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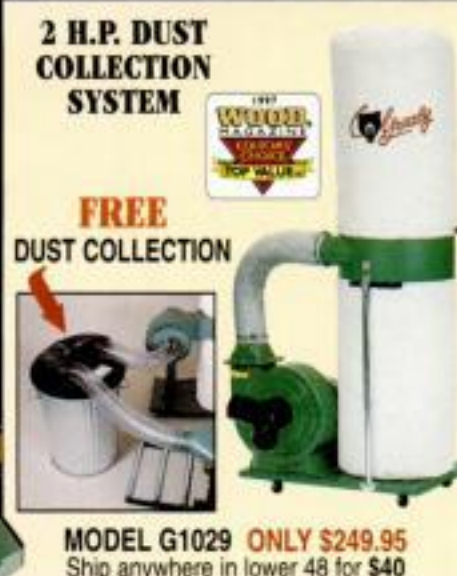
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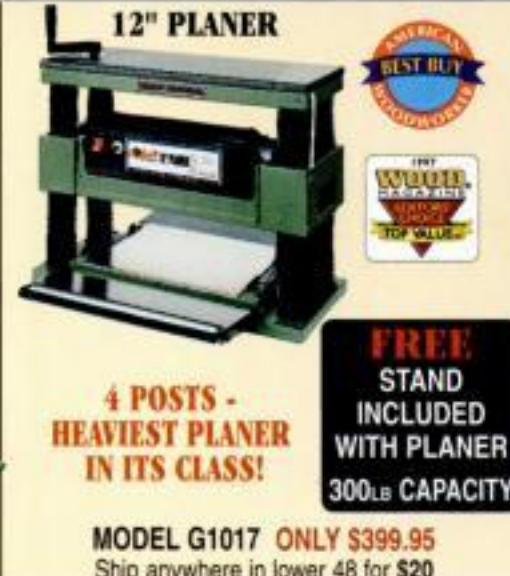
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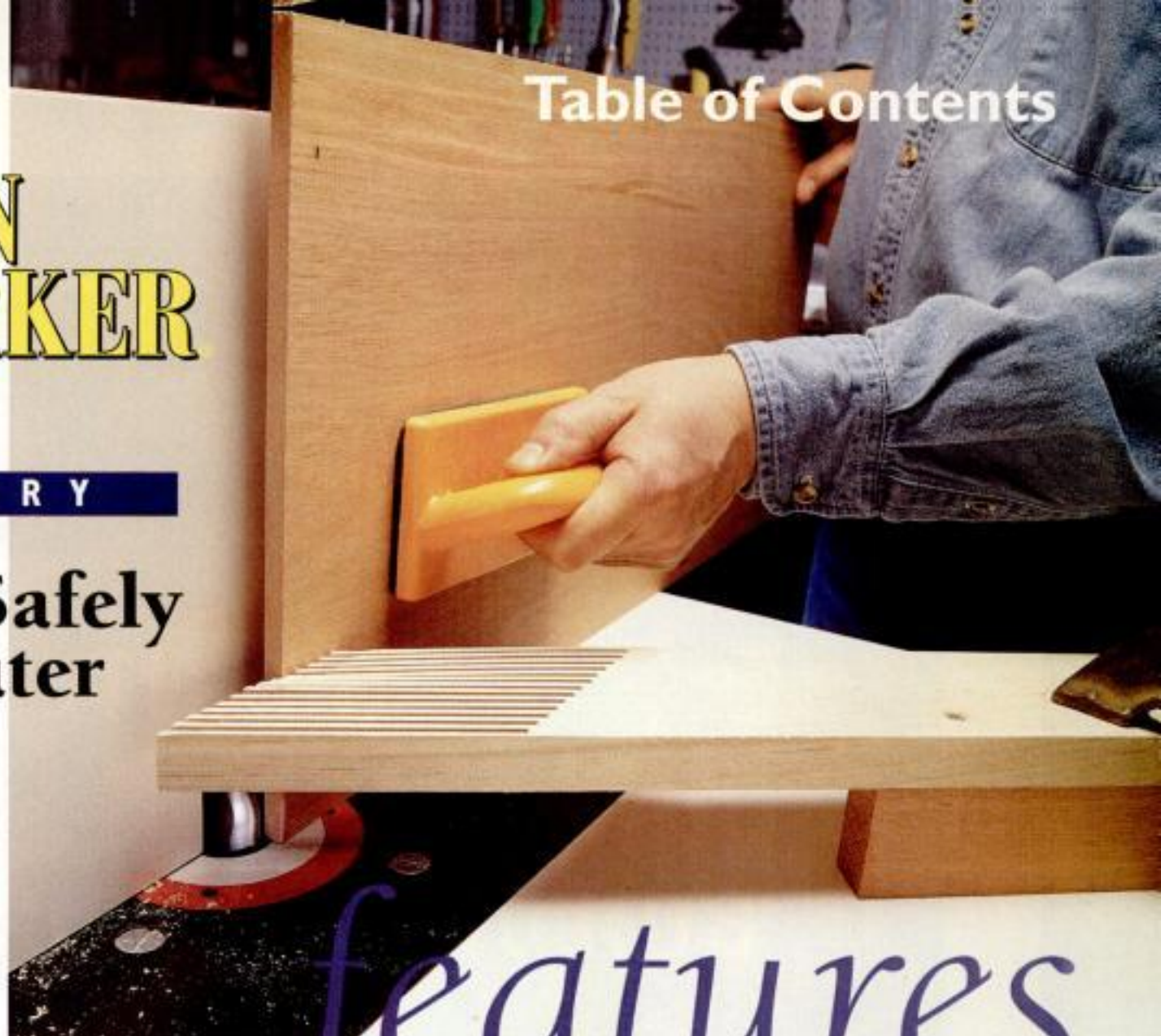
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Cover photo by Bill Zuehlke

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New wood, old woodworkers.

Some people take a coffee break, some a cigarette break, but around here, we take breaks to admire new wood.

It happened a while back when the wood for Tom Caspar's Cafe Table arrived (see page 44). He was using jarrah, a wood that we had heard of but never handled, and the truck was waiting. Good thing we had a crowd, too, because those planks felt like steel beams, they were so hard and heavy. I wish we could slip a sample into the magazine so you

could really see the beautiful chocolate brown color and impressive heft of jarrah (see p. 52). At around \$5 a board foot it's a perfect substitute for teak, at one-third the cost. Plus, unlike teak, it's not oily and hard to glue, or full of tool-dulling silica. Give it a try—it's a fine wood.

Tom built the Cafe Table in his old shop, and on a visit there I noticed a huge collection of dusty, old cardboard patterns for furniture parts, tucked away high on a wall. Patterns for legs, rococo

table rails, lyre chair backs—there must have been hundreds of them. These were the legacy of John Erickson, the old Swedish cabinetmaker in whose shop Tom learned his craft. By the 1970s, Erickson's shop was way behind the times, run by old men crafting furniture with traditional joinery and lots of handwork. The shop went out of business, and Tom inherited the patterns. They're an impressive, but saddening sight—a physical summary of artisans' lives working with wood, the men now gone, the traditions lost. All except for what they passed on to Tom, who will be passing it on to you here on the pages of *American Woodworker*. John Erickson would be proud.



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Send us your great ideas! We'll pay \$200 for each tip that's printed. Enclose a sketch or photo and make sure your return address is enclosed. Due to the volume of tips we receive, they cannot be returned. More complex tips may be used in Shop Solutions. We pay \$200 for each solution we publish. Send sketches and photos and make sure to include your return address.

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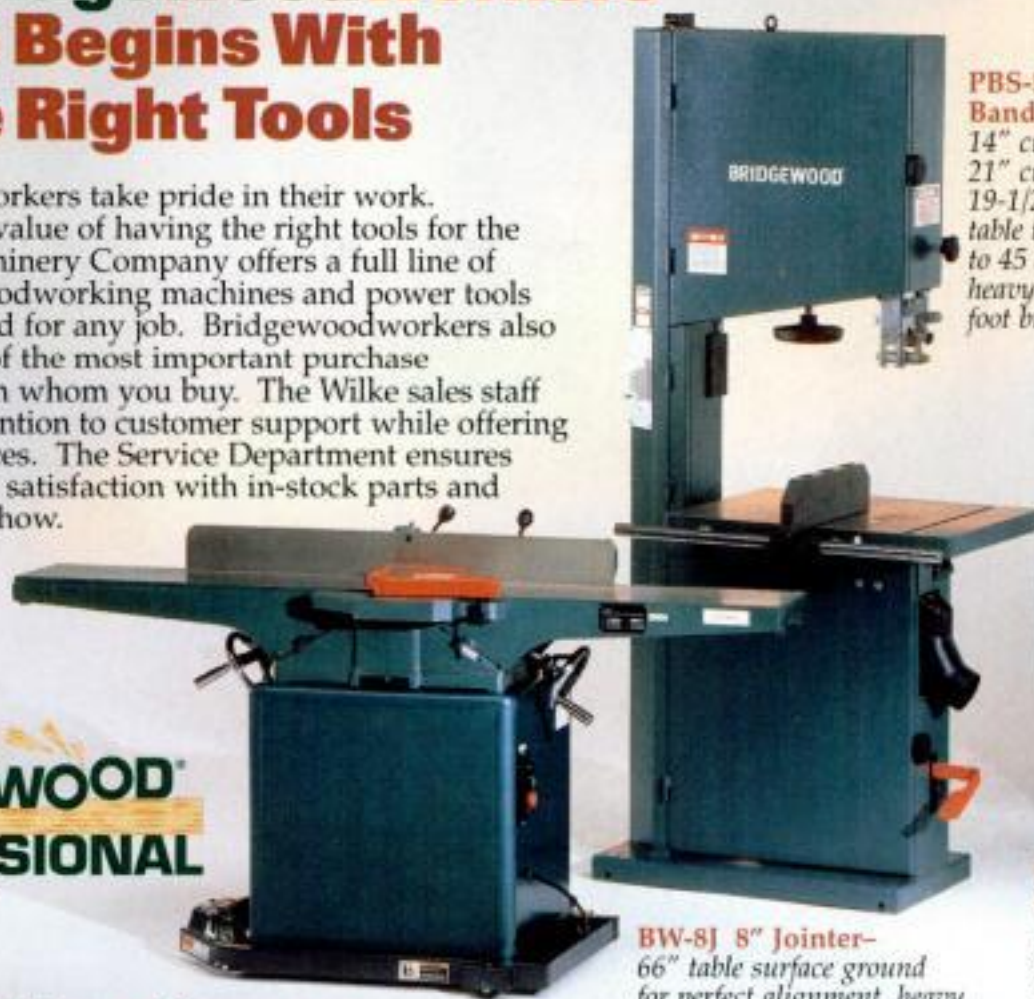
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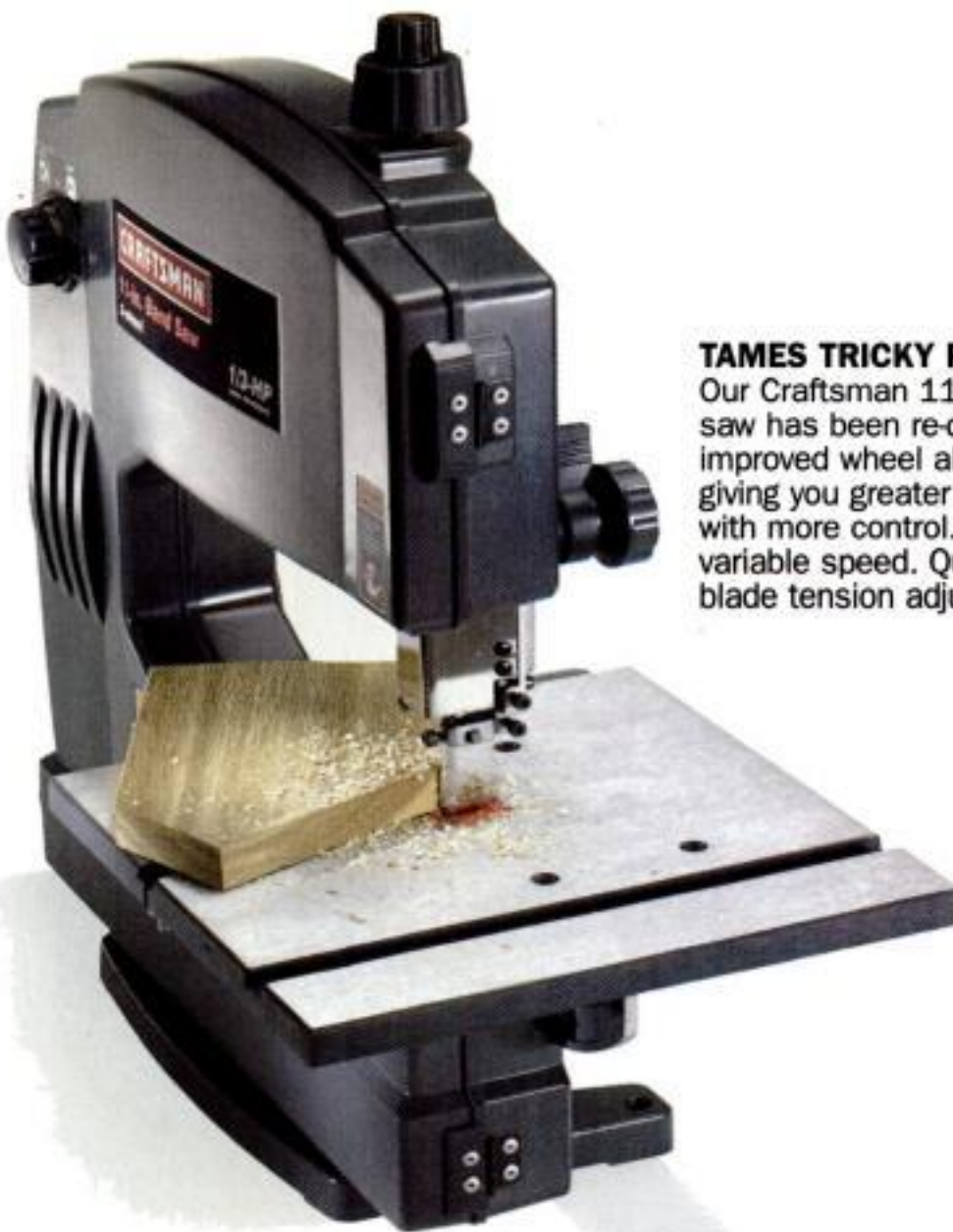
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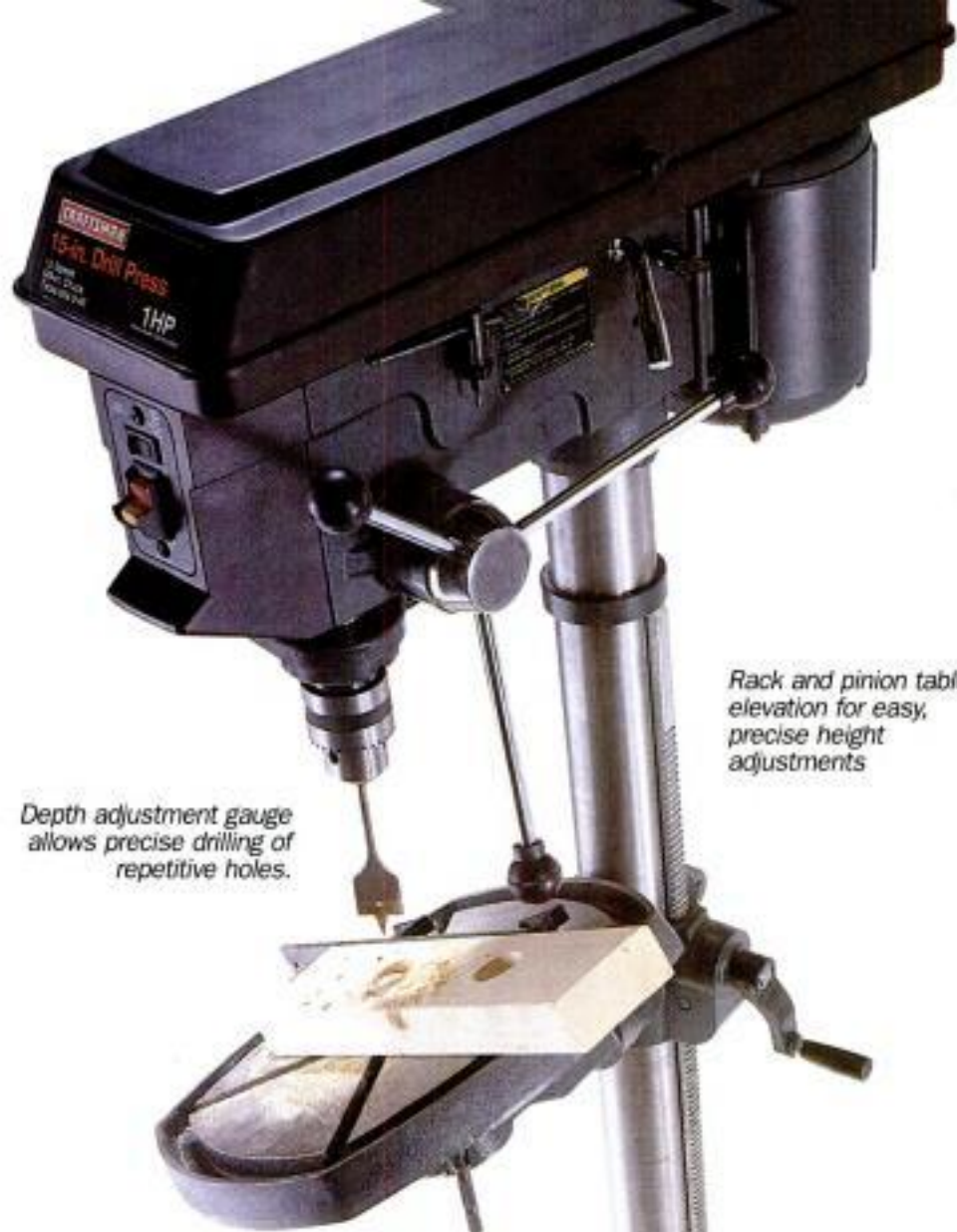
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Question & Answer

Mortising by Machine

Q. I'm having trouble with my mortising machine. I cut mortises by slightly overlapping each hole, but I've broken a few bits and my chisels have overheated and turned blue. Is there a problem with my method?

Steve Richardson
Cleveland, Ohio

A. Yes, there's a better method than overlapping holes. When you overlap, you're essentially cutting a hole with three sides. It's like trying to drill overlapping holes with a twist bit. The bit wants to follow the path of least resistance. It walks into the neighboring hole, bending as it goes.

When a mortising bit cuts an overlapping hole, it bends, too, and rubs against the side of the chisel. Both get hot. The chisel turns blue as the temper is drawn out, and the bit eventually snaps.

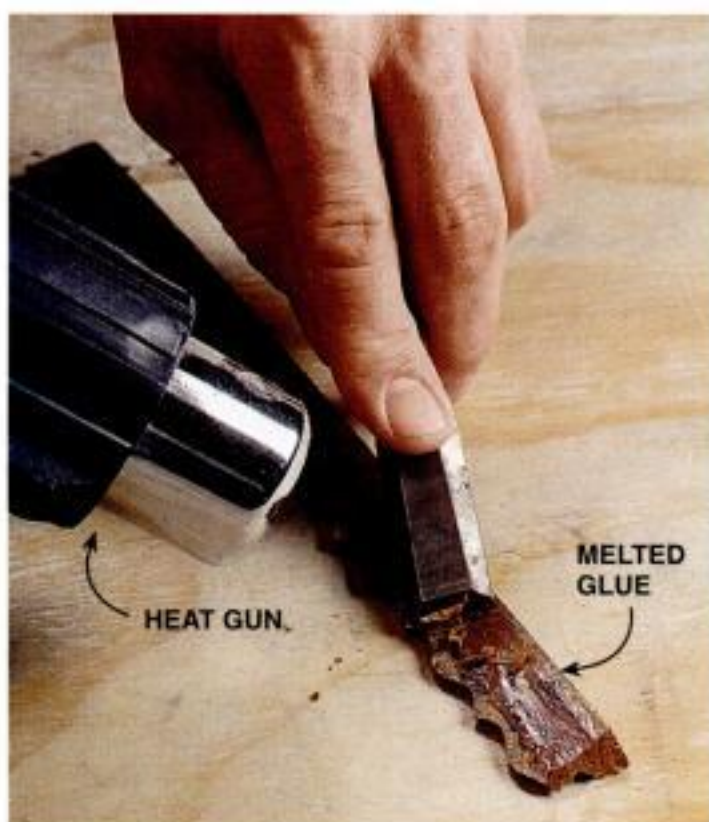
The solution is to drill four-sided and two-sided holes. Drill the two ends of the mortise first. Because the bit meets equal resistance on all four sides, it goes straight down.

Now, instead of overlapping, leave a space about half the width of the bit, and drill another hole. Keep skipping half a hole like this until you



get to the other end of the mortise. Next, drill two-sided holes in the half spaces. There's equal resistance on opposing sides of the bit, so the bit travels straight down.

Rick Christopherson
AW Associate Editor



Removing Old Glue

Q. I've got some old furniture that's been reglued too many times. How do I get the old glue off so I can get back to clean wood?

Barb Peterson
Northfield, Vermont

A. If your furniture was made before World War I, there's a good chance it was put together with hot hide glue. This glue is easy to identify and remove.

Apply some hot water to the dried glue, wait a minute and touch the surface with your finger. If the glue feels sticky, it's probably hide glue. Keep applying hot water and wipe off the glue. Antique restorers favor the con-

tinued use of hide glue today because it can easily be undone years from now.

If hot water doesn't work, try a heat gun. Common glues today, like Titebond and Elmer's, are thermoplastic. At a certain temperature they'll soften up and peel off the wood. Concentrate the heat on a small area of dried glue. (Don't heat a finish—shield it with cardboard.) In a minute or so the glue should feel rubbery under the pressure of a chisel. Scrape the stuff off and move on to another area. A chisel sharpened at 90 degrees makes a durable scraper.

Tim Johnson
AW Associate Editor

Garrett Wade Tools Free Catalog



SALE A / Cabinetmaker's Clamps Are Very Inexpensive – And Incredibly Useful
Despite their low cost, these are not Taiwan copies. They are high quality German-made. With a throat depth of 2½", these small fast-acting clamp are endlessly useful. They're light and strong, and the vinyl capped swivel end and perfectly flat jaw minimizes marring.

You'll be glad you have a bunch of them around your shop. You will be able to work faster and more efficiently because you won't have to search for clamps.

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37F10.10 Combo. Set \$205.85 **\$139.50**

B / Repointed Carbide Drills & Rasps Are An Incredible Bargain

These ⅝" shank drills, used in the electronics industry, have all been professionally resharpened. The assortment will have some duplications but there are about 20 different sizes and types. All are made in the spiral upcut style. The rasps have penetrating tips. A *phenomenal value*.

50J51.01 Carbide Set of 50 \$19.95

NEW C / Anchor Knife Slips Right Into Your Pocket

Made by one of the oldest established knife making firms in Solingen (the heart of German knife making) – a solid tool for recreation or day-to-day use in the shop.

This is not a "fancy" knife – just a solid workmanlike tool that just looks terrific and works really well. Anchor inlaid in brass.

Hand stropped as a final step. Single ready to use 2½" long blade.

10H07.01 Anchor Knife \$29.50

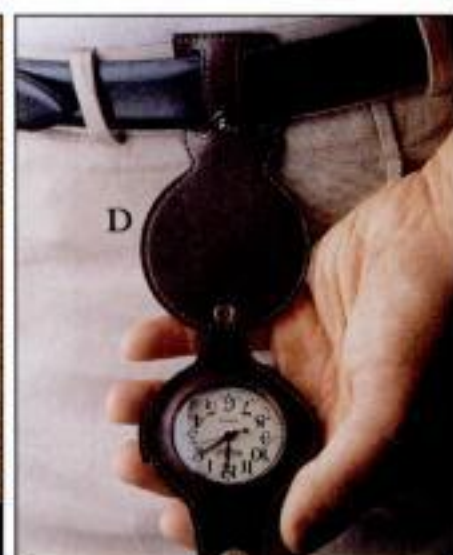
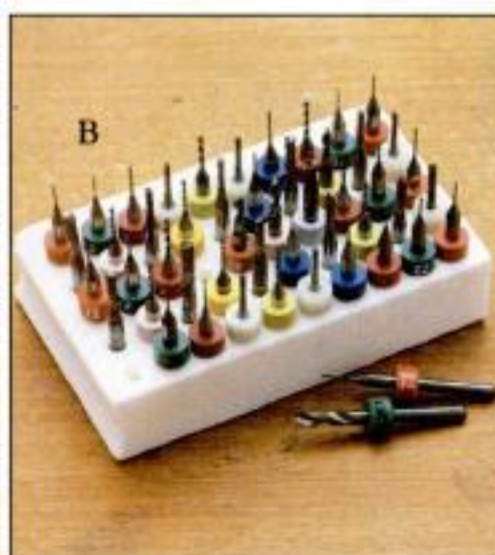
NEW D / A Great Woodworker's Belt Watch

It's a nifty timepiece set upside-down in its leather carrying case, with an integral belt loop. The snap holds it closed until you want to check the time. Then just reach down, snap it open, glance at the face, and snap it back closed again.

A well fitted out craftsmen in grandfather's day carried his watch in his pocket, where it would be safe and clean – if not terribly convenient. Here's a even better solution.

Nothing is on your wrist to be a safety hazard or to be "vibrated-to-pieces" if you are working with machinery.

78W01.02 Woodworker's Belt Watch \$64.50



SALE E / Iron Backed Tenon Saw Combines The Best Of Western & Japanese Style Saws
This new saw, with its unique tooth design, works astonishingly well – with a very smooth finish and an exceptionally fast cutting action.

This is a classic Western style tenon saw but with precision diamond cut Japanese-pattern teeth. (A Japanese-pattern tooth design is noted for its very fast cutting properties.)

The 12" long blade has 15 tpi, and is set into a ⅜" thick solid soft iron back. Depth of cut 3". The body of the blade is .025". Kerf is a narrow .035".

Like all Japanese saws it cuts very smoothly and quickly, but in the Western fashion, on the push stroke. The specially hardened teeth should last a lifetime. Must be used to be believed.

Regular Sale

93K01.01 Japanese Tenon Saw \$37.50 **\$29.95**

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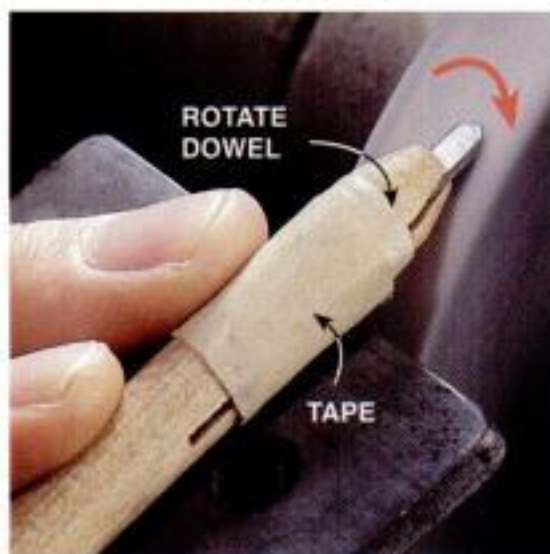
Cutting Gauge Tune-Up

Q. I bought a new marking gauge to cut across the grain when I lay out tenon shoulders and dovetails. The problem is, it doesn't make a clean cut. All I get is a raggedy line. How can I sharpen the tiny cutting knife to make it work better?

Craig Satterlee
Marietta, Georgia

A. Marking gauges come in two different styles. One with a needle-like pin works best when following the grain of a board. This is the kind to use when laying out the two sides of a mortise, for example.

The style you bought has a knife in it instead of a pin, and is sometimes called a cutting gauge. It's meant to be used across the grain, as you describe. It should make a cut as clean as one made by a razor blade. Here's how to fix yours:



You'll have to change the profile of the knife from pointed to round. A cutting edge that is a single point dulls quickly. A round edge will stay sharp longer because there's more cutting surface. Also, change the double bevel to a single bevel. A single bevel facing the gauge head pulls the head tight to the edge of the wood.

Remove the knife from the stock of the gauge. If the wedge that holds the knife is tight, pound it out from the bottom with a hammer and punch. Then flatten one side of the knife on a piece of 220-grit sandpaper. Next, make a holder from a length of 3/8-in.-dia. dowel rod. Saw a 1-in.-long kerf in the end of the dowel to

hold the knife. A bandsaw cuts a kerf about the right thickness. Insert the knife into the kerf and bind with tape.

Bevel the knife with a grinder or belt sander. Use a fine wheel or belt. A round profile is created by rotating the dowel on the tool rest. Grind past the old double bevel until the new bevel intersects with the side you flattened, and is round from side to side.

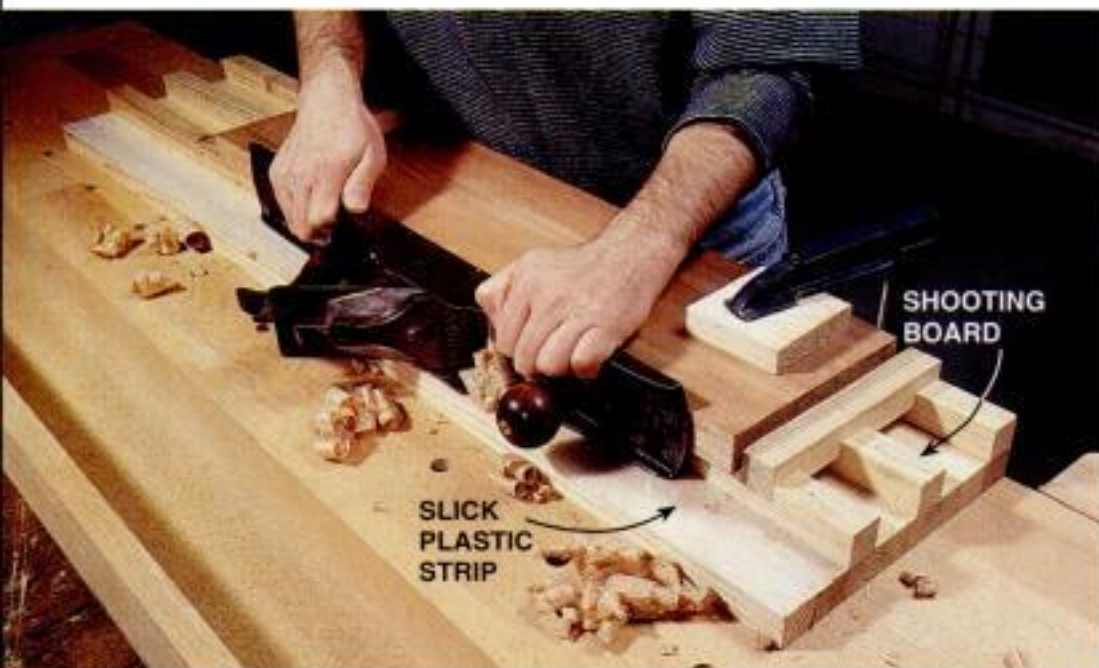
The angle of the bevel should be about 30 degrees. Use a light touch when grinding this thin piece of steel, so you don't overheat it and draw the temper out. Take it out of the holder and remove its wire edge on the sandpaper.

Tom Caspar
AW Associate Editor

Jointing Edges by Hand

Q. I enjoy working with hand tools, but I'm having a hard time planing edges of boards straight and square. I don't want to add a fence to my plane. Isn't there another way to make jointing easier?

John Brodt, Springfield, Illinois



A. You can build a "shooting board" to plane perfect edge joints. Because it won't warp, a base made of narrow glued-up strips is better than one made of solid wood. Plywood or MDF will work, too. The longer the plane, the better the shooting board will work. A sharp, well-tuned, #7 jointer plane is ideal.

The plane's body doesn't have to be perfectly square. Let's say you are jointing two boards. Plane the edge of the first one with its face up. Plane the second board with its face down. When you butt the two boards together, any errors in the angle of the edges will cancel out, resulting in a flat top.

Here's how to plane an edge straight. The idea is to first make it slightly concave, then straighten it out. Your first strokes should start and stop one inch shy of each end. When the plane stops taking shavings, you have created a slightly concave edge. Then take a few passes the full length of the board, making one continuous shaving. The trick is to keep the sole of the plane flat against the board at the beginning and end of the stroke. Check with a long straightedge.

Peter Korn
Center For Furniture Craftsmanship
Rockport, Maine

Source: Plastic strip is available at Woodcraft Supply (800) 225-1153; \$17.50 for 3 in. x 10-1/2 ft. roll, item #16L65.

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Question & Answer

Setting Jointer Knives

Q. How can I set my jointer knives without using a jig?

Brenda Jones
Oakland, California

A. A wood block and a pencil will do the job on a jointer with an adjustable outfeed table. If the outfeed table on your jointer doesn't adjust, you're better off using a magnetic jig or dial indicator.

Make a maple block about 3/4-in. thick, 3-in. wide, and 12-in. long. Unplug the jointer. Remove the pulley guard so you can rotate the cutterhead by hand. Leave the dull knives in place.

You'll use the block to measure the height of the knives above the cutterhead. Set the block on the outfeed table, as in the photo below. Press down lightly on the block and rotate the cutterhead. The knife should tick against the block or lift up the

block and carry it a short distance.

Next, lower the outfeed table until the block moves about 1/4-in. as you manually turn the cutterhead. Using the edge of the outfeed table as a reference, mark the movement of the block from where the knife picks up the block to where it lets it down. This indicates how high the knife sticks up above the cutterhead. Now you can remove all the dull knives and have them sharpened.

The idea is to set the sharpened knives at the same height as the old ones. Put in a sharp knife. Rotate the cutterhead and raise or lower the knife until the block travels the distance marked. Check both sides and tighten down the knife, then check again. Set the other two knives the same way, and then raise the outfeed table until each knife barely ticks the block. Make sure all the knives have been tightened down, then plug the machine in and joint a 3-ft. board. Raise the outfeed table if there's snipe at the end of the board. Lower the table if the cut trails off to nothing.

Chuck Dyas
Menomonie, Wisconsin



Matching Old Stains

Q. I have to match an old stain. I've come pretty close with a new stain I bought at the hardware store, but it's not good enough. Is there a way I can tint the stain?

Paul O'Brien
Springfield, Virginia

A. There are several fairly simple ways to alter the color of commercial stain. Probably the easiest is to mix two or more colors of the same type and brand of stain to match what

you need. This guarantees that the components and drying times are compatible and consistent.

You can also alter a stain with small amounts of concentrated pigment pastes called "universal tinting colors." They are compatible with both oil-based and water-based stains and are available from most home stores and many craft stores. Because the universals, called UTCs, are so concentrated, you probably won't be adding enough to substantially change the drying time of the stain you started with.

If you are certain that the stain is oil based, you can also tint it with artist's oil colors or Japan colors. Both are available from most craft and art supply stores. Again, the small amounts you are likely to add probably won't affect the drying time much, but as a rule of thumb, oil colors will typically slow down the drying time while Japan colors will not.

Michael Dresdner
Puyallup, Washington



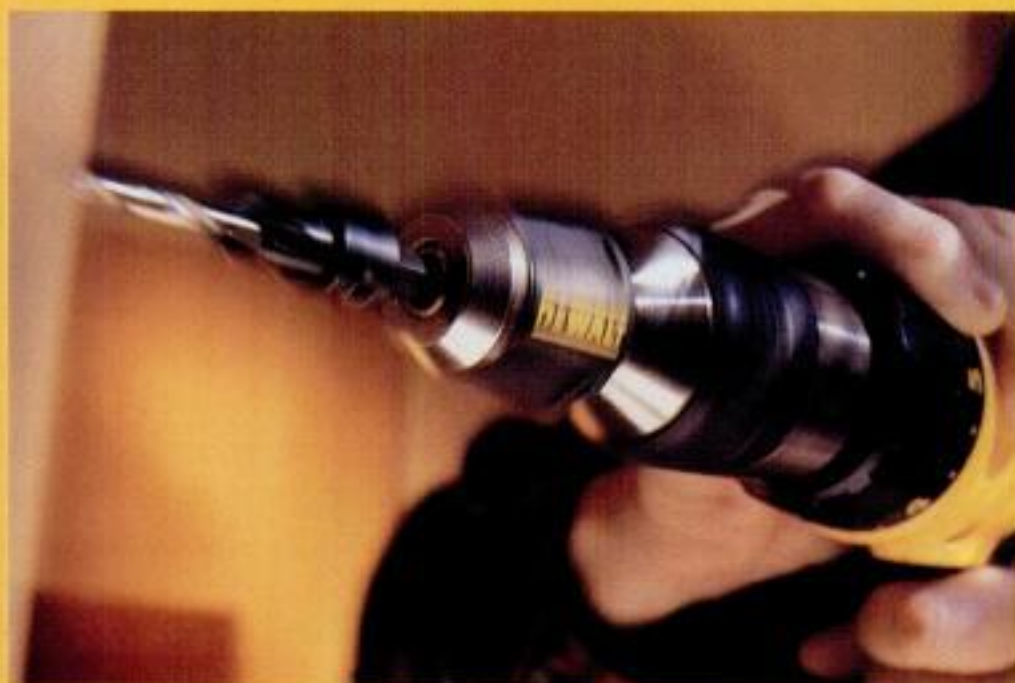
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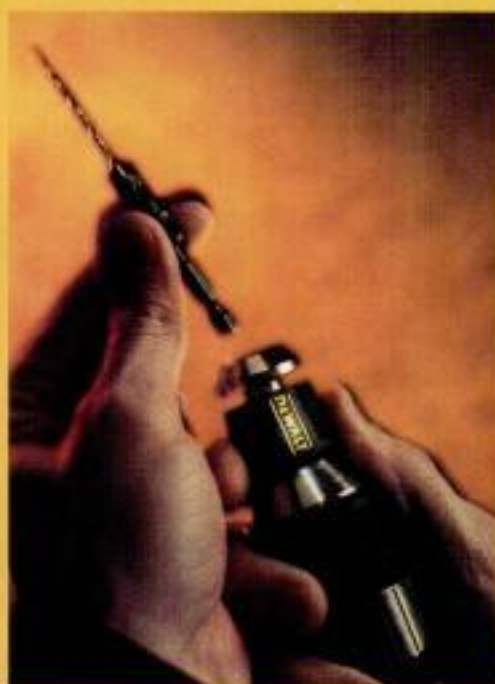
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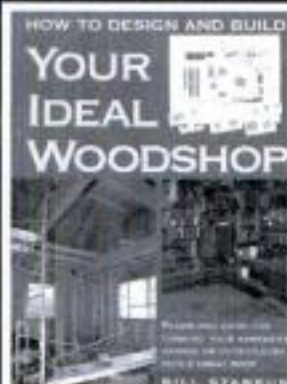


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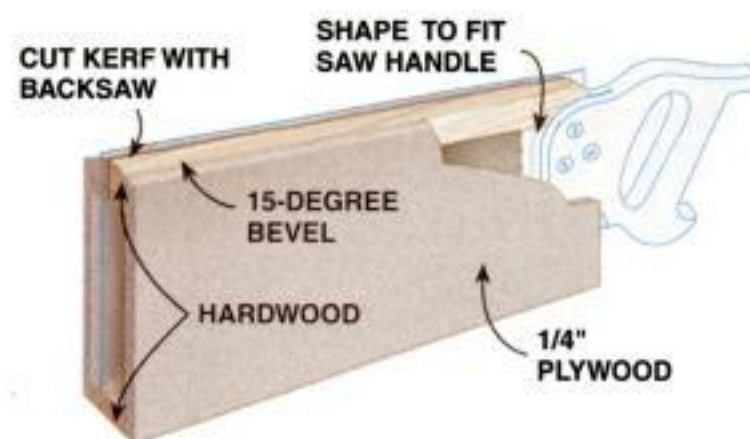
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WorkShop Tips



Saw Sharpening Jig ▲

I made this jig to hold a dovetail or other back-saw when filing and resetting the teeth. To use, insert the saw blade, teeth up, and clamp the jig in a bench vice.

RICHARD JONES / HOUSTON, TEXAS

Fishy Dust Blower

My scroll saw's dust blower gave out so I replaced it with the electric aerator from a fish tank. I attached the clear plastic tubing to the guard where the original had been, then I modified the wiring so both scroll saw and aerator turn ON together.

JAMES M. JONES / MONROE, LOUISIANA



Multiple Plugs ▲

Faced with cutting hundreds of plugs for a big project, I came up with this idea: I cut the plugs a little deeper than needed. Then I ran strips of masking tape down the faces of the plugs. When I cut them free on the bandsaw they stayed stuck to the tape instead of scattering all over the floor.

GEOFFREY PEAKE / WYOMING, OHIO

Saw Blades to the Cleaners

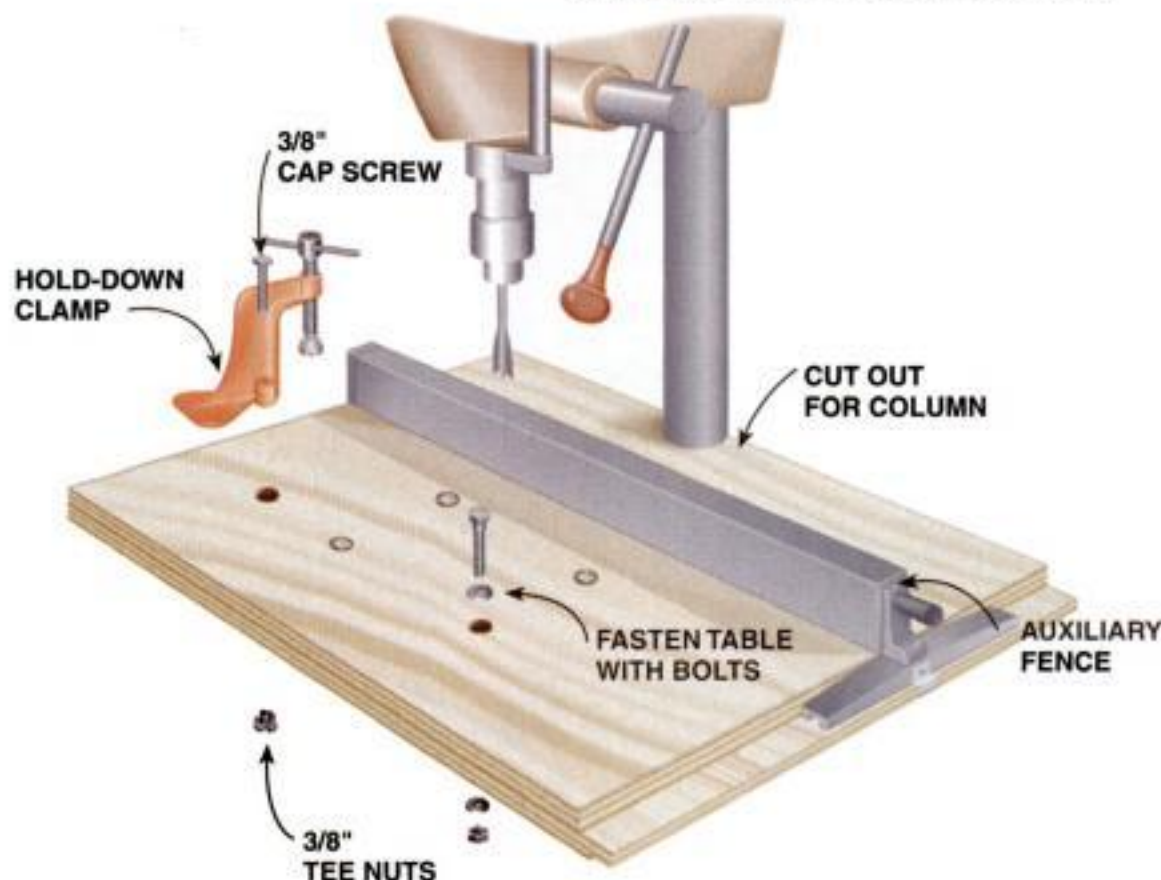
Gum and pitch soon build up on blades and router bits causing them to overheat, warp and dull. I find soaking cutters in Lestoil, straight from the bottle, to be the safest cleaning method. The lid from a 5-gallon drywall bucket makes a handy soaking container.

WILLIAM KOECHER / ALIQUIPPA, PENNSYLVANIA

Auxiliary Drill Press Table ▼

Most drill presses come with small, cast iron tables with stiffening ribs underneath that make it awkward to clamp a workpiece. I designed this auxiliary table to accept a fence and installed tee-nuts in the underside of the plywood so I could grip the work securely with a hold-down clamp (available from Tools on Sale 800-328-0457). This Craftsman fence comes with holes that make adding or removing a wooden face easy. You can order the fence by calling Sears at (800) 377-7414 and asking for part No. 23402.

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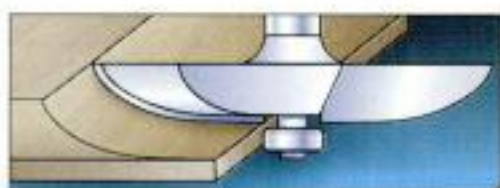
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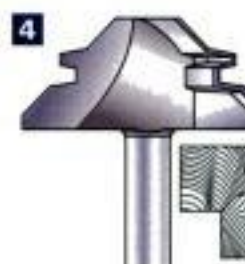


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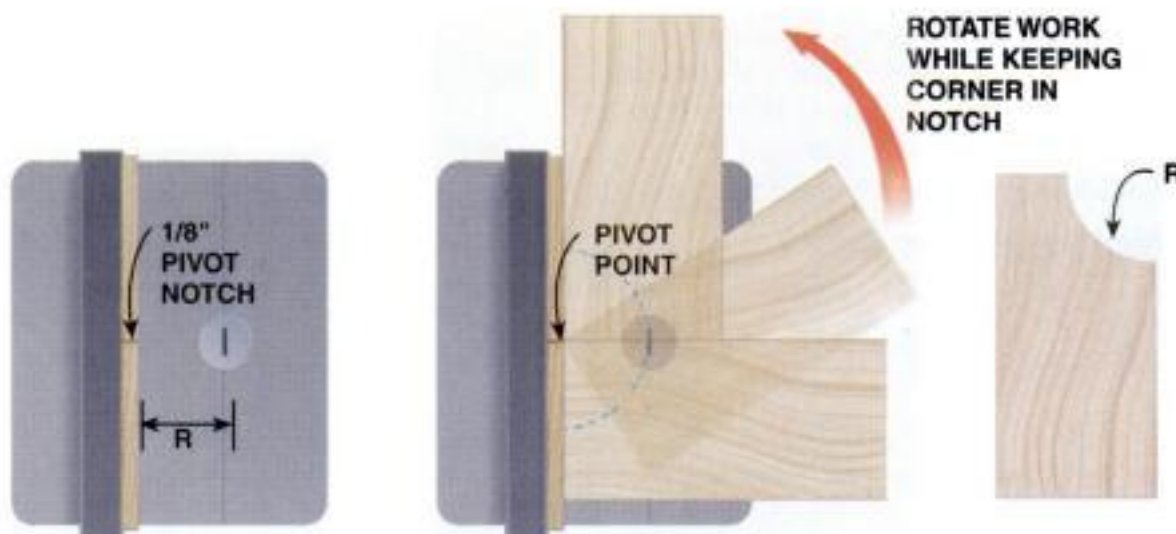
Workshop Tips

Easy Compressor Drain

To reduce the amount of moisture in compressor lines, you should drain your tank daily or weekly depending on use. This can be a real pain because the tank's stopcock is located under the tank. To make it easier to reach the stopcock, I extended it out the side. After disconnecting the power to the compressor, I drained the tank. Then I brought the stopcock to the hardware store as a reference for pipe size. I purchased a short nipple, two elbows and a 12-in. straight pipe to extend the stopcock to the side, where it can be reached.

Because the stopcock is used to drain the water from the bottom of the tank, make sure that all of your added plumbing is either level, or down hill and make sure to seal the pipe joints with Teflon tape.

TOM LOVELACE / AUSTIN, TEXAS



Bandsawing Inside Curves ▲

This is a useful trick when bandsawing inside curves. It requires no marking and no special jig. First I cut a shallow slot in a piece of scrap and attach it to the bandsaw fence, as shown. The radius of the cut, "R," is the same as the distance between the fence and the blade. The notch acts as a pivot point as the workpiece is rotated around the cut.

LEONARD STALLER / GERMANTOWN, WISCONSIN

Extension Cord Reel

I just bought a storage reel for extension cords. I started with one end of the cord and rolled to the other end. This left me with one end buried and unusable without unrolling the whole cord. Solution: Start rolling from the center of the cord, leaving both ends free regardless of how much is left on the coil.

DICK WRIGHT / OAKTON, VIRGINIA

◀ Storing Lumber

This rack is easily made from galvanized iron pipe and threaded floor flanges. For light loads use 10-in. lengths of 1/2-in. pipe and 2x4s. For heavier loads go to 3/4-in. pipe and 4x4s. Be sure to anchor the flanges securely to the wall using bolts, washers, and nuts—not just wood screws. If you plan to store finished material on the racks, slip plastic tubing over the pipe to protect the surfaces.

WAYNE SCHVANVELDT / WALTERVILLE, OHIO



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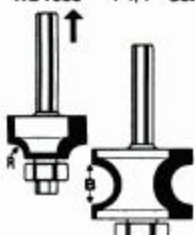
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WL-1045	3/8"	*11.
WL-1046	1/2"	*13.
1/2" Shank		
WL-1049	1/8"	*9.
WL-1042-5	3/16"	*9.
WL-1050	1/4"	*9.
WL-1044-5	5/16"	*10.
WL-1051	3/8"	*12.
WL-1052	1/2"	*13.
WL-1053	5/8"	*16.
WL-1054	3/4"	*18.
WL-1055	7/8"	*25.
WL-1056	1"	*27.
WL-1057	1-1/8"	*30.
WL-1058	1-1/4"	*30.



Bullnose Bits with Bearing

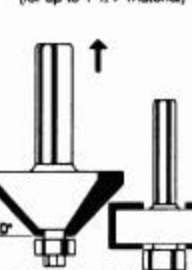
1/4" Shank • Bead		
Opening		
WL-1100	1/4"	*12.
WL-1101	3/8"	*14.
WL-1102	1/2"	*16.
WL-1103	5/8"	*18.
WL-1104	3/4"	*19.
1/2" Shank		
WL-1110	1/4"	*12.
WL-1111	3/8"	*14.
WL-1112	1/2"	*16.
WL-1113	5/8"	*18.
WL-1114	3/4"	*19.
WL-1115	1"	*22.
WL-1116	1-1/8"	*25.
WL-1117	1-1/4"	*28.
WL-1118	1-1/2"	*32.



1/4" Shank • Radius		
WL-1159	1/8"	*10.
WL-1160	3/16"	*10.
WL-1161	1/4"	*11.
WL-1162	3/8"	*13.
WL-1163	1/2"	*14.

Cove Bits (continued)

1/2" Shank		
WL-1169	1/8"	*10.
WL-1170	1/4"	*11.
WL-1171	3/8"	*13.
WL-1172	1/2"	*14.
WL-1173	5/8"	*18.
WL-1174	3/4"	*20.
Chamfer Bits		
1/4" Shank • Degree		
WL-1180	15°	*10.
WL-1181	25°	*10.
WL-1182	45°	*12.
WL-1183	45°	*14.
(for up to 3/4" material)		
1/2" Shank		
WL-1184	45°	*10.
WL-1185	11-1/2°	*12.
WL-1186	15°	*12.
WL-1187	22-1/2°	*12.
WL-1188	30°	*14.
WL-1189	45°	*15.
WL-1190	45°	*22.
(for up to 1-1/4" material)		



1/4" Shank • Kerf		
WL-1220	1/2"	*11.
WL-1220-2	1/16"	*10.
WL-1220-3	1/8"	*10.
WL-1220-4	1/4"	*10.
WL-1220-5	3/8"	*10.
1/2" Shank		
WL-1225	1/2"	*11.
WL-1225-2	1/16"	*10.
WL-1225-3	1/8"	*10.
WL-1225-4	1/4"	*10.
WL-1225-5	3/8"	*10.
WL-1225-6	3/4"	*12.

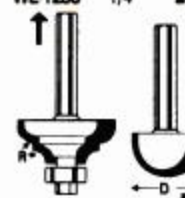
1/4" Shank • Radius		
WL-1230	5/32"	*13.
WL-1231	1/4"	*15.
1/2" Shank		
WL-1235	5/32"	*13.
WL-1236	1/4"	*15.

1/4" Shank • Radius		
WL-1240	5/32"	*18.
WL-1241	1/4"	*20.
1/2" Shank		
WL-1245	5/32"	*18.
WL-1246	1/4"	*20.

Ask about our unique
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ROUTER TABLE

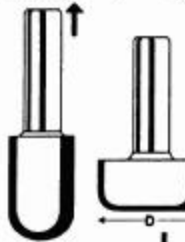
Classical Ogee Bits

1/4" Shank • Radius		
WL-1250	5/32"	*18.
WL-1251	1/4"	*20.
1/2" Shank		
WL-1252	5/32"	*18.
WL-1253	1/4"	*20.



1/4" Shank • Diameter		
WL-1370	1/8"	*10.
WL-1371	1/4"	*9.
WL-1371-1	3/8"	*9.
WL-1372	1/2"	*10.
WL-1373	3/4"	*12.

1/2" Shank • Diameter		
WL-1375	1/4"	*9.
WL-1375-1	3/8"	*11.
WL-1376	1/2"	*12.
WL-1377	3/4"	*14.
WL-1378	1"	*16.



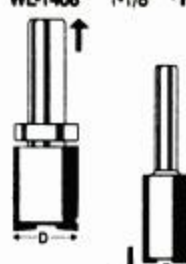
1/4" Shank • Diameter		
WL-1380	7/16"	*13.
WL-1381	3/4"	*15.
1/2" Shank		
WL-1385	3/4"	*15.
WL-1386	1-1/4"	*18.

1/4" Shank • Diameter		
WL-1390	3/4"	*12.
1/2" Shank		
WL-1391	3/4"	*12.
WL-1392	1"	*14.
WL-1393	1-1/4"	*15.
WL-1394-1	1-1/2"	*16.
WL-1395	2"	*28.

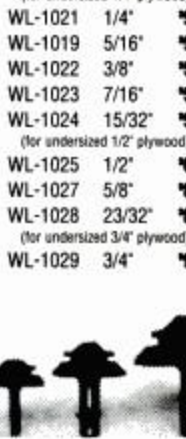
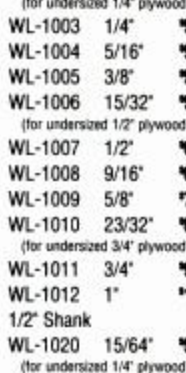


Pattern Cutting Bit

1/4" Shank • Diameter		
WL-1400	1/2"	*12.
WL-1401	5/8"	*12.
WL-1402	3/4"	*12.
1/2" Shank		
WL-1405	3/4"	*15.
WL-1406	1-1/8"	*18.



1/4" Shank • Diameter		
WL-1001	1/8"	*18.
WL-1002	3/16"	*5.
WL-1002-ss	5.5mm	*5.
(for undersized 1/4" plywood)		
WL-1003	1/4"	*5.
WL-1004	5/16"	*5.
WL-1005	3/8"	*5.
WL-1006	15/32"	*5.
(for undersized 1/2" plywood)		
WL-1007	1/2"	*6.
WL-1008	9/16"	*6.
WL-1009	5/8"	*7.
WL-1010	23/32"	*9.
(for undersized 3/4" plywood)		
WL-1011	3/4"	*9.
WL-1012	1"	*10.
1/2" Shank		
WL-1020	15/64"	*5.
(for undersized 1/4" plywood)		
WL-1021	1/4"	*5.
WL-1019	5/16"	*5.
WL-1022	3/8"	*5.
WL-1023	7/16"	*5.
WL-1024	15/32"	*5.
(for undersized 1/2" plywood)		
WL-1025	1/2"	*6.
WL-1027	5/8"	*6.
WL-1028	23/32"	*6.
(for undersized 3/4" plywood)		
WL-1029	3/4"	*9.

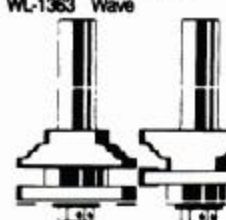


1/4" Shank • Radius		
WL-1250	5/32"	*18.
WL-1251	1/4"	*20.
1/2" Shank		
WL-1252	5/32"	*18.
WL-1253	1/4"	*20.

For the Shaper
Lock Mitre WL-1581 *40.

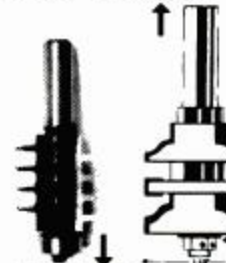


Horizontal Panel Raiser with Undercutter • 1/2" Shank		
WL-1346	Ogee	*40.
WL-1347	Traditional	*40.
WL-1348	Convex (Cove)	*40.
WL-1359	12" Facecut with Quarter Round	*40.
WL-1363	Wave	*40.



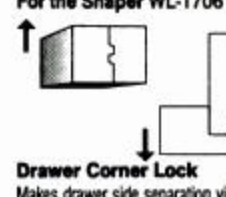
2-piece Rail & Stile Cutter Sets		
1/2" Shank		
WL-1360	Ogee Profile	*59.
WL-1361	Roundover	*59.
WL-1362	Cove & Bead	*59.

1-piece Rail & Stile Cutter Sets		
Just raise the cutter to make the matching cut. No changing or reversing.		
1/2" Shank		
WL-1365	Ogee Profile	*40.
WL-1366	Roundover	*40.
WL-1367	Cove & Bead	*40.
WL-1368	Wedge	*40.
WL-1374	Dbt Roundover	*40.



Finger Joiner Router Bit		
WL-1429		*39.
For the Shaper WL-1580		*89.

Reversible Glue Joint		
WL-1430	1-3/4" Diam	*35.
For the Shaper WL-1706		*35.



Drawer Corner Lock		
Makes drawer side separation virtually impossible		
1/2" Shank		
WL-1435	For 1/2" material	*30.

SHAPER CUTTERS

3/4" BORE		
Corner Round		
WL-1509	1/8"	*22.
WL-1510	1/4"	*24.
WL-1511	3/8"	*26.
WL-1512	1/2"	*26.
WL-1513	3/4"	*30.
WL-1514	1"	*32.
WL-1515	1-1/4"	*38.

Bead		
WL-1520	1/4"	*24.
WL-1521	3/8"	*26.
WL-1522	1/2"	*26.
WL-1523	3/4"	*28.
WL-1524	1"	*30.

Flute		
WL-1530	1/4"	*24.
WL-1531	3/8"	*26.
WL-1532	1/2"	*26.
WL-1533	3/4"	*28.
WL-1534	1"	*30.

Rabbeting/Straight		
WL-1540	1/4"	*24.
WL-1541	3/8"	*26.
WL-1542	1/2"	*26.
WL-1543	3/4"	*28.
WL-1544	1"	*30.
WL-1545	1-1/2"	*32.
WL-1546	2"	*48.



SHAPER CUTTERS 3/4" BORE		
1-piece Rail & Stile		
Just raise the cutter to make the matching cut. No changing or reversing.		
WL-1500	Roman Ogee	*89.
WL-1501	Roundover	*89.
WL-1502	Cove & Bead	*89.
WL-1503	Dbt Roundover	*89.

WL-1600		
WL-1601		
WL-1602		
WL-1603		
WL-1604		
WL-1605		

Panel Raisers (Shaper Cutter)		
3/4" Bore		
WL-1600	Ogee	*59.
WL-1601	15° Facecut	*59.
WL-1602	18° Traditional	*59.
WL-1603	Convex (Cove)	*59.
WL-1604	12° Facecut with Quarter Round	*59.
WL-1605	Wave	*59.

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Model	Description	List Sale
31-750	NEW Bench Random Orbit Sander	199
28-150	NEW 9" Bench Band Saw	155
50-860	850 CFM Air Cleaner	239
31-695	6" Belt/9" Disc Sander	441
23-710	Sharpening Center	217
31-460	4" Belt/Disc Sander	198
40-560	16" 2 speed Scroll Saw	230
40-540	16" variable Scroll Saw	249
11-990	12" Bench Drill Press	255
11-090	32" Radial Bench Drill Press	279
43-050	6" Bench Router/Shaper	398
22-540	12" Bench Top Planer	259
22-560	12" 1/2" Planer w/ extra knives	329
35-865	Versa Feeder Stock Feeder	249
36-220	10" Compound Miter Saw	294
36-240	10" Sliding Miter Saw	439
37-070	6" w/spd Bench Jointer	351
14-650	Hollow Chisel Mortiser	380
17-900	16-1/2" Floor Drill Press	490
17-924	NEW Mortise Chisel Kit	490
36-285	8-1/4" Builders Saw w/ stand	275
34-555	Sliding Table	487
36-250	10" Slide Compound Saw	825
31-780	Oscillating Spindle Sander	253
31-780K31	780 w/ 31-781 spindle set	209
46-700	12" Wood Lathe	575
40-650	Q3 18" Scroll Saw	389
36-905	30" Unifence	346
36-905	50" Unifence	444
36-444	10" Contractors Table Saw	519
37-195	NEW 6" Professional Jointer	625
33-830	NEW 10" Radial Arm Saw	851
36-455	10" Contractors Table Saw w/ 30" unifence, cast iron wing, 34-914 table board, & carbide blade	849
22-675	DC380 15" Planer	1175
28-275	14" Band Saw 3/4 HP	595
28-280	14" Band Saw 1 HP motor with enclosed stand	739
28-270	14" Band Saw 1 HP w/ 50-274 mobile base, 28-855 rip fence, & 28-266 cool blocks	849
31-280	Sanding Center w/ stand	789
37-190	6" Deluxe Jointer	603

50-850	1-1/2 HP, 1200 CFM	285
50-851	2 HP, 1500 CFM	489

Item	Description	Teeth	List Sale
6527-6	Sawzall with case		343 169
6537-22527	quick lok blade change	224	179
0207-2212V	Drill w/ryk's chuck & 2 batt	380	175
0224-1	3/8" Drill 4.5 amp magnum		236 134
0234-1	1/2" Drill 4.5A mag 0-850 rpm	255	134
0235-6	1/2" Drill w/keyless chuck		255 139
0244-1	1/2" Drill 4.5A mag 0-600 rpm	255	139
0222-1	3/8" Drill 3.5 amp 0-1000 rpm	213	125
0228-6	3/8" Drill 3.5 amp 0-1000 rpm	207	124
0375-6	3/8" close quarter Drill		255 148
0379-1	1/2" close quarter Drill		298 168
6546-6	Screwdriver 200 & 400 rpm	150	89
6547-6	6546-6 w/bits, 1/4" chuck & cs185	219	109
5399	1-1/2" D-handle Hammer Drill Kit	356	219
5397-6	3/8" w/ spd Hammer Drill Kit	275	145
5371-6	1/2" w/ spd Hammer Drill Kit	360	194
3107-6	1/2" w/ spd right angle Drill Kit	411	239
6142	4-1/2" Grinder w/case & acc.	224	162
6490-6	10" Miter Saw	496	269
6491	6490 w/ carbide blade & bag	594	345
6494-6	10" Compound Miter Saw	585	319
6266-6	Top Handle Jig Saw	315	159
6496-6	10" Slide Compound Saw	1050	569

Item	Description	Teeth	List Sale
L727M010	Gen Pur. A.T.B. 10"	60	42
L82M010	Cut-off 10"	80	93
L84M010	Comb 10"	50	75
L85R010	Super Cut-off 10"	80	115
L87M010	Ripping 10"	24	69
L73M010	Cut off 10"	60	48
L87R010	Thin Kerf 10"	24	72
L88M010	Thin Kerf 10"	60	48
L98R010	Ultimate 10"	80	126
L99M010	Compound Miter 10"	60	88
F410	Quiet Blade 10"	40	95
S0308	8" Dado - Carbide	230	119
S0508	8" carbide w/case & shims	344	172
FB100	16 piece Forstner Bit Set	338	194
94-100	5 pc. Router Bit Door System	320	169
FT2000E	Plunge Router		185

Model	Description	List Sale
C8F82	8-1/2" Slide Compound Saw	1169
C10FS	10" Slide Compound Saw	1627
C15FB	15" Miter Saw	1346
NV45AB	Coil Roofing Nailer	935
NT32AE	New Pinner 5/8" - 1-1/4"	85
NT50AE	New Pinner 3/4" - 2"	119

Model	Description	List Sale
5090DW	3-3/8" Saw Kit 9.6 volt	290 139
DA391D	3/8 angle Drill 9.6V	166 114
DA391DW	3/8" angle Drill Kit 9.6V	341 175

Model	Description	List Sale
6095DWE9	6 volt Drill Kit w/2 batt.	125
6095DWE2	6095DWE w/flashlight	139
632007-4	9.6 volt Battery	47 30
632002-4	7.2 volt Battery	39 26

Model	Description	List Sale
6343DWAE	1/2" Drill Kit	255
5620DWA	6-1/2" Circular Saw Kit	259
DK1016	1/2" Drill & 6-1/2" Saw combo kit	389

Model	Description	List Sale
9900B	3"x21" Belt Sander w/bag	347 165
9924DB	3"x24" Belt Sander w/bag	360 172
1900B	3-1/4" Planer with case	263 145
1912B	4"x3" Planer	253 105
N5514B	4" Disc Grinder 4.5 amp	118 65
DA3000R3	8" Angle Drill	355 185
2708W	8-1/4" Table Saw	637 295
6405	3/8" Drill Rev. 0-2100 rpm	115 65
6013BR	1/2" Drill Rev. 6 amp	270 149
9401	4" x 24" Belt Sander w/bag	456 219
5007NBK7	7-1/4" Circ Saw w/ case	250 125
L51011	10" Slide Compound Saw	995 429
L51211	12" Slide Compound Saw	1620 695
3901	Plate Joiner Kit	376 159
3612C	3 HP Plunge Router	492 265
L51040	10" Compound Miter Saw	460 259
L51013	10" Dual Compound Slide Miter Saw	1066 599
BO5010	5" Random Orbit Sander	142 69
L51220	12" Compound Miter Saw	379
9227C	7/8" Polisher	350 195
SAJ401	16" Bench Scroll Saw	300 175
2702	8-1/4" Table Saw	349
2703	10" Table Saw	319

Model	Description	List Sale
SPN45	Finishing Nailer 1" - 2" w/ cs	448 299
SNR45	NEW Stapler 7/16" crown, 1" - 2"	
SLP20	Pinner w/cs 5/8 - 1-5/8"	422 199
SKS	Stapler 5/8 - 1-1/2"	390 279
SN70	Framing - Clip Hd 2 - 3-1/2"	725 449
SN65	Framing - Full Hd 2 - 3-1/2"	709 369
SN600	NEW Framing 2 - 3-1/2"	699 369
SPN40	Finishing Nailer 1-1/4 - 2-1/2"	569 359

Model	Description	List Sale
A100LS	Finish Stapler 1/2" - 1-1/2"	180 109
A150LS	Finish Stapler 1/2" - 1-1/2"	220 139
A125BN	Brad Nailer 5/8" - 1-1/4"	160 99
A200BN	Brad Nailer 5/8" - 2"	215 139

Model	Description	List Sale
NO5-1	Stick Nailer	325
RN45	Coil Roof Nailer 3/4 - 1-3/4	845 359
NO6FN-2K	Finishing Nailer w/ case	557 269
BT35-2K	Brad Tracker 5/8" - 1-3/8" w/ case, oil, & brads	279 125
MMFS	Flooring Stapler 15 gauge	902 539
S325X-1K	Finish Stapler 1/2" - 1-3/8" w/ case & oil	269 139

Item#	Length	Capacity	List Sale
4	4-1/2"	20.35	12.50 69.95
#1	10"	6"	23.30 13.50 73.95
#2	12"	8-1/2"	26.75 15.75 86.95
#3	14"	10"	33.85 19.35 109.95

Model	Description	List Sale
50	3/4" Black Pipe	15.45 6.50 94.00
52	1/2" Black Pipe	12.65 6.95 79.00

Model	Description	List Sale
50	3/4" Black Pipe	15.45 6.50 94.00
52	1/2" Black Pipe	12.65 6.95 79.00

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Model	Description	List Sale
DW124K	1/2" right angle Drill	580 329
DW321K	Top Handle Jigsaw Kit	300 164
DW364	7-1/4" Circ. Saw w/bake	294 155
DW610	1-1/2 HP 2 handle Router	266 149
DW411K1/4	sheet Palm Sander w/ case	588 50
DW682K	Biscuit Joiner with case	448 169
DW705	2" Compound Miter Saw	734 359
DW621	2 HP Plunge Router	400 199
DW621 comes with Free DW5955 fine height adjuster!		
DW675K	3-1/8" Planer with case	292 164
DW431	3 x 21 w/spd Belt Sander	338 188
DW421	5" Palm Ran. Orb Sander	144 74
DW423	Palmgrip Random Orbit Sander - variable speed	170 80
DW421 & DW423 come with Free DW4317 case!		
DW272	Drywall Gun, 0-4000, 6.3 amp	160 95
DW276	Drywall Gun, 0-2500, 6.5 amp	160 95

Model	Description	List Sale
DW972K-2	3-3/8" variable speed w/ two 12V XR batteries	362 184
DW991K-2	3-3/8" variable speed w/ two 14.4V XR batteries	415 209
DW994KQ	1/2" variable speed w/ one 14.4V XR batteries	458 239
Above drill kits come w/ charger & steel case!		
DW991KS-2	DW991K drill, DW935 trim saw, 2 XR batteries & case	345

Model	Description	List Sale
DW933K	NEW Jigsaw Kit	468 269
DW938K	Recipro Saw Kit	520 269
DW995K-2	1/2" Drill Kit w/ 2 batt.	531 259
DW997K	1/2" Drill/Hammer Drill Kit	454 249
DW936K	5-3/8" Saw Kit	458 249
DW995KS-2	DW995K Drill, DW936 Saw and case	385
DW995KC-2	DW995K 18V drill kit, DW936 18V reciprocating saw, & case	395

Model	Description	List Sale
DW708	12" Slide Miter Saw	649
DW788	20" Scroll Saw	549
DW733	12" Planer w/ extra blades	369
DW744	10" Portable Table Saw	499
DW756	6" Bench Grinder	164 75
DW758	8" Bench Grinder	184 115

Model	Description	List Sale
LP5-20A	Sight Level package 20x...	329 239
LP6-20XLA	LP6-20A with 9056 tripod and 7620 rod	409 269
LT8-300	Level Transit - 26x	739 539
LT8-300P	above Level with optical plumb	869 629
LT6-900	Level Transit - 20x	419 299
LTP6-900	Above Level with tripod & rod	615 395
ALT6-900	Automatic Level - Transit - 18x	66 479
ALTP6-900	above Level with tripod & rod	799 549
AL6-225	Automatic Level - 22x	583 279
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1275DVS	3"x24" w/ Belt Sndr	379 219
1276DVS	4"x24" w/ Belt Sndr	408 229
1194VSRK	1-1/2" w/ spd Drill w/ case	303 159
1613EVS	HP w/ Plunge Router	369 199
1634VSK	Recip Saw 10.5 amp	335 185
331SK	12V T-handle Drill Kit	345 159
361SK	14.4V Drill Kit	354 174
3107DVS	5" Random Orbit Sander	165 98
3107DVS	3107DVS with case	195 118
3725DVS	5" Random Orbit Sander	256 145
3727DVS	6" Random Orbit Sander	266 149
3915	10" Slide Compound Saw	1050 479
3912	NEW 12" Compd Miter Saw	638 299
11224VSR	7/8" SDS Rotary Drill	404 229
1703AEVS	5" Grinder - 8.5 amp	245 145
1347AK	4-1/2" Grinder with case	159 92
1636K	Drywall Cut-out Unit	185 105
1617	1-3/4 HP Router - 2 handle	516 159
1617EVS	HP Router w/ variable speed - 2 handle	516 189
1618	1-3/4 HP Router - "D" handle	516 179

Model</

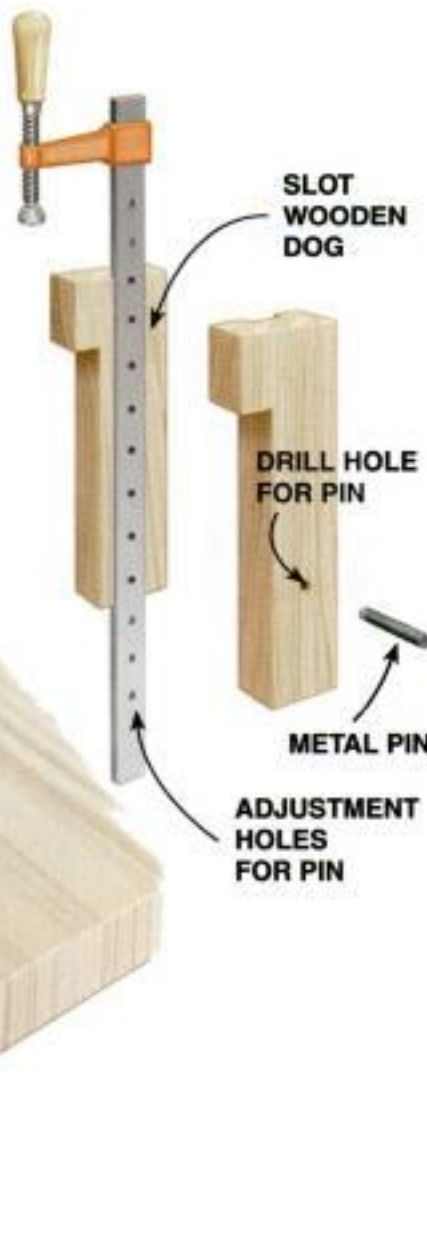
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Spiral-Turned Candlestick

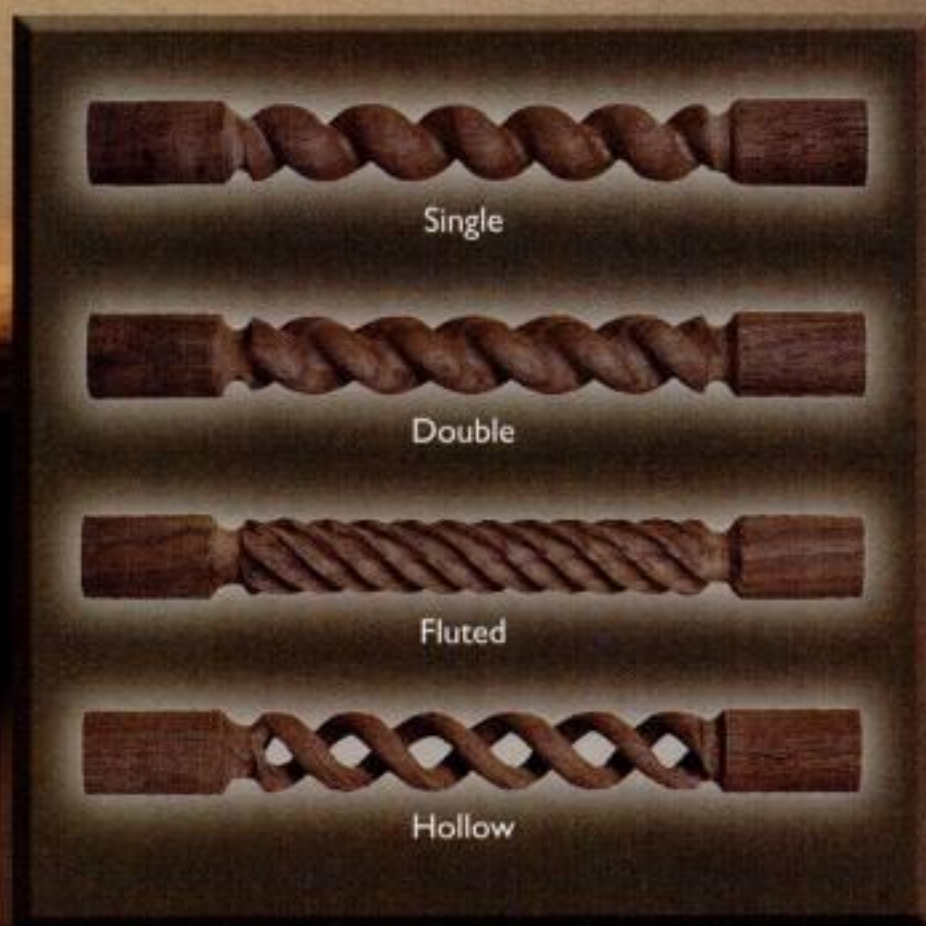
Learn the basics of spiral work and make an elegant candlestick in the process. A lathe, a few hand tools and some basic geometry are all you'll need.

Making spirals will add new dimension to your woodworking, whether in simple objects like these candlesticks, or as parts for furniture and cabinets. Impressive as it is, this classic technique can be accomplished with only simple layout work and a few basic tools.

Prepare the Candlestick Stem

Select straight-grained wood that carves well, such as walnut or mahogany. Don't choose wood like kiln-dried ash or oak that is prone to chip or tear out when carved across its grain. You may want to practice on softer, less expensive wood, like pine or alder. For a tall candlestick, as shown on the far left, start with a 12-in.-long blank mounted between centers and turn it to a 1-1/4-in.-diameter cylinder. Mark the middle 8 in. as the spiral section and make a relief cut at each end to give yourself clearance for sawing and carving (Fig. A). For shorter candlesticks, change the proportions accordingly.

Variety is easy! Once you've learned the trick, spirals can be cut in many styles. Single, double, fluted, and hollow spirals are just a few of the designs you can create by experimenting with these techniques.



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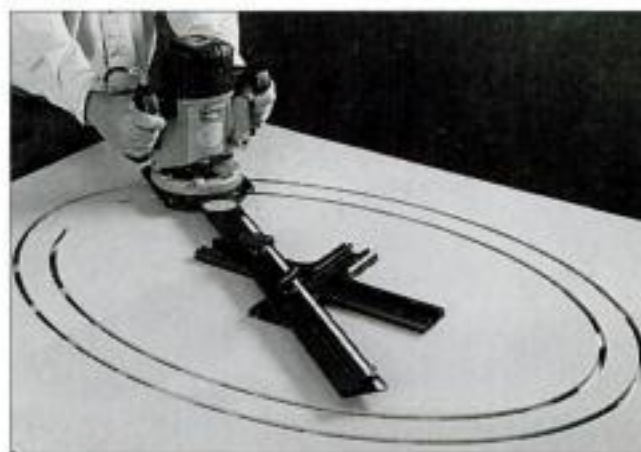
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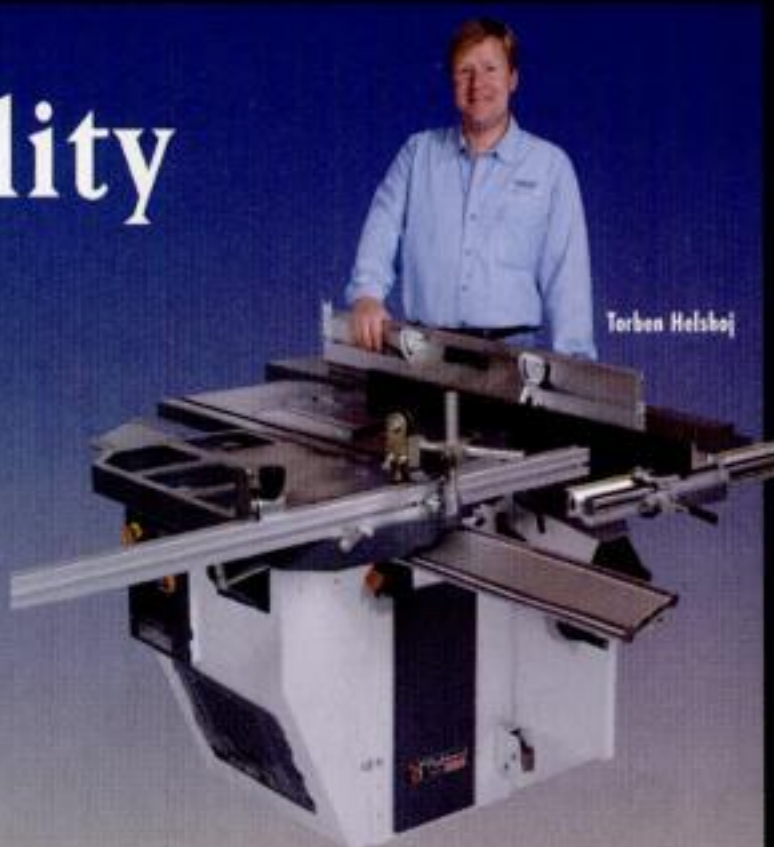
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Woodturning



1 **DRAW** a pair of lines lengthwise on opposite sides of the spindle. You can use the centering lines on the end of the blank to determine start points or use the index on the lathe's headstock.



2 **PENCIL** two sets of rings around the cylinder. The first set marks the pitch segments and the second set divides each pitch segment in half. The resulting grid makes drawing the spiral line easy.



3 **USE** a flexible straightedge or piece of cardboard to draw diagonals through one set of the "boxes" created by the layout lines. Continue this line down the entire spiral section's length to complete the spiral. Make sure the line is accurate.

FIG. A
SPIRAL LAYOUT

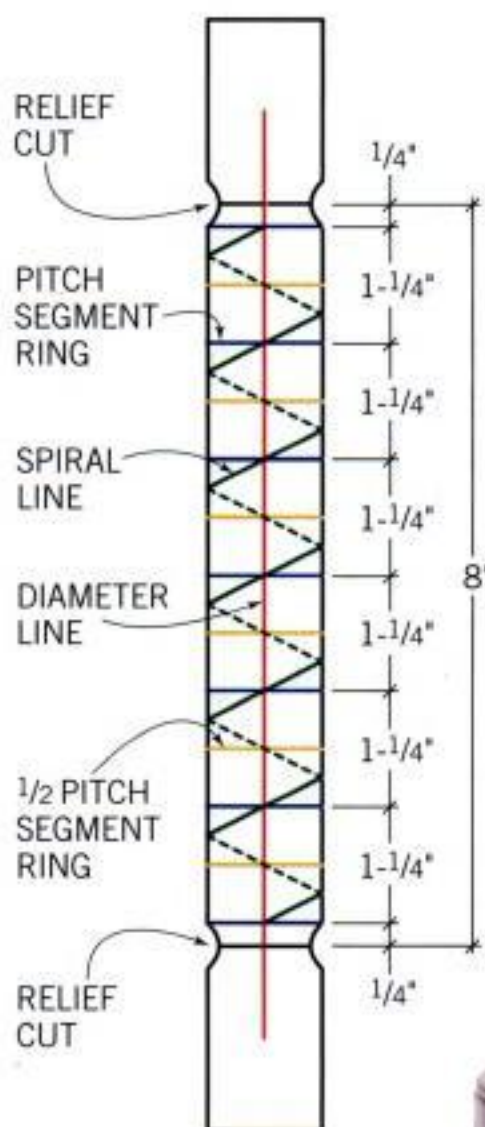
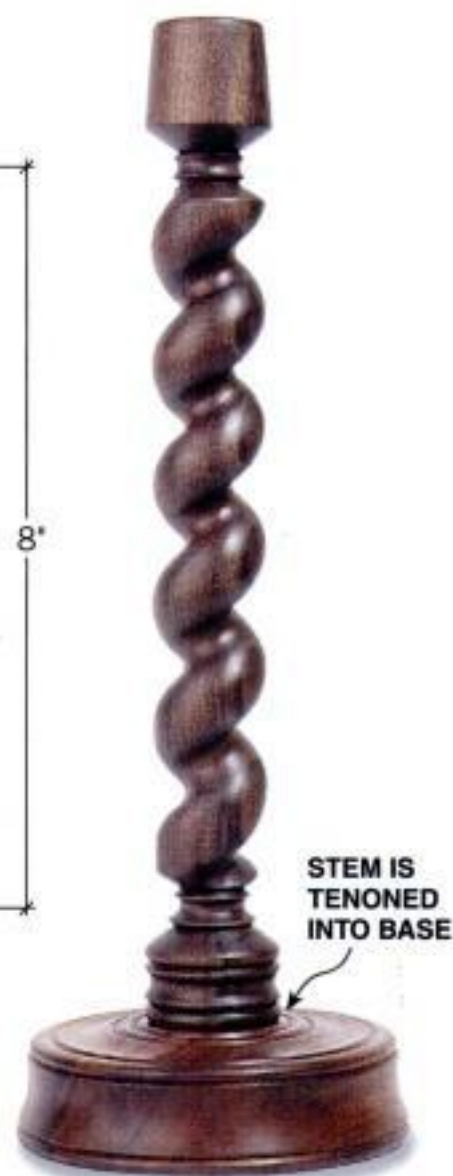


FIG. B
FINISHED CANDLESTICK



The relief cut gives clearance for the tools used during the shaping process and is modified later when the stem turning is completed. The completed stem ends in a 3/4-in. long tenon which is glued into a 3/4-in. dia. hole drilled in the base.

Lay Out the Spiral

Draw two straight lines opposite one another down the length of the spiral section, 180 degrees apart. The tool rest makes a handy straightedge (Photo 1).

The pitch of the spiral is set by dividing the cylinder into equal segments. An easy way to do this is to use the diameter of the cylinder as the segment length. This is a 1:1 ratio of pitch: One complete twist travels a distance in length equal to the diameter of the cylinder.

Six 1-1/4-in. segments fit into the 8-in. section of this candlestick with a little room to spare. That's OK. The dimension of the spiral section is arbitrary—just a guide for overall proportion. Mark the positions of the pitch segments centered in the spiral section. Draw one set of rings around the cylinder at these marks and another set of rings that divides each of these segments in half (Photo 2). Each set of rectangular "boxes" resulting from the intersection of these rings with the two lengthwise layout lines will contain one complete twist of the spiral.

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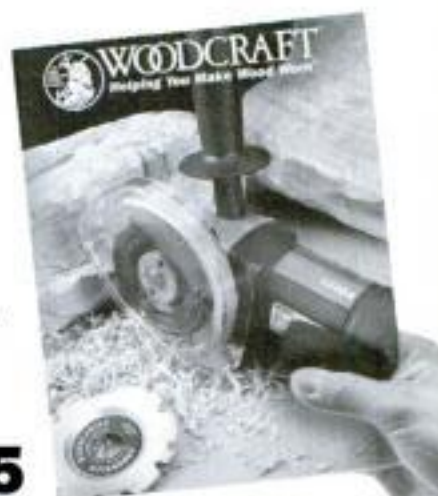
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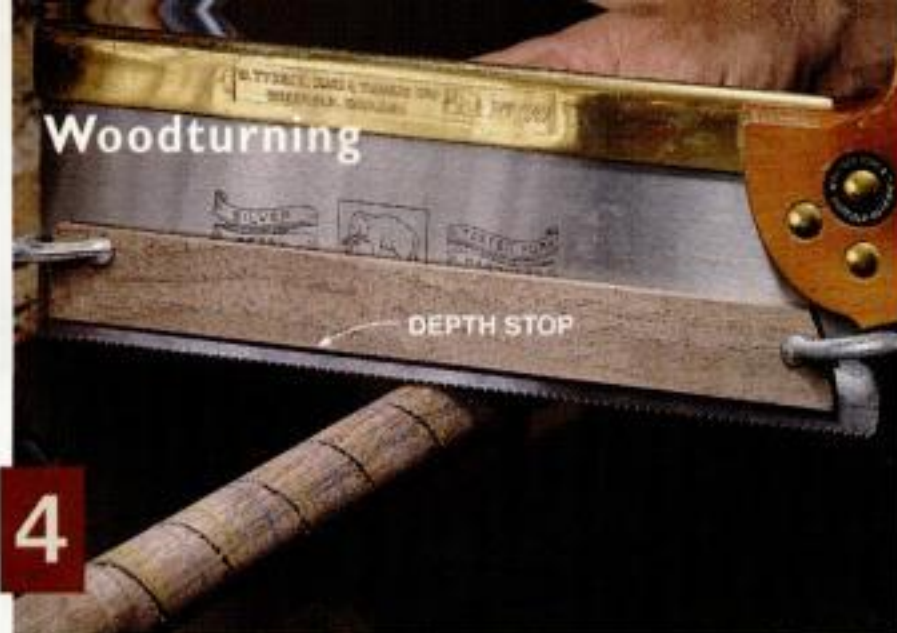
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4 **CUT** on the spiral line with a handsaw to a depth equal to one-quarter of the cylinder's dia. Cut at the top of the cylinder, and rotate the turning by hand as you cut. A wooden stop clamped to the saw will keep the depth of your cut consistent.



5 **PARE AWAY** waste from both sides of the saw cut to create a valley, and begin to round its shoulders. Cut with the grain, not into it, or you will lift the wood and chip off pieces of the spiral.



6 **USE** a fine round rasp or file to round and smooth the bottom. Rotate the spindle by hand as you work, and remove all saw marks.



7 **ROUND** the top shoulders of the spiral with a carving gouge, concave side down to create a clean, even profile. Be careful not to let the gouge cut into the bottom of the valley.

Now decide if your spiral will be left- or right-hand. Historically, most pieces of furniture that used spirals were balanced, with the spiral sections on opposite sides of the piece done as mirror-image twists. Angling the pitch lines from the left front corner to the right back corner creates a left-hand spiral. Angling from the right front to left back creates a right-hand spiral. The candlesticks we made have a right-hand spiral.

Starting at one end of the spiral section, draw a diagonal line through the corners of one of the boxes produced by the intersection of the layout lines (Photo 3). Continue this diagonal line from box to box around the cylinder to create the spiral line.

Saw the Spiral Line

Remove the tool rest from your lathe to avoid damaging your saw. Position a handsaw on the spiral line at the top of the cylinder and keep it there as you cut, rotating the cylinder frequently (Photo 4). Be sure to keep the cut vertical to the lathe's axis. Complete the saw cut to the ends of the spiral section.

Shape the Valley

Use a sharp chisel to pare away waste material down to the depth of the saw cut, tapering the top edges of the shoulders. You may want to pencil out limits before chiseling. Study the grain to determine the direction it runs and take care not to cut into it with the chisel—you may flake off the top edges of the shoulders if you do. Instead, position yourself so you can pare down each side of the shoulder across and with the emerging grain. Start from whichever end is easiest for you, pare one shoulder, then reverse the piece between the lathe's centers so you can pare the other (Photo 5). If your space allows, you can work from both sides of the lathe instead.

Once the shoulder waste is removed, refine the valley you have created with a rasp or file (Photo 6). Be sure to keep the width and angle of the valley uniform for the length of the section, following the original saw cut. Detect variations by eye. Rough-sand the valley with 80-grit abrasive wrapped around a dowel that fits the valley's curve, or just rolled into a round tube. Sanding shows if you have left any saw marks. Be careful not to go too deep—80-grit abrasive cuts quickly!

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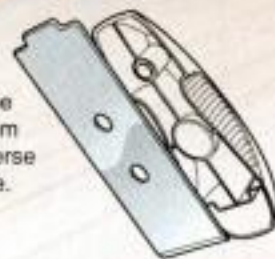
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Woodturning

Round the Hills

Rounding the top of the spiral to a consistent radius with no torn grain requires careful attention. I use a #7 carving gouge (Photo 7). The remaining intersections of the pencil lines mark the center of these "hilltops," for reference.

Smooth the Spiral

With the electronic variable-speed drive on my lathe, it is possible to sand spirals at very low speed (less than 50 rpm). I simply allow the strip of abrasive to "follow the threads." This speeds and eases the sanding process. If you are



SAND the spiral quickly by working an abrasive strip back and forth through the "threads," but don't sand away detail.

planning a lot of spiral work, you may want to consider rigging a low speed on your lathe. Reversing lathe direction allows sanding from both ends. If you must sand by hand, strips of abrasive will make it easier (Photo 8). Because you have exposed a lot of end grain in your carving, finish-sand to at least 320 grit. If these surfaces are left coarse, the final finish will be mottled and irregular. Don't over-sand the spiral sections, or they will lose definition.

Finish Turning the Candlestick Stem

Finish the top and bottom sections of the stem with coves, beads, and tapers (Photo 9 and Fig. A). Drill the candle cup (Photo 10) and saw the base off the tenon. Cut light grooves in the tenon along its length for glue squeeze-out.



A TAPERED SKEW CUT finishes the candlestick. At the other end, turn a tenon to fit in the base, but leave at least a 1-1/4-in. section of the full dia. cylinder to support the spindle when you drill the candle cup (Photo 10).



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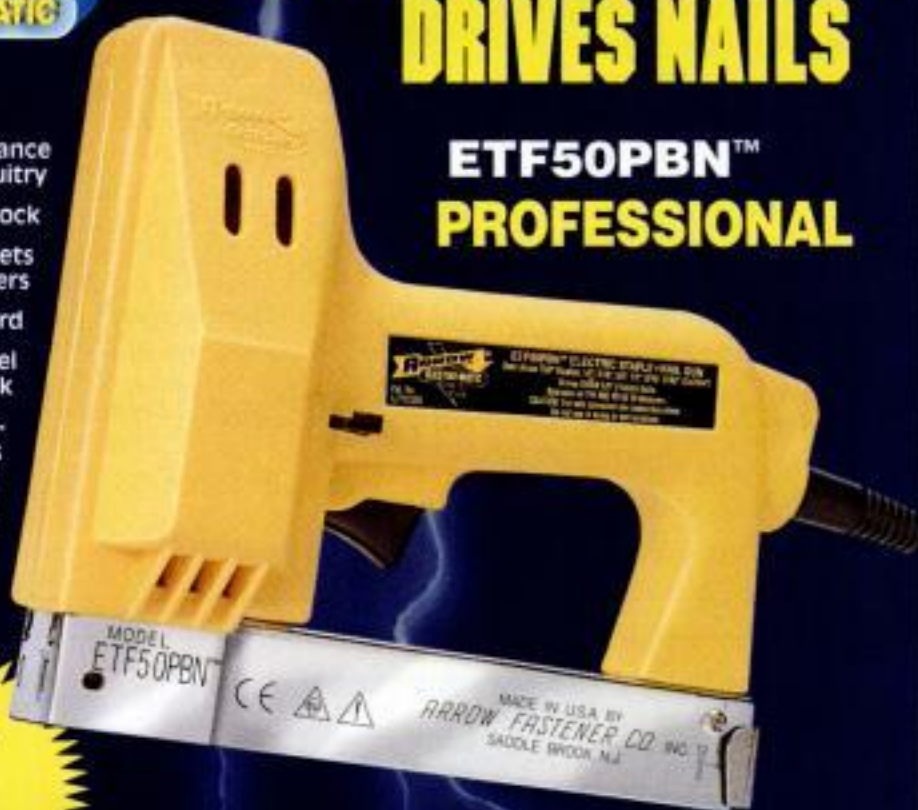
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BORE the candle cup on the drill press to a 1-in. depth using a 7/8-in. Forstner bit aligned on the lathe's center mark. If you plan to use a metal candle cup (see Sources), drill to fit.

The base is a faceplate or screw-chuck turning, designed so it doesn't compete with the spiral stem (Photo 11 and Fig. A). Make it of 1-1/4-in. thick stock, 4-1/2-in. diameter, so it's large enough to keep the candlestick from tipping. Cut the blank round before mounting it on the lathe.

I like walnut with a deep, antique color, so I used several coats of Watco natural oil as a finish. It also keeps candle wax from sticking to the candlestick. After finishing, glue the tenon into the 3/4-in. hole in the base, and glue a piece of felt to the bottom.

11

TURN the base on a faceplate or screw chuck. Drill the hole for the tenon on the drill press after you're done turning.

Once you have mastered the single, or "barley" twist, you can do most any spiral work (see p. 28). Varying the number and placement of layout lines and expanding on the sawing and shaping techniques described here will keep you busy "twisting the night away!" **AW**

SOURCES

Metal candle cup: Craft Supplies U.S.A., 1287 E. 1120 S., Provo, Utah 84606; (800) 551-8876; www.craftusa.com

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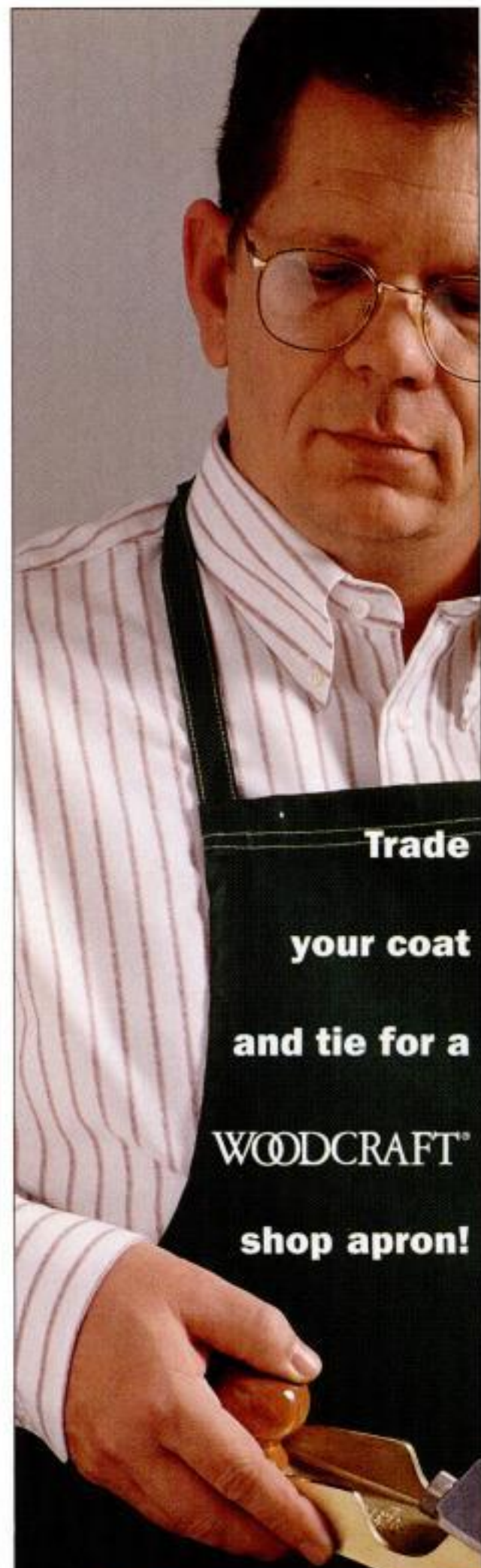
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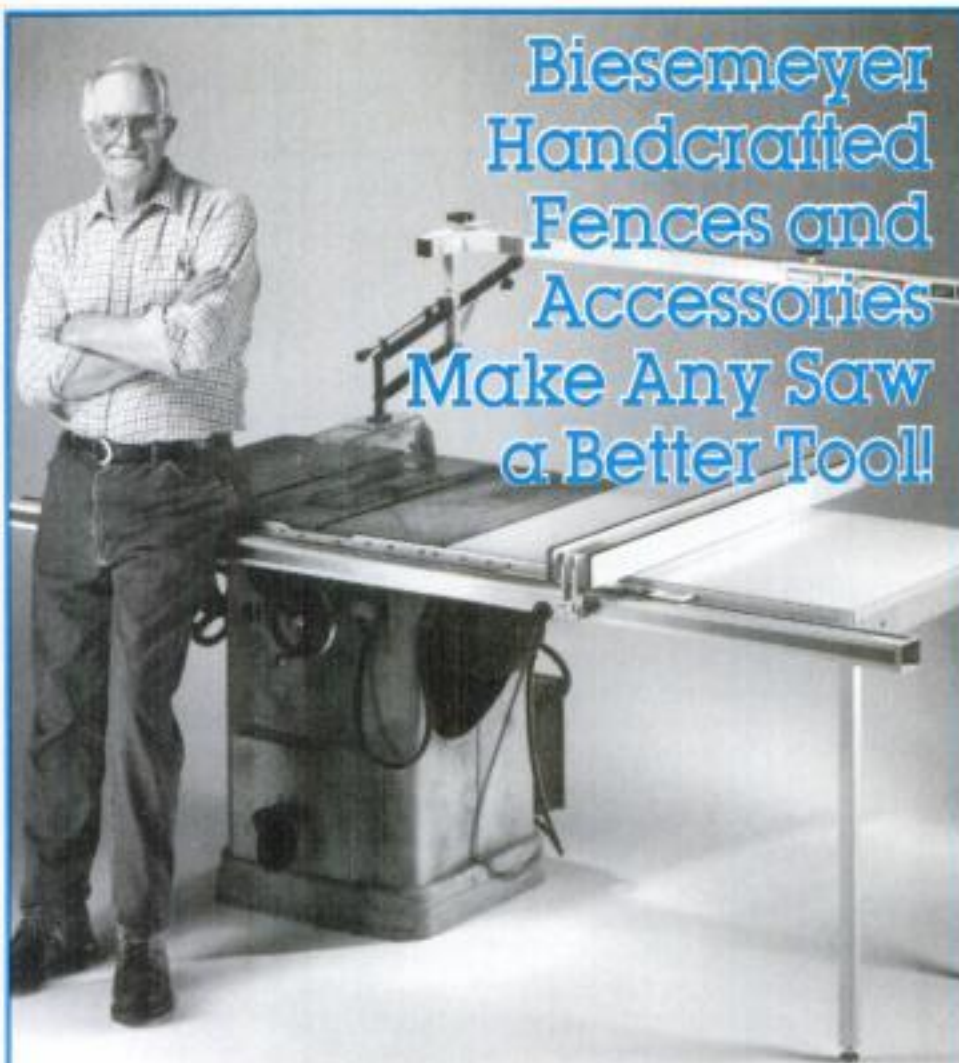
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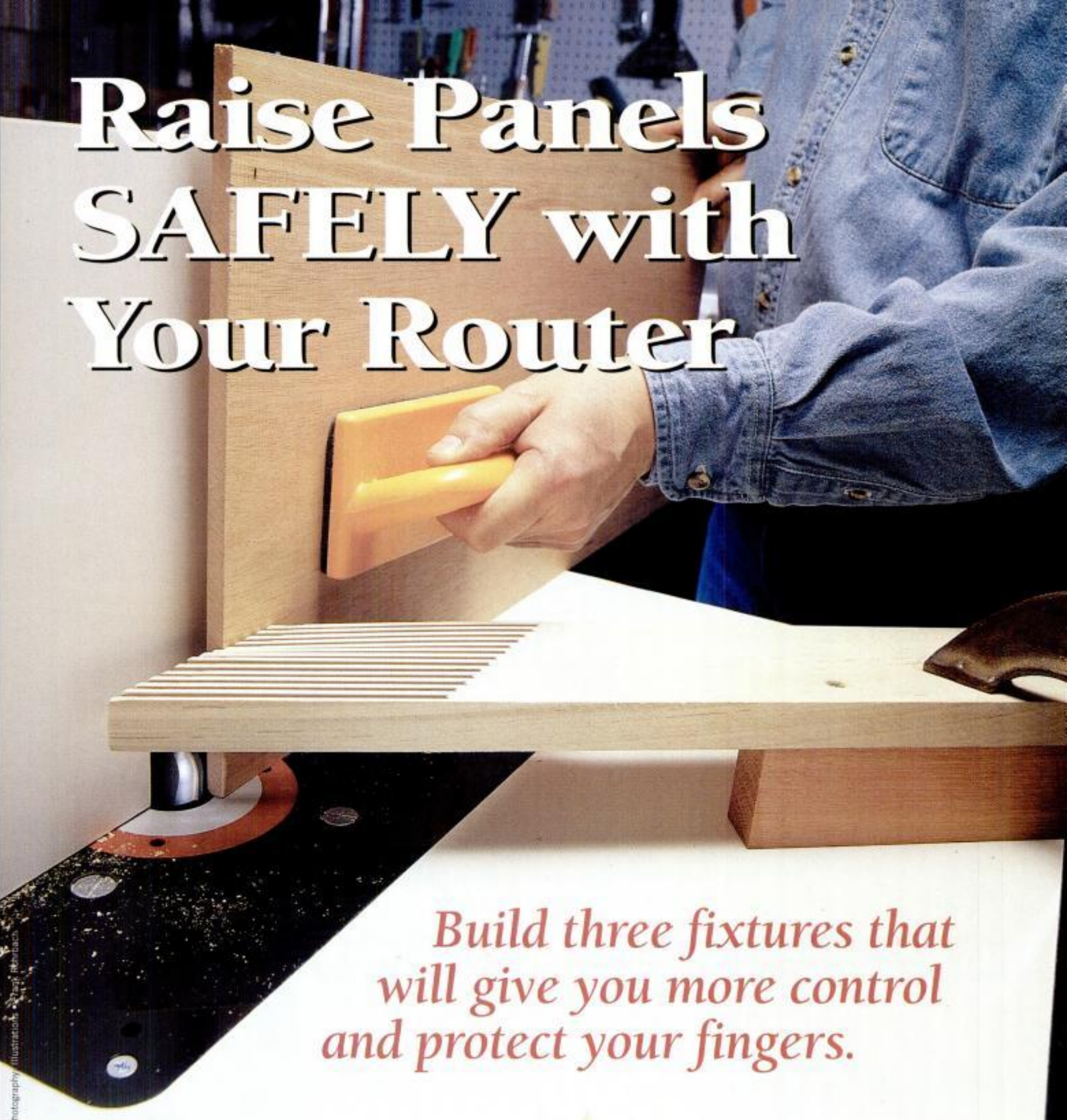
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SCARY. That's what most woodworkers think about raising panels with a router. The idea of that big hunk of sharpened steel spinning around near your fingers is frightening. But what are the options? Raising panels by hand is time consuming and raising them on the tablesaw is just as scary.

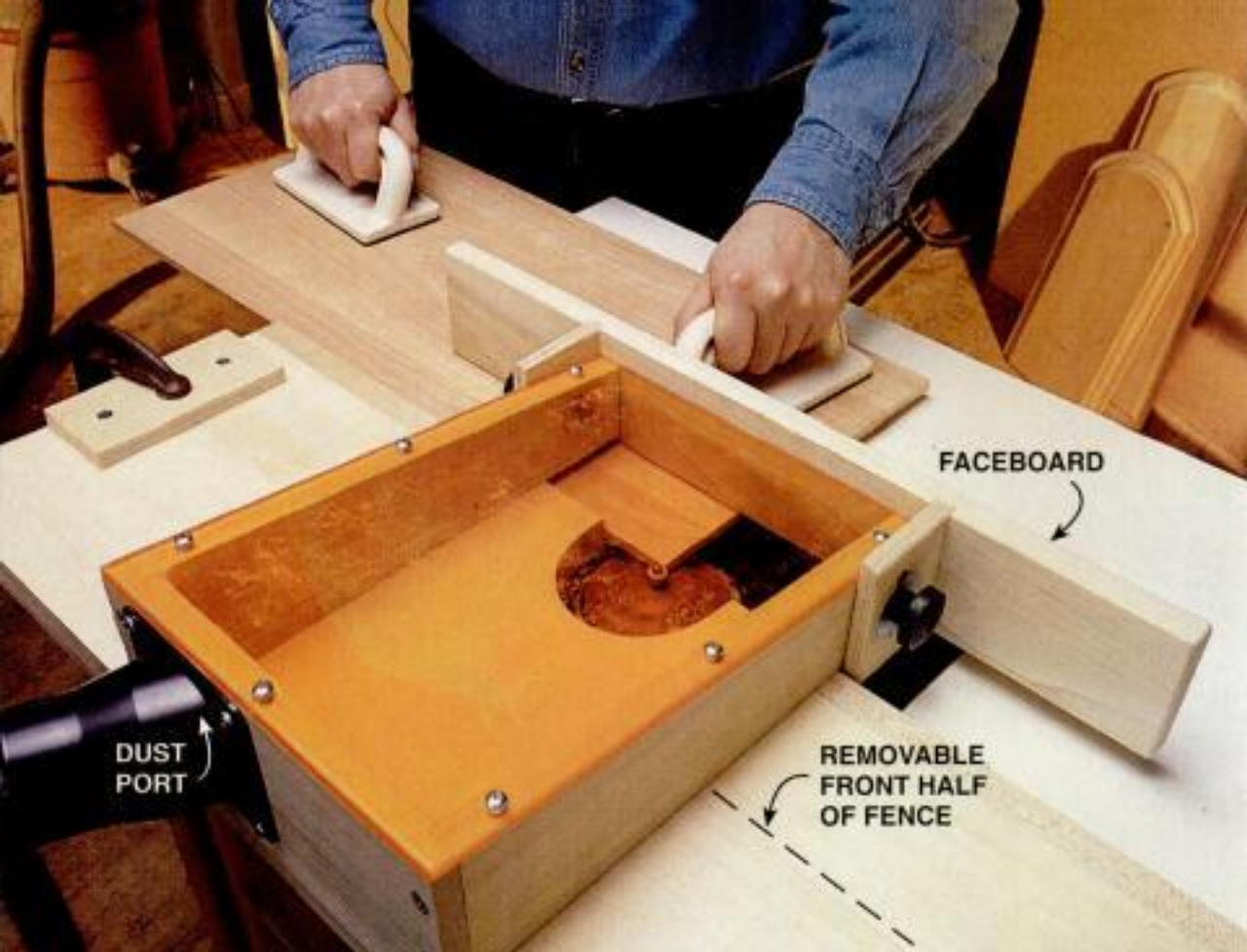
Give your router a chance. I'll show you three different fixtures designed to tame those scary bits. When properly set up and used, they will make panel raising with your router safe and easy. Instead of feeling scared, you'll feel confident.

Those Big Bits

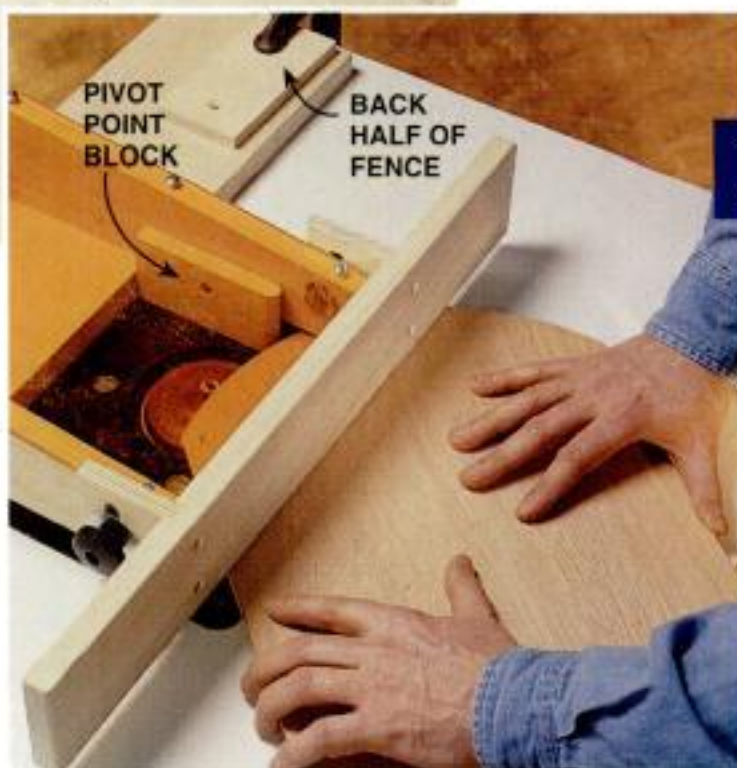
There are two types of panel-raising router bits (p. 40). Either the panel is laid flat on the work surface and fed past a horizontally oriented bit, or the panel is tipped on its edge and fed past a vertically oriented bit. Each type has advantages.

Because they are fitted with a bearing, horizontal bits can raise panels with either straight or curved edges. If you want

BY TIM JOHNSON



1 THE BOX FENCE keeps your fingers well away from the router bit, and has an adjustable faceboard to hold the panel tight against the table. The box makes dust collection very effective and visibility through its polycarbonate top is excellent.



2 FOR ARCHED PANELS, the front half of the base is removed, allowing you to swing the work past the bit. A pivot-point block, attached to the infeed side of the box, keeps the panel from kicking back when you feed it into the bit. The fixture is positioned to locate the pivot point close to the bit.

TYPES OF PANEL-RAISING ROUTER BITS

Panel-raising bits operate horizontally or vertically.

HORIZONTAL BIT

PROS

- Most versatile; can cut straight or curved edges

CONS

- Expensive
- Requires a powerful (3 hp) router with variable speeds
- Large diameter cutter looks scary



VERTICAL BITS

PROS

- Cheaper
- May be compatible with your old router because they require less power and small diameter bits (1-in.) can operate in single-speed routers

CONS

- Can't do curved edge
- Running lots of panels on edge can be tiring



to raise arched-top panels, a horizontal bit is your only choice. The bit's massive cutting surfaces and weight require a powerful router and its large diameter requires one with variable-speed capability. The combination of a horizontal bit with a 3-hp, variable-speed router is hard to beat. The bit gives you versatility and the router lets you adjust the speed for the best cut. However, these bits are costly—\$85 to \$145—and if you don't own a compatible router, the total expense could be prohibitive.

If straight-edged panels are all you anticipate making, vertical bits will serve you well. Because of their vertical

The Box Fence

For safe use of large, horizontal bits.

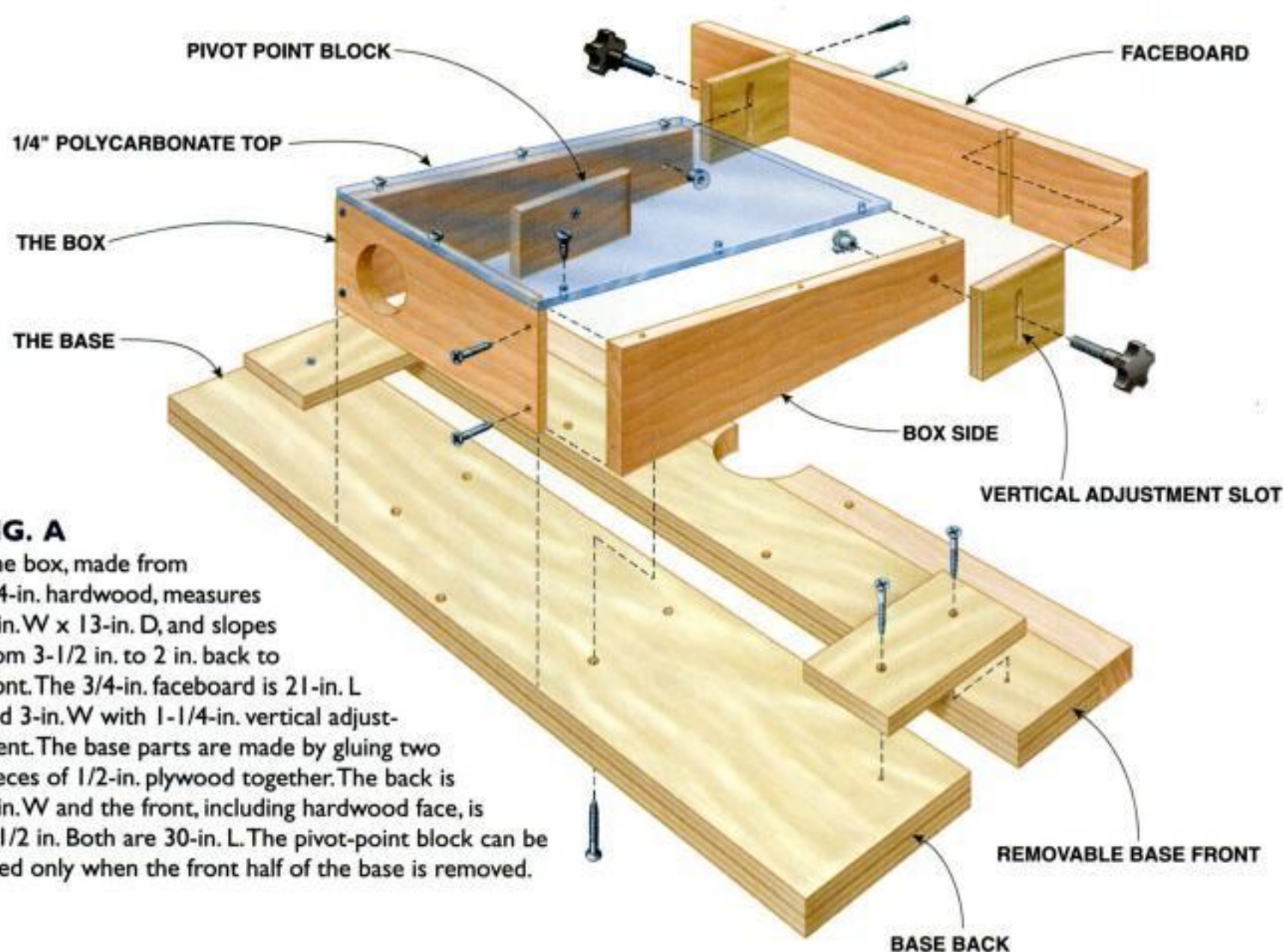


FIG. A

The box, made from 3/4-in. hardwood, measures 9-in. W x 13-in. D, and slopes from 3-1/2 in. to 2 in. back to front. The 3/4-in. faceboard is 21-in. L and 3-in. W with 1-1/4-in. vertical adjustment. The base parts are made by gluing two pieces of 1/2-in. plywood together. The back is 6-in. W and the front, including hardwood face, is 4-1/2 in. Both are 30-in. L. The pivot-point block can be used only when the front half of the base is removed.

orientation, they are smaller in diameter than their cousins, so they're less expensive and require a less powerful router to operate. Variable-speed control is less of an issue, as the smaller bits (1-in. diameter) can be used with single-speed, high-rpm routers.

The key to being comfortable using either of these bits is to protect yourself from them. Two accessories listed in the "Four Rules for Safe Operation," at right, help you do just that. Featherboards do double duty. They protect against kick-back and also effectively block the bit and keep your fingers out of harm's way. Push blocks keep a firm grip on the workpiece and protect your hands in more ways than one. Keeping them away from the bit is obvious, but you'll find that gripping the push blocks is much less fatiguing for your hands than holding and manipulating the panel without them. Use these tools without fail—you'll be glad you did.

The Box Fence: Safe Housing for Horizontal Bits

This fixture, consisting of a box and a base, surrounds a horizontal bit. It is derived from fixtures Lonnie Bird used when raising panels on his shaper (AW #34 and #72). The box has an adjustable faceboard at its front to bear on the panel, a polycarbonate top for visibility, and a dust collection port at its rear.

The box is attached to a split base. Aligned with the bit's pilot bearing, the front half of this base acts as a fence for straight-edged panels (Photo 1). Remove the front half of the base, add the pivot-point block, and the fixture accommodates curved-edge panels, or other operations run off the pilot bearing (Photo 2).

This fixture is effective because it offers versatility, excellent visibility, and great protection. If you can justify the expense of the horizontal bit and 3-hp., variable-speed router, read no further.

FOUR RULES FOR SAFE OPERATION

These guidelines must be followed when using panel-raising bits:

1. Slow the router's speed according to the bit manufacturer's specifications. The larger the bit, the slower the speed.
2. Use a slow, steady feed rate and make several shallow passes. Listen to the motor, don't bog it down, and use common sense.
3. Make cross-grain cuts first.
4. Use appropriate safety gear:
Eye and ear protection
Featherboards
Push blocks



3

THE HIGH FACE on this fence provides ample support for panels. Its hardwood top surface is smooth and splinter-free. Dust collection is effective because of the point-of-discharge port. The fence swivels on a threaded lock knob on its infeed end, and when used with a clamped block on the other end, makes minor adjustments easy.

A TALL FENCE, a featherboard, and a push block help to advance a panel, tipped on its edge, past the vertical bit.

The Tall Fence for vertical bits.

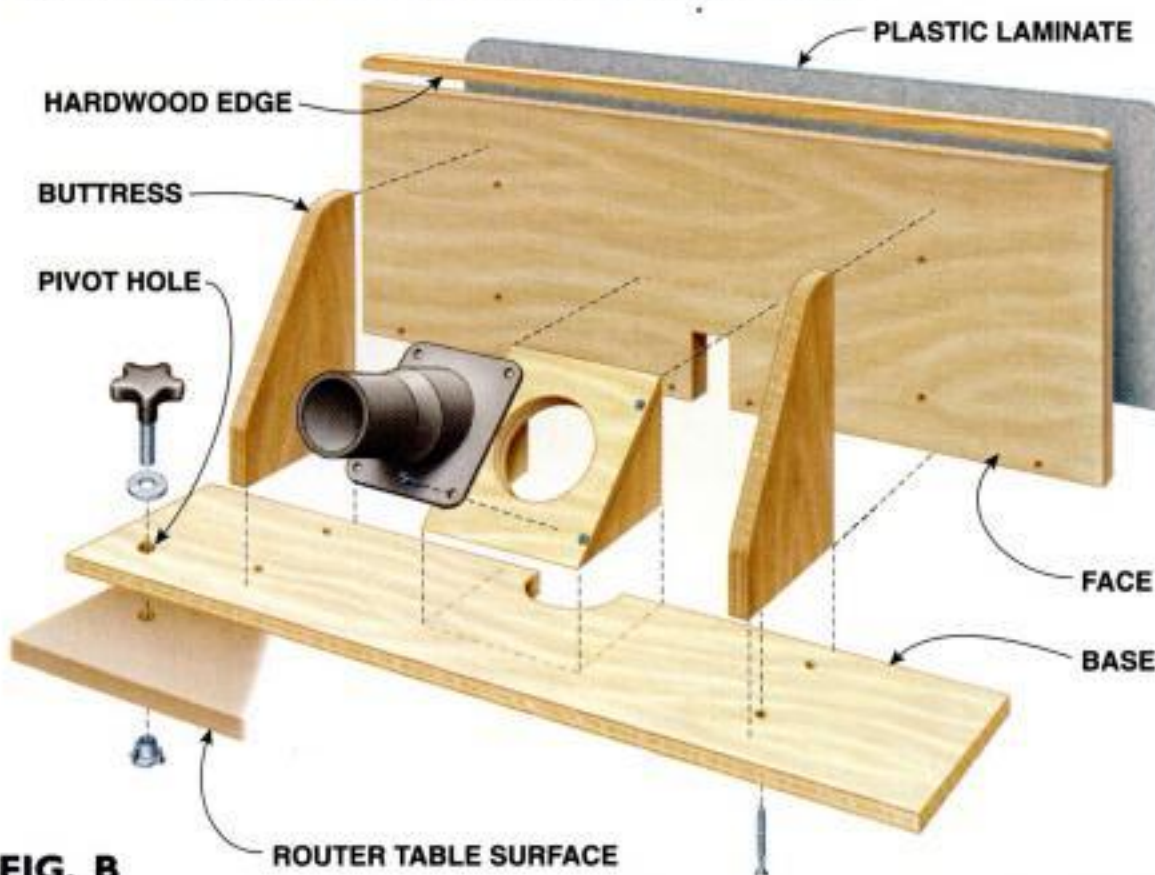


FIG. B

This fixture, made from 3/4-in. plywood, consists of a plastic-laminate covered, 10-in. high fence edged on top with hardwood. It is mounted to a 5-1/2-in. wide base and held perpendicular to it by buttresses. It pivots around a hole drilled through the infeed side of the base and router tabletop and is fixed by a threaded lock knob.

A Safe Fence for Vertical Bits

Safely using the vertical bit requires a fence with a tall face. This idea has been around for a long time, and is usually associated with the tablesaw. This fixture is the easiest of the three to build. Its face is 10-in. tall, high enough to support most panels (Photo 3 and inset). It must be firmly supported and built square so that it clamps perpendicular to the router table.

The key to making this fixture work safely is a featherboard mounted on a block so that it presses the panel against the fence above the cut of the bit. It is positioned over the bit and clamped securely to the table.

When used with a push block, this fixture keeps your hands clear and eases the job of running panels on edge. Unfortunately, using it makes you stand in a twisted position, and that's a big shortcoming. With extensive use, this fixture can be tiring.

Make Vertical Bits Work Horizontally

If you're set on using vertical bits, consider mounting the router horizontally on the end of your tablesaw. Then you can lay the panels flat and raise them without contorting your body. This idea was incorporated as part of "The Ultimate Router Fence" (AW #37) and explained in detail in Bill Hylton's book "Router Magic." The fixture is complex and will take time to build, but its benefits will be noticeable if you have large panels or a large number of panels to raise. Although shown dedicated to a tablesaw, it could be adapted to a router table as well.

This fixture consists of a piece of plywood fastened perpendicular to the saw and an arm, housing the router, fastened to it. The arm pivots to raise the router and bit into position (Photo 5) and, when locked, acts as a bearing fence for the panel (Photo 4). Again, a block-mounted featherboard must be employed to bear on the panel beyond the top of the bit's cut. Positioned over the bit and clamped to the pivot arm, the featherboard effectively blocks your hands while guarding against kickback.

Once built, this fixture is effective

Pivot Arm Router Table

Holds vertical bits horizontally for easier use.

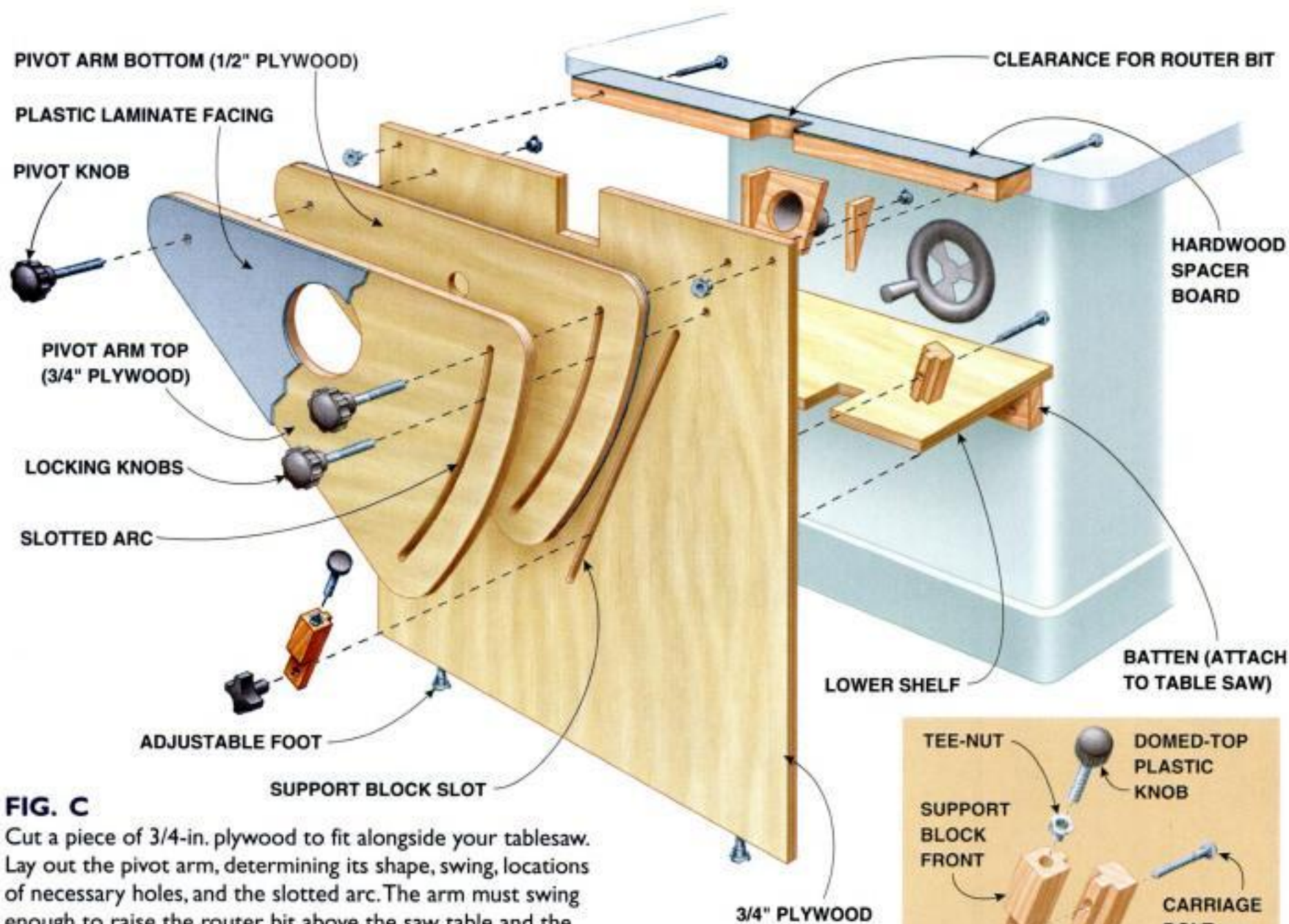
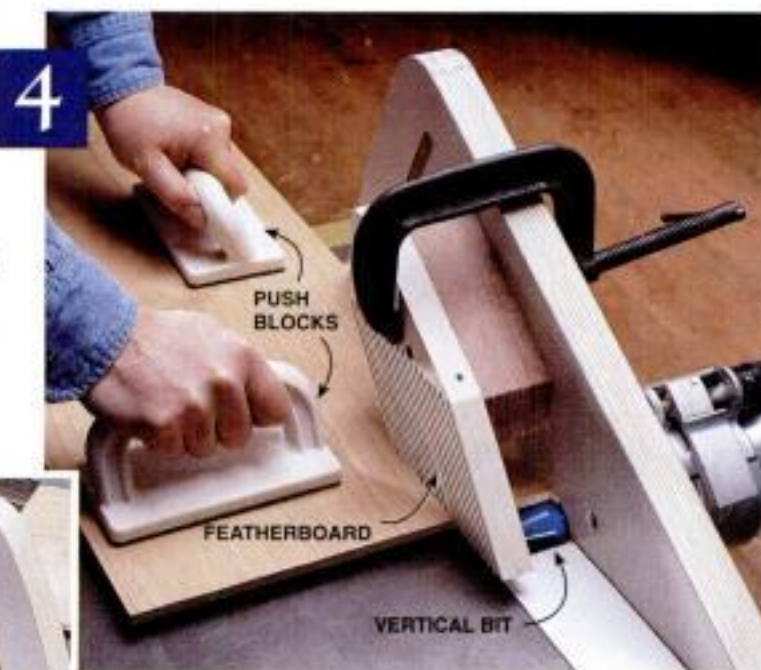


FIG. C

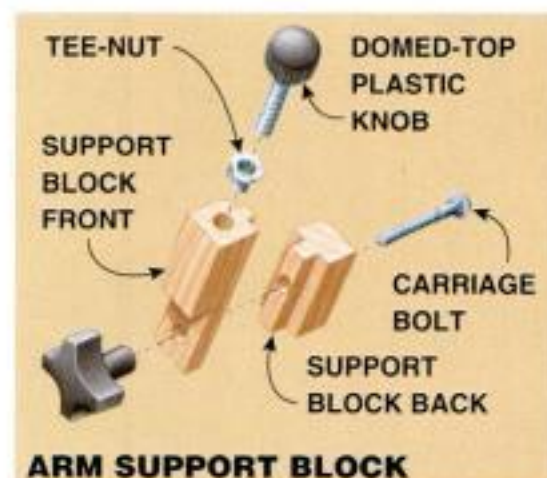
Cut a piece of 3/4-in. plywood to fit alongside your tablesaw. Lay out the pivot arm, determining its shape, swing, locations of necessary holes, and the slotted arc. The arm must swing enough to raise the router bit above the saw table and the support block must support the arm through the length of its swing. The spacer board and the lower shelf hold the fixture properly at the side of the table.

THIS FIXTURE mounts to your tablesaw or other flat surface. It allows you to place the panel on its face, making it easy to control. The featherboard keeps the panel from kicking back and blocks your hands from the bit.



5

HEIGHT ADJUSTMENT is precise: One complete turn of the knob moves the bit one-sixteenth of an inch. Make test cuts on scrap stock to dial in the exact position. A white line painted on the edge of the knob serves as a reference point.



ARM SUPPORT BLOCK

because, with the panels on their faces and gravity as your ally, you can address them straight-on. Push blocks work great with this set-up.

You will find this fixture useful for any other operation where you would normally run the workpiece on its edge: Wide molding profiles or tenons, for example. **AW**

FOR MORE INFORMATION

"Router Magic"

by Bill Hylton. Reader's Digest, 1996 pp. 191-202; to order call (800) 452-6798. Price: \$29.95 plus \$5.17 S&H.

SOURCES

Rockler Woodworking and Hardware
4365 Willow Dr., Medina, MN 55340
800 279 4441

www.rockler.com

To order back issues of AW, see p. 8.

Transform rugged Australian jarrah into a graceful outdoor table.

Cafe Table

By Tom Caspar

Picture yourself at a small, round cafe table with a cup of coffee and a newspaper. The world goes by along a busy boulevard. People are hurrying about their business, but you're an island of calm in a crazy world. Although your backyard may not be quite that busy, you can enjoy the same tranquility with this outdoor table.

This table is just the right size for one person to spread out the Sunday paper, or for two people to have lunch. It has three feet

instead of four, so it sits firmly on an uneven deck or terrace. It has a turned central column instead of legs, so you can comfortably stretch out your legs.

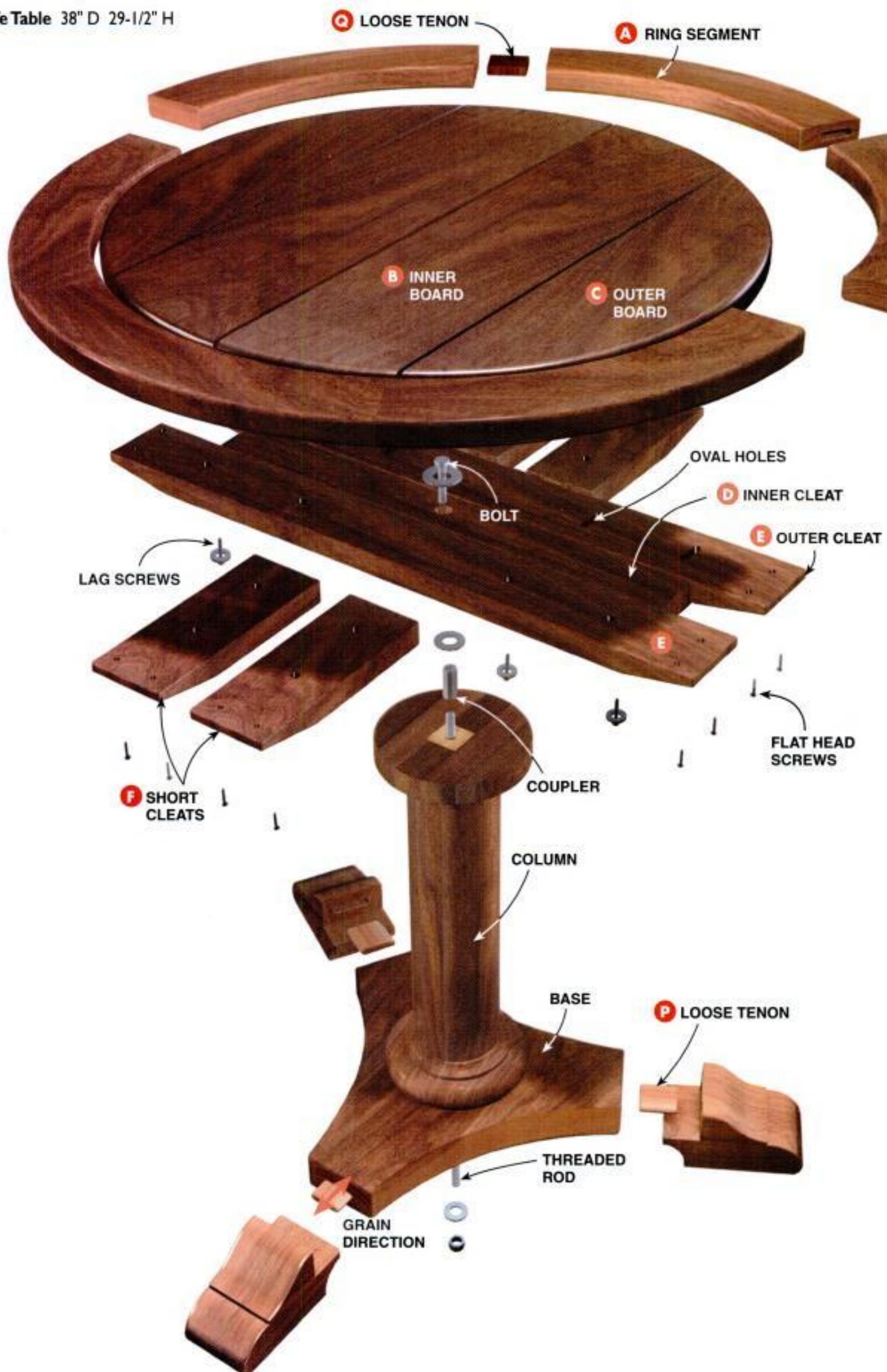
The table is made from jarrah, a weatherproof wood from Australia that's strong and durable. (For more on jarrah, see page 52.) White oak would be a good alternative. Total material costs are about \$450.

The table consists of four major parts: the top and cleats, made from 6/4 lumber; and the column and base, made from 8/4. Tackle the bottom half first, beginning with the column.

ART DIRECTION • JOEL SPIES; PHOTOGRAPHY • MIKE HABERMANN; ILLUSTRATIONS • DAN WESTERBERG

FIG. A CAFE TABLE EXPLODED VIEW

Cafe Table 38" D 29-1/2" H





Cafe Table

The Column

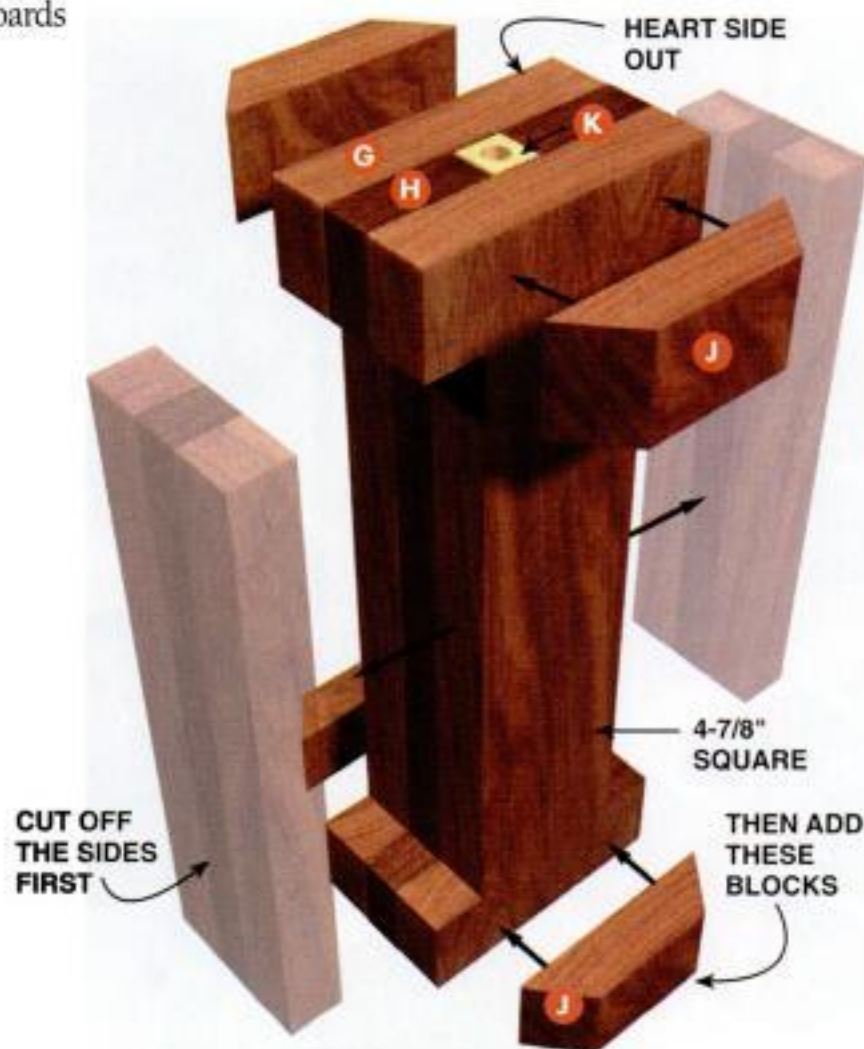
The column is made from four pieces, with a cavity between them that houses a threaded rod. Cut all four pieces a bit longer than the finished length of the column. Orient the two largest pieces so their heart sides (the sides nearest the center of the tree) face away from each other (Fig. B). This keeps the glue joints tight if the boards cup, since most boards cup away from the heart.

Use a weatherproof glue, such as Franklin's Titebond II, for all the joints in this table. Spread it on the column pieces with a small paint roller and clamp with moderate pressure (Photo 1). Let it dry overnight. Then take the blank to the bandsaw to slim down the central section before turning (Fig. B).

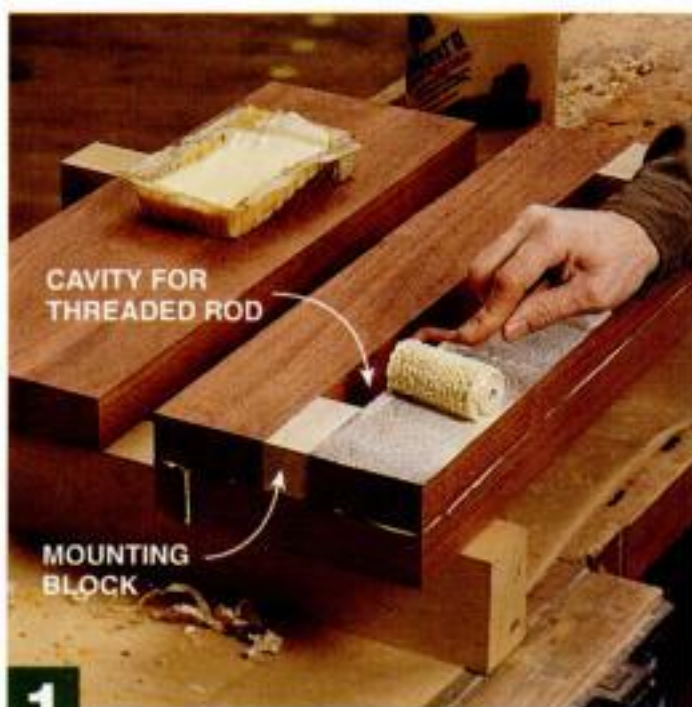
Add four short pieces of wood to the top and bottom of the column to increase its diameter. The growth rings of these pieces should go the same direction as the wood that they're glued to. Cut off the outside corners of the four pieces at 45 degrees before gluing them on. This makes the column easier to turn. After the glue is dry, stand the

FIG. B THE COLUMN BLANK

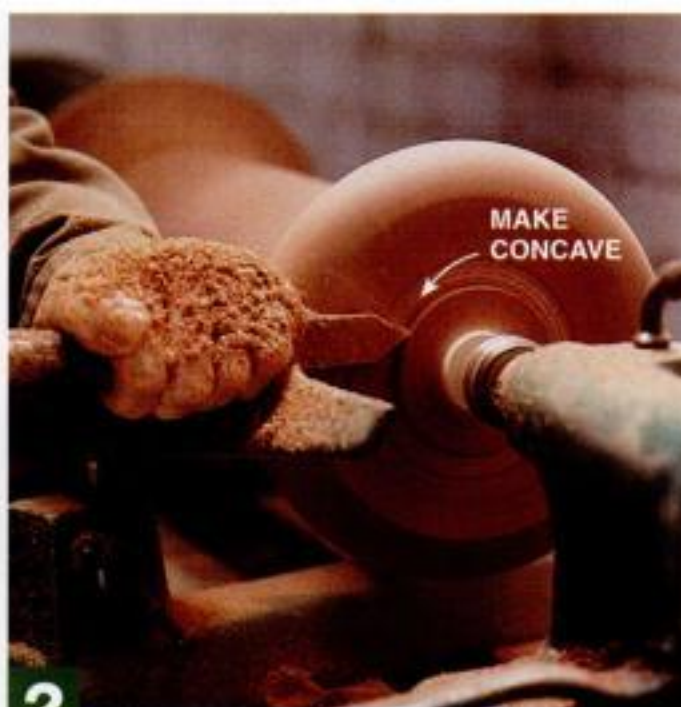
Bandsaw the waste from both sides of the glued-up blank to make it lighter and easier to turn. Then glue on four short pieces to increase the column's diameter at the top and bottom.



8"
4-3/4"



1 **GLUE UP** 8/4 lumber to make the column. A cavity runs down the middle for a threaded rod that holds the table together. Blocks at the ends of the cavity will be used to mount the column on the lathe.



2 **EVEN UP** the ends of the column and make them slightly concave with a parting tool. This concave end will always sit tight on the base.

6"
8"

column up on end and split off the square corners of the large blank to finish making each end an octagon.

Any good lathe can handle this large turning, but the machine must have a sturdy base. Jarrah is heavy! Sandbags on the base's shelf will help dampen vibration. Run your lathe at its lowest speed as you rough out the column. Once you've made a cylinder, use a parting tool

to cut down to the diameter of the central shaft in a few places (Photo 2). Then part to the diameter of the narrow ring that separates the cove and bead. Cut the ends of the column to length with the parting tool as well. Leave a 1-in.-diameter stub while making each end slightly concave (Photo 2). Then complete the turning and sand it on the lathe.



FIG. C THE BASE

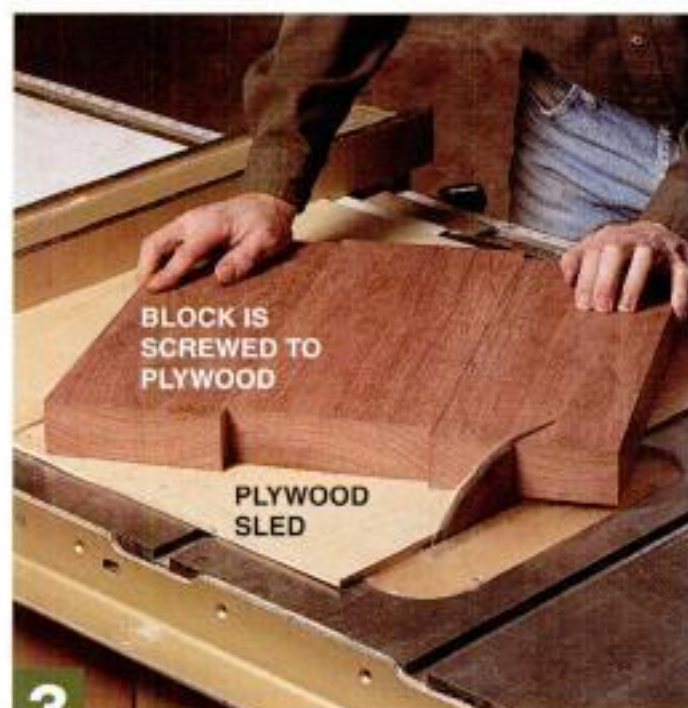
LAY OUT the curves in the base with simple geometry.

Step 1: Lay out the centerline of the glued-up blank. Use a trammel to draw a circle that touches one end of the middle board. Start at point A with the trammel and step off arcs around the circle to give you points B and C. Connect B and C with the center to divide the circle into three parts. These three lines are the centerlines for the feet.

Step 2: Draw perpendicular lines to mark the ends of the feet. Cut the waste off on the tablesaw.

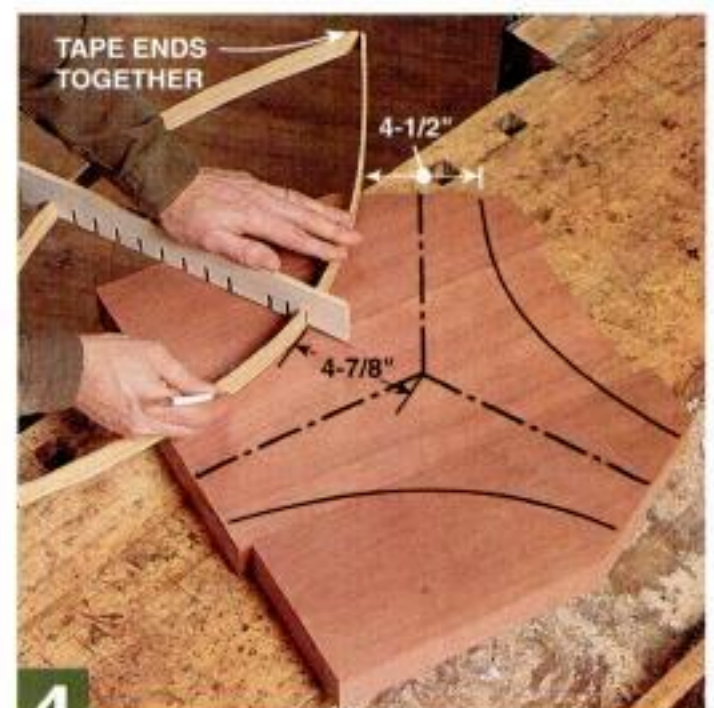


DRAW large curves with a shop-made trammel. A sharp nail fits tightly in the holes to make different radius circles.



3 CUT the corners of the base on a table-saw, using a plywood sled. To set up the cut, place one edge of a plywood square along the layout line and screw the plywood to the base. The saw fence is set to the width of the square.

Saw guard removed for photo clarity. Use yours!



4 FOLLOW the curve of a bent bow to finish laying out the base. Make the bow from two strips held together with duct tape. A notched bar creates the arc.



Cafe Table

The Base

Cut the base from a glued-up blank. To figure out the least amount of wood you need for the blank, draw a full-size pattern of the base onto a piece of paper. If you make the blank the size suggested here, draw the pattern directly on it, and use the waste for the feet. In any case, here's a way to save yourself some work: trim the end of the center piece straight and square before gluing up the blank. Now you have a finished surface onto which you'll attach one of the feet.

Use a shop-made trammel to lay out the base (Fig. C). You can make a trammel that's accurate enough for this project out of a 2-ft. length of 3/4-in. square stock, a pencil, and a sharpened 8d nail (Fig. C). Drill a hole for the pencil near one end. The pencil must fit snugly. Drill three smaller holes for the nail, to make 9-in., 15-3/8-in., and 19-in. radius circles. Hammer the nail into each hole, as needed.

Draw the corners directly onto the base. Use a tablesaw to cut the blank,

using a 24-in. square piece of plywood as a sled to hold the work (Photo 3). Align one edge of the plywood with the layout line for a corner, clamp the plywood in place, and run in three screws to attach the plywood to the base. (The screws go in the middle, so the holes will be covered by the column.) Set the saw's rip fence to the size of the plywood square. Then, cut the blank exactly on the layout line. Reposition the plywood for the third corner and repeat the process.

Lay out the large concave curves of the

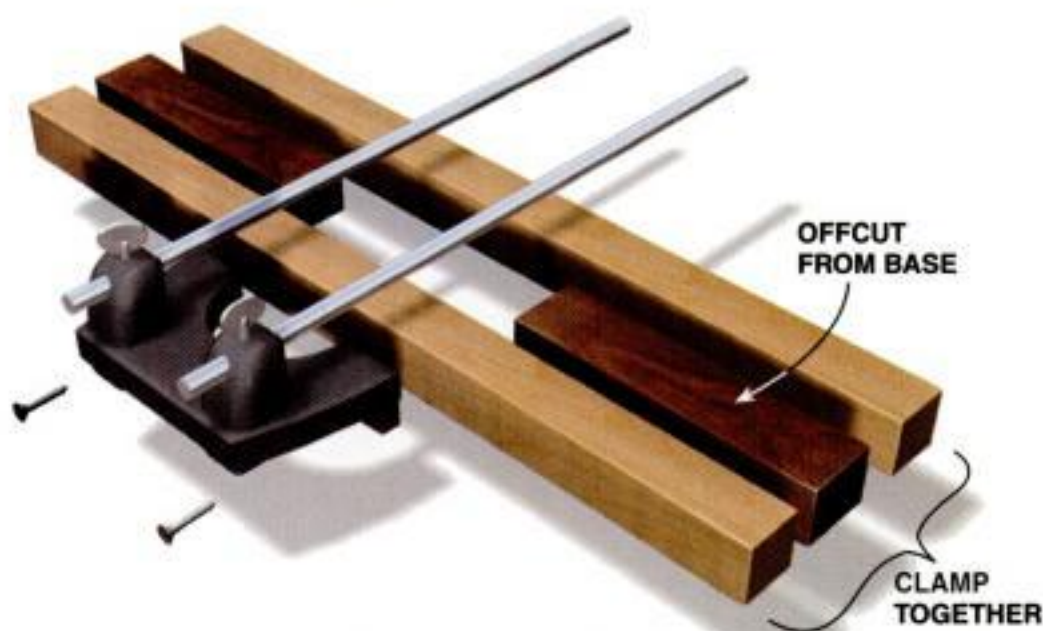


FIG. D SLIDING ROUTER JIG

STEADY the router when cutting mortises on a narrow end (Photo 5) with a simple fence. The wood blocks slide back and forth with the router.

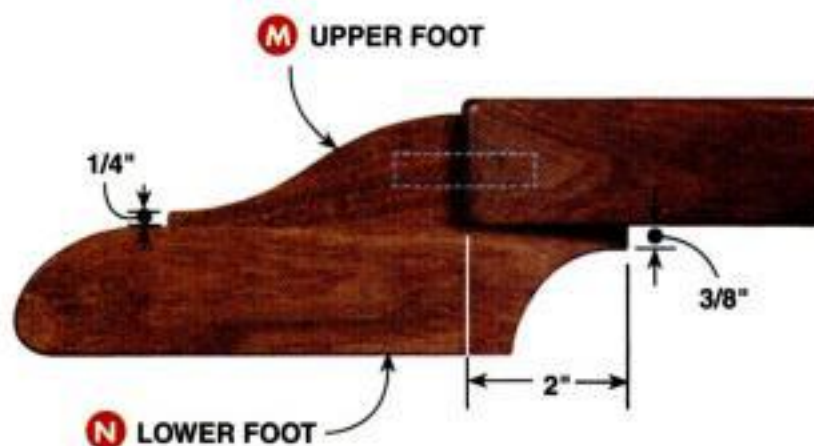
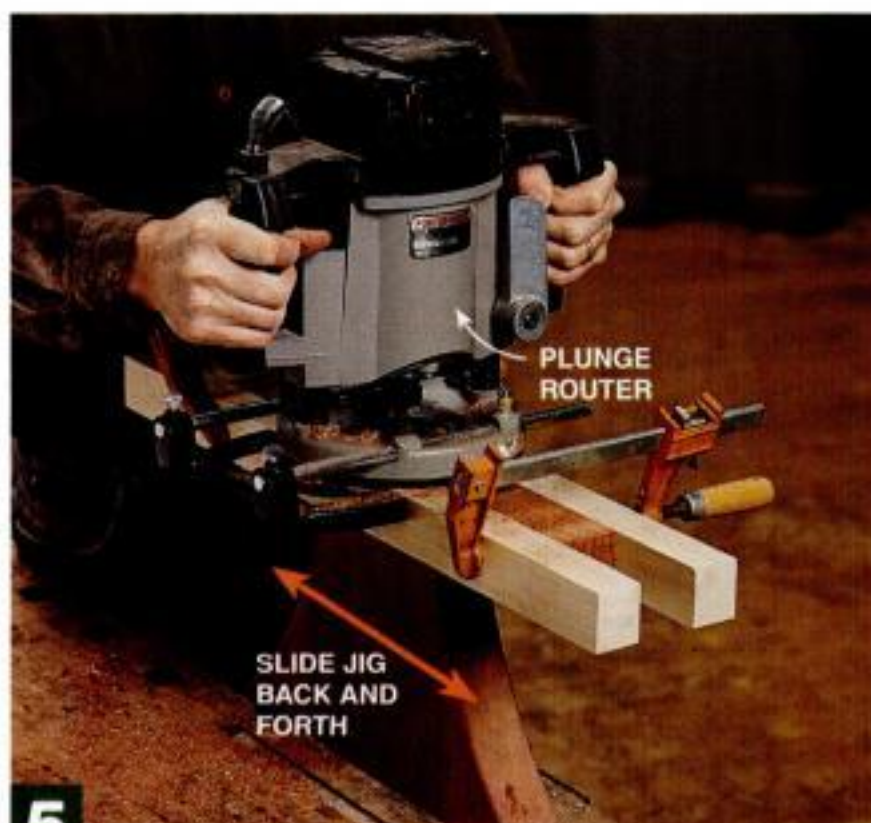


FIG. E THE FOOT

BANDSAW the curves of the lower foot piece first, then glue on the upper piece. Even-up the two pieces and saw the ogee curve on the upper foot.



5 ROUT mortises into the ends of the base. Loose tenons will join the feet and base together.



6 GLUE the foot onto the base using a clamping block. The block won't split under pressure if it's made of two pieces: a thin piece of plywood screwed and glued to an ogee-shaped piece of pine.

base with a bent bow (Photo 4). Cut the curves on a bandsaw and clean them up with a belt sander or half-round file and scraper.

The Feet

Each of the three feet is glued-up from two blocks of 8/4 stock. Cut the mortise for the loose tenon in the upper block with a plunge router (Photo 5). Bandsaw the end of the lower block, sand the curve, and glue the two parts of the foot

together. Smooth the sides and cut the ogee curve on the bandsaw. File and sand the ogee.

Radius all the edges of the foot and base with a router, using a 3/16-in. round-over bit. Mill some 12-in. long blanks for the loose tenons. Round their sides with a 1/4-in. radius round-over bit to fit the ends of the mortises. Make up a two-piece clamping block for squeezing the feet onto the base (Photo 6). Build the block from pine and plywood.

The Top

All wood expands and contracts with the cycle of the seasons. That's why the top of this outdoor table is made of small units that are independently attached to a supporting framework of cleats. Each unit is free to shrink and swell on its own.

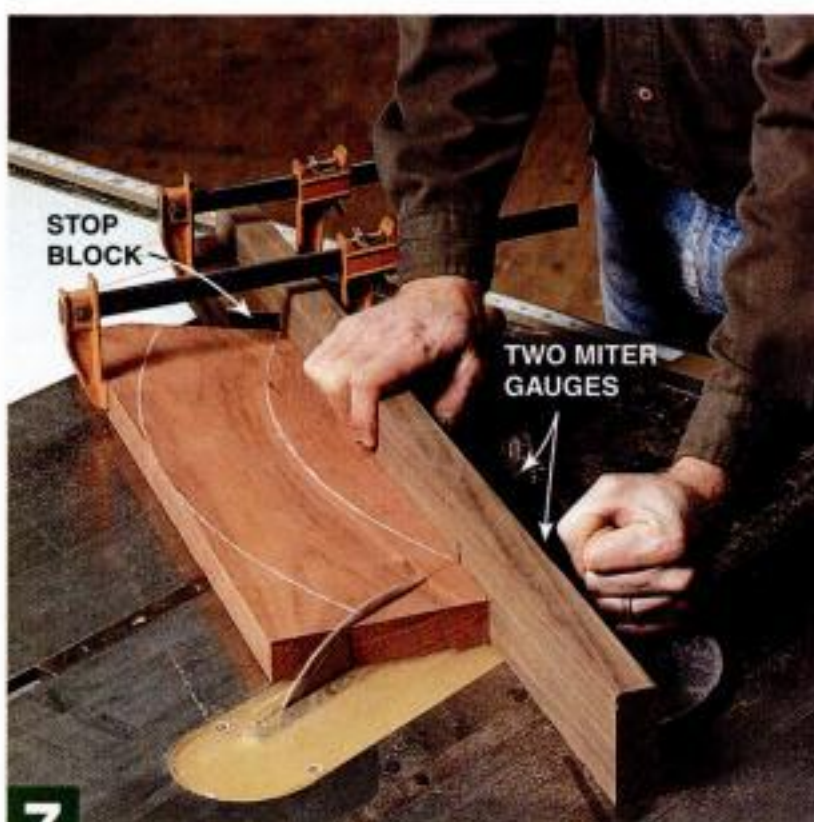
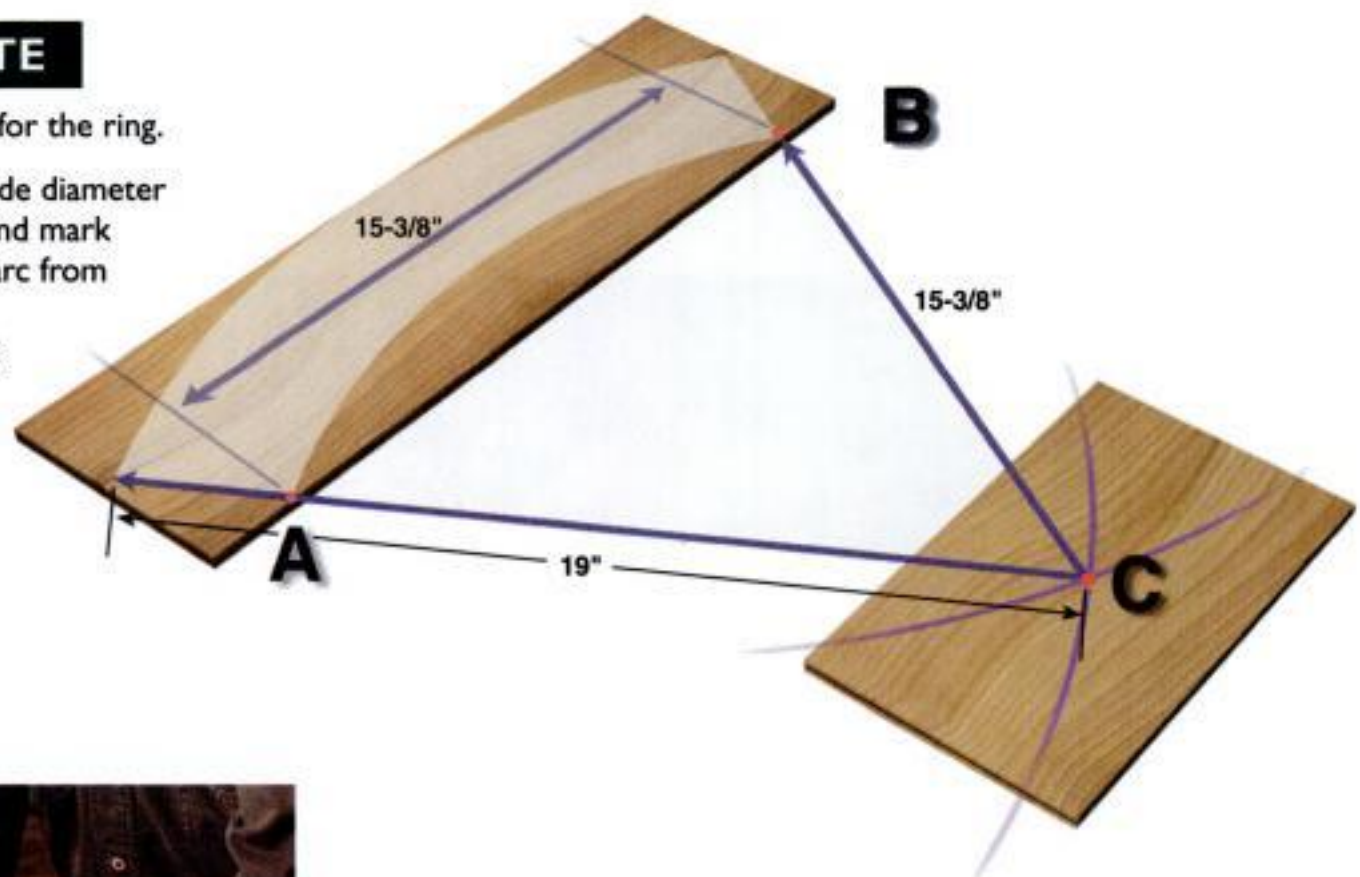
The two halves of the outer ring are laid out, sawn, and glued-up first. Make a plywood pattern of one ring piece (Fig. F). Try the pattern on your rough lumber before deciding where to cut. Mill six blanks.

FIG. F RING TEMPLATE

USE a trammel to make a template for the ring.

Step 1: Set your trammel to the inside diameter of the ring. Place the pin at point A and mark point B. Find point C by drawing an arc from A and an arc from B.

Step 2: Place the trammel's pin at C and connect A and B with an arc. Draw straight lines from C through A and C through B. Reset the trammel to the outside diameter of the ring and draw its arc. Cut out the template on a bandsaw.



7 CUT 60-degree miters on six ring-segment blanks. Two miter gauges spanned by a fence make a rigid jig. Each miter gauge was set up with a plastic drafting triangle.

Saw guard removed for photo clarity. Use yours!



8 TIGHTEN one bar clamp to glue up the ring. Stop blocks clamped to a stiff board keep the ring from spreading under pressure.



Cafe Table

Miter one end of each ring piece. Mark the other end using the plywood pattern, and line up the mark with the kerf in your fence. Clamp an angled stop block onto the fence and saw all the opposite ends (Photo 7).

Trace the curves of the pattern onto the mitered pieces. Cut them on a bandsaw. Lay out the pieces in a ring and mark which ends get splines and which don't. (There are no splines between the two halves.) Use a plunge router to make the mortises. Note that the mortises aren't centered side to side. They're offset away from the short grain of the curve. Glue three pieces into a half ring with one bar clamp (Photo 8). Smooth the sides and radius all the edges with a router.

Now you can figure out the dimen-

sions of the top's inner boards. Lay out the top, with spacers, and scribe around the inner edge of the ring with a compass set to 3/16-in. (Photo 9). Cut the boards on the bandsaw, smooth and radius all the edges. Counterbore the underside of the two middle boards for the bolt and washer.

The Cleats and Assembly

Five cleats support the top. One is connected to the column and the others support the middle of the rings. All have tapered ends. Counterbore the bottom of the main cleat to receive the washer. The main cleat is wide enough that allowance must be made for wood movement. Thus, half the holes for the lag screws are oval (see Fig. A). Assemble the tabletop upside down, with spacers, and lay the

cleats on top of it. Pre-drill the holes for all the screws that will connect the cleats to the top. Screw down the four short cleats. Drill a 7/8-in. hole in the top of the column for the coupler. Drill 1/2-in. holes in the bottom of the column and base for the threaded rod.

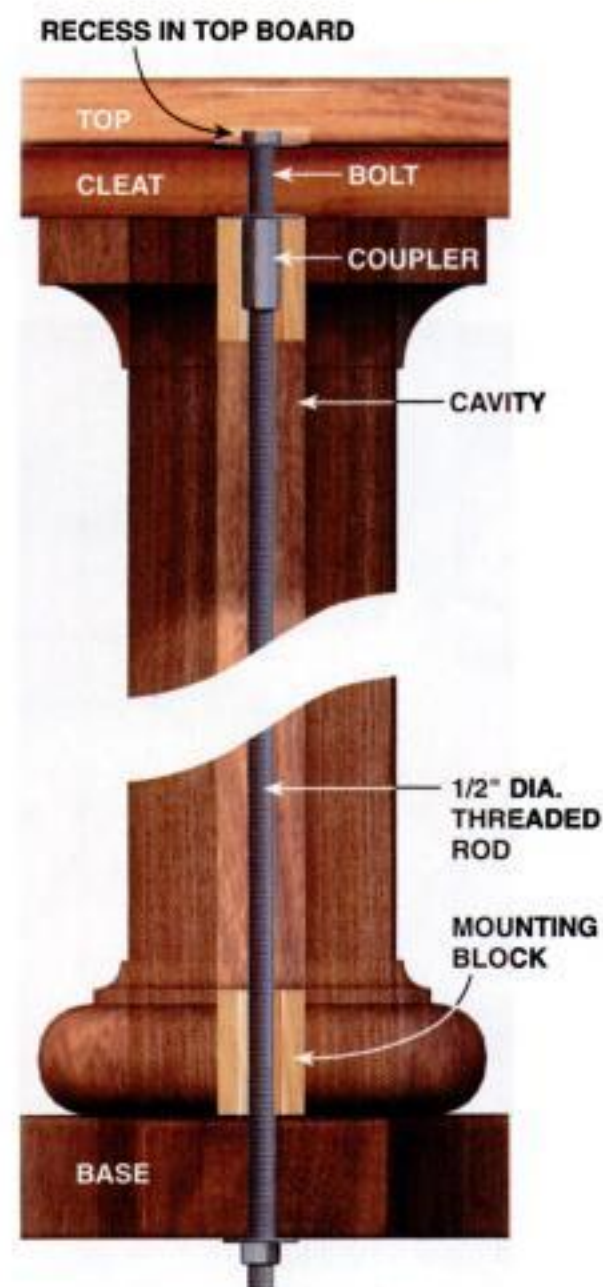
The completed assembly will be very sturdy. Slip the washer and bolt through the main cleat, put another washer on the other side, and tighten down the coupler. Then, screw the cleat to the top boards. Screw the threaded rod into the coupler and slip the column and base over the rod. Rotate the base so the grain of the top runs the same direction as the grain of the base. Add a stiff Grade 8 washer and stainless steel nut, which won't rust. You'll have to turn this nut every few



9 **SCRIBE** the gap between the inner boards and the rings with a compass. Spacers keep the gaps uniform during layout. All the parts of the top will be supported by stout cleats.

FIG. G BOLT AND ROD ASSEMBLY

CONNECT the cleats with the base of the table with one bolt, a coupler, and a long threaded rod.



years to re-tighten the table.

Jarrah is such an attractive wood that you might want to put an outdoor oil finish on it to preserve the rich color. The drawback is that you will have to renew the finish every year or so. Left unfinished, the table will weather to a handsome silvery-gray color. After many years of enjoying this durable table, maybe you'll be a silvery-gray, too! **AW**

Sources

An exterior oil finish:
Performance Coatings
Penofin Marine Oil Finish,
(800) 736-6346;
www.penofin.com.

Jarrah:
Timber Holdings Ltd.,
2400 W. Cornell Ave,
Milwaukee, WI 53209;
(414) 445-8989.

MATERIALS LIST

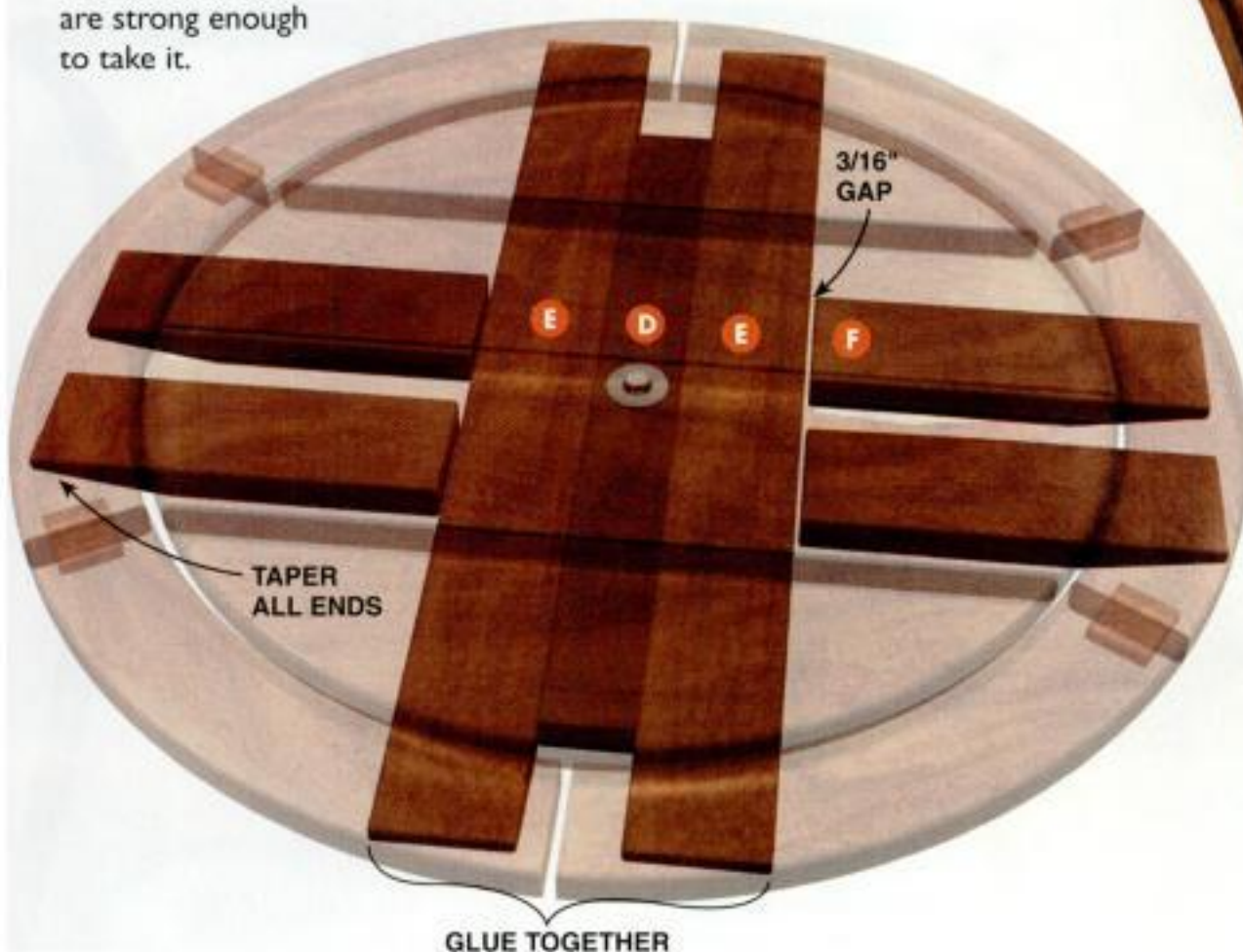
Jarrah Cafe Table 38" D 29-1/2" H

Ref.	Qty.	Part	Stock	Thick	Width	Length	Comments
Top							
A	6	Ring Segments	6/4	1-1/8"	5-7/8"	20"	3-5/8" Finish Width
B	2	Inner Boards	6/4	1-1/8"	7-9/16"	32"	Rough Width
C	2	Outer Boards	6/4	1-1/8"	8"	28"	Rough Width
Cleats							
D	1	Inner Cleat	6/4	1-1/8"	2"	28"	
E	2	Outer Cleat	6/4	1-1/8"	3"	36"	
F	4	Short Cleats	6/4	1-1/8"	5"	13-1/2"	2 From Column Waste
Column 23-1/2" Finish Length							
G	2	Outer	8/4	1-3/4"	8-1/8"	24" Rough	
H	2	Inner	8/4	1-3/8"	3-3/8"	24"	
J	4	Make-up	8/4	1-5/8"	6-7/8"	3-1/4"	
K	2	Mounting Blocks	8/4	1-3/8"	1-3/8"	3"	
Base							
L	1	Blank	8/4	1-7/8"	19"	16"	
M	3	Upper Feet	8/4	1-5/8"	4"	5"	
N	3	Lower Feet	8/4	1-7/8"	4"	9"	2 From Base Blank
Other							
P	3	Loose Tenons For Feet		1/2"	3"	1-7/8"	
Q	6	Loose Tenons For Top		1/2"	2-1/8"	1-7/8"	
	1	Plywood Square Jig		1/4"	24"	24"	
Hardware							
	1	Threaded Rod	1/2" Dia			25" L	
	1	Coupler					
	1	Bolt	1/2" Dia			1-1/2" L	
	3	Grade 8 Washers	1/2" ID				
	1	Nut					
	16	Lag Screws/Washers	3/8" Dia			2" L	
	16	Flat Head Screws	#12			1-1/2" L	

FIG. H THE CLEATS

SIT ON THE EDGE

of this table or pick it up by the top. The stout cleats are strong enough to take it.



GLUE TOGETHER

FIG. J RING MORTISE DETAILS

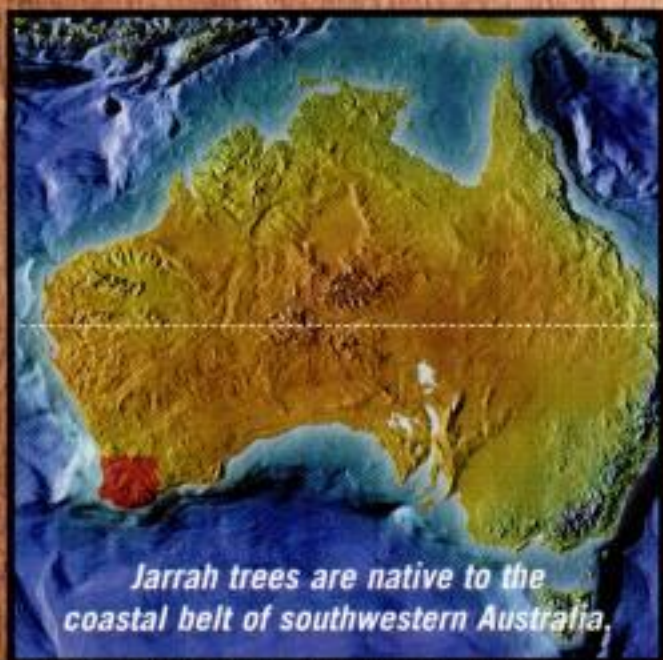


OFFSET the mortise sideways for strength. The short grain on the inside of the curved ring is weak.

FIG. K CLEAT TAPER DETAILS

BANDSAW tapered ends on all the cleats and round their edges.





An exciting
wood from
the land
down under.

BY TOM CASPAR

JARRAH

Imagine a rich, red wood that's strong enough to support a steam locomotive and weatherproof enough for the dock that launched the *Titanic*. Imagine a wood named *Eucalyptus marginata* that grows in one small forest on the other side of the world. Imagine this exotic wood transformed into a table in your shop. Now stop dreaming and experience jarrah.



Chair designed and built by
David Uphill-Brown, Canberra, Australia.



Picnic table designed and built by Peter Sustar and Greg Beaupre of Sylvan Studio, Wauwatosa, Wisconsin.



Jarrah has many uses, from outdoor furniture to fine interior woodwork.

Harvested only from old-growth forests in the coastal belt of southwestern Australia, jarrah is hard, strong, heavy wood. Historically, it was used for the undistinguished projects of heavy industry. (The sleeper ties under the rails of the London Underground are made of jarrah.)

Today jarrah enjoys an elevated status and is prized for use in fine furniture. Woodworkers concerned about the depletion of old-growth forests have recycled industrial jarrah into flooring and furniture. There's no old jarrah in the U.S., so we bought new lumber from the largest supplier in the U.S.,



"Music of the Spheres" by John Wooller, Melbourne, Australia

lumber is dried to a 10- to 12-percent moisture content, because it's intended primarily for outdoor use.

Jarrah isn't oily like teak, although it will turn the same silvery-gray color when exposed to the sun and rain.

However, to keep its original rich color intact outdoors, you can apply an oil finish that has ultraviolet inhibitors. The finish should be renewed each year.

Working with jarrah is a pleasure, but because it's so hard, you must have sharp blades in your jointer and planer and a good combination blade in your tablesaw.

We used a 30-tooth Forrest Woodworker II.

a company that first brought jarrah here in the 1970s to rebuild parts of the boardwalk at Atlantic City.

Only prime-grade jarrah is imported, so there are no large knots to cut around. The color of the heartwood varies from dark brown to light red. The wood we bought didn't have any sapwood. Gum pockets, like the kind you see in softwoods, are present in some boards. They are either a nuisance or an opportunity to put character in your work.

Jarrah is heavier than hard maple and white oak. It's as resistant to rot and insects as redwood and teak. And it's as beautiful as mahogany.

Milled only in Australia to metric dimensions, jarrah comes in thicknesses equivalent to 4/4, 6/4, and 8/4 lumber. It costs about \$5.50 per bd. ft. in all thicknesses. The lum-

When handling jarrah, wear gloves to avoid splinters from rough lumber. Be prepared to lug around some hefty timbers. Like other dense, exotic woods, jarrah reduces to a fine powder that may irritate your eyes, lungs and skin. Wear a dust mask.

Much of the old-growth jarrah forest is carefully regulated by the Australian government. New plantations of jarrah are growing in Australia, though the trees are not mature enough yet to be harvested for furniture. **AW**

SOURCES

TIMBER HOLDINGS LTD.
2400 W. Cornell Ave.
Milwaukee, WI 53209
(414) 445-8989

For more information on jarrah forests:
From an Australian woodworkers association:

<http://home.vicnet.net.au/~woodlink/>

From the Australian government:

<http://calm.wa.gov.au/>

From Forest Conservation Archives, an environmental group

<http://forests.org/>



Successful Strip

You can do it safely and effectively.

LET'S FACE IT; stripping wood is a drag. We approach it knowing it's a difficult, messy job, but hoping we can reclaim a jewel from the muck. Knowing what to use and how to use it is essential to success. Here's a run through of the three basic types of strippers and how to use them safely and effectively.

Safety First

It's impossible to talk about stripping without talking about safety. Some strip-

pers require less protection than others, but always err on the side of safety and follow these guidelines:

- Protect your body with long sleeves and a solvent-proof apron.
- Wear splash-proof goggles; not just safety glasses.
- Use long, neoprene gloves and turn back the ends into cuffs, so that when you lift your arms, the stripper drips into the cuff, not onto your arm.
- Work only in areas with good ventilation or outdoors. You should never be able to smell the fumes.
- Wear an activated-carbon respirator with working cartridges.

Some strippers, especially those called "refinishers," are highly flammable. If the can says the stripper is flammable, keep sparks and flames away from your work area. If you use a fan that is not explosion proof (it has an exposed motor, for example), position it so that you are between the fan and the window or door. Have the fan push clean air toward you, and the vapors away from both you and the fan. That way you will not be drawing vapor-filled air through a spark-producing fan motor.

Finally, if you have heart disease, avoid using strippers that contain methylene chloride. Inhaling methylene chloride reduces the amount of oxygen in the blood, and can trigger an attack in people with heart disease. Even for healthy people, methylene chloride-based strippers require powerful ventilation.

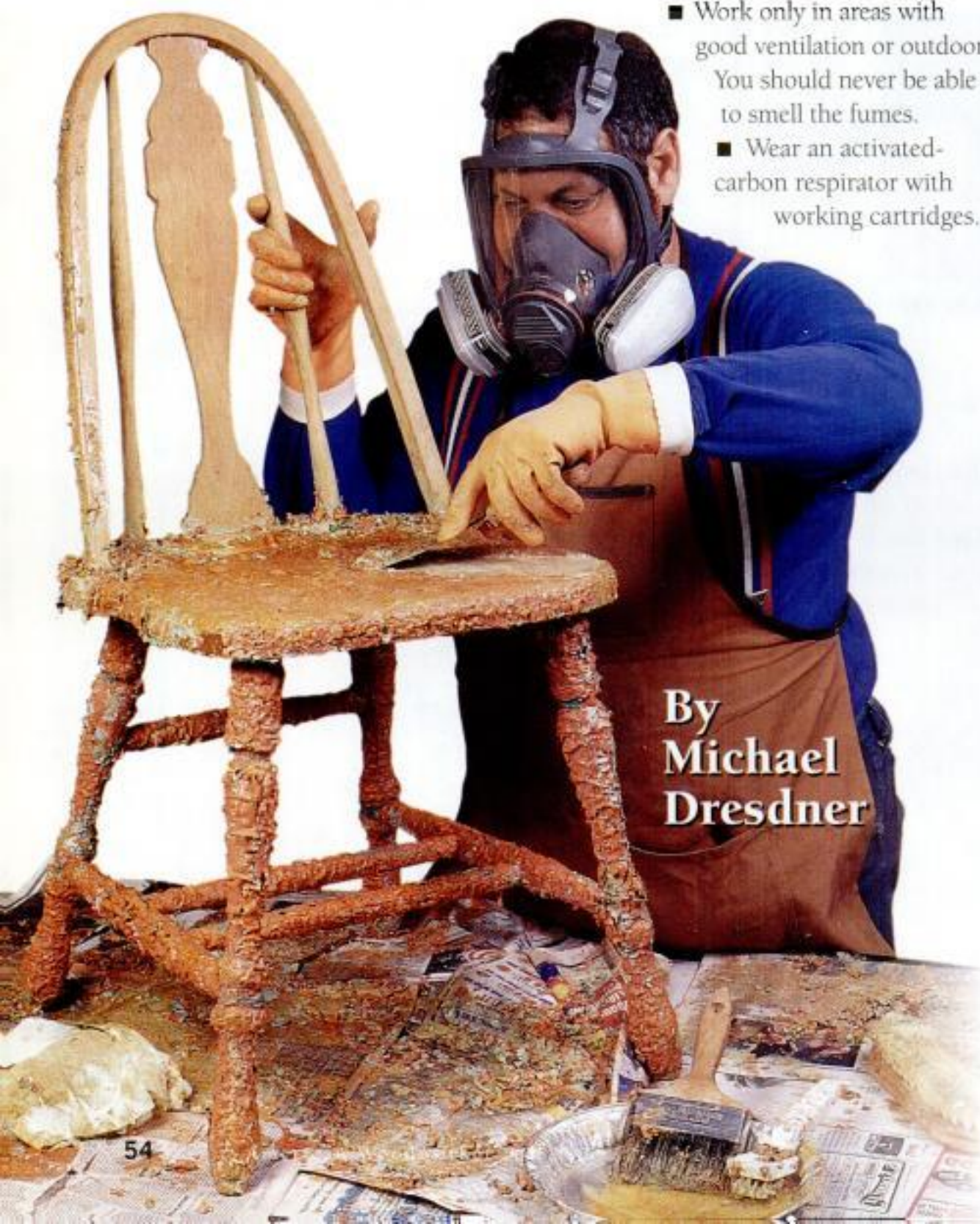
Choose a Stripper

Except for "refinishers," which are only for shellac and lacquer, most strippers will remove just about any finish. Choose a stripper based on its speed and safety. A good rule of thumb is: The safer it is, the slower it works. As shown in "Choosing a Stripper," p. 56, you can choose fast and hazardous, moderately fast and moderately hazardous, or slow and safe. Be aware that the safety requirements for each stripper may be different; read labels carefully.

There are modern finishes that won't budge for any stripper, but they're rare. Some very old pieces may have a thin milk-based paint on them that is also resistant to normal strippers. However, it will come off with a strong lye wash.

Set Up Your Work Area

After choosing your stripper, gather together your stripping paraphernalia (see



By
**Michael
Dresdner**

ping

Here's how.

"The Basic Equipment," at right). Dismantle the piece as far as is practical, and remove any hardware, making certain you label all the parts carefully for reassembly. I sometimes do a numbered sketch for complicated pieces, and number parts in hidden areas, such as inside the joints. You might even want to take "before" photos.

Put on the Stripper

The key to easy stripping is to apply a lot of stripper, convince it to stay on, and give it plenty of time to work, without interruption. Many strippers contain a wax that will rise to the surface and form a crust to prevent the active solvent from evaporating. If you brush the stripper, you disturb the crust and allow the solvent to evaporate.

Shake the can of stripper gently before use, then cover the cap with a rag or paper towel. Unscrew it slowly because sometimes the stripper spurts out. Apply the stripper thickly (Photo 2) and try to keep the work horizontal so the stripper doesn't run.



STRIPPERS MADE OF SOLVENT MIXTURES work from the top down (left), melting the finish into a soft goo. Methylene chloride strippers work by dropping through the finish (right) to break the bond between it and the wood.



THE BASIC EQUIPMENT for safe stripping includes:

- A fan for ventilation
- Long neoprene gloves, with cuffs rolled back to keep goop from running down your arm
- Solvent-proof apron, either heavy cloth, plastic, or rubber
- Organic-cartridge respirator (with some strippers)
- Splash-proof goggles (if they're not part of the respirator)
- Tools for removing the gunk:
 - a dull putty knife, scrub pads and brushes, wood shavings, string, wooden sticks, and scrapers
- A big, sloppy, old brush and a can or bowl for applying and holding the stripper
- Solvents for washing the stripped surface; water or alcohol, lacquer thinner and mineral spirits, depending on the stripper
- Plastic bags or sheeting to cover your piece while the stripper works.

I've found the most effective way to keep the stripper wet and active is to seal the workpiece in plastic. You can use a leaf bag (Photo 3), or a tent of polyethylene film available in rolls from your home center. Use duct tape to seal the plastic, keeping the tape on the outside. Do a dry-run first, to make sure the plastic covers the piece completely.

For fast methylene chloride strippers, an hour in the bag should do the trick. Allow two to three hours for the moderately fast strippers, and overnight for 3M's Safest Stripper. If you aren't sure, put the stripper on late in the day, bag your work, and leave it overnight.

The bag method works for all except caustic strippers, which should be checked periodically and the gunk removed as soon as the wood comes



APPLY THE STRIPPER in a thick layer, 1/8- to 1/4-in. thick. On vertical surfaces, semi-paste removers work best because they cling. Once on, leave the stripper alone and let it do the work.

Choosing a Stripper

FAST BUT HAZARDOUS STRIPPERS



REFINISHERS work only on plain lacquer or shellac. They dissolve the finish instantly, but are highly flammable. They're used differently than other strippers: Wearing gloves, goggles and respirator, soak steel wool or an abrasive pad with refinisher, scrub the surface, and wipe off the finish as it liquifies. The finish will start melting almost immediately. Repeat until you are down to bare wood.

METHYLENE CHLORIDE (also called dichloromethane or DCM) strippers soften a finish in as little as 10 minutes. They work from the bottom up, so the finish comes off in sheets (Photo 1). Because they work by making the finish let go of the wood, you often need to use less of this stripper than other types. This type of stripper is non-flammable, but its vapor is harmful. Wear an activated-carbon respirator and have plenty of ventilation.

MEDIUM-FAST AND MODERATELY HAZARDOUS STRIPPERS



SOLVENT MIXTURES may contain small amounts of methylene chloride mixed with other solvents, or new non-flammable stripping agents like n-methyl-2-pyrrolidone and gamma butyrolactone. You still must wear gloves and goggles, and most require ventilation. These strippers work from the top down (see Photo 1). For many folks they represent a happy medium, being relatively safe yet relatively fast.

CAUSTIC STRIPPERS are strong alkalines like lye. Although water-based and non-flammable, they can seriously burn your skin and eyes, so wear goggles and gloves, and be careful not to splash. Because caustic strippers are water-based, they raise the wood grain and can loosen joints and veneer. They also may darken the wood, so they're often used when the wood will be repainted. Unlike other strippers, you can't leave them on longer than necessary, or the wood itself may get damaged.

SLOW AND SAFE



SAFEST STRIPPER, made by 3M, is the only very safe stripper. It can be used indoors with no special ventilation and no gloves (although if your skin is sensitive, you may want to wear them anyway). Safest Stripper is particularly effective on oil-based paint and polyurethane. However, it can take as long as 24 hours to soften a finish. Safest Stripper seems to pull oil-based finish out of the pores better than other strippers, so it's handy for woods like oak and ash. Because it's water-based, it will raise the wood grain and can loosen veneer.

Successful Stripping



SEAL YOUR WORK IN A BAG. If the piece is too big for a bag, cover it with a tent made of polyethylene sheeting. I like to put several layers of newspapers under the work to catch the drips.

clean, to prevent possible damage to the wood. The other strippers can remain on the wood for long periods without damaging it.

Take it All Off

Before you remove the bag, open the windows, turn on the fan, put on your goggles, gloves, apron and respirator. Open the bag carefully. The finish should virtually fall off right down to the bare wood. Scoop it off (Photos 4 and 5), using whatever tool works without damaging the wood. If you're using a water-based stripper, don't use metal tools or steel wool; they can leave rust marks on the wood.

As you remove the sludge, spread it out on newspaper. The object is to let it dry out before you dispose of it. If the stripper on your piece starts to dry before you get it off, add more stripper with your brush or pad. If the finish still doesn't come completely off, recoat the wood, tie up the bag, and repeat the process.

Washing the Wood

Before the wood has a chance to dry, wash off any last bits of paint or residue



4

SCOOP OFF THE FINISH

using a putty knife with a dull edge and rounded corners.

from the stripper. For methylene chloride strippers, use a mix of equal parts of denatured alcohol, mineral spirits, and lacquer thinner applied with a nylon pad. For other strippers, use the solvent recommended on the container.

Finally, repeat the scrub with a solution of one cup household ammonia in a quart of warm water. This will remove silicone or other oils that can interfere with both solvent- and water-based finishes.

Note: If you're using a refinisher, neither of these washes is necessary. Apply your new finish directly to the stripped wood.

Cleaning Up

Clean scrubbers, brushes, gloves, and other tools in the remaining solvent wash. Put your messy plastic, newspapers with finish gunk, and solvent-soaked rags outside in the fresh air to dry, away from people and pets. Let used solvent wash evaporate. This will go quickly if you pour it onto a pile of wood shavings spread on newspaper or plastic, someplace where there is no risk of fire.

Dry residue from household stripping projects, unless it includes lead paint, is usually considered safe to throw out with the trash. Any residue containing lead paint, and all liquid residue should be treated as hazardous waste. Contact your local health, environmental, or sanitation authorities for disposal instructions. **AW**



5

WOOD SHAVINGS

help scrub sludge from turnings and carvings. Other useful tools include string for getting into cracks and turnings, plastic scrub brushes, and pointed dowels for tight corners. The bag and newspaper act as a drop cloth and clean-up aid.



6

THE WOOD IS WASHED CLEAN

with the recommended solvent to remove any bits of paint and any remaining stripper. I recommend a final wash of one cup ammonia in a quart of water, then an overnight drying.

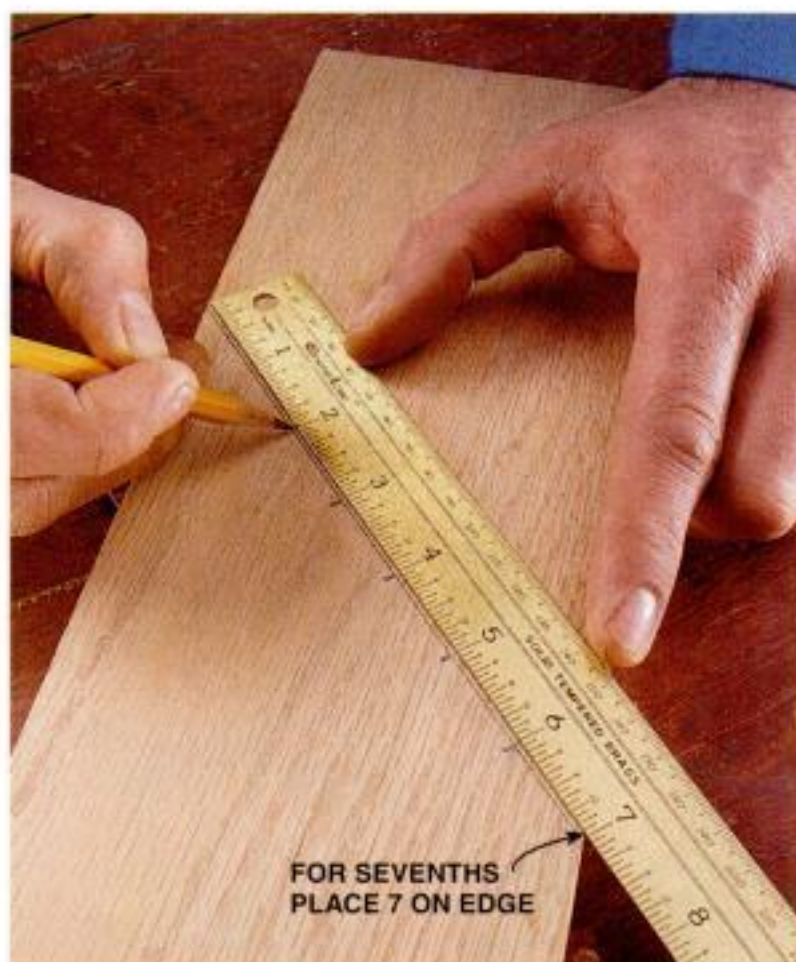
TIPS FOR ACCURATE LAYOUT

by **George Vondriska**

Layout is the cornerstone of any project. Do it wrong and your entire project may be ruined. Here are 21 ways to help you do your layout easier and better.

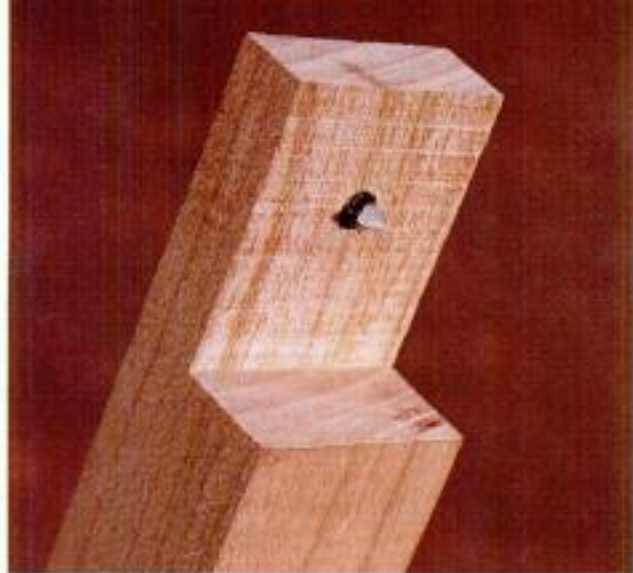
Dividing a Board

This one is a chestnut, but everyone ought to know it: You can quickly divide a board into equal widths without complex fractions. Place a ruler diagonally across the surface so you can mark off the number of segments in whole numbers. For example, to divide a board into seven equal parts, place the zero mark on one edge, and place the 7 in. mark on the other edge. Make a pencil mark at each 1 in. mark to divide the board.



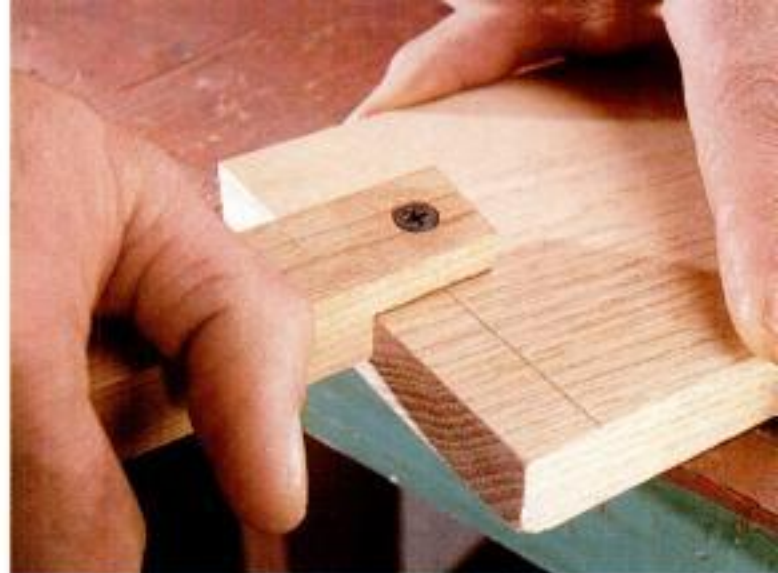
Layout on Metal

A permanent marker works well for laying out marks on machines or tools. Rub the felt-tip marker over the whole area where you need to scribe a mark, let it dry for 30 seconds, and scribe into the ink. The extra ink can be removed with rubbing alcohol or steel wool.



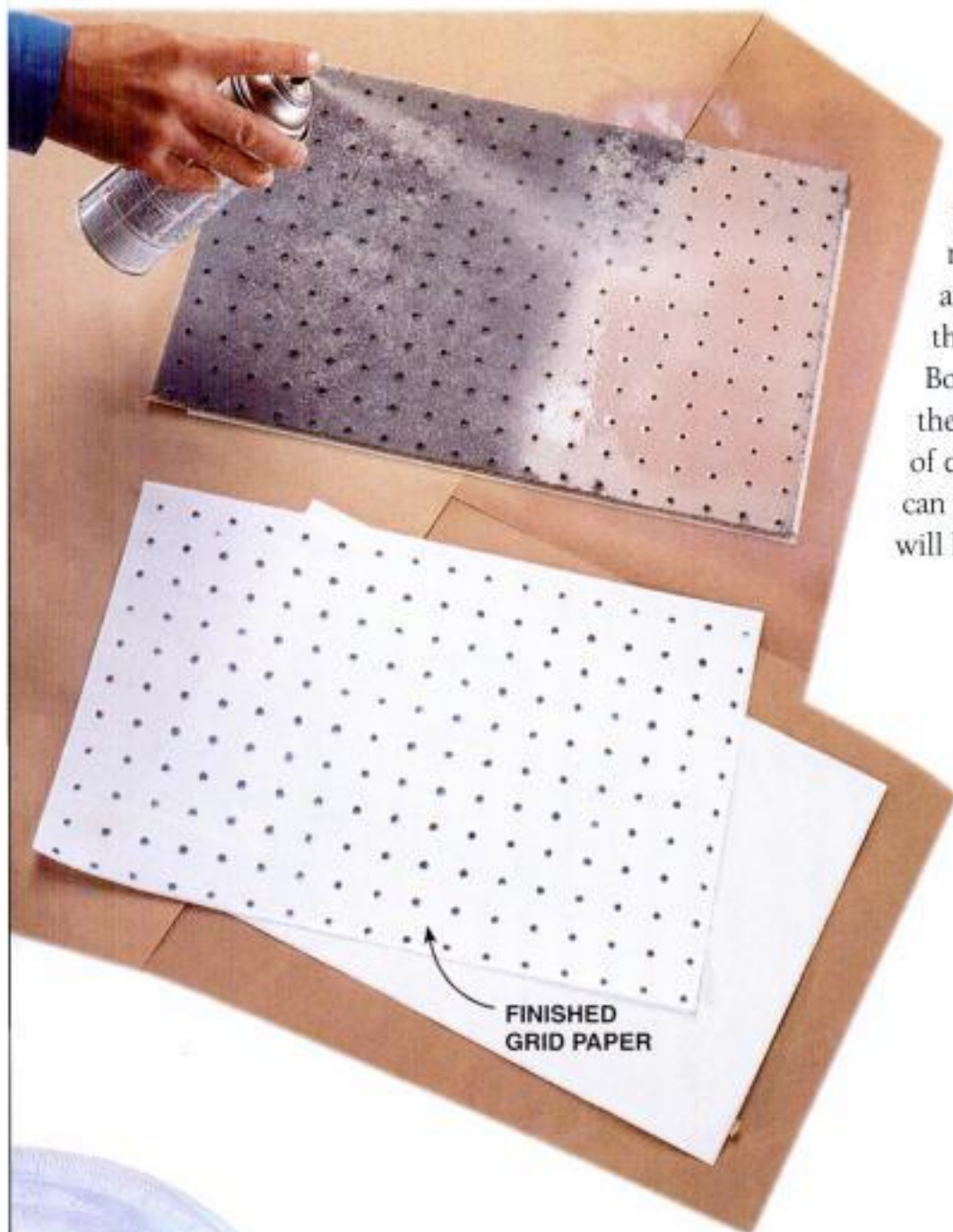
Dedicated Gauge

If you frequently set a marking gauge to a certain measurement, it may be worth making a dedicated gauge. Cut a short rabbet in the end of a hardwood blank and drive a sharpened drywall screw through it at the correct distance from the shoulder of the rabbet.



Quick Grids

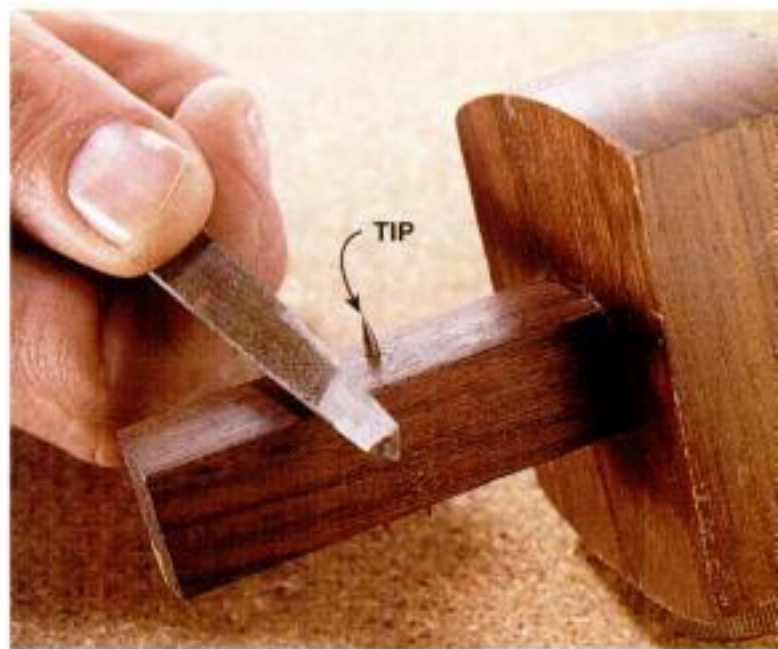
Scale plans are often drawn on a grid of squares so you can accurately enlarge the original drawing. Enlarging means drawing the grid to a larger scale—a tedious and time-consuming job. I've found a quick way to do this with 1/8-in. Masonite Peg-Board. I place the Peg-Board over the paper I'll use for the enlarged drawing, then lightly spray the surface with paint. I end up with a pattern of dots that form the intersections of an exact 1/2-in. grid. You can reuse the Peg-Board many times, but changing colors of paint will help you see if you have covered the board completely.



FINISHED
GRID PAPER

No Tape Measure

If you need to take an inside measurement, use a folding or steel rule instead of a tape measure. The floating tip of a tape easily becomes inaccurate.



Tuned-Up Marking Gauge

To make a marking gauge work better, file the tip to a sharper, more knife-like point with a fine-mill file.

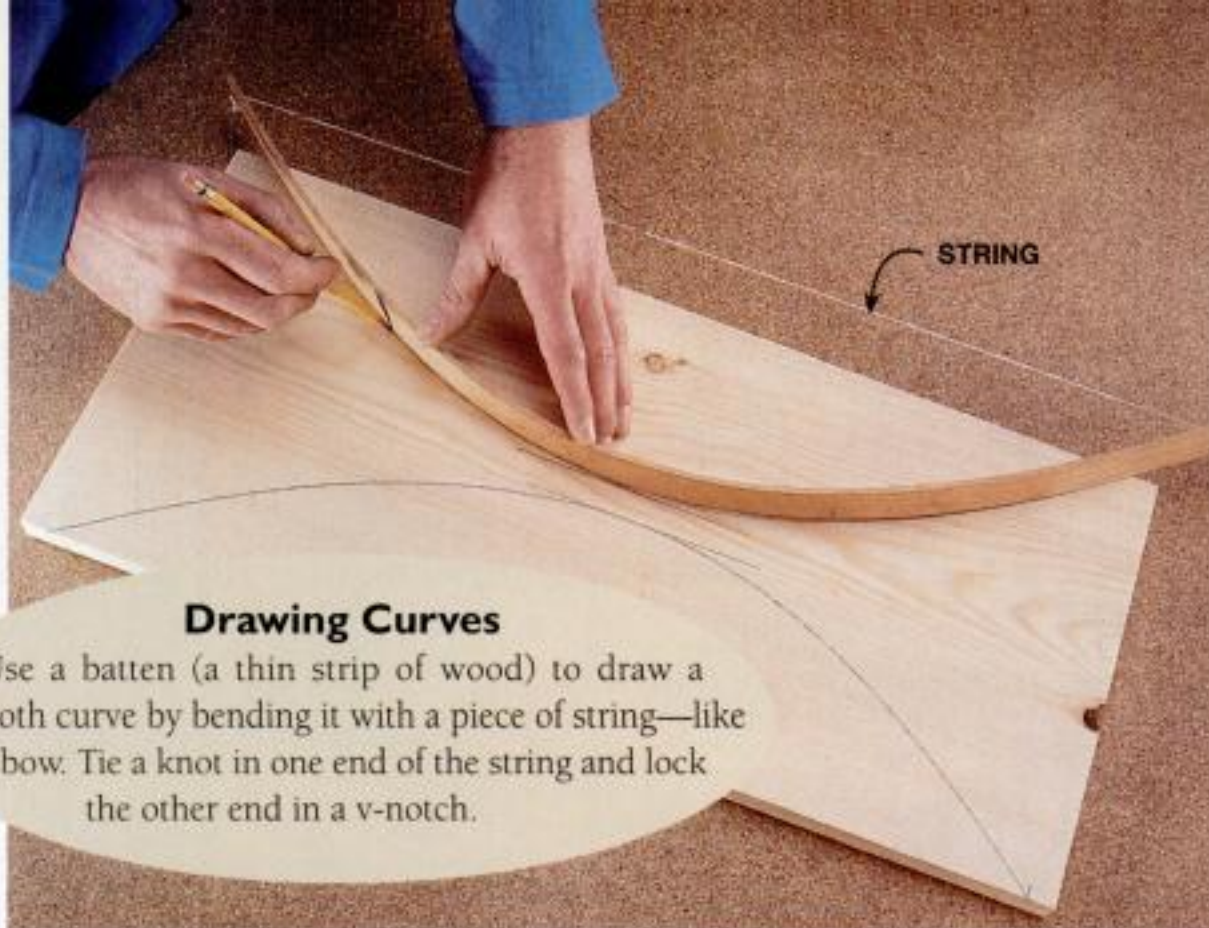




TIPS FOR ACCURATE LAYOUT

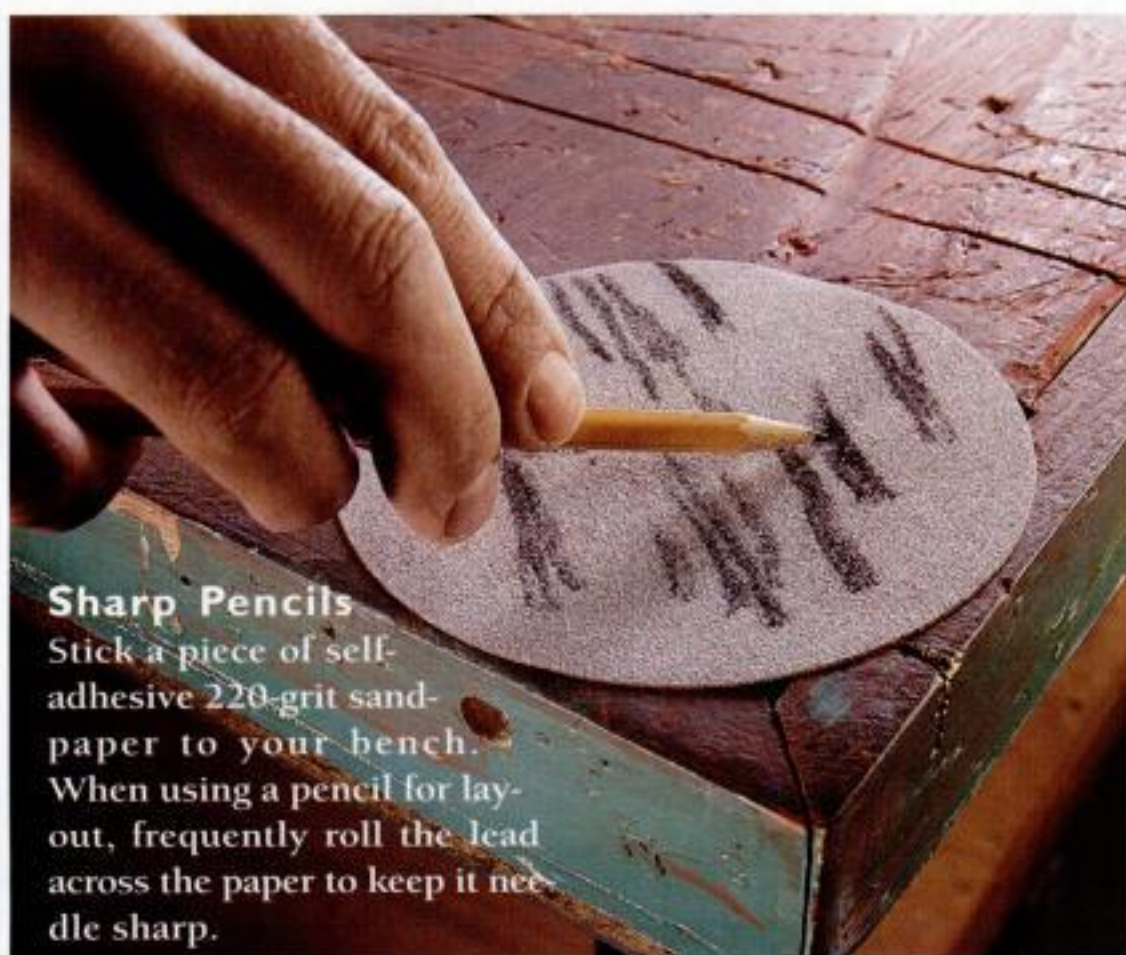
Drawing Curves

Use a batten (a thin strip of wood) to draw a smooth curve by bending it with a piece of string—like a bow. Tie a knot in one end of the string and lock the other end in a v-notch.



Accurate Squares

To check a square for accuracy, place the head on the edge of a board and draw a line along the blade. Flip the square and do the same on the other side. If the lines are parallel, all is well. If they are not, your square is not square. If you have a framing square that tests out of square, you can adjust it. Lay the corner of the square on an anvil, and tap the face with a hammer. Hitting it close to the outside reduces the angle, tapping near the inside increases it.



Sharp Pencils

Stick a piece of self-adhesive 220-grit sandpaper to your bench. When using a pencil for layout, frequently roll the lead across the paper to keep it needle sharp.

Drafting Gear

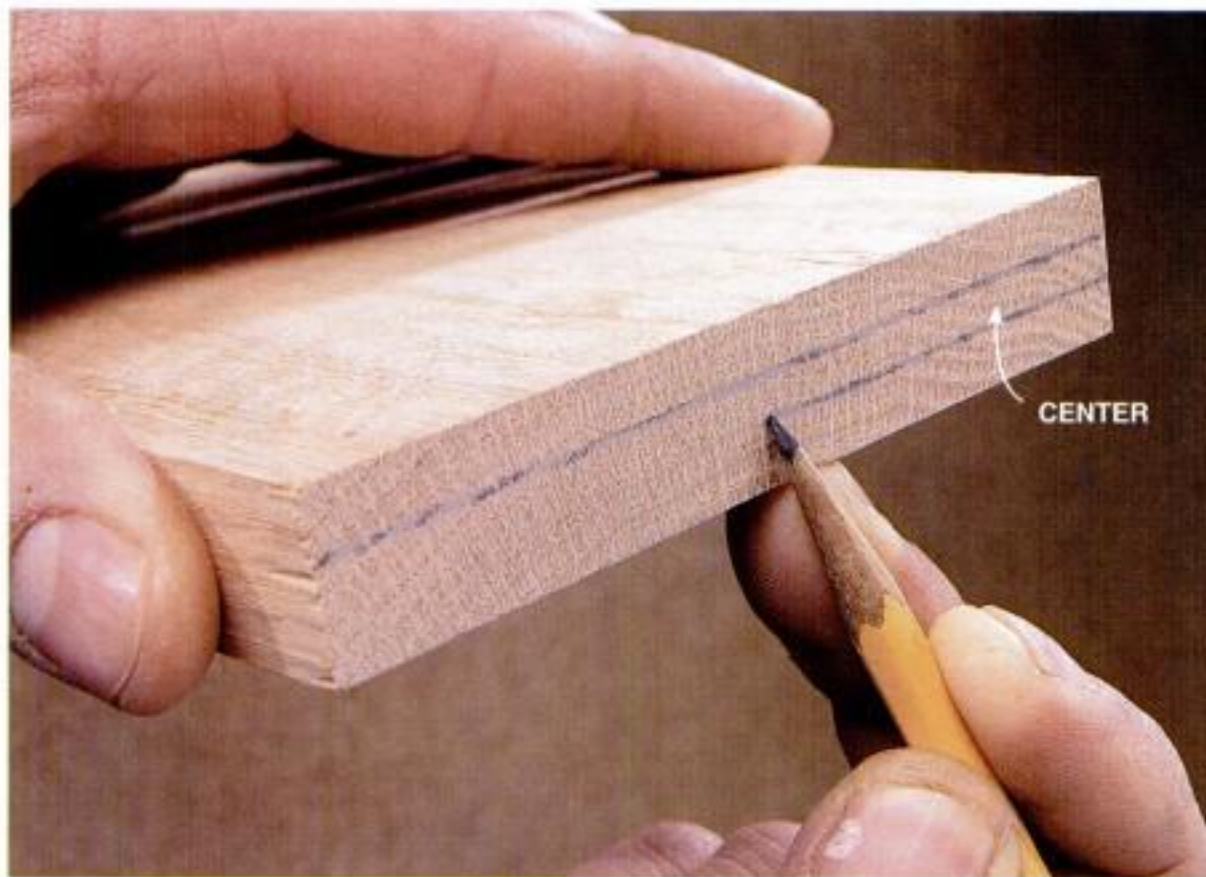
The right equipment will help you lay out your projects more accurately. In my shop I often use; French curves, flexible curves, marking knives, pencils (2.5 lead), rolling ruler, trammel points, and marking gauges.





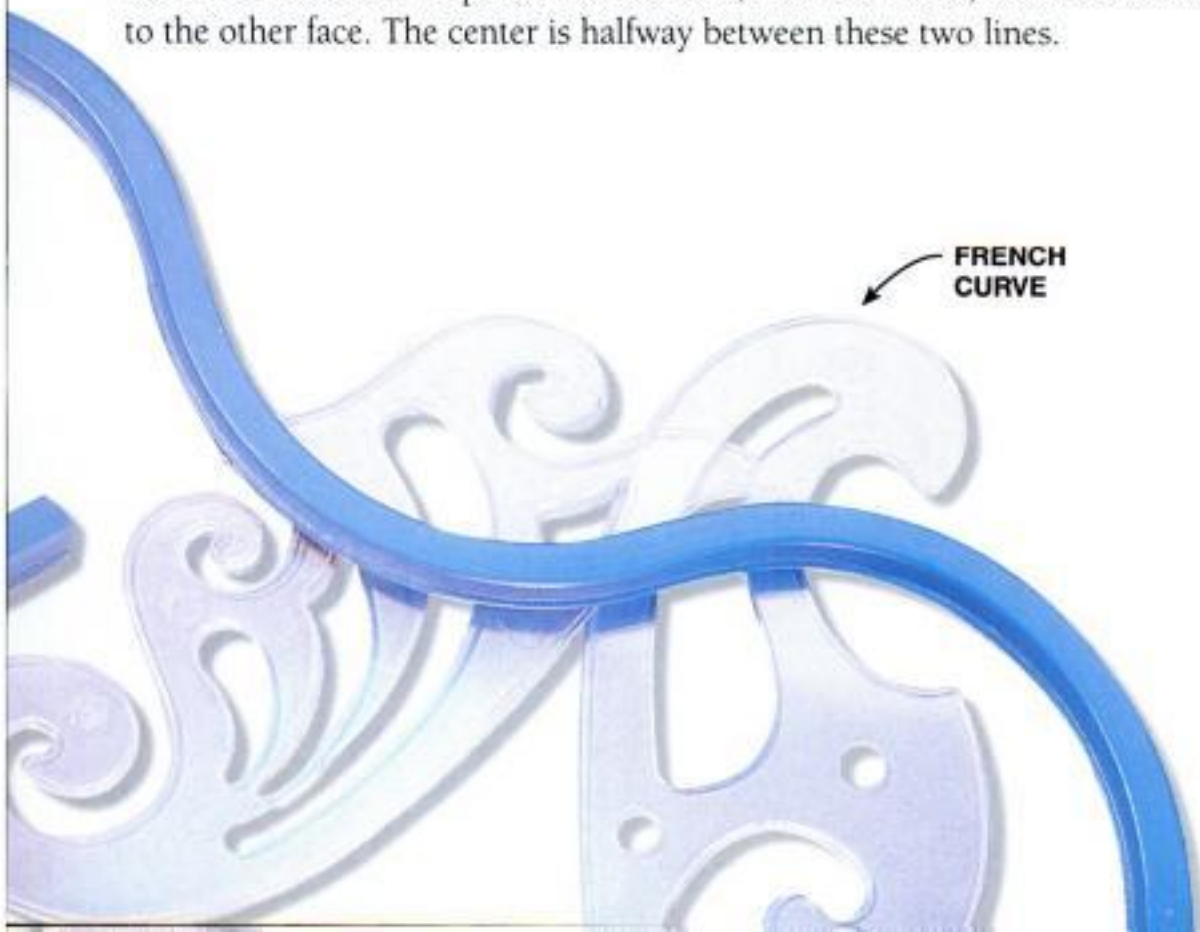
3-4-5 Square

If you want to check something for square, try using the carpenter's 3-4-5 Method. If one leg of a triangle measures 3 in., and the second measures 4 in., the hypotenuse must be 5 in. if the corner is square. This also works with 6, 8, 10; 12, 16, 20; and so on. Any units of measurement will do, as long as you use multiples of 3-4-5.



Finding Centers

To quickly find the approximate center of a narrow board, use your fingers like a marking gauge. Set a pencil in your fingers, allowing one finger to run along the face of the board. Make a line parallel to one face, turn the board, and make a line parallel to the other face. The center is halfway between these two lines.



FRENCH CURVE



Divide the Circumference

To divide the circumference of a round spindle, wrap masking tape around it so it overlaps itself, and make two aligned marks, one on each part of the overlap. Remove the tape, measure between the marks, and divide as needed. Reapply the tape to transfer the layout to the cylinder.

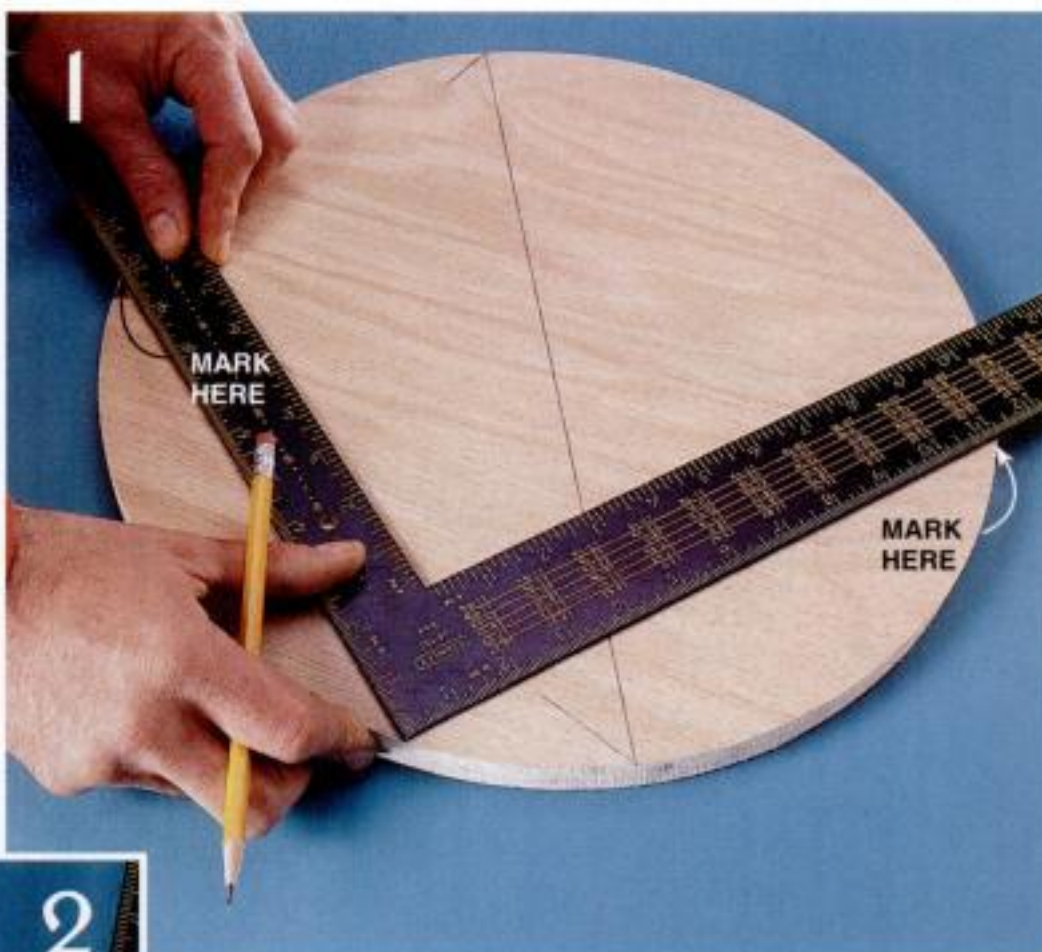




TIPS FOR ACCURATE LAYOUT

Circle Center

Use a framing square to find the center of a circle by placing the corner of the square on the circle, and marking where the legs meet the circumference. Draw a line from one mark to the other. Do this a second time. These lines intersect at the center.



Easier Dividing

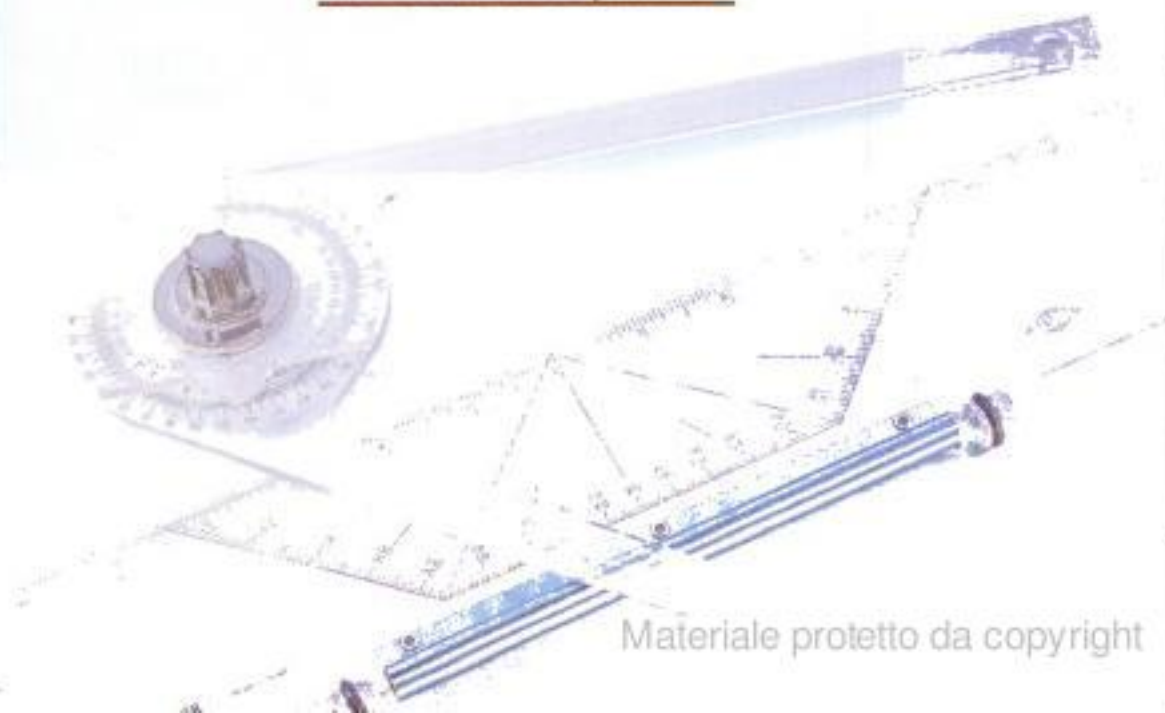
If a project calls for creating lots of divisions, try a metric ruler for that part of the project. It's easier to divide 47 mm by 7 than it is 18-5/7 in. by 7!

Don't Measure!

Whenever possible, use layout tools like marking gauges to transfer measurements instead of using rulers. This will help eliminate the potential for error you get from reading rulers.

Better Templates

If you want to make templates that will last a long time, try the following materials; Plexiglas, tempered hardboard, Baltic birch or ApplePly plywood. Vinyl flooring and contact paper also work well for patterns.



Larger Try Square

Make a framing square into a large try square by adding a wooden head. The holes bored through the framing square to hold the head must be oversized to allow adjustment. Check the tool for accuracy as shown on p. 60, and adjust accordingly.



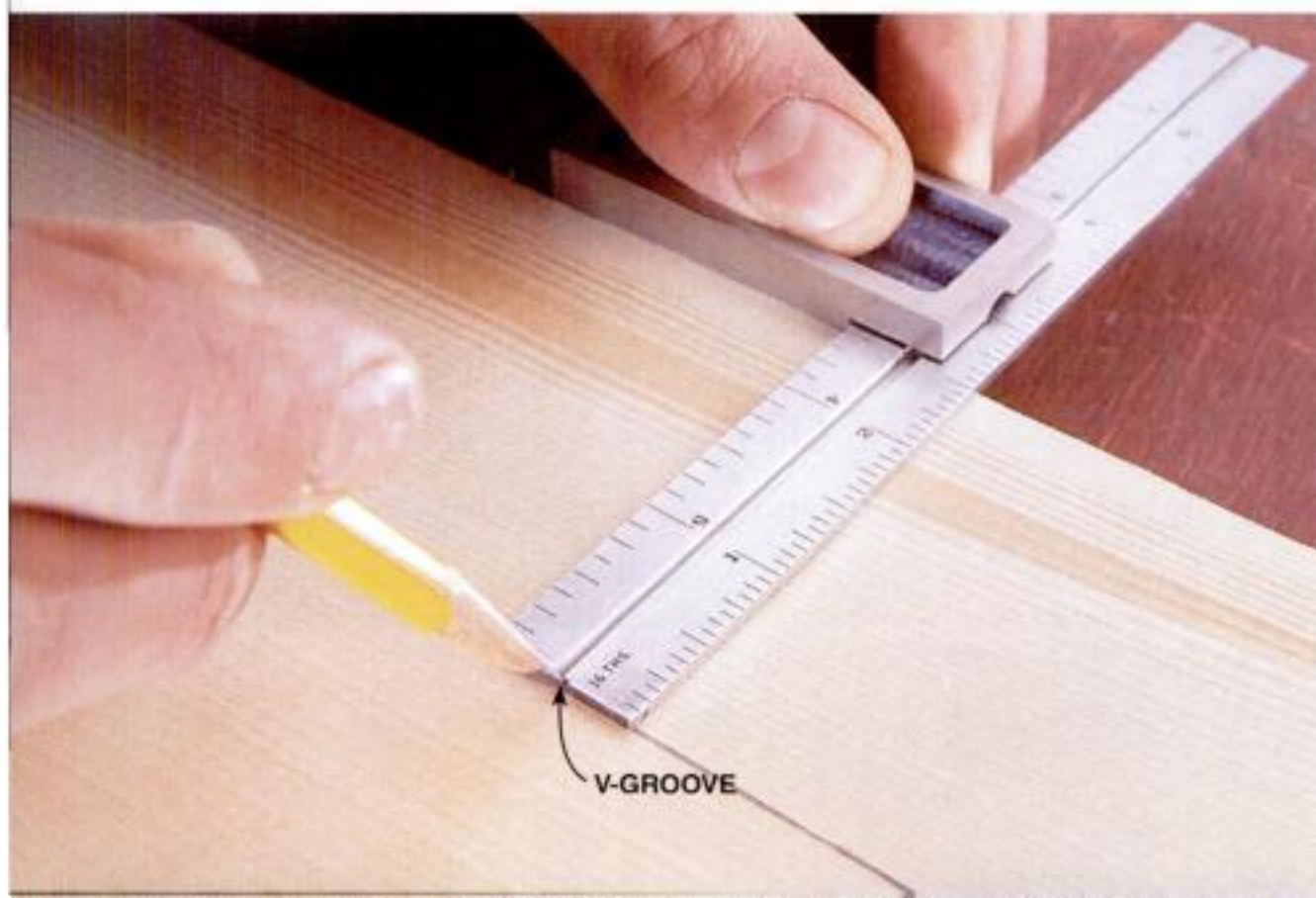
White Lines

It can be difficult to see pencil lines on dark wood, like walnut. Try using a white colored pencil. The lead is soft, so it will need frequent sharpening, but the lines are highly visible. Or try Saral paper, available from art supply stores. It's similar to carbon paper, but transfers white lines.



Transferring Patterns

If you need to transfer a pattern from paper to your workpiece, you can do it by photocopying the pattern, then placing the copy face down on your wood. Ironing the back of the copy will transfer the lines. Don't forget, though; you will have a mirror image of the pattern.



Quick Marking Gauge

A combination square can easily be used as a marking gauge. Use a fine, triangular file to cut a small v-groove in the center of the end of the sliding rule. Put a pencil or steel scribe in this notch and, using the square's head as a guide, draw your lines. **AW**

It's just you, your knife, and the wood.

Whittled Peg Rack

By Tim Johnson

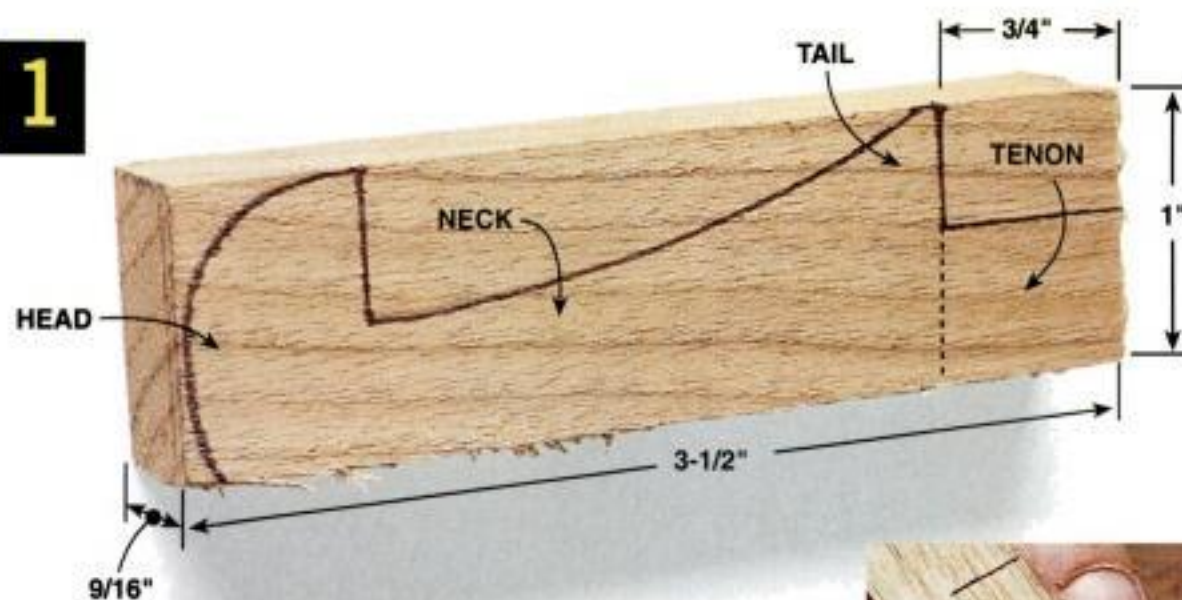
HAVE YOU EVER HAD one of those days (or weeks) when everything went wrong and you wondered why you decided to take up woodworking in the first place? It's supposed to be fun, right?

Well, sometimes it helps to get back to basics. After all, the only things you

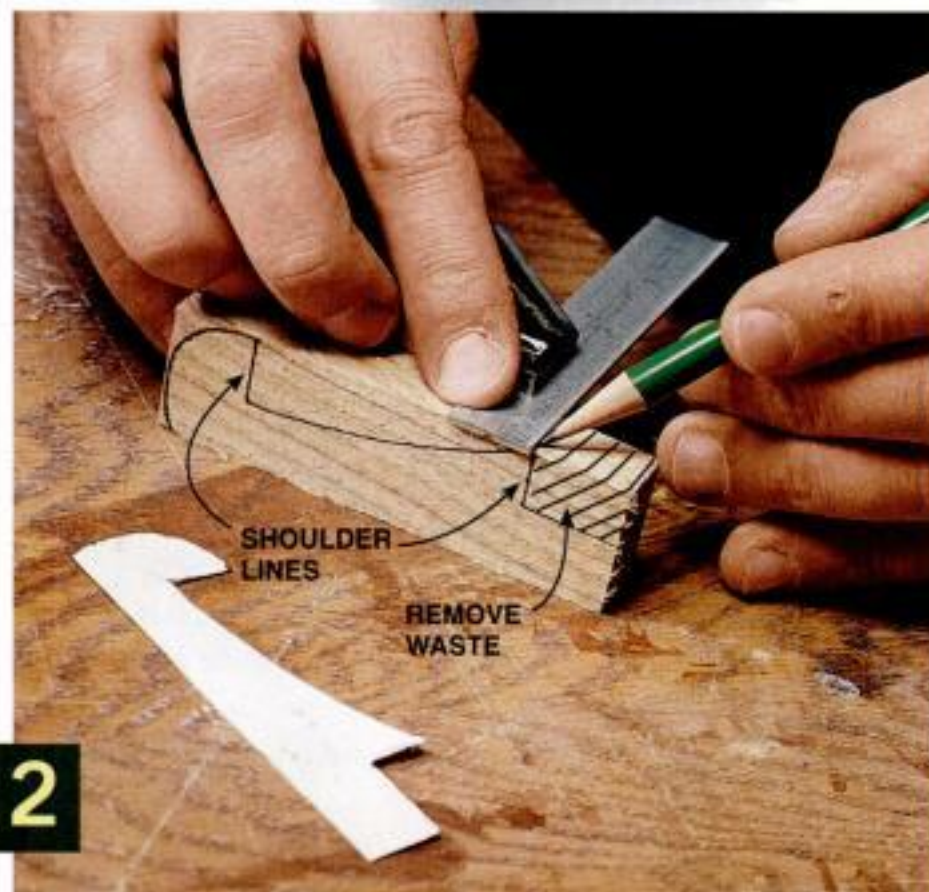
really need to be a woodworker are:

1. wood; 2. something sharp. Whittling is just that. It's relaxing and enjoyable. You can do it anywhere, anytime. A young person or beginning woodworker would enjoy this project just as much as an old codger.

1



TRANSFER the peg's profile onto both sides of a blank. Orient the grain so it runs roughly parallel to the bottom of the blank.



EXTEND the shoulder lines of the peg's head and tail across the top of the blank, then cut squarely along them to establish the shoulders. Remove the waste above the tenon.

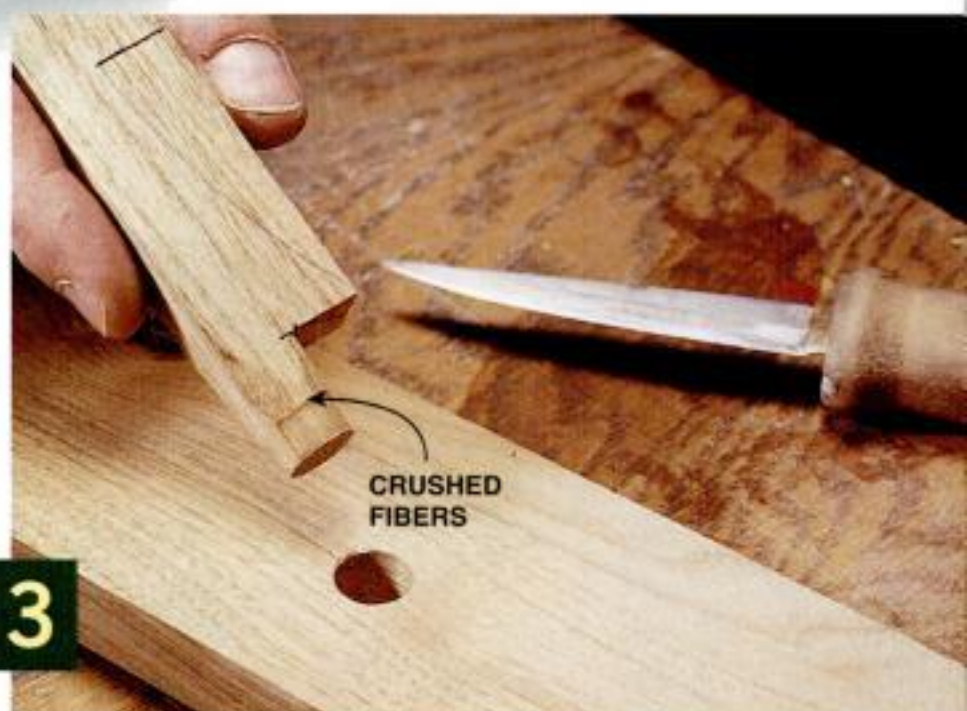
Historically, peg racks like this one were hidden. They were fastened to the back walls of wardrobes in the days before wire coat hangers were invented. But this one's too nice to hide!

You can adjust the length of your peg rack to fit any wall, and you can mount as many or as few pegs as you like. Plan on making a few extra ones. They don't all have to look alike, either. As your technique improves, the pegs will become more consistent.

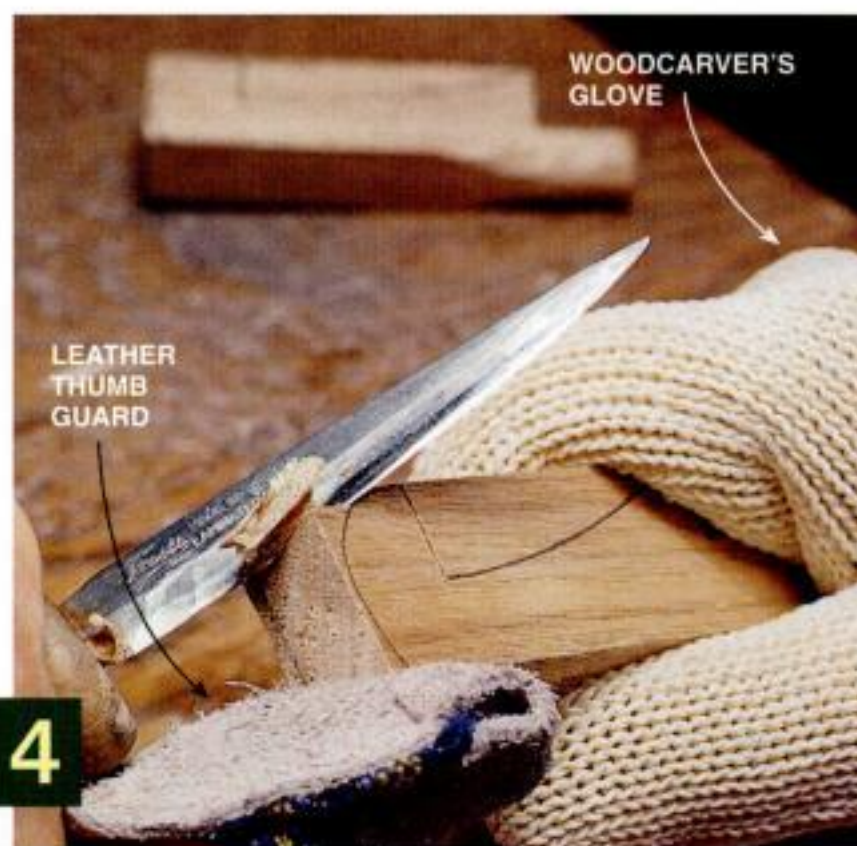
Butternut is a good choice of wood. It's pretty and cuts easily. White pine and basswood work just as well, but need to be painted. Walnut and cherry are harder to cut, but stronger and more durable.

The only tool you need for whittling is a knife. Choose one that's comfortable. I prefer a big handle. Make sure the knife is sharp—you'll be able to make controlled cuts that are clean and smooth. A dull knife won't cut it.

Practice on an extra blank. Think of peeling a potato. Hold the piece of wood in your free hand, position the thumb of your whittling hand against the end of it, and draw the knife blade



ROUND the back end of the tenon blank with short, paring cuts until it just starts to fit a 1/2-in. hole drilled in a scrap piece of butternut. Apply a little pressure and spin it to slightly crush the fibers of the unfinished part of the tenon. Remove the peg and pare the rest of the tenon to this mark. Test and pare as necessary for a snug fit.



CREATE the convex curve of the head by making shallow, flat cuts across the end grain. Work down from the top and up from the bottom towards the middle. That knife is sharp! I prefer a long-blade knife, but a shorter blade is safer. Always wear a woodcarver's glove and a leather thumb guard ([see Sources, p. 66](#)) to protect yourself.

Whittled Peg Rack

CRADLE the blank in one hand and use a potato-peeling motion. Draw the knife through the wood to the stop cut at the shoulder. This is where a sharp, stiff blade is at its best. Work down by alternately chamfering the outer edges, then removing the center ridge until you reach the pattern lines. Finish the peg by chamfering all outer edges (see photo 7).

5



6

CHAMFER the edges of a 2-3/4-in. wide backboard. Make it as long as you want. Drill 1/2-in. holes located 1-5/8 in. from the top and spaced at least 5 in. apart. Drill holes between the outer two pegs on each end for attaching to a wall.

through the wood towards your thumb. Make deliberate, shallow cuts. Apply just enough pressure to let the knife do its job. Don't make too deep a cut and don't force the knife.

You'll be able to tell which way the grain runs by how the knife cuts. Cutting with the grain is smooth and easy. So is cutting across the grain, as long as you cut from the outer edges toward the center. However, cutting against the grain is likely to result in slips and tear-out. When this happens, just turn the piece around so you can cut with the grain. Whittling is so easy that with just a little practice it will become second nature. **AW**



7

APPLY glue around the insides of the holes with a wooden stick, then twist the pegs into place.

Sources

You can get knives, gloves and thumb guards from:

The Cutting Edge
7123 Southwest Freeway
Houston, TX 77074
(713) 981-9228
www.cuttingedgetools.com

Woodcraft
210 Wood County Industrial Park
P.O. Box 1686
Parkersburg, WV 26102
(800) 225-1153
www.woodcraft.com



TABLESAW TENONING JIG

**A precision
joint-making
tool for
less than \$30.**

By Frank Gregg

A tablesaw tenoning jig is an essential tool for most woodworkers. But commercial units cost \$100 and up, and shop-made jigs that I've tried, all riding on the fence somehow, were unstable and hard to adjust. So I devised this jig, which features the safety and stability of a crosscut sled, combined with a micro-adjust tenoning carriage. With it, you can safely and accurately cut tenons, half-lap and bridle joints. Best of all, it's cheap and easy to make; all you need are a couple pieces of scrap hardwood plywood and \$10 worth of common hardware store items.

**FIG. A TENONING JIG
EXPLODED VIEW**



MATERIALS LIST

1/2" hardwood plywood	(24 x 36)
1/4" hardwood plywood	(19 x 20)
2x4 softwood	6"
1/8" x 3/4" aluminum bar	4"
3/8" threaded rod	7-1/2"
3/8" nuts	2
3/8" square nut	1
5/16" x 3" carriage bolt	1
5/16" square nut	1
5/16" washer	1
1/4" x 2" machine bolt	1
1/4" nut	1
#6 x 1/2" round-head screws	4
1/2" dowel	1-1/4"
maple or plastic runners	2

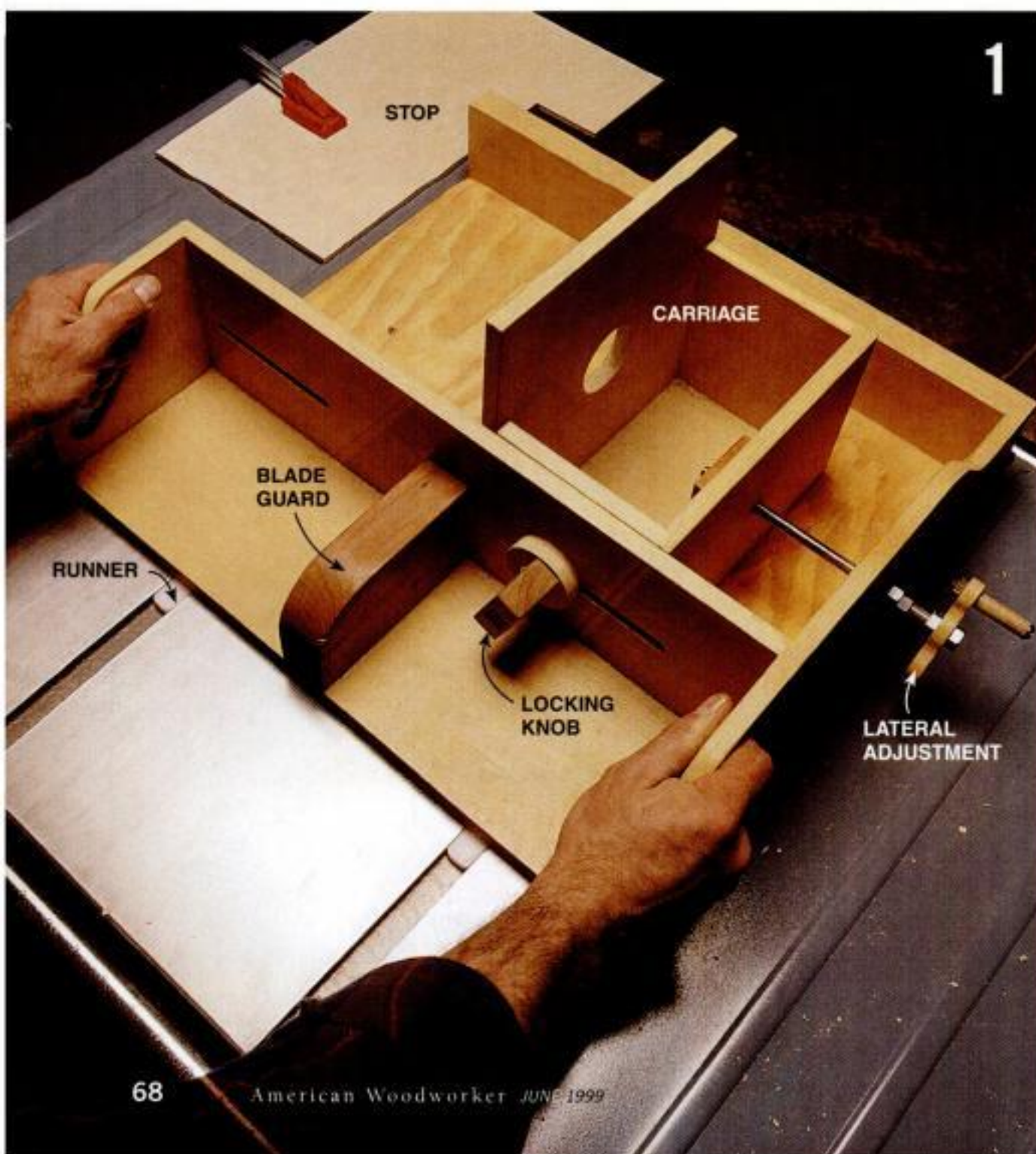
UHMW plastic is available from Rockler Woodworking and Hardware, (800) 279-4441; \$9 for 4 x 24 x 3/8-in. sheet; #67934.

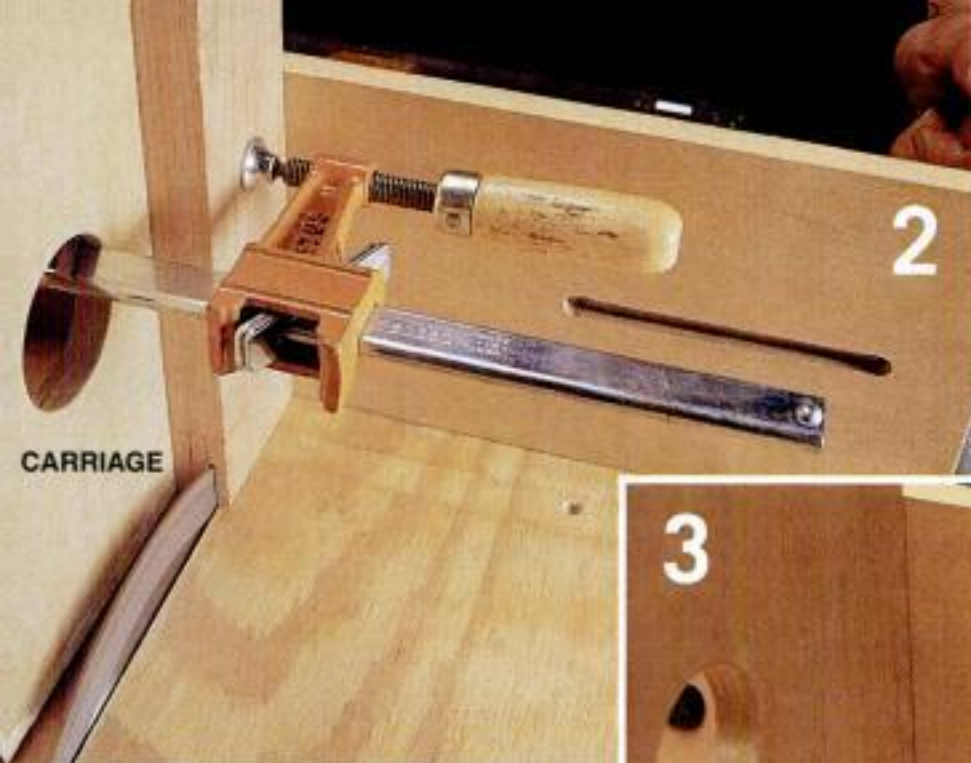
HOW IT WORKS

The jig has two parts: a fairly traditional crosscut sled that rides in the miter gauge slots; and a carriage, which is held by a threaded rod (Fig. A). When you crank the threaded rod, the carriage moves 1/16 in. for each full turn. A locking clamp holds the carriage in position when you've got it set just right.

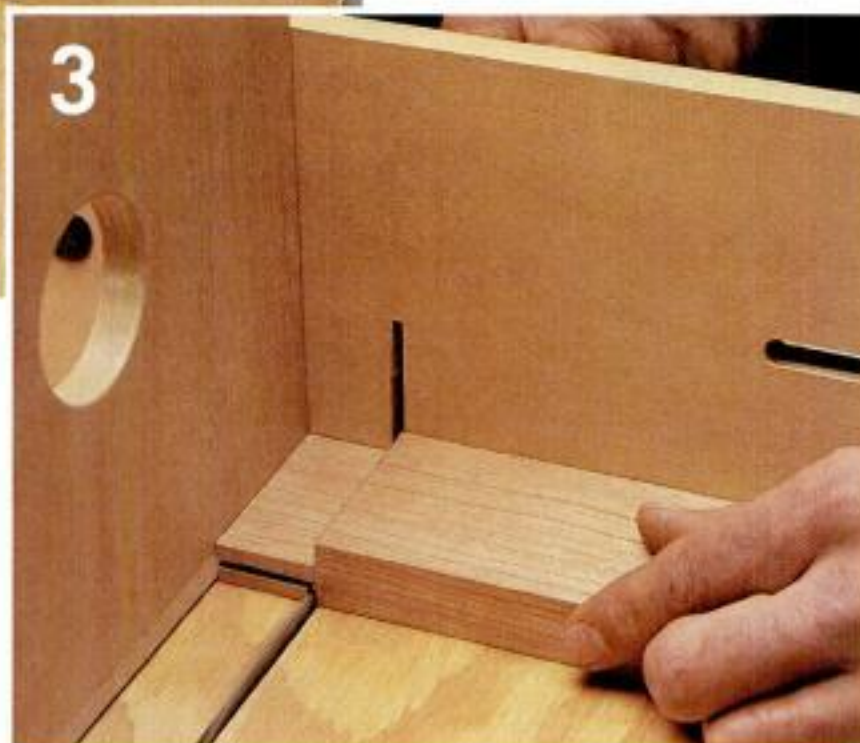
To make tenons, clamp each workpiece to the carriage and cut one cheek (Photo 2). Readjust the jig and cut the

THE JIG consists of a crosscut sled that rides on runners, with a laterally adjustable carriage that holds the workpiece. A stop prevents the jig from sliding too far forward.





2 CUT TENON CHEEKS with this jig by clamping the workpiece to the micro-adjustable carriage, which is attached to a crosscut sled.



3 CUT TENON SHOULDERS using the crosscut sled part of the jig. The micro-adjustable carriage is used as a stop to control the cut location.



4 A GROOVED, THREADED ROD is at the heart of the adjustment mechanism. The groove is made with a file while the rod is turned slowly in a drill or drill press. Two nuts tightened against each other make a stop to help control the file.

second cheek on all pieces. Now, here's a great feature of this jig: To cut the shoulders, you use the crosscut sled part of the jig, and the carriage becomes a micro-adjustable stop, making this second part of the tenoning operation quick and accurate (Photo 3).

This jig is also designed for safety. Unlike many tenoning jigs, your hands are far from the saw blade at all times. A wooden blade guard houses the blade after it makes the cut, and it's easy to rig up a stop that prevents the jig from going too far forward (Photo 1).

GENERAL ASSEMBLY

The basic construction of the jig is straightforward, because it's essentially made of plywood boxes. When you cut the parts, make sure they are dead square, because the accuracy of the jig

depends on it. The rabbets help keep the pieces square during glue-up. You may find it easier to make the cutouts for the handle before you cut out the parts, just because you'll have more material to hold on to. I drill two holes and then use a jig-saw to connect them—you could use a scrollsaw or router as well. Make the clamp hole in the carriage with a hole saw, then save the circular waste piece to use under the lock knob.

I made the locking clamp and the crank from wood, but commercial threaded knobs work, too.

THE ADJUSTMENT MECHANISM

The heart of this jig is the micro-adjust mechanism, which consists of two parts: an aluminum bar with a slot in it; and the threaded rod, with a groove filed in it. The groove fits in the slot, to capture the rod. To cut the slot, drill a 1/4-in. hole in the aluminum bar (available at hardware stores) and use a hacksaw to cut the sides of the slot. To cut the groove in the threaded rod, chuck the rod in an electric drill or drill press and hold a file to it (Photo 4). Check that the slotted bar fits neatly on the threaded rod. If the groove is too wide, put a pair of nuts on

the rod and tighten them against the bar.

To make the crank handle I used a piece of 1/2-in. dowel. You can also use a piece of scrap tubing or pipe. There's a trick to drilling a hole through the middle: Clamp a piece of scrap to your drill press table and drill a 1/2-in. hole in it. Put the dowel in the hole, and you can drill a 1/4-in. hole neatly through the center.

ASSEMBLING THE SLED

I made my sled runners from ultra-high-molecular-weight (UHMW) plastic (see [Materials List, p. 68](#)), which is slippery and makes the jig slide easily. Maple or another dense hardwood would also work well.

The runners must be attached exactly perpendicular to the fence at the back of the jig. Here's how to do it: First, make sure that your tablesaw blade and rip fence are exactly parallel to your miter slots. Set the runners in the slots and place the sled on top of them. Lock your rip fence next to the sled, and use a large, accurate square (a drafting triangle is good) to set the sled's fence perpendicular to the rip fence. Drive a couple of brads through the sled into the runners to hold them, then screw them on.

Make test cuts to be sure the sled is giving you square cuts, then attach the tenoning carriage and you're ready to start tenoning. **AW**

We Pick the Best!
**SHOP
TEST**

Plate

Plate (or biscuit) joinery was developed to provide woodworkers with a quick and simple method for creating a joint. The joiner cuts a semi-circular slot into the workpiece, and a football shaped biscuit fits into this slot. Biscuits are made of compressed beech, which swells to fill the slot when wetted with glue. Biscuit joints are fast, easy to make, versatile and relatively strong.

Our Test

We assembled a panel of six woodworkers of varying skill levels, asked them to examine each of the 13 joiners

in our lineup, and report on their findings. This part of the test was designed to examine the subjective qualities of each tool.

Next, we went to work examining the objective, measurable qualities of each tool, such as cut performance and sound level. As a final step, we took each tool apart and examined the internal construction and design.

SWITCH LINKAGE IS NEEDED TO CONNECT THE SWITCH LEVER TO THE ACTUAL ELECTRICAL SWITCH INSIDE THE BARREL

POWER SWITCH IS LOCATED IN THE BACK OF THE HANDLE TO KEEP THE BARREL SIZE SMALL

DUST COLLECTING BAG



WHICH JOINER IS RIGHT FOR YOU

If one tool fit the needs of every woodworker there wouldn't be so many tools on the market. In reality, every woodworker has their own needs and preferences. The goal of a tool test is to assist you in making the tool purchase decision that best suits your needs.

1 Biscuit Joiner Anatomy:

We cut this joiner in half to show you what makes a joiner work. Believe it or not, it still runs!

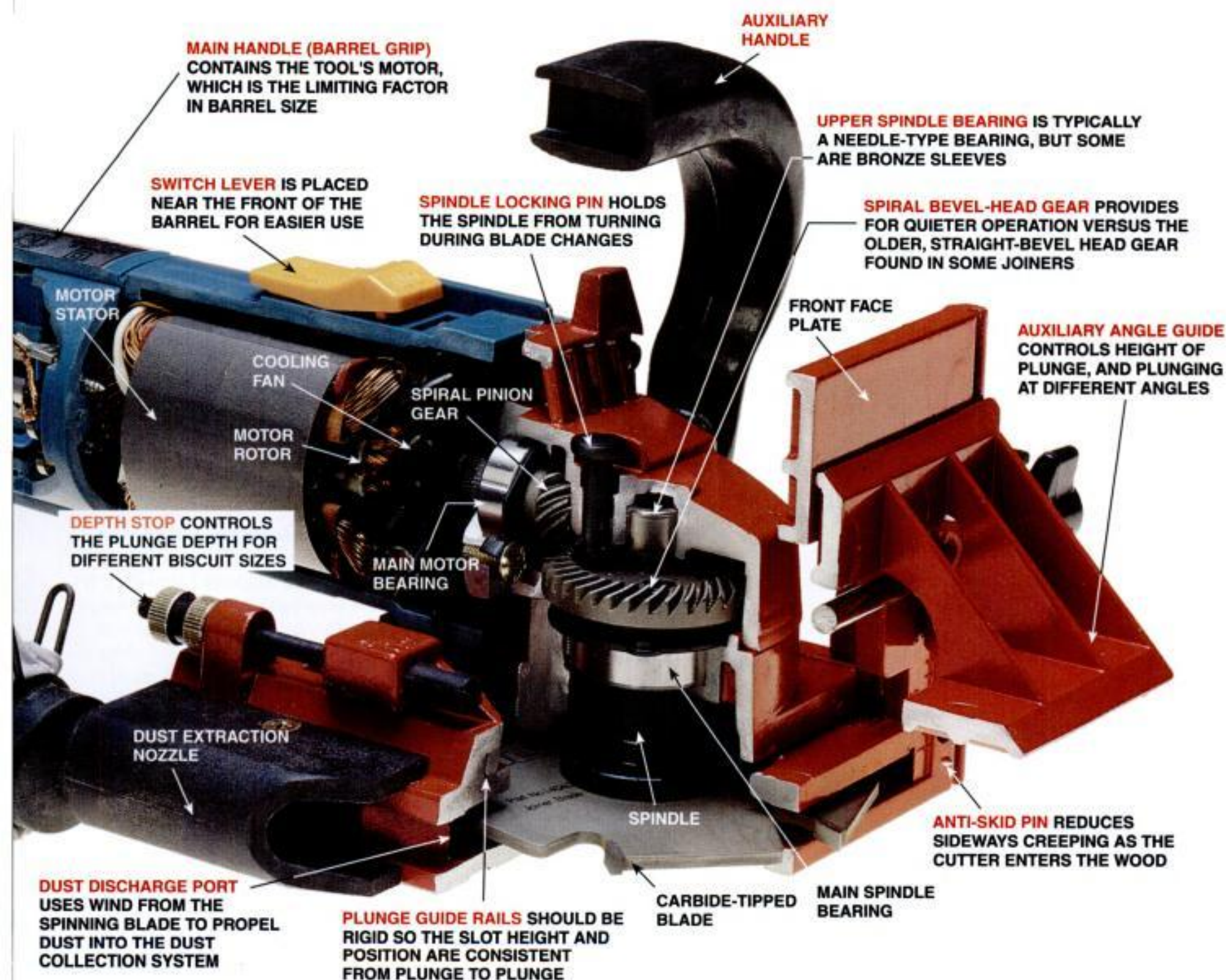
By Rick Christopherson



VERSATILITY AND PERFORMANCE: AW EDITOR'S CHOICE

For those woodworkers who want the ultimate tool, to do every operation in the best way possible, regardless of cost, the Porter Cable 557 (\$200, street price) is clearly the best and most versatile, and is the AW Editor's Choice.

Joiners



PERFORMANCE AND PRICE: AW EDITOR'S CHOICE II

Though not as versatile as the Porter Cable 557, the DeWalt 682 (\$159, street price) is a solid, comfortable tool with an excellent fence system. It receives our second Editor's Choice award.



MOST BANG FOR THE BUCK: AW BEST BUY

Woodworkers who use a biscuit joiner just a few times a year probably want a low cost unit that performs well. The Freud JS100 is the lowest-priced joiner with solid construction (\$100, street price), can serve the needs of the infrequent user, and is our choice for Best Buy. The Porter Cable 556 and the Freud JS102 are also good tools, and for just a few dollars more (\$130 each, street price).

FENCE HEIGHT ADJUSTMENT

Fence designs range from the simple to the elaborate, but they all do the same thing: provide a consistent slot height, parallel to the board's surface. With simple fence designs, you need to set the fence parallel to the blade using an external means, like a block of wood or a rule. This is not particularly convenient, especially when plunging mitered joints.

The newest fence designs have micro-adjustments and linear guides for easy adjusting, while maintaining parallelism (Photos 2 and 3). The fence designs used on the Craftsman Industrial, DeWalt 682, and Porter Cable 557, stand out in their means of maintaining parallelism. The Craftsman and DeWalt fence design uses a dual rack-and-pinion adjustment which mates the right and left sides together (Photo 2). The Porter Cable 557 uses precision-ground stainless-steel rails and widely spaced bearing sleeves to prevent the fence from racking (Photo 3).

FENCE ANGLE ADJUSTMENT

An important feature of plate joiners is making miter joints. Not only

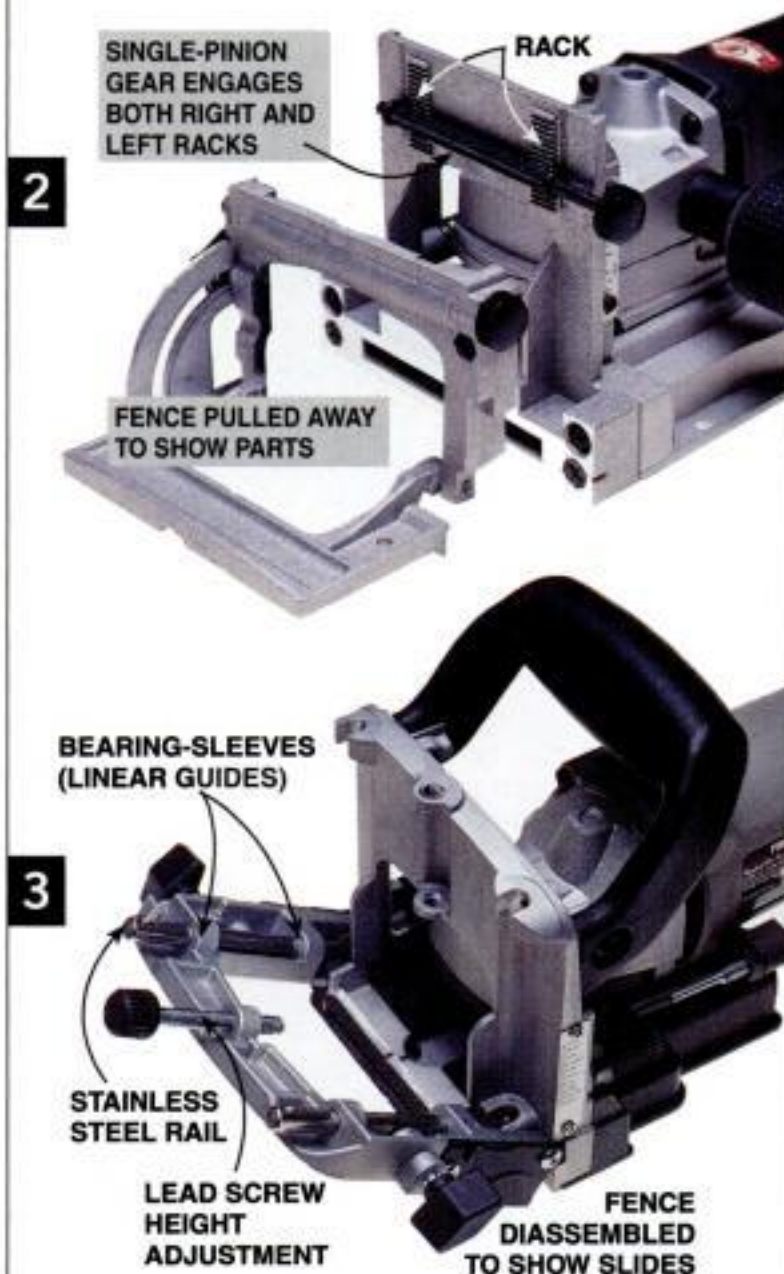
does a biscuit add strength to a miter joint, it also helps control alignment of the pieces. In some cases, it is important to have the inside edges of the miter aligned, which requires a fence setting of 45 degrees. More often, it is desired to have the outside edges aligned, which requires a fence setting of 135 degrees (Photo 4).

To achieve a 135-degree fence setting, many joiners use the miter registration notch, as shown in Photo 5. However, the limited surface area of this notch can lead to unstable plunging motion. The Craftsman 17501, Ryobi JM80, and Porter Cable 557 have a better design: Their fences swivel from 0 to 135 degrees, providing full contact of the fence face and more stability.

The Freud JS102, Lamello Classic, Lamello Top20, and Makita 3901 plate joiners use an auxiliary angle guide, which also has a miter registration notch.

PLUNGING DEPTHS

There are three standard biscuit sizes that all plate joiners are capable of using: #0, #10, and #20. To use the various sizes, each joiner has a depth-stop adjustment knob. Several

KEEPING THE FENCE HEIGHT ADJUSTMENT PARALLEL

An important difference between machines is how well the fence stays parallel with the base as the fence height changes. The best have a mechanical system to keep the fence parallel. The dual rack-and-pinion design of the DeWalt 682 (Photo 2) controls both right and left sides of the fence racks with a single pinion gear. The Porter Cable 557 (Photo 3) uses precision-ground stainless steel rails with widely spaced linear guides to keep the fence from racking.

PORTER CABLE 557

While many of the joiners we examined had good features in one area or another, the Porter Cable 557 had leading features in every area. Clearly, the engineers at Porter Cable did their homework before this tool left the drawing board. The 557 earned our Editor's Choice award.

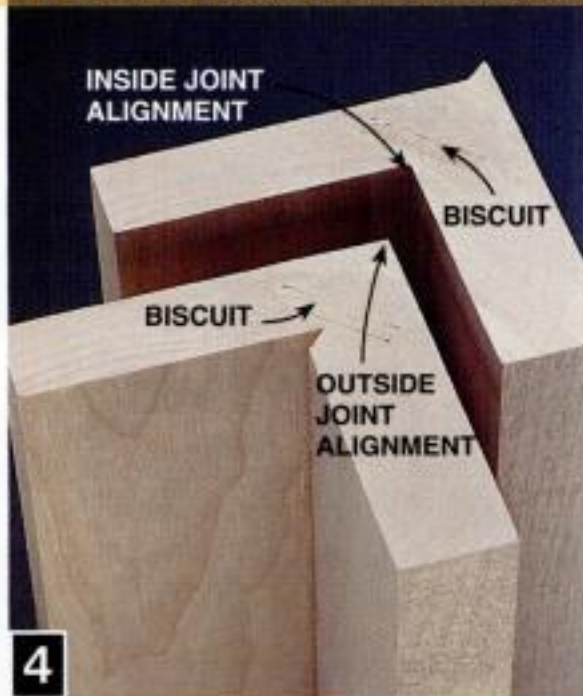
The fence has complete adjustment from 0 to 135 degrees, and has a micro-adjust height setting. The fence rides on precision-ground, stainless-steel linear slides, which do a good job at keeping the fence parallel to the cutter. Our panel of testers thought the trigger and handle were the most comfortable to operate. Porter Cable designed the 557 with a long dust chute that can be connected to a 1-in. vacuum hose, used with the included directional port or the standard dust bag.

The 557 has the most versatility of all the joiners when it comes to plunge depths. It comes equipped with a second carbide cutter for use with the smaller, face-frame size biscuits, giving it the capability to plunge for seven preset depths: FF, #0, #10, #20, Simplex, Duplex, and S6.

Street Price: \$200; Porter Cable, (800) 487-8665.



FENCE ANGLE ADJUSTMENT



Miter Alignment: Keying the fence on the outside corners results in alignment at the outside of the joint, and keying on the inside corner aligns the inside of the joint. When selecting a joiner, it should easily perform the type of miter joint you use most often.

machines are also capable of plunging to additional depths: Simplex, Duplex, and S-6 (these are also known by the "S," "D," and "Max" settings, respectively). With these settings, the joiner can be used with specialty accessories like Simplex knock-down plates for non-permanent joint assembly, Duplex hinges for doors (both are available from Tools on Sale 800-328-0457), or the large, S-6 biscuits.

The Porter Cable 557 is the only plate joiner we tested that comes equipped with a second cutter for faceframe sized



135-degree Plunging: Many joiners use the miter registration notch for 135-degree plunging (at left). Fences which fully tilt to 135 degrees provide a larger bearing surface and are more stable (at right).

(FF) biscuits. These are smaller biscuits (approx. 1-1/4 by 1/2 in.) for assembling faceframe material less than 2-1/4 in. wide. (Lamello has a cutter for their H9 biscuits, but it must be purchased separately.)

MAIN HANDLE

Many woodworkers find D-handle tools to be the most comfortable. However, only a few joiners have this design. Most joiners use a barrel grip design, where the operator grasps the tool around the motor housing. Even if you can palm a basketball, this grip can be uncomfortably large and a firm grip



on the tool is key to creating accurate and consistent slots.

Two barrel-grip joiners stand out from the crowd, however: The Porter Cable 557 and DeWalt 682. Our testers found their pistol-grip handles very comfortable and easy to control.

POWER SWITCH

The slide-type power switch has been around since the first biscuit joiners, but newer, more ergonomic machines have trigger-type switches. Most of our testers thought the trigger-type switches were easier to operate.

DEWALT 682

The fence system used on the DeWalt 682 joiner is both versatile and easy to use. The dust collection system can be used with the collection bag, directional discharge, or a vacuum attachment. The trigger is very easy to operate, and the handle is one of the most comfortable. With features like this, we gave the DeWalt 682 our second Editor's Choice award.

The slide mechanism for the plunging operation uses plastic gibs, which can be replaced as they wear (available from a local DeWalt service center for about \$2 per pair; 800-433-9258). While most other gear-box designs use needle bearings at the top of the spindle, this joiner uses bronze bearings. The package includes a T-20 torx-head driver for servicing the tool. However, there is no supplied driver that fits the screws for calibrating the height gauge.

Street Price: DeWalt: \$160; (800) 433-9258.



Four plate joiners have trigger-type switches under the barrel: Craftsman Industrial, DeWalt 682, Lamello Top20, and Porter Cable 557. Of these four joiners, our testers found the Porter Cable and DeWalt triggers to be the best for comfort and ease of use. Of the slide-type switches, the Makita was the most comfortable because the switch is placed halfway between the top and side of the barrel—where a right-handed person's thumb naturally rests.

The Lamello was the only tool with a "safety-lock" on the trigger to prevent an unexpected start-up. However, the same lever that unlocks the trigger for operation, also locks the trigger into the "ON" position. As a result, several of our testers were startled to find the tool still running after they released the main trigger. On at least one occasion, when the tool was plugged in, it was locked into the "ON" position, because the trigger lock was inadvertently engaged when a tester picked up the tool by the barrel.

DUST COLLECTION

During our tests, we found that most machines with dust collection bags clogged up occasionally. Several of the machines had a restriction in the dust discharge port near the blade area to prevent the operator from contacting the blade with a fingertip. This seemed to make them prone to clogging. The Craftsman Industrial, DeWalt 682, both Freuds, and the Makita all clogged on more than one occasion during our tests.

Several of the machines could be connected to shop vacuums, but you'll want to verify that the adapters are compatible with your vacuum.

NOISE

We tested all of the plate joiners with a sound level meter and surprisingly, they all rated within a few decibels of one another. However, this electronic meter can't quantify the "annoyance factor" of the sound. Some joiners had a very smooth sound, while others

sounded as though they were going to grind themselves to shreds.

This grinding noise is due to the gear lash in the right-angle drive of the joiner, but is not necessarily an indication of a poorly built tool. The spiral-bevel gear design (opening cross-section photo) is quieter than a straight-bevel gear, but the straight-bevel gear is stronger. Joiners with a straight-bevel gear had a more pronounced grinding sound than those with a spiral-bevel gear. Fig. A shows which type of gears are used in each joiner.

The D-handle joiners do not have the distinctive grinding noise. Before you buy, you may want to ask to turn the tool on, to see if the sound will bother you. You don't need to make any cuts to hear the sound. **AW**



CRAFTSMAN 17501

This D-handle joiner uses all plastic construction for the base and fence. A unique design feature is that it uses a dust collection box instead of a bag. This box is located at the rear of the base just under the handle, is fairly effective and easy to empty. The front edge of the fence has a molded handle for steadying the machine during plunging. The fence system has a good design, but solidity of construction is not in line with tools in the same price range.

Street Price: \$95; contact your local Sears store.



RYOBI JM80

The Ryobi D-handle joiner uses plastic construction for the base, but the fence is stamped steel. The movement of the fence is smooth and adjusts from zero to 135 degrees. The main handle is comfortable to hold, and the rubber edge of the fence serves as a good auxiliary handle. The fence platform is large, making it easy to keep the tool stable while plunging. This joiner is easy to use, but the plastic construction seems less rugged than the cast aluminum on other tools.

Street Price: \$100; Ryobi, (800) 525-2579.

FREUD JS100 AND JS102 (not shown)

The JS100 and JS102 plate joiners use the same motor, gear box, base, and blade. Where they differ is in the fence system. The JS100 uses a fixed-angle main fence, while the JS102 has an adjustable-angle fence. For the price, they are very well built, with cast aluminum base and lower gear box, but the upper gear-box cover is plastic. We didn't find this to be a significant problem with the tool, especially when price is considered.

These joiners have a pronounced grinding noise in normal use, due to the straight-tooth bevel pinion and head gear. Another drawback is the large, squared-off barrel, which is difficult to grab with small- to medium-size hands. While the power switch operation may be awkward for right-handed people, the position and operation work well for lefties. The JS100 is a well-built tool, one of the lowest priced, and receives our Best Buy award.

Street Price: JS100: \$100; JS102: \$125; Freud, (800) 334-4107.



SKIL HD 1605

The Skil plate joiner has all plastic construction for the base and the plastic fence allows for fixed plunging only at 0, 45, and 90 degrees. The plunge mechanism uses steel linear rails with plastic slides. Adjusting the height of the cut is awkward because it requires an Allen wrench, although one is stored in the back of the base for easy access. Unlike most other plate joiners, the dust collection bag mounts to the rear of the base and is supported by a clip on the power cord, well out of the way. The materials and construction are not as solid as comparably priced machines.

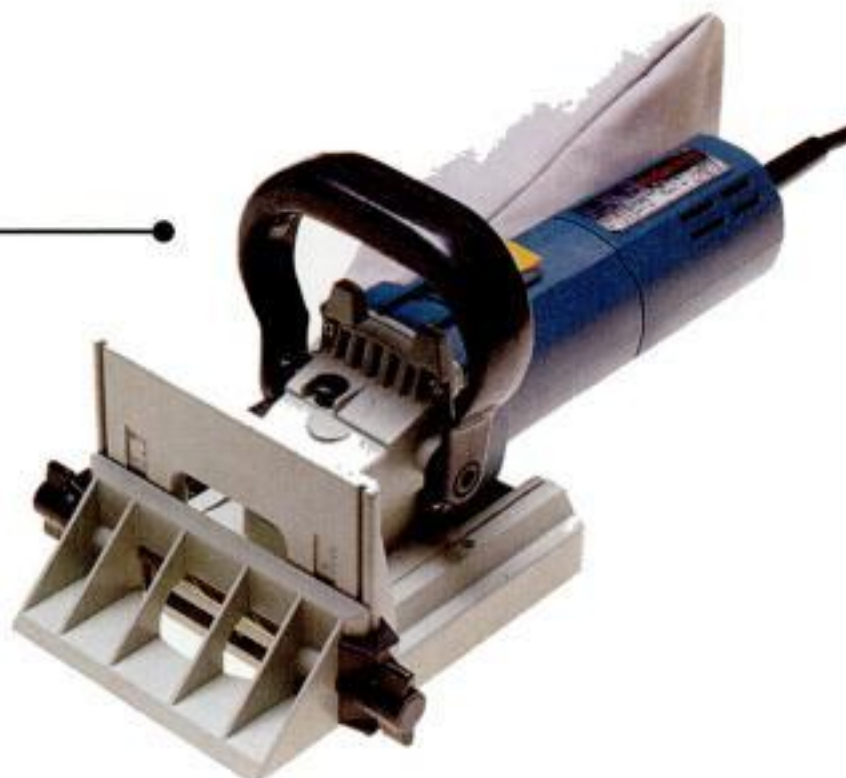
Street Price: \$120; Skil, (800) 301-8255.



JEPSON 7204

This is a fairly straightforward tool with rugged construction. The upper and lower gear cases are cast aluminum, and support the roller and needle bearings of the spindle. The power switch is easily reached with your right or left thumb. The fence is very basic, and provides for only 0-, 45-, and 90-degree plunges. The micro-adjustment of the plunge depth is easy to change, but the coarse adjustment for different biscuit sizes is awkward. Changing the height of the fence is awkward too; it requires two hands to simultaneously turn right- and left-hand knobs, leaving you without a means for holding the fence steady.

Street Price: \$140; Jepson, (310) 320-3890.



SHOP TEST Plate Joiners



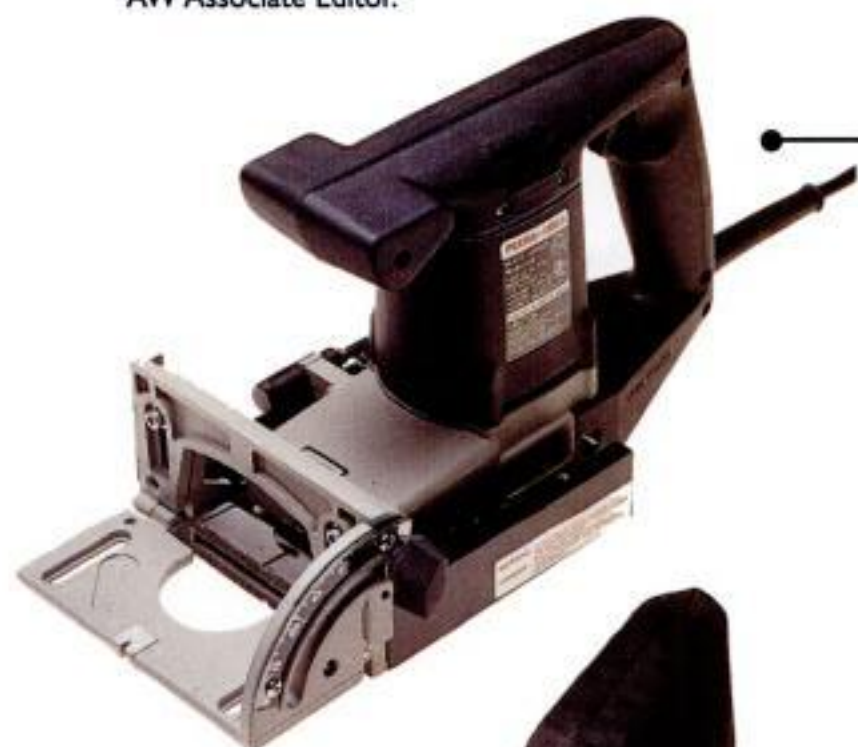
The Testing Panel

We gathered a group of woodworkers to examine each of the biscuit joiners: (right to left):

Gene Anderson,
Dick Christopherson,
Paul Mayer,
Nina Childs-Johnson,
Karen Anway,
Nick Medwid,
Rick Christopherson,
AW Associate Editor.

FIG. A PRODUCT COMPARISON

Brand	Street Price	Plunge Size*	Handle Circumference	Dust Collection**
Craftsman 17501	\$95	0,10,20	na	7
Ryobi JM80K	\$100	0,10,20	na	7
Freud JS100A	\$100	0,10,20,S, D, M	8.5 in.	7
Skil 1605	\$120	0,10,20	8.125 in.	8
Freud JS102	\$125	0,10,20,S, D, M	8.5 in.	7
PC556	\$130	0,10,20	na	none
Jepson	\$140	0,10,20	8.0 in.	8
Makita 3901	\$160	0,10,20,S, D, M	8.0 in.	7
DeWalt 682	\$160	0,10,20,M	6.5 in.	7
PC 557	\$200	0,10,20,S, D, M, FF	6.0 in.	9
Craftsman 27730	\$200	0,10,20,M	8.5 in.	7
Lamello C2	\$340	0,10,20,S, D, M	8.0 in.	optional
Lamello Top20	\$640	0,10,20,S, D, M	8.75 in.	optional

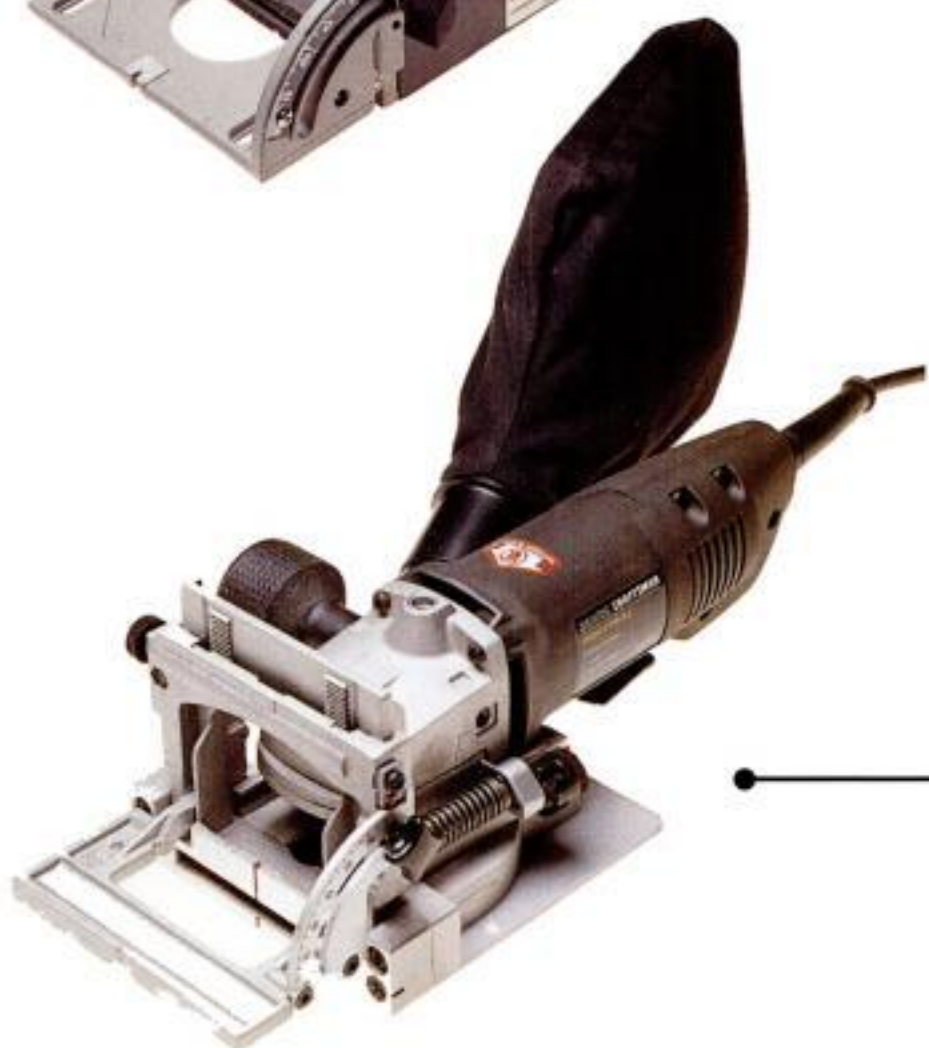


PORTER CABLE 556

Of all the D-handle type joiners, the PC 556 seems to be the most solidly built, with an aluminum base and fence. The 556 comes with two separate fence attachments. The first is a fixed-angle fence for plunging at either 90 degrees or 135 degrees. The second attachment is an adjustable-angle fence for plunging between zero and 90 degrees. While swapping fences may be cumbersome, this type of set-up is versatile. The overall fence system would be easier to adjust if thumb screws were used, but instead, the fence locks in position with Allen-head screws. A major drawback is the lack of dust collection capability.

Several of our testers felt that the angle of the D-handle was too steep, forcing your wrist to bend too far, and that the position of the auxiliary handle was too high for good control of the plunge. Aside from the ergonomics, this is a good tool for the woodworker buying a joiner on a budget.

Street Price: \$130; Porter Cable, (800) 487-8665.



CRAFTSMAN INDUSTRIAL

The fence system on the Craftsman 27730 Industrial joiner uses a dual rack-and-pinion design to adjust fence height. The fence and gearbox are the same as the DeWalt 682 and are completely interchangeable. The Craftsman Industrial varies from the DeWalt 682 in the barrel and trigger design. The Craftsman joiner uses a barrel grip similar to many of the other joiners we examined, but the paddle-type power switch is located under the barrel. Our panel found it less comfortable than the DeWalt 682.

Street Price: \$200; contact your local Sears store.

Gear Type***	Main Handle	Trigger	Fit & Finish	Fence	Rigidity	Brand
straight	8	9	5	4	4	Craftsman 17501
na	10	10	7	6	6	Ryobi JM80K
straight	6	6	8	7	8	Freud JS100A
straight	8	7	6	6	5	Skil 1605
straight	6	6	8	7	8	Freud JS102
na	8	10	7	5	7	PC556
spiral	8	8	7	6	8	Jepson
spiral	5	8	7	8	8	Makita 3901
straight	10	10	9	9	9	DeWalt 682
spiral	10	10	9	10	10	PC 557
na	10	10	9	9	9	Craftsman 27730
spiral	7	8	10	7	10	Lamello C2
straight	6	4	10	7	10	Lamello Top20

*S, D, M =Simplex, Duplex, S-6 (Max) plunge depth

**Ratings are on a scale from 1 to 10, with 10 being best

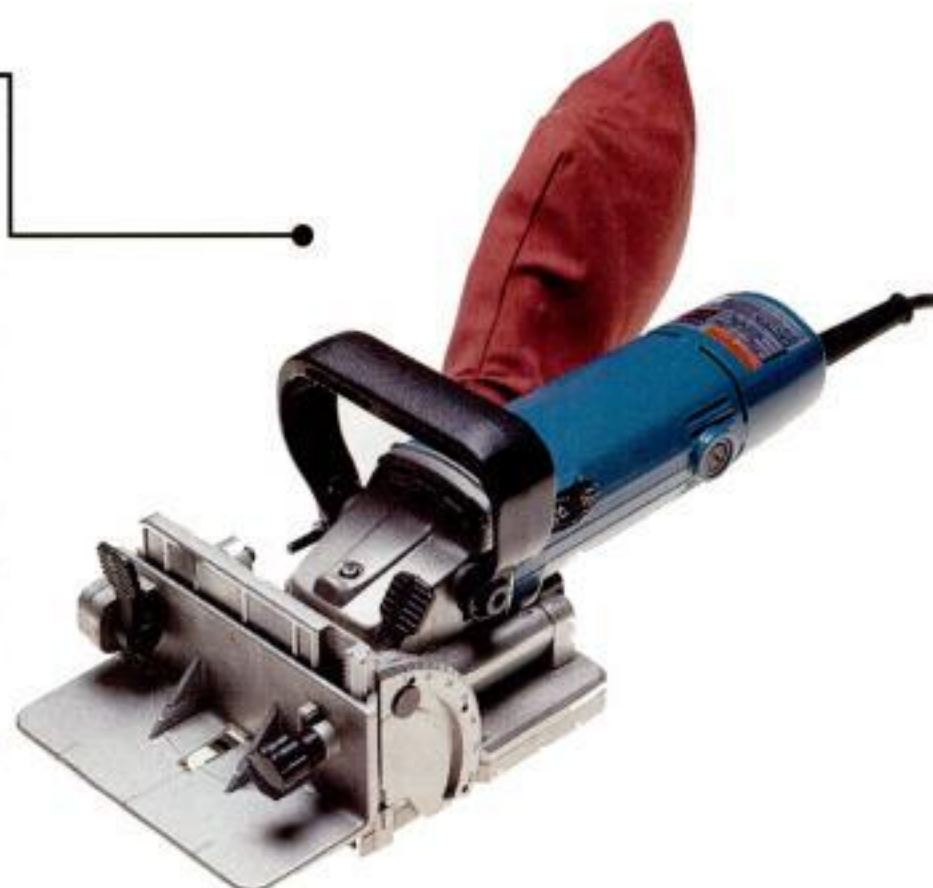
***The gear type relates to motor noise:spiral gears tend to have less clatter. (see [NOISE](#), p. 74)

na = not applicable

MAKITA 3901

The Makita plate joiner is a solid and flexible tool. It uses a single rack-and-pinion height adjustment that is very easy to use. Plunging angles from 0 to 135 degrees is possible by adding or removing the auxiliary fence to the adjustable base. The lever-type clamping locks are metal, and provide for fast and easy changes in the fence settings. The coarse depth-adjustment stop is easy to reach and turn, even for those with large hands, but the indicators are difficult to read. Accessing the blade and dust shoot area is the easiest of all the plate joiners we tested. A simple thumb screw on the back of the tool releases a hinged cover, exposing the blade. The plunging action is guided by linear slides on steel rails. The most significant problem we found with this tool was the motor's brush- holder caps which protrude from the sides where your hand grips the barrel. This can make the handle uncomfortable.

Street Price: \$160; Makita, (800) 462-5482.



LAMELLO TOP20 and CLASSIC C2 (not shown)

Lamello has a longstanding reputation for building plate joiners that last forever. These tools are very well built, and have quality that is more than just skin deep. For the average home woodworker, however, the price may be hard to justify. Both tools have an adjustable fence for mitered plunges, and an adjustable auxiliary angle guide.

The Lamello Classic has a long slide switch mounted on the top of the barrel, and is well within reach of your thumb. We did not like the operation of the Top20's trigger switch, because the safety release lever also serves as the trigger "ON" lock, which can cause the tool to remain "ON" unexpectedly.

Street Price: Classic C2: \$340; Top20: \$640; Lamello, (800) 252-6355.



GLUE & CLAMPS

A dry run is

*the key to
a hassle-free
glue-up.*

By Ian Kirby

Everything looked good, until you added glue and clamps. Then the wood began to slip and slide, you scrambled for scrap blocks and more clamps. The glue ran before it grabbed, welding the blocks to your project. You'll have to saw them off, you can look forward to scraping hardened glue, and you know you'll never quite get it all, so bye-bye flawless finish. Haven't you been there?

It doesn't have to be this way. With good clamps, knowledge of how pressure spreads, and most important of all, a thorough dry run, you can have a neat, controlled glue-up. Let's examine the whole procedure, one element at a time.

Buying Clamps

Clamps come in two types: C and bar. Bar clamps need to be heavy and rigid, with jaws that remain square to the bar under heavy pressure. I like Record bar clamps because they meet these criteria ([see Sources, p. 81](#)). For making furniture and cabinets, 3-ft. bars will be most useful, and six of them would be a good start. Clamps are heavy, and extra length is not only awkward to handle, but also

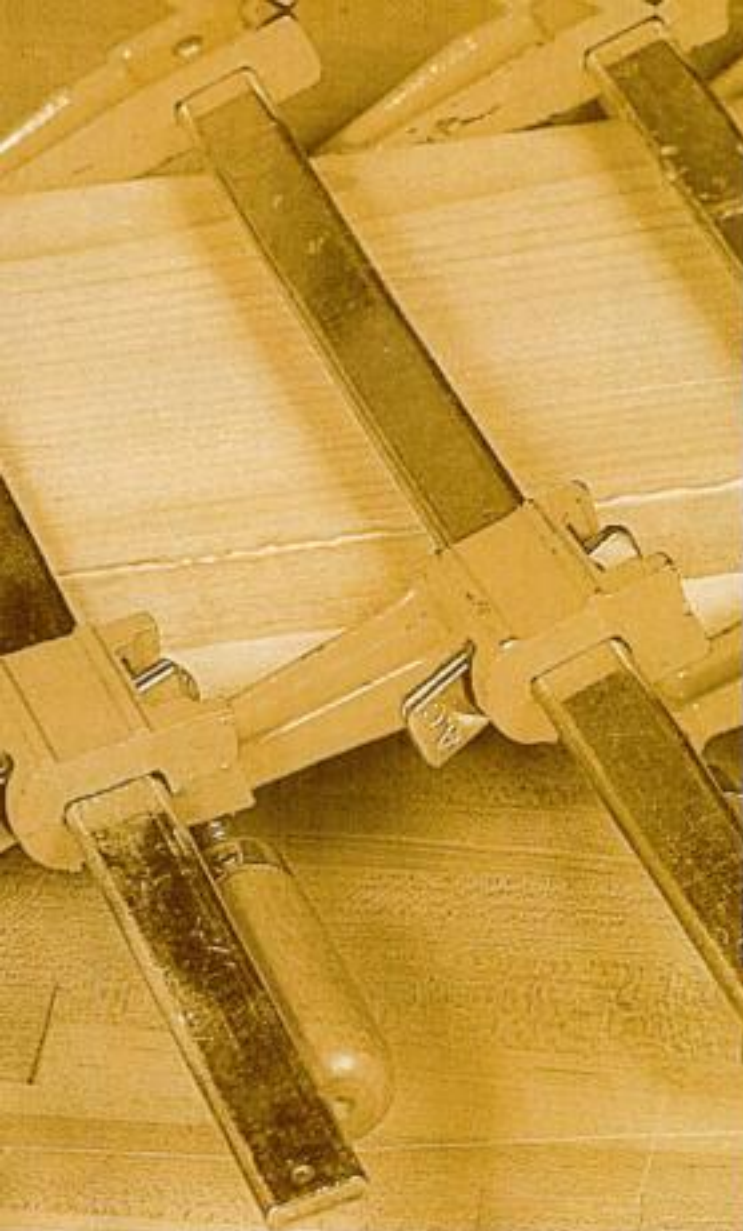
likely to twist the workpiece. Don't just buy the longest and figure they'll work for everything. Record clamps can be joined end to end when you really do need a longer reach (see Photo 3).

Pipe clamps are widely available and affordable. However, the cast parts aren't very accurate and the pipes bend under pressure. Consequently, pipe clamps are difficult to align and untweakable when you need to square-up the assembly. If you've been using pipe clamps your whole woodworking life, spring for a pair of good bar clamps. The difference will amaze you.

C-clamps are the woodworker's third hand. Unlike bar clamps, there's not much reason to recommend one brand of C clamp over another. The 6-in. size is handy, they cost under \$10 each, and six or eight of them is a good starting kit. Longer and deeper clamps may sometimes be necessary, but not often, so buy them only as you need them. Sometimes a C-clamp gets bent or twisted from overtightening. There's nothing you can do, except chuck it out and resolve not to overtighten the next one.



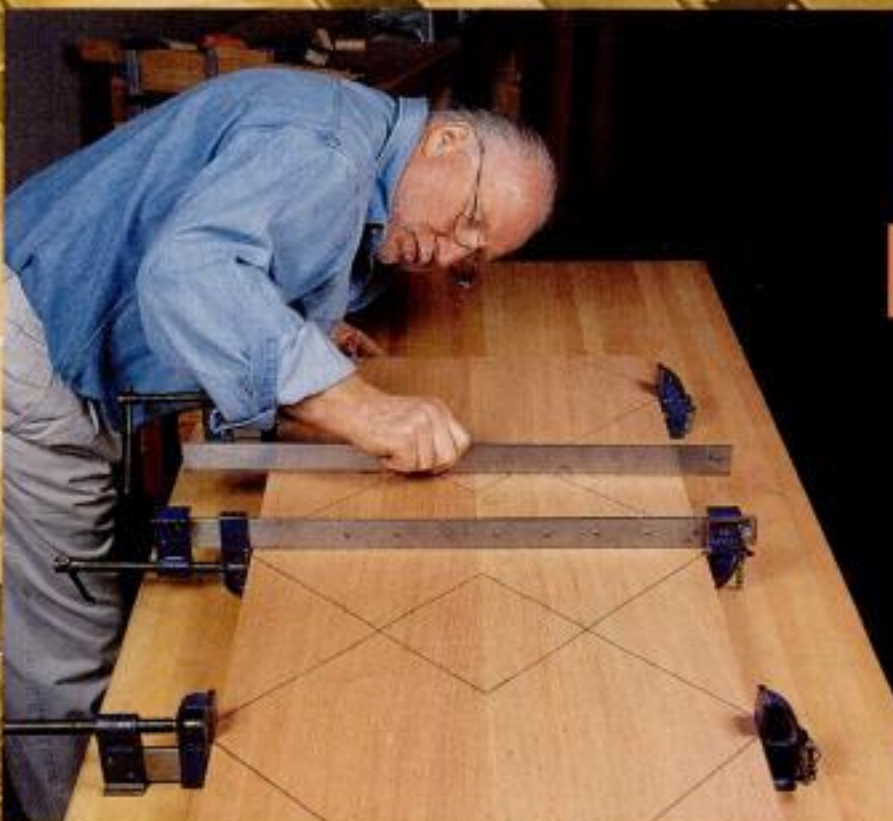
CAREFUL ALIGNMENT of clamps and blocks keeps your work flat and square.



The Pressure Fan

In direct glue-up situations, such as an edge-to-edge butt joint, the problem is transmitting uniform pressure to the glue line. How many clamps do you really need? The answer depends on the width of the wood. Because of the way pressure fans out from the clamp jaws, the narrower the wood, the more clamps you need.

As shown in Photo 1, the pressure makes a fan with a total angle of about 90 degrees. If you imagine fans like these radiating from each clamp jaw, you'll know how many clamps you need. With wide boards, although a single clamp may be enough to distribute the pressure to the whole glue line, using three gives you a lot more adjustability. You can keep the panel flat by tightening and loosening one clamp or another, and by shifting the workpiece up or down on the clamp jaws. It takes a lot of clamps to glue a narrow edging onto the edge of a panel (Photo 2), but only one clamp if you glue them two at a time (Photo 3).



1 PRESSURE FANS OUT

from each clamp to cover the full glue line. Fiddling with the placement and tightness of the clamps will keep the panel flat. Check for flatness with a straightedge.



2 NARROW EDGING

will take a lot of clamps because the pressure from each clamp does not extend very far.



3 ONLY ONE CLAMP

may be needed when the edging is sandwiched between two wide plywood panels. These Record bar clamps can be joined end-to-end to extend their reach.

4 the CHECKS

tightness



4 CHECK THAT THE JOINT HAS CLOSED

The fit you see now is the fit you're going to get when you add glue. If it's not what you want, now's the time to correct it. The other three checks may disturb the fit, so look again at the end.

alignment



5 CHECK FOR ALIGNMENT

Leg-Rail Assemblies: Use a straightedge to align the outer surfaces of the legs. Use a clamping block the same thickness as the rail, and move the block up or down to align the legs' faces. **Panels:** Use a straightedge and your fingertips to check across the joint. To make corrections, loosen the clamps a tad and push or tap the board into line. If they won't line up, fix the problem now—glue won't solve it for you.



twist



6 CHECK FOR TWIST

Leg-Rail Assemblies: Press one side of the assembly down on the bench, sight across it, and see if it rocks. Eliminate twist by loosening the clamps and pushing the parts into the same plane. **Panels:** Take twist out of a panel by pushing the boards down flat on the clamp bars. Here's where heavy clamps, on a flat workbench, really pay off.



square



7 CHECK FOR SQUARE

For boxes and leg-rail assemblies, measure both inside diagonals. Keep the tape straight and in the same position. Again, move your clamp blocks slightly to get the assembly square. For panels, this check is unnecessary.



The Dry Run

The key to a calm and successful glue-up is rehearsing the whole thing dry. Clear off the bench, fetch the clamps, glue bottle and applicators, and get out your measuring tools. Fit the parts together, make clamping blocks, and clamp up. Use clamping blocks not just to protect the wood, but also to distribute the pressure. Cut them out of hardwood to fit the job—a random chunk of scrap wood won't direct the pressure controllably.

If there's anything wrong, now's the time to fix it. When you do add glue, it's the only remaining variable, and you'll have time to control it because you've already taken care of everything else. While your work is dry-clamped, make the following four checks:

Before—and after—you glue: (Photos 4 through 7):

1. Check that the joint has closed.
2. Check for alignment.
3. Check for twist.
4. Check for square.

Together these four checks help you take the time to get the glue-up right, without racing against the glue. It may take a bit of fiddling, but if you get it right dry, you'll be able to do the same wet.

Spreading Glue

Spread glue exactly like paint, laying down a smooth and uniform coating. Depending on the situation, you should coat one surface of the joint (Photo 8), or for sliding fit joints, coat both surfaces (Photo 9). With a direct interface, such as an edge-to-edge butt joint or when veneering, clamping pressure will transfer glue from one piece to the other. However,

with a sliding fit such as a mortise-and-tenon joint, there is no pressure and no glue transfer, so you've got to wet both surfaces with glue.

Everybody uses too much glue, and that means trouble. First, too much liquid makes the parts swim around. Second, regular yellow glue dries by evaporation, but thick drools of glue slow it down by trapping moisture in the glue line. Third, dripping glue makes a mess on the work and bench. The right amount squeezes out in tiny, little beads (Photo 10).

When there are more than two or three boards in the assembly, you'll avoid a lot of sliding around by gluing them one at a time. Let each glue line cure for an hour, then unclamp and add the next piece of wood.

Slipping boards are not an issue with leg-rail assemblies and other joints that slide together, but a good glue line still doesn't happen automatically. For best results, remove the bar clamp after a half-hour, and set a C-clamp across the joint so it squeezes the mortise cheeks against the faces of the tenon. **AW**

Ian Kirby makes furniture and teaches woodworking at his studios in Connecticut. He's currently writing a new series of woodworking handbooks for Cambium Press, (203) 426-6481.

SOURCES

Record bar clamps are available for \$26 to \$30, plus shipping and handling, from Grizzly Industrial, Inc., P.O. Box 2069, Bellingham, WA 98227; (800) 523-4777.



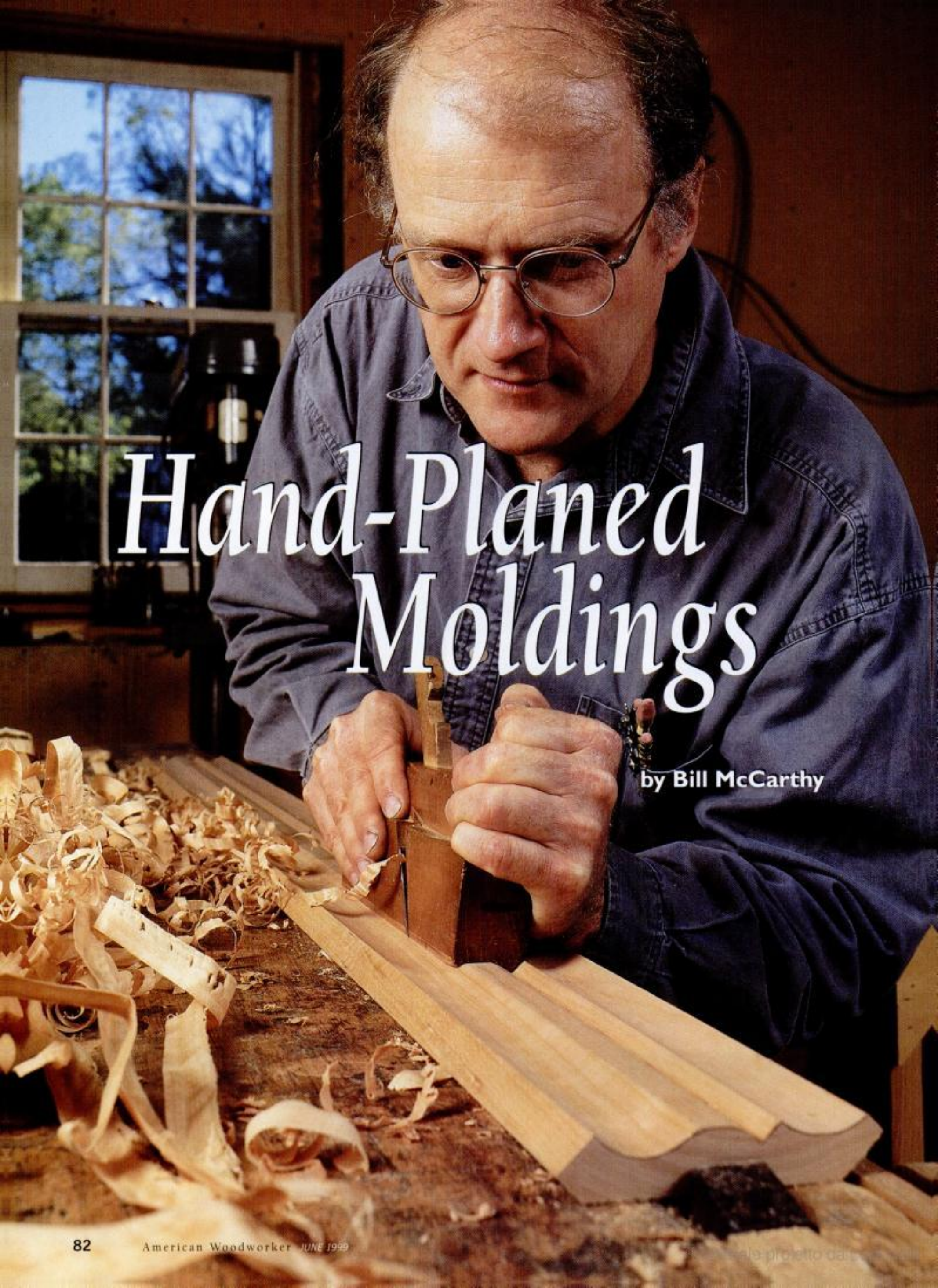
8 WET ONE SURFACE for edge joints and veneering, where the clamping pressure will transfer glue to the other surface. Nothing beats a disposable paint roller for applying the glue. Between glue-ups, seal the roller and tray inside a plastic freezer bag.



9 WET BOTH SURFACES of sliding-fit joints, like mortise-and-tenon and dovetails, because the glue won't transfer well during assembly. Paint all mating surfaces with glue, including end grain. A trimmed-down flux brush makes a good applicator. Keep it in a jar of water between uses.



10 THE RIGHT AMOUNT of glue will give you a thin line of squeeze-out at the joint. No dribbles, no drools, no mess.

A man with glasses and a blue shirt is focused on hand-planing a piece of wood. He is using a hand plane, and a large pile of wood shavings is visible on the left side of the workbench. The background shows a window with a view of trees outside.

Hand-Planed Moldings

by Bill McCarthy

Use a pair of planes to create custom profiles.

A woodworker who needs a small amount of hardwood molding for a furniture or cabinet project is often out of luck. Hardwood moldings are scarce at local home centers, and most commercial shops can't economically set up a molding machine for a short run. And the typical small-shop shaper can't produce moldings wider than about 3 in.

Fortunately, there's a way to make your own custom moldings using traditional molding planes. In this article, I'll show you how to tune up and use a hollow plane and a round plane—two of the most versatile molding planes. The hollow plane, with its concave sole, cuts a rounded shape (lead photo). The round plane has a convex sole and cuts a hollow in the workpiece. A pair of these planes with the same radius is commonly used to produce a true ogee—one whose curves mirror each other.

In this article, I'll show you how I make a 4 1/2-in.-wide crown molding using a set of complementary, 1-in.-radius planes. Once you get the hang of working with these time-honored tools, you'll be able to make a variety of moldings (see Fig. A).

Selecting and Tuning Up the Planes

Old hollow and round planes are often available at flea markets or from antique dealers for less than \$35 apiece. Look for a pair with matching radii. When selecting a plane, make sure it is in good overall condition. It should have no cracks in the plane body and no heavy rust or deep pitting on the iron.

You'll want to tune up each plane before using it. It's best to start with the round plane. Use a reliable straightedge to check the flatness of the sole along its length. If the sole is bowed, plane it straight using a block plane set for a light cut. Take a series of light, overlapping passes to shape the cross section of the sole to the desired radius (Photo 1). You can make a cardboard template to



1 PLANING THE PLANE. The bottom of an old plane often needs to be reshaped. I used a block plane to true up the bottom of this round plane before smoothing the contour with sandpaper.



2 SCRIBING A ROUND IRON. To transfer the shape of the sole to the plane iron, coat the iron with machinist's bluing, then scribe it with a knife.



3 HONING A HOLLOW IRON. After grinding the iron, I bring it to final shape using a modified "roughing" stone.

FIG. A CROWN MOLDING PROFILES

Here are a few crown molding profiles that you can make with a set of matched round and hollow molding planes. Design the profiles to approximately match the radius of your planes.

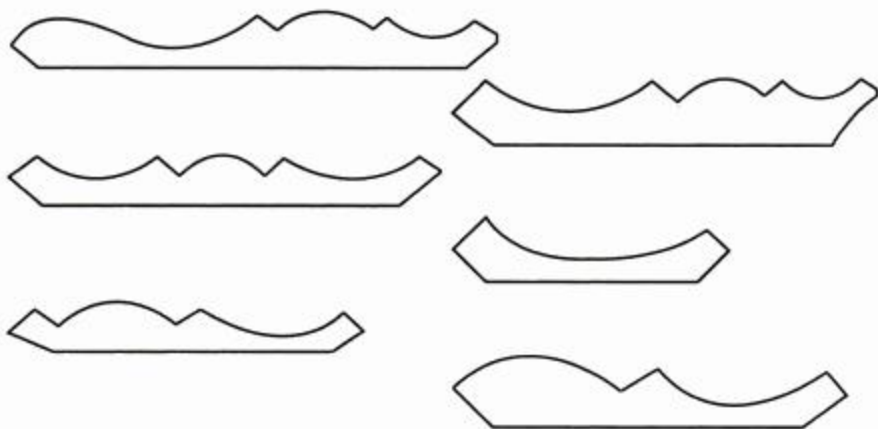
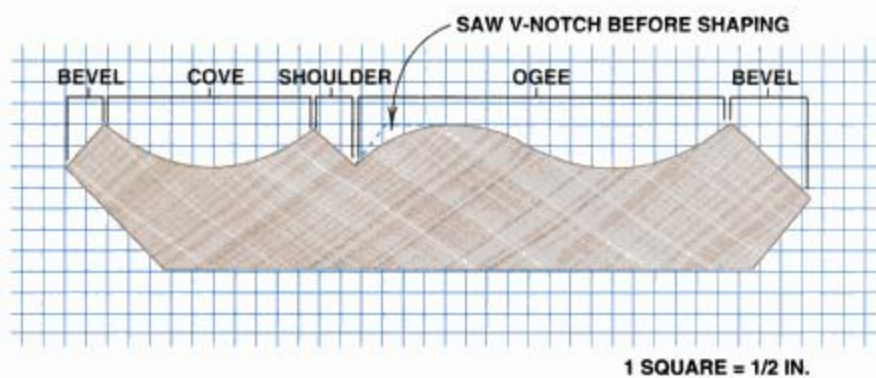


FIG. B OGEE CROWN MOLDING PROFILE



check the radius all along the sole. Finish up by smoothing and fairing the curve of the sole with sandpaper.

Next, check the shape of the iron's cutting edge. It should conform as closely as possible to the curvature of the plane's sole. If the curve is off, you'll need to reshape it. Begin by coating the back of the iron with machinist's layout bluing. (see *Sources*, p. 85). The bluing allows you to scribe a highly visible line into the iron. Insert the iron in the plane so its entire cutting edge projects about 1/16 in. Transfer the curvature of the sole onto the iron using a dull knife (Photo 2).

Grind the cutting edge down to your scribed line. I use a 60-grit white or pink grinding wheel. (see *Sources*, p. 85). Dip the iron in water frequently to prevent overheating. After grinding, hone the bevel and the back of the iron to

bring the cutter to a razor-sharp edge. Reassemble the plane, set it for a light cut, and test it on a piece of scrap. To adjust the iron for a deeper cut, tap it lightly downward with a hammer. To retract the iron slightly, tap on the rear of the plane body.

You can now use the tuned round plane to shape the sole of the hollow plane. Afterward, scribe the hollow's iron as you did the round plane's iron. I find that grinding a concave cutting edge is easier on a grinding wheel with a rounded edge (see *Shaping a Grinding Wheel*, p. 85).

I hone the iron (Photo 3) with a soft, aluminum oxide "roughing" stone (see *Sources*, p. 85). To hone a concave cutting edge, I grind off the stone's corners using a typical, vitrified, gray grinding wheel.

Making a Crown Molding

With your planes tuned up, you're ready to make some molding. Fig. B shows a nice molding profile that incorporates an ogee and a cove, with a shoulder separating them. To lay out the molding, first make a cardboard template of the profile. Lay out the profile on the end of a short length of 13/16-in.-thick by 4-1/2-in.-wide straight-grain softwood. You will use this piece for practice.

Before planing, you need to do a little tablesaw work: First, saw all the 45-degree bevels on the edges of the molding stock (Fig. B). Then, saw a 45-degree V-shaped notch in the face of the stock to create the shoulder. I use a jack plane to clean up any saw marks on the four edge bevels.

Begin shaping the molding by planing the concave half of the ogee with the round plane. Make sure you're working on a firm, flat surface. I clamp a 1-in.-thick wooden straightedge to the molding to guide my first few strokes. I plane to about 1/8-in. deep. After that, I remove the straightedge and let the hollow guide the plane.

Make each planing pass with a firm, steady stroke. Each complete pass should yield one continuous shaving. If you find yourself fighting the plane, retract the iron slightly. If the plane skips over the middle of the board, try shimming under the center of the molding to raise it a bit.

As I approach the final depth of cut, I roll the plane to one side or the other as necessary to widen the hollow and match the desired profile. The outside edge of the hollow should meet the sawn bevel in a sharp edge.

After completing the hollow, I use a rabbet plane to remove any saw marks on the edge of the molding's shoulder (Photo 4).

Next, clamp your straightedge to guide the first few passes on the molding's cove (Photo 5). Remove the straightedge as before and complete the cuts, again rolling the plane to one side or the other to create the desired profile. The cove should meet the bevel and shoulder in a sharp edge.



PLANING THE SHOULDER. A rabbet plane cleans up any saw marks left on the molding's shoulder.



STARTING STRAIGHT. Guide the first few hollowing passes with a wooden straightedge that's clamped along the workpiece.

The last step is to plane the convex section of the ogee using the hollow plane. The V-shaped ridge on the sole of the plane rides against the molding's shoulder to guide this cut.

Place the sole's ridge into the molding's V-shaped notch and make your first cut. For each subsequent cut, tilt the plane farther into the workpiece (see lead

photo). You're done when the ogee's curves meet in a smooth transition that matches your profile.

If you've done your work well, you should have a lovely molding that needs little or no sanding. **AW**

Bill McCarthy is the owner of Restoration Millwork in Pennsylvania.

SOURCES

White or pink grinding wheels, machinist's layout bluing, diamond dressers, and dressing sticks are available from Wholesale Tool, (800) 343-1008; (\$25 min. order). Pink grinding wheels, roughing stones, and machinist's layout bluing are available from MSC, (800) 645-7270; (\$25 min. order).

SHAPING A GRINDING WHEEL

The squared edge of a typical grinding wheel doesn't lend itself well to shaping the concave profiles you'll find on molding plane irons, carving tools, and turning gouges. To make grinding odd profiles much easier, it's a simple matter to reshape a wheel to suit the desired profile of the iron.

All you need is a "soft" grinding wheel and a tool to dress it. White or pink grinding wheels (see Sources, above right) have a softer bond than typical gray wheels and can easily be shaped with a dressing tool. I prefer 60-grit grinding wheels.

Dressing sticks are commonly available, and work fine for rounding over a grinding wheel. But I prefer using a diamond-tipped dresser. Don't panic; they only cost about \$6 (see Sources, above right). This dresser is simply a steel rod with an industrial diamond mounted on its end. It allows you to dress the edge of a grinding wheel to any shape you like.

When dressing a grinding wheel, adjust the grinder's rest about 1/2 in. below the center of the wheel (see photo, at right). Apply light pressure to the wheel and don't overheat the diamond. You can't cool it in water or it could break. Rotate the diamond occasionally to distribute wear.



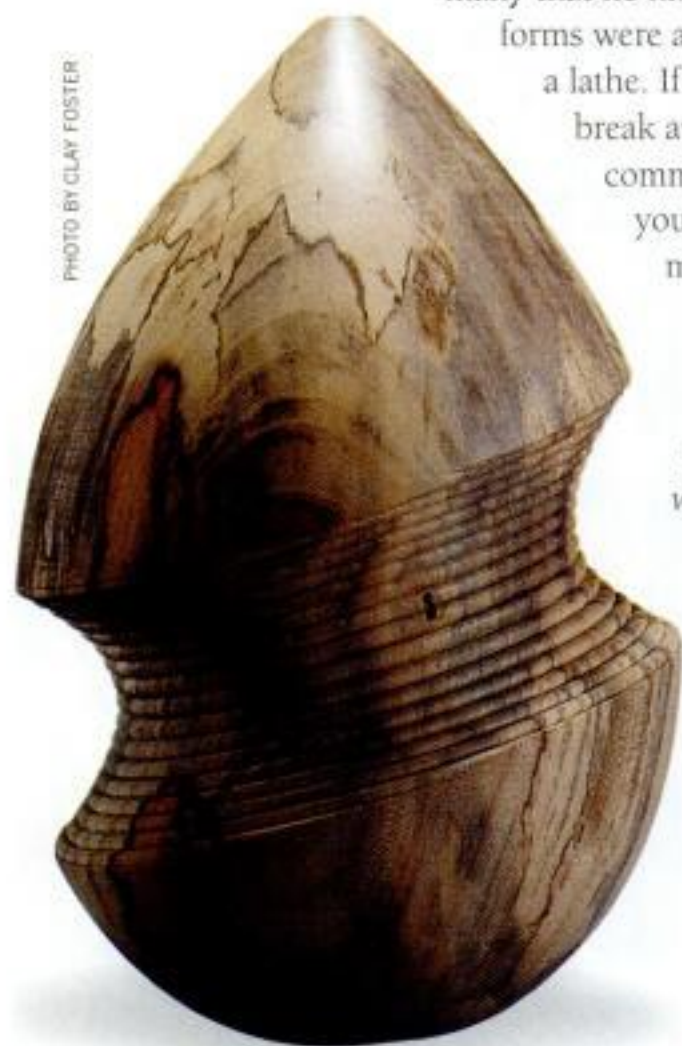
DRESSING A WHEEL. A diamond-point dresser will shape a soft grinding wheel to any profile you need for grinding concave plane irons.

Multi-axis Turning

“Multi-axis turning” is the fancy name for a very simple technique. You turn a shape on the lathe, then reattach the wood in a different spot, creating a second turning axis and thus an asymmetrical turning. Multi-axis turning has been practiced for 300 years, mainly for shaping the feet on cabriole legs. In the last 15 years, woodturners have experimented with it to produce some wildly imaginative forms. Some are faceplate-turned, some spindle-turned, some a combination of both. Some have two axes, and are only

slightly asymmetrical, some have so many that it's hard to believe the forms were actually turned on a lathe. If you're looking to break away from the commonplace with your turning, give multi-axis turning a try. **AW**

Objects for this month's Gallery were selected by Mark Sfirri.



Multiple-axis Vessel
Clay Foster
Hackberry
8-in. H x 6-in. D



Suspended Sphere
Todd Hoyer
Cedar, ink
20-in. H

Wheel of Fire
John Wooller
Jarrah Burl
43-in. H



PHOTO BY FOONS PHOTOGRAPHY

PHOTO BY TODD HOYER



Boxe
Jean Francois Escoulen
Pink Ivory
12-in. H

PHOTO BY DANIEL GUILLLOUX

Spider Table
Mark Sfirri
Sheoke (Lacewood)
and Curly Maple
26-in. H x 18-in. W x
12-in. D



PHOTO BY MARK SFIRRI



PHOTO BY MARK SFIRRI

Rejects from the Bat Factory
Mark Sfirri
Pink Ivory, Bubinga, Wenge, Shedua,
Figured Maple
33-in. L



PHOTO BY TIM BARWELL

Torso
Stony Lamar
Ash
18-in. H

PHOTO BY JUDY DITMER



Blue Egg Bowl
Betty J. Scarpino
Maple, milk paint
4-3/4-in. x 3-1/2 in.

New Products

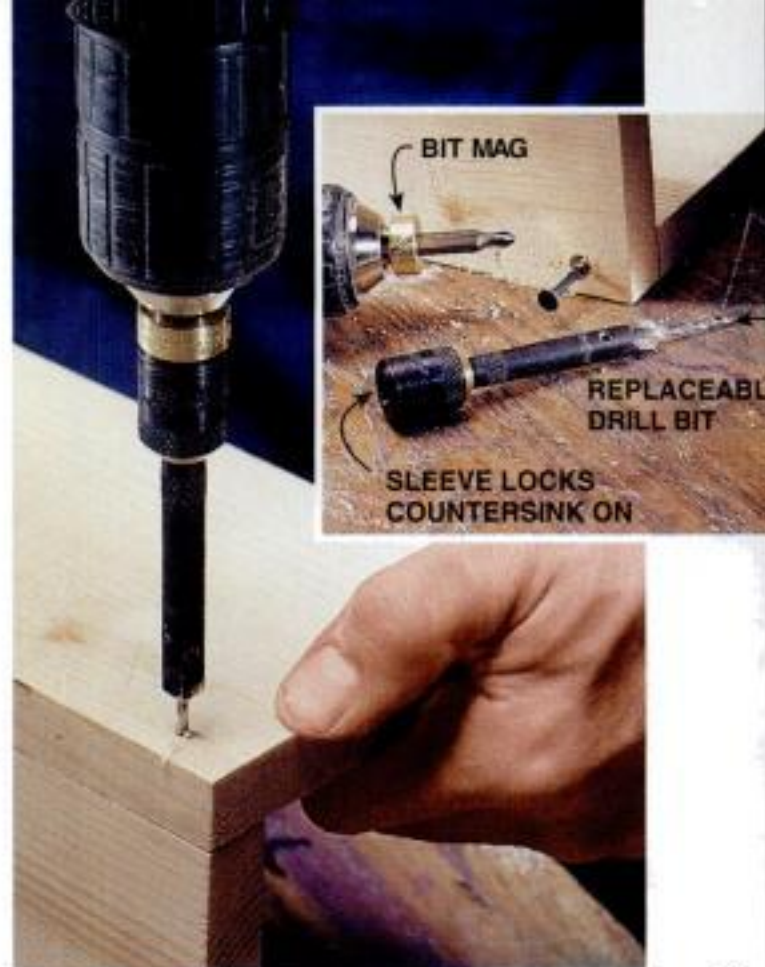


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Irregular shapes can be hard to hold, but Woodcraft's Pattern Makers vise can handle anything. You can angle the jaws, swivel the entire vise 360 degrees, and tilt it up 90 degrees. Four dogs hold round work, and the jaw pivots 30 degrees for tapered work.

Two possible drawbacks: You'll need to do some serious routing into your bench to mount the vise and there's no quick-action mechanism on the jaws. However, they're a small price for a vise with impressive flexibility.

Buy it for \$200 from Woodcraft (800) 225-1153; item #128748.



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The Jack Rabbit is available in three sizes, #6, #8, and #10, selling for \$20 to \$30. Get the Bit Mag for about \$15. Buy them from major mail-order supply houses like Woodworkers' Supply (800) 645-9292.

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One drawback: You need to turn the speed down to zero every time you stop the lathe, then dial back up through the speed range when you start back up. The 12-amp motor bogged down a little when shearing the outside of a 14-in. mahogany bowl. When I took it a little easier, the lathe worked fine. This lathe sells for \$420 at Sears.



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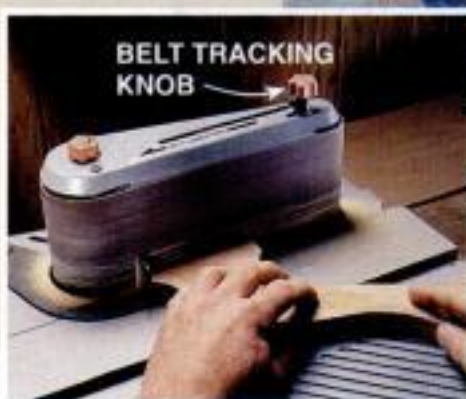
The poles secure to the ceiling, so you can draw the plastic up tight. After the room is erected and the plastic drawn tight, tuck it under the bottom of the poles so it's tight to the floor. These poles are a great way to isolate an area for finishing, separate your shop from your living space, or create an area for temporary heating.

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Carter's MiniMach



Carter's MiniMach uses a shop vacuum to hold itself to the benchtop and also to hold the workpiece in place.

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everything. If you're working on a lot of parts, this really speeds up the process. In addition, you don't have to worry about clamp marks.

The only assembly the MiniMach requires is screwing the gate valve and tapered hose adapter into the bottom of the device. Then you simply slip your shop

PROS

- + Good holding power
- + No need for awkward clamping
- + Speeds up repetitive operations

CONS

- Must listen to noise of shop vacuum
- Bench and material must be very flat

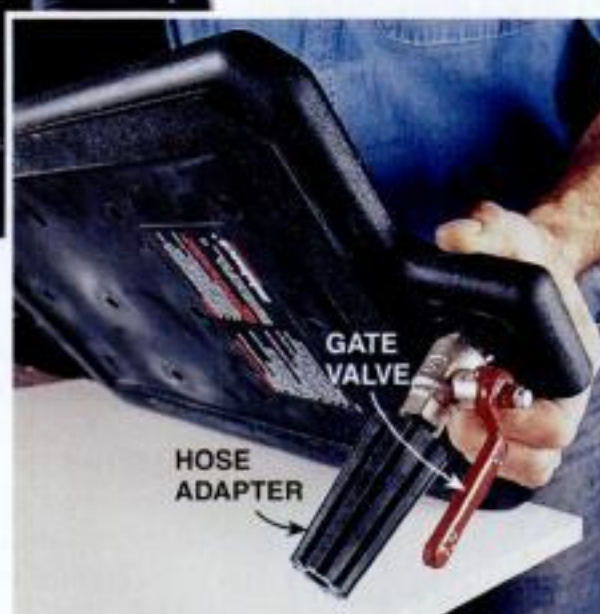
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vacuum hose onto the taper, turn on the vacuum, and you're in business. Suction is turned on and off by the gate valve. Set the MiniMach on a flat surface and open the gate valve. This attaches the device to your benchtop. When you set your workpiece onto the top, the spring-loaded ball valves open. The pressure of your workpiece will open only those valves beneath it, so that suction is applied only to the area directly under your workpiece.

You must keep a few things in mind in order for all of this to work. The bench you are seating the MiniMach to must be fairly flat. The gaskets only

make up for small irregularities. When I used the device on my melamine-topped workbench, it didn't move a bit. If your



The tapered adapter fits hoses from 1-in. to 1-3/8-in. dia. Vented ribs allow continuous airflow so the vacuum doesn't overheat.

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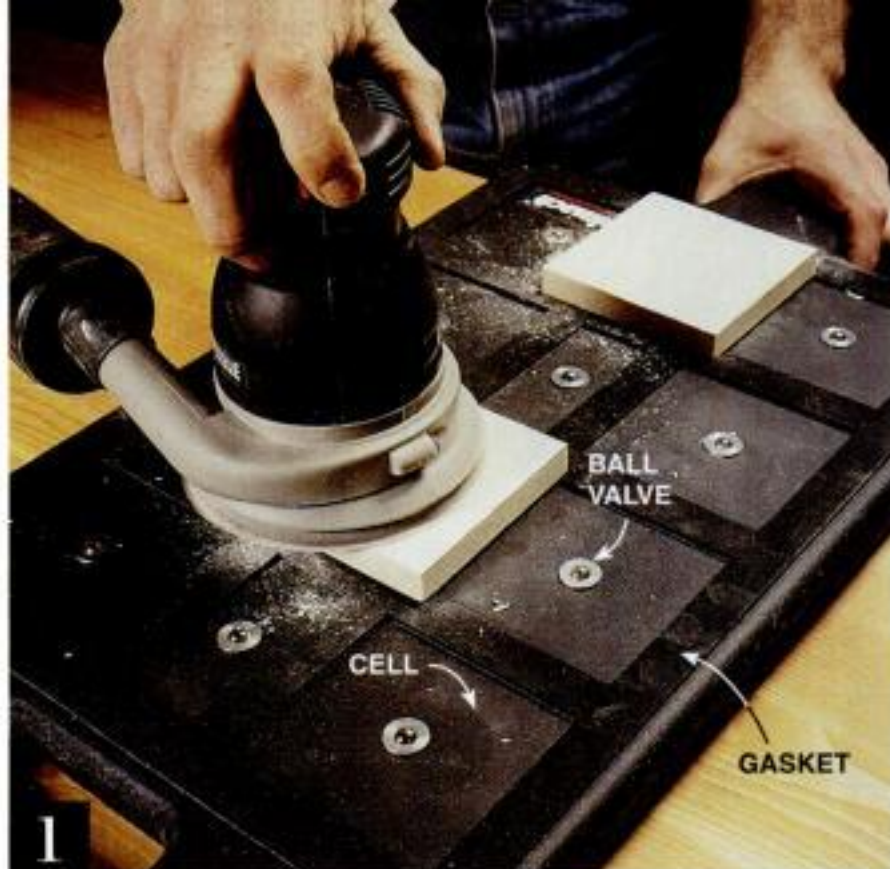
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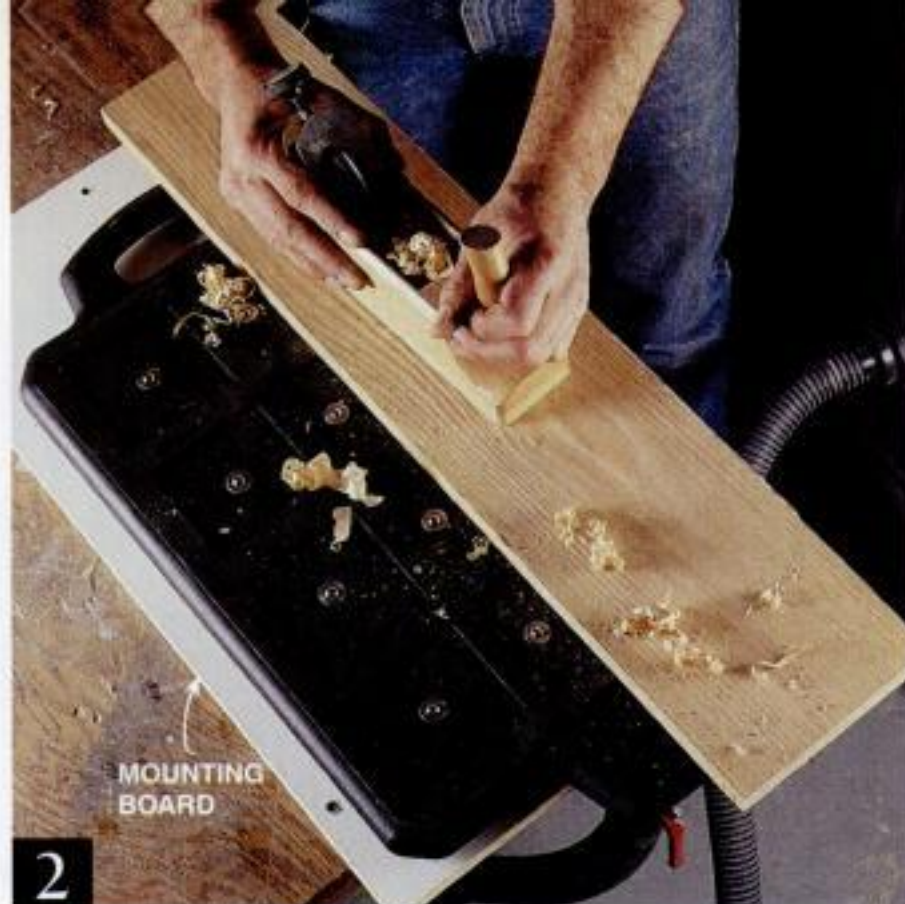
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1 The work is held on gasketed cells, each with a ball valve in the middle. Each spring-loaded valve is normally closed, but the weight of a piece of wood opens it. Thus only the cells under your work are under vacuum pressure.



2 The fixture holds very tightly, so you can do hand planing or belt sanding without slipping. If your bench isn't flat, attach a flat mounting board.

bench isn't flat, make up a mounting board. Your workpiece must also be flat, and can't be rough sawn. Your workpiece must also cover one or more cells. The smallest cell is 2-1/2 by 4 in., so even the smallest of pieces will cover a cell.

I used the MiniMach to rigidly hold workpieces for planing, belt sanding, and routing. Even template routing worked with no slipping. I used pieces as small as 3 by 4 in. and as large as 48 by 48 in. When working on pieces larger than the MiniMach itself (13 by 24 in.), though, you need to provide a spacer on the bench to help support the end. Solid wood and manufactured materials were held equally well, as long as the material was flat.

The MiniMach requires the high static pressure found in shop vacuums, and will not work with a dust collector. The manufacturer recommends a vacuum with a 1.5 hp or greater motor. The tapered adapter fits hoses with an internal diameter of 1 to 1-3/8 in. Vents in the adapter prevent the shop vacuum from being completely choked off. This is necessary so your vacuum won't overheat. Even with the vents, the manufacturer recommends you use the device in 30-minute stretches, allowing the vacuum to cool off for 10 minutes between uses.

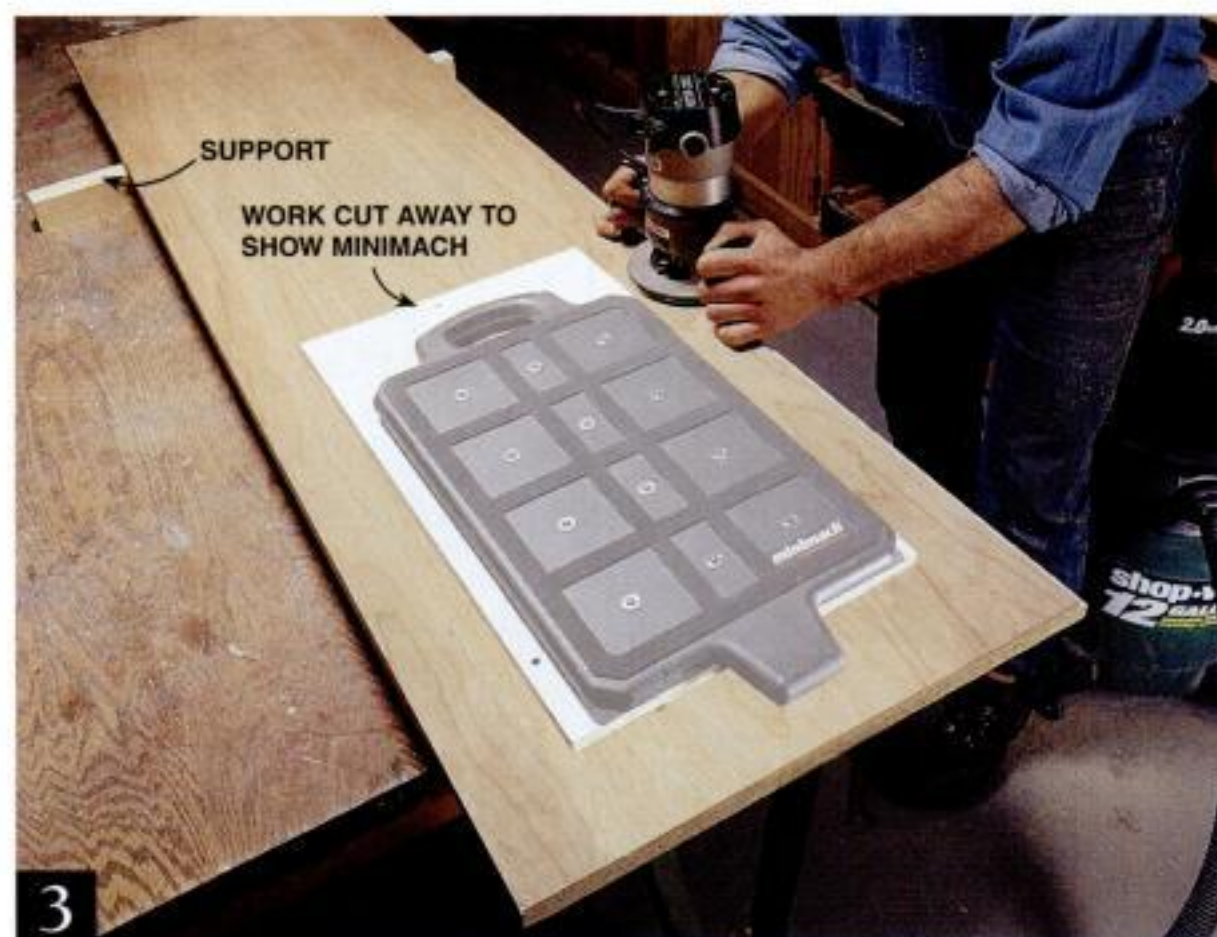
Don't own a shop vacuum? Another way you can create a suitable vacuum for the MiniMach is by using a venturi or

rotary-vane pump. The engineers at Carter can help you with the specs to set these up.

One drawback to the MiniMach is having to listen to your shop vacuum. If you're routing, you're probably wearing hearing protection already. But if I'm hand

planing, the last thing I want is the noise of my power tools.

As you work with the MiniMach, be careful with the gaskets. If they tear, you won't have the seal you need. Replacement gasket material is provided in case you need to make a patch. **AW**



3 Longer pieces require a support block to prevent twisting off the workpiece.

BOTTOM LINE: The MiniMach is a simple and effective tool for vacuum clamping. It's useful for machining multiple parts, like routing a whole kitchen full of door and drawer fronts, without wasting time moving clamps. It works.

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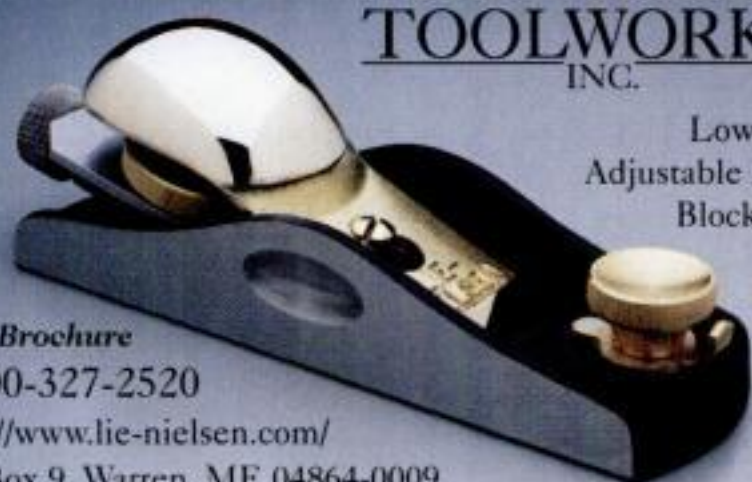
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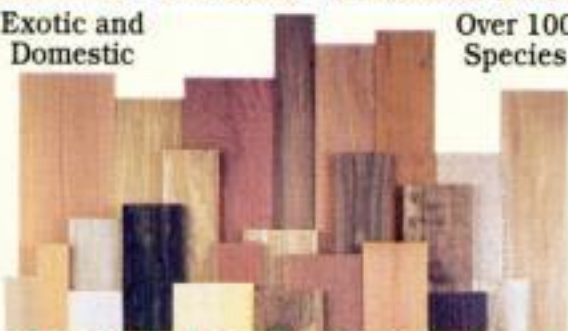
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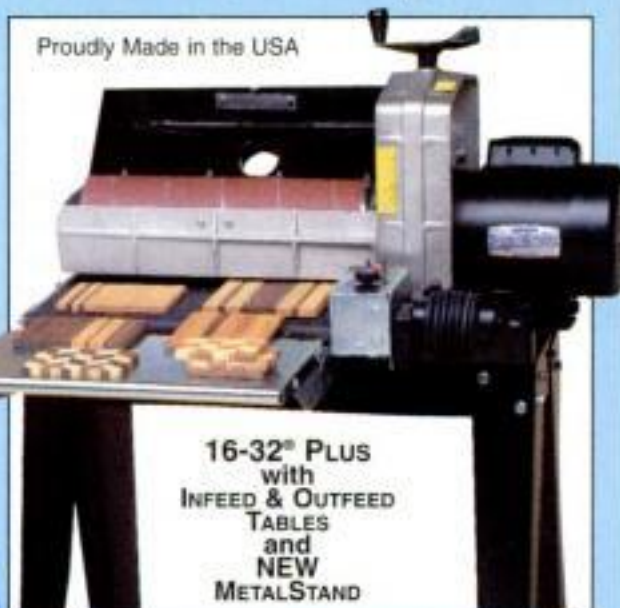
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Touch up: Repairing a Damaged Finish

Hide blemishes without refinishing.



1 Oh, no! When a finish gets dinged, don't panic. Damage like this can be touched up.

Touch up refers to techniques used to repair and disguise damage on already finished wood—without refinishing. Whether you've rubbed through a finish, discovered glue spots or putty patches that stick out, or been faced with damage to the wood itself, knowing how to touch them up can save the day. Read on to discover the tools and techniques needed to masterfully disguise dings, dents and other blemishes.

Touch-up Tools

I'd like to tell you that you can just buy two or three felt-tip pens and a bunch of spray cans. Sadly, that's not the case. To accurately reproduce the wide range of colors that appear in finished wood, you'll have to mix them yourself, like an artist.

To do this you'll need to accumulate a variety of touch-up tools (Fig. A) and learn how to use them. You'll also need good lighting. Ideally, you should perform touch-up work in the same lighting (fluorescent, incandescent, direct, indirect, etc.) under which the piece will be viewed. The next best choice is daylight, or artificial, full-spectrum light.

Repair the Damage

If you are touching up a light sand-through or glue spot where both back-

ground color and grain are still intact, you can skip to the section called "Adjust the Color," on p. 100.

Auto body filler is well suited for use in wood repairs. It is a catalyzed, high-strength adhesive that cures fast, smooths well and takes a finish. Drop it into the center of the damaged area with a palette knife and work it out to the edges to ensure a good bond (Photo 2). Add more to the center until the patch is over-filled. When the filler has started to harden, but before it has completely cured, shave it flat to the surface with a sharp chisel (Photo 3). If you notice any voids, simply add more filler and shave it down. After the filler has cured, sand it smooth with fine sandpaper, and you're ready to begin the touch-up process.

Wood putty can also be used for repairs, just be sure it is one or two shades lighter than the lightest color you can see in the wood. It's quite difficult to hide a darker patch—it always shows up as a shadow.

Seal First, Then Color

As a first step, and again in between each layer of color, seal the touch-up area with a bit of clear finish. This shows you the true color of the surface under a finish so you can match the touch up correctly. It also provides a base for each layer of color. I like to use thin, dewaxed shellac for the sealer, applied with a small brush, a cotton cloth formed into a pad, or a spray can. Let the sealer dry at least 10 minutes before you continue.



FIG. A TOUCH-UP TOOLS

This versatile touch-up kit includes the usual tools for patching dings as well as those for disguising the patch: shelf-stable powdered pigments; a mixing tray; fresh dewaxed shellac; one or more very fine, red sable brushes; graining pens; and furniture touch-up markers.

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Just Finishing



2

Fill the hole.

Use a palette knife to drop auto body or wood filler into the center of the damaged area, then work it firmly to the edges.



3

Pare the patch flush.

A sharp chisel pares the semi-hardened body filler flush with the surface.



4

Add background color.

Brush a thin, but opaque mix of powdered pigments and shellac to color the patch.

After sealing, check the background color. If it's correct, go directly to the graining step. If the patch is too light, mix a color one shade lighter than the lightest background color in the area around the patch. Use a brush to create a small puddle of shellac on the mixing tray. Dip the brush into whichever pigments you need and add them to the shellac until you have a thin but opaque "paint," thinning it with alcohol as needed. If it is too thick it will build up a "scab" of color. Apply the pigment and shellac mixture with a small brush, taking care not to make the touch up larger than it needs to be (Photo 4).

Add the Grain Lines

As before, seal the color coat and let the shellac dry. Simply put, adding grain lines is painting a picture of the wood onto the patch. Using your finest brush, mix a dark color to match the grain of the wood and copy the missing grain pattern (Photo 5). A good, red sable brush that comes to a fine, sharp point allows you to control the color in thin lines. Use short, careful strokes. If you are not comfortable with a brush,

most suppliers also sell fine-point felt-tip markers specifically for graining.

Work on the graining until you are satisfied with it. If it starts to get away from you, "erase" it with some 0000 steel wool and start over. You can do this because you sealed the previous

color coat. When you are satisfied with them, seal over the grain lines before continuing. Note: Even though you have not changed the background color, adding the grain lines makes the overall patch appear darker. That's why you start with a background a shade lighter.



5

Add grain lines.

Connect the wood's grain across the patch with a good, sharp-pointed brush.

Adjust the Color

Take a careful look at the spot, stepping back and viewing it from several angles. If the grain lines look right, but the patch is still too light overall, add a thin translucent layer of color to blend the spot. When you're touching up a glue spot or an area sanded through that still retains the grain lines and background color, this will be the only step you need to take.

Mix a small amount of pigment into a puddle of shellac—just enough to tint it but not enough to make it opaque. Imagine that this "wash" is a translucent, colored film that you will lay on top of the patch. This wash should be a weak but fairly dark tint, since you are blending the color already there. For that reason, you should be able to add thin coats over the grain lines as well without making them lighter or

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Just Finishing

muddier. You can also use touch-up markers, or even a mixture of alcohol-soluble dye and shellac instead of pigment. Take it slow on this step. It is easy to go too dark and undo all your fine artistic work.

When the touch up is virtually invisible, seal it again with several coats of shellac. Let the touched-up area dry overnight if you plan to add another type of finish. Make sure you have enough shellac over the last color coat to allow you to rub out the area to match the sheen of the rest of the piece (Photo 6).

One final comment: The object of touch up is to fool the eye by camouflaging the repaired area. The truth is you will always be able to spot your own touch up, no matter how good it is, but those who don't know it's there will never see it. **AW**



6 Voilà!

Fine-tune the color match, build the finish and rub out the sheen to match the surrounding area.

SOURCES

Homestead Finishing Products offers a complete touch-up kit including a box, 18 colored powders, and a red sable brush for \$53 and a 12 color kit without brush for \$35. They also offer several grades of dewaxed shellac flakes. 1935 W. 96th St., Unit Q, Cleveland, OH 44102; (216) 631-5309; e-mail: jbjewitt@gwis.com

Mohawk carries all of the components you'll need to create your own kit: powders, shellac, graining and touch-up pens, and brushes; (518) 843-1380.

Red Sable touch up brushes (sizes 0, 1, 2, and 3) are available at any artist's supply store.

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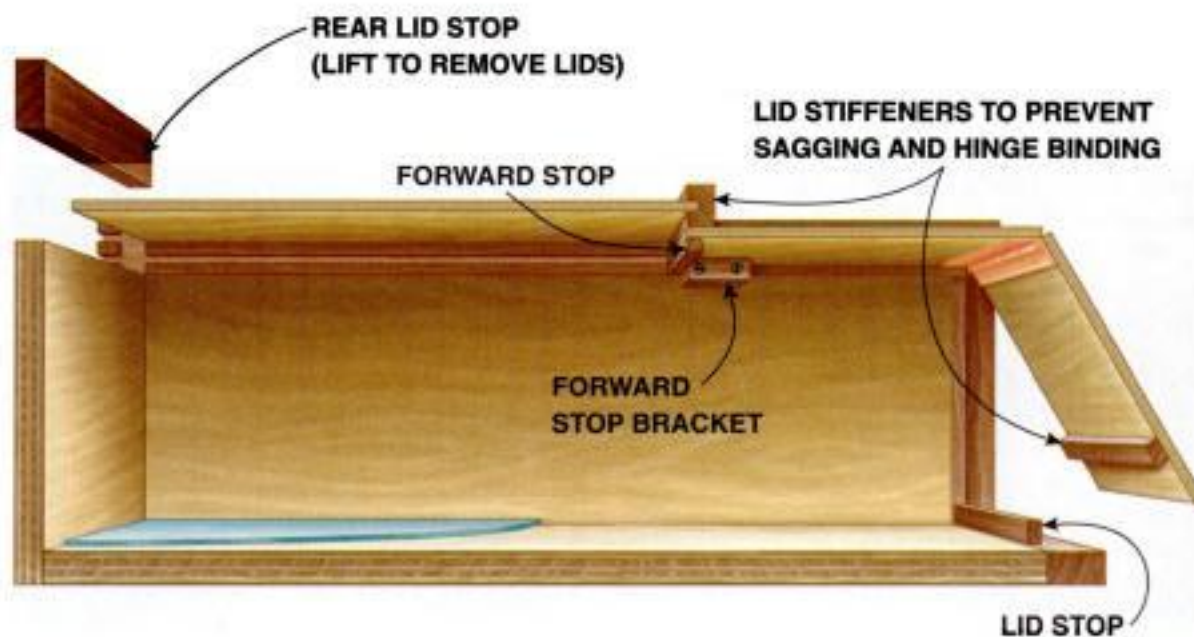


Dust-free, convenient tool storage is always a problem in a wood-working shop—especially a small one. This storage box for hand planes can be kept under a workbench where normal hinged lids wouldn't work.

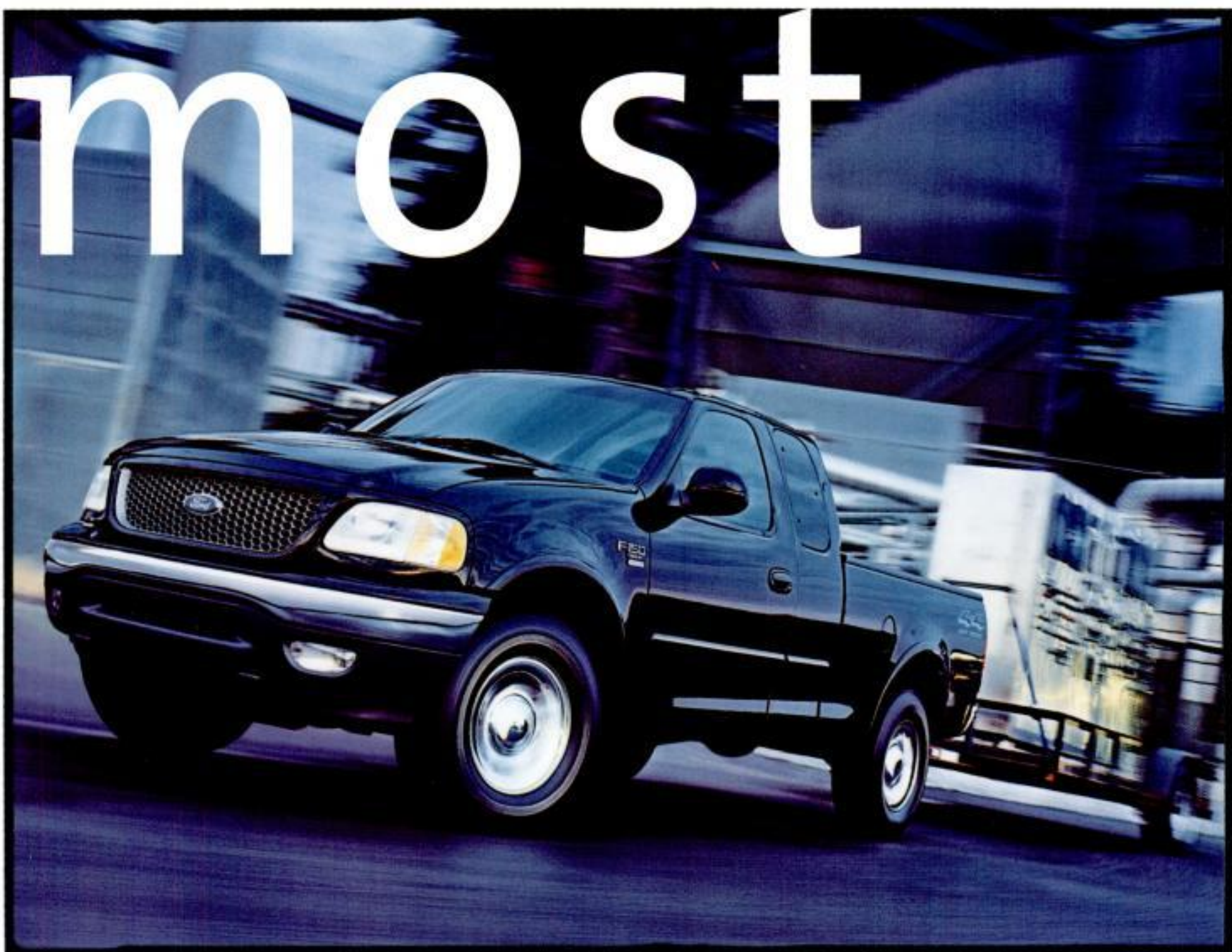
To open the chest, the main lid lifts up at the front and slides back in a set of dados. Both parts of the lid can slide out the back and be removed.

To protect the soles and irons of the planes, the chest can be lined with laminated vinyl sheeting. This material is used on drafting tables, is resilient to cuts and has self-healing properties. It is available at drafting supply stores or contact Engineering Repro Systems at (800) 537-3776; www.ersdigital.com. Small wooden dividers keep planes from banging into one another. **AW**

The plans and concepts for this Shop Solution were submitted by William White of Williston, Vermont.



If you have a great shop solution, send it to us with a sketch or photo and a brief explanation. We pay \$200 for each one we print. Send to: **Shop Solutions, American Woodworker**, 2915 Commers Drive, Suite 700, Eagan, MN 55121. Submissions can't be returned and become our property upon acceptance and payment.



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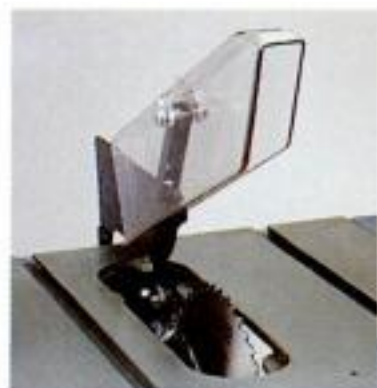


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