14 NEW TOOLS!

20 SHOP TIPS!

WIN A LAGUNA BANDSAW! PAGE 73

American Woodworker

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#147, APRIL/MAY 2010

Bent-Lam Trestle Table

Mastering Door Locks

Decoding Any Finish

Weekend Project: Baffling Bandsaw Box

Rescuing Old Tools

New England Bench

Swing-Up Storage

Small Shop Slider

Tips for Perfect Sanding

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- Table size with extension wings: 40" x 27"
- Arbor: ⅝" • Max. dado width: ⅞"
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- Max. depth of cut: 3" @ 90°, 2⅛" @ 45°
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- Universal router mount
- Table insert size: 4"

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- Motor: 5 HP, 220V, single-phase
- Table size with extension: 30¾" x 48⅜"
- Arbor speed: 3600 RPM
- Arbor: ⅝" & 1"
- Max. dado width: ¾"
- Max. rip capacity: 36"
- Max. depth of cut: 4" @ 90°, 2¾" @ 45°
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MADE IN ISO 9001 FACTORY!

- Motor: 1 HP, 110V/220V, single-phase, TEFC, 1725 RPM
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- Table size: 14" sq.
- Table tilt: 45° R, 10° L
- Max. cutting height: 6"
- Blade size: 92½" to 93½"L (⅛" - ¾" W)
- Cast iron frame
- Approx. shipping weight: 198 lbs.

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- Precision ground cast iron table size: 23⅝" x 17¼"
- Table tilt: 5° left, 45° right
- Max. cutting height: 12"
- Blade size: 131½"L (¼" - 1"W)
- 2 blade speeds: 1700 & 3500 FPM
- Approx. shipping weight: 418 lbs.

Product Reviews & Awards

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- Rabbeting capacity: ½"
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- Cutterhead speed: 4800 RPM
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G0452 1 HP MOTOR ~~$435.00~~
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~~$695.00~~ **SALE $675.00**

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8" x 76" Parallelogram Jointers

- Motor: 3 HP, 220V, single-phase, TEFC, 3450 RPM
- Precision ground cast iron table size: 8" x 76⅜"
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- Deluxe cast iron fence: 36"L x 1¼"W x 5"H
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- Motor: 3 HP, 220V, single-phase
- Precision ground cast iron table size: 12¾" x 83½"
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- Max.depth of cut: ⅛"
- Max. rabbeting capacity: ¾"
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- Max. cutting width: 15"
- Max. cutting height: 6"
- Min. stock thickness: ⅛"
- 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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- Motor: 3 HP, 220V, single-phase
- 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

- Motor: 5 HP, 220V, single-phase
- Table size: 20" x 25¾" (20" x 55½" with extension)
- 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.

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- Motor: ¾ HP, 110V, single-phase
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- Table size: 11⅜" sq.
- Table swing: 360°
- Table tilts: 90° L & R
- Swing: 14"
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- Drilling capacity: ¾" steel
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- Approx. shipping weight: 171 lbs.

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16" x 43" Swivel Head Wood Lathe w/Cast Iron Legs & DRO

- Motor: 2 HP, 110V, single-phase
- Precision milled cast iron bed
- Dist. between centers: 43"
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2 HP Dust Collector w/2.5 Micron Bag

- Motor: 2 HP, 220V, single-phase, 3450 RPM
- Motor amp draw: 12 Amps
- Air suction capacity: 1550 CFM
- 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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American Woodworker

#147, April/May 2010

Features

How Do You Create Endless Cabinet Door Making Possibilities?

Profile Shown:
Round Over
(#99-760)

Patented design allows for multiple rail & stile project combinations

With Freud's New Premier Adjustable Rail & Stile System

Now with Freud's new, patented Premier Adjustable Rail and Stile router bit system, you are able to build any style of cabinet door in a wide range of door thicknesses and sizes! This extremely easy-to-use solution gives you unlimited creative freedom, and solves the long-standing limitations of existing frame and panel door construction.

This one of a kind solution allows you to create extended tenons for extra door joint strength, adjust groove width for different panel thicknesses and choose from a variety of material thicknesses for your stiles and rails (5/8" to 1-1/4"). Optional add-on cutters increase your bits' capabilities even more, allowing you to create glass panel and double sided profile doors.

Four profiles are available; **Round Over** (#99-760), **Ogee** (#99-761), **Round Over Bead** (#99-763), and **Bevel** (#99-764).

Standard stub tenons in regular 3/4" stock

Extended tenons for strong joints in larger doors

Glass & screen panel capability

Double Sided Profiles in thick stock

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www.freudtools.com/PremierRailandStile

Others

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Cabinet Doors In Varying Material Thickness +

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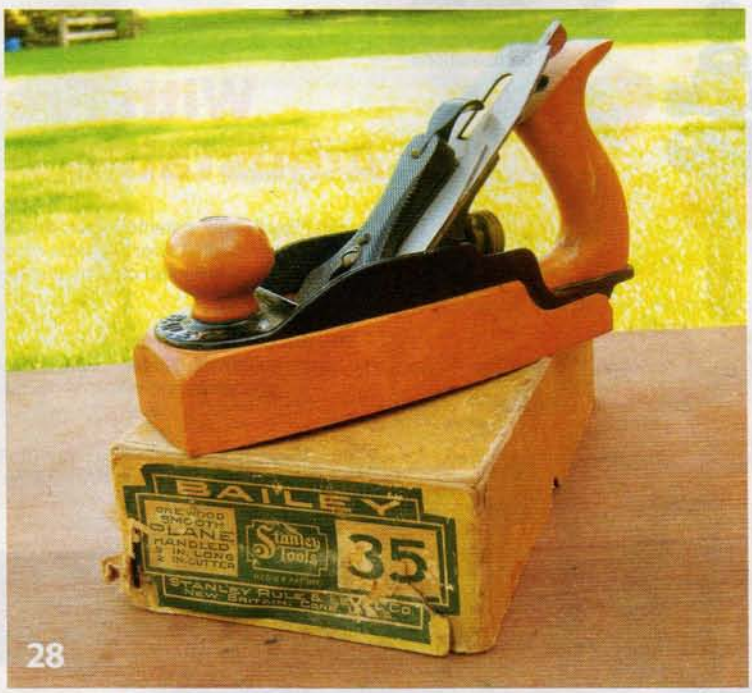

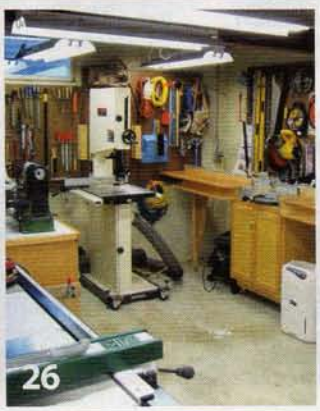

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#147, April/May 2010

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From the Editor's Desk

Future Woodworkers of America

I RECENTLY HAD THE OPPORTUNITY to tour a few high school woodshops in and around Las Vegas, Nevada, and I got to talk with both teachers and students.

Having taught woodshop myself, it was obvious that many positive things haven't changed. The teachers are still deeply committed to their students and programs. Their ability to keep 20 to 30 students safely working in a room full of woodworking machines is nothing short of amazing. These dedicated teachers know what's happening across the shop by just listening to the machines and confirming with a quick glance whether a student needs immediate assistance—or is simply having a "learning experience."

Students still show genuine enthusiasm for the opportunity to work with tools and make something useful with their own hands. Also unchanged is the pride they take in their finished projects. The projects haven't changed much either, although the VHS video storage cabinet has become the DVD storage box and the writing desk is now the laptop desk. The paintball gun case was a surprise—but from a more traditional viewpoint, it's just a scaled-down blanket chest or an oversize jewelry box.

The woodworking machinery remains basically the same, although two new tools stand out: the SawStop cabinet saw and the ShopBot CNC router. In addition to being a top-quality saw, the SawStop makes excellent safety sense for schools because of its unique blade stop/retraction system. The Shopbot CNC router links woodworking to computer technologies and design, and it provides a new (digital) way of producing project parts.

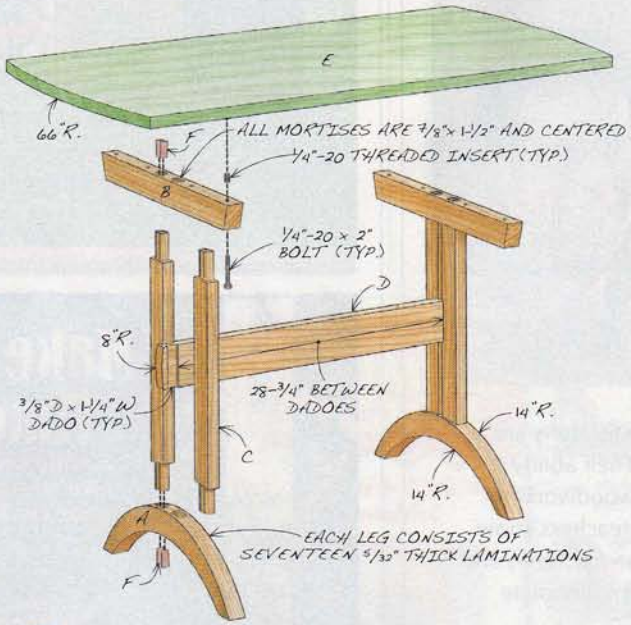
Seventeen of the forty-five or so high schools in the Las Vegas, Clark county school district have at least one ShopBot CNC router—that's pretty impressive. The teachers that I spoke with found the CNC technology to be a valuable teaching tool that helped students apply knowledge from other subjects. To quote one student, "Wow, that X, Y, Z axis stuff from math class really does have an application. I get it now." Some teachers have their students use the ShopBot to cut out parts for entire projects; others use it primarily to decorate part surfaces.

For photos and more information about these school shops, visit: **www.AmericanWoodworker.com/147/LVshops**

Enjoy,

Randy Johnson

More On the Web at AmericanWoodworker.com



Trestle Table Plans

Get plans and a cut list for a 52" x 96" version of this table.
www.AmericanWoodworker.com/147/LargeTrestleTable

Perfect Pommels

For the complete story on creating pommels, go to
www.AmericanWoodworker.com/147/PerfectPommels

How Do *You* Sand?

To share the sanding method that works best for you, go to **www.AmericanWoodworker.com/147/Sanding**

Bandsaw Tuning

For information on how to tune a bandsaw, go to
www.AmericanWoodworker.com/147/BandsawTuneup

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See how to glue up a bent-laminated foot at:
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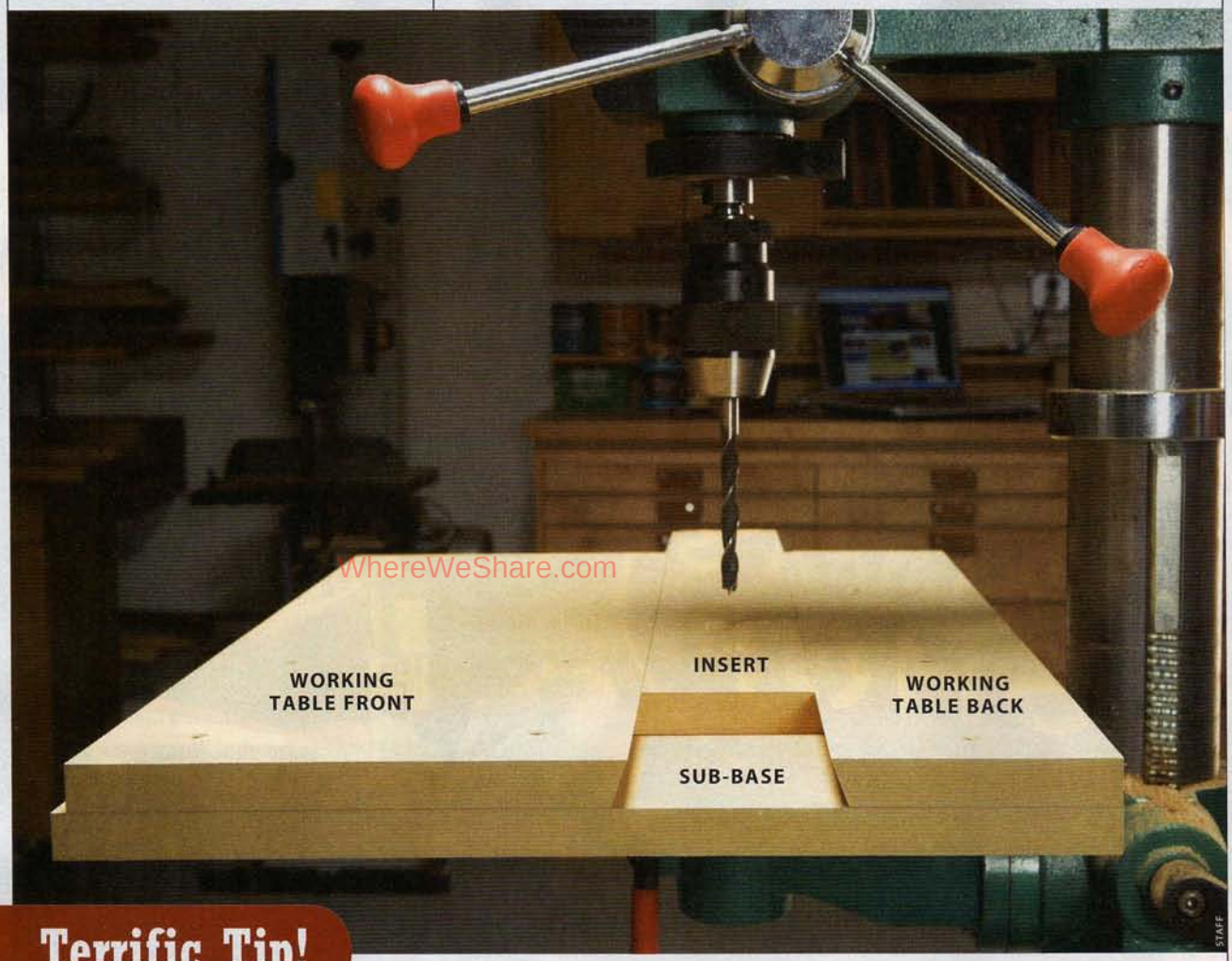

Terrific Tip!

Dovetailed Drill Press Table

TO AVOID MAKING a new wooden drill press table each time one gets full of holes, I made a table with a dovetail-shaped sliding insert. The insert has room for many more holes, and is easily replaceable. By extending one end, it can also support long stock. Removing the insert creates a cavity for a sanding drum.

The table is two layers thick, each made from 3/4" MDF. Attach the bottom layer, or sub-base, to the cast iron table of your drill press. Make the top layer–the working table–whatever size you want. Cut a center section about 3" wide, and make a few extra centers for use later. Saw the angled edges of the table's pieces at 20°. Clamp the front piece, the insert, and the back piece together on top of the sub-base and center the insert under the chuck. Screw the working table's front and back pieces to the sub-base.

Clinton Jones

Terrific Tips Win Terrific Tools!

We'll give you $100 for every original workshop tip we publish. One Terrific Tip is featured in each issue. The Terrific Tip winner receives a 12" Leigh Super Jig with VRS (Vacuum and Router Support), a $239 value.

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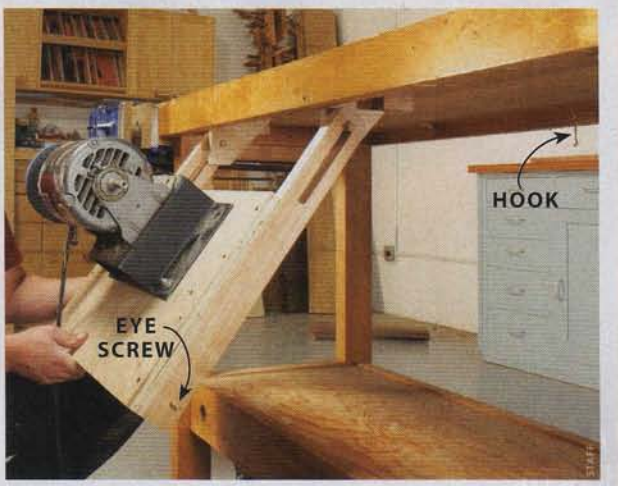
EDITOR: BRAD HOLDEN • PHOTOGRAPHY COURTESY OF CONTRIBUTOR UNLESS NOTED

Foam-Tubing Seal

AFTER HOOKING UP MY new dust collector to my contractor's saw, I found that it just didn't pull as much air as I'd like, even after sealing up the most obvious leaks. After further inspection, I found the problem: major gaps underneath the table where it bolts to the stand.

I bought a 4' length of 2" dia. foam tubing (used for insulating water pipes) and cut it into pieces to fit the gaps. Foam tubing compresses for a nice, tight fit, and greatly improves my dust collection.

Mark Thiel



Swing-Under Bench Tools

IN ORDER TO KEEP my bench clear for working, yet have the tools I need close at hand, I came up with this stowable mounting system. Each of my bench tools is mounted on a board with slotted guide bars that ride on dowels.

When the tool is in use, the board locks in position at a comfortable working height. When not in use, the tool swings out of the way under my workbench and is held in place with a hook-and-eye screw.

Peter Unger

Testing for Square

ON A CROSSCUT SLED, the fence must be absolutely square to the blade. Here's a super-accurate method of testing for square. It makes errors easier to detect by magnifying them by a factor of four. The same method also works for a miter gauge, using smaller test pieces.

Start with a piece of plywood about 16" x 16" that's more or less square. Cut one edge using your sled and a sharp crosscut blade. Rotate the board so that the freshly-cut side is against the fence, and cut again. Rotate and cut two more times. Rotate the piece one more time, back to the original cut. This time, cut off a sliver about 1/16" thick.

Use a caliper to precisely gauge the sliver's thickness. If your fence is perfectly square, this sliver will be the same thickness over its entire length. If your fence is not square, the sliver will be thicker at one end than the other. The difference in thickness indicates four times the amount of error in each cut. Keep adjusting the fence by minute amounts, repeating the procedure until the last sliver is perfect.

Joe Emenaker

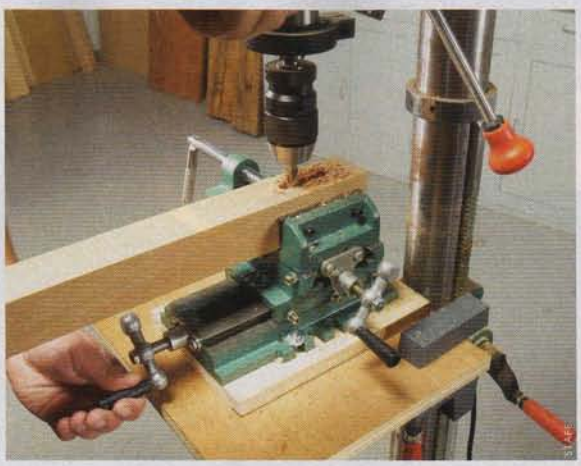
Dust Separator Upgrade

HERE'S AN EASY UPGRADE for a 30-gallon trashcan dust-separator lid. (The lid directs most shavings and chips to the trashcan, so a small-capacity vacuum or dust collector doesn't fill up as fast.) As purchased, the separator has holes to accept two 4" hoses. On my lid, the hoses tended to slip out of the holes. This loose fit allows a fair amount of vacuum loss.

To improve the lid, I bought a 4" plastic dust collection splicer and cut off two 2" sections. I glued these short tubes to the lid's holes using silicone, and mounted the hoses with hose clamps. I also put weather stripping around the bottom edge of the lid for a better seal to the trashcan.

Frederich Meder

Source: Rockler Woodworking and Hardware, www.rockler.com, (800) 279-4441, Large Dust Collection Separator, #27351, $32; 4" Splicer, #88535, $7.



Drill Press Mortiser

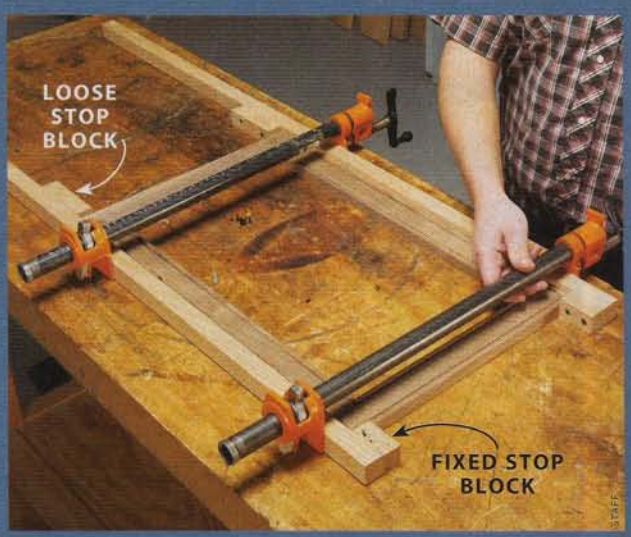
IF YOU HAVE A DRILL PRESS and a cross-sliding vise, there's no need to purchase a mortising machine. A cross-sliding vise is a machinist's vise with two crank handles–one crank moves the part held in the vise back and forth, while the other moves it side to side.

Mount the vise on a piece of plywood or MDF with a 3/4" spacer block under the vise so that the handles can turn all the way around. Clamp the assembly to your drill press table.

Chuck an end mill the size of your mortise into the drill press. An end mill is similar to a drill bit, but it allows you to cut sideways as well as downward. It also leaves a flat bottom. Line up the end mill with your layout lines and cut. Don't try to cut the whole mortise to full depth in one pass, though.

Peter Ingrassia

Sources: Grizzly Industrial, Inc., www.grizzly.com, (800) 523-4777, #G1064 Cross-Sliding Vise, $45. Little Machine Shop, www.littlemachineshop.com, (800) 981-9663, End Mill Set, 6 pc., 4 flute, #1243, $19.



Picture Frame Glue-up

HERE'S A QUICK WAY to glue up a mitered frame of any size using only two clamps, with no worry that the frame will shift out of alignment.

You'll need two 1" x 1" hardwood bars (make them whatever length suits your needs). Fasten a 1" x 1" x 2" fixed stop block to one end of each bar, and make two 1" x 1" x 4" loose stop blocks for the other ends.

Lay two opposing pieces of the frame against the bars, with one end butted against the fixed stop. Place the loose stops against the other end of each piece, and screw the stops to the bars. The distance between the stops on both bars should be exactly the same. You're ready to glue.

Charles Richey

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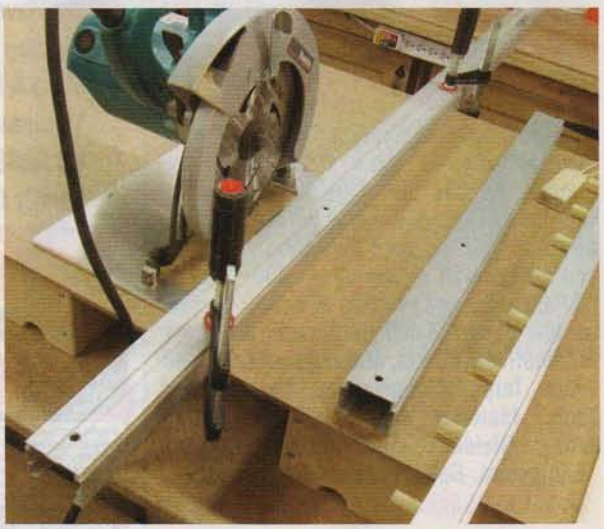
Mixing with Pasta Sauce Jars

MOST FINISHES NEED to be thinned for my HVLP spray gun. I used to buy measuring cups for mixing a finish, but one day I noticed that the pasta sauce jars I was throwing away had measurements on the side, as well as airtight lids. Forget the measuring cups–now I just use the jars (I darkened the measurements with a marker to make them easier to read). If I don't use all the finish on the project at hand, it'll stay fresh until the next job.

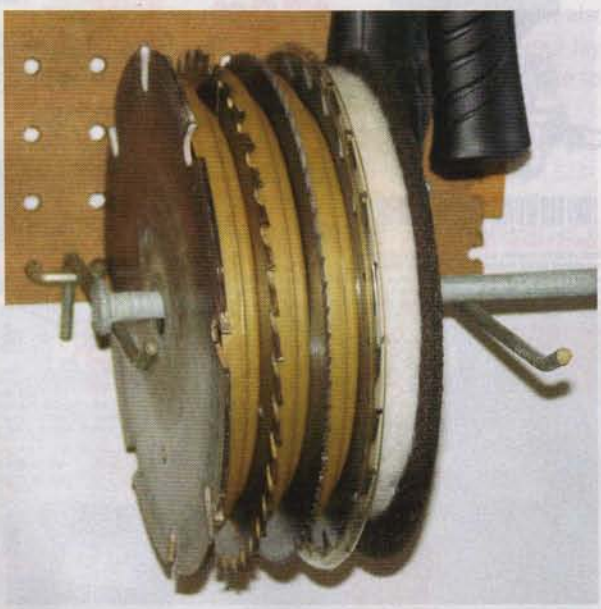
Mitch Palmer



Window Blind Edge Guides

WHEN I REPLACED MY vertical window blinds, I realized that their lightweight and very stiff aluminum tracks would really be useful in my shop. They make great straightedges and saw and router guides.

Serge Duclos



Cheap Blade Protectors

HERE'S A DIRT CHEAP way to store your saw blades and keep their carbide teeth from knocking into each other. Slip the blades onto a 3/8" dia. landscape nail, using plastic coffee-can lids as spacers. I hang the nail on a perf-board tool holder, but you could pound it into the wall, instead.

William Monahan

EDITOR: BRAD HOLDEN • PHOTOGRAPHY COURTESY OF CONTRIBUTOR UNLESS NOTED

Magnetic Sandpaper Saver

I'VE SPENT THE LAST FEW YEARS collecting old hand planes and chisels. Flattening their soles and backs on sandpaper makes mounds of metal waste. The waste clogs up the paper and seems to wear it out prematurely. It also creates an awful mess.

One day, thinking in the kitchen about flattening the next tool, I grabbed a large, flexible magnet from our refrigerator and headed back to the shop. I lapped until the sandpaper was filled with waste, then passed the magnet over it. Voila! I was left with clean, unclogged paper. Now, I use the magnet quite often. I'm convinced that clean sandpaper cuts faster and lasts longer, and that this simple trick saves a few precious bucks.

Sam Brewster

Tapering Jig Solves Bandsaw Drift

ONE OF THE BEST WAYS to save money is to find multiple uses for your tools. Here's one of my favorites: To accommodate bandsaw-blade drift, I use my tablesaw's tapering jig. I fasten it to the bandsaw's fence using double-faced tape, then swing the loose arm until the saw cuts a straight line. After tightening the arm, it's plenty sturdy.

Bob Ross

Pie Plate Shim Stock

MY TABLESAW'S MITER GAUGE used to wiggle in the saw's slot, throwing off every cut I made. Rather than buy a new, fancier gauge with adjustment screws on its bar, I added shims to my saw's miter slots.

To make the shims, I rescued an aluminum pie tin from the recycling bin and cut its bottom into narrow strips. I fastened the strips to one side of each miter slot using thin double-faced tape. Perfect!

If the fit had still been sloppy, I would have applied another shim on the slot's other side. If the pie tin material had been too thick, I would have scrounged around for something else, or, as a last resort, purchased 2 mil foil tape at the local home center. It costs about $8 per roll.

Bill Nedelka

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Easy-to-Adjust Featherboards

AMERICAN WOODWORKER EDITORS PICK

AT FIRST GLANCE, JessEm's Paralign Featherboard might look like any other featherboard–except for those two extra knobs. What's the deal?

You tighten one set of knobs to lock the featherboard's mounting bracket. Then you slide the featherboard through the bracket until the pressure is right, and lock the featherboard with the second set of knobs. Using this method, setting up the Paralign is much easier than most featherboards, where you clamp and adjust pressure at the same time. Our only complaint–and it's a minor one–is that we wish the knobs were larger and more comfortable to grip.

This sliding-plate design guarantees that the fingers will be parallel to your work, delivering equal pressure. Thus the name: Paralign. The mounting bracket is reversible, to increase the amount of travel. The finger plate is reversible, too, so the fingers can be pointed in either direction.

The Paralign featherboards are also stackable, to help prevent a tall workpiece from tipping. They're available singly or in a twin pack that contains the hardware for stacking two on top of each other. Paralign featherboards come with hardware for 1/4" T-slots and a bar for a 3/4" tablesaw miter slot.

This featherboard's innovative design has earned it our Editors Pick Award.

SOURCE: JessEm Tool Company, www.jessem.com, (866) 272-7492, single Paralign Featherboard, #04015, $21.99; Twin Pack Paralign Featherboards, #04016, $36.99.

Compact, Powerful Drills

MY FIRST DRILL WEIGHED as much as a bowling ball and seemed to be twice as large. It had a pesky cord and only one speed–fast, which was great for stripping screws. Thankfully, drills are getting smaller, lighter and more controllable each year.

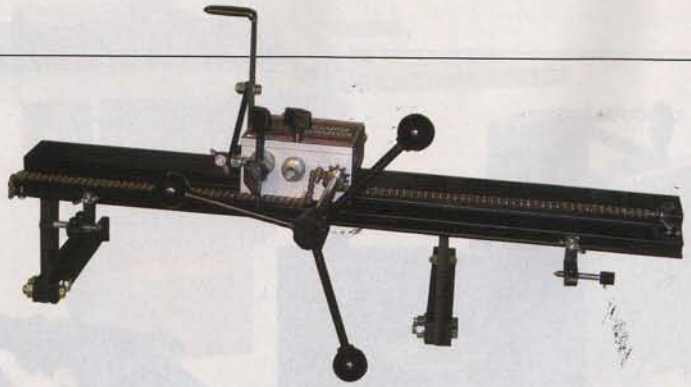
Hitachi's 18 volt Compact Pro drill and impact driver only weigh about 3-1/2 lbs. each. Boy, are they small! The drill is less than 8" tall, and the impact driver is only 7" tall. With this combination of power, weight and size, you can precisely maneuver your drill into smaller and tighter spaces than you ever thought possible.

The drill has a 1/2" chuck and a 22-position clutch. Both Compact Pros have very responsive variable-speed triggers, so you won't accidentally drill through your cabinet when putting on hinges. Both also feature LED lights positioned under the chucks to illuminate your work.

The drill is available in a kit with an 18 volt flashlight, a charger and two 1.5 Ah batteries. The impact driver features a 1/4" quick-change chuck and comes with a charger and two 1.5 Ah batteries. You can also get the drill and impact driver together in a kit with an 18 volt flashlight, a charger and two 1.5 Ah batteries. The drill and impact driver are covered by Hitachi's 10-Year Lithium Ion tool warranty and come with a 2-Year Lithium Ion battery warranty.

SOURCE: Hitachi Power Tools, www.hitachipowertools.com, (800) 706-7337, 18-volt Compact Pro Driver Drill and Flashlight, DS18DSAL, $179; 18-volt Compact Pro Impact Driver, WH18DSAL, $199; 18-volt Lithium Ion Compact Pro 3-Tool Combo Kit, KC18DHL, $259.

EDITORS: ANDREW ZOELLNER, TOM CASPAR • PHOTOGRAPHY COURTESY OF MANUFACTURER UNLESS NOTED



Duplicator for a Mini-Lathe

OK. YOU'VE TAKEN the better part of a day getting that one spindle just right. It's beautiful–but what about the other 20 you need? Fear not! General International's Mini-Lathe Duplicator may be your salvation. It can help you replicate that turning from your original, or help you repair and restore old furniture.

The Mini-Lathe Duplicator is designed for mini-lathes or lathes with shorter bedways. It features a handwheel-controlled chain-drive system and a high-speed-steel cutter.

It has a maximum duplicating length of 17-7/8", a maximum duplicating diameter of 7" (depending on lathe swing over the bed), and a maximum duplicating depth of 3". It can reproduce originals up to 3" dia. or templates up to 2" wide, with a 1/8" maximum depth-of-cut per pass.

SOURCE: General International, www.general.ca, (514) 326-1161, Mini-Lathe Duplicator, #25-024, $315.

Master Miter Saw

THE NEW MAKITA Dual Slide Compound Miter Saw uses a 10" blade–but it allows you to cut a crown molding as large as many 12" saws can handle. The saw has a vertical baseboard cutting capacity of 4-3/4" and a crosscutting capacity of 12" at 90°.

Makita has redesigned the sliding system of the saw. Six linear ball bearings allow it to deliver smooth, adjustment-free cuts. The four-rail system is more rigid than comparable saws with two-rail systems. It's also more compact front to back, so you need less bench space than a 12" saw, or, for that matter, some 10" saws. The saw comes with a laser guide (LS1016L) or without (LS1016).

This saw merits our Editors Pick Award for its large capacity and small size.

SOURCE: Makita, www.makita.com, (800) 462-5482, 10" Dual Slide Compound Miter Saw, LS1016L, $549; LS1016, $499.

Small-Shop Slider

WHO HASN'T DREAMED of having a sliding table saw in their shop? Nothing beats it for crosscutting wide pieces, like cabinet parts. But most of us don't have the space for a slider, let alone the money to purchase a machine that's more commonly found in industrial settings.

Fortunately, Grizzly has found a way to incorporate a sliding table into a saw that's about the same size as a standard cabinet saw. The G0700's base measures 25-1/2" by 27-1/2". The saw is priced right in line with most cabinet saws.

The saw features a 5 hp motor, an adjustable scoring blade (for tear-out-free cuts in plywood) and an extruded-aluminum sliding table and miter fence. The miter fence can be positioned 45° right and left and has a flip stop for repetitive cutting. The sliding table has a crosscut capacity of 34"; the saw's main fence has a rip capacity of 34". Unlike many sliding tablesaws, this saw's arbor accepts a dado set up to 13/16" wide.

The saw also has an adjustable riving knife and great dust collection, with a 4" main dust port and a 2-1/2" blade-guard dust port.

This saw's small size and competitive price have earned it our Editors Pick Award.

SOURCE: Grizzly Industrial, www.grizzly.com, (800) 523-4777, 10" Sliding Table Saw with Scoring Blade Arbor, Model G0700, $2595.

Professional Quality in a Compact Package

EARLEX'S COMMERCIAL-GRADE HV6900 sprayer packs a lot of features into a portable unit.

Originally launched in the United Kingdom, the Spray Station is now available stateside. It's lightweight, easy to use and easy to clean up. Its design minimizes waste and avoids clogging and overspray. The Spray Station helps you create a first-class, quality finish.

The HV6900 is perfect for use in a cabinet shop where a dedicated sprayer is a good investment. Its compact size doesn't take up valuable floor space, but it's also great for use in the field, because the sprayer is easy to carry.

The spray gun is fitted with a 2.0 mm stainless steel needle and tip, Teflon-lined 1-quart cup and a three-position spray pattern system. Optional tips and needles are available for thicker or thinner materials.

The three-stage, 1100-watt turbine makes the HV6900 Spray Station suitable for thick and thin viscosity materials. It also features an easy-change pre-filter, a 13-foot cord, a carry handle and cord storage. A 30-foot hose is also available to extend the sprayer's reach.

The HV6900 can spray a wide variety of finishes including oil-based and water-based stains, varnishes and polyurethanes.

SOURCE: Earlex, www.earlex.com, (888) 783-2612, HV6900 Spray Station, $499.99.

Neatnik's Vac

IF YOU HATE KEEPING TRACK of all the parts of a typical shop vacuum, you'll love the new Smart Cart from Ridgid.

Everything has a home. The hose, cord and accessories (two extension wands, utility nozzle, claw nozzle, wet nozzle, crevice tool, and dusting brush) are all stored on board. The hose coils up in the top drawer, and is also accessible by flipping open the lid; the cord wraps around a pair of brackets in back; the wands stand up in back, next to the cord; and all the accessories fit in a second drawer, under the hose. There's even a basket on back for cleaning supplies.

Speaking of convenience, here's another new idea: You don't have to turn the Smart Cart over to empty it. Debris is collected into an 11-gal. drawer in the bottom of the unit. Emptying it is as easy as popping a few latches, taking off the three-stage filter, and dumping the drawer. If you've vacuumed up a liquid, you can open the drain on the front of the unit to empty it.

The Smart Cart has a powerful but fairly quiet motor (6.5 peak hp; about 80 dB). At 30" tall (35" to the top of the handle), and a 30" x 19-1/2" footprint, it fits well under many workbenches or neatly along a wall. The vacuum has a flat top, which allows you to store or stack stuff on top of it in between bouts of tidying up your space.

SOURCE: Ridgid, www.ridgid.com, (888) 743-4333, Smart Cart Wet/Dry Vacuum, WD7000, $200.

Craftsman Goes Granite

GRANITE HAS PROVEN to be a great alternative to cast iron. It's rock solid, can be machined perfectly flat, absorbs vibration, and won't rust or warp. Craftsman's new granite-bed planer and granite-topped tablesaw are the latest machines to take advantage of this material.

Their 13" Thickness Planer is equipped with a three-blade cutterhead, four widely-spaced posts for raising and lowering the cutterhead (eliminating the need for a cutterhead lock in order to fight snipe), eight preset depths-of-cut, and a 15-amp motor. The planer also features top-mounted return rollers, a reversible dust collection chute and a 2-1/2" to 4" dust-port adapter. The planer weighs 95 lbs.

A new spiral cutterhead accessory, using 26 double-edged high-carbon steel inserts, is also available for this planer. While we haven't tried it, the manufacturer says that this cutterhead reduces tearout in figured wood (which our experience with other spiral cutterheads supports) and reduces noise.

The Craftsman Professional Premium Hybrid Table Saw features a granite table and two granite extension wings. The saw comes with a newly designed Craftsman fence and features a tool-free riving knife, a push-button arbor lock and a 1-3/4 hp, 120/240 volt motor, enclosed within the cabinet. The saw's trunnions are mounted to the cabinet, rather than to the top. This configuration, similar to full-fledged cabinet saws, reduces vibration and makes aligning the blade with the saw's miter slots much easier. The saw weighs 432 lbs.

SOURCE: Craftsman, www.craftsman.com, (800) 377-7414, 13" Thickness Planer, $449.99; Spiral Configured Cutterhead Assembly, 21749, $299; 10" Professional Premium Hybrid Saw, $999.99.

Safe, Smooth Tapers

MOST COMMERCIAL TAPERING JIGS don't include hold-down clamps, so we've usually made our own jigs from scratch. We think those clamps are essential for safety, as well as for guaranteeing a smooth, burn-free cut. Rockler has just introduced a new tapering jig that's just as good–and probably better–than any of our shop-made jigs.

The Rockler Taper/Straight Line Jig rides in your saw's miter slot, rather than up against the fence. It's easy to set up for tapers, and, as the name implies, can also be used to straighten and square the edge of a rough-sawn board.

SOURCE: Rockler, www.rockler.com, (800) 279-4441, Taper/Straight Line Jig, #21597, $71.99.

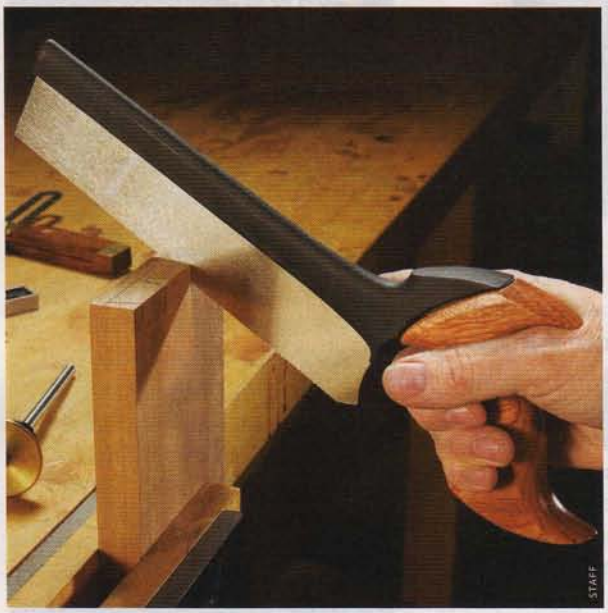
Drill for Tight Spaces

SOMETIMES YOU DON'T KNOW you need a new tool until you've already gotten yourself into a tight corner. Then, you might find a right-angle drill mighty handy–especially one without a cord to tangle you up.

Milwaukee's 12 volt M12 Cordless Right Angle Drill is the latest in their line of compact 12 volt tools. It's lightweight, but still powerful enough for most shop tasks. And, with its right-angle head, it's perfect for drilling holes or driving screws in close quarters.

The drill has a 3-3/4" long head, a 3/8" keyless chuck, and weighs just under 2-1/2 lbs. It has 11 torque settings (up to 100 inch-lbs. of torque), and the variable speed trigger delivers 0-800 RPM. The drill also has an integrated LED, because you'll need some light in that tight space.

SOURCE: Milwaukee Electric Tool Corporation, www.milwaukeetool.com, (800) 729-3878, M12 Cordless Right Angle Drill, #2415-20, $129.



Classic Saws, Updated

YES, THE WORLD DOES NEED a better and more affordable precision hand saw. Even though we can make virtually every joint by machine these days, nothing beats the pleasure of doing it by hand. Two new saws from Lee Valley work so well, right out of the box, that you may well turn to them first, before using a machine. If you're just beginning to learn how to saw by hand, these are the perfect companions.

The saws are similar in design, with blades that are only 0.020" thick. One is a 16 tpi crosscut, for cutting tenons, and the other is a 20 tpi rip, for dovetailing. Saws with such thin blades require less effort to push, so you can concentrate on steering the saw, rather than muscling it through the cut.

Many similar saws are available, but most are not sharpened properly, and require resharpening and resetting before they work well. The Lee Valley saws, by contrast, are ready to go, and compare well with the performance of similarly-priced Japanese saws. Unlike Japanese saws, though, whose teeth are hardened, these saws will require resharpening from time to time. Please note–that requires patience and skill.

How do they feel in your hand? Very nice. They're well-balanced and have comfortable, pistol-grip handles. The blades are stiffened by a high-tech composite spine, rather than by a traditional brass spine. Clearly, Lee Valley isn't satisfied with merely recreating old tools; they're making them better.

SOURCE: Lee Valley, www.leevalley.com, (800) 267-8735, Veritas Small Crosscut Saw, #05T06.01, $65; Veritas Fine-tooth Dovetail Saw, #05T05.05, $65.

Redesigned Triton

TRITON MADE QUITE A SPLASH a few years ago with their 2-1/4 hp plunge router. Everybody was talking about it because its plunge design allowed the collet to be extended below the base.

You might ask, "What's the big deal about that?" Well, turn the router upside down, put it in a router table, and you'll see. You can raise the collet above the table–which allows you to change bits right then and there, without fumbling under the table. In addition, you can adjust the bit's height from above the table with a speed-wrench. The 2-1/4 hp was one router-table-friendly machine. All it needed was more power for large bits.

Triton has delivered. Their new TRA001 plunge router has a 3-1/4 hp, 15 amp motor, and the above-the-table adjustments we liked so much. The TRA001 also features five speed ranges, from 8,000 to 21,000 rpm, and has an integrated dust port. The opening in the base is 3-1/8" dia., large enough for many big bits, but not quite large enough for 3-1/4" panel-raising bits.

The TRA001 also inherited a unique plunging mechanism from its smaller predecessor. In rack and pinion mode, you can make a plunge cut by rotating a handle, or do it the standard way, by pushing down on the handles. In rack and pinion mode, rotating the right handle one full revolution drives the router up or down through its entire plunge range (2-5/8"), and a micro-adjust wheel lets you fine tune the depth. Setting the plunge depth is fast and easy.

The router comes with an extended baseplate, which accomodates a fence and circle cutter, a 1/2" collet and 1/4" reducer, a straight 1/2" bit and a bit-changing wrench.

SOURCE: HTC Products, www.htcproductsinc.com, (586) 725-2701, Triton 3-1/4 HP 1/2" Plunge Router, TRA001, $299.

My Down Under Shop

A NUMBER OF YEARS AGO, when my wife and I were shopping for a new home in Pennsylvania's Lehigh Valley, we came across a house with a unique feature: a large room underneath the garage. Immediately, I knew that this unusual space would be the perfect spot for my future home woodshop. This room was separated from the adjoining basement of the house, so dust and noise issues would be minimized. I'd have to contend with three fuel oil drums and a corrugated steel ceiling with heavy-duty steel beams, but the room was free of other typical basement obstacles, such as a furnace, a hot water heater, laundry equipment, heating ducts and plumbing pipes. I could enter the shop via a stairway down from the garage or from the adjoining basement; I could unload materials from my truck through the basement entry.

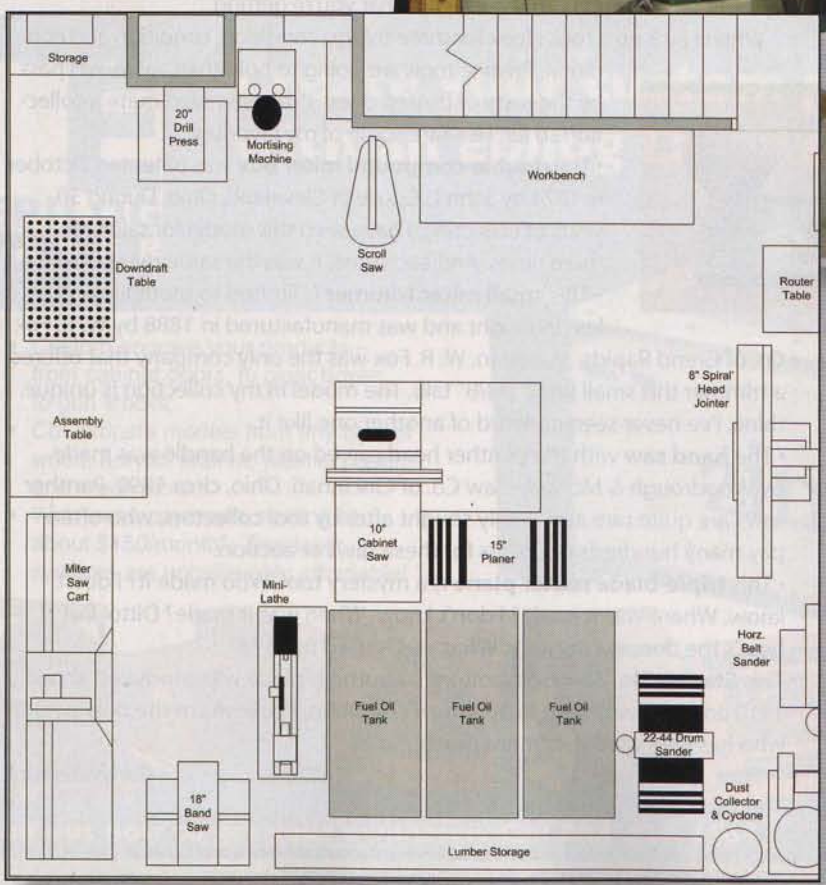
I was eager to claim the space, so I could realize my dream of becoming a bona fide woodworker. We bought the house, and as soon as my work and night school schedules allowed, I started purchasing woodworking tools and honing my skills—the only formal training I'd had was shop class, over 30 years ago. I learned a lot by building my own shop cabinets and tool fixtures.

My first major purchases were a tablesaw, a 20" drill press, a 1-1/2 hp dust collector and a 6" jointer. As my skills and thirst for woodworking grew, I acquired more tools, which necessitated designing a real layout for the 24' x 25' space. I installed a 5000 watt heater, since the bulk of my woodworking projects get completed in the wintertime. I rewired the shop to handle the needs of the

new equipment and added 16 fluorescent shop lights along the ceiling. I also installed overhead dust collection, with drops to each of the stationary tools. Most of the stationary tools are equipped with mobile bases, to provide some flexibility, depending on the projects I'm building.

As I've developed my skills, my projects have become increasingly complex. I've built a new entry door for our home, a complete bedroom set for our daughter, and a variety of furniture pieces for ourselves and friends. Having this dream shop has allowed my affinity for woodworking to grow.

Bruce Greenawald
Schnecksville, PA



Tell Us About Your Shop

Send us photos of your shop, a layout drawing, and a description of what makes your shop interesting. Tell us what you make in it and what makes your shop important to you. If "My Shop" features *your* shop, you'll receive $100.

E-mail your entry to **myshop@americanwoodworker.com** with digital photos attached. Or mail your description with digital photos on a disc to My Shop, American Woodworker, 1285 Corporate Center Drive, Suite 180, Eagan, MN 55121. Please include your phone number. Submissions cannot be returned and become our property upon acceptance and payment. We may edit submissions and use them in all print and electronic media.

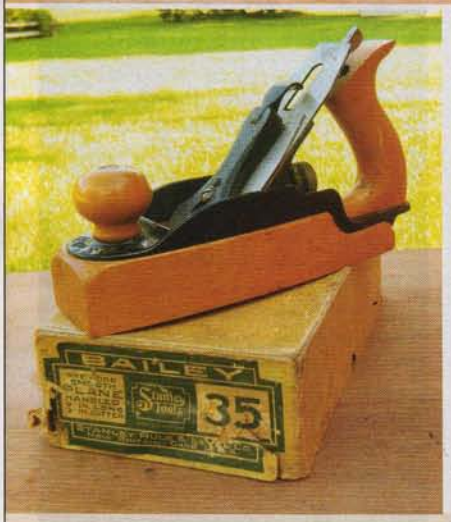
EDITORS: DAVID RADTKE AND TIM JOHNSON • PHOTOS COURTESY OF BRUCE GREENAWALD

Trim Carpenter's Collection

I AM A TRUE-BLUE, dyed-in-the-wool, completely incurable TOOL NUT. For 40 years, I was a member of the Chicago Regional Council of Carpenters Local 558, installing high-end architectural woodwork. I started collecting hand tools in 1977 and joined The Mid-West Tool Collectors Association (www.mwtca.org). What a wonderful bunch of people! The MWTCA has chapters in every state that sponsor one or more swap meets each year. While eBay is a good way to find a bargain these days, you can't beat a swap meet for buying tools, because you can see exactly what you're getting.

When I pick up a tool, I look for three things: condition, condition and condition. Pristine tools are going to hold their value, so I pass by the rusty or busted ones. I've assembled quite a collection so far. Here are some of my favorites:

- The **double-compound miter box** was patented October 6, 1874 by John L. Gause of Cleveland, Ohio. During 30 years of collecting, I have seen this model for sale only three times. And each time, it was the same miter box!
- This **small miter trimmer** is limited to mouldings 2" or less in height and was manufactured in 1888 by W. R. Fox Co. of Grand Rapids, Michigan. W. R. Fox was the only company that offered a trimmer this small (only 3-3/8" tall). The model in my collection is unique, I think. I've never seen or heard of another one like it.
- The **hand saw** with the panther head carved on the handle was made by Woodrough & McParlin Saw Co. of Cincinnati, Ohio, circa 1890. Panther saws are quite rare and highly sought after by tool collectors, who often pay many hundreds of dollars for these saws at auction.
- This **triple-blade router plane** is a mystery tool. Who made it? I don't know. Where was it made? I don't know. When was it made? Ditto. But here's the deepest mystery: What was it used for?
- This **Stanley No. 35** wood-bottom smoothing plane was produced about 1910 and is in very near factory-new condition. I believe I'm the only person who has ever used it–but not much!



Carl Bilderback

We'll pay you $100 to share your favorite tools, new or old, with fellow readers. Contact us by e-mail at **toolnut@americanwoodworker.com**, or mail us at American Woodworker, 1285 Corporate Center Drive, Suite 180, Eagan, MN 55121. If possible, please include digital photos of your tools.

EDITOR: TOM CASPAR - PHOTOS COURTESY OF CONTRIBUTOR.

Turned Letter Opener & Butter Knife

by Alan Lacer

METAL HAS LONG SINCE REPLACED WOOD as the preferred material for household utensils. But that doesn't change the fact that opening letters and spreading butter can be accomplished effectively with wooden tools. So, here's a chance to make a pair of useful utensils that will stand out beautifully from the tarnished crowd, especially in the eyes of a woodworker. Why two separate projects in one article? Because the techniques used to create each one are similar.

Choose closed-grain hardwood for both projects. The letter opener requires durable, sharp edges and the butter knife will be much easier to keep clean if the wood doesn't contain large open pores. Hard maple is an excellent choice—so are cherry, pear, apple, Osage orange and a host of exotics, including goncalo alves, olive, ebony, and purpleheart. Even laminated bamboo flooring material will work for the letter opener, although you may have to glue several pieces together to reach the necessary thickness.

Both projects are evenly divided between turning operations and contour sanding. Basic spindle turning tools are all you'll need for the turnings: a spindle roughing gouge, a spindle/detail gouge, a parting tool and a skew chisel. If you are adept with the skew chisel, you can complete both projects with it alone.

To shape the blades, you'll need a Jacobs-type chuck that fits your lathe's headstock and a 5" firmed-backed sanding disc holder (see Sources, page 32). If you want to add curves to the blade of the butter knife, as I have, you'll need a 1" or 2" sanding drum that fits into the Jacobs chuck You'll also need 80, 120, 150 and 220 grit paper for the sanding disc and a 100 grit sleeve for the sanding drum.

The how-to steps for both projects are basically the same, with a few minor variations. So, I'll show how to turn and shape the letter opener first. Then I'll explain the variations used to turn and shape the butter knife.

The letter opener

1. Start with 1-1/4" squares of wood that are approximately 10" long. Mount a blank and turn it to a cylinder (**Photo 1**).

2. Determine where the handle will transition to the blade. Make the blade portion longer, rather than

EDITOR: TIM JOHNSON

Many steps in making a letter opener and a butter knife are the same. Start both projects by turning the square stock into a cylinder.

Separate the handle from the blade area by rolling a bead. Cut in with a parting tool or skew chisel. Then roll the bead with a spindle/detail gouge.

To make a letter opener, shape the blade portion to look like an asymmetrical ellipse, using the skew chisel or spindle/detail gouge.

Shape the handle to a form that fits nicely in your hand—this is a great opportunity to try different shapes.

Detail the handle. One option is to lay out a series of small beads with the long point of the skew. To roll the beads, use either the skew or the spindle/detail gouge.

Turn both ends to a small diameter with the long point of the skew. Then carefully part off the turning at the headstock end. This leaves only a bit of waste to cut through at the tailstock end.

dividing the parts evenly, and mark the transition by creating a bead (**Photo 2**).

3. Traditional metal letter opener blades often swell from the tip, so turn the blade portion to look like an ellipse—an asymmetrical "ellipse" looks the best (**Photo 3**).

4. When shaping the handle, the top priority is always a comfortable grip. Here, the handle echoes the blade's elliptical look (**Photo 4**). A gradual taper from the end to the bead also forms a comfortable grip.

5. The handle's surface can be detailed or left smooth. A series of small beads can make the handle easier to grip. Vary the beads' sizes for interest, wider in the middle and gradually narrowing towards the ends (**Photo 5**).

6. Finish-sand everything but the blade area to 220 grit.

7. Remove the letter opener from the lathe and cut the waste material from both ends, using a coping saw or Japanese-style saw. Alternately, you can save some sanding by using the skew chisel to part off the letter opener at the headstock end (**Photo 6**).

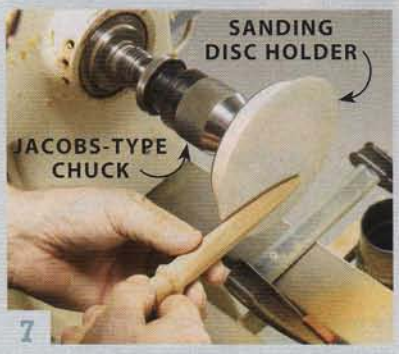
8. Shape the blade by sanding. One way to reduce the amount of sanding dust raised during this step is to cut away most of the waste wood with a small saw earlier, while the letter opener is still on the lathe. The alternative is to plan to capture a lot of dust. Position a dust collection hose near the headstock and be sure to wear an effective dust mask (rated at NIOSH 95).

9. Mount the Jacobs-type chuck in the headstock and install the 5" sanding disc holder with 80 grit paper attached.

10. Work the blade slowly into the basic shape. Then start tapering from the middle to the edges to create the double-sided wedge shape (**Photo 7**). For the opener to work effectively, the edges of the blade must be fairly sharp. If the 80 grit paper cuts too aggressively, switch to 100 grit. Switch to 120 grit when you near the final shape; switch to 220 grit to complete the disc sanding.

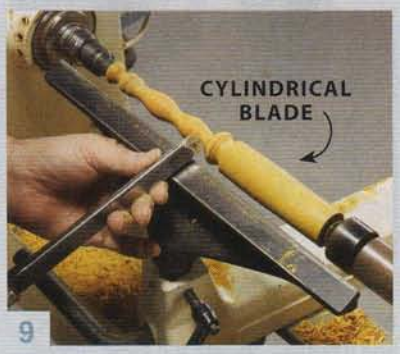
11. Finish-sand the blade by hand, following the grain (**Photo 8**).

12. Test the opener on several sealed envelopes. You'll discover that (1) a certain level of edge sharpness is required to cut the paper, and (2) properly shaped wedges aid the cutting process by easing the envelope open. You may need to do some reshaping to achieve optimal results.



Install a sanding disc holder to finish shaping the letter opener's blade. On both sides, create tapers from the center to the edges and from the handle to the tip.

Complete the letter opener by sanding with the grain to remove cross-sanding marks from the blade.



Although a butter knife's handle may be differently shaped, the main differences from the letter opener are that the knife's blade is shorter and turned to a cylinder.

Whenever you turn a handle, it's a good idea to stop during the process and check the way it feels in your hand.

The butter knife's blade tapers from the handle to the tip, and from the top to the bottom. Only the bottom edge tapers to a point.

Shape the butter knife's blade on a sanding drum, to add interest. A concave curve on the top edge complements the curve on the front at the bottom.

The butter knife

1. Turn the blade area to a cylinder, instead of an ellipse, and experiment with a variety of shapes for the handle (**Photos 9 and 10**).

2. When shaping the blade with the 5" disc, taper from the topside down, to create an edge at the bottom (**Photo 11**). This edge doesn't have to be as sharp as the edges on a letter opener. Generally speaking, butter knife blades are a bit thinner, usually about 1/8" thick along the top edge of the blade, and more consistently thick from end to end.

3. Use a sanding drum to make the blade look more interesting (**Photo 12**). After shaping these curves, you may have to return to the 5" disc to refine the edge.

Finishes

Almost any finish will work for the letter opener. Wipe-on poly or gel varnish would be good choices if you prefer a film-forming finish. For an oil finish, choose an oil-varnish blend or a drying oil such as linseed oil or tung oil.

The butter knife is a little different, as it will be washed and used with food. The first option is no finish—just let the knife take on the natural look it acquires through use. For a more finished look and a little protection against staining, try an oil finish such as pure mineral oil, walnut oil or tung oil. (Make sure the product you use contains no toxic additives.) For still more protection, apply coats of wipe-on or gel-type varnish. These finishes will be food safe once they've fully cured, which may take several weeks.

SOURCES

Packard Woodworks, www.packardwoodworks.com, (800) 683-8876, Jacobs-type Chuck #2MT, # 111012, $36.95.
The Sanding Glove, www.thesandingglove.com, (800) 995-9328, 5" Firm Disc Holder #SM35F, $15.95.
Rockler Woodworking and Hardware, www.rockler.com, (800) 279-4441, 15 Piece Sanding Drum Kit #42937, $14.99.

To see more of Alan's work, visit www.alanlacer.com.

Trestle-Style Dining Table

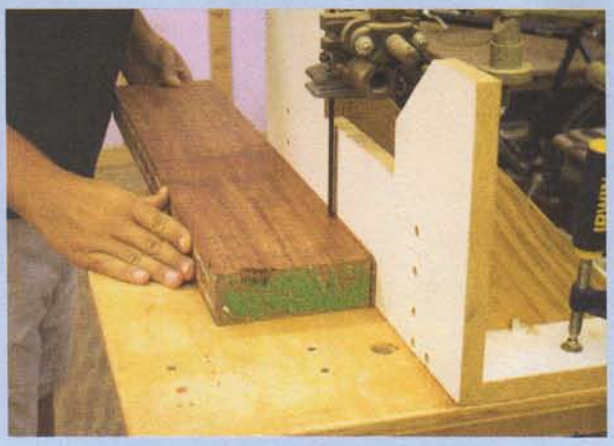
Graceful bent-laminated feet are super-strong. by Chris Cander

THIS MODERN INTERPRETATION of a Shaker communal table appeals to furniture maker Mark Love's customers because of its elegant simplicity, ample legroom, and the fact that it's easy to clean under. But Mark loves to build it because of the feet.

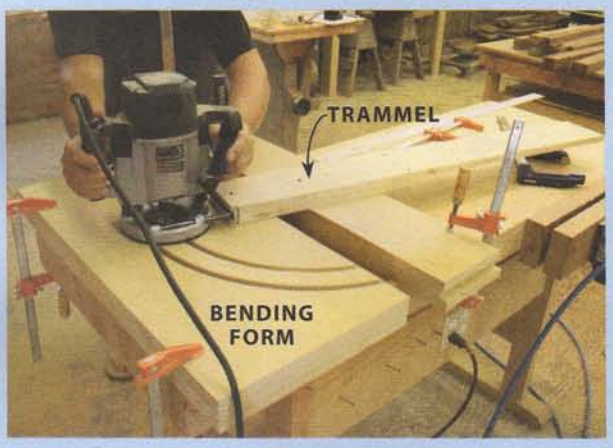
"Making these feet out of glued laminations and seeing how beautiful and strong they are when you do it right is thrilling," Mark says. "Sam Maloof made the rockers for his famous chairs using the same technique. Because the line of the grain follows the arc, they are exceptionally strong." Building this table is an ideal way to develop your bent-lamination skills. It would be much easier to saw the feet out of 7" wide boards, but then the grain would run across the arc instead of with it. This short-grain orientation would make the feet much weaker, and more likely to break under the table's weight.

EDITOR: TIM JOHNSON • PHOTOGRAPHY: CHRIS CANDER AND MARK LOVE • ILLUSTRATION: FRANK ROHRBACH• TABLE DESIGNED AND BUILT BY MARK LOVE.

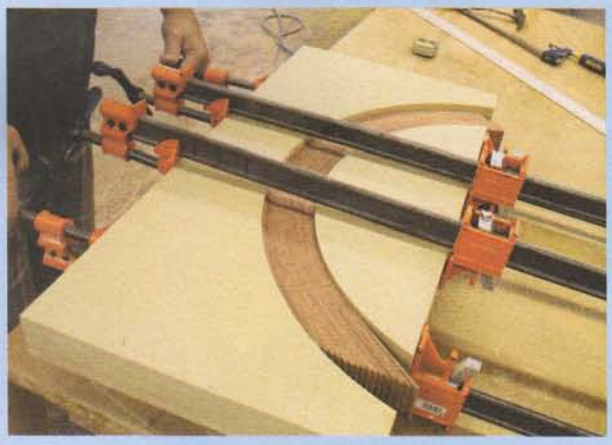
To watch a video showing how to glue up a bent-laminated foot, go to: **www.AmericanWoodworker.com/147/BentLam**



1 Saw laminations to make the feet. Each foot contains seventeen 5/32" thick laminations.



2 Make a bending form to laminate the arched feet. Use a shopmade trammel to rout a pair of arches in a glued-up MDF blank. Remove the curved section in the center to create the two-part form.



3 Test-bend the laminations without glue, and replace any that fracture. When the laminations draw together easily and tightly, without any gaps, they're ready to be glued. Unclamp, apply glue to each lamination and then clamp them all back together.

4 The curve on the top surface of each foot must be consistent, so screw it to a "lazy Susan" jig and sand down the high spots.

Materials

Mark built the 28" x 56" table shown here out of a single board of bubinga, an exotic hardwood with a ribbony texture and reddish-purple overtones. Bubinga is usually very stable and straight. "It's not essential to make the table from a single board, but I found one that was big enough for my entire cut list," Mark says. "It was a fun challenge to figure out how to do it, and I ended up with very little waste." To see the plans and cutting list for a 52" x 96" version of this table, visit **www.AmericanWoodworker.com/147/LargeTrestleTable**.

Rough out the parts

1. Roughsawn boards typically have end checks (cracks in the ends) that must be cut off. To make sure the checks are completely removed without wasting precious length, nibble each end in 1/16" increments. Make a crosscut and test the thin offcut—if it breaks when you gently bend it, make another crosscut. Repeat until you get an offcut that won't easily break. You can often lose several inches on a piece of hardwood by doing this, but it's a small price to pay when the alternative is discovering cracks in the completed project.

2. Lay out the parts on your boards before you start cutting. You may have to try several times in order to find the right combination of efficient use and good-looking pieces.

3. Mill everything to within 1/4" of its finished dimension (Fig. A, page 41 and Cutting List, page 42). Milling often releases internal stresses in rough boards, so once you cut the parts, sticker them and allow them to rest (ideally overnight) until the parts adjust to their new width and thickness.

Laminate the feet

4. Each foot consists of seventeen 5/32" thick laminations. To make the blank from which the laminations come, mill a piece that's 2" thick and 36" long, with enough width to yield about forty 3/16" thick laminations. You can use multiple blanks if you don't have one wide

enough to get all the laminations, as long as the color and grain are consistent. Joint one edge of the blank. Then using the bandsaw, rip a 3/16" thick lamination and set it aside (**Photo 1**). The bandsaw leaves a rough edge, so you'll have to joint the blank after ripping each lamination. Repeat the process until you end up with 34 laminations (plus extras, for insurance) that are jointed on one side and bandsawn on the other.

5. Run the laminations through the planer, jointed side down, until they are all precisely 5/32" thick.

6. Glue together three pieces of 3/4" MDF to make the bending form for the feet (Part A, Fig. A and Fig. B). Cut concentric arcs into the form by setting the router up twice, but keeping the same pivot point on the trammel. Using a 1/2" straight bit, make several passes until you have gone as deep as you safely can. (**Photo 2**). Take the form to the bandsaw and cut along the channels you've just made. Flip over the two jig parts, so the rough edge left by the bandsaw is at the top. Then remove the rough edges by routing with a flush-trim bit. Rub paraffin wax on both of the completed form's arcs to keep the laminations from sticking during glue-up.

7. Clamp 17 of the laminations in the form without glue and replace any that crack (**Photo 3**). Prepare to work quickly when you're ready to glue—yellow wood glue has only about five minutes of open time. Apply glue to one side of all 17 laminations and stack them, maintaining the original order to preserve consistency of the grain. Do not put glue on the outside faces of the top and bottom laminations! Place the stack in the form and clamp it together. This assembly is under considerable stress, so wait 24 hours before you remove the clamps.

8. The sides of the feet are rough when they come out of the bending form. Scrape off the squeezed-out glue and joint one side to flatten it. Then run each foot through the planer, to flatten the other side. Mill the feet to final 1-3/4" thickness.

9. Use a shopmade "lazy Susan" jig

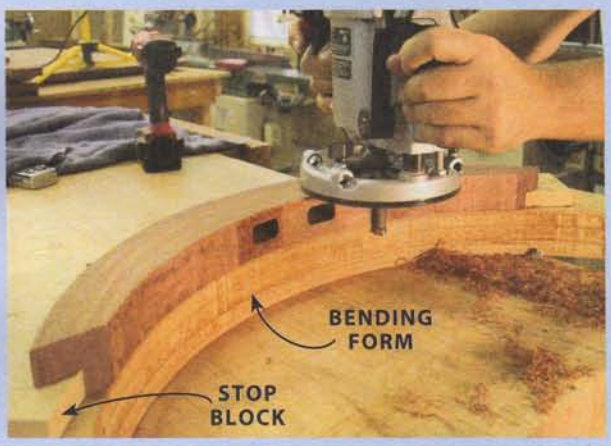
5 Sand the bottom of each foot flat after cutting it to final length.

6 Stand the feet on a flat surface to lay out the mortises. Mark a centerline to use as a reference point.

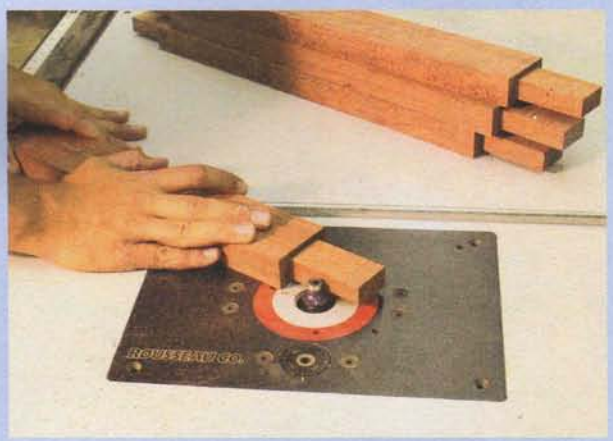
7 Rout through mortises in each foot in three steps. First, use a jig to plunge-rout the mortises from the top, as deep as possible. The jig provides a flat surface for routing on the arched foot.

8 Next, tip the foot over and drill pilot holes deep enough to reach the mortises routed from the top.

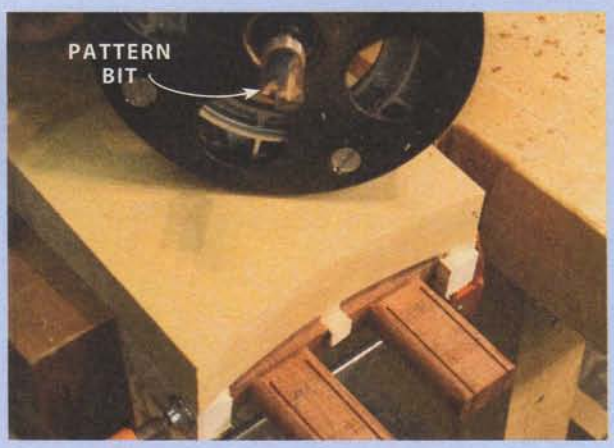
9 Improvise a level platform to complete the mortises. Install a flush-trim bit, and plunge through the pilot holes. The bit's bearing rides on the walls of the previously routed mortises.



10 Rout the bottom edge of each foot, to make it more graceful. Use the bending form (with a custom stop block attached) as a pattern to match the radius of the bottom arc with the top. This step creates tapers at both ends of the foot.



11 Round the uprights' tenons to fit the mortises in the feet and top rails. Stop routing before the bit cuts into the tenon shoulder and complete the job by paring with a chisel or sanding by hand.



12 Shape the uprights' bottom shoulders to fit the arched feet, using a shopmade jig and a pattern bit. A pattern bit is a plunge cutting flush-trim bit; its bearing is mounted above the cutters.

to true the curved top edge of each foot (**Photo 4**). Fasten the foot to the jig's 14" radius circular piece with screws near the ends, so that it barely protrudes (about 1/32") beyond the edge. The ends of the foot will be cut off, so the screw holes won't matter. Clamp the jig's bottom (square) piece to the sander's table so that the foot almost touches the belt. Then gently tap it forward with a hammer until it just touches. Rotate the foot back and forth until your edge is smooth.

10. Cut each foot to its final 24" length. Lay each foot on its side and square a straightedge across the ends, 7" down from the top, at the center. Draw a line across both ends. At this line, the foot should measure 24" from tip to tip. Bandsaw each end below the line. Then sand to it (**Photo 5**).

Rout mortises

11. Two through mortises must be routed in each foot (Fig. C). The surfaces are curved, so a pair of jigs are required to complete the job. The first jig guides the router on the top of the foot (Fig. D). The holes in the jig are larger than the mortises by 1/4" all around, which allows using a 3/4" guide bushing and a 1/2" mortising bit to rout the mortises. Find the centerline of each foot (**Photo 6**). This line will be your reference for positioning the foot in the mortising jig. Centerlines marked on both sides of the jig match up with the lines marking the center point of the foot. Clamp the jig to the foot, using small clamps that run underneath the foot. Clamp the assembly in your bench vise and then plunge-rout the mortises halfway through the foot (**Photo 7**).

12. Finish the mortises from the bottom of the foot. First, drill pilot holes (**Photo 8**). Then use an improvised platform to hold the router level and a flush-trim bit to finish the mortises (**Photo 9**).

13. Rout the bottom edge of the foot, to lighten its appearance. Simply use the top half of the bending form to rout a 14" radius. Install a stop block to secure the foot and rout the arc with a flush-trim bit (**Photo 10**).

Finish-sand before assembly

14. At this point, finish-sand both feet. "Nothing affects the final finish as much as sanding does," according to Mark (see "Sanding—Finishing's Essential First Step," page 43).

Make the top rails

15. Mill the top rails (B) to their final dimensions, and mark their through mortises (Fig. E). There's no need for a jig to rout these mortises, because the router will ride nicely on the flat surface. Install a 1/2" upcut spiral bit and set the router's edge guide exactly 7/16" from the outside of the bit. Then plunge-rout each mortise from both sides. This creates a perfectly centered 7/8" wide mortise, although a bit of chisel work is required to flatten the peaks left where the two cuts meet. Use the drill press to drill the counterbored holes, through which the bolts that secure the top will go. Drill 1" deep with a 1" Forstner or spade bit, and then switch to a 3/8" brad point bit to drill the shank holes.

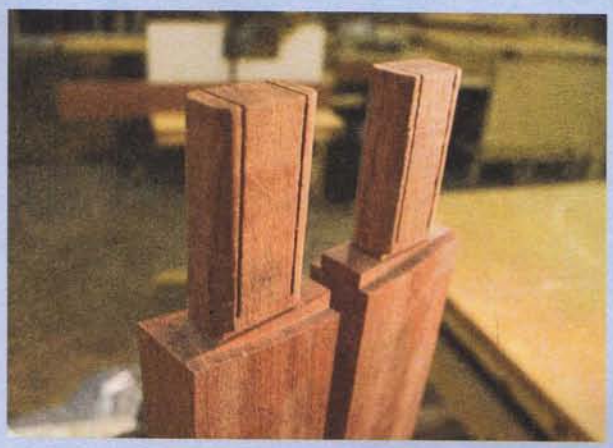
Cut the tenons

16. The uprights (C) feature wedged tenons on both ends (Fig. F). Note that the bottom tenons are longer. Start by cutting the tenon shoulders on the table saw, using the miter gauge equipped with a fence and a stop block. Saw the tenon cheeks slightly oversize on the bandsaw. Then install a dado set to precisely cut the tenon cheeks to final thickness.

17. Radius the tenon edges to fit the mortises with a 1/4" roundover bit, followed by paring or sanding (**Photo 11**).

18. Assemble each end to make sure everything fits. Disassemble the parts and then use the bandsaw to cut slots in each tenon for the wedges.

19. Shape the bottom shoulders of the uprights, so they fit properly on top of the arched foot. Make a jig to hold each pair of uprights for routing (Fig. G). The jig has a 14" radius arc to match the foot and a center divider that exactly positions the uprights.

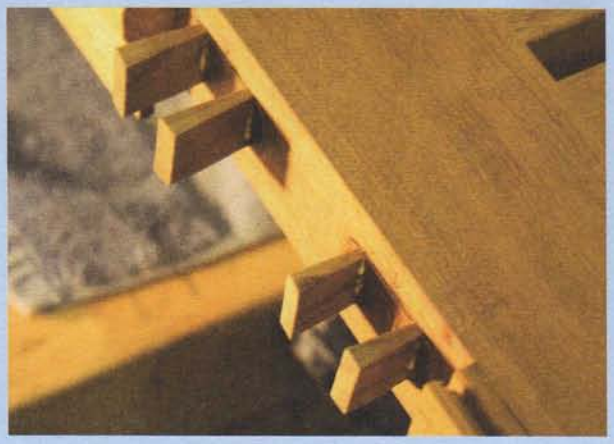


13 Routing leaves some work to be done to complete the uprights' arched shoulders. Remove the remaining waste by hand.

14 Complete the stringer. Cut dadoes for the uprights and shape its curved ends.

15 Assemble the base in stages. First, glue and clamp the stringer between the uprights. Work on a flat surface and mount the top rails to keep the uprights aligned.

16 Complete one end at a time. Apply glue and install the top rail and the foot. Then use clamps to gently draw the joints together.



17 Drive in the wedges as far as they'll go. After the glue has dried, cut off the waste and rout the wedges flush.

18 Place a straightedge across the top during glue-up, to make sure it stays flat when clamping pressure is applied.

19 Use a shop-made trammel and a straight bit to rout the top's ends. Complete the job in several steps, by making incrementally deeper passes.

20 Attach the top after applying the finish. Center the base and use a brad point drill bit to mark the locations for the threaded inserts in the top. Drill holes and install the inserts. Then bolt on the top.

Place an upright on each side of the divider with its top shoulder registered against the 1/4" spacer. Clamp the uprights together across the jig. Flip the assembly over and mount it in your bench vise. Then use a flush-trim bit with a top-mounted bearing to rout the uprights' arched shoulders (**Photo 12**). Flip the uprights over, reinstall them in the jig, and repeat the process to rout the remaining shoulders. After routing, you'll have to finish the job by hand (**Photo 13**).

20. Fit the tenons in the mortises and check the shoulders. The bottom tenons will protrude. Cut off the extra length, leaving just a bit to be cleaned up later with a flush-trim bit.

Assemble the base

21. Mill the stringer (D). Then locate the dadoes for the uprights (they're spaced 28-3/4"). Size the dado widths so that the unsanded uprights will almost, but not quite, fit. When the uprights are finish-sanded, they'll fit perfectly.

22. Draw the arc on each end of the stringer and then sand to the pencil line (**Photo 14**).

23. After finish-sanding all the parts, it's time to assemble the base. There's no joinery to hold the uprights to the stringer, so carefully measure and mark the centerpoints on both the uprights and the stringer, and match them up. Brush glue into the dadoes, install the uprights, and gently apply clamps. Then knock on the top rails to keep everything in place (**Photo 15**). Allow at least a couple of hours for this assembly to dry.

24. Remove the top rails, apply glue around all the tenons and slide them back on. Repeat with the feet (**Photo 16**). Draw the parts together with clamps, using small wooden blocks to protect the already finish-sanded pieces.

25. Complete the base by driving in the wedges that spread and lock the tenons (**Photo 17**).

Glue up the top

26. Lay out the rough-cut boards you've set aside for the top (E) to create a pleasing appearance. Once you're satisfied with your layout, draw a chalk triangle on the boards to make it easier to maintain the order as you joint the all the edges. Alternatively mark the edges "I" and "O" to designate which side goes "in" or "out" against the jointer fence. This cancels out unsatisfactory results caused by a slightly out-of-square jointer fence. Check the fit of each joint as you joint the edges.

27. Although they aren't absolutely necessary, you may want to use biscuits or splines to align the boards for gluing. Mark swears by Domino tenons, spaced at 10" to 12" intervals. Spread glue on the edges of each board and then glue and clamp the top (**Photo 18**).

28. Use a shop-made trammel to rout the 66" radius arcs on the ends of the top (**Photo 19**). Then finish sand.

Apply finish and attach the top

29. Apply your favorite finish to the top and the base. Mark uses a HVLP gun to spray lacquer in satin finish. Let each coat dry, sand with 400 grit paper, and then spray another coat.

30. Now the base is sanded, finished and ready to go. Place the top upside down on a blanket to protect the finish. Then measure and set the base onto the top where it will go. Poke a 3/8" brad point drill bit through the holes in the top rails and tap it with a hammer to mark the top.

31. Drill 9/16" deep holes in the top and use a T-wrench to drive in the 1/2" brass threaded inserts (see Source, page 42). Position the base on the top and fasten it (**Photo 20**). There's enough play between the 3/8" shank holes in the top rails and the 1/4" bolts to accommodate the top's seasonal movement.

Fig. A: Exploded View

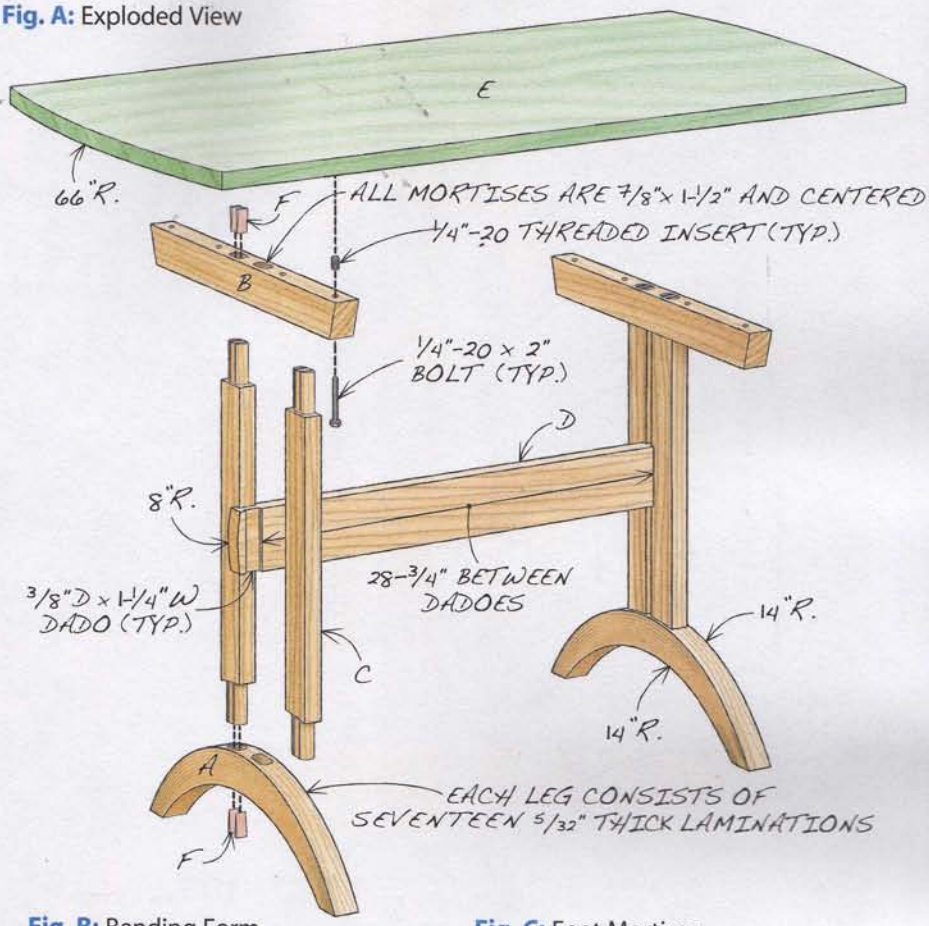


Fig. B: Bending Form

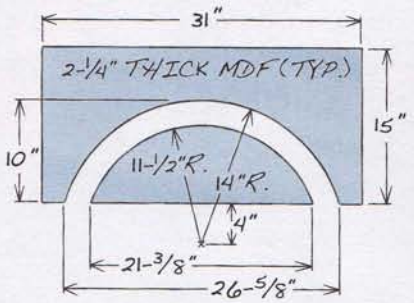


Fig. C: Foot Mortises

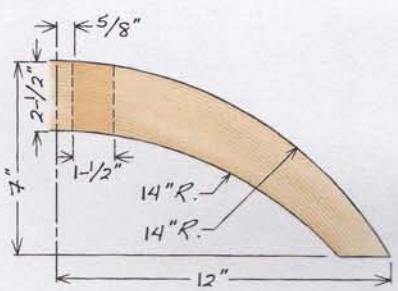


Fig. D: Mortising Jig

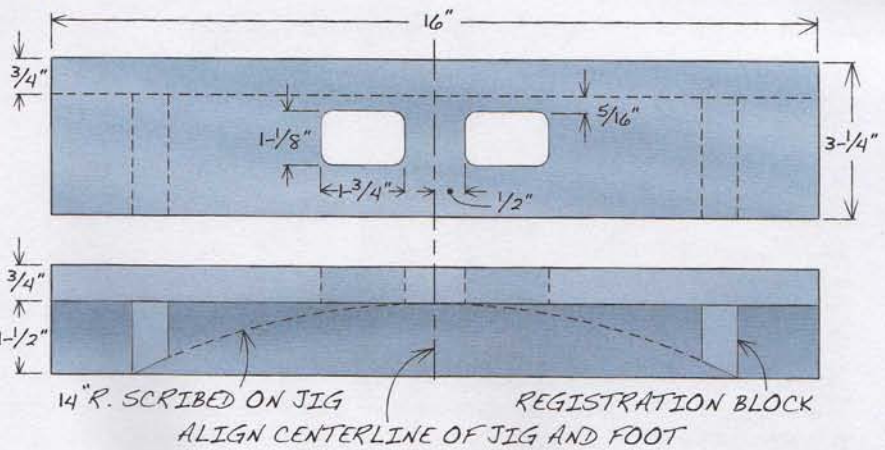


Fig. E: Top Rail Details

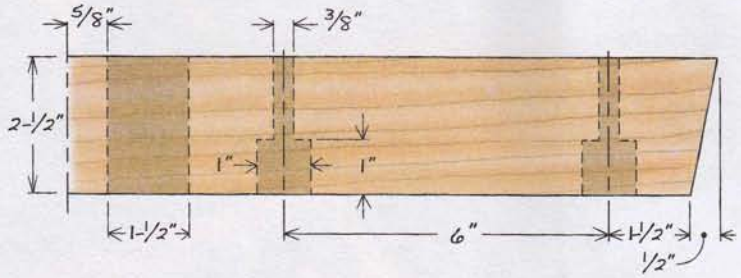


Fig. F: Upright Details

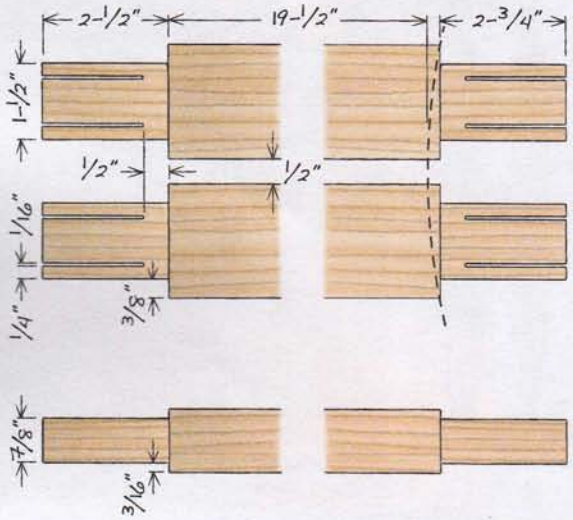
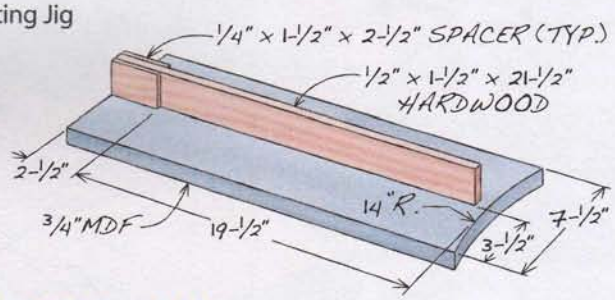


Fig. G: Routing Jig



Trestle-Style Dining Table

Overall Dimensions: 56" L x 28" W x 30" H

Part	Name	Qty.	Material	Th x W x L
A	Foot	2	Bubinga	1-3/4" x 7" x 24" (a)
B	Top Rail	2	Bubinga	1-3/4" x 2-1/2" x 24" (b)
C	Upright	4	Bubinga	1-1/4" x 2-1/2" x 25" (c)
D	Stringer	1	Bubinga	1-1/4" x 4" x 33-1/2" (d)
E	Top	1	Bubinga	1" x 28" x 56" (e)
F	Wedge	16	Walnut	1/4" x 7/8" x 2" (f)

Notes

(a) Each foot consists of seventeen 5/32" x 2" x 36" laminations. The 7" width represents the foot's overall height, measured from the floor. The foot's actual width, measured at its widest point, is 2-1/2". The radius of both the top and bottom arcs is 14".

(b) The length is measured at the top edge; the length at the bottom edge is 23".

(c) The length is nominal, and will be reduced when the lower tenons are trimmed.

(d) The distance between the two dadoes is 28-3/4". The radius of the end arcs is 8".

(e) The radius of the end arcs is 66". The overhang to the top rail is 11-7/8".

(f) The wedges taper from 1/4" to 0".

Chris Cander is a freelance writer and novelist. In addition to writing for *American Woodworker*, Chris is a contributing editor to *Oxygen*, *Maximum Fitness* and *Clean Eating* magazines.

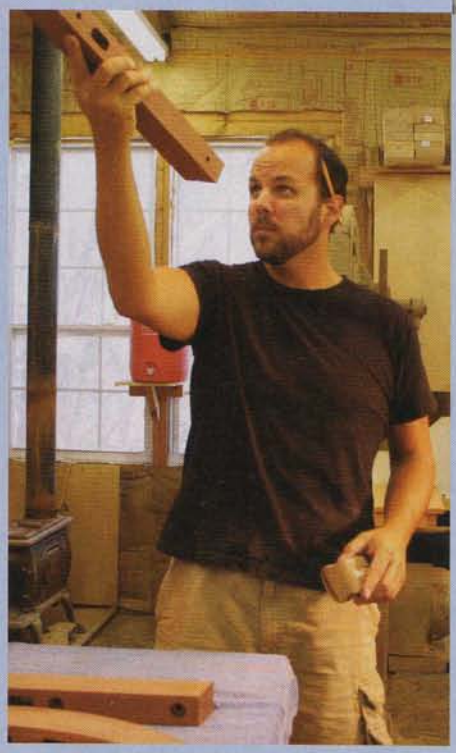
Mark Love is a professional furniture maker in Wimberly, Texas. To see more of his work, visit www.marklovefurniture.com.

To see the plans and cutting list for a 52" x 96" version of this table, visit: **www.AmericanWoodworker.com/147/LargeTrestleTable**

SOURCE

McFeely's, www.mcfeelys.com, (800) 443-7937, 1/4-20 Brass Threaded Insert, #3606-BI, $12.10 for 25.

Sanding—Finishing's Essential First Step



As I sand a part, I stop and hold it up to the light. In the reflection I can see whether or not I've removed the scratches from the previous grit.

"Nothing affects the final finish as much as sanding does," according to furnituremaker Mark Love. "For years, I applied oil finishes on my pieces. Oil finishes benefit from sanding to very fine grits, so I learned some important sanding lessons. I learned to work through the grits without skipping and to change paper frequently, to make sure that it's always abrading the surface. Sanding with worn-out paper is never a good idea. I use a block to sand flat surfaces; Dura-Block hard foam sanding blocks are my favorites.

"I sand slightly diagonally, and change directions whenever I change grits. This makes it easy to see when all the scratches from the previous grit have been removed. When I sand with the final grit, I follow the grain, and finish by slightly rounding over the sharp outside edges by hand, without using a block.

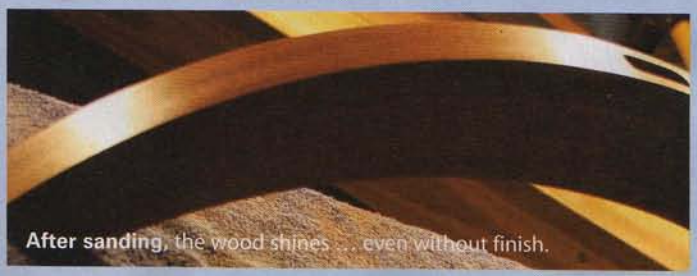
"To ensure perfect sanding in even the tightest places, I finish-sand each part before I glue anything together—except for glue surfaces and boards for a table top or panel, which I sand after they're glued together.

"I now use clear lacquer as a finish. Like other film-forming finishes such as varnish and polyurethane, lacquer is much more durable than oil finish. To prepare dense hardwoods such as bubinga (shown here) for a film-forming finish, I start with 80 grit sandpaper and work through 100, 120, 180, and 220 grit, before finishing with 320 grit."

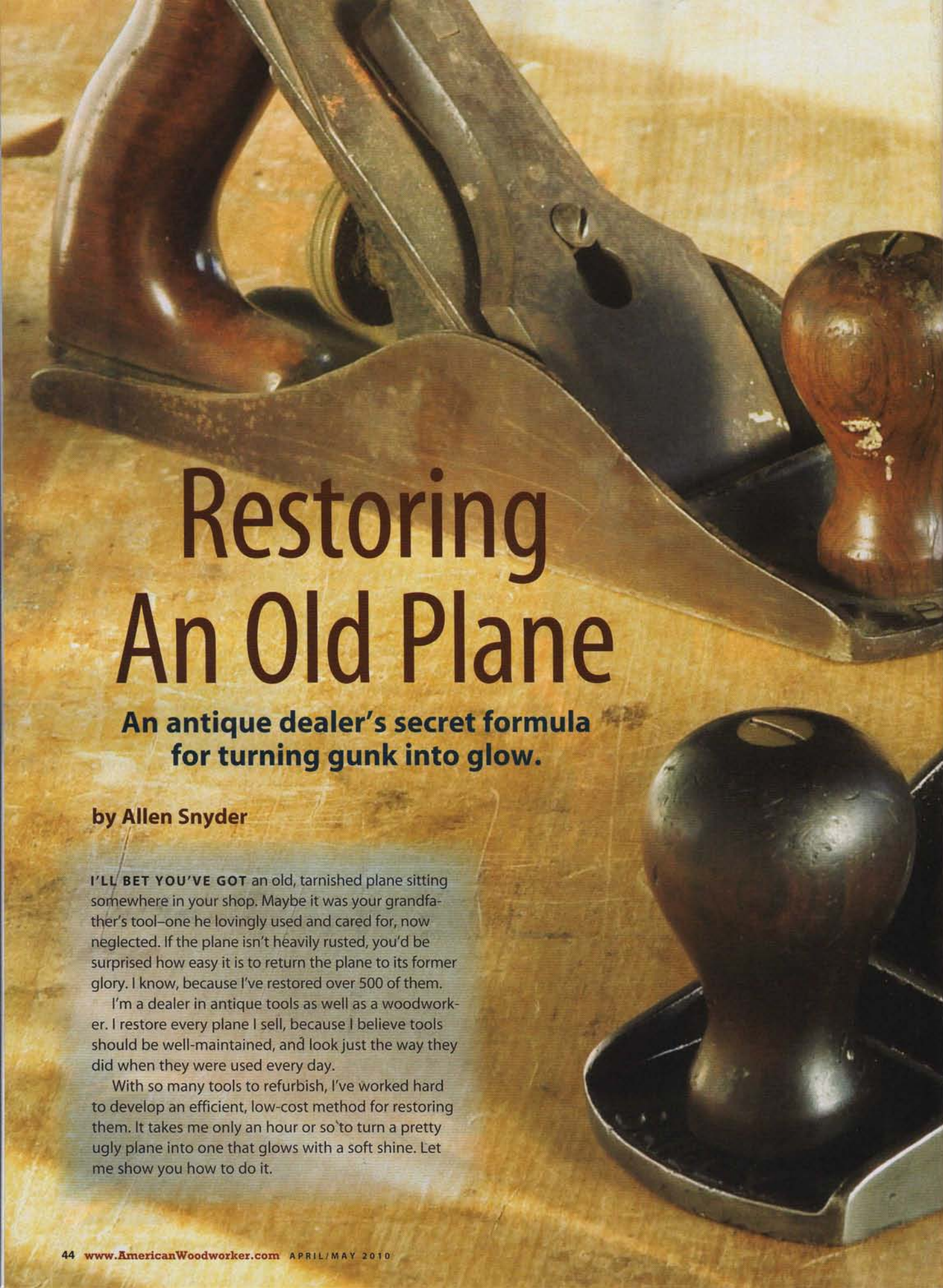
Mark sees a difference in the final appearance when he sands dense hardwoods to 320 grit, but some finish manufacturers don't recommend sanding beyond 220 grit, especially if you plan to stain the wood, or if you're working with soft woods such as butternut or pine. So check the label of the finish you plan to use and follow the surface preparation instructions.

How much finish sanding do you do? To share the finish-sanding method that works best for you, go to: **www.AmericanWoodworker.com/147/Sanding**

The part on the left has been sanded all the way to 320 grit. The part on the right has only been sanded to 180 grit. Clearly, 180 grit scratches are so coarse they make the wood look dull.



After sanding, the wood shines ... even without finish.



Restoring An Old Plane

An antique dealer's secret formula for turning gunk into glow.

by Allen Snyder

I'LL BET YOU'VE GOT an old, tarnished plane sitting somewhere in your shop. Maybe it was your grandfather's tool–one he lovingly used and cared for, now neglected. If the plane isn't heavily rusted, you'd be surprised how easy it is to return the plane to its former glory. I know, because I've restored over 500 of them.

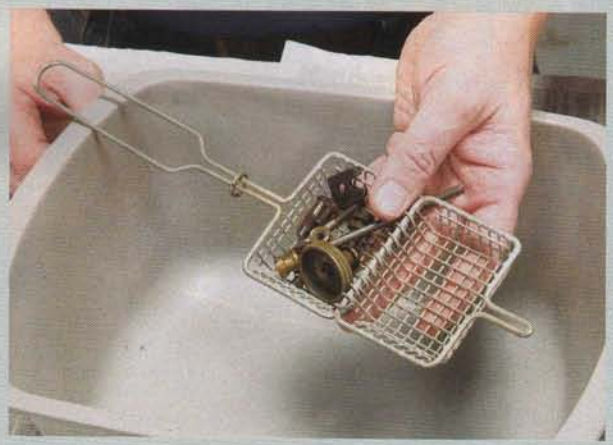
I'm a dealer in antique tools as well as a woodworker. I restore every plane I sell, because I believe tools should be well-maintained, and look just the way they did when they were used every day.

With so many tools to refurbish, I've worked hard to develop an efficient, low-cost method for restoring them. It takes me only an hour or so to turn a pretty ugly plane into one that glows with a soft shine. Let me show you how to do it.

To see a video on how to make a home-made plane-cleaning product at **www.AmericanWoodworker.com/147/PlanePolish.**

1 Completely disassemble your plane. To avoid damaging any parts, use a screwdriver with a large blade that perfectly fits the screw slots.

2 If a screw won't budge, use a brace and bit for added leverage. Secure the piece in a handscrew or vise.



3 Gather all the parts for degreasing. Put the small ones in a metal container, so they don't get lost. Don't include the plane's frog or body. Degreaser may harm the black paint, also called japanning.

4 Spray degreaser on every surface. Removing oils with degreaser is an essential step. It prepares the parts for removing rust and tarnish.

Disassembly

First, take the plane completely apart. As you disassemble it, count and keep track of the parts–particularly the screws. They may have special threads, and often can't be replaced by hardware-store screws.

First, remove the lever cap and the plane iron assembly. Separate the iron from the chip breaker by unscrewing the cap screw. Next, remove the frog by loosening the two screws that fasten it to the plane's body (**Photo 1**). Each screw should be accompanied by a washer. Disassemble the frog by unscrewing the brass adjustment nut, then remove the lever cap screw (**Photo 2**) and the frog adjusting screw and tab.

Remove the knob and handle. They'll be fastened to the plane's body by a bolt and brass nut. To avoid damaging the nuts, use a screwdriver with a wide blade (you may have to shorten a screwdriver with a grinder to get a good fit). If possible, unthread the nuts from the bolts.

Degreasing

Next, clean the accumulated grease and grime from all the unpainted parts. I place the small ones in a wire basket that I found at a flea market (**Photo 3**), but a strainer–a kitchen utensil–would work just as well. Set aside the plane's body and frog for now, because degreasers usually soften their paint.

Degreasing agents are corrosive, so wear rubber gloves and work in a well-ventilated area. Spray all of the parts with degreaser and allow them to sit for a few minutes (**Photo 4**). Scrub the parts with a nylon brush to remove any stubborn grease deposits, then rinse the parts in hot water (**Photo 5**).

Dry the parts thoroughly with compressed air (**Photo 6**).

De-rusting

Now you're ready to treat corrosion on the plane's body and frog. You can use a knife or scraper to remove most of it, but I like to use a small pry bar on which I've freshly ground a sharp, 60° edge (**Photo 7** and Sources, page 48). Used carefully, this tool won't damage

EDITOR: TOM CASPAR • PHOTOGRAPHY: STAFF

the cast iron. Alternatively, you can make a scraper from a hacksaw blade. Snap 6" off one end, then place this short piece on your bench and sand 1" of both faces on 120-grit paper. File or grind the end square. With this tool, pushing works better than pulling.

To remove the rest of the corrosion, I use a product called Rust Free (see Sources). Again, wear rubber gloves and work in a well-ventilated area. Don't use Rust Free on a very old, plated tool, however. Its chemicals may damage the plating.

Spray Rust Free directly on the plane (**Photo 8**), but avoid getting it on the japanning (the black, enamel-like paint on the plane). Gently scrub the area with a fine abrasive pad (**Photo 9**). I use 3M Metal Finishing pads, cut into small pieces. 3M Scotch Brite 7447 pads are similar, and available in bulk quantity. I usually go through about one-half pad per plane.

While the treated surfaces are still wet, thoroughly dry them with paper towels. If you don't, the chemicals in Rust Free may continue to work after you are finished, producing an inconsistent appearance on the surface. After drying, the metal should appear dull and free of black corrosion. If rust remains in some spots, repeat the process, starting with the pry-bar scraper.

Polishing

Next, polish all of the plane's parts using a fine wire wheel (**Photos 10 and 11**). Begin by using the edge of the wheel, then the flat side. The wheel shouldn't leave any marks, but if it does, remove them using 0000 steel wool.

It's pretty hard to get inside the brass adjusting nut with a large wire wheel, however. For this part, and other similar items, use a small wire wheel mounted on a rotary tool, such as a Dremel (**Photo 12**). Be careful when polishing brass parts–you don't want to dig in and texture their surface.

The stud for the adjusting nut is also hard to get to with a wire wheel. Clean this by hand with a wire brush (**Photo 13**).

5 Scrub the parts with plain water and a nylon brush to wash off the degreaser.

6 Thoroughly dry each part with compressed air. This removes moisture from every nook and cranny.

7 Turning to the plane's body, scrape off rust and tarnish with a descaling tool. I use a hardware-store pry bar whose end is beveled and sharpened.

8 Spray Rust Free on the body to help remove the rust that you can't get to with the descaling tool. Avoid getting Rust Free on the japanning.

9 Scrub with a fine abrasive pad. Wipe off the residue with paper towels before it dries. You may have to repeat this a few times. Use the same procedure on all of the other parts.

10 Polish the body, and all the other parts, with a fine wire wheel chucked in your drill press.

11 TIP: If your wire wheel becomes contaminated with oil or dirt, run it against the corner of a 2x4. This transfers the oil from the wheel to the wood.

12 Use a small wire wheel mounted in a rotary tool, such as a Dremel, to polish the inside of the brass adjusting nut.

Do not use a wire wheel or steel wool on a highly polished surface. They will dull it, and you'll have to buff the surface to restore its shine.

Immediately after cleaning and polishing, treat all the parts with a preservative to ensure that they do not begin to rust (**Photo 14**), which can happen right away. I use Boeshield T-9 (see Sources). Allow the T-9 to dry for at least one hour (overnight is best), then remove the excess with a paper towel and buff with a cotton rag.

Cleaning

Clean the japanned parts of the plane–and any other painted parts–with Natchez Solution (**Photo 15**, see Sources). Scrub with a toothbrush. If the grime residue is especially stiff, scrub it lightly with 0000 steel wool.

Wipe the parts dry with a paper towel, then polish with a cotton rag. Natchez Solution leaves a clear waxy finish on the japanning. It should be shiny–if the finish appears dull, then a grime residue remains. Repeat the process until the shine lasts.

I also apply Natchez solution to all the unpainted parts, too, because it leaves such a nice, soft luster.

Treat the knob and handle with Natchez Solution (**Photo 16**). Remove dirty solution with a paper towel. Apply an additional coat and allow the solution to remain overnight, so that the wood will absorb it. (If the wood's color has faded, repeat this process several times. Staining shouldn't be necessary.) Polish with a clean cotton rag.

Reassemble your plane. For further protection, add a drop of 3-In-One oil to all the screws and under the frog. You may have to reapply Natchez solution to the knob and handle every three months or so to retain the luster.

SOURCES

Boeshield, www.boeshield.com, (800) 962-1732, T-9, 4 oz. drip bottle, $8.49; Rust Free, 8 oz. bottle, $10.99.

The Natchez Solution, www.natchez-solution.com, (888) 795-8989, Natchez Solution, three 8 oz. bottles, $35.

Northern Tool + Equipment, www.northerntool.com, (800) 221-0516, Pry Bars, 4 pc. Set, # 2515530, $10.99.

Tuning Your Plane

Many old planes don't work very well because they haven't been tuned. They weren't like electric drills, ready to go right out of the box. Back in the glory days of hand tools, experienced artisans expected that new tools would need additional work–but most folks didn't do it.

Once you've restored a plane, here's a tuning checklist:

- Flatten the bottom.
- Fit the chip breaker to the iron.
- Flatten the frog.
- Ease the sole's edges.
- Grind a cambered or straight edge on the iron, depending on how the plane will be used.
- Square the frog to the sole.
- Adjust the amount of pressure delivered by the cap screw.
- Adjust the setback of the chip breaker and the throat opening as required.

For information on how to perform these procedures, go to www.AmericanWoodworker.com/147/SuperTunePlane.

Allen Snyder

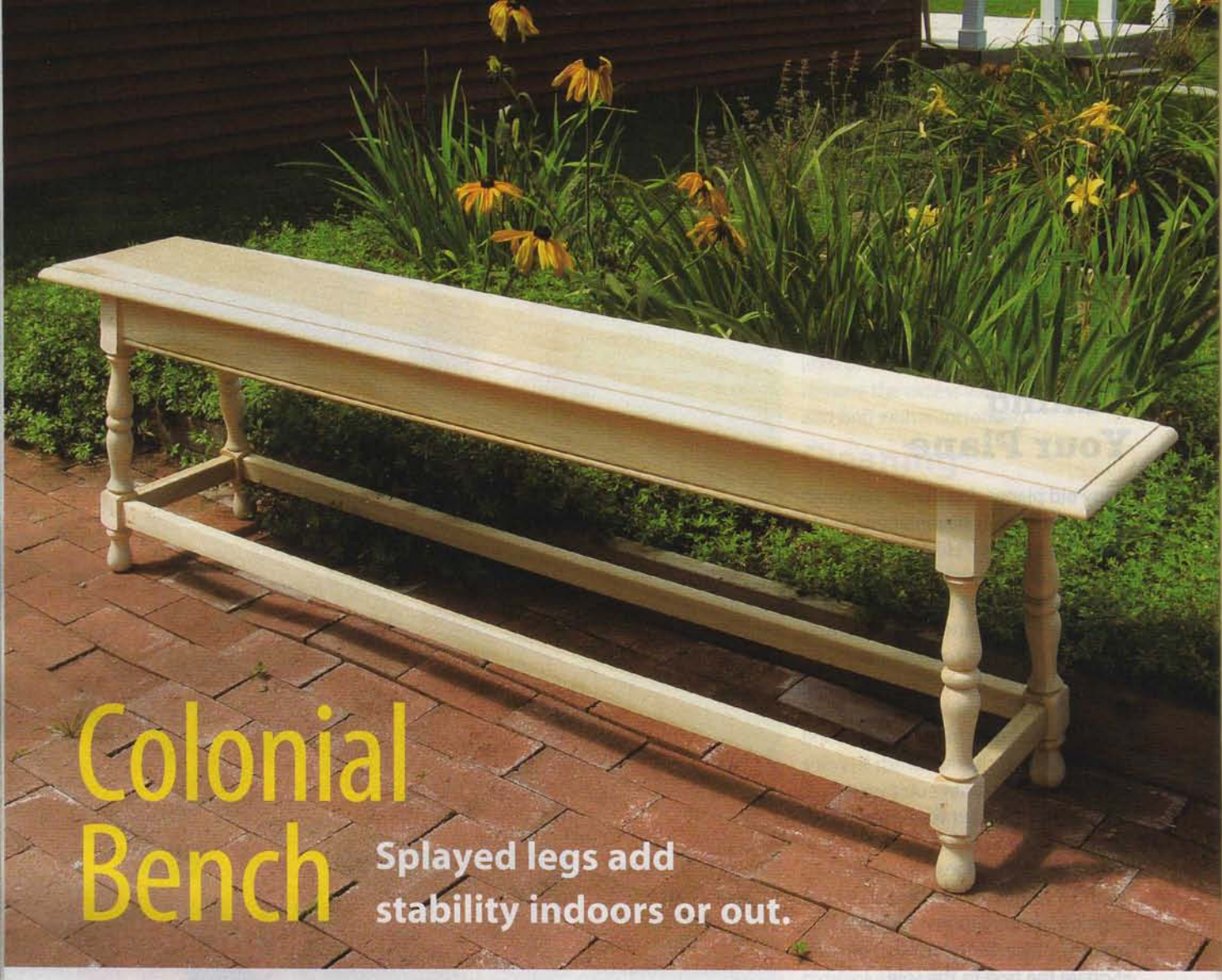
Allen is a financial executive, dealer in antique tools and a lifetime woodworker. Allen sells his tools at Midtown Antiques in Stillwater, Minnesota. His e-mail address is greywolfantiques@q.com.

13 **If the threads** on the adjusting-nut stud are rusty, clean them with a wire brush.

14 **Immediately after polishing** the plane body and all other parts, apply Boeshield T-9 to protect them from tarnishing.

15 **Clean the japanning** on the plane's body and frog with Natchez solution, a mixture of light oils and beeswax.

16 **Clean the handles** with 0000 steel wool and Natchez solution. to bring back the finish's luster.



Colonial Bench

Splayed legs add stability indoors or out.

by Steven Bunn

I DEMONSTRATE Windsor chair-making at the Common Ground Country Fair in Unity, Maine, an event that celebrates traditional crafts of all kinds. There's never enough seating, so this year I resolved to build some benches to set up around my demonstration area. I wanted a simple design that would complement my Windsor chairs and stand up to hard use.

The bench shown here combines elements from several historical benches with a few of my own ideas. The legs splay, to increase stability, and the turnings consist of vases and rings, features commonly found in 17th and 18th century furniture. Historically, a clear pine seat would be typical. But I use poplar, because it costs less than pine these days, and wide boards without knots are readily available. Following tradition, I use 8/4 maple for the legs. Of course, you can change the length of the bench, or the width; just adjust the lengths of the aprons and stretchers to match your top.

Turn the legs

1. Mill four 1-7/8" x 1-7/8" x 21" turning blanks for the legs (Part A Fig. A, page 52 and Cutting List, page 55) and mark the centers on both ends.

2. Make a template of the turned leg (Fig B), using a piece of 1/4" plywood.

3. Position the bottom end of the template (the foot) flush with the end of one of the blanks, and mark the turning's two square sections. Carry the lines around all four sides of the blank. Transfer these lines to the other three blanks.

4. Mount a blank on the lathe and define the shoulders of the leg's two square sections by cutting in with a parting tool on the waste side of each line (**Photo 1**). To avoid chipping the corners, start by making a shallow cut at the line. Carefully back out the tool and make a second adjacent cut to widen the groove. Then go back and deepen the first cut.

5. Switch to the spindle roughing gouge and turn the blank to a cylinder between the square sections and at the bottom. You may have to reduce the cylinder's diameter slightly, if your blank isn't perfectly centered—small variations between the finished legs won't be noticeable after the bench is assembled.

6. Using the template, mark the

EDITOR: TIM JOHNSON • PHOTOGRAPHY: IAN ALEXANDER BUNN • ILLUSTRATION: FRANK ROHRBACH

Start by turning the legs. Mount a blank on the lathe and cut in with a parting tool to establish the two square sections.

Turn the center section to a cylinder. Then use a pattern to mark the transition points between the turned elements.

Establish the center ring by cutting in with a parting tool.

Rough out the ring and the vase shapes using a spindle/detail gouge. Shape the vases by eye, using the reference marks you've made. Switch to the skew chisel to finish the job. Use the same tools and techniques to turn the leg's bottom section.

center cylinder's major features (**Photo 2**). I mark both ends of the ring and the two large diameters of each vase.

7. Use a parting tool to define the ring's two shoulders (**Photo 3**).

8. Switch to the spindle/detail gouge and cut away most of the waste at the base of each vase. Ease the outside edges of the ring to start forming its rounded profile. Then form the sweep of the upper portion of each vase (**Photo 4**).

9. Cut in with the parting tool to create the narrow fillets that flank the ring.

10. Use the skew to shape the ring and fair the curves on the vases.

11. Completing the bottom section of the leg is a breeze, because it includes the same elements that comprise its center section—a ring, a fillet and a vase-shaped foot.

12. Use the skew to cut in the transitions between the vases and the square sections (**Photo 5**). Then use the spindle/detail gouge to shape the rounded pommels on the ends of the leg's square sections. Always work from the large diameter (the square section) to the small diameter (the turned section). Complete the job by making several light cuts, rather than a single aggressive cut. For each cut, start with the handle held low and the flute facing straight up, so the gouge's bevel rubs on the area to be cut. Then, to make the cut, roll the gouge while lifting the handle and pushing in. For the complete story, see "Perfect Pommels," AW #126, Jan 07, or visit www.AmericanWoodworker.com/147/PerfectPommels.

13. Finish-sand each leg while it's still on the lathe.

Cut the mortises

14. Choose the best-looking adjacent faces on each leg. Then mark the other two adjacent faces for mortising.

15. Mark the apron's bottom edge on the appropriate faces of each leg by drawing a registration line 3/4" up

For the complete story on creating pommels, visit **www.AmericanWoodworker.com/147/PerfectPommels**

Fig. A Exploded View

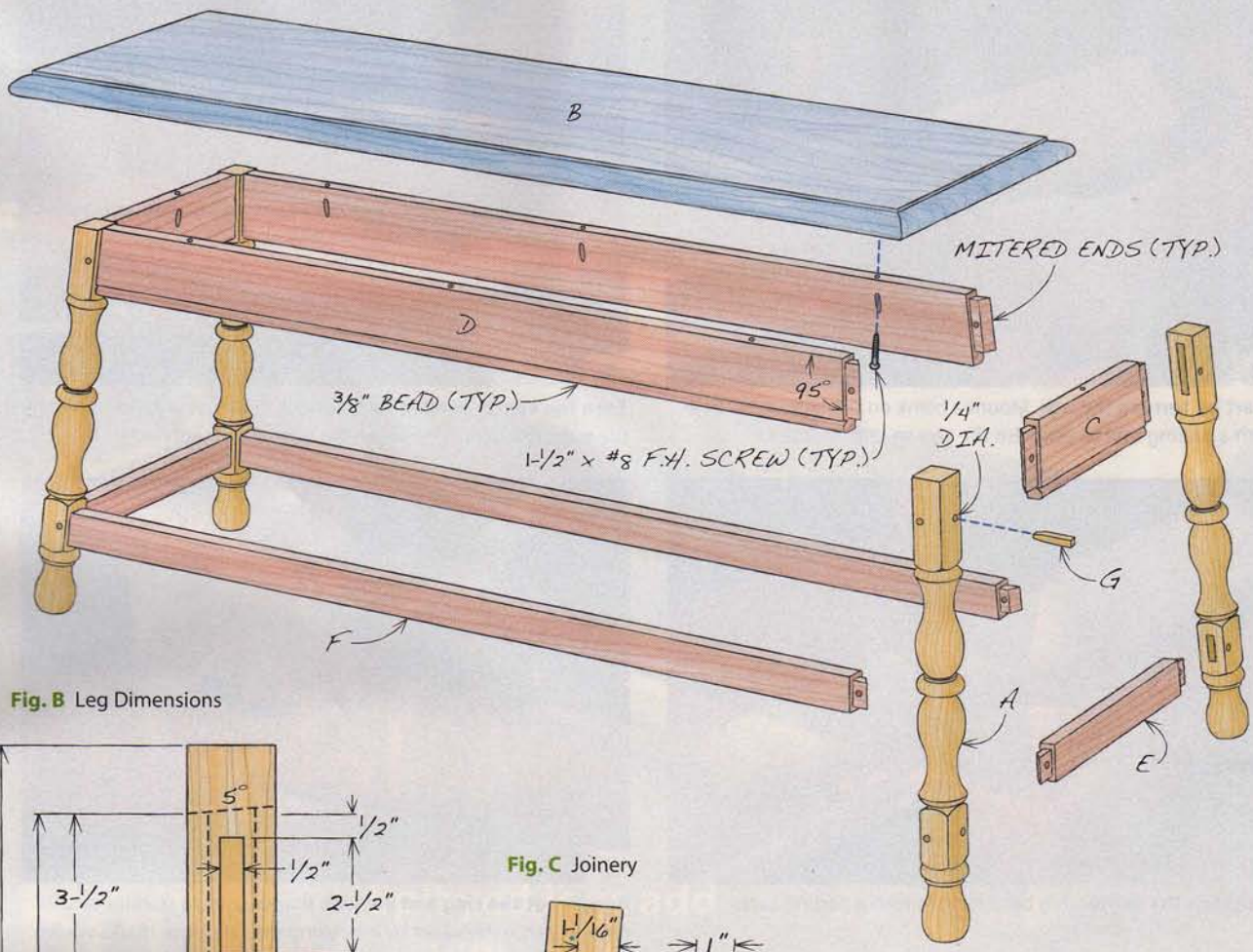


Fig. B Leg Dimensions

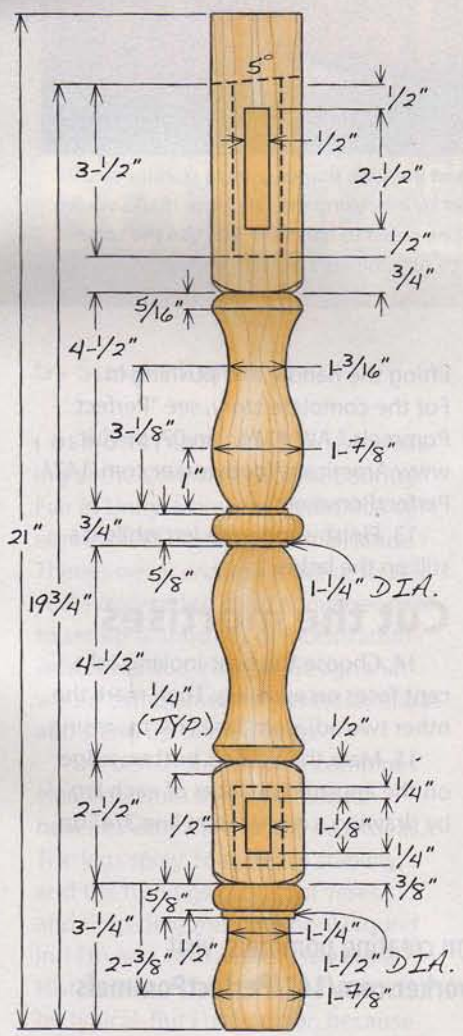
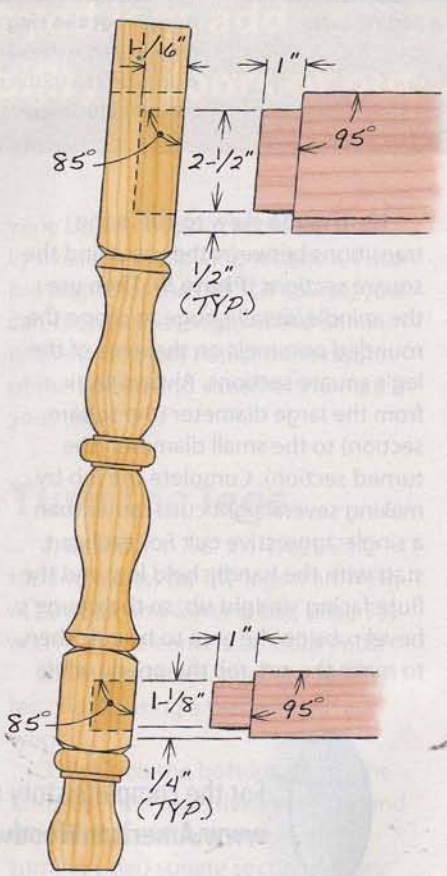


Fig. C Joinery



from the start of the square section (Fig. B). On the lower square sections, mark the top of each stretcher.

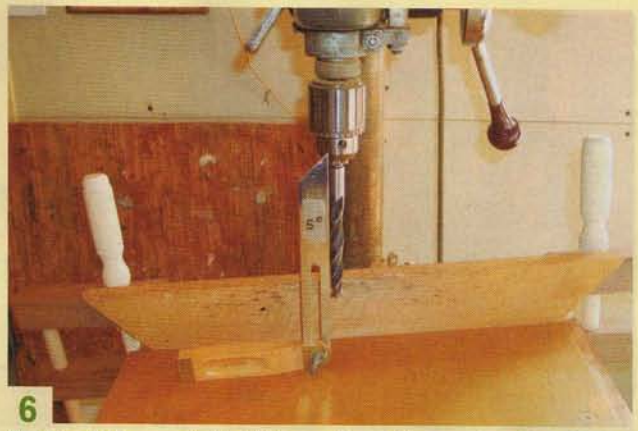
16. Use the registration lines you've drawn to scribe the 1/2" wide, centered mortises.

17. Rough out the mortises on the drill press. Set the adjustable table to a 5° angle and clamp on a temporary fence (**Photo 6**). To make sure each mortise slopes in the proper direction, always orient the leg on the table so it slopes downward from the top to the bottom. Set the fence to center a 1/2" brad point or Forstner bit between the scribed lines that mark the sides of the mortise. Adjust the depth stop to drill about 1-1/16" deep.

18. Rough out each mortise in two steps (**Photo 7**). First, drill a series of adjacent holes. Then go back and drill

5

Use the skew to shape the transition between the vases and the square sections. Then switch to the spindle/detail gouge to round the square shoulders.



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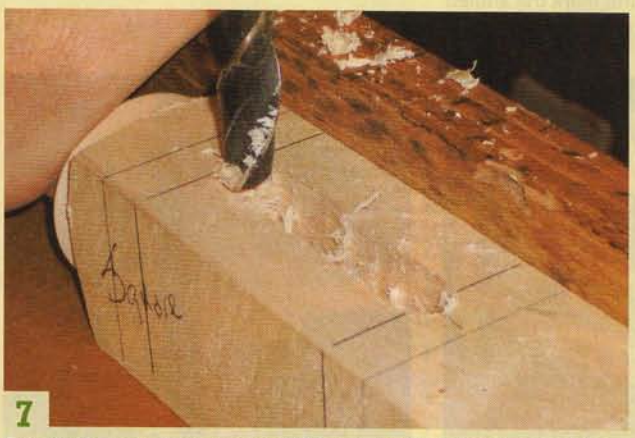
Tilt the drill press table 5° to rough out the mortises. To ensure that the mortises will slope in the correct direction, orient each leg with its bottom end on the low side of the table.



7

Create the mortises on the drill press. I drill slightly beyond the lines that indicate the ends of the tenons. Then I don't have to round the tenon shoulders.

8

Use the rip fence and miter gauge to cut tenons on the aprons and stretchers. The ends of these pieces are cut at 95°, so you have to angle the miter gauge similarly to cut the tenons.

out the ridges that remain in between. (The mortises on each leg will meet in the middle.) Clean the mortise shoulders by hand, using the scribed lines and a chisel.

Mill the aprons and stretchers

19. Mill the 5/4 stock for the bench's top (B), aprons (C and D) and stretchers (E and F) to 1". Set aside a 13" x 74" piece for the top and cut blanks for the aprons and stretchers.

20. Rip a 5° bevel on the top edge of each apron board—because the legs splay 5°, this cut will level the tops of the aprons with the legs. Return the blade to 90° and rip the aprons to final width (3-1/2", measured on the outside face).

21. Use a chop saw set at a 95° miter to cut the aprons to length. Miter one end, then measure along the top edge to mark the other end for cutting, 7-3/4" for the ends and 63-1/4" for the sides. Make sure each pair of aprons is identical in length.

22. Cut a 95° angle on one end of each of the four stretcher pieces. Leave the other end long by an inch or two for the time being.

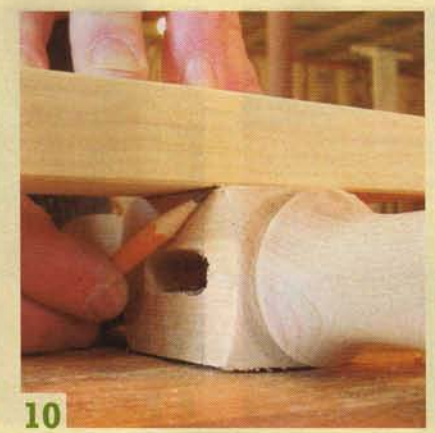
Cut the tenons

23. Cut and fit the tenons on both ends of the aprons and on the angled end of each stretcher. To assure tight-fitting joints, wait until later to scribe the uncut shoulder and tenon on the other end of each stretcher.

24. I use my tablesaw to cut the tenons on the skirts and stretchers. Because of their angled ends, the cheeks on one side of each tenon are cut with the gauge angled 5° from 90° in one direction and the cheeks on the other side are cut with the gauge angled 5° in the opposite direction. Set the rip fence 7/8" away from the blade. Then use the workpiece to set the miter gauge. Simply rotate the head of the miter gauge until the angled edge of the workpiece rests flush against the rip fence.

25. Raise the blade to 1/4" and make test cuts on scrap stock to dial in the correct tenon thickness (**Photo 8**). Make a series of crosscuts to remove the waste; on the last pass, the angled end butts against the rip fence. (If you have a dado set, you can cut each tenon cheek in two passes.) Flip the workpiece over, reset the miter

Rout a bead on the bottom edge of each apron. Gang the aprons together to provide additional support for the router.



To ensure a tight fit, one end of each stretcher has been left unfinished. Clamp each apron between its pair of legs. Then position the stretcher and mark the angled tenon shoulder on the unfinished end.

Dry assemble both ends; if all the joints fit correctly, disassemble, apply glue, reassemble and clamp each end overnight.

The next day, glue and clamp the long aprons and stretchers.

Cut the legs flush with the aprons. Then install the pins.

gauge to make the angled end rest flush against the rip fence, and cut the other tenon cheek. Test the tenon's fit in one of the mortises—the tenon should slide in without binding and fit without wiggling. Adjust the blade height and cut another test tenon, if necessary.

26. Cut all the tenon cheeks. You'll need to attach a long fence to the miter gauge to support the long aprons and stretchers.

27. Use the bandsaw to cut the tenons' top and bottom shoulders.

28. Miter the ends of the tenons, so they'll fully seat when you assemble the joints. Tilt the blade to 45° and use the same two miter gauge setups that you used earlier. Make sure to orient each skirt correctly before cutting the miter.

29. Rout a bead on the bottom edge of each apron, using a 3/8" beading bit (**Photo 9**).

Assemble the base

30. Clamp the appropriate apron between each matched pair of legs. The legs will be too long (they'll be cut to fit after the base has been glued together), so use the registration lines drawn on the legs to locate the bottom edge of each apron. Next, place the appropriate stretcher in position, with its angled tenon shoulder butted against the inside face of one leg's lower square section. Then scribe a line across the opposite end of the stretcher, where it crosses the inside face of the other square section (**Photo 10**). Add 1" to this shoulder line to allow for the tenon. Cut each stretcher to final length. Then cut the remaining tenons.

31. Dry-fit each sub-assembly to make sure all the joints fit properly (**Photo 11**).

32. Glue together the two ends and allow them to dry overnight.

33. The next day, complete the base by gluing and clamping the long aprons and stretchers between the two ends (**Photo 12**).

34. After the glue has dried, saw the ends of each leg flush (**Photo 13**). I use a block plane to clean up these cuts.

35. Pin the mortise and tenon joints. Today, these pins are mostly decorative. But before reliable wood glue was available, joints were secured

14

Rout the top edge to create a "thumbnail" profile. Shape the top edge with a 3/4" roundover bit, to create a fillet. Then flip the top over and use a 1/4" roundover bit to ease the bottom edge.

15

Fasten the top with screws after drilling countersunk shank holes in the aprons.

Colonial Bench

Overall Dimensions: 72" L x 12-3/4" W x 20-1/2" H

Part	Name	Qty.	Material	Th x W x L	Rough Size
A	Leg	4	Maple	1-7/8" x 1-7/8" x 19-1/2" (a)	1-7/8" x 1-7/8" x 21"
B	Top	1	Poplar	1" x 11-3/4" x 72" (b)	1-1/4" x 13" x 74"
C	End Apron	2	Poplar	1" x 3-1/2" x 7-3/4" (c, d)	1-1/4" x 4" x 9"
D	Side Apron	2	Poplar	1" x 3-1/2" x 63-1/4" (c, d)	1-1/4" x 4" x 65"
E	End stretcher	2	Poplar	1" x 1-5/8" x 10-1/4" (d, e)	1-1/4" x 1-3/4" x 12"
F	Side Stretcher	2	Poplar	1" x 1-5/8" x 65-3/4" (d, e)	1-1/4" x 1-3/4" x 68"
G	Pin	16	Maple	1/4" x 1/4" x 2"	

(a) Cut to final length after assembly.
(b) 3-1/2" overhang on the ends; 1-1/8" overhang on the sides.
(c) Bevel top edge 5°. Width as measured on outside face.
(d) Length as measured on top edge; length includes 1" tenons on both ends.
(e) Cut to final length during assembly.

mechanically with long tapered wooden pins driven through slightly offset holes that had been drilled through both the leg and tenon faces. These offset holes—and the joints—were pulled tight with an iron tool called a drawbore. Then the pins were driven in and cut flush.

Mark out the pin locations on each leg and drill 1/4" dia. holes about 1-1/2" deep, so that the pins will go through the tenon and into the body of the leg.

36. To make the pins (G), bandsaw a 1/4" x 1/4" length of scrap hardwood into 2" lengths. Shave the end of each pin with a chisel to ease the corners. Apply a bit of glue in each hole and hammer the pins home. Trim the pins flush with a saw.

Make the top

37. Cut the 1" thick top blank to final dimensions.

38. Use a pair of router bits to create a traditional "thumbnail" edge profile on the top. Install a 3/4" roundover bit and set the depth to cut a strong 1/16" step (or "fillet") in the top's edges (**Photo 14**).

39. To complete the profile, flip the top over and install a 1/4" roundover bit to ease the bottom side of the edge. Blend the two router cuts by sanding.

40. Finish-sand the top and then attach the base with screws (**Photo 15**). First drill shank holes diagonally through the aprons from the top. Make sure the shank holes are large enough to allow for the top's seasonal movement. Clamp the top in position and drill pilot holes through the shank holes, using a countersink bit. Then install the 1-1/2" x #8 screws. For an even more authentic look, fasten the top with forged iron nails.

41. Stand the bench on a flat surface to level the feet. Scribe a line around each foot at the same distance from the flat surface (approximately 1/4"). Then cut each foot at the line.

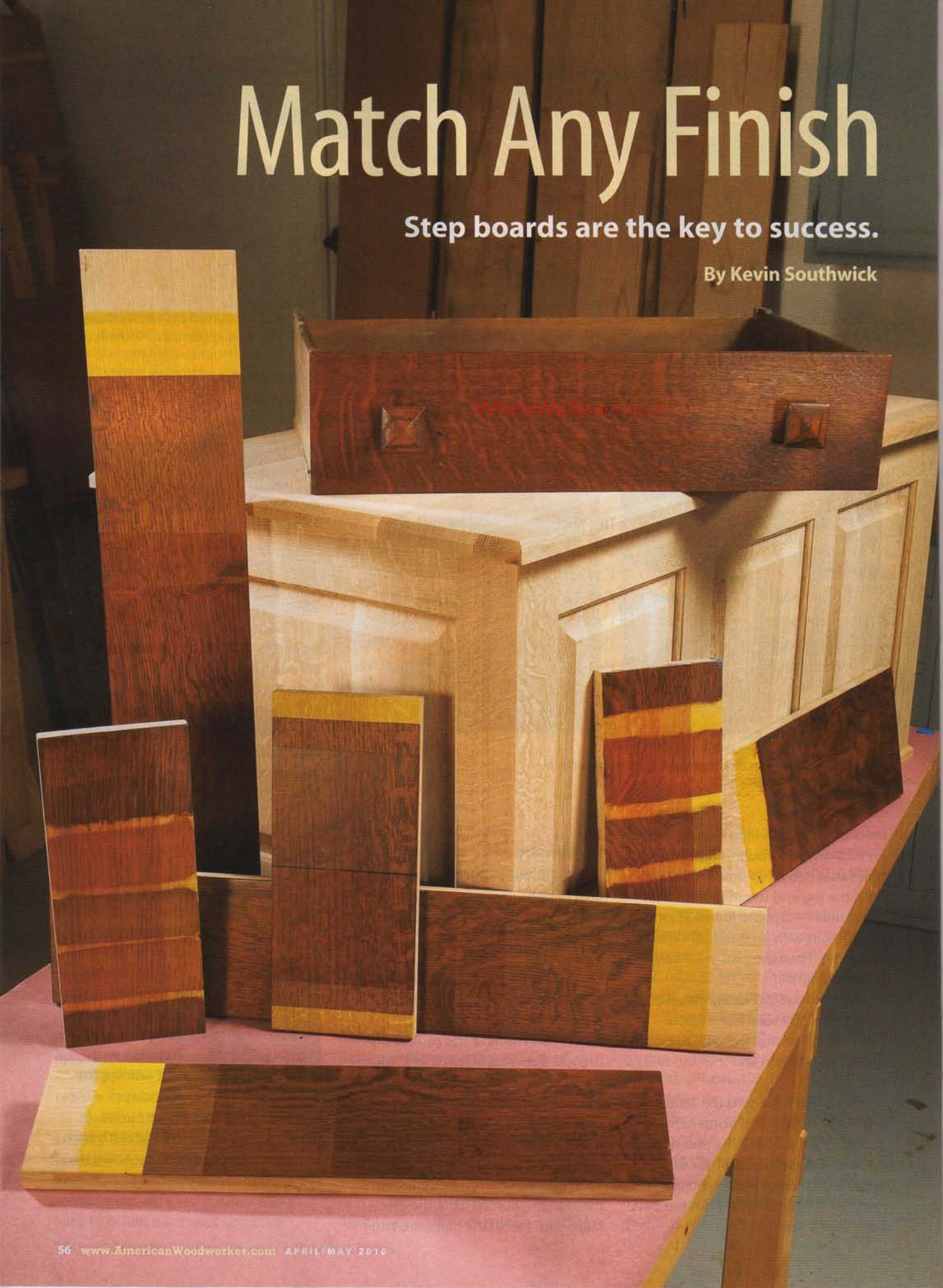
42. All that's left now is to paint the bench. I use milk paint, for authenticity, but today's exterior enamel paints offer a durable alternative.

Steve Bunn owns and operates a cabinet shop in Bowdoinham, Maine, where he specializes in crafting Windsor chairs. Steve has also written articles for *Woodwork, Fine Woodworking* and *Home Furniture* magazines. Visit **www.stevenbunn.com** or contact Steven by email at sbunn@suscom-maine.net.

Match Any Finish

Step boards are the key to success.

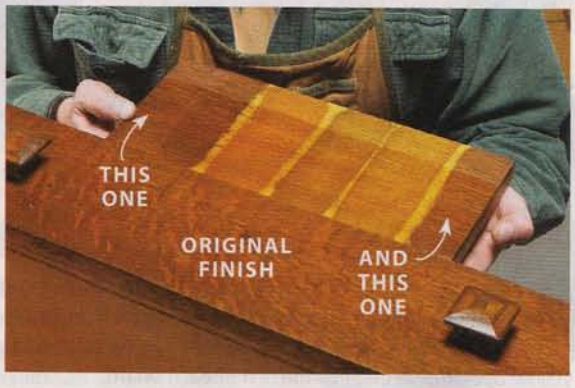
By Kevin Southwick



WIPING PAINT THINNER on a board gives a pretty good idea of the color you can expect from a clear, low sheen oil-based finish. And often, a few quick stain samples will be good enough to choose an acceptable color. But there are also times when "pretty good" and "good enough" won't do. Suppose you've built a blanket chest to complete the antique bedroom set your spouse inherited from dear Aunt Irene. If you don't replicate the set's 100-year-old patina, the chest will never truly match the other pieces. Step-by-step sample boards (called "step boards") are the solution, because they allow you to build the finish layer by layer, just like the patina of that antique finish.

1 Step boards show the effect that each individual component has on the overall appearance of a finish. This board shows three different components layered on top of each other. Specifically, it tests how different dye stain ground colors affect the final appearance.

2 Step boards are essential tools for matching a finish, such as the original finish on this old Mission style drawer. This step board tests several pigment stains layered between yellow dye and amber shellac, two other components that the new finish is sure to include. Two of the stains look promising and warrant a closer look on separate step boards.



Step boards are essential

Why take chances when it comes to finishing any project? Simply put, making step boards is the best way to ensure success, because they allow you to dial in the perfect finish on replaceable wood, rather than on your project. In addition, experimenting on step boards gives you the freedom to make mistakes and learn important lessons about different finishing materials and methods.

Step boards are very different from stain samples at a store, or samples made by hastily wiping stain on an offcut. Step boards are carefully planned to show every step in a finishing process, so you can clearly see the effect of each step. Step boards can do much more than eliminate bad color choices. They can provide surprising answers to simple questions (see "Step Board Q&A," page 59). Step boards can expose unexpected problems such as blotching, or allow you to learn the best way to highlight the wood's figure. Whenever you're working with a new type of wood, a new finishing product, or a new application method, it's a good idea to make step boards.

Good investments

The time, money and effort you spend to create step boards are good investments. A collection of completed step boards is a valuable tool for comparing finishes or for plotting a course for a new finish. Such a collection increases in value over time, because you gain experience and information with each new addition. As a professional finisher, I use step boards to ensure that my clients' expectations are crystal clear and to ensure consistency throughout big projects. In a nutshell, properly prepared step boards turn finishing from a guessing game into a problem-solving process that guarantees predictable results.

No short cuts

Making accurate step boards requires the same methodical approach and attention to detail that's required to complete any complex woodworking task. Follow these instructions to control variables and ensure reliable results.

- Carefully select the wood to represent the appropriate quality, cut, grain and figure of the wood used in your project. Each board must be large enough (6" x 20" to 30") to clearly show every step, including a large sample (at least 6" x 8") of the completed finish.
- Buy enough lumber. If your project includes plywood, molding or carving with exposed end grain, include samples of each.
- Prepare the surface exactly the same as on the project. Use the same sanding materials and processes.
- Apply all stain products in the same manner as on the project and with the same timing.
- Apply topcoats using the same methods and materials. Different topcoats can have a significant effect on color and sheen. Allow proper dry time and include sanding between coats, when appropriate.
- Record the materials and application methods you use for each and every step. Mark the step board itself or keep a finishing notebook.

EDITOR: TIM JOHNSON • PHOTOGRAPHY: STAFF • BLANKET CHEST BY ERNIE SPINKS

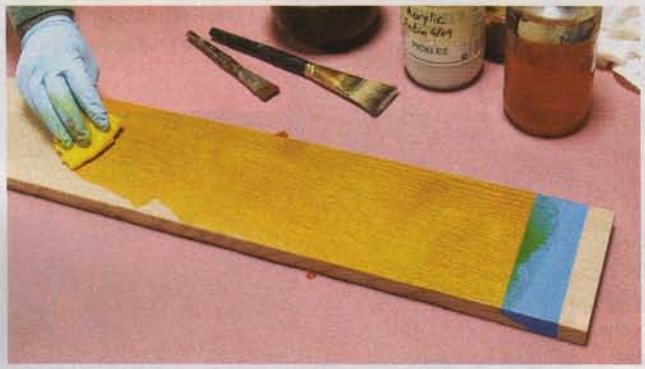
Match a finish

Making step boards is the best way to discover how valuable they can be. The process will open your eyes to the way various finishing materials work separately and in different combinations. Once you've made step boards for several different projects, you'll be amazed how adept you've become at knowing how to create interesting finishes that enhance the pieces for which they're designed.

To get you started, I'll use step boards to solve a difficult challenge—matching an authentic "mission oak" finish. I'll demonstrate the process and give you the recipe. Your job is to locate a worthy piece of quartersawn white oak and make your own step board to catalog this attractive finish.

Successfully matching an existing finish requires diagnostic skills that come with finishing experience, because the process involves layering different colors and finishes. The best way to develop these skills is to experiment on step boards and observe the results. Use the information each board provides to guide your next effort.

The finish I'm going to match appears

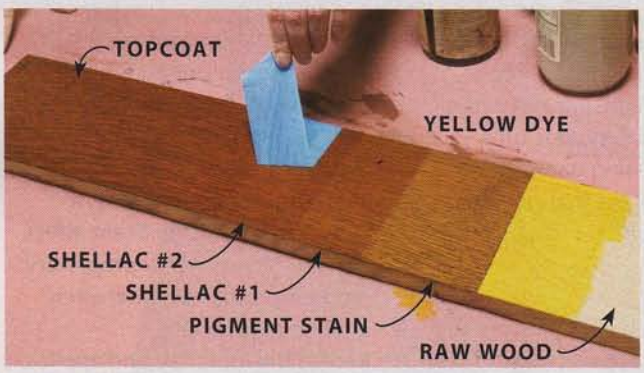


3 Make a large step board for each of the two promising stains, so you can compare them both to the original finish. After taping off the first 3" to retain the board's natural color, apply the yellow dye ground color to the rest of each board.

4 Tape off the next 3" on each board. Then apply one (or the other) pigment stain and wipe it off. Taping off isolates each finish step, so it will show as a band on each completed board.

5 Reposition the tape on each board and apply two coats of amber shellac. Allow the first coat to dry. Then move the tape and apply the second coat.

6 Move the tape on each board for the final time and apply the water-based polyurethane topcoat.



7 Each completed step board clearly shows the progression from raw wood to completed finish.

8 The two completed step boards show subtle color differences due to a single variable—slightly different dark brown pigment stains. The bottom step board matches the drawer's original finish very nicely—we have a winner!

on an old drawer front made of quartersawn white oak. It has golden, glowing rays, a dark brown hue, black pores, an amber tone and a low sheen.

Experience tells me that the best way to imitate the intensely colored rays is to use a golden brown or yellow dye as a ground color. I know that I can replicate the dark brown tone and black pores with an oil-based pigment stain. I can duplicate the amber tone by using orange/amber shellac (which I'm sure is the original finish), and I can achieve the low sheen by applying a topcoat of satin varnish.

Now that I've identified the basic components of the finish, I can start making step boards. As the overall color of the finish is created by layering dye stain, pigment stain and shellac, I'll use all three components to determine the exact color of each one. On my first step board, the dye color is the variable; the pigment stain and the shellac are consistent (**Photo 1**). On my second step board, the pigment stain is the variable (**Photo 2**).

The next step is to make a pair of complete step boards, so that I can compare the two promising finishes that I've identified. Each board must be large enough to adequately show each finish layer, with a large section at the end showing the completed finish. These large samples make it easier to choose the one that matches the best. One interesting thing about step boards is that the finish doesn't look right until the last layer is applied (**Photo 3**). For each finish layer you add on the step board, follow the same application method and drying time that you'll use on your project (**Photo 4**).

Using amber shellac to match the amber tone of the original finish may take some experimenting. With one coat of shellac, the amber tone of my step boards looked pale, compared to the drawer's original finish. So, I applied a second coat (**Photo 5**).

Applying the topcoat is the last step (**Photo 6**). Each completed board clearly shows every finishing step (**Photo 7**). I now have two similar—but distinct—finishes to choose from (**Photo 8**). And as I've recorded every step, I can easily duplicate them both.

The "mission oak" recipe

Materials

- Transfast yellow water-soluble dye (powder form), mixed at half the label strength.
- Bartley's jet mahogany gel stain.
- Zinsser amber shellac, 2 lb cut.
- General Finishes water-based high performance polyurethane, satin.

How-to

1. Finish sand all surfaces to 150 grit.
2. Apply the dye liberally, let it saturate the wood for a couple minutes, and then wipe off the excess. Allow the dye to completely dry—usually about one hour.
3. Apply the gel stain liberally and immediately wipe off the excess. The working time for gel stains is about five minutes, so work in relatively small areas. Allow the stain to dry twelve hours.
4. Brush on two coats of shellac, allowing 1/2 hour dry time following each coat.
5. Scuff the shellac with a gray nylon abrasive pad.
6. Brush on one or more water-based polyurethane topcoats.

Blanket Chest
by Ernie Spinks

Step Board Q & A

Step boards can provide definitive answers to finishing questions, because they allow testing each variable independently. The results can be subtle, or surprising. For example:

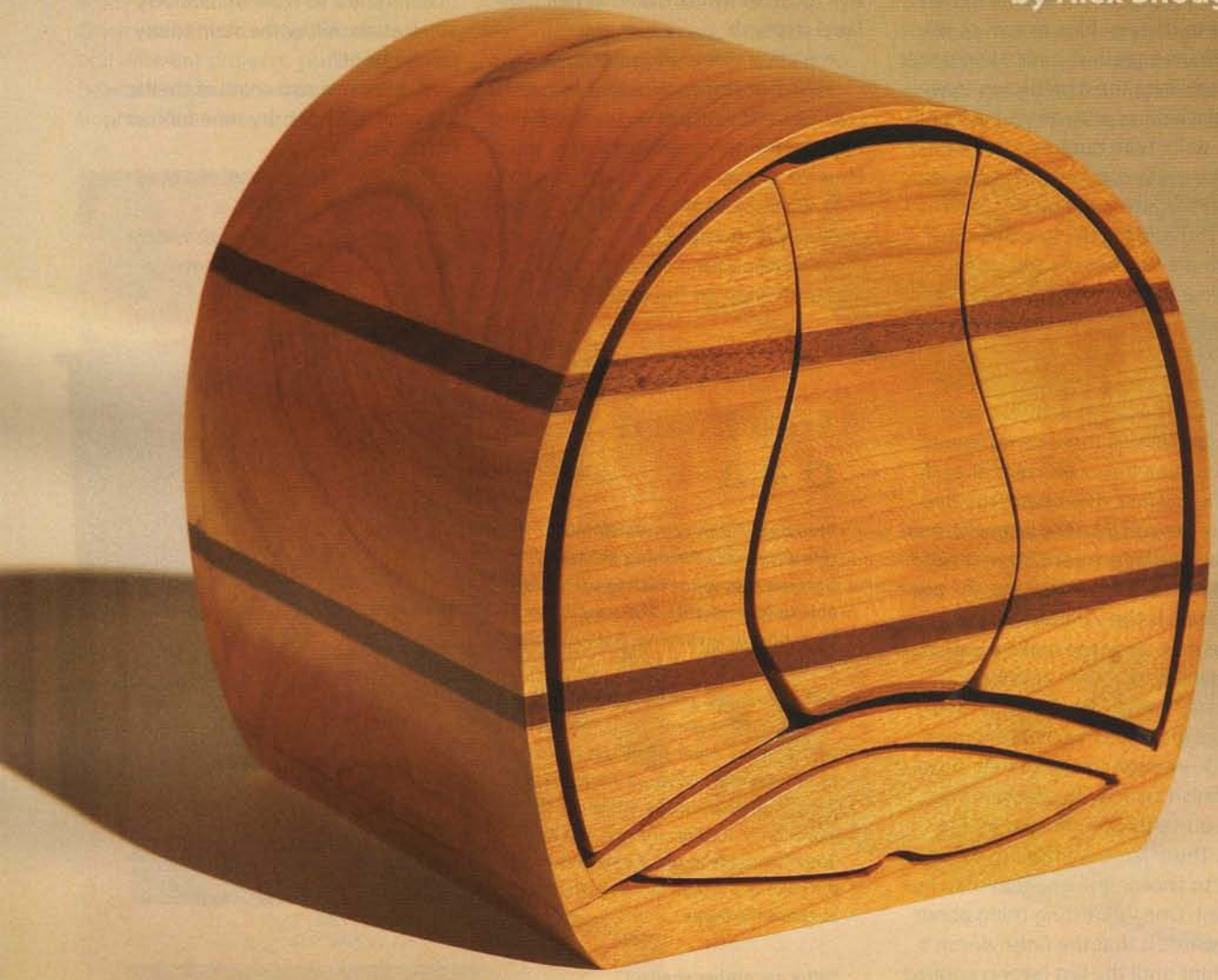
"What does the yellow dye do?"
When used as a ground color on the raw wood, yellow water-based dye helps to create the nuances found in mission-era finishes on quartersawn white oak. Most importantly, it colors the rays and intensifies their appearance. It also enriches the color of the dark brown stain and blackens the pores.

"Why use amber shellac?"
Wow! As you can see, amber shellac literally transforms the color when it's applied over layers of dye and pigment. Its unique effect is a key element in creating authentic-looking finishes for Arts and Crafts style furniture pieces.

"How does a clear finish change the color of the wood?"
A clear finish can produce a variety of colors, depending on the number of coats that are applied. The color of this walnut board deepens dramatically as the wood becomes fully saturated and a film builds on top.

Push-Button Bandsaw Box

by Alex Snodgrass



How do you open it?
Just push the bottom drawer.

IF YOU'VE EVER BEEN TO a woodworking trade show, you've probably seen me demonstrating on the bandsaw. I've been doing it for, oh, 21 years now–a long run. Last year, I introduced a box whose drawers pop out with the push of a button, and folks have loved it.

It took me a while to figure out how to make the mechanism work, but it's really quite simple (see Fig. A). There's a T-shaped piece of bent metal hidden inside the back of the box (it's just a mending T-plate from the hardware store). When you push the bottom drawer, which I call a push button, the T-plate pivots and pops out the drawers above. When you push in the drawers, the T-plate pivots the opposite way and returns the push button to its original position.

If this is your first time around making a bandsaw box, don't worry. This one is pretty easy, and the pivoting mechanism really doesn't complicate things. The main idea is that you'll be cutting things apart, removing a waste piece, and gluing the parts back together. The pictures on the next two pages tell the story quite well, but I've also made a video that shows every step of the process (see Source, page 63).

Before you begin, make sure that your bandsaw's table is square to the blade, side-to-side and front-to-back. I use three different blades for making this box (see 7 Tips for Making Bandsaw Boxes, page 64), and they really have to be sharp to accurately cut wood this thick. Take care when installing each blade; setting the guides properly is essential for you to be able to follow the cutting lines.

Think carefully about working safely. Your hands will often be very near the blade, but make sure they're never in front of the blade's teeth. Cut at a slow but steady pace–don't force the cut. A new or sharp blade will make this much easier.

Make the blank

The blank is 5-5/8" thick, 5" wide and 6" long. It's composed of three layers of 1-3/4" thick wood and two layers of 3/16" thick wood.

Fig. A Exploded View

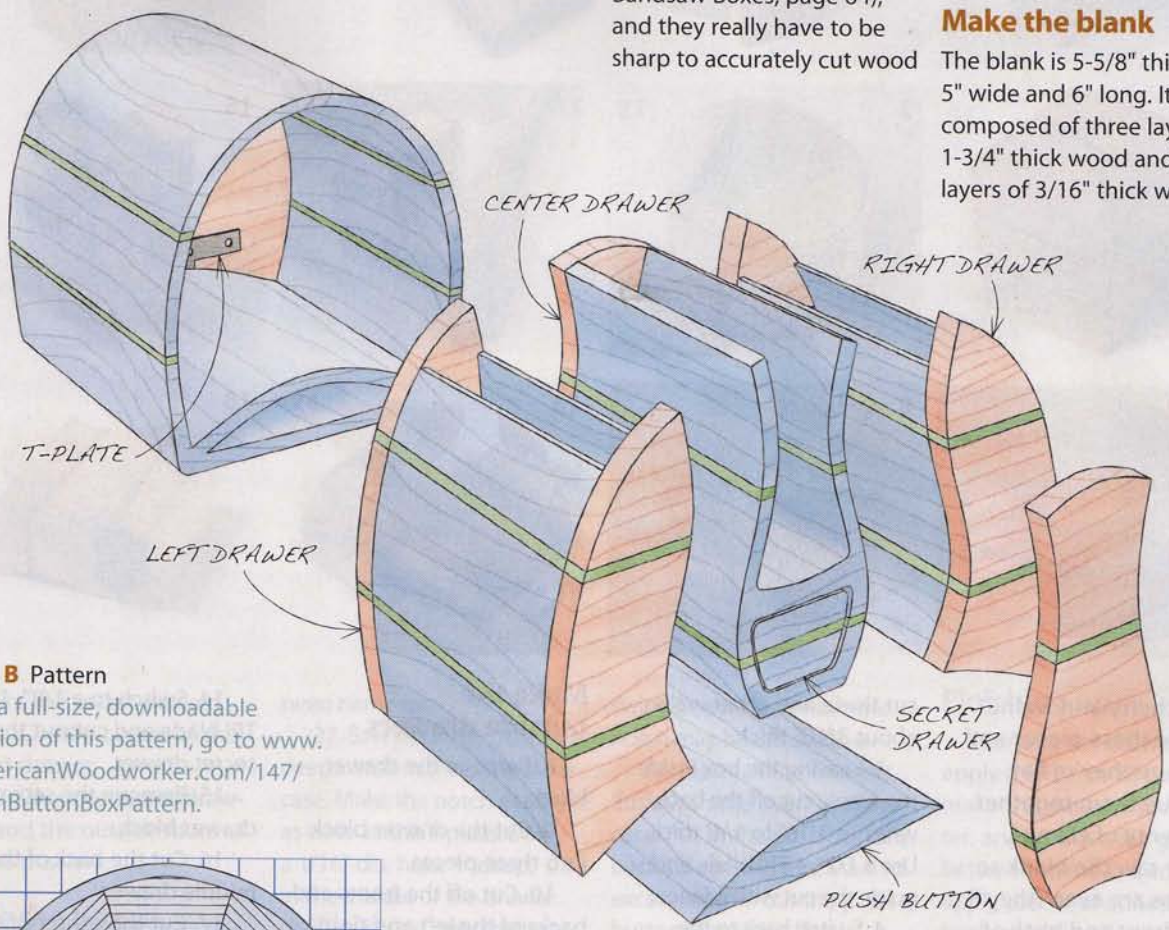


Fig. B Pattern

For a full-size, downloadable version of this pattern, go to www.AmericanWoodworker.com/147/PushButtonBoxPattern.

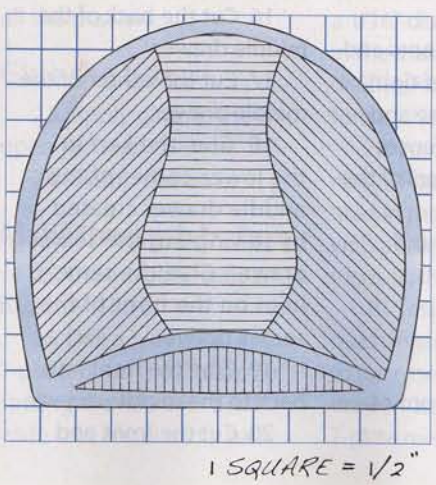
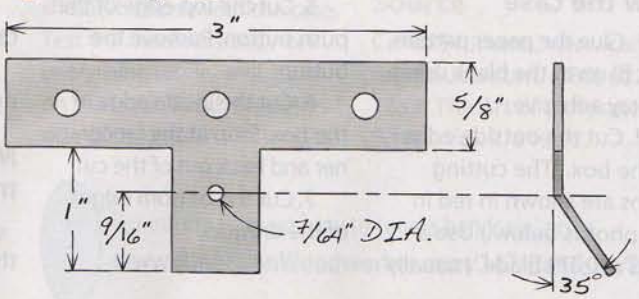
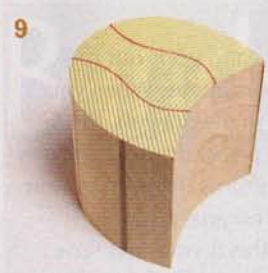
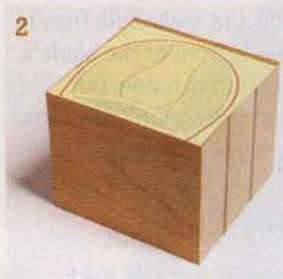


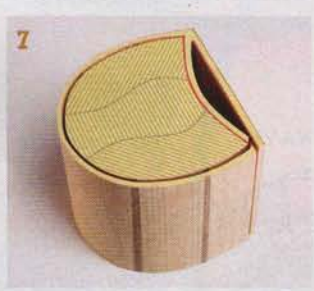
Fig. C Pivoting Plate



EDITOR: TOM CASPAR • PHOTOGRAPHY: STAFF







I used cherry and walnut. Machine these pieces and make sure they're flat, then glue them together with plenty of clamps. Joint or saw the blank so the sides are even (they'll be the front and back of the box).

Saw the case

1. Glue the paper pattern (Fig. B) on to the blank using a spray adhesive.

2. Cut the outside edge of the box. (The cutting paths are shown in red in the photos below.) Use a 3/16", 10 TPI blade. I usually cut these and other walls about 3/16" thick.

3. Leaving the box inside the blank, cut off the back, which is 3/16" to 1/4" thick. Use a 1/2", 4 TPI blade and guide the cut with a fence.

4. Switch back to the 3/16" blade and cut the bottom edge of the push button.

5. Cut the top edge of the push button. Remove the button.

6. Cut the inside edge of the box. Stop at the far corner and back out of the cut.

7. Cut the bottom edges of the drawers.

Make the outside drawers

8. Remove the drawer block.

9. Cut the drawer block into three pieces.

10. Cut off the fronts and backs of the left and right drawers. Guide these and similar cuts with a fence.

11. Cut the centers of the drawers.

12. Glue the left and right drawers.

Make the middle drawer

13. Cut off the front of the middle drawer.

14. Switch to a 1/8", 14 TPI blade and cut out the secret drawer.

15. Remove the secret drawer block.

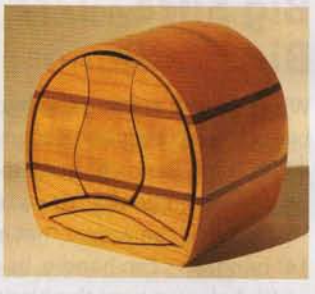
16. Cut the back of the middle drawer.

17. Cut the center of the middle drawer.

18. Glue the kerf in the lower corner of the middle drawer created by sawing out the secret drawer. Glue the same joint on the front of the secret drawer.

19. Glue the front and back to the middle drawer.

20. Cut the front and



back of the secret drawer.

21. Cut the center of the secret drawer.

22. Glue the secret drawer. Sand the outside faces of all the drawers.

Glue the box

23. Apply glue to the two open joints of the box.

24. Clamp the box.

Make the push button

25. Cut a T-plate with a hacksaw (Fig. C).

26. Drill a 7/64" hole in the T-plate. Bend the T-plate by striking the fold with a 3/4" wide cold chisel and a ball-peen hammer.

27. Saw or rout a 1/8" deep notch in the back of the case. Make the notch exactly as wide as the T-plate. Drill a 1/16" dia. hole, 1" deep, in the middle of the drawer divider. Round over the bottom of the notch using a file.

28. Place the T-plate in the notch. Place a 2d (1" long) brad in the hole. Cut the brad with a side cutter so that it's top is flush with the T-plate.

29. Test the push-button mechanism. Clamp the back to the case and insert the drawers and push button. The T-plate mechanism should swing freely. If it doesn't, the notch may be too shallow.

30. Insert all the drawers, flush with the outside of the case. Put in the push button, back side facing out. Mark its excess length. Cut the push button along this line.

31. Replace the push button, front side out. Its front should be flush with the case. Test the mechanism. Once everything works well, glue on the back. Sand the outside of the case.

Finishing up

Remove the drawers and apply a finish to all parts. To make the drawers slide better, and to close the gaps between them, cut and apply pieces of adhesive-backed felt inside the case and push button's opening.

Source

Carter Products, www.carterproducts.com, (888) 622-7837, The Art of Bandsaw Boxes, Vol. 2, $19.95.

For information on how to tune a bandsaw, go to **www.AmericanWoodworker.com/147/BandsawTuneup**

7 Tips for Making Bandsaw Boxes

Big Slice, Big Blade

When you're cutting the back off a big box, your best bet is to use a 1/2" 4 TPI (Teeth Per Inch) hook-tooth blade, and guide the cut with a fence. This blade is the widest that most 14" bandsaws can handle. Its extra width helps prevent the blade from bending backwards and twisting, which can result in a bowed cut. This blade's extra-deep gullets have plenty of room for carrying away sawdust, which also helps prevent a bowed cut. A fence, of course, assures that the cut will be straight–which is essential when you glue the two pieces back together later on.

The Workhorse Blade

My favorite blade for cutting curves is a 3/16" 10 TPI. It cuts a curve as small around as a nickel. Sometimes I use a 1/4" 4 TPI blade–but it leaves a coarser surface that requires more sanding. One good thing about the 1/4" blade, though, is that it's more aggressive. You have to go a bit slower with the 3/16" blade, but the results are worth it.

Both blades require careful setup, particularly with ball bearing guides. The front edge of the guides should be positioned a hair behind the blade's gullets, so the blade's teeth won't contact the guides. Rounding the back of the blade with a dry oilstone will help the blade negotiate tight curves (see Sources, below).

For Tight Curves, An Extra-Small Blade

When a box calls for curves that are smaller than the radius of a nickel, I take the time to switch to a 1/8" 14 TPI blade. It can cut curves down to a 1/4" radius.

A blade this small isn't easy to set up with conventional guide blocks, unless you're using phenolic Cool Blocks (see Sources). Cool Blocks won't damage the blade's teeth, so you can set the blade right in the middle of the blocks.

I developed an alternative guide system, called the Carter Stabilizer, for 1/4" and smaller blades (see Sources). It temporarily replaces the guides on your saw and is very easy to install. The Stabilizer is essentially a thrust bearing with a groove down the middle. When you set it up, you spring the blade forward a bit, so the blade remains seated in the groove. Just back off the lower bearings, and away you go.

Sources:

Carter Products, www.carterproducts.com, (888) 622-7837, Band Saw Stabilizer (many sizes available; inquire for prices).

Woodcraft Supply, www.woodcraft.com, (800) 225-1153, Cool Blocks, (many sizes available; about $14.50 per set).

Gorilla Glue, www.gorillatough.com, (800) 966-3458, Gorilla Tape, (see website or call for nearest dealer).

Highland Woodworking, www.highlandwoodworking.com, (800) 241-6748, Blade Rounding Stone, #486031, $11.99.

by Alex Snodgrass

Alex is the inventor of the Stabilizer and the Quick Release Arm, both carried by Carter Products. He's demonstrated for Carter at trade shows for years, and has produced videos for Carter about tuning a bandsaw, making puzzles, and bandsawing many types of boxes.

Smooth Joints with Sandpaper

Before you glue parts together to rebuild a box, sand their edges on a full sheet of 80 grit sandpaper. This will make the edges absolutely flat, which helps make the joints invisible.

I put the sandpaper on the cast iron wing of my tablesaw and secure it with Gorilla Tape so the paper doesn't buckle or shift (see Sources, page 64). I tried masking tape and duct tape, but they don't hold as well. This stuff does the trick.

Save Elbow Grease

The fastest way to clean up the bandsawn surfaces of a box is to use a combination belt/disc sander. It doesn't matter what size it is–a benchtop model works fine.

Use the flat belt for convex curves. For the smoothest results, support your work on the machine's work table. For concave curves, use the belt's round nose. Be very careful, though, and use only fine grits and light pressure to maintain control as you sand.

Felt Makes the Difference

I line the inside of a bandsaw box with adhesive-backed felt. It makes the box's pieces nest together much better, because the felt's thickness is just about equal to a blade's kerf. The wood you lose by sawing is made up for by the felt. Felt also makes drawers glide like butter. Adhesive-backed felt is available at many craft stores, and is easy to cut with a pair of scissors.

Use a Sub-Table

Sometimes the cuts don't come out square when making small pieces. I found this out the hard way one day, when a very small drawer turned out tapered from front to back. I discovered that the problem wasn't my setup or technique.

The problem was the saw's throat plate. It wasn't level with the saw's table, and, being plastic, had some give in it, so the workpiece leaned into the blade.

I solved this problem in a hurry by grabbing a piece of plywood to cover the table. I cut a kerf to the plywood's center and clamped the plywood to the table. Done deal–this made a perfectly flat work surface.

To protect my fingers, I held the piece in a small handscrew. I cut notches in the handscrew to help hold curved pieces.

EDITOR: TOM CASPAR • PHOTOGRAPHY: STAFF

Installing a Half-Mortise Door Lock

by Lonnie Bird

DURING THE 18TH CENTURY, locks were often used on casework to secure spices, important papers, jewelry and other valuables. The most commonly used type of lock fits into a half-mortise (a mortise that's open on one side).

I use a combination of power tools and hand tools to create those half-mortises–the kind of work I particularly enjoy. It's not a difficult task, but after installing dozens of these locks, I've realized that it's important to do each step in a particular order.

Why Use Locks Today?

I made this 18th century corner cupboard the way it would originally have been built–with half-mortise locks, instead of handles or pulls. The key serves as a handle, and the lock's bolt works as a catch. If you're building a period piece, you'll probably be installing similar locks, because they're often an essential element of a piece's design and history.

While most folks today don't need to keep everything in the house under lock and key, locks do have a place in contemporary furniture. A lock adds curiosity and mystique to a door (especially if you cannot remember where you hid the key!). And without a pull or handle, a door can have a much sleeker look.

Buy the right lock

The first step, of course, is to get the correct lock. That's not as easy as it may seem. Locks for doors and drawers often have two keyholes positioned 90° apart, which makes this type of lock interchangeable; it can be mounted vertically for a door or horizontally for a drawer. Ordering a lock for a door can be tricky, because locks come in right hand and left hand versions. Unfortunately, this designation is not universal among suppliers, so you'll need to inquire which is which when purchasing the lock.

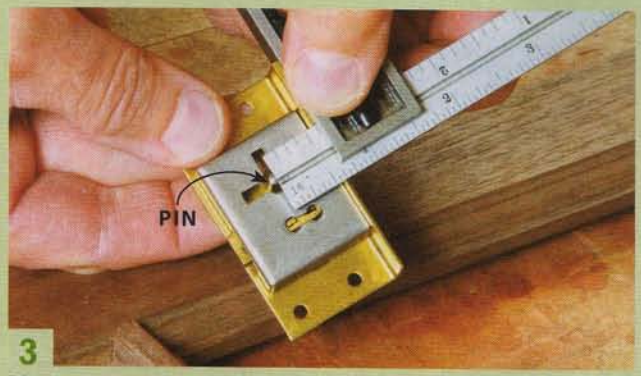
The next item to address is the lock's size. Size determines the distance between the edge of a drawer or door and the keyhole and escutcheon. The larger the lock, the longer this distance will be. For doors, the width of the stile will determine the maximum size of the lock.

Selecting the right escutcheon is just as important as selecting the right lock. Escutcheons are often made of brass, but you can make one from contrasting wood or an old ivory piano key. During the 18th century, escutcheon styles continuously changed in keeping with furniture styles. If you want your cabinet to look authentic, find some photos of genuine pieces made in the same style and compare their escutcheons with what's available in

EDITOR: TOM CASPAR • PHOTOGRAPHY: LONNIE BIRD.

Begin by placing the lock's escutcheon on the door using double-faced tape. Mark the center of the escutcheon's circular opening.

Remove the door and draw a line through the mark.



Measure the distance from the edge of the lock to the pin that receives the key.

Mark this distance on the door.

a catalog or online. I usually order an escutcheon from the same company that supplies the lock to make sure the lock's key will fit the escutcheon.

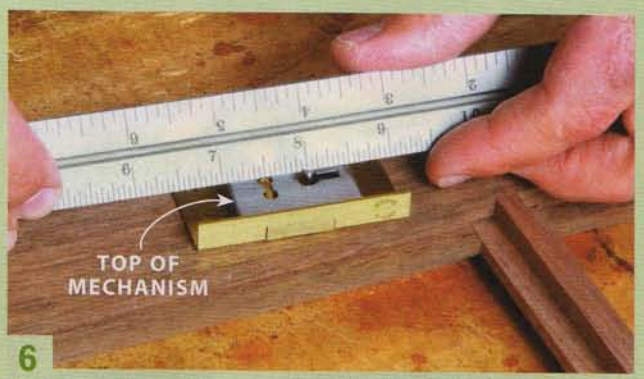
Position the lock

OK–you've bought the lock, and you're ready to install it. Let me walk you through how to do this on a door (the procedure for installing a drawer lock is very similar). First, carefully fit the door and install the hinges. Next, determine the lock's exact location by positioning its escutcheon. The distance of the escutcheon's center from the door's edge is a given–it's the distance from the edge of the lock to the pin on which the key pivots.

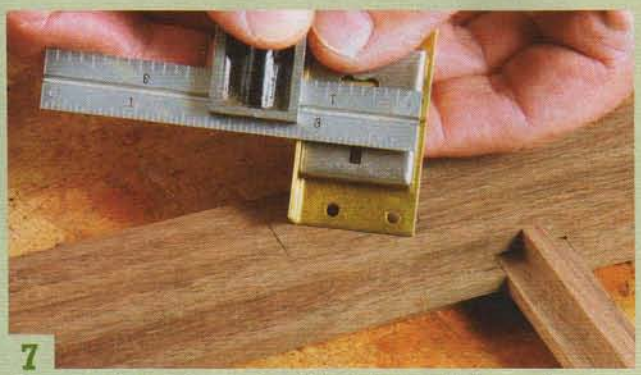
The best height for the lock isn't as obvious. From an aesthetic point of view, I prefer to position the escutcheon above or below the door's centerline–not right on it. If the lock goes on the upper door of a large piece, I'll probably place the lock slightly below center, so the key is easier to reach. If the lock goes on a lower door, I'll place it slightly above center, for the same reason. In either case, make sure to locate the lock so that the lock bolt will not interfere with interior shelves.

To determine the lock's exact height, stick the escutcheon to the door stile with double-faced tape (**Photo 1**). Step back and take a look at how the escutcheon balances with the other brass hardware

Drill a hole through the stile at the intersection of these two lines.

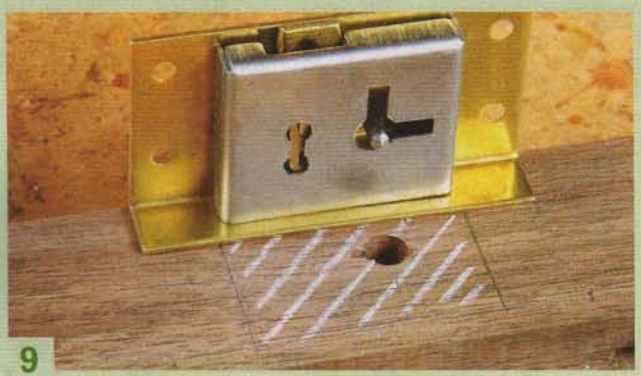


Next, lay out a mortise to receive the lock's mechanism. Measure the distance from the center of the pin to the top of the mechanism.

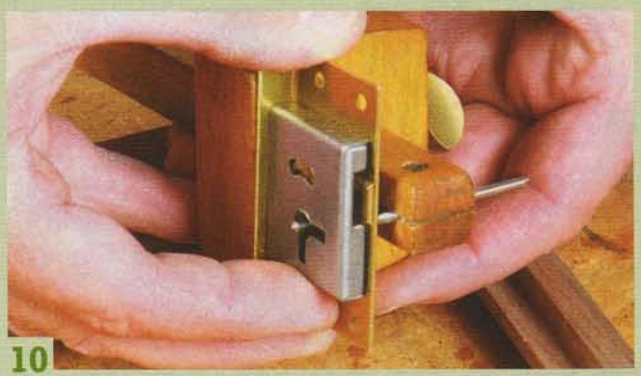


Measure the mechanism's width, including the brass plate.

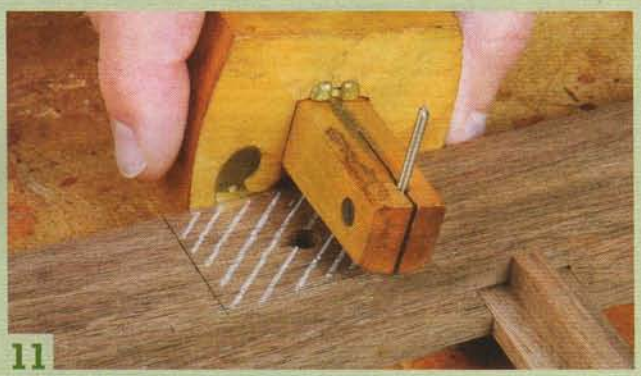
Transfer both measurements to the inside face of the door.



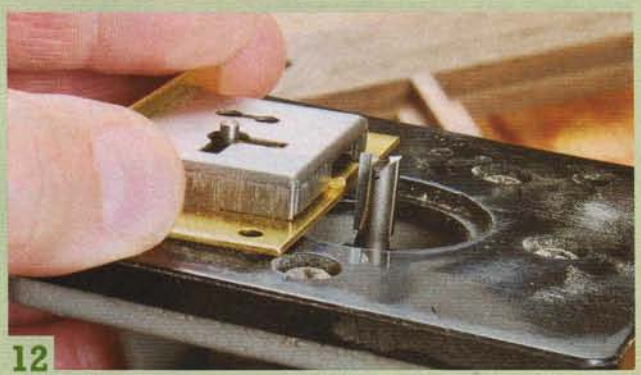
Mark a line for the bottom edge of the mechanism and shade in the mortise.



Before cutting the mortise, set a marking gauge to the width of the lock's back plate.



Mark this distance.



Adjust a laminate trimmer slightly deeper than the combined depth of the lock's mechanism and back plate.

and the lines of the cabinet. I usually try moving the escutcheon up or down a bit, just to see how it looks, and wait a day before making a final decision.

Once you're satisfied with the placement of the lock, mark crosshairs inside the circular opening of the escutcheon to indicate the location of the pin on which the key pivots. Remove the door and draw a horizontal line through the crosshairs (**Photo 2**). To accurately draw the vertical line, measure the distance from the edge of the lock to the center of the pin (**Photo 3**) and mark this distance on the door (**Photo 4**).

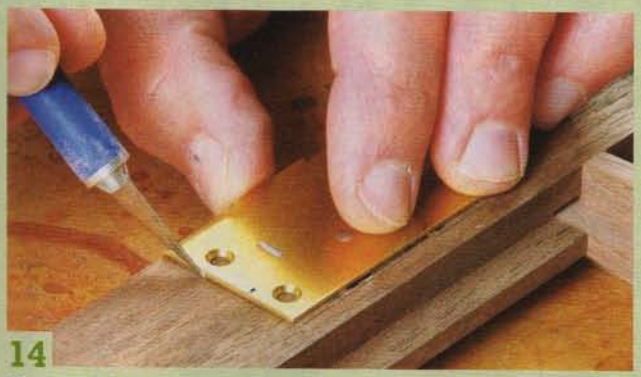
Cut the mortise

Next, drill a hole through the stile at the intersection of the crosshairs. Select a drill size which closely matches the diameter of the keyhole in the escutcheon (**Photo 5**). Flip the door and lay out three lines for the lock's mortise on the inside face of the stile. First, measure the distance from the pin to the top edge of the mechanism (**Photo 6**) and mark this on the stile. Measure the mechanism's width, including the brass edge plate (**Photo 7**) and mark this on the stile (**Photo 8**). Lastly, measure the full height of the mechanism and mark its bottom edge on the stile. Shade in the mortise (**Photo 9**).

Before you cut the mortise, use a marking gauge to lay out the far edge of the recess for the lock's backplate. Set the gauge directly from the lock (**Photo 10**),

13

Rout the mortise up to the lines, freehand.



14

Place the lock in the mortise and scribe both sides of the back plate.

15

Pare to the lines, going across the grain to prevent tearout.

16

Place the lock back into the mortise. Scribe around the three sides of the back plate's edge.

then scribe the line (**Photo 11**). Why do this now? The reference surface for the gauge will be removed once you cut the mortise.

I use a laminate trimmer with a 1/4" bit to rout the mortise. Place the lock on the router's base and set the depth-of-cut slightly more than the combined thickness of the lock mechanism and the plate (**Photo 12**). Clamp the door securely to a solid workbench and rout the mortise up to the layout lines (**Photo 13**).

Cut two recesses

Place the lock in the mortise, then use a knife to mark around the lock's backplate (**Photo 14**). Carve a recess for the plate by paring across the grain with a chisel (**Photo 15**). You could mark the depth of this recess with a gauge, but I just do it by eye, checking as I go.

Next, position the lock in the mortise and mark around its side (**Photo 16**). A series of shallow chisel cuts across the grain (**Photo 17**) make it easier to pare this shallow recess (**Photo 18**). Elongate the keyhole with a rat-tail file to accommodate the key.

Replace the lock and drill pilot holes for the screws. Remove the lock and run steel screws into the holes (**Photo 19**). Steel screws are much less likely to break than brass screws, so I always use steel screws first, to tap the holes. Remove the steel screws, replace the lock, and install it with brass screws (**Photo 20**).

17

To aid in paring this recess, make a series of shallow cuts using a chisel.

18

Then pare across the grain.

19

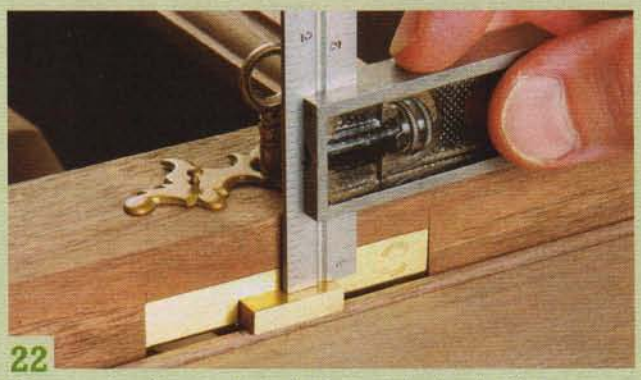
Mark the lock's screw holes, drill pilot holes, and drive steel screws into the holes.

20

Remove the steel screws and install the lock using brass screws.

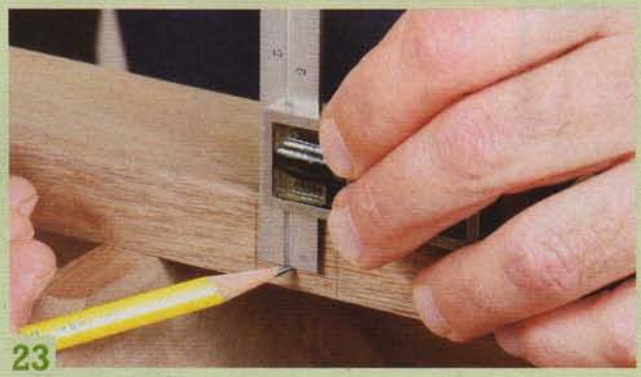
21

Place the door back on the cabinet and mark the location of the lock's bolt.



22

Measure the distance from the front of the door's stile to the bolt.



23

Transfer this measurement to the cabinet's frame.

24

Cut the bolt's mortise. Done!

Cut the bolt mortise

Next, cut a mortise in the cabinet's stile to accept the lock's bolt. First, extend the bolt and mark its location on the stile, leaving about 1/16" leeway on either side of the bolt (**Photo 21**). Measure the distance from the face of the door stile to the bolt (**Photo 22**) and mark this distance on the cabinet (**Photo 23**). As you cut the mortise, gradually work your way toward the face of the cabinet (**Photo 24**). The final shaving from the mortise allows the bolt to slide smoothly into place.

Lonnie Bird

Long-time woodworker, author and teacher, Lonnie runs a school in East Tennessee. You can find out more about his school at www.lonniebird.com.

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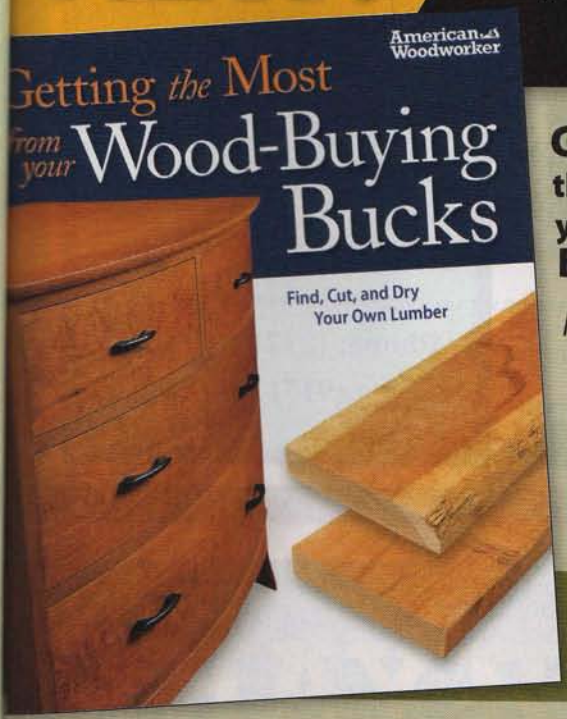

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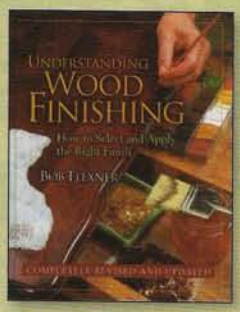

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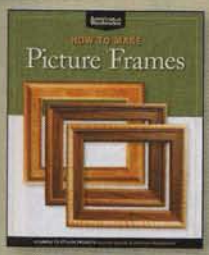

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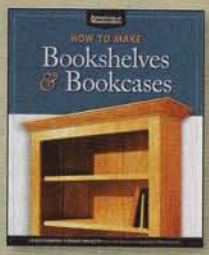

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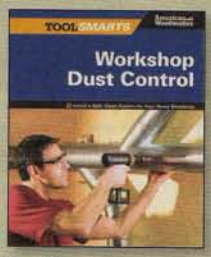

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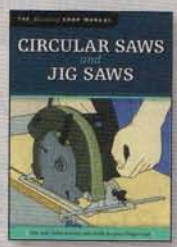

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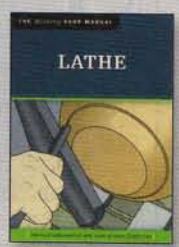

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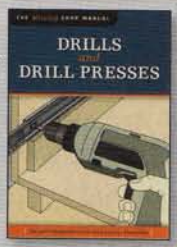

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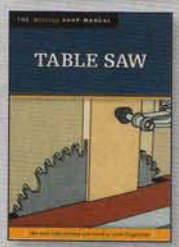

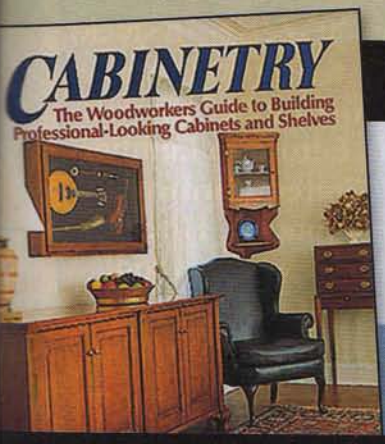

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Oops! Crazy Mistakes Woodworkers Make

Bee Gone

SO, I'M USING A WIRE BRUSH chucked in a drill to clean the rust off of some old metal brackets that I'm planning to use in my new lumber rack. I've got a bracket in one hand and the drill in the other when a bee lands on my chest. That little voice tells me to put down the bracket and drill, but I decide to whisk the little guy off with the spinning wire brush instead. Bad idea. In a heartbeat, the brush is twisting my tee shirt into a tourniquet, and instead of whisking off the bee, it's whisking off the hair and skin from my chest. Talk about getting stung! I guess I'd better improve my bee control methods.

Gordon Zaagsma

Watch the Birdie

ONE OF MY FIRST SCROLL SAWING projects was a candy dish with a small clock insert and a scrollwork hummingbird feeding from a trumpet vine flower. After completing all of the decorative cuts, I used a 1-3/8" Forstner bit to drill the hole for the clock insert. Unfortunately, the scroll-sawn dish was too delicate, and the bit shattered all of my hard work.

After getting over the shock, I noticed that the hummingbird itself was still intact, so I decided to turn it into a hanging ornament. I put the bird on my bench-mounted belt sander for a bit of touch-up sanding. But when I flipped the switch, the belt grabbed the bird from my fingers and shot it across the room, where it stuck, beak first, in the wall.

Chuck McCracken

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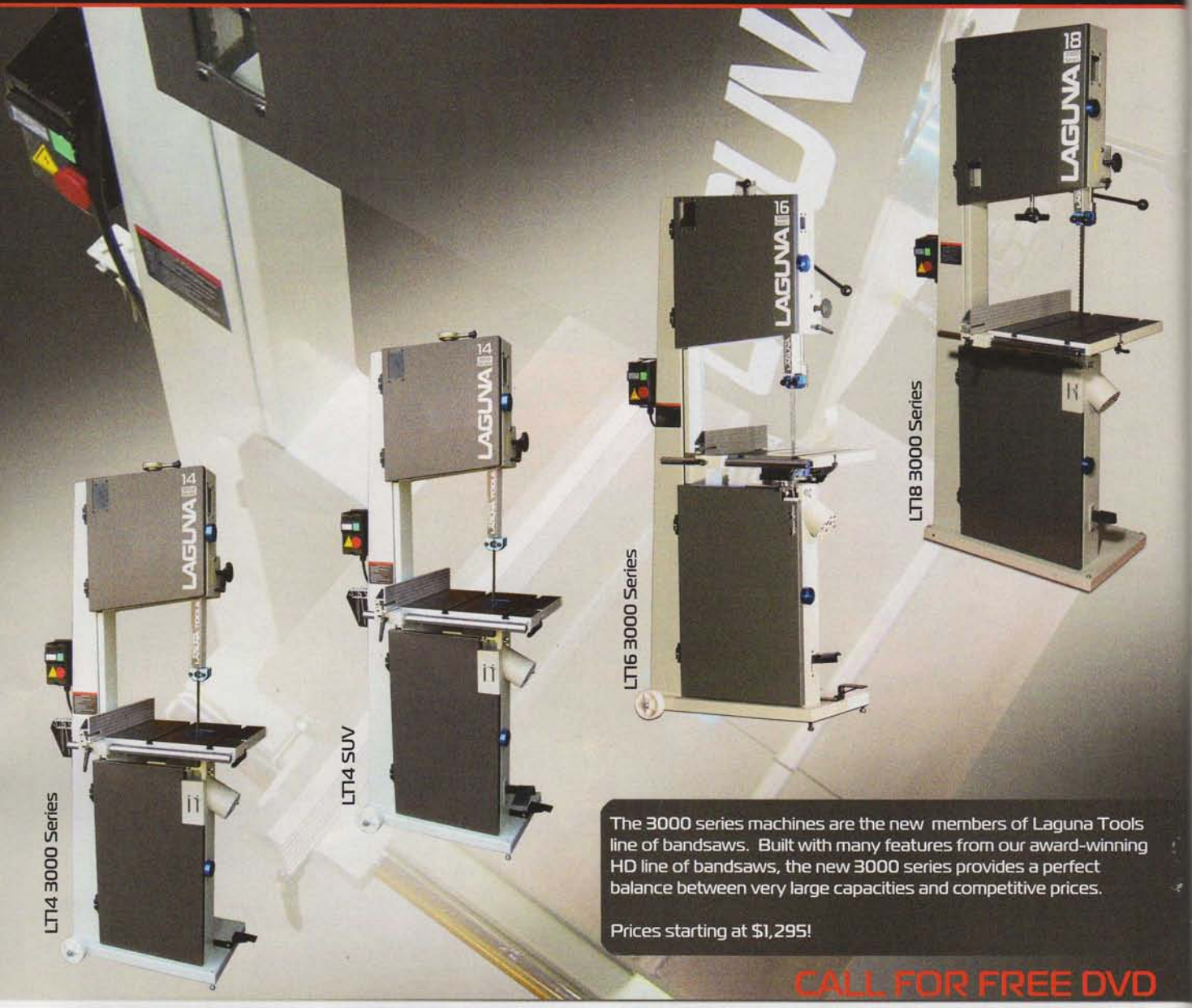

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