for adjustment, or to swap jaws for a different type or size of saw. The wooden jaws may also warp or twist over time and need to be removed for an adjustment.

Tight fit. *The jaws of the vise hold the sawblade and keep it from vibrating. If you hear an awful noise, the jaws need some work.*



ELEVATION



PROFILE

Clamp the assembled saw vise to your bench and put your saw in place. Set the blade so the teeth are parallel to the top of the jaws, and as close as possible. Place an F-style clamp on the uprights above the fulcrum and below the jaws, then tighten it. If the jaws secure the blade, you're ready to start sharpening.

If the grip isn't strong enough, be sure the clamp is centered in the width of the upright and try a different vertical position for the clamp. If that doesn't work, check the way the jaws fit the blade and adjust the faces of the jaws with some judicious planing.

Practice Makes Perfect

The good thing about learning to sharpen saws is that you can pick up a decent old saw at a yard sale or flea market for a few dollars and use that to practice on. Filing the teeth of a saw is more about consistency than skill, and it doesn't take long to get the hang of it. Put a good light on the work (and get a pair of magnifying goggles if you're older than 40) and have at it.

Begin by matching the existing angles of the saw you have. Set the file in the gullet between two teeth and take a few strokes. The goal is to make the metal shiny all the way across the front of a tooth that points away from you and the back of the tooth ahead of it. The teeth will tell you when you have the angles right.

If it's a crosscut saw, angle the file about 15° back toward the handle when viewed from above. Start at the end of the blade closest to the handle, as these are the least-used teeth. File every other tooth, then turn the saw around and file the opposite set of teeth.

If it's a rip saw, file straight across. When you are adept at matching existing angles, you'll have the skills to experiment with differing rake angles (the slope of the front of the tooth from vertical) and fleam angles (the angle of the face of the tooth from the body of the blade).

It's best if you can find someone to show you how, but the next-best thing is to watch a good video. In the box below we've listed one of the best we have found, as well as sources for instruction and supplies. **PWM**

Bob is executive editor of Popular Woodworking Magazine *and the author of several books that he shamelessly plugs when given the opportunity. Visit his web site at craftsmanplans.com.*

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New Life for an Old Table Saw

by Steve Shanesy

The refurbished 1944 Unisaw is ready for another 50 years of service. The labor of love included new arbor and motor bearings, a thorough cleaning, some paint and rewiring, among other chores. The original fence was upgraded to a modern Biesemeyer model.

The dream of a "barn find" looms large in most people's imagination, whether it's 1,000 board feet of 18"-wide walnut or a '67 Mustang (pony interior, of course). Problem is, it rarely happens to you.

My turn came last fall when I stumbled on an old Delta Unisaw. And I mean WWII-era old. The serial number and a quick Internet search gave me a "born on" date of 1944, about the fourth year of production for this stalwart table saw model.

But finding this relic and owning it were two separate matters. The contents of the building where I discovered it were to be sold at auction. So just how much should I pay for the saw? Would it be a steal? Would a "collector" bid up the price? The auctioneer asked for $125. No takers. Next he asked for $75 and a hand went up. Then $100 and my hand went up. In a matter of seconds, it was mine for $165.

And thus began my relationship with a 65-year-old woodworking machine. As you would expect, "getting acquainted" was the first order of business after hauling the Unisaw back to the *Popular Woodworking Magazine* shop.

There were three things that first struck me about my "new" machine: 1) how familiar it looked (there had been very few significant design changes through the decades); 2) the Art-Deco style and logo were very cool looking; and 3) the shape of the motor was far different from any "modern" motor I'd ever seen.

I've owned two table saws during the past 30 years and both were made by Delta (a "contractor" saw purchased in 1980 or so, then a new Unisaw I bought in 2000) and it was clear this 1944 version shared a lot of the same DNA. The old saw's fence was essentially the same as the Jet Lock rip fence from my contractor saw. The overall look, interior workings, trunnions and more looked like they could easily interchange between Unisaws. In fact, when I decided to upgrade the 1944 Unisaw with a new Biesemeyer fence, I found the hole centers and bolt sizes for attaching the new fence were exactly the same today as they were 65 years ago.

What I did find completely different was the motors. Just about all motors on modern machines are capacitor-start induction motors. The capacitor element of the motor, simply stated, helps give the heavy motor armature an extra jolt of power to get it up to speed, then it cuts out. This old saw uses a repulsion-induction motor. To get this armature up and running, extra power feeds through four carbon brushes and a commutator. When the armature turns fast enough, centrifugal force cuts out the extra juice.

Because of its shape, the monster 86 pounder was called a "bullet" motor. The plate rated it at just 1-horsepower, but in use, I can only say they must have made horses differently back then. Or, to quote an old friend in the woodworking machine industry, "Those old motors had more guts than a butcher's dog."

Back at the shop, I was tempted to simply plug it in and flip the switch for a quick "test drive." However, my instincts suggested a thorough look at the switch and plug wiring. Although the outside sheath was intact, I found the inner wire insulation was dry-rotted and required replacement.

With the motor out and the top off, examining and servicing the trunnions was easy. All the moving parts were easy to clean and worked like new with just a bit of penetrating oil, an abrasive pad and some elbow grease.

The arbor bearings were quite another story. The ancient grease in these old sealed bearings meant replacement. So I disassembled the arbor mechanism, pulled the old bearings and pressed new ones in place – not a particularly difficult or time-consuming task.

I next turned my attention to the saw exterior. My dilemma was how to deal with the dirty and worn original paint. Should I go for a shiny new paint job, or just clean the years of grime off and let the "battle scars" remain? Ultimately, I decided on a combined approach. The cast iron base was somewhat rusted, so I elected to clean and paint it, but I kept the original cabinet paint. I treated it with a cleaning agent, a #400-grit wet sanding and a final coat of wax.

I also cleaned the cast iron top, steel fence and fence guide bars. With that, the machine was ready for reassembly and testing.

It was a wonderful moment when I flipped the switch and the motor whirred to life. I mounted a blade and made several cuts. But after about 20 minutes, I started ripping a piece of 8/4 poplar and the motor came to a heart-sinking stop. Now what?

I found a lot of help at the web sites Old Wood-Working Machines (owwm.com) and its companion message board (owwm.org). I guessed the issue was the commutator and centrifugal device that shorts out the motor. So out came the motor. With some trepidation, I cracked the cases and took it apart. Inside, it was a filthy mess. Inspecting the so-called "necklace," that part of the starting mechanism mentioned earlier, it appeared that a spring was stretched beyond its ability to properly hold the works together.

When purchased, it was clear the saw needed work, but how much was unknown.

To make a long story short, I recompressed the spring and replaced the two motor bearings while I was at it. Next, I gave the entire motor interior a thorough, if gentle, cleaning and put everything back together. It was a satisfying moment to hear the motor power up, stronger and quieter than before. That same 8/4 poplar piece cut easily this time.

To bring this old Unisaw closer to the features of a modern machine, I fabricated a dust-collection arrangement at the back of the saw and made a motor cover. I wanted a modern fence, so I installed a new one from Biesemeyer.

With some luck, my old Unisaw may see another 50 years of service. And if so, I'll be even more proud of the work I put into the refurbishment. I discovered in doing the work that tasks such as changing bearings and performing rudimentary motor repair were within my abilities – even if undertaking them was a bit scary at the outset.

I'd like to invite you to follow me in my journey bringing this fine old machine back to good working order. You can do that by viewing the six short videos we made of the various stages of work. You can view those, free, on the *Popular Woodworking Magazine* web site at popularwoodworking.com/jun10.

Steve is the publisher of Popular Woodworking Magazine. *A long time woodworker, he also "wrenches" on vintage motorcycles as well as woodworking machinery.*

Meet your Daddy! The WWII-era Unisaw design was relatively unchanged until Delta released its totally redesigned Unisaw in 2008.

PHOTOS BY AL PARRISH

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BY STUART PAGE

Country Workshops

This sylvan school offers a wide variety of classes in woodworking and more.

Country Workshops. *Nestled in a beautiful Appalachian valley an hour's drive north of Asheville, N.C., Drew Langser's school, Country Workshops, sits quietly in its stunning surroundings. The workshops and accommodations are in the converted tobacco barn (left), while Drew and Louise Langsner's home is farther up the hill (right).*

Country Workshops began when Drew Langsner and his wife, Louise, moved from California to the Smoky Mountains. On their farm, a 15-minute drive from the nearest tarmac, they've built a two-story cabin by hand, which took two years (and an infinite amount of patience) to build.

As I drive the path to the Langsner farm, I marvel at their beautiful buildings: the old tobacco drying barn used as a workshop and guest quarters; and Drew and Louise's cabin farther up the hill, which looks out over the valley below. Nestled in the trees of the surrounding woodland is a second guest lodge. And just when you think things can't get better, you eat some of Louise's home-cooked food (picked from the garden) and watch the sun set over the valley.

I stayed above the workshop in student accommodations, where it is pleasantly cool even in the summer heat. The rooms are Spartan but comfortable, with plenty of craft books for bedtime reading. I found myself diving into tomes about knife-making before falling asleep to the sounds of the forest.

If you're looking for a five-star hotel, look elsewhere. But if you want simple comforts, healthy food in workingman's portions, warm fires and good company then Country Workshops is what you're looking for.

Old & New

I first heard of Drew Langsner when I began my education in furniture making. He was one of the few people who had written a book on Windsor chairs, and I am from the home of Windsor chairmaking in England, High Wycombe. Moreover, I had a desire to learn traditional woodwork – something sorely lacking in my ultra-modern college workshop.

When I needed to build a shaving horse to drawknife 23 table legs, I turned to Drew's design in "The Chairmaker's Workshop," which is an enlightened mix of old and new. Not only was his horse prettier, it worked better.

So when I toured North America to visit woodworkers, Drew was on my list. It was the whole ethos of "rustic precision" that I found intriguing – that a piece of furniture did not have to be high style to be well-made, that rustic does not equal unrefined.

A Search for Knowledge

It was toward the end of my long journey around America and Canada's workshops that I arrived in North Carolina at the tiny

Chair and baskets. *A low-back "stick" style Windsor chair from Country Workshops' " Rustic Windsor Chair" class, with some basketwork displayed behind.*

PHOTOS BY THE AUTHOR

Benchroom. *The main bench room is a light, airy space. The only problem is focusing on what you are turning on the lathe and not gawping at the amazing view out the window.*

Old-world and new. *An array of shaving horses for students' use rest alongside the familiar table saw.*

sign for the Country Workshops. Knowing something of Drew and Louise's work, the sign made sense to me. Though, as Drew admits, it is a singularly non-descriptive title.

"Country Workshops is a lousy name because it doesn't tell you anything about what we do," Drew said. "We even had a competition to improve it, but decided to keep it."

In the end, I think a more colorful name would narrow the school's impressive range of focus. Country Workshops offers not only a variety of green woodworking courses but also Japanese woodworking, tool making, willow basketry, organic gardening and cooking. Drew and Louise even organize annual craft tours to Europe and the Far East.

Friends, Mentors & Masters

How Drew involved himself in so many crafts is a story that begins when he and Louise went to Europe and met Ruedi Kohler, one of the few master coopers in the Swiss Alps. Drew took a short apprenticeship there and learned coopering and basic woodworking.

At first Drew was daunted by Kohler's skill. "I realized that I wasn't that talented in precise work but learned much from coopering, despite moving away from it," Drew said.

The Langsners returned to the United States, bought their 100-acre farm and built Country Workshops together. Their only building at the time was the tobacco smokehouse, which is where they ran their first course that same year, 1978.

Today the workshop is divided into three rooms: a machine room, a bench room and a timber/parts store upstairs.

The shop is geared toward green woodwork and chairmaking. Thus, Country Workshops has few accoutrements of cabinetmaking: there is only one jointer, one cabinetmaker's bench and a small table saw; but there are five electric lathes, six shaving horses and many small benches for working chair parts. There is also a beast of a bending bench, with multiple dog holes to help make steamed shapes.

Famed Swedish craftsman Wille Sundqvist taught that first course in 1978; since then, the list of instructors reads like a who's who: John Alexander, Dave Sawyer, John Brown, Brian Boggs, Carl Swensson. And in the process of running the school, Drew himself has become a force in green woodworking.

Just like his shaving horse, Drew's knowledge and skill is a mixture of old and new. For example, he used to make traditional hayforks by hand, but then he found the manufactured variety worked better. It is ironies such as this that he and Country Workshops embody.

"The hayfork was a symbol of life when it was harder to live but easier to enjoy – when you understood who you were," Drew said. "But it was harder to put food on the table."

So Country Workshops embodies the spirit of the rural past but exists in a modern age. While attending a course there, you will work on the shaving horse with a drawknife, but also use an electric lathe.

It's Elemental

Drew sees Country Workshops as answering problems posed by modern woodworking, the machinery associated with it and the way we learn to make things.

"Knowing what to do doesn't mean you can do it. There is a general lack of skill which people look to technology to answer, and really all you need is practice," he said.

And that is one of the great things about Country Workshops. You don't just sit in a classroom and learn the theory – you also practice. And you get to do this in the clean air and quiet landscape of North Carolina, so you can relax into a working rhythm.

A visit to Drew's school is not just another woodworking course, it is an immersion (albeit temporary) in the experience of green woodworking – of working by hand, outdoors, from the tree to the finished object. The whole experience is just like one of Drew's chairs – "rustic with finesse." PWM

Stuart is a furniture maker who lives in Scotland. He came to the United States in the summer of 2009 on a Winston Churchill Trust grant to meet as many of the top furniture makers as he could.

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BY BOB FLEXNER

Twenty Questions

Did I mention there would be a quiz?

Glazing and toning. *Both of these processes are a way to add color over sealed wood. Glazing (on the left) involves applying and manipulating a thick-pigmented stain; toning (on the right) is a thinned and lightly colored (pigment or dye) sprayed finish.*

Here are 20 questions, together with the answers, based on my articles from *Popular Woodworking*. If you have been reading regularly, you should do well.

For more in-depth explanations, go to popularwoodworking.com/finishing, where you'll find many of the articles, and you can find explanations in my book, "Understanding Wood Finishing."

True or False?

1 ■ The crucial element causing finish deterioration and color fading is light.

True. Especially UV light from direct sunlight and fluorescent light.

Fading finish. *Notice the fading and finish deterioration in the top two-thirds of this cabinet, which backed up against a west-facing window for many years.*

2 ■ The purpose of a sealer is just as the name implies – to seal the wood.

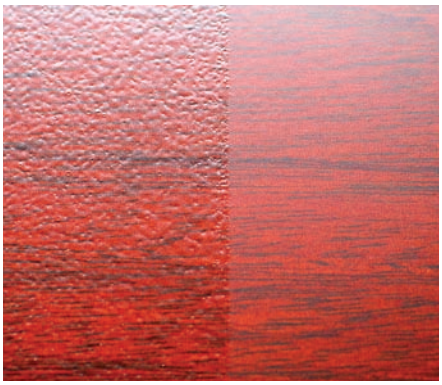
False. The first coat of any finish seals the wood. A "sealer" solves a problem. Sanding sealer makes sanding easier. Shellac blocks silicone oil, pine resin and bad odors.

3 ■ Washcoating refers to the procedure of washing the wood with a solvent to clean the wood before applying a finish.

False. Washcoating refers to partially sealing the wood with a thinned finish before applying a stain to reduce blotching.

4 ■ Many products labeled "tung oil" are not tung oil at all.

True. Most are varnish thinned about half with mineral spirits. They have nothing to do with tung oil.



Orange peel. *The finish on the left side of this photo was sprayed too thick with too little air pressure. The orange peel was avoided on the right side by thinning the finish.*

5 ■ Glazing and toning are two ways of adding color over sealed wood. Which of the pictures above shows glazing and which shows toning?

The cabinet door on the left was glazed. That is, a thick-pigmented stain was applied and selectively removed and brushed out to create the darker coloring in the recesses and on the edges. The cabinet door on the right was toned. A colored finish was sprayed into recesses and on the edges and left. It wasn't touched.

6 ■ The only way to get a perfect finish, despite many claims to the contrary, is to sand the finish level and rub it to the sheen you want using various grades of abrasives.

True. Unfortunately. The phrase "perfect finish" is way overused.

7 ■ The way to avoid orange peel (seen in the photo at immediate left) is to increase air pressure, thin the finish or both.

Both. These are the remedies because the primary cause of orange peel is spraying too thick a liquid with too little air pressure.

8 ■ The basic instruction for applying a stain is to apply a wet coat and wipe off the excess before it dries.

True. It's critical that the wood first be wet with stain to get an even coloring.

9 ■ Always apply compatible oil or varnish (polyurethane) finish on oily woods such as teak, wenge and cocobolo.

False. The oily resin in these woods hinders the drying of oils and varnishes but not

PHOTOS BY THE AUTHOR

other finishes. To get oils and varnishes to dry normally, clean the oily surface of the wood by wiping with naphtha just before applying the finish or apply a coat of shellac to block the oily resin.

10 ■ Always brush stains and finishes across the grain first to work them into the grain.

False. Stains and finishes soak into the grain of wood by capillary action no matter in which direction they are brushed.

11 ■ Finishing undersides and insides of a project prevents warping.

False. Finish only slows moisture penetration; it doesn't stop it. If the wood isn't dried properly for the climate, it will still warp.

12 ■ Other than spraying, the most efficient way to apply a stain is to brush it.

False. It's much quicker to wipe on a stain using a cloth or sponge. Then wipe off the excess.

13 ■ Always begin sanding wood with #80-grit sandpaper to remove flaws.

False. The grit sandpaper to begin with varies depending on the situation. Always begin with a grit that removes flaws, such as washboarding, snipes or gouges, efficiently without creating deeper-than-necessary scratches that then have to be sanded out.

14 ■ Judging by the amount of color the finish adds to the wood, which cherry panel of the two pictured below is finished with water-based polyurethane and which with oil-based polyurethane?

The colorless left panel is finished with water-based polyurethane. The richer right panel is finished with oil-based polyurethane.

Oil stain vs. dye. *Oil stain (left) doesn't color the dense parts of oak as well as dye stain (right).*

Reflected light. *Always check for developing problems in a reflected light.*

15 ■ Judging by the amount of color added to the wood in the left photo above, which side (left or right) would you think was stained with a common oil/wiping stain and which with a water-soluble dye stain?

The left side was stained with a common oil/wiping stain, the right with dye.

16 ■ The most important instruction to follow when brushing or spraying a finish is to watch what's happening in a reflected light.

True. In a reflection you can see problems as they occur and fix them (see photo at upper right). Without a reflection, you're blind.

17 ■ "HVLP" refers only to spray guns with air provided by a turbine rather than a compressor.

False. "HVLP" refers to a soft spray created by high air volume rather than high air pressure. Both air sources can produce this soft spray if the gun is made to do this.

18 ■ Blotching can be avoided in cherry by applying a wood conditioner before applying a stain.

False. The wood conditioner itself will cause blotching. Most cherry boards blotch no matter what you do. The only way to totally avoid this blotching is to cover and hide it with glaze, which obscures the wood, of course.

19 ■ The most widely used finish among amateur woodworkers, and the finish I've suggested produces the best results with the least experience, is wiping varnish.

True. Wipe-on Poly, Waterlox, Seal-a-Cell, Arm-R-Cell, Pro Fin, and many brands labeled "tung oil" are all wiping varnish – that is, varnish thinned about half with mineral spirits. You can make your own.

20 ■ Thinning the first coat of finish half with thinner creates a better bond to the wood.

False. Thinning the first coat makes it easier to sand, which should be done to create a smooth surface for subsequent coats. Thinning doesn't improve the bond to the wood. **PWM**

Bob is the author of "Understanding Wood Finishing" and contributing editor to Popular Woodworking Magazine.

Oil vs. water. *Oil- and water-based polyurethane look very different on wood. Water-based polyurethane (left panel) adds no color to the cherry. Oil-based polyurethane (right panel) adds a warmer yellow/orange coloring.*

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TO BUY: *Bob Flexner's book, "Understanding Wood Finishing," is available at Amazon.com.*

VIDEO: *Wood Whisperer applies varnish.*

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GLOSSARY

Woodworking's lexicon can be overwhelming for beginners. The following is a list of terms used in this issue that may be unfamiliar to you.

beetle (n)
(1) A creature that may crawl out of stock when you bring it inside for acclimation. (2) A large wooden maul bound with iron rings at each end of the head to prevent it from splitting. A beetle is used to strike a wedge when splitting logs.

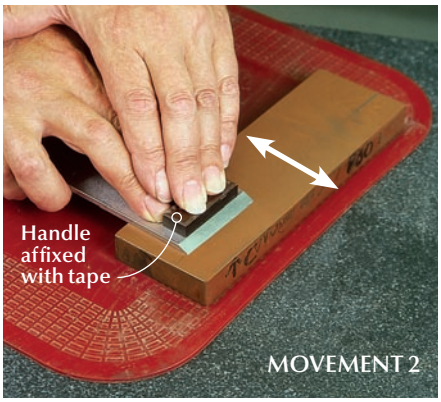
burnisher (n)
A handled hardened steel or carbide rod that usually has a smooth, rounded edge or convex surface. In woodworking, it is used for turning the edges of scraper blades, forming a burr by rubbing. The most popular style is round, though burnishers are also available in triangular or oval shapes.

burr (n)
A small wire edge that often remains after manipulating metal, such as in sharpening a plane blade. It is usually removed by rubbing the back of the blade on a stone. With a scraper, however, the burr is burnished into a hook.

camber (n)
A slight curvature that is recommended by some for the cutting edge of plane blades. On a fore plane, for example, Editor Christopher Schwarz hones a curve with an 8" radius on the edge to prevent the corners of the blade from digging in.

"Be obscure clearly."
— E.B. White (1899 - 1985)
American writer

drawer slips (n)
A narrow grooved framework glued to the inside of drawer sides in which the drawer bottom is captured; typical of 18th-century English case pieces. Slips have a few advantages: Dovetail layout is easier. The drawer bottom and sides can be thinner. If you bevel the tops of the slips it makes the drawers easier to clean (if you do that sort of thing).



entablature (n)
The support structure above a column in any of the classical column orders (such as Doric, Ionic and Corinthian).

froe (n)
An L-shaped tool with a metal head and wooden handle used to split thin planks along the grain from a chunk of wood. The metal blade is pounded into the end of the wood along the grain, then twisted by the handle to split out a plank.

"Movements 1 & 2" (n)
In "Success With Scraper Planes" (page 42) David Charlesworth refers to two techniques from his "Ruler Trick" article (you'll find a link online to the November 2004 story at popularwoodworking.com/jun10). First, affix a small wooden block to the edge of the blade just behind the bevel, to serve as a handle.

"Movement 1" refers to lengthwise strokes made by laying the blade across the stone, so that the edge of the blade is hanging about 1/2" off the edge of the stone. Using considerable downward pressure on the handle, David moves the blade steadily up and down the length of the stone and allows the edge to drift on to the stone to flatten the back of the blade.

In "Movement 2," the blade is laid across the stone at one end, with the edge of the blade about 1/2" off the edge of the stone. The stroke is crosswise, bringing the blade one-third of the way across the stone before returning to the start position. Considerable pressure is exerted on the center of the handle. During about 40 to-and-fro strokes the blade is allowed to drift up the length of the stone, and then back down to the starting position.

The stone is then rotated 180° as before, so that the other edge of the stone may be used.

The two movements may need to be repeated several times to remove the blade manufacturer's grinding scratches just behind the cutting edge.

saw file (n)
A small file that is almost always triangular and tapers toward the end to easily fit between the teeth on a saw for hand filing.

saw set (n)
A tool that, when you squeeze its handle, bends the teeth of a saw to the right or left of the blade a measured amount.

spade bit (n)
Generally used for rough boring, spade bits are flat, have a center point and two wing-like cutters, sometimes equipped with spurs.

trifid foot (n)
A carved foot comprised of three connecting lobes; sometimes called a "drake" foot. It's most often found on 18th-century designs, particularly on Queen Anne pieces. **PWM**

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ARTICLE: *Read David Charlesworth's "The Ruler Trick," from the November 2004 issue of* Popular Woodworking.

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BY JOE BARNHART

Sandpaper Drawer

The lessons I learned from Dad's crumpled and worn-out abrasives.

Whether you're a professional or hobbyist woodworker, having a keen sense of proper material utilization reduces the cost of projects while extending increasingly hard-to-find resources. Conservation means taking advantage of carefully thought-out plans, cut lists and diagrams, board selection and myriad other techniques – all while avoiding mistakes.

Building Baltic birch plywood drawer boxes the other day, it dawned on me that I'd forgotten to allow space for the full-extension slides. I'm avoiding my accompanying phraseology here; let's just say I threw an immature tantrum, then trimmed the parts. Later, I wondered what childhood woodworking experience would cause such a negative reaction.

Possibly, my actions resulted from adventures with an obscure sandpaper drawer in a cramped basement workshop. I loved the morning sun's warming glow beaming into the dust-coated haven that shared precious space with a forced-air furnace and boxes of Christmas decorations.

In that cubbyhole, I avoided my Mom while creating wooden memorabilia including a heavily nailed and crooked pine stepstool and rubber-band guns.

My Dad was my head trainer; he started me off with hand tools and reluctantly issued supplies. Gradually, more elaborate and powerful tools were added, including a Craftsman table saw. Mom was petrified with disbelief: "You can't let that 10-year-old run a table saw!"

As I finished my first rubber-band gun one Saturday morning, Dad directed me to, "Get some #100 grit from the drawer over there." Anxious to finish and use my new weapon, I opened the drawer, and dug around for the right paper. What I discovered was an assortment of relics. Crumbled, sandless paper arranged into what looked to be a gerbil's home away from home.

I grabbed a decomposing piece and sanded like crazy. It was slow going – akin to sweeping a sidewalk with a toothbrush. What seemed like punishment was Dad's way of teaching me to conserve materials. "Cutting the board this way will give you more pieces" and "Don't throw that away; we'll use it later," were time-honored words of wisdom, imparted to a hyper-active kid with a five-minute attention span who just wanted to build something.

Those primitive projects nurtured a sense of accomplishment the way only wood can. No other medium can offer such complex shapes, patterns and textures. This is not without a price. Nick Engler points out in his June 2000 *Popular Woodworking* article (#115) "The Way Wood Works" that, "Wood is a cantankerous substance … it's a complex and often perplexing building material."

Case-in-point are some oak cabinets I'm just finishing up. Being basically cheap, I picked No. 2 red oak but worried about working around the "cantankerous" defects, potentially rendering boards worthless. However, many times I marveled at the incredible grain patterns as a board exited the planer. Discovering and capitalizing on those unique characteristics while making efficient cuts are challenges all woodworkers face.

My Dad passed away more than 10 years ago but his many lessons still linger. As I scrutinize a board for the best cut, sometimes I get caught short of breath with memories of that little dusty shop where he instilled in me an appreciation for conservation in woodworking.

So these days, after finishing a project I painstakingly gather the well-worn sandpaper and place it in my sandpaper drawer … wait – are you kidding?! I chuck it. Besides conservation, Dad indirectly taught me that sanding with dull sandpaper is sheer agony. PWM

Since his first sandpaper experience, Joe has spent thousands of hours teaching woodworking conservation techniques in college material processing labs.

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Christopher Schwarz
Popular Woodworking, August 2008

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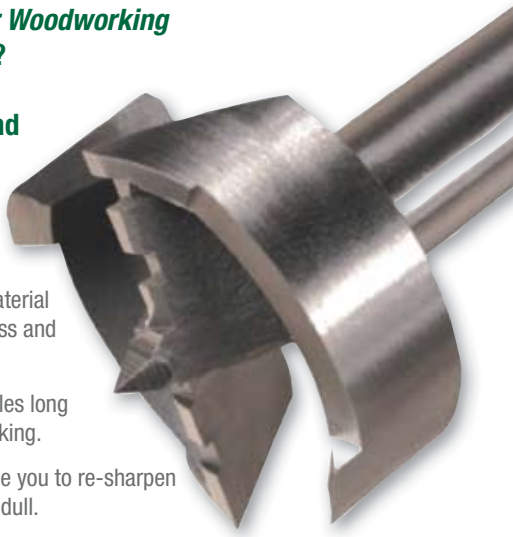

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