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#158, FEB/MAR 2012

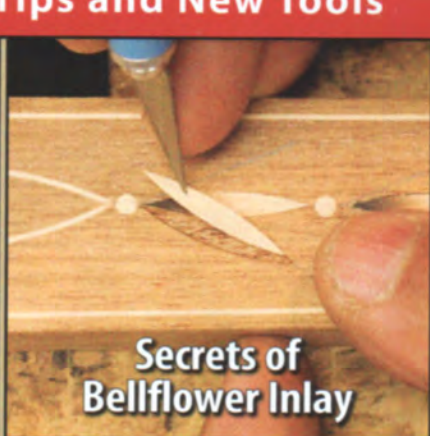
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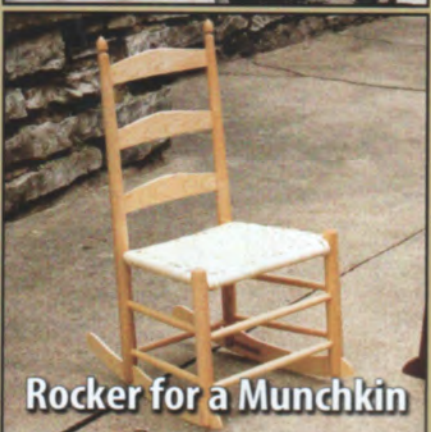
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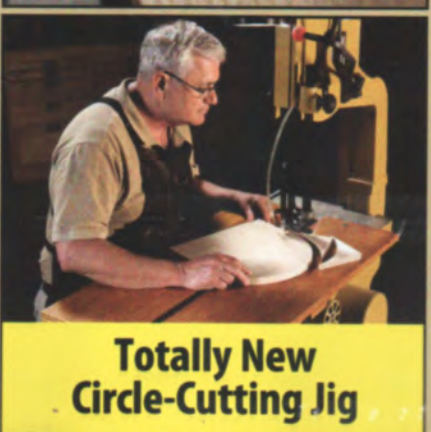
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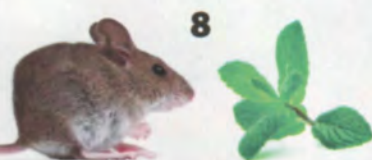
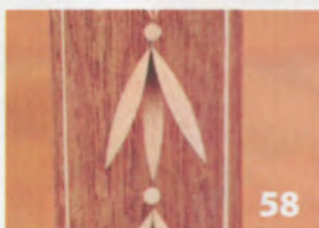
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#158, February/March 2012

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ADVERTISING SALES

1285 Corporate Center Drive, Suite 180, Eagan, MN 55121

Brian Ziff, bziff@AmericanWoodworker.com
 office (860) 417-2275, cell (203) 509-0125

Susan Tauster, stauster@AmericanWoodworker.com
 office (630) 858-1558, cell (630) 336-0916, fax (866) 643-9662

Tim Henning, thenning@AmericanWoodworker.com
 office (708) 606-3358, fax (866) 496-2376

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Chief Executive Officer Stephen J. Kent
 Executive Vice President/CFO Mark F. Arnett
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Customer Service

Subscription/Billing Questions

Online: www.AmericanWoodworker.com/SubInfo
Email: awwservice@AmericanWoodworker.com
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Contact the editors

Email: aweditor@AmericanWoodworker.com
Phone: (952) 948-5890, Fax (952) 948-5895
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Terrific Tip!

Sharpen While You Work

CHISELS DON'T WAIT to get dull until you've finished a job—do they? The trick is to keep them sharp while you're working.

Rather than pull out my stones to renew an edge, I keep a piece of MDF charged with honing compound close at hand. It works just like a leather strop—only I skip the leather.

I don't use a honing guide, either. My chisels are hollow-ground, which makes it easier to find the bevel angle by hand. I just lift up the handle until I feel both the heel and toe of the bevel touch the MDF, and I'm good to go. A few strokes on both sides of the chisel does the trick.

I renew my edges this way as a matter of routine. After every 10 licks or so on the wood, I take a 30-second break and strop the tool. Since the honing compound doesn't remove much steel (unlike a stone), you can't let the chisel get too dull before stropping. This technique won't work if you wait too long.



Of course, the MDF board doesn't replace my stones. When a chisel gets really dull or the bevel gets too steep from stropping, I go back to the grinder and pull out the stones.

David Robbins

SOURCE

Lee Valley and Veritas, leevalley.com, 800-871-8158, Honing compound, 6 oz., #05M08.01, \$12.



Mouse vs. Mint

Mice used to rule my shop. They got into everything! That all changed when someone told me that fresh mint repels mice.

Mint grows wild in one corner of my yard (it's a perennial and comes back each year), so every couple weeks, I pick a handful and spread it around my floor. Now my shop is rodent-free, and smells nice, too!

Wesley Hompe



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Bevel-Up Versus Bevel-Down Planes

Explaining the difference between bevel-up and bevel-down planes

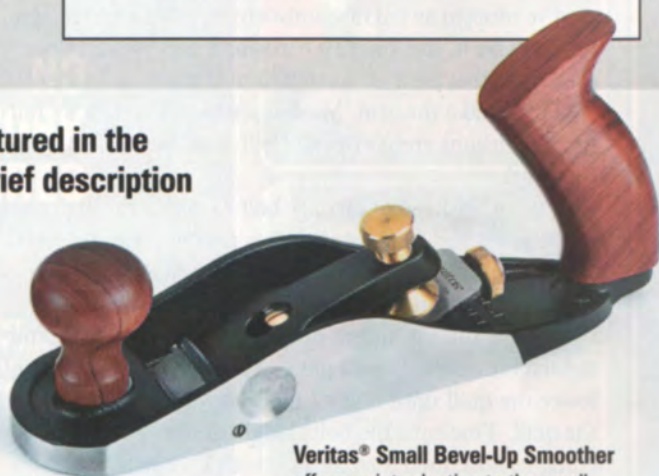
Here are just a few examples of the products featured in the videos we have produced to date, along with a brief description of the video's main focus.



Veritas® Miniature Router Plane takes a closer look at this small but functional plane. 05P82.01



Veritas® Spokeshaves offers an introduction to the flat, round and concave spokeshaves. 05P33.01 +



Veritas® Small Bevel-Up Smoother offers an introduction to the small bevel-up smoothing plane. 05P39.01



Veritas® Dual Marking Gauge shows you how to mark out mortises, tenons and dovetail baselines with the dual marking gauge. 05N70.01



Veritas® Mk.II Honing Guide shows you how to set up and use the honing guide for sharpening your chisels and plane blades. 05M09.01

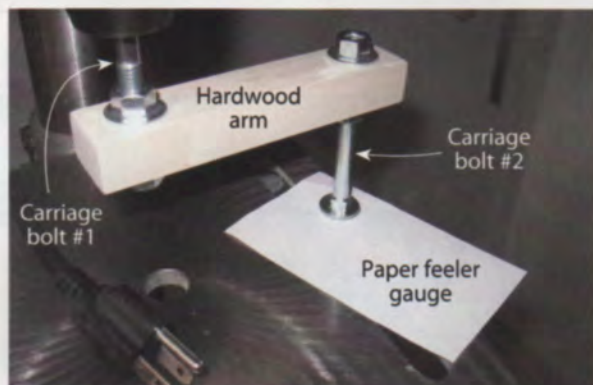
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Drill Press Test

HOW DO YOU KNOW if the table on your drill press is square? Not more-or-less square, but precisely square?

I've adopted an old machinist's trick, using a very simple jig. To make it, you'll need a hardwood arm, two 5/16" carriage bolts that are 2"-3" long, four nuts and four washers.

First, make the arm. Mine is about 3/4" x 1" x 6", but the dimensions aren't critical. Drill 5/16" holes 1" in from each end.

Cut off the head of carriage bolt #1. Slip it through one of the holes and fasten it with two nuts and two washers. Insert bolt #2 in the other hole, as shown in the photo. Fasten it with nuts and washers.

To use the jig, insert bolt #1 in the drill press and tighten the chuck. Place a piece of paper on the table, then lower the quill until bolt #2 just touches the paper. Lock the quill. Fine-tune the bolt's height, if necessary, by loosening its nuts; then turn the bolt with a wrench.

Rotate the chuck—by hand—so the arm points to the other side of the table. Try sliding the piece of paper under the head of the bolt, using the paper like a feeler gauge. Adjust the table's tilt until you can "feel" the bolt with the arm pointed both ways.

John Cusimano



Edge-Knot Repair

FILLING KNOTS with colored epoxy usually works quite well, but sometimes the void is in a spot that's difficult to fill, like the edge of a board.

Here's how to do it. First, apply some paste wax to a piece of melamine so the epoxy won't adhere to it. Clamp the melamine to the workpiece, creating a well.

Thoroughly mix the epoxy, then add tempera powder. Start with about a 1:1 ratio of epoxy to powder. You can use powder of any color (a wide assortment is available at craft or hobby stores); black generally looks the most natural. I use slow-setting epoxy because it gives me more time for mixing in the powder, but 5-minute epoxy will work.

Fill the well with the epoxy until it just starts to overflow. If you don't overfill, you'll have to add more epoxy later, because the glue usually soaks into the wood a little bit. Slice away the excess epoxy with a chisel before it fully hardens. Sand it smooth when it's cured.

Richard Helgeson

Make Your Mark

I ALWAYS SIGN MY WORK, now that I've figured out an easy and permanent way to do it: I use an engraver. But not just any engraver—it has to have an adjustable stroke (the distance the tip moves in and out). Set the stroke to maximum.

An engraver works just like a pencil, but some practice will help. To make the engraving stand out, rub in contrasting wood putty. After the putty dries, sand off the darkened area around your signature.

Richard Tendick



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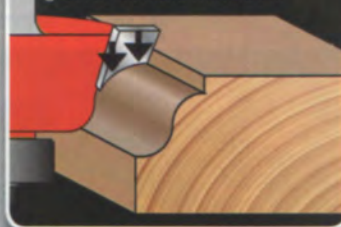


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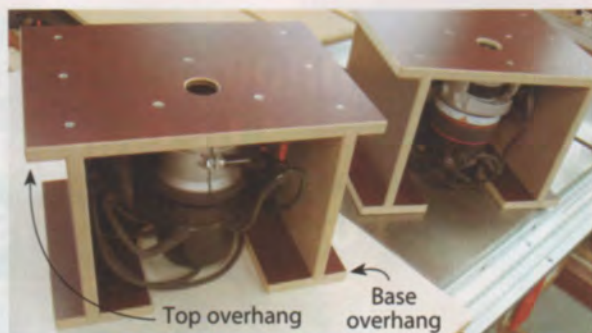
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Workshop Tips

continued



Mini Router Tables

I'VE ACQUIRED a bunch of routers over the years—enough so that I can afford to keep a few permanently mounted in these mini router tables.

For lots of jobs, you don't need a large table or a sophisticated fence; a small, flat surface and a board clamped to the top will do. The base's overhang provides room for clamping the table to my bench; I use the top's overhang for clamping the fence.

When I'm done routing, these mini tables stack neatly on a shelf. In fact, they're handier than the cases that the routers came in!

Serge Duclos



Back Rabbets

THE FASTEST WAY to rabbet the back of a cabinet is to do it all at once, after the cabinet is assembled. Unlike rabbeting individual pieces before assembly, I don't have to worry about where to start or stop a rabbet or whether each rabbet will be level with its neighbor. As long as the sides of the cabinet are level, the rabbets will be level, too.

I use a rabbeting bit with a bearing to make the cut in one pass. To balance the router, I cut a milled 2x4 to fit tight into the opening and position it level with the side. Then I clamp across the cabinet to keep the board from shifting. I rout the long sides first, then cut the 2x4 to fit the short sides. The bit leaves round corners, of course, so I just round the corners of the back to fit.

Tom Caspar



JASON
ZENTNER

Custom Chamfering Plane

CHAMFERING AN EDGE with a block plane is often easier, faster and safer than using a router or tablesaw—particularly on a small part. I do it so often that I've dedicated one of my planes for the job.

To modify your plane, make two 3/16" thick hardwood sides, two 3/8" thick chamfering guides and shims of various thicknesses. Shape the sides and shims to fit your plane. Bevel the guides at 45° and glue them to the sides.

The space between the guides determines the width of the chamfer. I made my guides wide enough to make a 1/8" chamfer, then add shims between the sides and the plane to make larger chamfers.

To attach the guides, drill mounting holes in the sides for 8-32 machine screws. Position the guides on the plane and mark the holes' locations with a center punch. Drill and tap the holes.

When you start planing, hold the tool at approximately 45°. It will automatically adjust itself to the correct angle as you go. When the plane bottoms out against the guides, you're done.

Doug Perlick



JASON
ZENTNER

Slicker Saw

I OFTEN LUBRICATE the soles of my planes with paraffin wax to make them slide easier. While ripping a board that was insistent on pinching just enough to make sawing difficult, it occurred to me to lubricate my saw, too. Suffice to say, I've been doing this ever since.

Yoav Liberman



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- Arbor: ¾"
- Arbor speed: 4000 RPM
- Capacity @ 90°:
3¼"
- Capacity @ 45°: 2¾"
- Rip capacity: 12" L, 30" R
- Quick change riving knife
- Cast iron trunnions
- Approx. shipping weight: 354 lbs.



G0732 INTRODUCTORY PRICE \$795⁰⁰

10" HYBRID TABLE SAW With Riving Knife

- Motor: 2 HP, 110V/220V, single-phase
- Precision-ground cast iron table size w/ wings: 27" x 40" • Arbor: ¾"
- Arbor speed: 3850 RPM
- Capacity:
3¼" @ 90°,
2¾" @ 45°
- Rip capacity: 12" L, 30" R
- Cast iron trunnions
- Approx. shipping weight: 354 lbs.



G0715P ONLY \$795⁰⁰

12" 5 HP LEFT-TILTING TABLE SAWS With Riving Knife

- Motor: 5 HP, 220V, single-phase or 7½ HP, 220/440V*, 3-phase
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ONLY \$2195⁰⁰**

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- Motor: 3 HP, 220V, single-phase, TEFC
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- Max. depth of cut: ½"
- Max. rabbeting depth: ½"
- Cutterhead dia.: 3"
- Cutterhead speed: 5000 RPM
- Cuts per minute: 20,000
- Approx. shipping weight: 500 lbs.



**G0656P ONLY \$795⁰⁰
G0656PX ONLY \$1195⁰⁰**

15" PLANERS

- Motor: 3 HP, 220V, single-phase
- Precision-ground cast iron table size: 15" x 20"
- Min. stock thickness: ¾"
- Min. stock length: 8"
- Max. cutting depth: ½"
- Feed rate: 16 FPM & 30 FPM
- Cutterhead speed: 5000 RPM
- Approx. shipping weight: 660 lbs.



**G0453P ONLY \$1050⁰⁰
G0453PX ONLY \$1650⁰⁰**

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- Motor: 2 HP, 220V, 3-phase with single-phase frequency drive
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- Distance between centers: 47"
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- Spindle bore: 0.393"
- Approx. shipping weight: 547 lbs.



G0733 INTRODUCTORY PRICE \$1695⁰⁰

14" HEAVY-DUTY BANDSAW

- Motor: 1½ HP, 110V/220V, single-phase, TEFC
- Precision ground cast iron table size: 14" x 20½"
- Table tilt: 10° L, 45° R
- Cutting capacity/throat: 13¼"
- Max. cutting height: 6"
- Blade size: 92½" - 93½" L (½" - ¾" W)
- Quick release blade tension lever
- Cast iron wheels
- Approx. shipping weight: 262 lbs.



G0555X ONLY \$795⁰⁰

12" BABY DRUM SANDER

- Sanding motor: 1½ HP, 110V, single-phase
- Conveyor motor: ¼ HP, 110V, single-phase, variable speed 5-35 FPM
- Max. stock thickness: 3¼"
- Min. stock length: 8"
- Sanding drum size: 4"
- Sanding belt: 3" x 70" hook & loop
- Dust collection port: 2½"
- Approx. shipping weight: 160 lbs.



G0459P ONLY \$595⁰⁰

2 HP DUST COLLECTOR With 2.5 Micron Bag

- Motor: 2 HP, 220V, single-phase, 12A, 3450 RPM
- Air suction capacity: 1550 CFM
- Static pressure: 11"
- Bag capacity: 5.7 cu. ft.
- Impeller: 12¼" balanced steel, radial fin
- Height w/ bags inflated 78"
- Portable base: 21¼" x 33½"
- Approx. shipping weight: 126 lbs.



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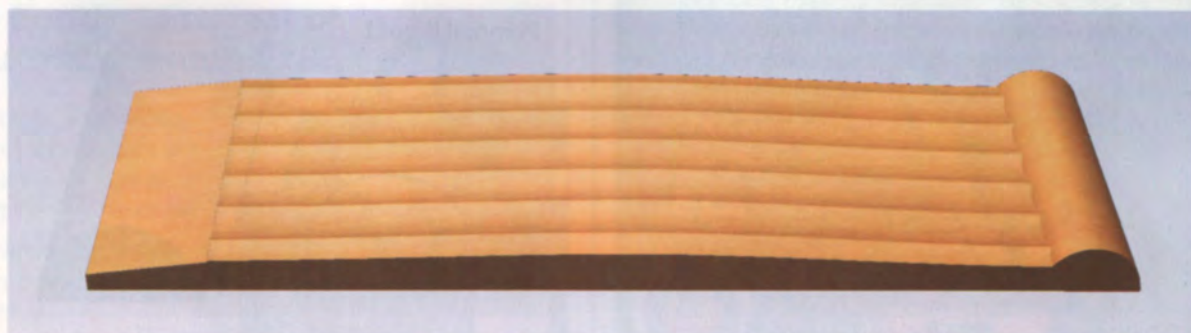


A ROTARY INDEXING HEAD allows a CNC machine to create 3-dimensional shapes in the round. It's an accessory that can be added to most CNC machines. Some companies even make it as a stand alone machine. A rotary indexing head looks similar to a standard woodturning lathe, but its approach to shaping wood is quite different. In fact, it's more like milling than woodturning. One of the best features of a rotary indexing head is its ability to create shapes that aren't easily turned on a standard

wood lathe, such as this hexagonal chisel handle. Intricate round relief carvings are also possible. Because it's CNC based, a rotary indexing head is capable of great precision and easy repeatability. However, since the shaping is done with a router bit in small increments (as small as 1/50" per pass), the milling process can take a while to complete. Machining this chisel handle took about 2-1/2 hours, but its unique shape was intriguing to design and mill. It also makes an attractive addition to my tool box.

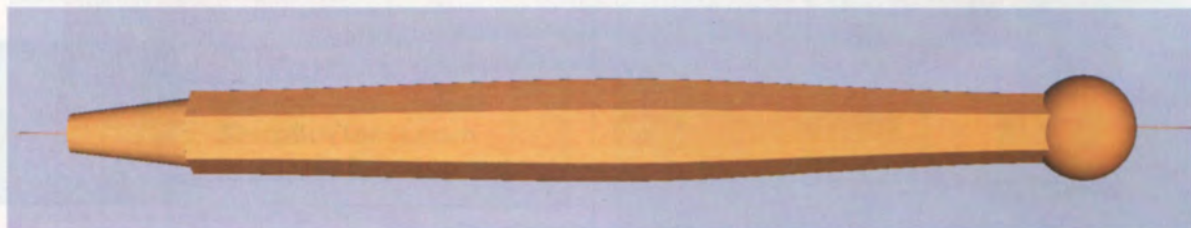


You need to think a little differently.



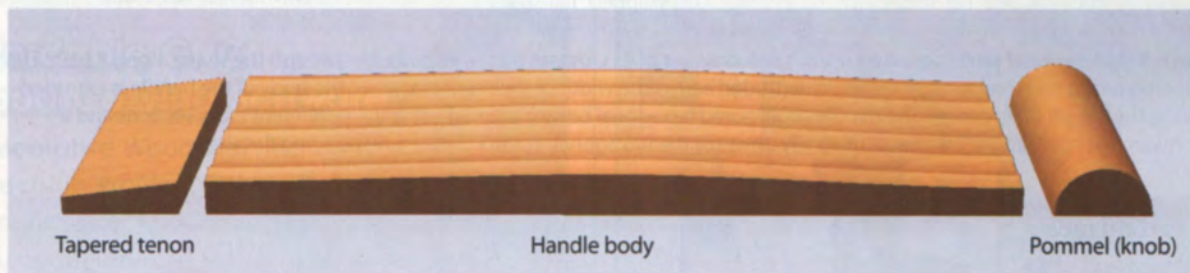
Think Flat

CNC turnings usually start out as a flat design, so the first step is to “unwrap” the cylindrical profile. CNC design software uses a variety of drawing tools that assist this process. One tool automatically calculates the flat design’s width, based on the maximum diameter you specify for the turning. Another tool takes complex shapes such as the hexagonal cross section of this handle and converts it into the flat shape.



Think Round

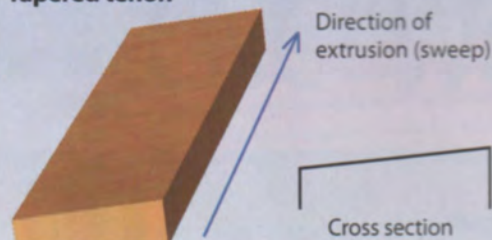
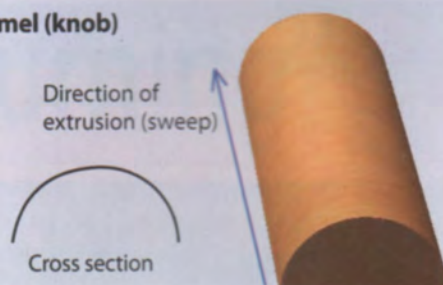
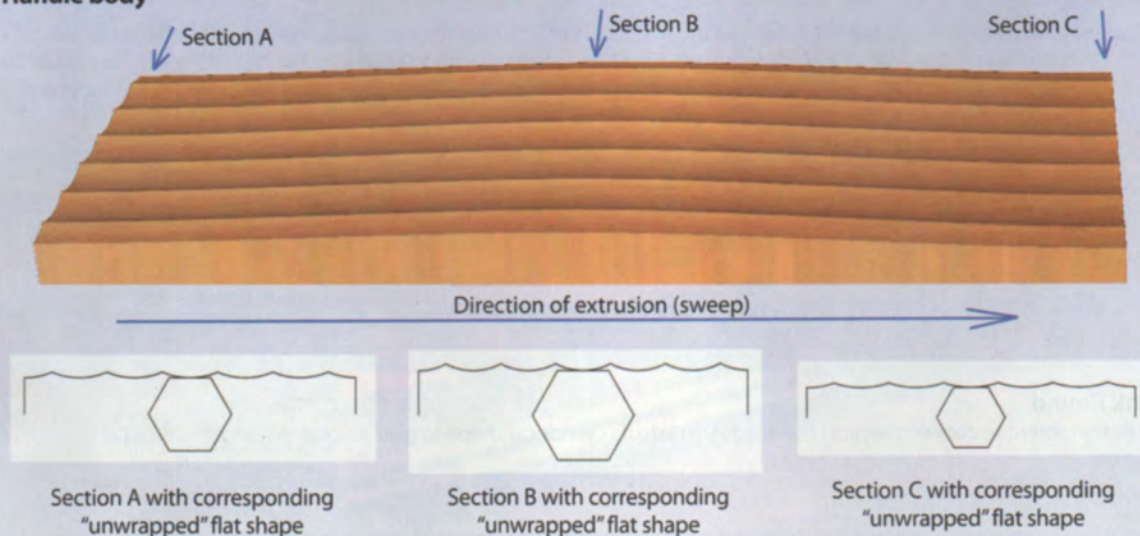
The design software converts (wraps) the flat design into its cylindrical shape to give you a preview of the final piece.



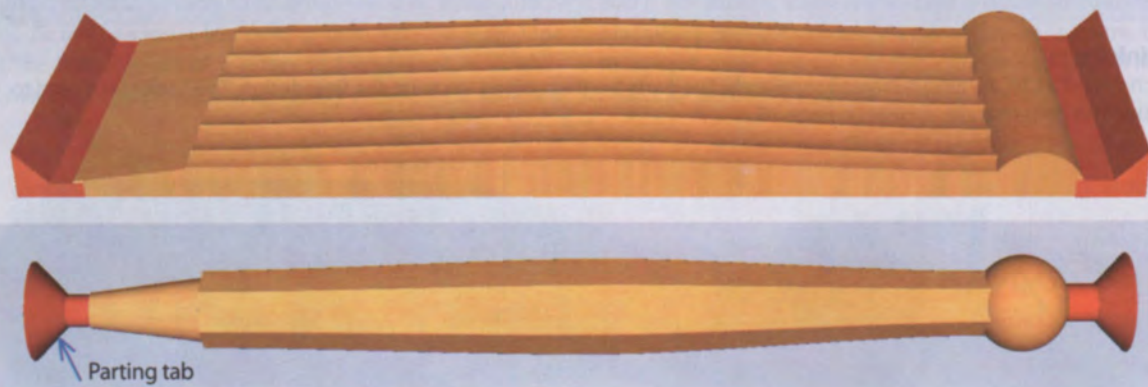
Think Parts

Each part of a CNC turning is created separately. The parts are then joined to create the final design. The basic steps used to design this chisel handle appear on page 16.



Tapered tenon**Pommel (knob)****Handle body**

Each 3-dimensional part is created using a line drawing of its cross section to extrude (or "sweep") the shape along a path. The tapered tenon and the round pommel are extruded across the width of their designs, while the body of the handle is extruded along the length of its design. The handle's contoured hexagonal body is created using three different cross sections and a software tool (or "gadget") that automatically unwraps the hexagonal shape into its corresponding flat shape.

Parting tabs

Parting tabs are added to the ends of the final design to connect the part to the unmachined ends of the billet. The tabs are created using the same drawing tools used to create the tapered tenon and the round pommel.

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Basic Machine Steps

Step 1**Create a cylinder**

The first step is to round off corners of the billet to create a cylinder. The CNC design software includes a gadget that automatically calculates the cutting paths needed to remove the corners, based on the dimensions of the square billet and the finished diameter of the cylinder. To create the hexagonal chisel handle I started with a 2" square billet and rounded it to 1-3/4" diameter using a 1/4" dia. bullnose bit. Rounding this 22" long cylinder takes about 20 minutes.

**Step 2****Rough rout the shape**

The same 1/4" bullnose bit roughs out the handle's hexagonal shape. In this case, the cutting passes are programmed to run the length of the cylinder and remove a 1/8" deep x 1/8" wide a strip of material with each pass. The last pass leaves 1/32" of material to be removed in the next step. Roughing out this shape takes about 25 minutes.

**Step 3****Finish rout the final shape**

The final (finishing) pass removes the last 1/32" of material and leaves a smooth surface. To do this, the 1/4" bullnose bit is programmed to "step over" each previous pass by only 1/50". This tiny step-over leaves a surface that's easy to clean up with 180 grit sandpaper. This finishing pass takes about 50 minutes to complete.

**Step 4****Add details**

The surface of a CNC turning can be embellished with additional details, including lettering. For this chisel handle I combined a 60° V-bit and a script-style font to create a look similar to metal engraving or laser etching. These finely detailed 3/4" tall letters demonstrate the precision of a CNC's operation. Routing them takes only a minute. See a "twisted" example of this handle at AmericanWoodworker.com/CNC.

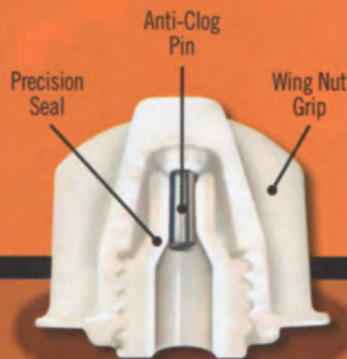


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Super-Skinny Blade

IF A THIN-KERF blade is good, wouldn't an extra-thin-kerf blade be better? That's what the folks at Total Saw Solution propose: their Micro-Kerf 40 cuts a path that's only .062" wide, about half as narrow as a standard thin-kerf blade.

What's the advantage to a blade this thin? Mostly, it's about maximizing the power of your saw—an important consideration if your saw runs on 120 volts. The less material you remove in a kerf, the further your horsepower goes. If you've ever bogged down your saw or tripped a breaker, reducing the load on your saw's motor by using a blade this thin could be a big benefit.

That's not all. A blade that cuts a kerf that's only as thin as a dime makes less sawdust and less noise. It can also get you thinking about the times when a super-thin kerf would have been handy, say, for eking out the last 1/32" of yield from a board or sawing really narrow spline slots.

Naturally, you're going to ask: "Won't it wobble?" I thought it might, so I ripped some 2" thick ash and examined the saw cuts. I was impressed! Their surfaces were perfectly straight and smooth. I also found that the Micro-Kerf 40 works equally well in crosscutting; it's a true general-purpose blade.

However, there are two downsides. First, you're limited to a 2" depth of cut by the dampeners permanently mounted on both sides of the blade. Second, the kerf is too narrow to work with the splitters or riving knives on most saws, and that might make the saw's guard difficult



to install. Total Saw offers a very thin splitter that's easy to mount to a zero-clearance insert.

The Micro-Kerf's teeth can be re-sharpened 10 to 15 times. The blade can also be re-tipped. Total Saw recommends that you send the blade to them for sharpening and re-tipping.

SOURCE

Total Saw Solutions, totalsawsolutions.com, 800-773-3133, Micro-Kerf 40 10" Table Saw Blade, \$185; Splitter Guard, \$17.99.

Engineered Marking Knife

DOVETAILING is all about cutting and paring to a very accurate line. Making that line requires the right tool. The new IBC marking knife, designed and produced under the watchful eye of hand-tool guru Rob Cosman, is the total package.

At first glance, it looks suspiciously like a utility knife, but that's selling it short by a long shot. Like dovetailing itself, there's lots of attention to detail here.

When I first picked up the knife, I noticed right away



that it's got some heft, which I like. I found that it automatically registers comfortably in my hand, due to its rectangular cross-section and indented sides.

Looking closely at the blade, I spotted two bevels—a primary bevel and a micro-bevel—with a centered cutting edge. Why have a micro-bevel? Rob explained to me that it prevents you from accidentally cutting into the pin or tail you're tracing. Clever!

I also noticed that the blade's tip has a slight radius. Rob believes that a radiused edge is less likely than a pointed edge to be pulled off course by the wood's grain. I discovered that I had to hold the knife at a lower angle than I was used to, but once I got the hang of it, the knife tracked beautifully.

A marking knife is also useful for tracing around a hinge or lock to outline a mortise or to lay out a mortise and tenon joint you're cutting by hand. It's an essential part of a layout tool kit, and this knife would be a real treat to own.

SOURCE

Woodcraft, woodcraft.com, 800-225-1153, Rob Cosman dovetail marking knife made by IBC, #153622, \$47; replacement blade, #153623, \$19.99.



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Toggle Clamp 2.0

IT'S ABOUT TIME toggle clamps made an evolutionary leap. Old-style clamps certainly work well, but you often have to fiddle around to get their pads at the right height, delivering the right pressure. The new Auto-Adjust Toggle Clamps from Bessey are much easier to set up.

Old-style toggle clamps only have a clamping range of about 1/2". To clamp anything thicker, you have to add a shim under the clamp's base, or switch to a clamp with a taller base—if you can find one.

The Auto-Adjust clamps are different. When it comes to pad height, "pretty close" is good enough. I couldn't believe it at first, but the clamp automatically adjusts to the thickness of the material. I found that I could clamp material from 0" to about 1-1/2" without any fussing with the pad's height.

As for adjusting pressure, it couldn't be easier: You just turn a screw. This enables you to fine-tune the pressure from 25 lbs. to 550 lbs.

Auto-Adjusts are available in two base heights. The flat-base model will handle material from 0" to 2" thick, while the tall-base model will take up to 2-3/4" stock, which is handy if you need to step over a fence,



as shown in the photo. They're also available as in-line style clamps, which have a horizontal plunger.

These new clamps cost about twice as much as old-style toggle clamps, but consider this: When you're setting up for a production run, how much is your time worth?

SOURCE

Bessey Tools North America, besseytools.com, 800-828-1004, Horizontal toggle clamps, #STC-HH50 & #STC-HH70, \$42-\$44; In-line toggle clamp, #STC-IHH25, \$23.

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Longer-Lasting Countersink

DRILLING IN MELAMINE, plastic laminate, particle board or other abrasive materials dulls a steel countersink very quickly. So why not make it out of carbide? That's what Amana has done—they say their Carbide Tipped Countersinks will last 100 times longer than steel.

Carbide countersinks are available for #4, #6, #8, #10, #12 and #14 wood screws, and come with either a round shank or a hex shank for quick-change collets. The countersinks are also available with tapered drill bits. Amana makes carbide-tipped counterbores for drilling flat-bottomed holes as well.

SOURCE

Amana Tool, amanatool.com, 800-445-0077, Carbide-tipped countersinks, \$14-\$26.



HAIKU BY TOM CASPAR

Layout Tool Haiku

*A framing square, small
Enough to fit in your hand
Is nuts-on 90.*

SOURCE

Lee Valley & Veritas, leevalley.com, 800-267-8735, Veritas precision square, #05N35.01, \$25.



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Nicely Equipped Hybrid

ARE HYBRIDS TAKING OVER? As you probably know, a hybrid is a cross between a contractors saw and a cabinet saw—it has a 120 volt motor, like a contractors saw, but it's tucked inside, like a cabinet saw. A hybrid is ideal for a small shop, because you can store it tight against a wall. When a hybrid comes with a built-in mobile base, like the new 10" R4512 from Ridgid, you might wonder, is this the future?

If you're in the market for a new saw, the R4512 is definitely worth a hard look. Let's go down its list of features: cast-iron top, left-tilt blade, adjustable fence with an easy-to-read cursor, riving knife, paddle-type on/off switch, 30" rip capacity, 4" dust port under the cabinet, 0° and 90° bevel stops adjustable above the table and a scale for cutting on the left side of the blade. As a bonus, the fence has T-slots for mounting a subfence, featherboards or stops.

Whew. That's a lot of check marks in the "key features" column. There are a few items on my wish list, too. For example, I wish the saw's miter gauge had an adjustable bar to prevent it from wiggling in the miter slot. I wish the cabinet had an access door so I could clean out the dust port when it gets clogged with cutoffs (as it is, you unscrew a panel). I wish I could buy zero-clearance inserts and cast-iron wings as accessories.

And I wish that the trunnions were mounted to the base, rather than to the top, which would make the blade



easier to align with the miter slots. But that would make it a cabinet saw, wouldn't it? Well, at this reasonable price, you can't have everything!

SOURCE

Ridgid, ridgid.com, 800-474-3443, R 4512 10" Cast-Iron Tablesaw, \$549.

4-in-1 Sander

SANDING has to be one of the most thankless jobs in woodworking, yet it's got to be done right. And that takes time. For a small production shop, one way to make sanding go faster is to have a machine set up for each type of operation, whether it's smoothing face frames, moldings, wide panels or distressing a finish. But who's got the space or budget for four separate units?

SuperMax has combined them all into one. Their 19-38" Combo Sander takes four different heads, which you can switch in less than ten minutes. A flap-style head, called a

"flatter," sands raised-panel doors, moldings and other contoured surfaces without

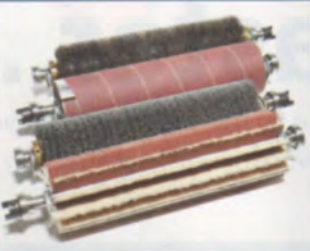
rounding over edges. The familiar drum sander head is for flat stock. The wire brush head and nylon flap heads create a distressed look on paneling and flooring. The Combo Sander comes with a 180 grit flatter head; the rest are accessories.

Each head is 19" wide, but the Combo's open-end design allows you to process material up to 38" wide. To sand wider stock, you send the work through twice, flipping it around between passes. To avoid lap marks in the middle, you push a lever to slightly tilt the bed, giving the work a slight crown. This is a more robust design than an open-end sander with a tilting head; on the Combo, the head travels at a fixed 90° angle on a large cast-iron frame.

Sanding a profile requires a slower speed than sanding a flat surface. The Combo allows you to vary both the speed of the head and the conveyor belt just by turning a dial. It also has an electronic feedback loop, called SandSmart, that automatically reduces the conveyor belt's speed if it senses too much load on the motor driving the sanding head.

SOURCE

SuperMax Tools, supermaxtools.com, 888-454-3401, #71938, 19-38" combo drum/brush sander, \$2,295; 19-38" sanding drum, \$350; nylon brush head, \$1,000; wire brush head, \$1,000; closed stand w/casters, \$370; open stand w/shelf, \$160; as pictured with closed stand, \$2,665.



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Mark Laub

Designing a New Life

by Spike Carlsen



Fantaisie Impromptu writing desk
Bubinga, fiddleback maple, pau amarillo, kiatt, wenge, Spanish cedar
Desk 50" x 65" x 30"
Bench 17" x 38" x 12"

"I DON'T WANT my furniture to look like the girl next door," explains Mark Laub. "I want it to look like the platinum blonde in stiletto heels that people stop to stare at. I want to create something memorable. Something that has mystery to it." Welcome to the unique words, mind and furniture of a man that passionately does what he loves and loves what he does.

Mark builds four or five major pieces a year, most in the \$20,000 to \$30,000 range, and is booked out three years in advance. Clearly, he's proficient at design, execution and operating a business. What's different is the priority he assigns each. "The dirty secret at the end of the day, is that woodworking really isn't that hard," Mark explains with a glint in his eye. "It takes time and attention and care, but what's really hard is design.



It's hard because most people don't pay attention to it. They invest their time and money in tools and classes, but they don't invest in design."

Inspired by ... everything

"Some people have a natural flair for design," Mark notes, "but most people just work hard at it." He uses internationally-known glass blower Dale Chihuly as an example: "I heard that when Dale was asked how he got from being a nobody to being an international icon, he explained it was sheer tonnage—just doing it. In woodworking, it's board footage. You just have to work at it. People who say they have no sense of design haven't exercised that part of their brain. What they're really saying is, 'I haven't found something yet that inspires me.'"

Where does Mark find inspiration? Just about anywhere: In the world of fashion, in movie marquees and building facades along Collins Avenue in Miami, in the wood block prints of the 19th century Japanese artist Hiroshige, in the inlay work of luthiers, and in the work of Erte, a fashion designer from the 1920s and 30s. "I just finished a piece where the doors are a rip-off of a women's vest Erte designed," Mark grins.

"When in doubt," Mark suggests, "plagiarize nature. I mean dragon flies, brain coral, butterflies and vines—how can you miss?" The proliferation of these items on Mark's pieces makes you realize he's true to his words. Yet one of Mark's greatest sources of inspiration lies between his own two ears. "There's this state between consciousness and sleep that people strive for when they meditate. Some people call it the swoon state. And you experi-

ence it every time you wake up and go to sleep, but you go through it quickly," Mark explains. "When I'm at those points everything is crystal clear; I'll solve all sorts of design problems."

"My clients are only concerned about four things," Mark explains. "Design, design, design and finish. They don't care whether the dovetails are cut by hand or by machine, they just want a piece that looks and feels fabulous." It's this type of frankness that makes you realize Mark is supremely comfortable in both his own woodshop and his own skin.



Swerve beverage tray
Quilted maple, bubinga, brass, patinated copper
1-1/2" x 21" x 8"

Execution with flair

Though Mark may downplay the "skill" part of his craft, he's paid his dues. His initial foray into the world of woodworking twelve years ago involved building period furniture, which allowed him to focus on traditional joinery, carving and sculpting—all of which are transferable to the pieces he now creates.

Mark's signature carved calla lily legs (photo, page 29, top left) are one example of this transference. They're inspired by the saber legs of Japanese furniture. "Calla lillies are the gift that keeps on giving," Mark continues. "It's probably the one single thing that has generated the most commissions."

Mark's shop contains a wide spectrum of tools ranging from carving chisels to auto body grinders. He loves working with hand tools, but explains, "I'm not a purist. I do lots



Planet Waves
Figured Bastogne walnut, blistered bigleaf maple, ebony, patinated brass and copper, foiled glass, abalone, mother of pearl, sterling silver
46" x 56" x 17"



Planet Waves detail

of things the hand tool guys would never do. I see no romance in removing waste wood with a plane. Give me a thickness planer."

Most of Mark's doors and drawers are composed of a 3-to-5 layer laminate core skinned with 5/64" thick veneers that he cuts himself. Tops, legs, stretchers and other components are solid wood. Almost all of his pieces contain a substantial amount of inlay. Mark gets the best results using a double-bevel marquetry technique. He temporarily adheres the mar-

quetry veneer to the carcass veneer, then, with his scroll saw blade set at a 7° angle, cuts through both layers at once. "When you put the two together," he explains, "the top piece fits into the bottom piece like a cork in a bottle."

Mark has also perfected other marquetry techniques. He uses "sand shading" to create dimension and depth (photo, page 29). This process involves placing the edges of individual pieces of inlay in hot sand to create mellow, graded

darkening. Mark's also a fan of inlaying silver, mother of pearl, abalone and pre-ban ivory gleaned from old piano keys. He shapes these fragile materials with a coping saw, files and luthier's tools, and then creates the insets for them using a Dremel tool and a steady hand.

Another favorite material is copper that Mark patinates using a technique called "direct earth burial." It involves applying sawdust and chemicals to the copper, wrapping each piece in plastic and then letting it fester for a month. The results (see *Swerve*, page 27 and *Abraxas*, below), while only semi-predictable, produce a stunning complement to the surrounding wood.

Even Mark's details have details. While examining *Abraxas*, my eye was drawn to a 1/4" wide band of inlayed silver. Upon closer examination I discovered the beginning lines of William Blake's "Auguries of Innocence," carved into it.

The business end

"The thing that sells my pieces is me," Mark explains with a grin. "A lot of woodworkers enjoy the romance of going into a shop and making stuff, but to make a living there's this nasty little thing called commerce."

Mark has developed a unique style and niche for which he's become known. And while he's a realist about the financial aspects of woodworking, he's also a romantic. "Part of the compensation winds up here," he explains pointing to his billfold. "But it's hard to put a value on the part that winds up here," he continues, tapping his heart. Mark strives to build and maintain a strong personal rapport with his clients, many of whom are repeat customers. "At just the right time in a project, I'll clear out an area in the shop, set out a few refreshments and invite the clients to come and look at it," Mark explains. "The great part," he



Abraxas

Wenge, figured maple, ebony, sterling silver, mother of pearl, abalone, patinated copper
50" x 36" x 20"



Calla lily legs



Sand shading

continues, "is people go back home to their dinner parties and talk about going to this old hippie's shop and having wine and cheese. They'll talk more about the experience than the furniture."

Mark builds one showpiece per year to make the rounds of galleries and craft shows. It displays new and unique elements and always packs a substantial WOW! factor. He'll dedicate up to 3 months—or "four cases of wine"—building the piece, because it's an effective sales tool. "People look at it and say, 'I can't spend \$30,000, but I like that detail. Can you build me something for half as much that includes that?'" Mark also uses the element of surprise. "I always include a hidden smile-producing feature in my pieces. It may be an inlay on the

back of a drawer or some other feature the homeowners don't notice for a year. But when they discover it, they love it.

Another tip: "Dining room tables are great publicity. A cabinet stays tucked away in a bedroom. But a dining room table is something friends and people sit around. They touch it. They notice the details. They'll talk about it."

Mark's playful business approach is substantially different from the approach he applied in the business world before turning to woodworking. "My father told me 'Get an education so you can work with your brains instead of your hands. Get into business so you can wear a white collar instead of a blue one.' And that's what I did."

But at the peak of his career, Mark walked away from it all. "I just burned out. At the time it seemed impetuous, but looking back I realize it was sanity preservation," he explains. "I'm so blessed. I wouldn't trade what I do now for anything. Every morning I wake up excited to go to work. I can tell you that during 30 years of business, there weren't many days I drove out the driveway thinking I was blessed. I figured out way too late in life what many people never figure out—that work is a lot of fun. You only go around once and you have to experiment and reinvent yourself. That's

what it's all about." And that's what Mark has done. 

See more of Mark's work at markklaub.com

Spike Carlsen is the author of *A Splintered History of Wood: Belt Sander Races, Blind Woodworkers and Baseball Bats* and the newly released *Ridiculously Simple Furniture Projects*. His upcoming book, *The Woodworking Answer Book*, will be available in the spring of 2012



Star Dancer

Bubinga, maple, ebony, sycamore, kiatt, pau amarillo, koa, holly, wenge, abalone, mother of pearl, sterling silver, glass, patinated copper
67" x 25" x 16"

Socket Chisel Handles

Here's a 1-2-3 system for getting a perfect fit.

HIGH-QUALITY SOCKET CHISELS—

such as the Stanley Sweathearts and Lie-Nielsen—are making a big comeback. Why would these companies choose the socket style? Well, it's all about you, the user. If you're not satisfied with a handle's shape, you can change it. If you want a different wood—no problem. The handle of a socket chisel isn't glued or fastened to the tool, so you just remove it and make your own.

Truth is, woodworkers have been doing this for years. In the age before plastics, when a wood handle on a socket chisel split or mushroomed, replacing it was easy. But not all were fixed. Today, there are loads of wonderful old socket chisels going for a song, merely because they have busted or missing handles.

I'm a turner with a thing about handles—I just love making them. Screwdrivers, awls, ice cream scoops: If it's got a handle, I've got to make my own.

When I first turned handles for socket chisels, I would make a few crude measurements of the socket and just go at it. If the taper on the handle's shank wasn't quite right, I guessed where it was off and tried again. While this method works OK, I've since found a measuring system that's much more reliable. Following these steps, your shank should fit tight right away.

First, turn a cylinder that's an inch or two longer than the length of the handle you're going to make (of course, the full length includes the shank). The narrow end of the shank will most likely be a small diameter (anywhere from 1/4" to 3/8"), so I prefer using a cone-shaped revolving center in the lathe's tailstock. This gives me more room to maneuver the parting tool when cutting the shank's taper.



1

Chisel sockets come in many different sizes, so you'll need to take some measurements before turning the handle. Start by cutting a piece of notebook paper about 4" square. Roll it up around a pencil.



2

Push the paper cylinder all the way into the chisel's socket. Let go of the paper—it will unroll to form a cone. The cone will be exactly the same shape as the socket.



3

Stick one or two pieces of tape on the cone to hold its shape. Mark the cone at the end of the socket. Remove the cone from the chisel.



4

Set a divider to the distance between the pencil mark and the end of the cone.

Measure the socket

Start by wrapping a small piece of notebook paper around a pencil, forming a cylinder (**Photo 1**). Push the cylinder all the way down into the chisel's socket (**Photo 2**) and let the paper unroll into a cone. (You may have to help it a little bit.) Once the paper has fully conformed to the socket's taper, put a couple of pieces of tape on the paper, to hold its shape. Then draw a line on the cone, following the top of the chisel's socket (**Photo 3**). Remove the cone—you're all set to take three measurements.

First, set a divider to the distance between the pencil mark you made and the end of the cone (**Photo 4**). Transfer that distance to the handle blank (**Photo 5**). Second, set a caliper to the diameter of the cone at the pencil mark (**Photo 6**). Turn the blank to this diameter, immediately to the right of the mark indicating the shank's length (**Photo 7**). (I find it easier to do this if I start roughing out

the shank at the same time.) Third, reset the caliper to the diameter of the cone's end (**Photo 8**). Turn the end of the shank to this diameter (**Photo 9**), then form a straight taper up to the end of the shank.

Test the fit

If all has gone well, the shank should perfectly fit the socket. Just to be sure, perform a simple test. Rub a piece of chalk on the inside of the socket (**Photo 10**). Turn off the lathe, pull away the headstock and push the socket onto the shank. Twist the chisel a few times and remove it (**Photo 11**). If the fit is correct, most of the shank will be coated with chalk; if it's not, the chalk will show you the high spots that need to be removed. If the fit is too loose, your best bet is to cut off part of the shank and start over from the beginning. Don't worry—the turning goes pretty quick.



5

Mark this distance from the tailstock end of a blank you've roughed out.



6

Set a caliper to fit the cone at the mark you drew at the end of the chisel's socket. This will be the major diameter of the handle's shank (the part that fits into the socket).



7

Turn the blank to the major diameter, just to the right of the pencil line. Rough out the rest of the shank's taper.



8

Reset the caliper to fit the end of the cone. This will be the shank's minor diameter.



9

Turn the end of the shank to the minor diameter, leaning the parting tool at about the same angle as the rough taper. Cut a straight taper between the major and minor diameters.



10

Check the fit of the shank in the chisel's socket. First, coat the inside of the socket with chalk dust. Then turn off the lathe and pull away the tailstock.



11

Push the socket onto the shank and twist it a few times. If its taper is correct, the full length of the shank will be coated with chalk. If it's not correct, only the high spots will be coated.



12

Once the taper is correct, lengthen the shank about 1/8" to the left.



13

Shape the rest of the handle as you wish. Stop the lathe and remove the handle from time to time to test how it feels.



14

Part the handle from the blank using a spindle gouge. (My gouge is very short, from turning so many handles!)

Once the fit is OK, lengthen the shank by about 1/8" (Photo 12). (Notice the small gap between the end of the socket and the end of the shank on the handles shown on page 30.) This gap allows you to drive the shank tight into the socket. The end of the handle shouldn't butt up against the top of the socket. If it does, the handle could split when you strike the chisel.

Turn the handle to any shape you wish (Photo 13). There's really no right or wrong here; traditionally, chisel handles came in many different shapes and sizes. If your work requires you to strike the chisel hard, you may want to put a ferrule on one or both ends of the handle to prevent it from splitting. Turn off the lathe from time to time and test how the handle feels. When you're done, part off (Photo 14). To install your handle, just drive it into the socket with a mallet. With a tight fit, there's no need for glue. When you apply finish to the handle, don't put any on the shank. If the shank is too slippery, it won't stay seated in the socket. 



For more information about making and fitting ferrules on tool handles, go to AmericanWoodworker.com/WebExtras

My Comfortable Shop



Woodworking with all the comforts of home.

ONE GLANCE in my shop reveals an unusual device—a reclining chair. But don't get the wrong idea; things do get done here. It's just that my 70-year-old back isn't what it used to be and occasionally I need to sit down, put up my feet and catch a few minutes of the ball game.

I built this shop years ago while I was still teaching here in Rose Hill, Kansas, by carving out time on evenings and weekends. The main part is 36' x 60' with a 16' x 60' lean-to storage addition. It has 6" thick walls, a 10' ceiling and is heavily insulated. The walls and ceiling are covered with oriented strand board, so I can mount cabinets, shelves, conduit, etc., just about anywhere. All the shop cabinets are made from

salvaged scrap materials. It's amazing how a coat of red paint hides the imperfections and blends the assorted woods.

Besides the chair and TV, the shop has other creature comforts, including a bathroom with a built-in double sink and hot and cold running water. A refrigerator and a microwave oven reside in the office, so I can fix a snack whenever hunger strikes. The office also houses a drafting table and a drafting machine. A phone with a flashing strobe light and an amplified ringer, and a wireless intercom to the house keep me in touch with the world outside.

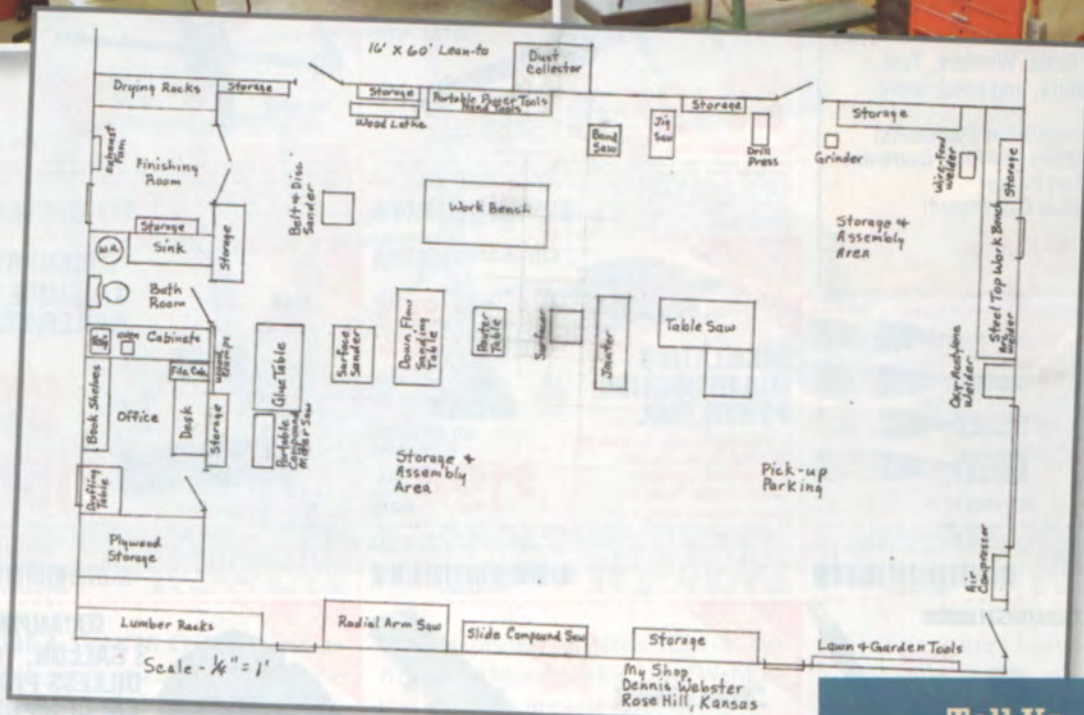
Another room is equipped for spray finishing, with a filtered ex-

haust fan and explosion-proof lights. When the exhaust fan is running, four filters housed in the room's double entry doors scrub the incoming air, to keep out the dust from the main shop.

Eighteen commercial fluorescent light fixtures illuminate the shop. I rewired each fixture so one, two or three bulbs can be turned on as necessary, to provide sufficient light.

The shop's 1,200 cfm dust collector is located in a small, insulated room in the lean-to, so the noise stays at reasonable levels. The dust-collection lines are made of PVC drain pipe and grounded with cop-





per wire. Air drawn through the collector returns to the shop through a pair of pleated filters.

My shop stays cool in the summer, thanks to all the insulation in the walls and ceiling. Five oscillating fans stationed side by side on a shelf provide a pleasant breeze, and a whole-house exhaust fan in the ceiling draws in fresh, cool air in the morning hours. In the winter, an overhead natural gas heater keeps things cozy. When the weather is cold, I park my truck in the shop, so I stay warm when I venture out in it.

You may be wondering about the tools! As you can see, I have a full line of stationary woodworking machines, portable power tools

and hand tools. My industrial-tech teaching background shows in the layout. Each machine is logically placed for processing, with plenty of room to work. As I live on a farm, my shop also houses metalworking tools and machines that I've used to build several implements for my tractor and other farm equipment.

I really enjoy working in my shop, especially when the weather is bad and I can't do anything outside. I've built a lot of furniture over the years, so my tools and equipment have paid for themselves many times over. 

*Dennis Webster
Rose Hill, Kansas*

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.

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Shaker Child's Rocker

**Build a classic
New Lebanon No. 1,
with arms or without.**

by Kerry Pierce



PICTURE A SHAKER CHAIR. Chances are, the one you envision was produced in New Lebanon, New York, under the guidance of Brother Robert Wagan in the second half of the 19th century, as these Shaker chairs are the most familiar. Wagan standardized the forms that the New Lebanon operation produced, offering chairs in a limited variety of configurations, each of which was available in eight sizes, ranging from the No. 0, which is suitable for a two-year-old child, to the No. 7 for behemoths like Abe Lincoln. The chairs shown here are No. 1s, a size that's comfortable for three- or four-year-old children.

This story shows how to build two versions this little rocker, as shown above. The basic construction of both rockers is the same, although adding the arms requires additional turning and joinery. This story does not cover installing the woven seat—

that's a project in itself. Check out AmericanWoodworker.com/WebExtras for the complete how-to.

*Some chairmakers
calculate every
detail. Others build
entirely by eye.
I fall somewhere
in the middle.*

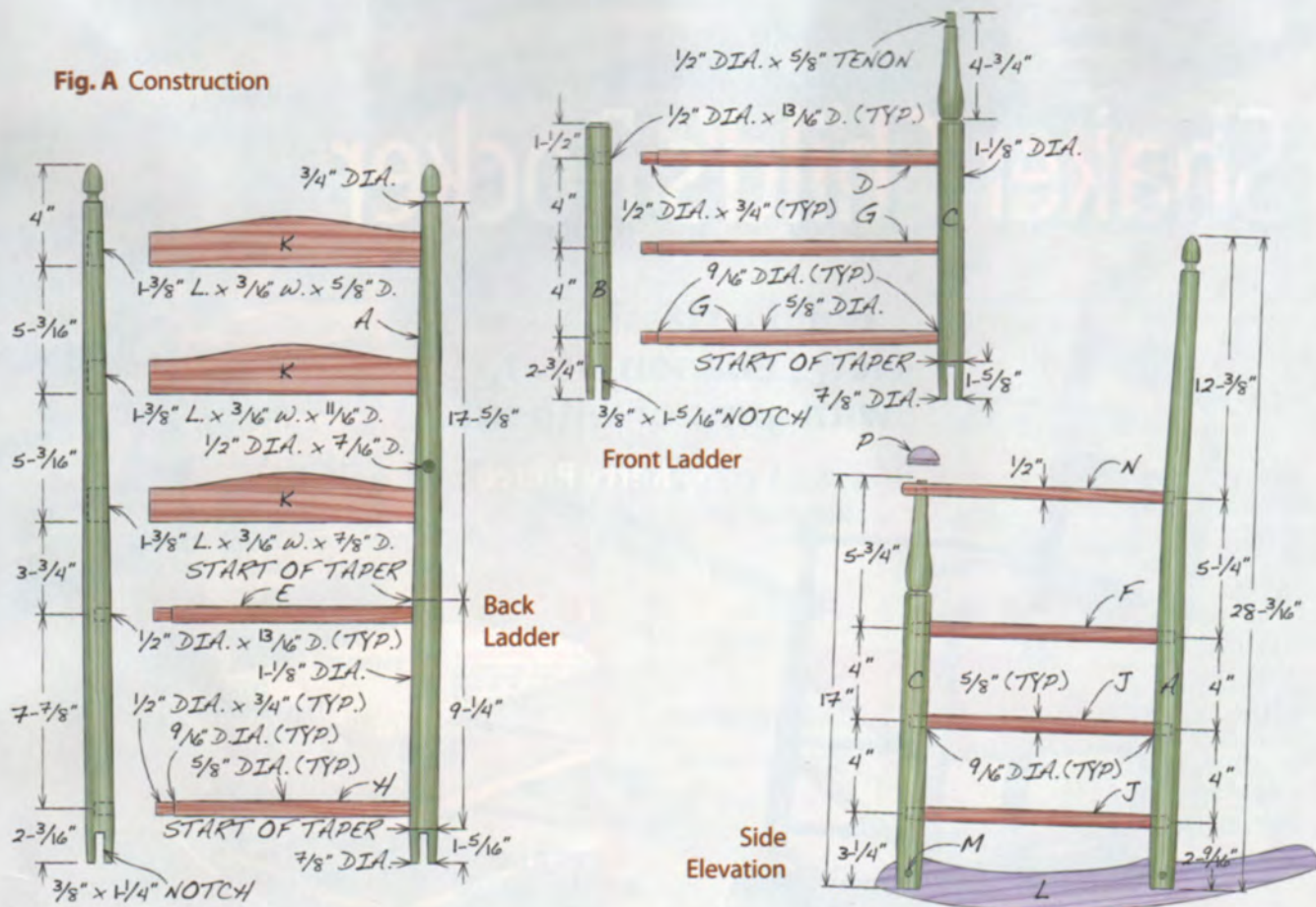
Over the thirty years I've studied and built Shaker chairs, I've settled on a series of characteristics that could conceivably be used to identify the work coming from my shop, just

as historians use idiosyncratic details to identify the origin of genuine Shaker chairs. As these rockers show, I use squat, acorn-like finials and my rungs swell in the middle, giving them a muscular appearance rarely found on Shaker originals.

Posts and rungs

The posts and rungs (which make up most of the parts in these chairs) are turned. The longest parts measure less than 30", so a standard lathe or a midi-lathe with a bed extension will suffice. The turnings are simple in shape, consisting of tapers embellished with a minimum of coves and vases. However, turning these slender parts isn't as easy as you might think, because they have a tendency to flex away when you apply pressure with a turning tool, causing it to leave unsightly chatter marks. This flexing can be controlled with

Fig. A Construction



1 Almost all of the parts for this chair are turned on a lathe. To avoid leaving chatter marks while shaping long, slender parts such as the back post shown here, use one hand as a live steadyrest to keep the workpiece from flexing.



2 Use a story stick to transfer the locations of decorative details such as the cove and finial at the top of each back post.

a mechanical steadyrest, which has to be constantly moved to stay in line with the point of contact, or you can do what I do: Use your off hand as a live steadyrest that's always right where you want it (**Photo 1**). If you use this method, it's imperative that you support the work with only the flat of your palm and that you keep your fingers pointing down, so they can't be drawn up into the gap between the tool rest and the rotating work. Protect this hand against friction heat with a few wraps of masking tape.

The back posts (A, Fig. A, above, and Cutting List, page 43) taper gradually from the seat to the finial and also at the bottom. Start with 1-1/4" x 1-1/4" blanks. Turn each blank to a 1-1/8" dia. cylinder and then use calipers to make diameter checks as necessary to create the tapers. Use a story stick to locate the cove and acorn finial on each post (**Photo 2**, Fig. B, page 40). Cut the cove with a 1/4" fingernail gouge and shape the finials with a skew chisel.

The front posts for the armless rocker (B) taper at the bottom and are slightly chamfered at the top edge. Use a fingernail gouge and skew chisel to turn the vase on the armless rocker front posts (C, Fig. A, and Fig. B). Carefully size the tenon above the vase with calipers and a parting tool. Use a skew chisel or wide parting tool to turn the tenon to its final 1/2" diameter. This diameter must be consistent along the tenon's entire length.

Use a skew chisel to shape the rungs. The seat rungs (D-F) are straight, but all the other rungs (G-J) are

tapered. Use the method described earlier to precisely create the rung tenons.

Front- and back-rung mortises

Draw an index line on each post and mark it to locate the rung mortises before removing the post from the lathe. Each index line must be parallel to the post's axis of rotation. To draw this line, engage the headstock's indexing pin to lock the post's rotation. Then slide a shop-made marking jig down the length of the post (**Photo 3**). The jig's height is determined by the distance between the lathe's bed and its drive center. Since the jig holds the pencil a consistent distance from the lathe's bed, the line it draws along the length of the turned post will be parallel to its axis of rotation.

Make story sticks that show the mortise locations for the front, back and side rungs. (Note that the side rung mortises are offset from the front and back rung mortises.) Mark the slat mortise locations on the back-rung story stick and the arm mortise on the side-rung stick. Then use the appropriate story sticks to mark the front-rung mortise locations on the front posts and the back-rung and slat mortise locations on the back posts.

Mount each post in a jig to drill the front- and back-rung mortises. The jig is simply a 2" thick x 24" long piece of stock with a length of 1/4" stock screwed to one end (**Photo 4**). Hold the post against the jig's long piece and fasten it to the narrow piece with a pair of screws so it can't rotate. Then drill the rung mortises (**Photo 5**).



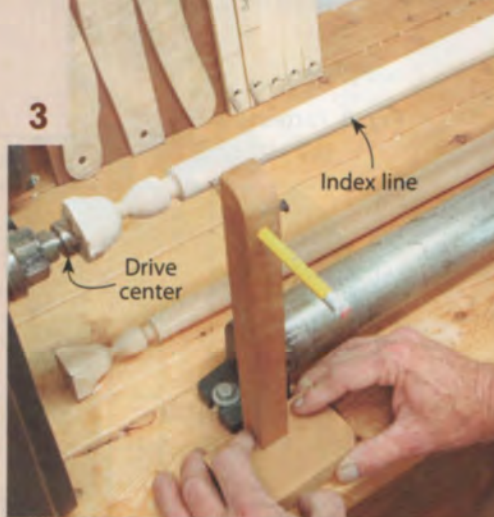
See how to build a simple steam box at AmericanWoodworker.com/WebExtras

Steam bending

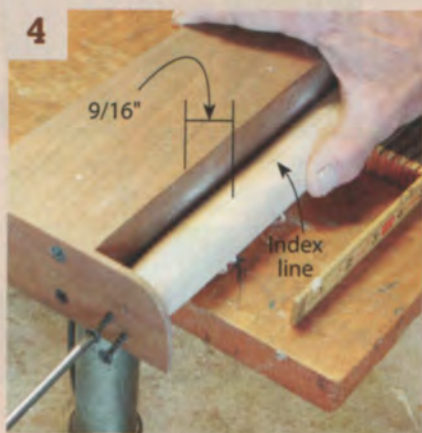
The back posts (A) and the slats (K, Fig. A, and Fig. B) are steamed prior to bending, so you'll need to build a steaming chamber and a pair of bending forms (Fig. C, page 42). Your steaming chamber doesn't have to be anything fancy, just a box long enough to hold the pieces, with an inlet port for the steam at one end and relief holes at the other. An electric teakettle can be used to supply steam. A steam generator is another option (available at rockler.com, #42826, \$89.99).

Make sure that the grain in any part you plan to steam bend runs continuously from end to end—any piece with grain that runs out is likely to crack or break. Ash, white oak and hard maple bend well; walnut and cherry require more caution. Thorough steaming is the best insurance against bending failure. Don't place parts in your steam chamber until steam billows from the relief holes. Carefully track the time parts are left in the chamber. Steam the 3/16" thick slats for a minimum of 30 minutes and the 1-1/8" dia. back posts for at least 75 minutes.

Draw an index line down the length of each post, parallel to its axis of rotation, using a jig that aligns a pencil with the point on the lathe's drive center. Then use a story stick to mark the mortise locations on the line.



Install each post on another shop-made jig to drill the front and back mortises. Rotate the post so its index line is located one-half the post's diameter away from the body of the jig.



Drill the front (or back) mortises at each marked location on all four posts, 1/16" deeper than the rung tenon lengths.



Use a form, a pair of wooden collars and a hose clamp to bend the back posts after steaming them. Bending these parts simultaneously takes a surprising amount of muscle, so use a drill to power the process.

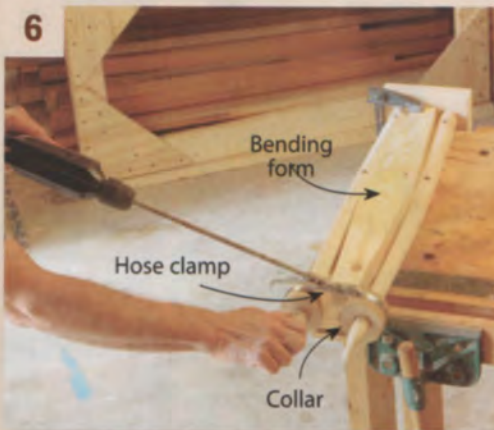
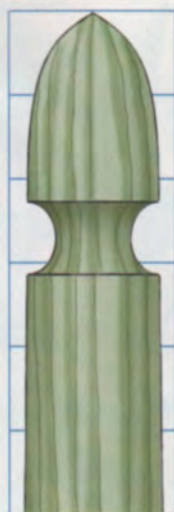


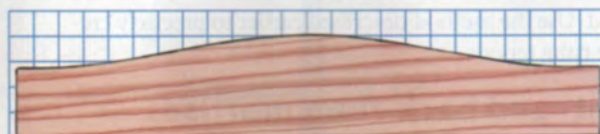
Fig. B Patterns
(all 1/2" grids)



Back Post



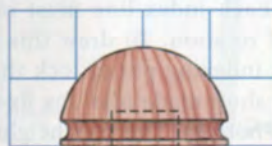
Front Post



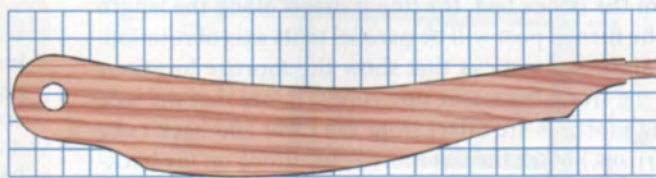
Slat



Download these patterns full size at
AmericanWoodworker.com/WebExtras



Mushroom Cap



Arm



Rocker



7

Bend the steamed slats in a two-part form. Crank the vise until both halves of the form are tight against the slats.



8

Visualize the correct angle for the slat mortises by positioning a steam-bent slat on the post after installing a rung. To accommodate the curve, these mortises must be located flush with the index line and chopped at an angle.

The steamed parts remain flexible for a very short time, so you have to work quickly to install them in the bending forms. They'll also be extremely hot, so wear gloves.

Install both back posts in the mortises at the bottom of the post bending form, oriented with their back-rung mortises facing up and their side-rung mortise locations facing out. Then bend both posts at once by tightening a hose clamp positioned over a pair of protective wood collars (**Photo 6**). Keep the posts in the bending form for a week to stabilize.

Cut the slat blanks to final dimensions and rough-saw the arcs. Then use a spokeshave or sanding drum to smooth the edges and finalize the shape. Mark the top of each slat so you can center them in the bending form. Bend all three slats at once, using a wood vise to close the bending form (**Photo 7**). As with the posts, keep the slats in the bending form for a week.

Slat mortises

To accommodate the curved slats, the slat mortises in the back posts must be angled and positioned flush with the index line—this places them slightly behind the centers of the rung mortises (**Photo 8**). Finding the correct angle is important, because the installed slats must meet both back posts at the same angle. Establish the sides and ends of each mortise on the post, using a marking knife. Then create the mortises in

stages, alternating between chopping and checking the angle by sighting between the slat and rung (**Photo 9**). Make shallow cuts from one end of each mortise to the other, using a 1/4" mortise chisel ground to 3/16" width. Then use a wider chisel to remove the waste and pare the sides. Repeat the process to deepen each mortise to its final depth.

Ladders

Glue the rungs and slats between the posts to create the front and back ladders. Note that the back ladder splays out above the seat rung, because the slat mortises become more shallow as the posts taper. Before the glue dries, check each ladder to make sure it's square and flat. Check for twist by laying each ladder on a flat surface or by sighting from above (**Photo 10**).

Side rung mortises

The side rung mortises have to be drilled at angles, because the front ladder is wider than the back ladder. The side rung mortising jig (**Fig. C**) is designed to position both ladders for drilling at the proper angles (100° for the front ladder; 80° for the back ladder). Still, I recommend drilling test mortises in a post made from scrap stock to dial in the setups.

Install the front ladder and position the jig on the drill press so that the bit is centered on the axis of the post. Use the mark from the lathe's drive center on the bottom end of a post to establish this position. Lower the bit and adjust the jig to align the bit's center point with the drive center's mark.

Clamp the jig in position, then drill mortises at the three marked side-rung locations (**Photo 11**). Rotate the ladder 180° to drill the mortises on the other post. To drill mortises in the back ladder (including the mortises for the arms, if desired), rotate the jig 180° and screw on the risers (**Photo 12**). Then follow the procedure described above to position the jig and drill the mortises.

Embracing error

When you dry-fit the side rungs in the mortises, you'll notice that they splay a bit too wide at the front ladder (**Photo 13**). This slight misalignment is intentional, because I think a chair should have a back-up joinery system in case the glue fails. I've discovered that building a minor and consistent error in the side-rung mortise angles produces a "sprung" chair frame that's under enough tension to stay together even without the chemical bond provided by glue.

Because these joints are under tension as you glue the chair together, it's imperative to use clamps to seat the tenons, so you can provide steady, slowly increasing clamping pressure. Do not use a mallet.

Rockers

Cut and finish-sand the rockers (L, **Fig. A**, and **Fig. B**). They fit in slots cut into the posts. Center the slots, using a template that's the same thickness as the rock-

Cut each slat mortise just deep enough to hold the slat erect. Then tilt the slat so it aligns with the rung at both ends to find the correct angle at which to chop the mortise (**Photo 8**).



Sight from above to make sure the glued-up back ladder is properly aligned. Make adjustments before the glue has dried by twisting the top while holding the bottom between your feet.



Use a sloped jig to drill mortises for the side rungs in the front ladder. These mortises must cant inward to align with the mortises in the back ladder. After drilling mortises in the first post, rotate the ladder 180° to drill the mortises in the other post.



Rotate the jig 180° and repeat the process to drill mortises in the back ladder. Rotating the jig makes these mortises cant outward to align with the mortises in the front ladder. Position the ladder on risers to accommodate the bent slats.

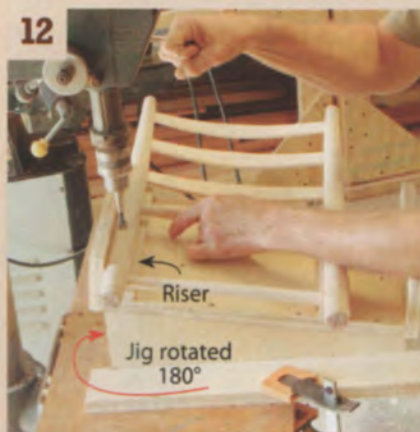
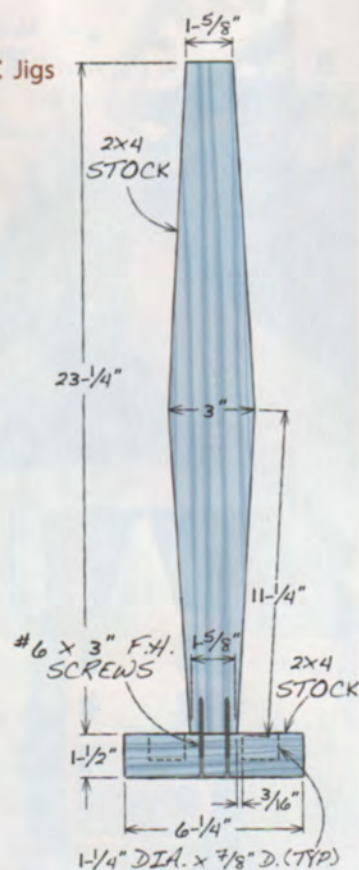
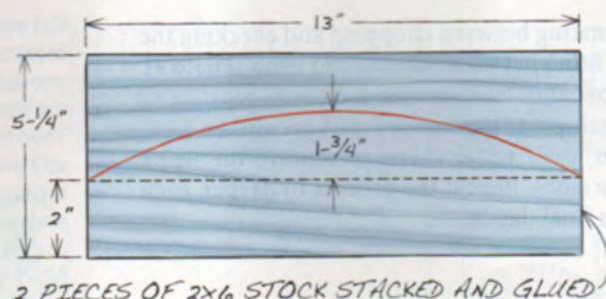


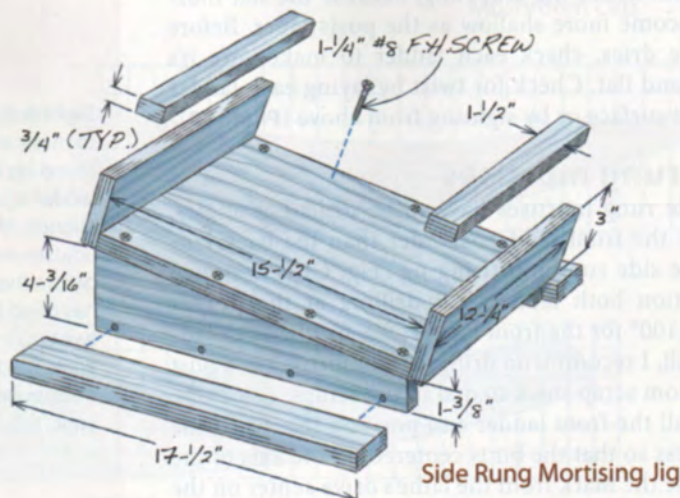
Fig. C Jigs



Back Post Bending Form



Slat Bending Form



Side Rung Mortising Jig



13

The side-rung mortising jig imparts a slight error in the mortise angles that keeps the assembled frame under constant tension, so the chair will stay together even if the glue fails.



14

Locate slots for the rockers using a template with notches that are cut to create a straightedge that lies flat on the ends of both posts, even though the posts lie in different planes.

ers and notched so it rests on the bottoms of both posts (**Photo 14**). Cut the slots (**Photo 15**). Install each rocker and fine-tune the fit by shaping the bottom of each slot to eliminate gaps. When the rockers are successfully seated, fasten them with pins (M). Drill a stopped hole that goes through the rocker and ends in the far side of the post. Apply glue sparingly inside the hole and on the end of the pin. Then use a clamp to seat the pin.

Arms and caps

Note: If you're building the armed rocker, make and install the arms before you install the rockers. Cut out the arms (N, Fig. A, and Fig. B) and drill holes for the front post tenons. Then gently round the edges and shape the tenons on the back ends (**Photo 16**).

Use a scrap-wood faceplate to turn the mushroom cap (P, Fig. A, and Fig. B). Drill a shallow, centered 1/2" dia. hole to house the front post's through tenon on the bottom of the blank. Carefully center the blank on the faceplate and attach it using a piece of newspaper that's glued to both the faceplate and the blank. Use the skew and a 1/8" fingernail gouge to shape the cap. Then use a wide butt chisel to cleave the completed cap from the faceplate—the newspaper-weakened glue joint makes this possible.

Apply glue and install each arm, seating it on the shoulder of the front post's tenon. (**Photo 17**). Then glue on the mushroom caps (**Photo 18**).

Add finish and splint

Finish-sand the rocker and apply the finish. Traditional finishes such as oil and wax or shellac are good choices. The splint seat is easy to install. Even if you've never woven anything before, you can do it. The materials are inexpensive and the process is straightforward. Using fabric tape (available at shakerworkshops.com) instead of splint is an appropriate option, as the Shakers offered these chairs both ways. 



Learn how to weave splint chair seats at AmericanWoodworker.com/WebExtras

Cutting List

Overall Dimensions: 29" H x 15" W x 19-1/2" D

Part	Name	Qty.	Th x W x L
A	Back post	2	1-1/8" dia. x 28-3/16" (a, b, c)
B	Armless front post	2	1-1/8" dia. x 12-1/4" (b, d)
C	Armed front post	2	1-1/8" dia. x 17" (b, d, e)
D	Front seat rung	1	5/8" dia. x 14-3/16" (f)
E	Back seat rung	1	5/8" dia. x 11-3/16" (f)
F	Side seat rung	2	5/8" dia. x 11-3/16" (f)
G	Front rung	2	5/8" dia. x 14-3/16" (f, g)
H	Back rung	1	5/8" dia. x 11-3/16" (f, g)
J	Side rung	4	5/8" dia. x 11-3/16" (f, g)
K	Slat	3	3/16" x 2" x 11-3/4"
L	Rocker	2	3/8" x 2-3/4" x 19-1/2"
M	Rocker pin	4	3/8" dia. x 1" (h)
N	Arm	2	1/2" x 2-1/4" x 12" (j)
P	Mushroom cap	2	3/4" x 1-1/4" dia.

Notes:

- a) Tapers above the seat rung from 1-1/8" to 3/4" at the finial.
- b) Tapers to 7/8" at the bottom, starting halfway between the bottom of the post and the bottom rung.
- c) 3/8" x 1-1/4" deep notch at the bottom; shape the bottom of this notch as necessary to fit the rocker and eliminate gaps.
- d) 3/8" x 1-5/16" deep notch at the bottom; shape the bottom of this notch as necessary to fit the rocker and eliminate gaps.
- e) 1/2" dia. x 5/8" tenon at top.
- f) 1/2" dia x 3/4" tenons at both ends.
- g) The rung's overall dia. tapers from 5/8" at the center to 9/16" at the shoulders next to the tenons.
- h) Pin does not go all the way through the post.
- j) 1/2" dia. x 5/8" tenon on back end; trim length to fit, as necessary.

Drill through the post to free the waste after sawing the sides of each notch.

15



Gently round the edges of each arm by fairing curves to a line drawn at the midpoint. Whittle the tenon on the end slightly oversize and then finalize its outside diameter with the file.

16



Install each arm by standing it on edge, pressing its tenon into the mortise in the back post, and then rolling it over and onto the front post's through tenon.

17



Glue on the mushroom cap to cover the through tenon.

18



Kerry Pierce has been building and writing about period furniture for almost 40 years. He has authored 19 woodworking books and is an instructor at the Marc Adams School of Woodworking.

How to Make A Free-Form Bowl

Put away the ruler, turn off the tablesaw,
and have fun just playing with shapes!

by Bill Fink



WOULD YOU LIKE to try your hand making something that's unique, creative and inexpensive? That's what free-form bowls are all about.

I got started in this craft by carving out traditional dough bowls with an adze, scorp and gouge. Pretty soon, I started experimenting with free-form shapes and unusual pieces of wood—and added power tools to my mix. I've since made dozens of bowls, all completely different, and have “orders” for many more.

Most of the wood I use comes from logs that nobody else wants. I salvage it from lumber mills and firewood piles, looking for pieces that are cut from stumps or crotches. Hiding under that gnarly bark is some of the most beautiful swirling grain you'll ever see.

Usually this wood is dry, or nearly dry. That's fine, because it's easier to shape dry wood than green wood with the grinding tool I use. Wet wood just clogs it up.

When you find a suitable log, rip it in half with a chainsaw, making two bowl blanks. If the log is cracked, try sawing along the crack. In any case, be careful; this isn't a job for a novice sawyer.

Each blank should be 2" to 6" thick. If it's thinner, switch gears and make it into a platter; if it's thicker, consider reducing its thickness, or you'll be faced with working lots of end grain and have a difficult time getting into the bowl's interior.

Remove the bark and examine the pieces for rot, insect damage and cracks. These aren't necessarily defects, but at least you'll know what you're up against.

Plane a flat bottom

Shaping the bowl creates lots of chips and dust, so I work outdoors. My "bench" is a large log firmly planted in the ground, which gives me a solid work surface and easy access to all sides of the bowl. To secure the blank, I fasten it to a piece of plywood with one screw, then fasten the plywood to the log.

Start by flattening the bottom of the bowl, using a hand-held power planer. Cut through the outer layer of soft cambium wood until you've made a flat area that's roughly parallel to the face that's screwed to the plywood. Outline the foot of your bowl with pencil or chalk (**Photo 1**). The foot doesn't have to be round, like a turned bowl; an asymmetric shape, as irregular as the blank, is best.

Making a foot that's stable is a crucial step, so it's a good idea to unscrew the blank from the plywood, turn the bowl over, and check out how it sits before moving on.

Shape the outside

Begin shaping the outside of the bowl with the power planer. Work downhill, from the foot to the rim, to create large facets (**Photo 2**).

After you've removed the bulk of the waste, switch to an angle grinder equipped with a coarse dish-shaped abrasive wheel (see Sources, page 47). A coarse wheel is very aggressive, so use a light touch. Blend the facets together and define a rim around the foot (**Photo 3**). You can also use this wheel to create hollows in the sides and work around burls or other features. To further accentuate the design, or to create a particular texture, use carving gouges or a spokeshave.

Keep working until you're satisfied that the outside shape is complete. It will be difficult to secure the bowl in the same way later on, after the next steps.

Flatten the bottom side of the bowl blank using a hand-held power planer. Draw an oval to outline the foot of the bowl. Fasten a piece of plywood to the other side, then screw the plywood to a solid work surface. I use a stump, outside my shop.



Shape the outside of the bowl with the power planer. Bevel the sides down to the perimeter of the bowl, leaving a rim that's about 1" thick.



Form a rim around the foot using an angle grinder equipped with a dish-shaped abrasive wheel. Use the same tool to sculpt the bowl's exterior. When you're done, unscrew the blank and fasten the foot to the plywood.





4

Hollow out the bowl's interior. Follow the shapes and angles of the outside walls as a guide. Leave a 1" wide rim around the top edge of the bowl.

Hollow the inside

Unscrew the bowl from the plywood and drill a pilot hole in the middle of the foot. Screw the foot to the plywood. Next, draw a rim around the perimeter of the bowl, keeping a constant distance from the edge (the rim on this bowl is about 1" wide). Using the grinder and abrasive wheel, start hollowing inside this line (**Photo 4**).

Work the interior so you reach the bottom and your desired wall thickness at the same time. Try to create a smooth, flowing surface that roughly follows the bowl's shape. The wall should have a consistent thickness, like a turned bowl.

To remove the bumps and swirls left by the grinder, switch to hand tools (**Photo 5**). I might use a compass hollowing plane, which has a round bottom (see Sources), a travisher (basically a spokeshave with a curved blade), carving gouges or curved scrapers.

Shape the rim

Making the rim of the bowl requires finesse (**Photo 6**). I use a low-angle, wooden-bodied shave—but a regular spokeshave would work, too. Adjust the blade to cut heavy on one side, light on the other, in order to sculpt an undulating, multi-faceted edge that wanders around the bowl.

While you could make a rim that is either thin or flat, I prefer a relatively wide, wavy edge to complement the irregular shape of the bowl itself. Reflecting light at different angles, it will definitely grab people's attention. Time to be bold!

Sand and finish

If you've used hand tools to smooth the surfaces of your bowl—particularly the rim—you'll probably want to preserve the crisp shapes and marks they've left. Keep sanding to a minimum, using only fine grits.

If you have a lot of smoothing to do, it's best to use a sanding pad chucked up in a drill press (**Photo 7**). (You can find these pads and sandpaper discs at most hardware stores or home centers.) Adjust your drill press to run at about 300 rpm



5

I switch to hand tools, such as this compass hollowing plane, to finish the interior. These tools smooth out the bumps left by the grinding wheel and create a surface that needs little sanding.



6

Sculpt the rim with a spokeshave. This tool gives you the freedom to make an undulating edge, which I prefer. It's often the most important feature of my bowls.

and start with an 80 grit disc. Work up through the grits, stopping at 150 or 220. Use a medium or hard pad for the bowl's exterior and a medium or soft pad for the interior. Power sanding creates swirl marks, but you can eliminate most of them by working with the grain.

Finally, mist the bowl with water to raise the grain. After the wood dries, sand it by hand with 320 grit paper.

Use a wipe-on polyurethane to finish the bowl. Apply at least four coats. You can finish the inside and outside of the bowl at the same time by resting its foot on a block of wood with some brads driven through it.

After the final coat is dry, wipe on a coat of wax or a mineral oil/wax mixture (see Sources) and buff with a soft rag (**Photo 8**). This final coat lends a wonderful tactile feel to the bowl and is easily refreshed by more buffing. 🐿

SOURCES

Kutzall, kutzalltools.com, 810-765-1000, 4-1/2" Dish Wheel for angle grinder, 7/8" bore, very coarse grit, #DW4120550, \$55.

Crown Planes, crownplane.com, 207-799-7535, Compass Hollowing Plane, \$95.

Howard Products, howardproducts.com, 800-266-9545, Howard Butcher Block Conditioner (mineral oil/wax mixture), \$9 for 12 oz.



Bill Fink

lives in Julian, California, where he builds furniture, bowls and interiors.

Bill teaches woodworking, writes a column for the Julian News and hosts a website, wmfink.com. He's also a member of the San Diego Fine Woodworkers Association.

Sand the bowl, inside and out, using a flexible pad mounted in a drill press.

7



Finish the bowl with wipe-on poly, for protection. Then add a coat of wax. Wax gives the wood a soft luster and a tactile feel that I really like.

8

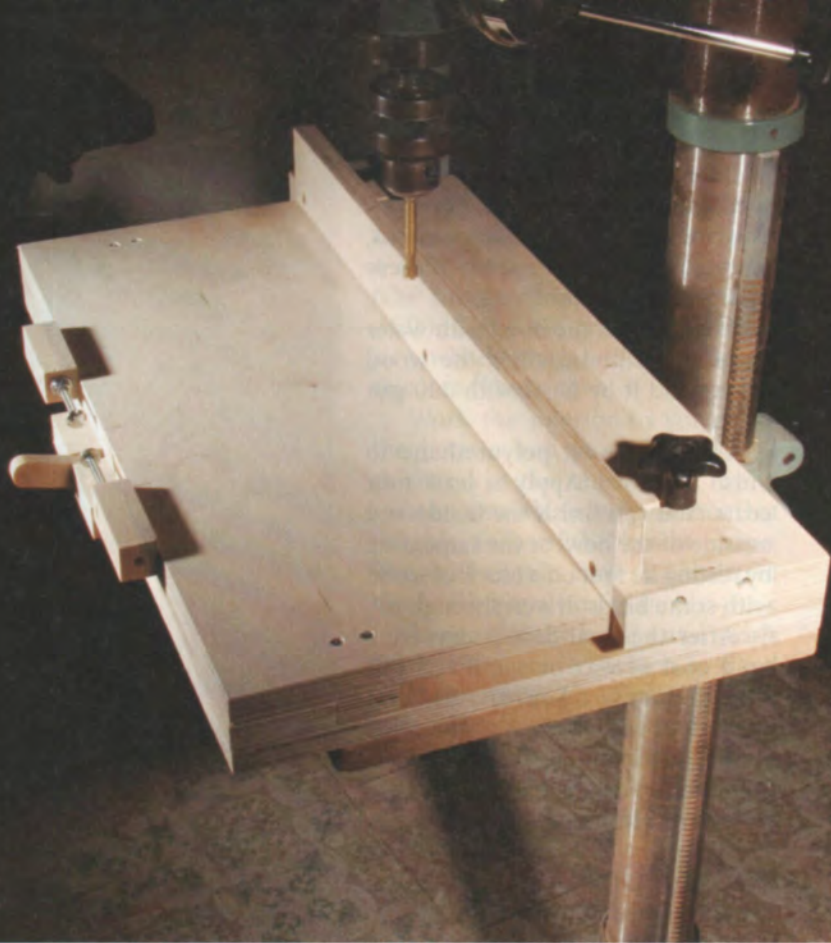


To see more bowls by Bill Fink, go to AmericanWoodworker.com/WebExtras

Drill Press Mortising Fixture

Cut mortises of any width and length in stock of virtually any size.

by Jim Stack



HERE'S A WIN-WIN PROPOSITION: Spend a day in your shop and turn your drill press into a mortising machine. This fixture makes it easy to cut mortises in multiples for doors, tables and frames. It has four components: a fixed base, a sliding table, an adjustable fence, and an adjustable stop mechanism. Building it requires less than a half-sheet of 3/4" plywood or MDF and some easily obtainable hardware. I use Forstner bits to create the mortises.

How it works

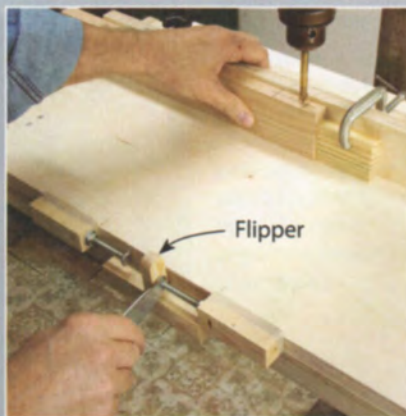
Mark the centerline and both ends of the mortise on one workpiece and use it to set up the fixture. Place the workpiece on the sliding table, lower the bit to the desired mortise depth and set the depth stop. Then adjust the fence to center the bit on the mortise (**Step 1**, below).

Maximize the sliding table's travel by lowering the flipper and backing off the stop mechanism's bolts. Next,



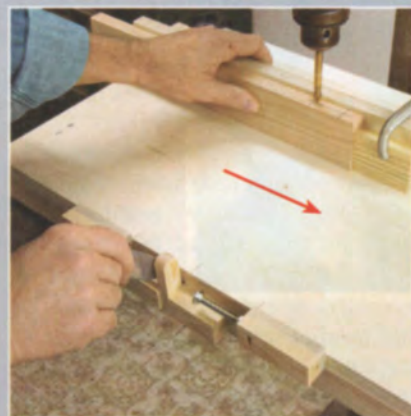
Step 1

Adjust the fence to center the bit on the mortise centerline.



Step 2

Locate the right end of the mortise, clamp on a stop block and set the first stop bolt.



Step 3

Slide the table to the left end of the mortise and set the remaining stop bolt.

roughly align the right end of the mortise with the outside edge of the bit and clamp a stop block against the workpiece. Then use the sliding table and the flipper-stop mechanism to dial in the bit's exact location (**Step 2**). Repeat the procedure to locate the other end of the mortise (**Step 3**). The fixture is now ready to process multiple pieces with mortises of the same size and location.

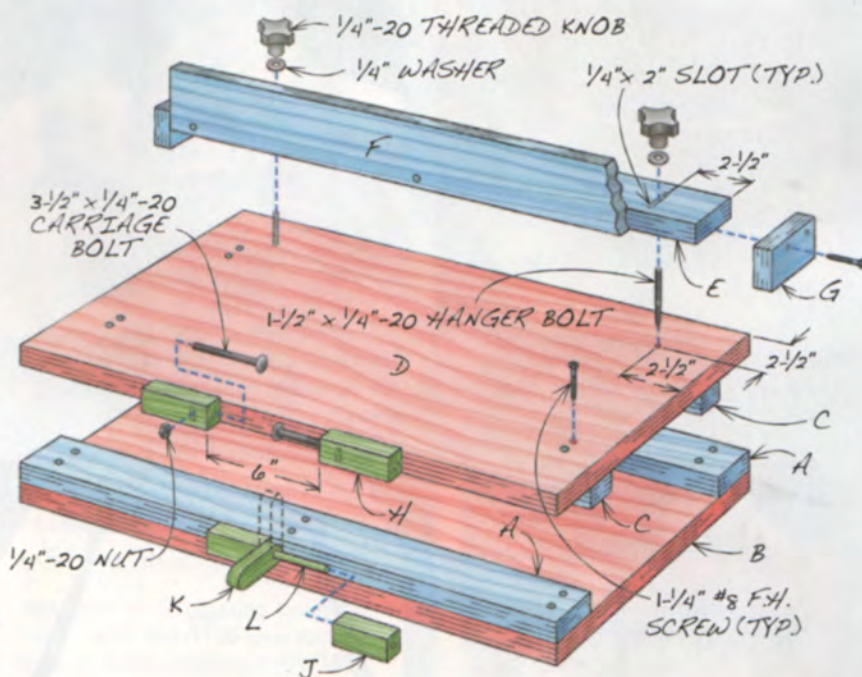
Create each mortise in two steps. First, drill overlapping holes to remove most of the waste (**Step 4**). Then complete the job by making incrementally deeper passes with the bit while sliding the table back and forth (**Step 5**).

Build it

Start by attaching the guides to the base and the runners to the sled (A-D, Fig. A, at right, and Cutting List, page 64). Sand smooth one long edge of each guide and runner, as these edges will rub against each other when the sled slides back and forth. Square the guides to the base, with the sanded edges to the inside, and fasten them with glue and screws.

Place the sanded edges of the two runners against the inside edges of the guides. Then use a piece of scrap wood and some wedges to hold the runners snugly—but not too tightly—against the two guides (**Photo 1**). Place the sled on top of the base assembly and square it. Then screw the sled to the runners. Remove the scrap wood and wedges. Then test the sled to make sure it slides smoothly, without binding or wobbling from side to side. If the fit is too tight, rub paraffin on the edges of the runners and guides. If the fit is too loose, glue a piece of veneer to one of the edges.

Fig. A Mortising Fixture



Outfit your drill press with a sacrificial table and clamp on a fence. Then use a 1/4" Forstner bit to cut a pair of 2" long slots through the fence cleat (E), 2-1/2" from each end (**Photo 2**). After drilling the overlapping holes, create the slots by sliding the cleat back and forth while slowly lowering the bit. Glue and screw the fence face (F) and the guide blocks (G) to the cleat. Then set the assembled fence on the sled and use its slots to locate the holes for the hanger bolts that attach these two parts. Note that the fence assembly is a tiny bit wider than the sled, so it will slide freely. Drill the hanger-bolt holes.

Cut the adjustment blocks (H) and flipper blocks (J) to final dimensions and drill a centered 1/4" dia. hole lengthwise through each block (**Photo 3**). Use the sacrificial table and clamp a scrap 90° block to the fence to locate and support these narrow pieces while drilling. Next, cut a stopped mortise in the side of each adjustment block for the captured nuts used to thread the stop bolts (**Photo 4**). This time, lay the 90° block on the table next to the adjustment block and press both pieces against the fence while drilling the overlapping holes and reaming out the slot. Cut the slots just wide enough to capture the nut, so it can't rotate, and just deep enough for the bolt to thread



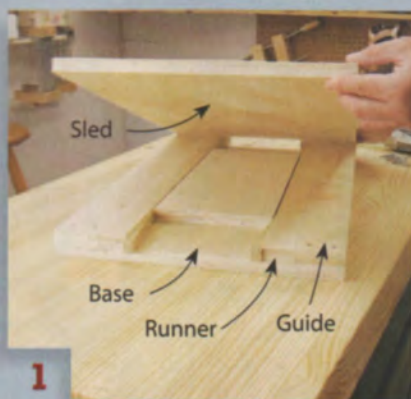
Step 4

Rough out the mortise by sliding the table and drilling a series of overlapping holes.

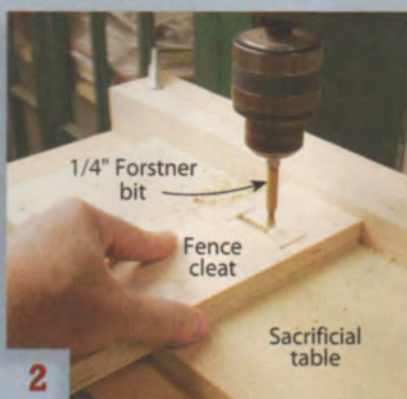


Step 5

Complete the mortise by sliding the table back and forth as you slowly lower the bit.



1 Locate the sled's runners by wedging them against the guides mounted on the base.



2 Create the slots in the fence cleat by drilling overlapping holes and then smoothing the shoulders.



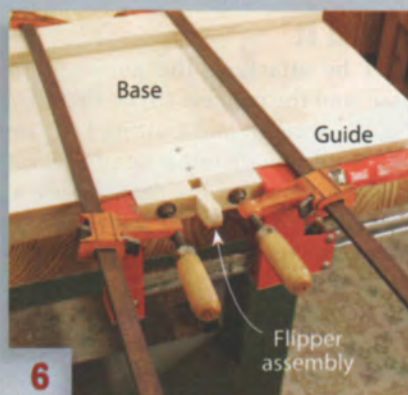
3 Drill a hole through each adjustment block and flipper block. Provide additional support to securely hold these narrow pieces.



4 Create a housing for the captured nut in each adjustment block by drilling overlapping stopped holes.



5 Glue the adjustment blocks to the front of the sled, spaced 6" and flush with the bottom.



6 Glue the flipper assembly to the base, flush with the guides.

into the nut. Center the adjustment blocks 6" apart on the front edge of the sled and glue them in place, flush with the bottom of the sled (**Photo 5**).

Cut out the flipper blank (K) and drill a 1/4" dia. hole at one end, aligned with the holes in the flipper blocks. Then round both ends of the flipper. Slide the dowel (L) through the flipper and install both flipper blocks without glue. Test the flipper's operation by setting the assembly against the fence on the sled and making sure the flipper doesn't rub against the mounting surface. Adjust

the shape of its back end if necessary. Then center and glue the flipper assembly to the front of the base (**Photo 6**). Press the blocks against the flipper, but make sure the flipper flips.

Install the fixture by fastening its base to your drill press. I keep a wooden table mounted on top of my drill press's metal table, so the base of this fixture simply screws into the wooden table. I use the same screw holes each time, so the fixture is always correctly positioned. Place the sled in place on the fixture's base and you're ready to cut some mortises. 

Cutting List

Overall dimensions:
4-3/4" H x 25-17/32" W x 17-1/2" D

Part	Name	Qty.	Material	Th x W x L
A	Guide	2	Plywood	3/4" x 2-1/2" x 24"
B	Base	1	Plywood	3/4" x 15" x 24"
C	Runner	2	Plywood	3/4" x 1-1/2" x 24"
D	Sled	1	Plywood	3/4" x 15" x 24"
E	Fence cleat	1	Plywood	3/4" x 3" x 24-1/32"
F	Fence face	1	Plywood	3/4" x 2-1/2" x 24-1/32"
G	Guide block	2	Plywood	3/4" x 1-3/8" x 3-3/4"
H	Adjustment block	2	Hardwood	1" x 1" x 3"
J	Flipper block	2	Hardwood	1" x 1" x 2-1/4"
K	Flipper	1	Hardwood	1/2" x 3/4" x 2-1/2"
L	Dowel	1	Hardwood	1/4" dia. x 3"



Jim Stack worked for 20 years in commercial cabinet-making and furniture making shops. He has written seven woodworking books and most recently was senior editor of *Popular Woodworking* books.

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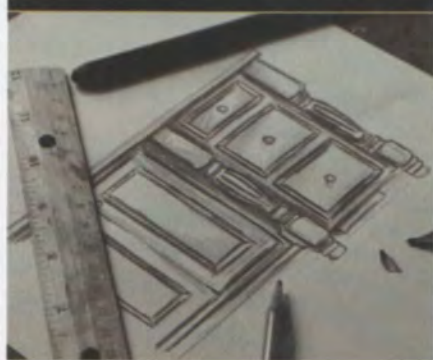


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Mouse House

An ideal project for learning how to make a bent lamination.

by Stephen Higginbotham



A MOUSE NEEDS A NICE HOME TOO, doesn't it? At least, that's what a friend had in mind when she asked me to design a little house to cover a mouse-chewed hole in her baseboard. She wanted to turn a lemon into lemonade, I guess.

The project turned out so well that I've made more as gifts. The tale of how the mouse house came to be goes with the gift, too, and always makes people laugh.

As far as the woodworking goes, though, this is a serious project. Using few materials, it's an inexpensive way to learn the fundamentals of making a bent lamination (a curved part that's built up from thin layers of wood). With this skill in hand, you can design and build much larger and more ambitious curved furniture.

To build the mouse house, you'll need to make a hot-pipe bending jig (see page 53). You'll also need a vacuum bag, which you can buy or make yourself (see Sources, page 56). Cheese is optional.

Make a bending form

The outside of the mouse house, which I'll call the arch, is composed of four layers of 1/16" thick veneer glued together (see Sources). To make the arch, you'll need a form to bend the veneer to the correct shape. Let's start by building the form.

First, make a full-size drawing of the arch (Fig. D), or download the drawing from the AW website and print it out. Cut a rectangular piece of 1/4" MDF or plywood the same

width and length as the pattern. Glue the pattern to the wood. Cut the curved portion with a scroll saw or coping saw, making a template (Photo 1). Smooth the curve with a file or sandpaper.

To build up the bending form, cut seven pieces of 3/4" MDF or plywood 1/8" longer and wider than the template. Glue and nail the template to one of these pieces with an even overhang all round. (You'll be cutting into this block later, so don't put any fasteners in the "No Nail Zone"—see Fig. E). Using a flush trim bit in a router table, rout the 3/4" piece so it's even with the template on all sides (Photo 2). Repeat the same process with four more 3/4" pieces, gluing, fastening and routing them one at a time.

The procedure for attaching the last two 3/4" pieces is a bit different. Glue one piece on top of the 1/4" template, then glue the other on top of the 3/4" pieces. Don't use any fasteners for either of these pieces. Rout both pieces flush. Cover the entire block with wide packing tape so glue won't stick to it.

Bend the arch

At 1/16" thick, the veneer you'll be using to make the arch is too stiff to bend around the form. This problem has a clever solution: a hot-pipe bending jig (Photo 3 and Fig. B). Using this device, you'll bend each piece of veneer into a U-shape before gluing them together on the form. Heat applied to wet wood does the trick, in much the same way that steam allows you to bend thicker pieces of wood into a permanent curve.

Cut the arch pieces (A) to rough size (see Cutting List, page 54). Soak them in water for about 15 minutes before bending. Secure the jig in a vise or clamp it to the benchtop. Light the torch, adjust the flame to low and secure the torch in its cradle. The nozzle should extend 1" or so inside the pipe. After a few minutes, dribble some water on the pipe. If the droplets boil in place, the pipe isn't hot enough; when the droplets skitter off, you're good to bend.

The bending technique is fairly simple (Photo 4). Be sure to keep the wood moving to avoid scorching. Remove the piece now and then and place it back in the water for a few seconds to re-wet it. Keep the bending form handy so you can eyeball the radius you need. The pieces don't have to match the form perfectly—close is good enough. When you're done with each piece, place it on edge to dry. Let all the pieces cool for several hours.

You'll use a vacuum bag to further bend the veneers to match the form. Getting everything ready to slide into the bag takes a few minutes, so I use Pro-Glue Veneer Bond, which has a long open time (see Sources). To start, place the form on a large piece of clear plastic sheeting. Coat the pieces with glue using a wide plastic putty knife and stack them on the form (Photo 5). Tape the pieces to the form so they don't shift. Wrap the form in the plastic sheet and secure it with tape. (The sheet prevents glue from adhering

The outside of the mouse house is made from four layers of 1/16" thick veneer, glued and bent over a form. Begin making the form by sawing out a template. Nail the template to a second piece of 3/4" MDF, slightly oversized.



Rout the second piece flush with the template. Add another piece of MDF and repeat the process. Keep on adding pieces, one at a time, until the form is 8 layers thick.



Set up a jig to pre-bend the veneer. The jig is basically a piece of steel pipe that's heated by a propane torch. Soak the veneer pieces in water before bending them on the jig.



Place each piece of veneer onto the pipe and slowly bend the wood into a curve. Back up the veneer with a piece of sheet metal to trap steam coming off the wet wood. After cooling, the wood will retain its bent shape.



For more information on using a hot pipe bending jig, go to AmericanWoodworker.com/WebExtras



Fig. A Exploded View

Fig. C Door Pattern

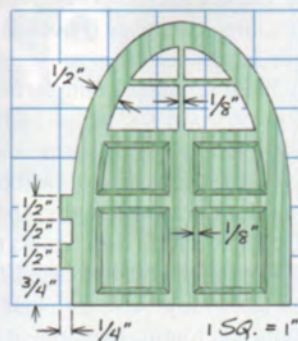


Fig. D Bending Form Pattern

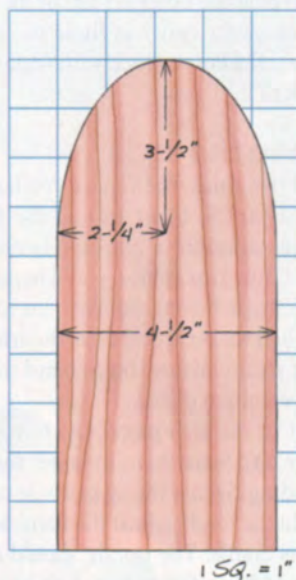
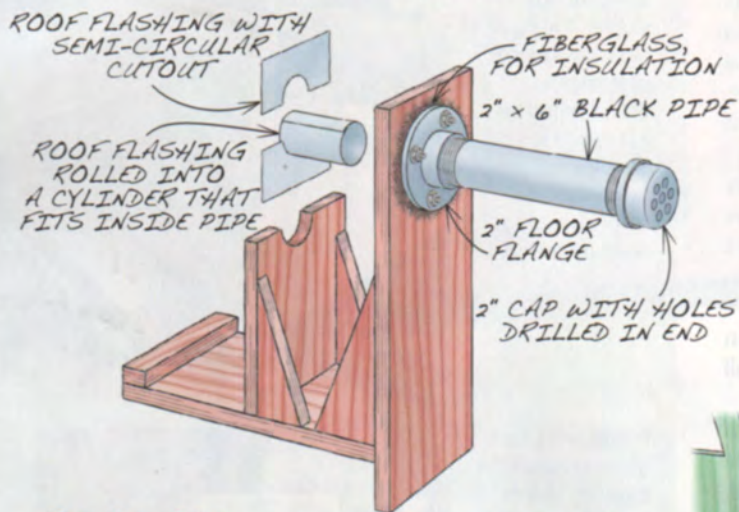


Fig. B Hot Pipe Bending Jig



Download full-size patterns for the bending form and door at AmericanWoodworker.com/WebExtras

Fig. E Bending Form

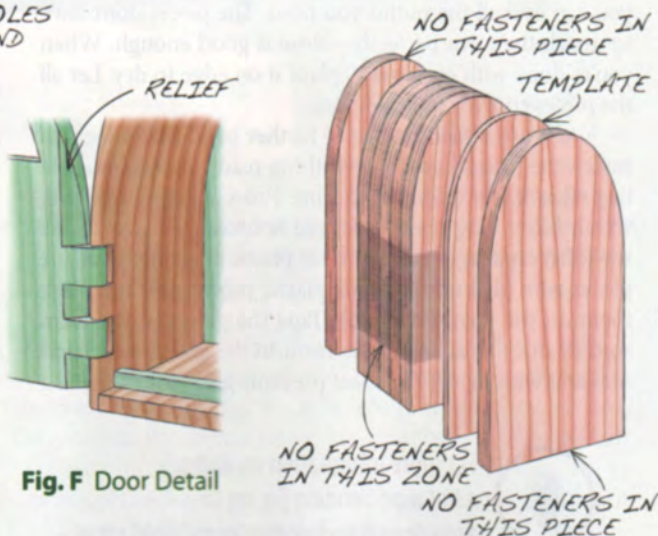


Fig. F Door Detail

Cutting List

Overall Dimensions: 6-5/16" H x 5" W x 4-1/4" D

Part	Name	Qty.	Material	Th x W x L
A	Arch	1	Veneer	1/4" x 4-1/4" x 6-5/16" tall (a)
B	Bottom	1	Solid wood	1/4" x 4-5/8" x 4-1/4"
C	Back	1	Solid wood	1/4" x 4-5/8" x 5-15/16"
D	Door	1	Solid wood	3/8" x 4-3/4" x 5-3/4"
E	Stop	1	Solid wood	1/4" x 1/4" x 4-1/2"
F	Hinge pin	1	1/8" rod	1/8" dia. x 2-3/8"

Notes:

a) The arch is glued up from 4 pieces of 1/16" x 5" x 20" veneer.

Coat the pieces of veneer with glue and place them on top of the bending form. Tape them to the form so they won't slide around, then wrap the whole assembly in plastic.



Compress and bend the veneer by using a vacuum bag. Once all the air is removed from inside the bag by a pump, normal air pressure will squeeze the bag and the veneer tight around the form, making a stiff arch.



to the vacuum bag.) Place the form in the vacuum bag and turn on the compressor (**Photo 6**). Leave the form in the bag overnight to give the glue time to cure.

Remove the form, unwrap the plastic and remove the tape. Center the arch on the form, if necessary, and nail it to the form along the bottom edges of both sides.

Build the house

Rip both sides of the form to cut the arch to final width (**Photo 7**). (You must use a bandsaw—this is not a safe operation on the tablesaw.) Clamp the form to the fence of a miter saw and cut the arch to final length (**Photo 8**). Remove the arch from the form. Sand inside the arch (a spindle sander works well) to remove any glue that has seeped through.

On the router table, cut a 1/16" deep rabbet inside the ends of the arch (**Photo 9**). To do this, I replace the bearing on the end of my flush trim bit with one that's 1/8" smaller in diameter, but you can also use a rabbeting bit, which usually comes with a set of bearings for making rabbets of different depths. Cut a similar rabbet all the way around the inside back of the arch.

Next, prepare stock for the bottom (B), back (C) and door (D). You can make these pieces from solid wood or, to guarantee that their grain and color matches the arch, laminate them from additional pieces of 1/16" veneer.

Cut the bottom piece to width and length (note that the grain goes from front to back). Stand the piece upright, clamp it to a large block and cut a rabbet on its back end. Glue the bottom to the arch (**Photo 10**).

Cut the back piece about 1/2" oversize in width and length. Place the house on top of the back and trace around inside the rabbets. Cut the curve and fit the back to the house, but don't glue it in yet.

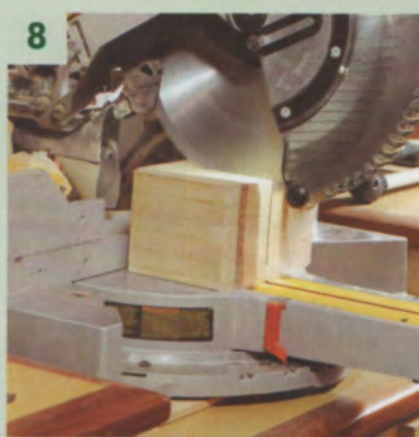
Make the door

Cut a rectangular blank for the door—make it exact width and about 1/2" extra long. Mark its front face. Place the house on the door and trace around the arch. Next, using a square and a marking gauge, lay out the hinges on the side of the door (Fig. C). Cut out the hinges, using a fine-toothed handsaw for the crosscuts and a fret saw or coping saw for the rip cuts.

Rip the front and back of the form using your bandsaw, equipped with a fence. This is the easiest and safest way to cut the house's arch to width.

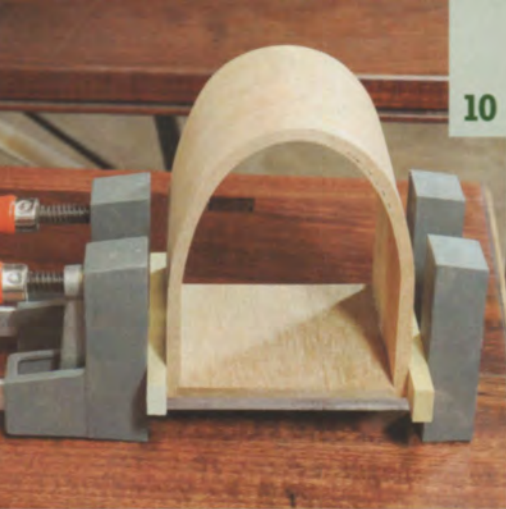


Crosscut the form to length. After this cut, remove the arch from the form.



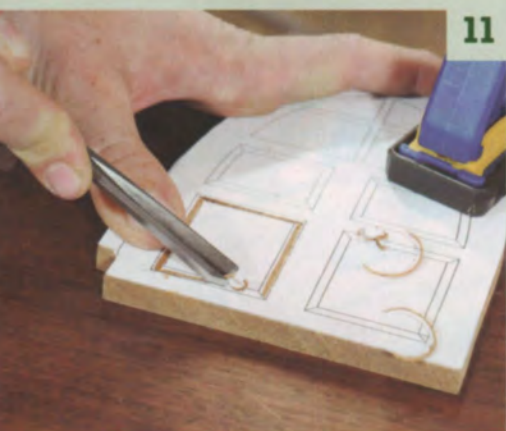
Rout shallow rabbets on the bottom and back side of the arch.





10

Glue a bottom to the rabbets.



11

Make the door from a single piece of wood. Carve the panels with a V-gouge and cut out the windows on a scroll saw.



12

Trace around the door's hinges with a knife.



13

Saw out notches for the hinges. Make sure the door fits OK, then round over the ends of the hinges, so the door can rotate. Round over the front of the arch, as well.

Saw the door's curve. Draw the door's panels and windows directly on the door, or download the pattern from the AW website, print out a copy and glue it to the door. Carve the panels (**Photo 11**) and saw out the windows. Fit the door, then glue on the back piece.

Place the door on the house and trace around the hinges with a marking knife (**Photo 12**). Saw out notches for the hinges (**Photo 13**). Place the door in the notches and drill a 1/8" dia. hole for the hinge pin (F). This hole must be plumb for the door to swing properly, so it's best to use a drill press, with the house clamped to a fence.

Round over the front of the house's arch with sandpaper or, on the router table, with a 1/8" roundover bit. Make a similar roundover on the ends of the door hinges. On the inside of the door, carve a bevel around the hinges (Fig. F). To test how the door swings, cut a 1/8" rod about 2" extra long, coat it with wax and insert it in the hinge pin hole (**Photo 14**). (The rod's extra length enables you to pull out the rod and remove the door for further fitting).

Once the door swings correctly, glue the stop (E) in place. Cut the hinge pin to final length and permanently hang the door. Finish the house with a wiping oil, then add a knob to the door (see Sources). 



Stephen Higginbotham is a 21-year-old woodworker from Houston, Texas. He's been working wood for about five years.

SOURCES

- Certainly Wood, certainlywood.com, 716-655-0206, 1/16" veneers in various species, call to place an order.
- Woodcraft, woodcraft.com, 800-535-4486, Pro-Glue Veneer Bond Dry Resin, #146191, 6 oz., \$6.99; Brusso MC-428 Small Box Knob, #150797, \$4.50.
- Veneer Supplies, veneersupplies.com, (no phone), kits and instructions for making a vacuum bag.



14

Drill a hole through the hinges and insert a 1/8" rod into the hole. Open the door and host an open house for a mouse!

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Bellflower Inlay

Once you know the secret, this technique is surprisingly easy to learn.

by Mario Rodriguez

A TOUCH OF WHIMSY. That's how I see bellflowers—as an elegant flourish to the linear stringing commonly found on Federal era furniture (1790-1830). Cabinetmakers embellished chairs, tables and sideboards with many variations of the bellflower design, adding a touch of nature to strictly geometric shapes.

While they may look complicated, bellflowers are really just composed of two elements: petals and dots. Some period makers cut the three-petaled flowers with a fretsaw as a single piece, but I prefer a simpler method. I cut every petal as an individual piece, using a carving gouge. The curve of the gouge automatically yields the same shape, petal after petal. I make the dots the same way—with a gouge.



The Portsmouth Card Table

This article is the second in a series on making a masterpiece of American design from the Federal period (1790-1830). In this series, I'll be showing you how to make banding, shade veneer with hot sand, cut and lay thick veneer on straight and curved surfaces, and make a knuckle joint. In the first article (AW #157, Dec./Jan. 2012), I showed you how to make stringing inlay.

I'll give you the plans for the entire table at the end of the series. I also teach a Master Class on making the table at Philadelphia Furniture Workshop (PhiladelphiaFurnitureWorkshop.com). Join me!

—Mario Rodriguez



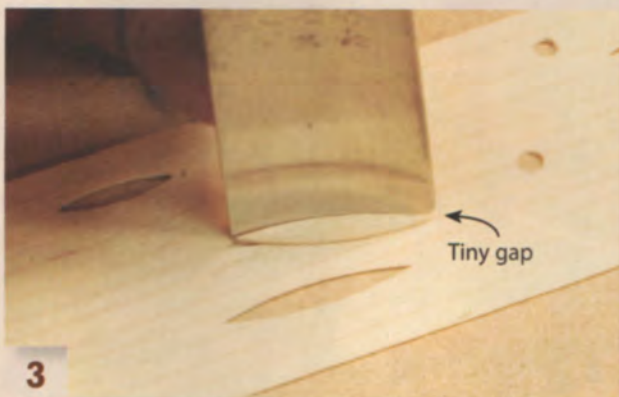
1

Bellflowers are composed of two simple elements: petals and dots. You'll make both using just a few carving tools. Start by cutting a dot from a piece of veneer using a 3mm #9 gouge.



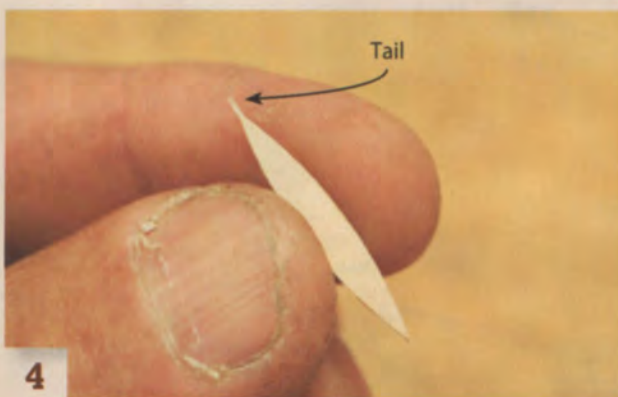
2

Outline the recess for the dot using the same gouge. Remove the waste with a 1/8" chisel and glue in the dot.



3

Cut out the center petals with a 25mm #5 gouge. Make them slightly oversize by leaving a small gap at one end of the second cut.



4

Look for a small tail on the end of the petal. This tells you that it's just the right size.

Tools

You won't need any exotic or expensive tools for this work—just a few carving gouges, a couple of narrow chisels and an X-Acto knife.

To make the dots, I use a 3mm (1/8") #9 sweep gouge. For the large petals, I use a 25mm (1") #5 sweep gouge; for the small petals, a 16mm (5/8") #5 sweep gouge. Gouges that are close to these sizes will work fine, too. The corners of the gouges must be square and sharp, not rounded or eased.

Materials

I make bellflowers from thin pieces of maple or holly. These woods yield clean outlines and are unlikely to split when cutting out the dots and petals. Look for wood with straight, even grain and little variation in color.

I use material about 1/32" thick, sawn from a board. (Standard veneer will also work, although it's a bit thinner.) It's easy to punch all the way through pieces this thin with a gouge. I prefer working with stock on the thick side because it locks into place so well. And if the petals and dots end up slightly proud, I've got plenty of material to scrape or sand flush.

Bellflower design

After studying many different bellflower designs, I've come to favor slender petals that are shaped like grains of rice. These

can be arranged to hang almost parallel with one another to resemble a dormant bud, or with the petal spread wide to suggest a flower in full bloom.

I designed a string of three bellflowers for the legs of the Portsmouth card table. The first flower, at the top, has three large petals. The next petal down has a large center petal and two smaller side petals. The third flower and the pendant hanging below are composed entirely of small petals. Between each bellflower and the pendant is an accent dot. This arrangement is modest and restrained, in keeping with the overall design of the table.

Start with a dot

Cut the dots with the #9 sweep gouge (**Photo 1**). Hold the gouge perfectly vertical and push down hard or tap it with a mallet. Partially overlap the cuts—it takes three or four stabs to come full circle and produce a perfectly round 3/32" dot.

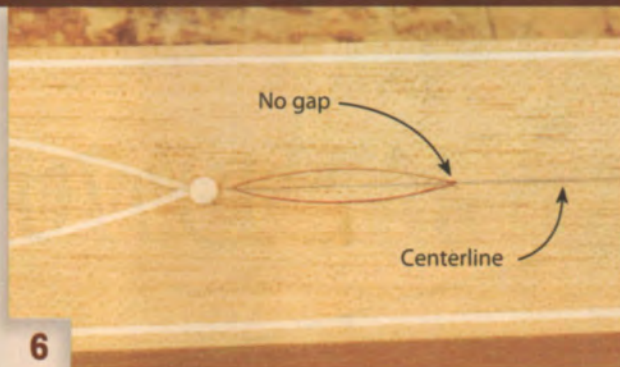
Draw a centerline on your workpiece to align the dots and center petals. On the Portsmouth leg, the first dot is located at the end of the stringing inlay.

Cut a recess for the dot using the #9 gouge; this time, hold the tool so its bevel is perfectly vertical. Carefully pick out the waste using a 1/16" chisel. If the bottom of the recess is irregular or slightly deeper than the thickness of the dot, don't worry—glue will fill the gaps.



5

Heat each center petal in hot sand to shade one end. This technique adds a "shadow," making the petals look three-dimensional.



6

Outline the center petal with two cuts along a centerline, using the same 25mm #5 gouge. This time, make both ends of the cuts meet. WhereWeShare.com



7

Remove the waste inside the petal with a 1/8" chisel. The bottom of this recess doesn't have to be perfectly flat.



8

Glue in the petal.

Fill the recess with yellow glue. Level the glue with a razor blade and remove any excess from the surface of the wood. Place the dot, with the grain vertically oriented, into the recess and flush with the surrounding wood (**Photo 2**).

Add the center petals

Like the dots, both the petals and their recesses are cut with the same gouge to ensure a perfect match. But unlike the dots, you'll cut the petals a bit larger than their recesses, so they're sure to fit tight.

Here's how you do it: Holding the gouge perfectly vertical, make the first cut into the wood, parallel to the grain. For the second cut, align one corner of the gouge with one end of the first cut. Position the other corner of the gouge slightly away from the first cut (**Photo 3**).

This method produces a petal with a tail (**Photo 4**). The tail indicates that the petal is just the right size.

I usually cut all the petals, large and small, at the same time—and quite a few extras, so I can pick the best. Then I shade some of them in hot sand (**Photo 5**; see "Sand Shading," page 61).

Next, make the recess for the top center petal. Start the first cut about 1/8" below the dot. Position the gouge so that both of its corners touch the centerline. Hold the gouge so its bevel is perpendicular and press hard, making a cut that's 1/16" deep.

For the second cut, position the gouge so its corners precisely meet up with the ends of the first cut (**Photo 6**). Remove the waste with a small chisel (**Photo 7**).

Set a shaded petal into the recess (**Photo 8**). Because the petal is a bit larger than its recess, you may have to press it in with a small block of wood to get it flush (**Photo 9**).

Continue down the centerline: Dot, petal, dot, petal and pendant. When you're done letting in all of these parts, let the glue dry for at least 12 hours. (Thick areas of glue in a recess with an irregular bottom need a long time to dry hard.)

Add the side petals

Lay out the angles of the side petals. (On this leg, the side petals are angled about 20° to 25°.) Using a sliding bevel, draw centerlines on both sides of the center petals (**Photo 10**). The ends of these lines should intersect the top of the center petal.

Outline the side petals using the same method you used for the center petals (**Photo 11**). The inside cuts will remove a small portion of the center petal. That's OK—the center petals will then look like they're sitting behind the side petals, and their shading will enhance the effect. Glue in the side petals—note that they are not shaded (**Photo 12**).

Wait overnight for the glue to dry, then level all the petals with a card scraper and sandpaper. 



9

Press the petal flush with a small block of wood. It should fit tight, because it's cut a bit oversize.



10

Lay out the centerlines of the side petals with a sliding bevel.



11

Outline the side petals. They intersect the top of the center petal.



12

Glue in the side petals. Bellflowers were originally arranged in many different ways. Now that you know the secrets behind making them, have fun experimenting!

Sand Shading

People are always curious about the shaded petals in the bellflowers. I make them with hot sand, the same method employed by cabinetmakers 200 years ago. After placing a maple or holly petal in hot sand for a few minutes, the wood gradually changes color along its length, from dark to light. Here's what you need for this very low-tech process:



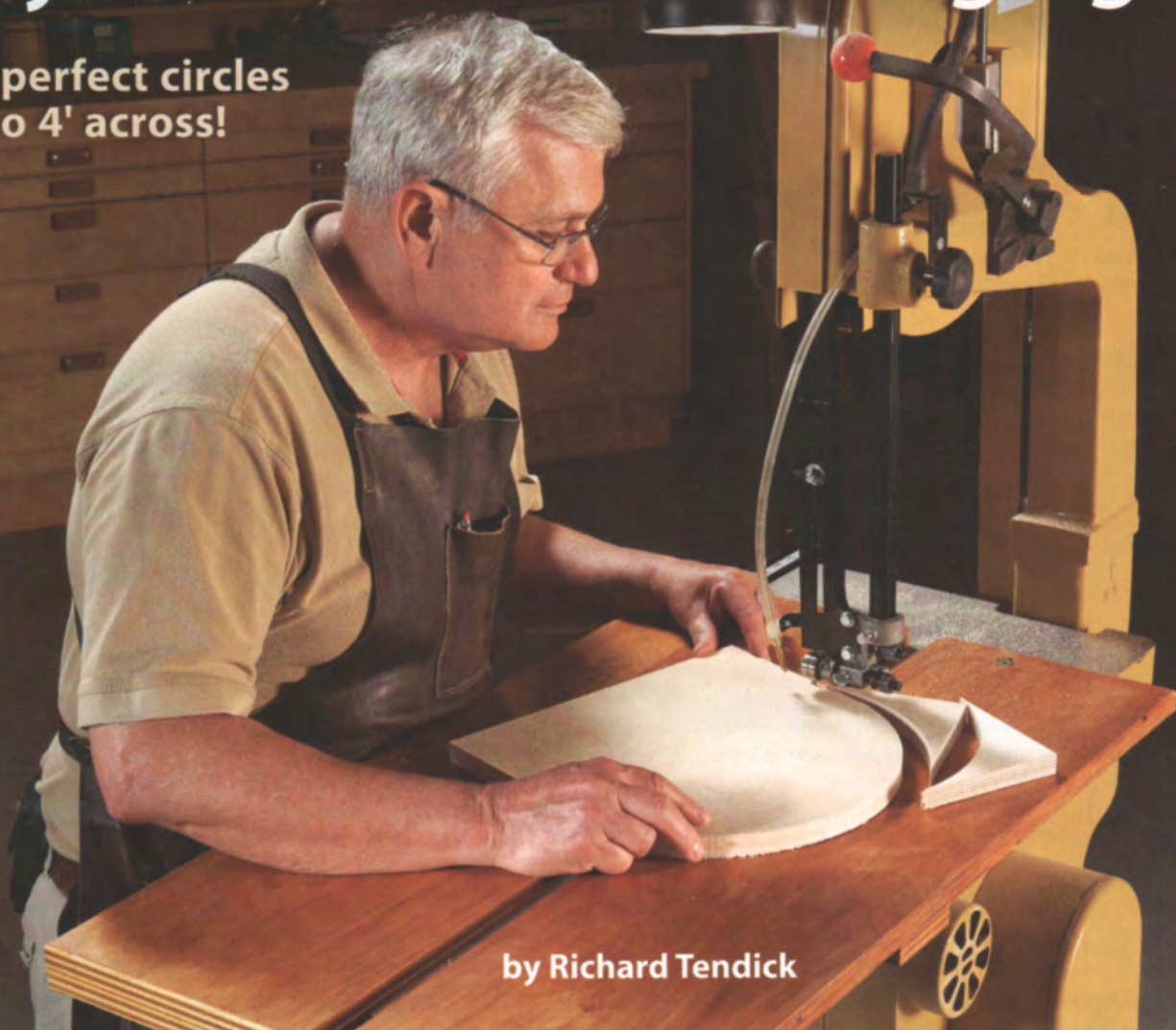
- **A hot plate.** Buy one at any home improvement center or hardware store.
- **A shallow metal container.** I use a small-diameter cast-iron skillet because its thick bottom delivers even heat. Caution: Don't use a thin metal pie plate; if it becomes too hot, it might melt.
- **Playground sand.** Buy it at a garden center. Make sure the sand particles are of uniform size. Large particles might burn your veneer unevenly.
- **A pair of tweezers.** The sand will become too hot to touch, so you'll need tweezers to handle the petals.

Set up your hot plate and metal container on a stable surface, clear of any flammable materials. Fill the container with about 1" of sand. Vary the depth of the sand a bit. If you place a petal in an area with less sand and closer to the heat source, you'll get a more pronounced burn; if you place a petal in an area with more sand, farther from the heat source, you'll get more subtle shading. The length of time you leave the petal in the sand will also affect its color.



Adjustable Circle-Cutting Jig

Cut perfect circles up to 4' across!



by Richard Tendick



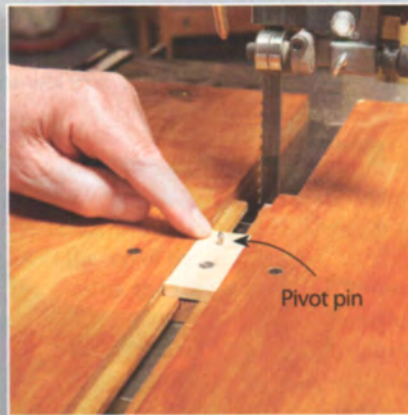
Easy to mount

Just slide the jig across the bandsaw's table until a bar drops into the saw's miter slot. Done!



Stays put

Two large rare-earth magnets hold the jig—enough force to support three full paint cans. No legs are necessary.



Easy to adjust

To change the size of the circle you want to cut, just move this sliding block. The wood rotates on a pin sticking up from the block.

HAVE YOU EVER tried to cut a circle on a bandsaw, freehand? It's quick, but it sure isn't exact. Dollars to doughnuts you'll get flat spots or bumps that are a pain to sand out. Big circles are really tough to get right.

Fortunately, there's a clever solution. If you rotate the wood on a fixed pivot point, like a record on a turntable, you'll be able to make a circle that's just about perfectly round, needing very little cleanup work.

Jigs that can provide this pivot point have been around for a long time, but I've never been satisfied with their design. They're hard to mount, hard to adjust and can't handle large pieces. This jig solves all three problems. No bolts or clamps are necessary to mount it on your saw. Using just a screwdriver, the pivot point can be adjusted to any radius you desire. And it makes circles as small as 1-1/2" across all the way up to 48" in diameter.

Make the sliding block

As with all jigs and projects, purchase the hardware first (see Hardware Shopping List, page 64). Begin building the jig by starting with the block that holds the pivot pin. The block is composed of two pieces (A and B) that are clamped together with a machine screw. Although these pieces are quite short, it's best to make them from blanks that are about 12" long, for safety when machining them. First, mill both blanks to final thickness and rip them to final width.

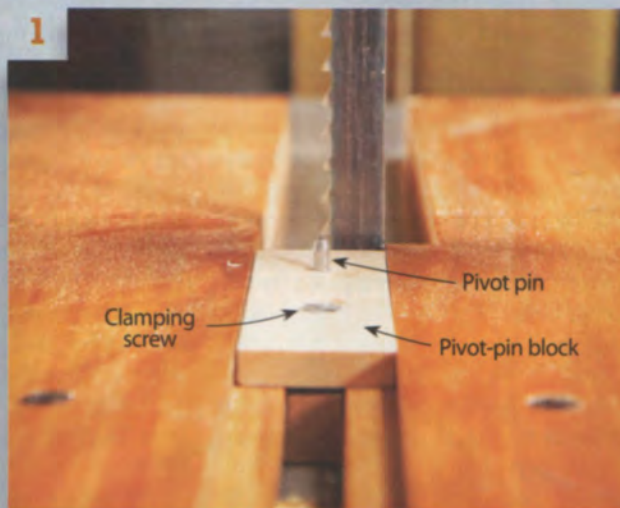
Using a router table or a dado set, cut rabbets on both sides of the bottom piece (B, Fig. B, page 64). Next, drill a shallow counterbore for the head of a T-nut in the center of this piece, opposite the rabbets. (It doesn't matter where you drill the hole along the blank's length; you'll trim off the ends later.) Drill a 1/4" dia. hole through the center of the counterbore. Place the bottom piece above the top piece (A) and continue the hole. Countersink the top piece to receive a 10-24 machine screw. Install the T-nut and clamp the two pieces together with the screw.

Make the pivot pin. You can use 1/8" dia. welding rod or cut off the end of an old 1/8" drill bit. Test the fit of your pin in a 1/8" dia. hole—it should be tight. Drill the hole for the pivot pin

Align the pivot pin with the front of the blade when you place the jig on the saw. Next, move the pivot-pin block the correct distance from the blade (the radius of the circle you'll be cutting). Lock the block in place by tightening its clamping screw.

How It Works

1



Make a square blank the same size as the circle you're going to cut. Drill a shallow hole in the center of the blank, on the bottom side, that's the same diameter as the pivot pin. Place the blank on the pivot pin, flush with the blade. Turn on the saw and rotate the blank to cut the circle.

2



Drill Test Holes for the Magnets

Drill the holes for the magnet cups very carefully. The depth has to be just right, so the magnets will be perfectly flush with the surface. Make some test holes in a piece of scrap before you drill into your jig.



all the way through the top piece and partially into the bottom piece. Cut both pieces to final length.

Make the top

Cut the top pieces (C) to final size. Mill the rabbets that will receive the pivot-pin block (Fig. C). (Note that the top and bottom rabbets are cut at different depths.) On the right piece, cut a notch for receiving the bandsaw's blade (Fig. A). On both pieces, drill holes for the rare-earth magnet cups. The depth of this hole is critical, so drill some test holes in a scrap piece that's exactly the same thickness as the plywood you used for the top pieces (see "Drill Test Holes for the Magnets," p. 63). For maximum hold-

ing power, it's important that the magnet be flush with bottom of the jig. Drill the holes for the machine screws that will hold the cups, then flip the pieces over and counterbore holes for the T-nuts using a Forstner bit. Install the magnet assemblies.

Make the cleats (D) and miter-slot bar (E). Cut a 1/16" deep dado in the top center of each cleat to provide clearance for the pivot-pin block (Fig. A). Make the bar so it fits snug in your saw's miter slot. Chamfer the bottom edges of the bar.

Fasten the cleats and bar to the tops. To space the top pieces, install the pivot-pin block at one end of the rabbets; place a cutoff from the block at the other end. Clamp across the assembly,

then install the cleats. Install the bar last—it must be perfectly square to the jig. Finally, install the pivot pin.

When cutting a large circle on your bandsaw, you may find that the cast-iron table will tip, no matter how hard you've tightened the trunnion knobs. The fix is simple: just install a shop-made device that clamps the table at 90°. I'll show you how to do that at AmericanWoodworker.com/WebExtras. 

SOURCE

Lee Valley, leevalley.com, 800-871-8158, Rare-earth magnets, 3/4" x 1/8", #99K32.11, \$7.20 for 5; 3/4" mounting cups, #99K32.54, \$1.40 ea.

Fig. A Exploded View

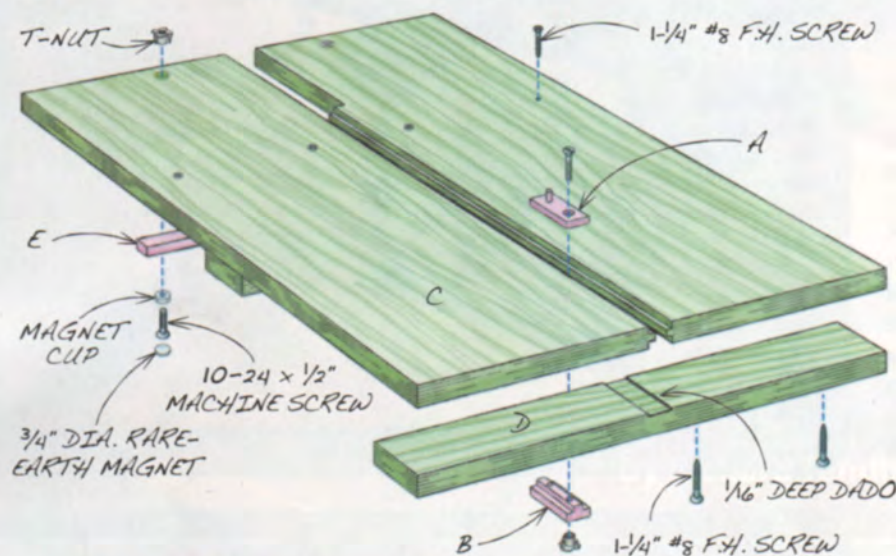
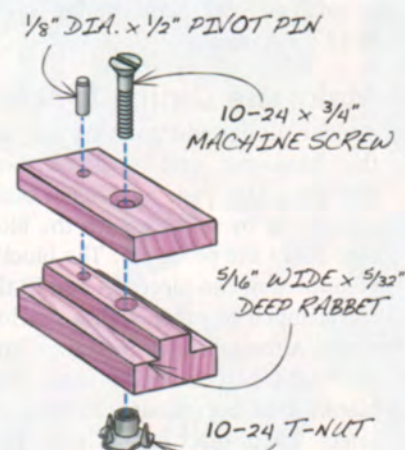


Fig. B Sliding Pivot Bar



Cutting List

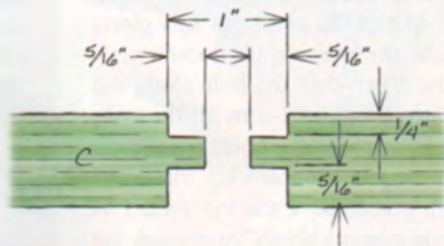
Overall Dimensions: 1-1/2" x 20" x 33"

Part	Name	Qty.	Material	Th x W x L
A	Top of pivot-pin block	1	Maple	7/32" x 1" x 2-1/2"
B	Bottom of pivot-pin block	1	Maple	7/16" x 1" x 2-1/2"
C	Top	2	Plywood	3/4" x 9-13/16" x 33"
D	Cleat	2	Plywood	3/4" x 3" x 20"
E	Bar for saw's miter slot	1	Maple	3/8" x 3/4" x 20"

Hardware Shopping List

- 2 3/4" Rare-earth magnets
- 2 3/4" magnet cups
- 3 10-24 T-nuts
- 2 10-24 x 1/2" machine screws
- 1 10-24 x 3/4" machine screw
- 1 1/8" x 1/2" rod or substitute
- 12 1-1/4" x #8 flat head screws

Fig. C Cross Section of Top



Learn how to tune up a bandsaw and make a lock to prevent your table from tipping at AmericanWoodworker.com/WebExtras

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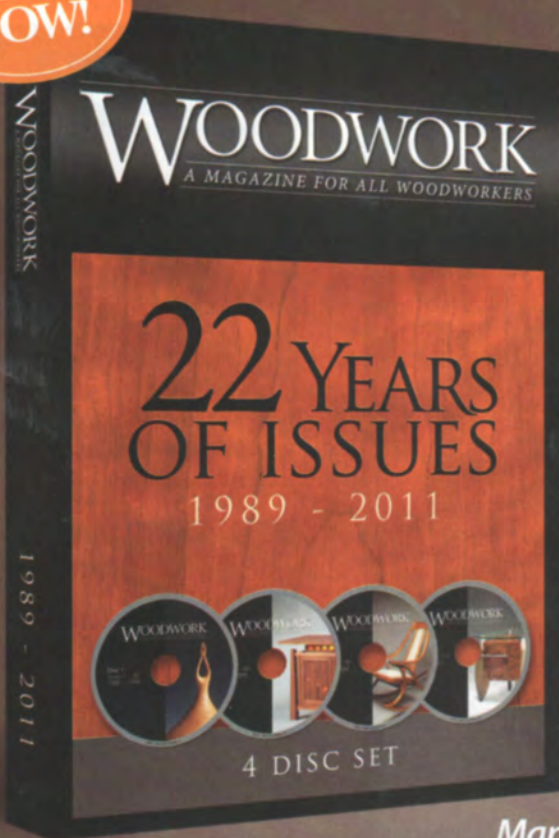
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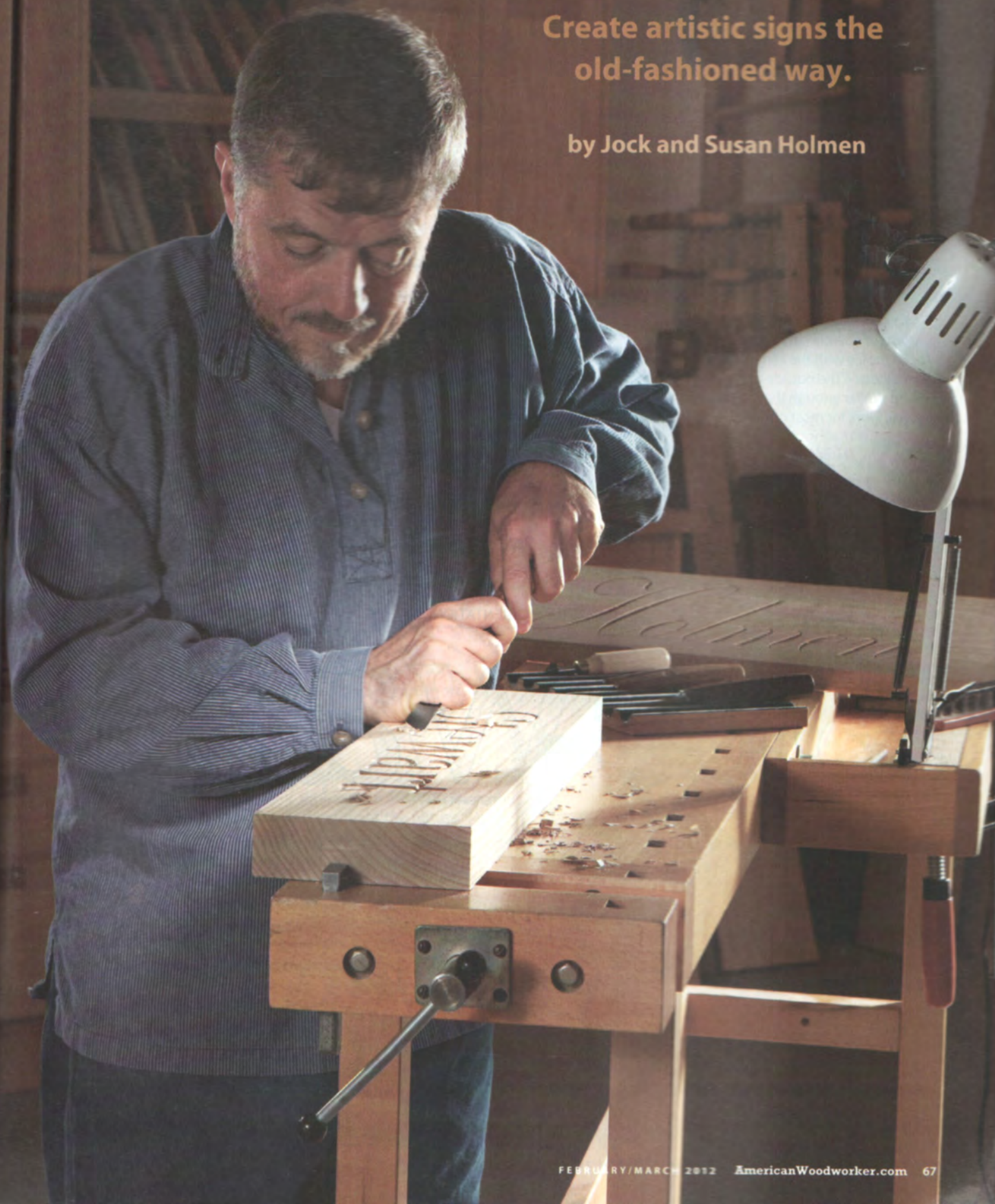
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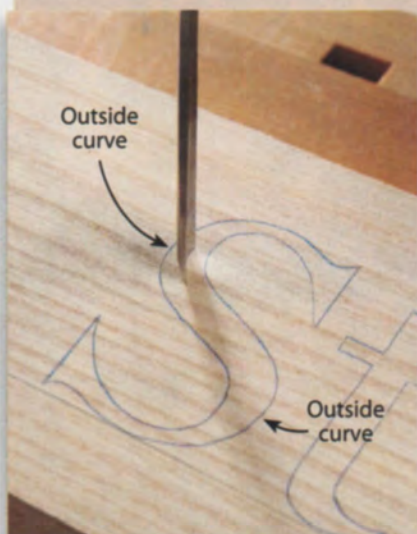
Carving Incised Letters

Create artistic signs the
old-fashioned way.

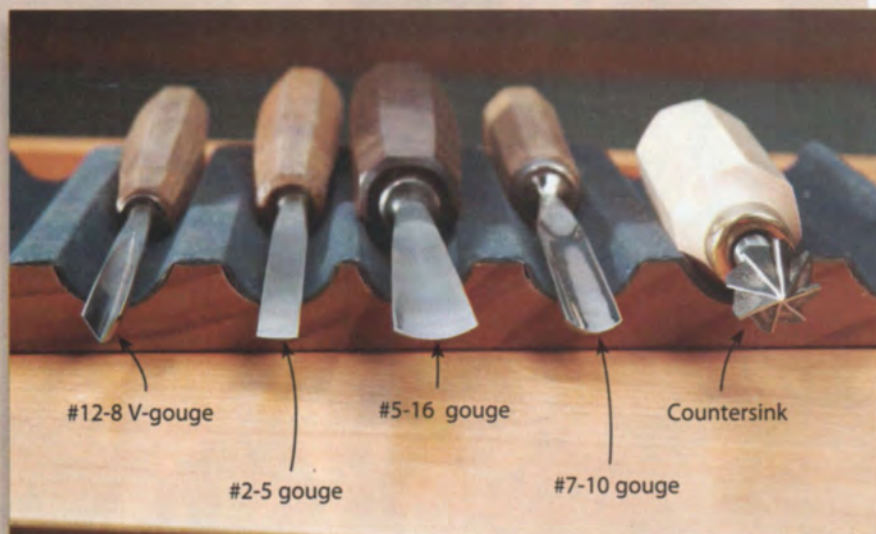
by Jock and Susan Holmen



Choosing Carving Tools



Choose a gouge to carve the letters' outside curves by matching its profile with the centerline of the letter. The outside curves will be similar enough that one gouge will work for most of them.



Only five tools are required to carve the 3" Georgia font shown in this story.

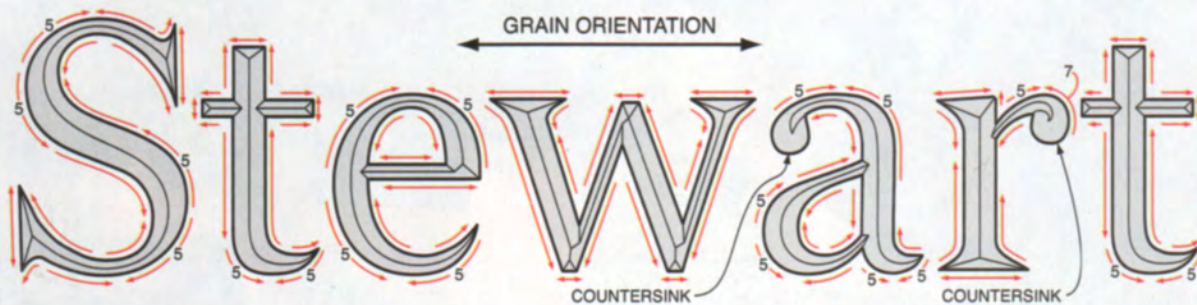
- A #12-8 V-gouge to establish the center of each letter.
- A #2-5 gouge to carve the straight shoulders and inside curves.
- A #5-16 gouge to carve the outside curves.
- A #7-10 gouge to match the tight dots found in some letters.
- A hand countersink to shape dots and rounded ends of letters.

(See Fig. B, page 70, to learn about carving gouge terminology.)

Fig. A Directions for carving the beveled shoulders

Incised letters are v-cut. Take care to follow the grain when you define the letters' outside edges and shape their beveled

shoulders by carving in the direction of the red arrows. Make all cuts with a #2 gouge, unless noted.



Georgia font, 3" letters

YOU CAN CHURN OUT lettered signs by the dozens with a router and a set of letter templates or produce them by the hundreds with a CNC machine. So why use any other method? Because routing with letter templates limits font choices and letter sizes; and CNC equipment is costly for the average Joe and comes with a difficult learning curve, especially if Joe isn't computer-savvy.

I prefer to carve lettered signs the old-fashioned way, by hand. OK, this method has drawbacks, too. Each carving tool costs nearly twice as much as a set of letter templates, and learning to sharpen and use carving tools takes hours and hours of practice. But this method allows you to create signs without mind-numbing noise or clouds of dust. You can carve letters in any style and add nuances to create depth and interest that's impossible with a router. And you'll have the ultimate satisfaction that comes from mastering a time-honored woodworking skill and using it to create unique works of art.

In this story I'll demonstrate the techniques I use to carve lettered signs. I'll also show how to choose letter styles that will be easy to carve and pieces of wood that will carve easily. The one thing I can't show is the hands-on experience that it takes to become familiar with carving tools and master their use. So if you're inspired to give letter carving a try, I recommend that you take lessons to learn basic skills and sharpening methods.

Choosing stock

The orientation of the grain and the type of wood are the most important considerations when choosing stock for hand-carved lettering. Surfaces with straight grain are the easiest to carve, so look for quartersawn or riftsawn boards. Straight grain running behind the lettering also helps to make the completed sign look straight.

Cedar, redwood, cypress, teak, genuine mahogany and catalpa are good choices for signs that will hang outdoors. For interior signs, basswood is an excellent choice, especially for first-timers. Oak, ash, walnut and maple are more difficult to carve.

Choosing a font

Today's computers make it easy to compare letter styles. To see how any font will look on your sign, open a document, enter the words that will appear and highlight the phrase. Then open the font window and click on the font you want to see. Presto! Click again to compare bold and italic versions. To compare fonts, just re-enter the phrase on a new line, highlight it and select the second font. Use the "font size" window to enlarge the phrases for a better view.

Once you've chosen a letter style and size, print out the phrase to create a full-size template. If the lettering is too large or long for your printer to produce, head to a copy center with a large-format printer.

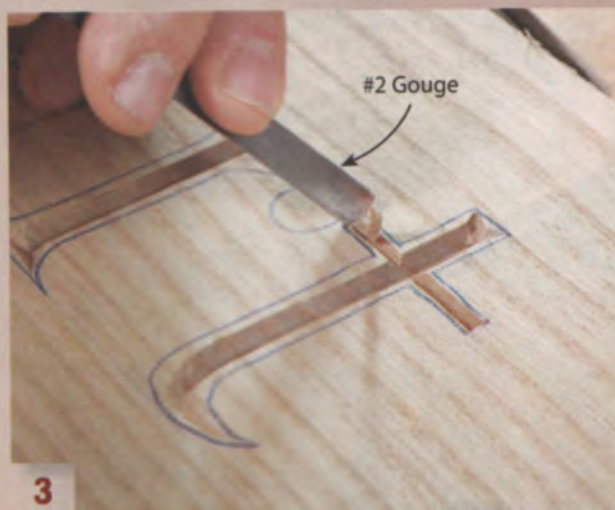
Tape the template to the blank and use carbon paper to transfer the letters. The transferred lines must be clean and crisp. Another option is to tack on the template using non-permanent spray adhesive and carve through the paper. Be sure to completely remove the adhesive when you've finished carving.



Rough out each letter by carving a centered groove. On straight sections, gradually deepen the cut to full depth as you go. Change direction and carve back full-depth to the starting point.



Rough out the serifs by cutting in from the corners. Start shallow and deepen the cut to match the center groove's depth.



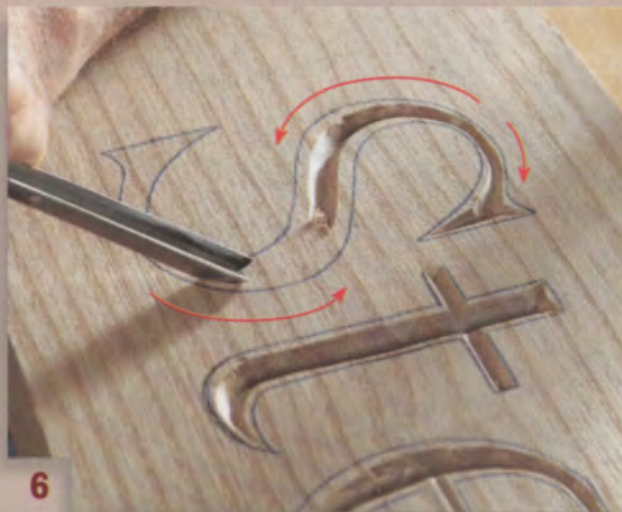
Square the ends of short, narrow stems with the #2 gouge. Note that the grooves in narrow portions of letters are less deep than the grooves in wide portions.



4
Carve the rounded ends of letters such as r and a and dots for letters such as i and j with a hand countersink. Center the countersink on the tightest radius of the rounded portion.



5
On curved sections, a letter often narrows to a point. Adjust the groove's width and depth to match. Work from shallow to deep to create wide sections, then work toward the narrow ends.



6
Carve letters with continuous curves and changing widths in multiple steps, rather than one continuous, undulating pass.

Choose a font that's legible. I find fonts with serifs (those little wings on the ends of letters) are easier to read than sans serif fonts. Complex font styles such as *Lucida Blackletter* are double-trouble—hard to read and tough to carve.

The key to determining whether a font will be easy to carve lies in the letters. Most will have consistent stems and curves in both upper and lower case, so you'll be able to use the same tools and techniques to shape them all.

However, almost every font will include some letters with eccentric shapes that require additional tools or carving methods. Studying these unusual letters is a good way to determine how challenging a font will be to carve. For example, letters such as a, e, f, g, j, r and s often have different curves (tighter or more elongated) than the other letters. Letters with slanted stems require following the grain, because its direction changes on each side of every v-carved shoulder. Letters that extend below the baseline can cause layout problems.

Sometimes, slightly modifying the letters is all it takes to solve the problem. I often make the ends of serifs pointed, for example. But in general, the font with the fewest unusual letters will be the easiest to carve. Georgia—the font shown in the how-to photos—is both legible and uniformly shaped, making it an excellent choice for one's first lettered sign.

Choosing carving tools

Carving gouges come in a bewildering array of shapes, sizes and numbering systems. To keep things simple, all the tools used in this story follow the Swiss numbering system. Within this system, each gouge is named according to its curve (called the sweep) and width (Fig. B, page 70).

Most carvers use a #12 (V-groove) gouge to establish the center of each letter, a skew chisel to shape the straight bevels, and gouges of various sizes to define the inside and outside edges and shape the curved bevels.

My method, honed by feedback from students in my carving classes, simplifies the process and limits the number of carving tools.

I use a #2 gouge instead of a skew, because my students find that it's easier to control. And I stick with the #2 gouge to shape as many of the inside edges, bevels and curves as possible.

To find the correct gouges to define the outside edges and shape the outside bevels and curves, use the centerline of each letter (Photo, page 66, top left). One gouge will work for most of these curves, but a few additional gouges will probably be required for letters with unusual curves. I pay particular attention to the letters g and s. They're typically the hardest to carve, because their curves have smaller radii than the other letters. Another excellent reason for choosing Georgia is that carving it requires only five tools (Photo, page 66, top right, and Sources, page 70). The techniques shown in the how-to photos will allow carving all the letters in Georgia and many other fonts.

It's important to note that changing the size of the font will change the gouges required to carve the curves. For example, the #5-16mm gouge I use to carve most of the out-

side curves in the 3" Georgia letters shown here won't match the outside curves in 5" Georgia letters.

Rough out each letter

Start by using the #12-8 V-gouge to establish the depth and center of each letter. The depth varies according to the letter's width—its widest points will also be its deepest. On straight sections, mark the transition between the stems and serifs as necessary. Then carve a centered groove between them at the full depth of the gouge, which is about 2/3 the height of its v-shaped blade (Photo 1). Grain direction is a minor factor when using a V-gouge. Finish by roughing out the serifs (Photo 2).

In narrow stems, such as the cross on a t or between the angled legs of a capital A, the grooves are less deep. The sweep on a #2 gouge is so slight you can use it to square the free ends of these stems (Photo 3). Why bother to sharpen a straight chisel when a gouge that you already plan to use will do? Another neat trick is to use a hand countersink to create rounded details (Photo 4 and Sources). You'll probably have to slightly alter the carved bevel to match the countersink's bevel where the two bevels meet.

On curved sections, carve at full depth in the widest

By learning the techniques used to carve the letters shown here, you'll be able to carve all the letters in this font and many others

part and gradually become shallow as you move toward the narrower parts (Photo 5). To create fluid curves that remained centered between the layout lines, it's sometimes better to work in stages (Photo 6). The primary goal of this process is to perfectly center the bottom of the groove inside each letter (Photo 7).

Carving

Incised letters are v-cut from the bottom of the groove to the layout lines. It's important to follow the grain when you make these finishing cuts (Fig. A, page 66).

Start by carving the straight sections (Photo 8). Create each shoulder by making several shallow passes with the #2-5 gouge. Hold the gouge at approximately 45°, with its leading edge above the wood and its side resting on the beveled v-groove. Then let the bevel guide the cut. Make sure to keep the tip of the gouge away from the bottom of the groove, as overcutting it will ruin the letter's centerline. Riding the groove's bevel also helps you control the gouge while paring the shoulders to the layout lines. Always keep the leading edge of the gouge above the wood. Make a final cleaning pass at the bottom of the groove (Photo 9). Then use both sides of the gouge to carve the serifs (Photo 10).



7

The goal is to center the bottom of the groove inside each letter. The top edges of the groove don't matter because they'll be pared away in the next step.



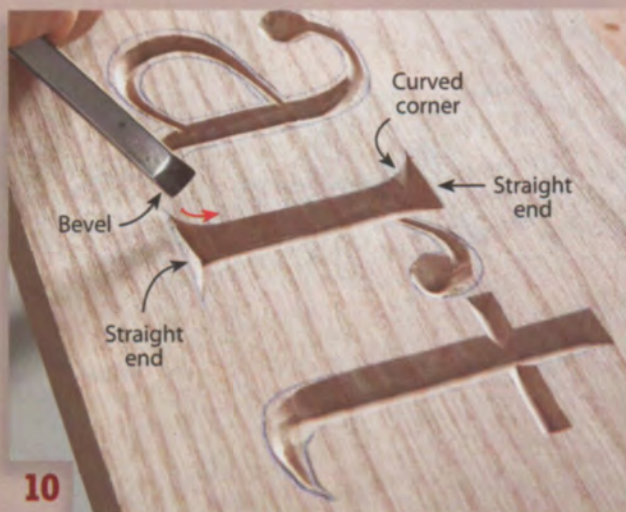
8

Carve both shoulders to create each V-cut letter. Use the #2 gouge to carve the straight sections. Ride the groove's bevel to keep from digging in at the bottom. At the top, pare to the layout line.



9

Make a final cleaning pass to remove the debris at the bottom of the groove that's left by properly riding the bevel in the previous step.



10

Hold the #2 gouge bevel-side-up and use its shallow sweep to help shape the serif's curved corners. Use the same gouge bevel-side-down to carve their straight ends.



11

Use the #5 gouge to carve the outside curves. Cutting straight in from the edge to the center usually does the trick. But a sliding, rotating motion is sometimes necessary to follow an unusual curve.



12

Use the #2 gouge to carve the inside curves. As before, complete the cut by making shallow passes, ride the gouge against the bevel, keep the leading edge above the wood, and follow the grain.

Use the #5-16 and #7-10 gouges to define the outside edges and shape the outside bevels and curves in this 3" Georgia font. Use the #7-10 gauge to shape the small-radius curves found on five lower case letters, f, g, j, r and y. (The letter r appears in the photos, but the other letters don't.) Use the #5-16 for everything else.

Always carve with the grain during this process. Carving against the grain will cause the edges to chip or tear out. Hold the gouge at approximately 45° and cut from the edge to the center.

Some letters have elongated curves that require a slightly different technique (Photo 11). The fluid carving motion these elongated curves require takes time to learn, so practice on scrap stock until it becomes natural.

Return to the #2 gouge to shape the inside curves (Photo 12). Carve with the grain and use the same techniques used to carve the straight sections.



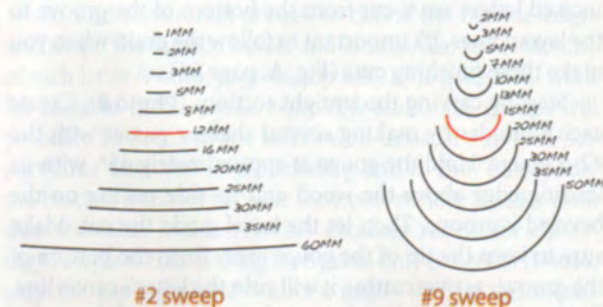
Jock Holmen is a carver from Burnsville, MN.

SOURCES

- Woodcraft, woodcraft.com, 800-225-1153, Pfeil #2-5mm Gouge, #05B06, \$32.99; Pfeil #7-10mm Gouge, #05E03, \$36.99; Pfeil #5-16mm Gouge, #05D06, \$36.99; Pfeil #12-8mm V-Gouge, #05T85, \$34.99.
- Lee Valley Tools, leevalley.com, 800-871-8158, Hand Countersink, 50K62.01, \$19.50.

Fig. B Carving gouge terminology

Each carving gouge is named according to the sweep of its cutting edge (#1–#12) and its width (in millimeters). The two gouges highlighted in red are called a #2-12 and a #9-15, respectively. These two drawings show profiles of 24 different carving gouges.



See Jock demonstrate carving incised letters at AmericanWoodworker.com/WebExtras



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Cordless Curler

AS I LEANED OVER to press down while drilling some holes in a board, my long hair slipped into the drill's vent slots and got caught in the motor. Before I could release the trigger, my head was pulled down tight against the drill. In shock, I ran into the house to survey the damage. The drill hung heavily above my right ear. I stared into the mirror trying to figure out how to extricate the drill without having to cut off my hair. I was considering a desperate dash to the salon (and the consequences of making a unique fashion statement there) when I remembered that the drill had a reverse switch. I flipped the switch, eased the trigger and gently pulled the drill. It worked! My hair slowly unwound—and aside from a having little extra curl, it looked as good as new.

Janice Hall



Blow in My Ear

MY GLUE BOTTLES have tips that must be pulled up in order to squeeze out the glue. Sometimes they clog up, so it's become my habit to pull open the tip, hold it close to my ear and listen to hear if air comes out when I squeeze. If I hear the air, I know the tip is clear.

While assembling my latest project, I absentmindedly reached for the glue, which

happened to be lying on its side, and raised it according to my habit. You guessed it. I squeezed a blob of glue right into my ear. It took gallons of water, a dozen paper towels and a handful of Q-tips to get it out. I don't use the blow-in-my-ear method anymore.

Dick Rank



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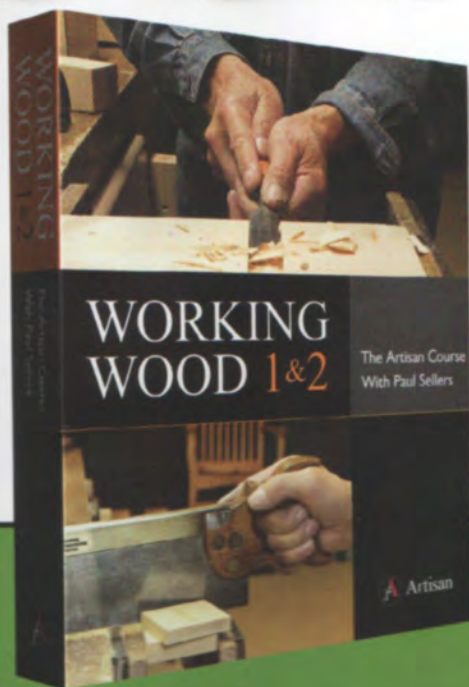
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Shorter Open Time	✓	
Doesn't Stain Skin	✓	✓
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