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#81
August 2000

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WOOD BEAUTIFUL®

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AMERICAN WOODWORKER®

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be removed,
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CLASSIFIED ADVERTISING **The McNeill Group, Inc. (215) 321-9662**

PUBLISHED BY HOME SERVICE PUBLICATIONS, INC.,
a subsidiary of the Reader's Digest Association, Inc.

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American Woodworker® (ISSN 1074-9152; USPS 0738-710) is published seven times a year in February, April, June, August, October, November, and December by Home Service Publications, Inc., 2915 Commers Drive, Suite 700, Eagan, MN 55121. Periodicals postage paid at New York, NY and additional mailing offices. Postmaster: Send change of address notice to American Woodworker®, P.O. Box 2134, Harlan, IA 51593-0323. Subscription rates: U.S. one-year, \$23.88; two-year, \$43. Single-copy, \$4.95. Canada one-year, \$31.88; two-year, \$58 (Canadian funds). GST # R122988611. Foreign surface one-year, \$35; two-year, \$65 (U.S. funds). Foreign air one-year, \$42; two-year, \$80 (U.S. funds). U.S. newsstand distribution by Hearst Distribution Group, New York, NY 10019. In Canada: Postage paid at Gateway, Mississauga, Ontario; CPM# 1447866. Send returns and address changes to American Woodworker®, P.O. Box 2134, Harlan, IA, USA 51593-0323. Printed in USA. © 2000 Home Service Publications, Inc. All rights reserved.

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Subscription inquiries

American Woodworker, Subscriber Service Dept.,
P.O. Box 2134, Harlan, IA 51593-0323; (800) 666-3111; e-mail: AWWcustserv@cdsfulfillment.com

Back issues

Some are available for \$5 each. Copies of past articles: photocopies are available for \$3 each. For either, write or call: American Woodworker Reprint Center, Box 83695, Stillwater, MN 55083-0695; (715) 247-5060, 8 AM to 5 PM CST, Mon. through Fri.

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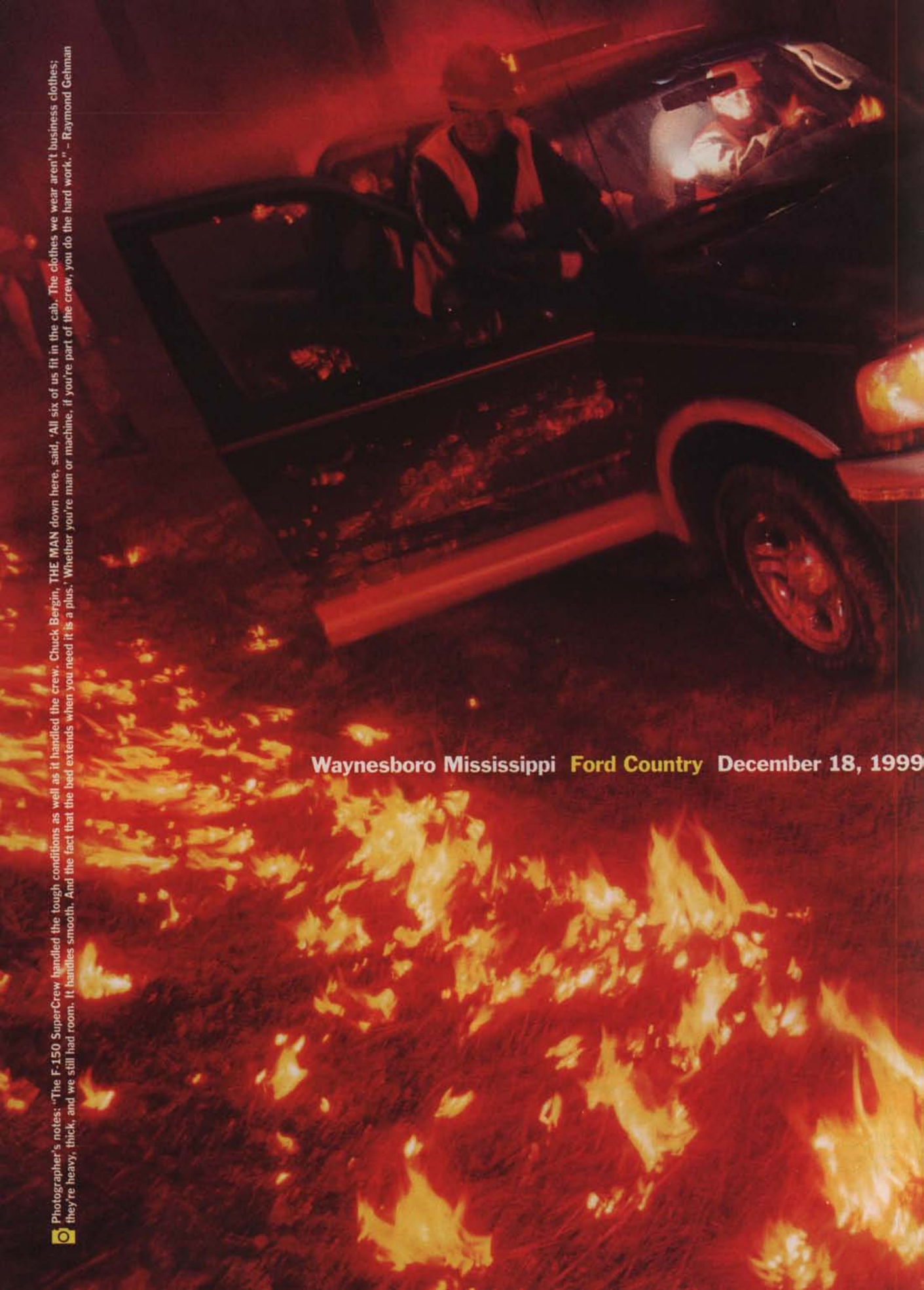


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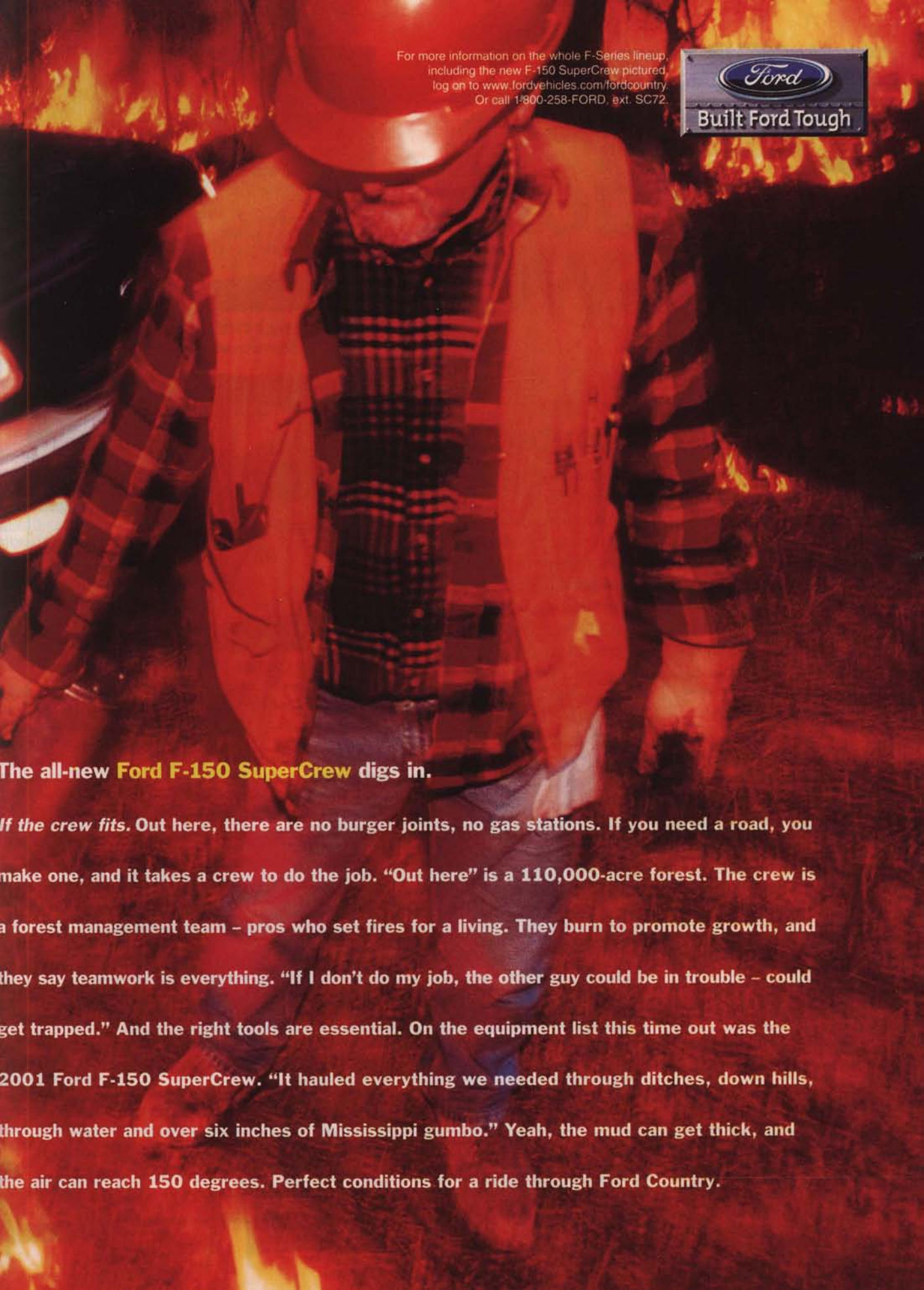


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Photographer's notes: "The F-150 SuperCrew handled the tough conditions as well as it handled the crew. Chuck Bergin, THE MAN down here, said, 'All six of us fit in the cab. The clothes we wear aren't business clothes; they're heavy, thick, and we still had room. It handles smooth. And the fact that the bed extends when you need it is a plus.' Whether you're man or machine, if you're part of the crew, you do the hard work." - Raymond Gehman



Waynesboro Mississippi Ford Country December 18, 1999



For more information on the whole F-Series lineup,
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The all-new **Ford F-150 SuperCrew** digs in.

If the crew fits. Out here, there are no burger joints, no gas stations. If you need a road, you make one, and it takes a crew to do the job. "Out here" is a 110,000-acre forest. The crew is a forest management team – pros who set fires for a living. They burn to promote growth, and they say teamwork is everything. "If I don't do my job, the other guy could be in trouble – could get trapped." And the right tools are essential. On the equipment list this time out was the 2001 Ford F-150 SuperCrew. "It hauled everything we needed through ditches, down hills, through water and over six inches of Mississippi gumbo." Yeah, the mud can get thick, and the air can reach 150 degrees. Perfect conditions for a ride through Ford Country.

Question & Answer

Jointing Thick Wood with a Router

Q. I have a very small shop and don't have the space for large machines like jointers and planers. I need to make thick table legs from three 3/4-in. boards that I glued together. I think I can joint the edges with my router but I'm not sure how. Any ideas?

Allen Collera
Raymond, WA

A. You're in luck. You can do a first-class jointing job with your router, a straightedge and two router bits.

On one face, mark the line to where you want to joint. Clamp a straightedge (1/4-in. tempered hardboard works well) right on the line. Then put a top-bearing,

flush-trim bit in your router—it's a straight bit with a bearing *above* the cutter. These bits come in different diameters and lengths but a larger diameter bit produces a smoother cut. Now extend the bit so the bearing rides against the straightedge. Make freehand passes on your leg, cutting no more than a third of the bit's diameter per pass. Continue until the bearing rides on the hardboard.

Remove the top-bearing bit and put in a bottom-bearing, flush-trim bit—this time the bearing is *below* the cutter. Flip the leg over and extend the bit out of the router until the bearing rides completely against the previously cut surface. Make passes to remove the remaining wood. You'll end up with a cleanly jointed surface.

Decay-Resistant Oak?

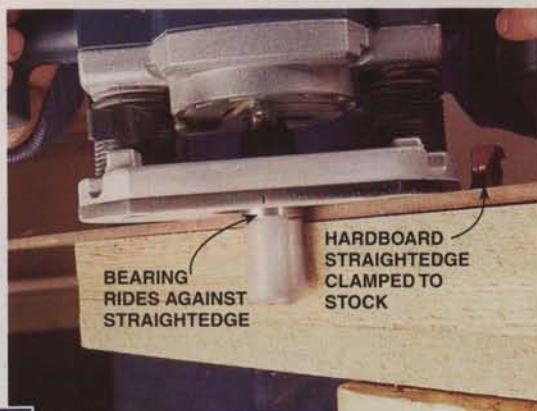
Q. I have leftover red oak and I want to use it to build some patio furniture. I've heard that red oak isn't a good choice for outdoor projects, but I'd still like to use oak. Should I switch to white oak?

Greg Byrne
Menomonee Falls, WI

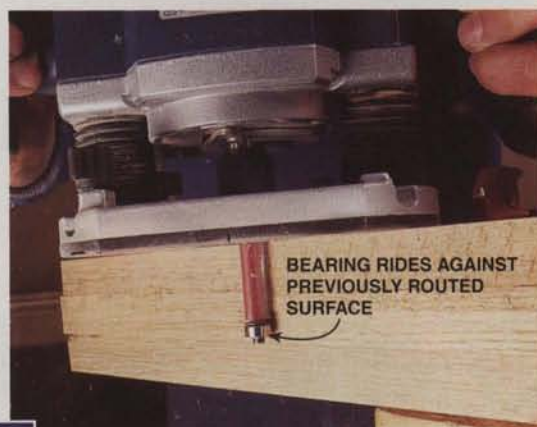
A. You're right. Red oak is nowhere near as decay resistant as white oak. Although many people will say that red oak "wicks" water up into its cells, causing it to rot, researchers say a far more important reason is that the cellular chemistry of red oak is more attractive to the decay producing fungi.

Here's how decay works: Fungus

spores (microscopic seeds) are carried by the wind and rain, and eventually end up on all open wood surfaces. Given enough water, the spores "sprout," grow and reproduce inside the wood and digest the cellulose or lignin in the wood for food. The cellulose in white oak isn't very "tasty" to the fungus, hence, it's a more decay-resistant wood.



1 JOINT HALF THE LEG with a straightedge and top-bearing, flush-trim bit.



2 CLEAN UP THE REST with a bottom-bearing, flush-trim bit after removing the straightedge and flipping over the leg.

Sources

Woodworker's Supply, (800) 645-9292
Top-bearing, flush-trim bit, 1/2-in. shank, 1-1/4-in. dia., 1-1/2-in. long, #50126, \$25.
Bottom-bearing, flush-trim bit, 1/2-in. shank, 1/2-in. dia., 1-in. long, #42110, \$15.

Ask Us

If you have a question you'd like answered, send it to us at: **Question & Answer, American Woodworker, 2915 Commers Drive, Suite 700, Eagan, MN 55121.** Sorry, but the volume of mail prevents us from answering each question individually.

our
NEW
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Staplers from
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If there is room for improvement, we can't find it.

Every square inch of Porter-Cable's new line of finishing nailers and staplers has been comprehensively redesigned. Each lightweight model includes so many new features, you'll be astonished at how all the innovations fit so securely in the palm of your hand.

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Featured on all brad nailer models only requires a single touch to open the magazine and a gentle push to close. Simplicity of design lets you do your job more quickly and without added hassle.

The Soft Touch Rubber-Coated Magazine End Cap

(Featured on all brad nailers) enables smooth, quick reload. This area also features a convenient storage compartment for the non-marring rubber tip.

The Easy-Load Magazine Unit

Designed for quick access to brads or staples, depending on which of the four new models you choose. This feature allows for a fast reload so you can get back to work.

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The Side-Mounted Quick Release Mechanism ensures expedient removal of infrequent jammed fasteners without compromising your view of the wood surface. We also included a rubber tip on the foot to prevent any marring of the wood surface.

The 360° Rotating Adjustable Exhaust Port gives the operator complete command over the direction of the air exhaust. Whether the tool is positioned overhead, below, or to the side, the port can always face the opposite direction. When it comes to woodworking, we know how important the details are.

The Powerful New Motor features a bored out cylinder that dramatically increases the performance of the tool. This motor equips every new nailer and stapler with 20% more power than previous models. The extra juice lets operators drive consistently throughout the workday, from the first nail to the thousandth.

The Ergonomically Sculpted Housing sports a series of contours that effortlessly align with the shape and movement of your hand. From the first moment of contact through continuous hours of use, the tool will feel like a natural extension of your arm. Each model is also specially balanced for even weight distribution when held upright or at a variety of angles for easy handling.

The Slender Nose Configuration deftly grants access to corners that previously may have proved to be a hard fit.

The streamlined design with the flattened, unobtrusive top side also offers the operator a clear line of sight to the work area. This way, you can focus on what matters most.

To Find Out More, visit your local Porter-Cable retailer. For a complete list of retailers, or for a free catalog, go on-line to www.porter-cable.com. We've updated our website to include everything from the latest news at our headquarters in Jackson, Tennessee, to direct links to retailers nationwide. To locate the dealer nearest you, call 1-800-487-8665. (In Canada, call 519-836-2840.)

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Restrictive Fire



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Length: 3/4" - 2"
Restrictive Fire



NS100A
18 Gauge
1/4" Crown Stapler
Length: 1/2" - 1"
Restrictive Fire



NS150A
18 Gauge
1/4" Crown Stapler
Length: 1/2" - 1 1/2"
Bottom Fire

Installing Threaded Inserts

Q. I made a jig that needed threaded inserts but I had one heck of a time installing them by hand. They went in cockeyed and I trashed their slots. What am I doing wrong?

Dean Ensrud
Winter Haven, FL

A. The most common kind of threaded insert is the straight brass barrel with thin outside threads and a single slot. A better one has wide threads, a hex wrench slot and is tapered to guide into the hole straighter (see Sources, below right). The most foolproof way to install both threaded inserts is to use an unplugged drill press and a bolt to support the insert. The drill press keeps the insert square to your board.



Here's how to install them:

1. Drill a hole of the recommended size (see package) into your piece of wood.
2. Unplug your drill press.
3. Cut off the head of a bolt with the same thread as the insert and grip it in your chuck.
4. Spin a nut, washer and insert onto the bolt. Turn the insert and the nut together, as tight as you can, by hand.
5. Center the hole directly under the insert and clamp the piece down to the drill press table. Advance the insert into the hole until it just contacts. Turn the chuck slowly, by hand, to advance the insert into the wood. Keep turning the chuck until the insert is fully engaged.

6. Back off the nut using a wrench. Reverse the spin of the chuck. The bolt will spin right out. The top of the inset may be a bit proud of the face. You can drive it below with a hex wrench or use a fine file to level it off.

If you don't have a drill press, don't worry, you can turn the inserts in by hand. Getting them started is the hard part, so be sure to use the tapered style insert. Drive in the insert using a hex wrench. Check with a small square to make sure it's going in straight.

Sources

Rockler Woodworking and Hardware, (877) ROCKLER; Hex-drive threaded inserts, 1/4-in.-20 (8 per pack), #31872, \$3.39; 5/16-in.-18, (8 per pack), #31880, \$3.39.

Dado Blade Sizes

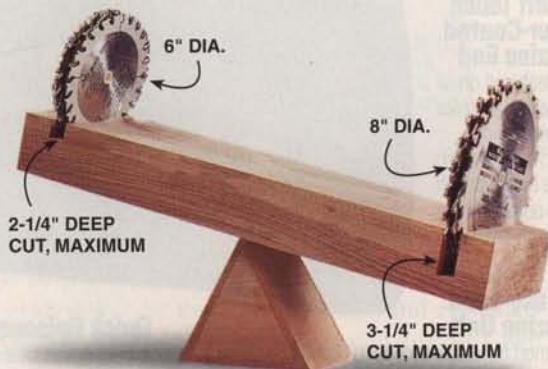
Q. I've been making dados with a wobble-type dado blade in my contractor's saw, but I can't get flat-bottom slots. I want to switch to stack-type dado blades. Should I get a 6-in. or 8-in. set?

Henry Hulben
Lubbock, TX

A. You should buy a 6-in. dado blade set to use in a contractor's

saw. An 8-in. blade weighs twice as much as a 6-in. blade so your saw motor has to work harder just to spin the larger blade set. Also, the amount of power needed to remove the wood in deeper slots is greater; the farther the teeth are from the arbor shaft, the more torque is needed to push the teeth through the board. Together, these power requirements tax your contractor saw's motor.

Your contractor saw's motor, arbor shaft, bearings and trunion were designed to spin a certain mass. The heavier 8-in. dado set puts extra stress on these parts, particularly the



bearings, shortening the life of the saw. In general, 1-1/2-hp contractor saws should use 6-in. dado sets. Three- to 5-hp cabinet saws can handle either the 6- or 8-in. sets. **AW**

Workshop Tips



Adjustable Curves

I'm not a fan of a large curve with a double-headed over-the-shoulder strap. In fact, I use a towel that can be adjusted to any curve I need to bend the job with my hands and then the curve will be perfect in my mind. This didn't work very well. The solution came to me in the bathroom when I looked up and saw that little chain hanging from the ceiling light.

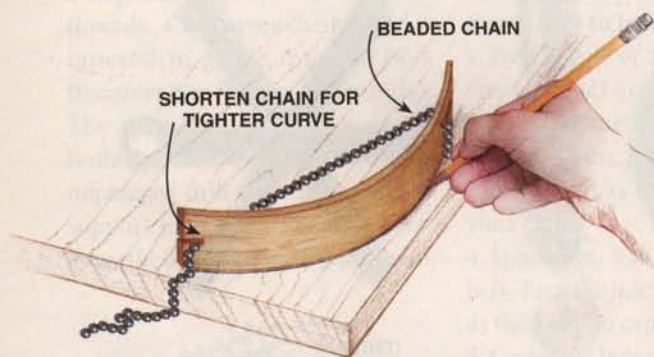
That's when I had the idea. I used a 1/4-in. dia. 1-1/2-in. wide and 28-in. long in the middle of each end I cut a 1/2-in. long slot in the middle. I slipped in the end of a 40-in. long barbed chain (available at most hardware stores) through one slot. While holding the free end, I pulled and pulled on the chain. I cut the chain at the end of the slot and the curve was perfect. I can make up-



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WorkShop Tips

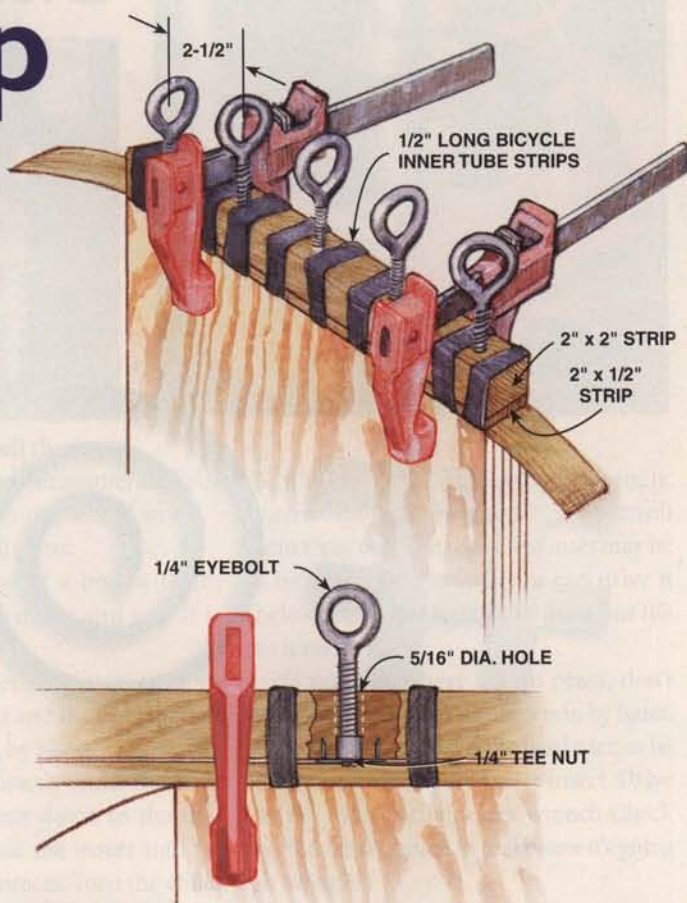


Adjustable Curves

Laying out a large curve with a cobbled-together, oversize compass is a pain in the neck. Instead I use a bowed slat that can be adjusted to any curve. I used to bend the slat with my hands and draw the curve with a pencil in my mouth. That didn't work very well! The solution came to me in the bathroom when I looked up and saw that little chain hanging from the ceiling light.

Here's what I did: First I ripped a thin, 1/8-in. slat, 1-1/2-in. wide and 36-in. long. In the middle of each end I cut a 1/2-in.-long slot on the bandsaw. I slipped in the end of a 40-in.-long beaded chain (available at most hardware stores) through one slot. While holding the free end of the slat and pulling on the chain, I create a curve in the slat. Slipping the free end of the chain into the other slot locks the slat into the curve. By shortening or lengthening the chain I can make subtle changes in the curve.

LEE ENSRUD
MILL VILLAGE, VT



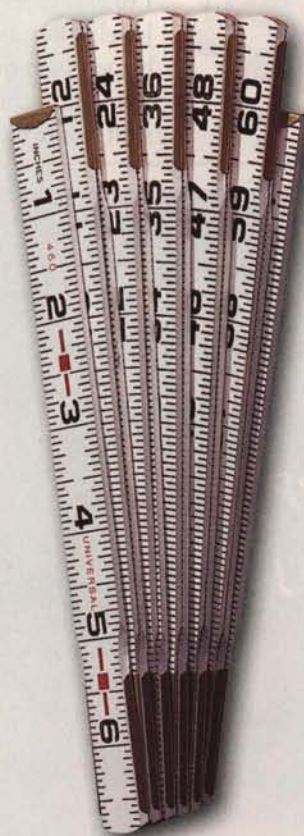
Edge-Banding Clamp

I ran out of clamps and patience the last time I applied a veneered edge to a long piece of plywood. The tangle of clamps to hold the veneer and cauls in place was more than I could take! To make life simpler, I came up with a slick way to clamp edge banding onto the ends of long boards without the need for long, cumbersome pipe clamps.

Now I glue my edge banding material onto the board's end and place my jig over it. Then I add a few clamps over the jig to hold it in place. A few twists of the eye bolts pushes the lower strip towards the edge banding material.

JAMES MATTEA
MILWAUKEE, WI

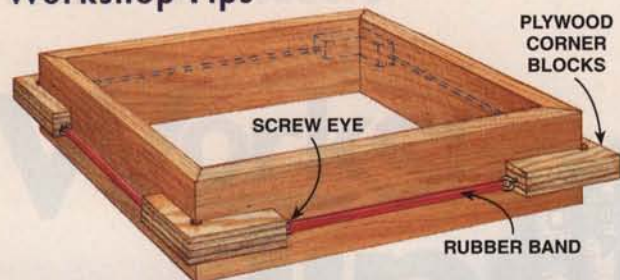
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Workshop Tips



Glue-Up Helper

I've always struggled with the rubber bands I use to hold jewelry box sides square and steady during glue-up. The biggest pain in the neck was cleaning the glue squeeze-out from under the bands. When I lifted the band the box would shift before my eyes! I was ready to chuck the whole mess in

the garbage when I came up with a clever new way to hold the boards.

I made L-shaped corner blocks with stiff rubber bands in between. The inside corners are cut back to prevent glue squeeze-out from gluing the blocks to the sides of the box. Now glue-up is a joy. I apply glue to all the mitered faces and slide the long sides inside the blocks. Then I slide in the short sides. The inside diagonals are measured and the box is shifted until they are equal. The rubber bands can be replaced with longer or shorter ones for different sized boxes.

GREG ALBURY
CEDARVILLE, ONTARIO

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tool since
the OPPOSABLE
THUMB.

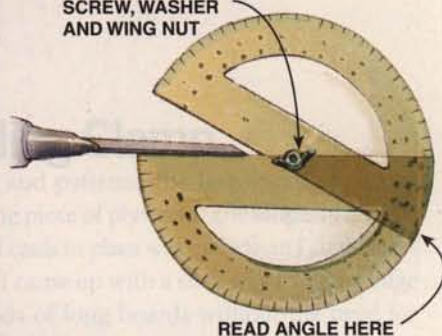


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AND WING NUT



Bevel Gauge

For years I ground a way-too-shallow edge on my favorite chisel. It wouldn't hold up worth beans, so I dug through the junk drawer for something I could make a bevel gauge out of. What I came up with is this simple jig.

Just place the chisel's bevel into the angle formed by two plastic protractors and read the degrees on the protractor's face.

JERRY LATTIMER
BLACK SPRINGS, NM
(continued on page 16)

Beauty is only a few layers deep.

Get to it three times faster.

That's because new 3M™ SandBlaster™ Sanding Sponges cut three times faster and last three times longer.* The packaging is color coded so you can easily pick the right sponge for the right job. SandBlaster sanding sponges make any job easy and beautiful.



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For a Fast Finish.

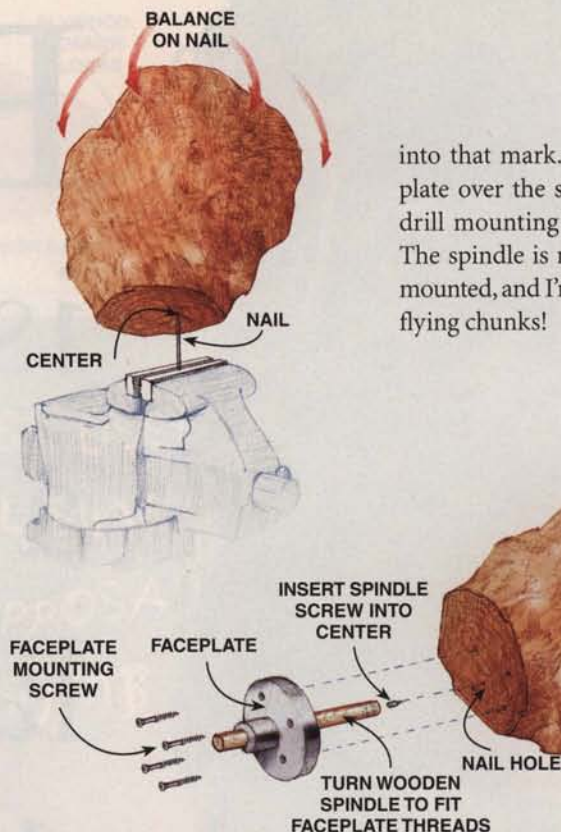
Workshop Tips

Centering a Faceplate

I've got a couple nasty dents in my wall from burlwood pieces that flew off my lathe. I learned real fast that these bumpy chunks need to start out centered on the faceplate.

Here's how I make it happen: I turn a spindle so it slips through the center thread of my faceplate. On the end of the spindle, I mark the center with a center-finding gauge. Then I drill a center hole the size of the unthreaded shank of a No. 8 wood screw. I nip off the head of the screw and epoxy it into the hole so only two or three threads stick out.

To prepare the blank for turning, I find the center by carefully balancing the end on a nail clamped in my metal vise. When it's balanced, I whack the blank with my hand, making the nail mark the center. I screw the spindle



into that mark. Then I slip the faceplate over the spindle and mark and drill mounting holes into the blank. The spindle is removed, the faceplate mounted, and I'm ready to go. No more flying chunks! **AW**

DEAN HARFORD
TROY, AL

The Bridgewoodworkers' Edge Begins With The Right Tools

Bridgewoodworkers take pride in their work. They know the value of having the right tools for the job. Wilke Machinery Company offers a full line of professional woodworking machines and power tools that are designed for any job. Bridgewoodworkers also know that one of the most important purchase decisions is from whom you buy. The Wilke sales staff pays special attention to customer support while offering competitive prices. The Service Department ensures your continued satisfaction with in-stock parts and technical know-how.



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BW-510TS
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more expensive industrial models.



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5/8" and 1" arbors allow the
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28-150	9" Bench Band Saw	195	155
50-860	850 CFM Air Cleaner	291	239
31-695	6" Belt/9" Disc Sander	441	299
23-710	Sharpening Center	228	155
31-460	4" Belt/Disco Sander	168	119
40-540	16" var/spd Scroll Saw	243	159
11-990	12" Bench Drill Press	237	184
11-090	32" Radial Bench Drill Press	471	279
22-540	12" Bench Top Planer	518	259
22-560	12" Planer w/ extra knives	572	329
36-865	Vsma Feeder Stock Feeder	337	249
36-220	10" Compound Mitre Saw	294	199
37-070	6" var/spd Bench Jointer	362	265
14-650	Hollow Chisel Mortiser with chisels and bits	380	249
17-900	16-1/2" Floor Drill Press	490	329
17-924	Mortise Chisel Kit	Sale	65
36-250	12" Slide Compound Saw	696	455
31-780	Oscillating Spindle Sander	261	194
40-650	30" Roll Saw	600	389
36-905	30" Unifence	363	259
36-906	50" Unifence	454	319
36-444	10" Contractors Table Saw	852	589
33-830	10" Radial Arm Saw	851	739
37-285	6" Jointer w/ stand	424	345
31-250	NEW 18" Drum Sander	Sale	789
36-475	10" Platinum Edition Contractors Table Saw w/ 30" unifence, cast iron wing, table board & carbide blade	Sale	849
28-275	14" Band Saw 4 HP	Sale	595
28-255	14" Platinum Edition Band Saw - 1 HP w/ mobile base, 18" rip fence	Sale	1199
22-680	15" Planer with stand	Sale	1199
31-280	Slender Center w/ stand	1012	789
37-190	6" Deluxe Jointer	615	445
37-195	6" Professional Jointer	625	539
50-850	1-1/2 HP Dust Collector	395	295

Model	Description	List	Sale
36-945	10" 3 HP Unisaw with 50" Biesemeyer fence	2420	1699
43-420	3 HP heavy duty Wood Shaper	2609	1499
37-350	8" Jointer - DJ20	2155	1499
36-850	Four speed, 3 roller Stock Feeder 1/4 HP - single phase 115V	632	469
36-851	Four speed, 3 roller Stock Feeder 1 HP - single phase 230V	1010	749
28-640	20" Woodcutting Band Saw	2934	1899
22-451	20" Planer - DC-580	4699	3995
31-390	6" x 132" Edge Sander	2669	2299

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Model	Description	List	Sale
5637-22	Super Sawzall	362	179
5621-21	Super Sawzall w/ orbital	375	185
0224-1	3/8" Drill 4.5 amp magnum	240	138
0234-6	1/2" Drill 4.5A mag 0-850 rpm	255	134
0235-6	1/2" Drill w/keyless chuck	255	142
0244-1	1/2" Drill 4.5A mag 0-600 rpm	255	142
0222-1	3/8" Drill 3.5 amp 0-1000 rpm	221	129
0228-6	3/8" Drill 3.5 amp 0-1000 rpm	214	125
0375-6	3/8" close quarter Drill	255	148
6176-20	14" Chop Saw	340	179
6546-6	Screwdriver 200 & 400 rpm	150	89
6547-6	6546-6 w/bits, 1/4" chuck & cs190	115	50
6390-21	7-1/4" Circular Saw w/ cs	267	139
5397-6	3.8" w/ spd Hammer Drill Kit	275	145
5371-6	1/2" w/ spd Hammer Drill Kit	360	194
6494-6	10" Compound Mitre Saw	595	329
6266-21	Top Handle Jig Saw w/ case	319	159

Item	Description	Teeth	List	Sale
LM2M010	Cut-off 10"	60	93	32
LU8M011	Comb 10"	50	78	45
LU8S010	Super Cut-off 10"	80	114	69
LU8S012	Super Cut-off 12"	96	185	99
LM7M010	Flipping 10"	24	69	39
LU8R010	Thin Kerf 10"	24	72	49
LU8R010	Thin Kerf 10"	60	88	55
LU9R010	Ultimate 10"	80	128	79
LU91M008	Compnd Mitre 8-1/2"	89	40	24
LU91M010	Compnd Mitre 10"	80	84	54
SD308	8" Carbide Dado	230	119	69
SD506	6" Carbide Super Dado	279	154	89
SD508	8" Carbide Super Dado	344	175	99
94-100	5 pc. Router Bit Door System	320	169	99

Model	Description	List	Sale
CF8B2	8-1/2" Slide Compound Saw	1169	449
C10F5	10" Slide Compound Saw	1627	799
C15FB	15" Mitre Saw	1346	659
C10FCD	10" dual bevel Compound Mitre Saw	550	265
NCV45B	Coil Rolling Nailer	935	369
EN52	2 HP, 4 gal. Compressor	561	289

Model	Description	List	Sale
5090DW	3-3/8" Saw Kit 9.6 volt	213	139
DA391D	3/8 angle Drill 9.6V	142	95
DA391DW	3/8" angle Drill Kit 9.6V	216	139

Model	Description	List	Sale
6095DWE9	1/2" Drill Kit w/2 batt	240	125
6095DWLE2	6095DWE w/flashlight	263	139
63200T-4	9.6 volt Mitre saw	55	30
632002-4	7.2 volt Battery	45	28

Model	Description	List	Sale
6343DWA6	1/2" Drill Kit	458	255
5620DWA	6-1/2" Circular Saw Kit	458	255
DK1016	1/2" Drill & 6-1/2" Saw combo kit	698	389
DK1021BL	18 volt Combo Kit. Includes drill, 6-1/2" Circ. Saw, Recipro Saw, and flashlight	Sale	579

Model	Description	List	Sale
9900B	3"x21" Belt Sander w/bag	322	165
9924DB	3"x24" Belt Sander w/bag	333	169
N1900B	3-1/4" Planer with case	268	142
1912B	4-3/8" Planer	360	209
N9514B	4" Disc Grinder 4.6 amp	106	65
DA3000R3/8"	Angle Drill	328	185
9013BR	1/2" Drill Rev. 6 amp	268	149
9401	4" x 24" Belt Sander w/bag	416	219
5007NBK7-1/4"	Circ Saw w/ case	328	125
LS1011	10" Slide Compound Saw	807	429
LS1211	12" Slide Compound Saw	1370	695
3901	Plate Joiner Kit	318	159
3612C	3 HP Plunge Router	503	265
LS1040	10" Compound Mitre Saw	474	249
LS1013	10" Dual Compound Slide Mitre Saw	1087	599
BO5010	5" Random Orbit Sander	121	69
LS1220	12" Compound Mitre Saw	678	379
9227C	7/9" Polisher	338	195
2702	8-1/4" Table Saw	538	299
2703	10" Table Saw	568	309

Model	Description	List	Sale
SNF30	Finishing Nailer w/ case	459	249
SN545	Stapler 7/16" crown, 1" - 2"	540	369
SLP20	Pinner w/cs 5/8 - 1-5/8"	422	189
SKS	Stapler 5/8 - 1-1/2"	390	259
SN70	Framing - Clip Hd 2 - 3-1/2"	725	449
SN65	Framing - Full Hd 2 - 3-1/2"	709	359
SN600	New Framing 2 - 3-1/2"	699	339
SNF40	Finish Nailer 1-1/4 - 2-1/2"	569	329

Model	Description	List	Sale
N80S-1	Stick Nailer	Sale	255
RN45	Coil Roof Nailer 3/4 - 1-3/4"	845	339
N60FN-2K	Finishing Nailer w/ case	557	239
BT35-2K	Brad Tacker 5/8" - 1-3/8" w/ case, oil, & brads	279	119
MIIF5	Flooring Stapler 15 gauge	902	539
S32SX-1K	Finish Stapler 1-1/2" - 1-3/8" w/ case & oil	269	135

SFN60	NEW Framing 2- 3-1/2"	699	339
SFN40	Finish Nailer 1-1/4 - 2-1/2"	569	329

BOSTITCH AIR NAILERS

Model	Description	List	Sale
N80S-1	Stick Nailer	255	155
RN45	Coll Roof Nailer 3/4 - 1-3/4"	845	339
	60FN-2K Finish Nailer w/ case	557	239
BT35-2K	Brad Tracker 5/8" - 1-3/8" w/ case		

B3552K	Black Reelers 3/8" - 1/2" with case, oil, & brads.....	279	119
MIIIF5	Flooring Stapler 15 gauge.....	902	539
S32SX-1K	Finish Stapler-1/2" - 1-3/8" with case & oil.....	269	135

JORGENSEN ADJUSTABLE HANDSCREWS					
	Jaw	Opening			Box
Item#	Length	Capacity	List	Sale	of 6
#0	8"	4-1/2"	20.35	12.95	69.95

Model	Description	List	Sale
PANASONIC CORDESS			
EY6431NQKW	1/2" 15.6V drill kit with two 3 amp-hr Ni-Mh batteries, 45 minute charger, & case	372	205
EY6431FOKW	1/2" 15.6V drill kit with two 2 amp-hr Ni-Cad batteries, 30 minute charger, & case	342	189
EY6407NQKW	1/2" 12V drill kit with two 3 amp-hr Ni-Mh batteries, 45 minute charger, & case	339	189
EY6406FOKW	3/8" 12V drill kit with two 2 amp-hr Ni-Cad batteries, 30 minute charger, & case	305	169
EYC133	5-3/8" 15.6V Wood Cutting Saw and Drill Kit	650	379

Model	Description	List	Sale
BIESEMEYER FENCES			
B-50	50' Corner Saw	443	325
T-SQUARE 52	52' Homeshop	360	275
T-SQUARE 40	40' Homeshop	335	255
T-SQUARE 28	28' Homeshop	325	245

Model	Description	List	Sale
AIRY AIR NAILERS			
02415K	Brad Nailer 3/8" - 1-3/4"	180	79
06265K	1/4" Crown Stapler 3/8" - 1-1/4"	89	49

Model	Description	List	Sale
STABILA LEVELS			
25010	10' die cast Torpedo Level	Sale	21.95
24640	24" Level w/ hand holes	Sale	47.95
24670	48" Level w/ hand holes	Sale	59
03050	Compact Laser Level	Sale	299
03100	Compact Laser Level with prism	Sale	359

Model	Description	List	Sale
25010	10' die cast Torpedo Level	Sale	21.95
24640	24" Level w/ hand holes	Sale	47.95
24670	48" Level w/ hand holes	Sale	59
03050	Compact Laser Level	Sale	299
03100	Compact Laser Level with prism	Sale	359

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Model	Description	List	Sale
DW124K	1/2" right angle Drill	590	329
DW321K	Top Handle Jigsaw Kit	300	164
DW364	7-1/4" Circ. Saw w/broke	294	155
DW378G	7-1/4" Framer's Saw	210	149
DW610	1-1/2 HP 2 handle Router	266	149
DW411K	1/4 sheet Palm Sander w/ cs88	58	58
DW482K	Biscuit Joiner with case	448	169
DW705	1/2" Compound Mitre Saw	734	339
DW621	2 HP Plunge Router	400	199
DW677K	3-1/4" Planer with case	268	155
DW421	5" Palm Ram. Orb Sander	144	75
DW272	Drywall Gun, 0-4000, 6.5 amp	160	95
DW276	Drywall Gun, 0-2500, 6.5 amp	160	95

Model	Description	List	Sale
DW972K-2	3/8" variable speed w/ two 12V XR batteries	362	175
DW991K-2	3/8" variable speed w/ two 14.4V XR batteries	415	199

Model	Description	List	Sale
DW991KS-2	DW991K drill, DW935 trim saw, 2 XR batteries & case	Sale	345
DW911	Jobsite Radio & Charger	Sale	139

Model	Description	List	Sale
DW933K	Jigsaw Kit	468	275
DW938K	Recipro Saw Kit	520	269
DW995K-2	1/2" Drill Kit w/ 2 batt.	Sale	259
DW997K-2	1/2" Drill/Hammer Drill Kit	Sale	454
DW995KS-2	DW995K Drill, DW936 Saw and case	Sale	399

Model	Description	List	Sale
DW006K	1/2" Drill/Hammer Drill Kit	560	299
DW007K	6-1/2" Circular Saw	560	299
DW008K	Reciprocating Saw	560	299

Model	Description	List	Sale
DW708	12" Slide Mitre Saw	Sale	649
DW788	20" Scroll Saw	Sale	469
DW733	12" Planer w/ extra blades	Sale	399
DW744	10" Portable Table Saw	Sale	499

Model	Description	List	Sale
660760	3 HP Model 66 Table Saw	2555	2099
660791	5 HP Model 66 Table Saw	2690	2199
1270100	3 HP Model 27 Shaper	2899	2299
1791237	Hollow Chisel Mortiser	887	649
1610050	8" Model 60 Jointer	2392	1899
1791051	6" Model 54 Jointer	684	549
1791070	1-1/2 HP Dust Collector	494	399

Model	Description	List	Sale
LP6-20A	Sight level package-20x	329	245
LP6-20XLA	Level Package	409	275
LT8-300	Level Transit - 26x	739	579
LT8-300P	above Level with optical plumb	869	649
AL76-900	Automatic Level - Transit - 18x	666	519
AL76-900	above Level with tripod & rod	799	559
ALP8-22	Automatic level - 22x with tripod and rod	Sale	355
AL8-26	Automatic Level - 26x	854	315
ALP8-26	AL8-26 with tripod & rod	Sale	379

Model	Description	List	Sale
1587AVSC	Top Handle "CLIC" Jig Saw Kit with case and Progressor blades	Sale	155
1584VS	Barrel"CLIC" Jig Saw	268	164
Bosch Metal Case for above Jig Saws		24	
Bosch 30 blade assortment for Jig Saws		299	99

Model	Description	List	Sale
1584VS or 1587VS	with steel case and 30 Bosch blades	Sale	189
1295DH	5" Random Orb Palm Sndr.	155	89
1274DV5	3"x21" v/spd Belt Sander	326	175
1278VSK	1-1/2"x12" Belt Sander	242	129
1276DVS	3"x24" v/spd Belt Sndr.	410	219
1276DVS	4"x24" v/spd Belt Sndr.	443	229
1194VSRK	1-1/2" w/ spd Drill w/ case	256	159
1613EVS	2HP v/s Plunge Router	374	

Turning Bocce Balls

Freehand turning of a near perfect wooden sphere without flat spots or bumps is a wonderful challenge for a turner. Whether it's for croquet, furniture drawer knobs or simply as a decorative object, the wooden sphere is a wonderful exercise in developing a form, tool control and understanding grain direction.

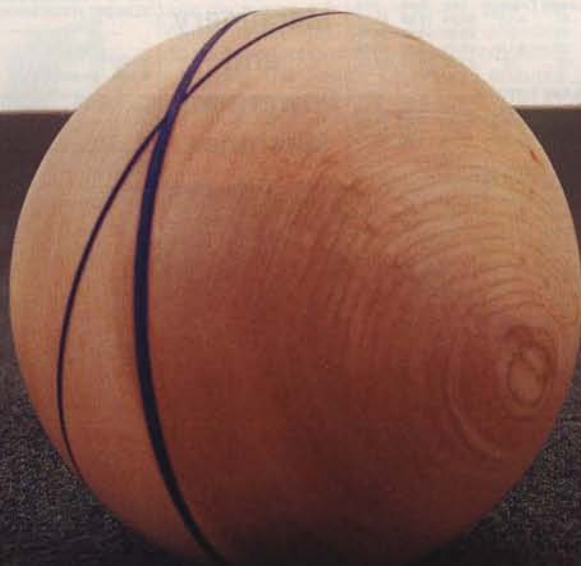
We've chosen to make wooden balls for the ancient game of bocce ball. Originating in the Middle East some 7,000 years ago, the game was popular with ancient Greeks and Romans. It hit its heyday in 16th-century Italy, where it was something of a national sport. Much of the vocabulary and manner of play stems from this period.

Bocce Ball Essentials

To play the game you have to make either five or nine wooden balls, in two sizes. One ball, the "pallino" or target ball, should be approx. 2-1/4 in. in diameter, in a contrasting or colored wood. The other balls, or "bocce" that are tossed, should be approx. 4 in. in diameter. Create either a full set with eight bocce or a half set of four, with one-half of each set in distinctive colors or patterns to identify two sides or teams. Within each team you may want to create a crisscross or other pattern to distinguish individual bocce balls.

Wood to Turn

Turn the bocce balls and pallino from a dense hardwood such as hard maple, birch or white oak in either solid or laminated stock. If you laminate, choose glue that is water-resistant and does not "creep" at the seams such as plastic resin or polyurethane.



Bocce ball is played with a "pallino," the small target ball (far left) and two sets of larger "bocce" balls. We cut thin grooves to identify individual balls and painted the sets in two colors, one for each team.



BEGIN by turning a chuck to hold the balls as they are turned. This one is for the larger balls, and is held at the headstock (Fig. A). Work from the center out with your round-nose scraper to produce a smooth surface. Make a smaller chuck for the headstock to hold the pallino.



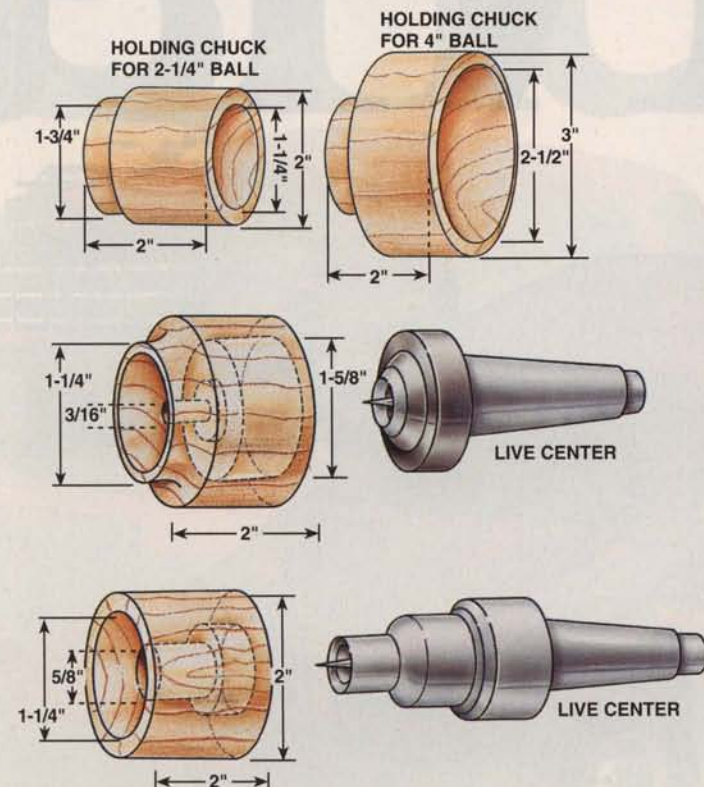
TURN another holding chuck for the tailstock. It needs to fit over a live center so it can spin freely (Fig. A). Drill or turn out the center of the chuck to match the outside diameter of the live center. Each live center requires a slightly different design. The chuck must be centered and fit snugly.



LAY OUT the size of the ball with dividers or a compass after roughing out the blank to a cylinder. Mark the centerline (red) and two radius lines (blue) that are equal to half the dia. of the cylinder. After marking, reduce the waste outside of the radius lines to approx. 1 in. in dia.

FIG. A SHOP-MADE CHUCKS

You have to make three different concave holding chucks to turn these balls. For the headstock side you need two different sizes that fit into your scroll chuck or a recess in a scrap block on your 3-in. faceplate (a "jam chuck," see Photo 2). On the tailstock side, make a chuck that slips over your live center (two styles are shown as examples). This tailstock chuck works for both size balls.



Here's what you need:

- Hard maple, 4x4 by 18 in. (makes four bocce balls; buy twice this amount for a full set of 8). Each ball blank should be 4-1/2-in. long.
- Hardwood, 2-1/4 by 2-1/4 by 2-3/4 in. (for one pallino).
- Basswood (or poplar) 3 by 3 by 2-in. in length (headstock side holding chuck for larger ball); two pieces 2 by 2 by 2 (headstock side holding chuck for smaller ball and for tailstock-side holding chuck that fits over the live center).
- 1/2-in. detailing gouge ground to a fingernail shape, roughing gouge, parting tool, 1/2-in. to 1-in. round-nose scraper, 1/2-in. or larger skew chisel.
- Outside calipers with a minimum capacity of 4-1/2 in.
- Dividers or compass.
- Either a scroll chuck or a 3-in. faceplate with 1-1/2-in.-thick piece of face-grain poplar or soft maple.
- Live center for tailstock, spur center for headstock.
- Jacobs chuck and appropriate bit for fitting tailstock-side chuck to your live center.
- Acrylic paint in two colors and a small, stiff brush.
- Wood dye.

Sources

Craig Lossing, 47 Fairmount Dr., Lino Lakes, MN 55014, (651) 785-4194. Pre-cut wood for ball making, 4 by 4 by 18 in. hard maple (makes 4 bocce balls), \$24, plus shipping; 2-1/4 by 2-1/4 by 2-3/4 in. hard maple (makes 1 pallino), \$2, plus shipping.

Woodcraft Supply, (800) 225-1153. Bright yellow dye for the pallino, #811757, \$4, plus shipping.

continued on page 22

The stout heart of every Dodge Ram pickup is massive Magnum® power. In fact, the Ram lineup is, overall, the most powerful line of pickups on the road. Choose a torquey 3.9 liter V-6, a 5.2 liter, 230-horsepower V-8, a 5.9 liter, 245-horsepower V-8, or a pavement-ripping, 310-horsepower, 8 liter V-10.* Truckers who spit and wear work boots can opt for an HO 5.9 liter Cummins Intercooled Turbo Diesel† that produces up to 505 lb-ft of torque and 245 horsepower. The HO diesel is mated with a six-speed manual transmission.



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Like other Dodge Dakota models, the new Dakota Quad Cab™ delivers big-truck capability and oversize fun in a compact truck.



Available Magnum power is one of the big sticks Dakota uses to clobber the compact truck competition. Dakota V-8 options include a 235-horsepower "Next Generation" 4.7 liter Magnum V-8,† and a 5.9 liter, 250-horsepower thoroughbred (245 horsepower in Quad Cab).* Plug that 5.9 into a Dakota R/T, and it's off to the races.



Ram Wagon has the power to move people. Lots of people. Up to 15 people in a Ram Maxiwagon. Choose either of Ram's available V-8s with any long-wheelbase Ram Wagon. That torquey V-6 is standard on short-wheelbase models. Heavy-duty, gas-charged shock absorbers, a front stabilizer bar, and double-sealed front doors help ensure that all your passengers will travel in quiet comfort.



Dodge trucks go to work. The Ram Crew Van is available with either of the two Magnum V-8s. More than enough muscle to move crew and equipment to the next job site. The Tradesman Crew Van package includes seating for five, a steel partition behind the second seat, a place to hang your hard hats and other gear, and a rear compartment Duraliner® system. The available steel shelves can help you outfit your Ram Crew Van to fit the job spec.



V-8

gnum



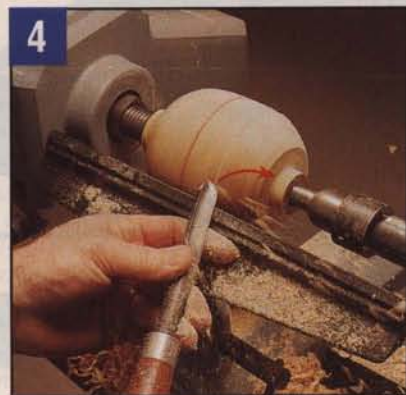
Whether you're hauling down a straightaway at 190 mph in a NASCAR Craftsman Truck Series racing Ram, or hauling supplies to the next job, Magnum engines have more than enough power to pull the load. It's a basic law of physics: Energy equals Magnum V-6, V-8, V-10, or Cummins Diesel.*

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*Availability depending on vehicle and model. HO diesel limited availability. †230 HP in California and northeastern states with special emission standards. Mopar® accessories shown optional. Always use seat belts. Remember, a backseat is the safest place for children 12 and under. Properly secure all cargo.

Woodturning



ROUGH CUT the cylinder to a very crude ball form using a 1/2-in. detail gouge. Don't be too zealous in trying to hit the perfect sphere at this point—it is far too easy to cut below the curves of the final sphere. Allow considerable waste material to be trimmed away in the next step.

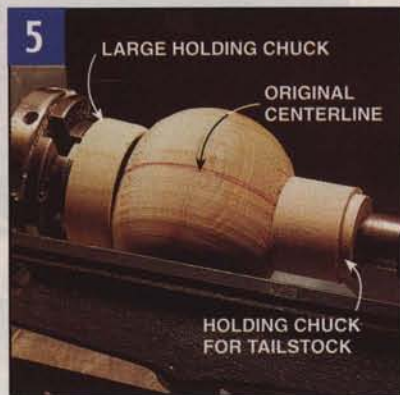
continued from page 19

THE RULES OF BOCCIE BALL

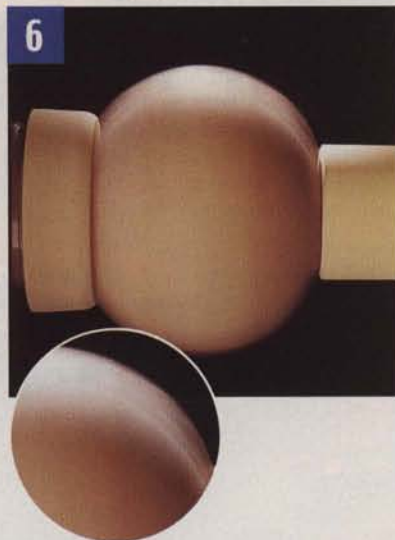
Official bocce ball is played on a court of fixed dimensions, often with walls and backstops. What most of us play is an informal version or "lawn bowling." Here are the basic rules:

- There are two teams, played with two, four, or eight players. In games of two or four players, you can get by with only four bocce balls. The game is a bit more interesting, though, if you play with a full set of eight balls.
- By a flip of a coin or some other means, choose one side to roll the small ball (pallino) out into the playing area. All throws must be made behind a real or imaginary foul line.
- The side that placed the pallino rolls one bocce ball as close to the pallino as possible (even touching it). This becomes the "point ball."
- The opposing side rolls all of its bocce balls to see if it can come closer to the pallino than the "point ball."
- The starting team rolls the remainder of its bocce balls to see if it can come closer to the pallino than any of their opponents' balls.
- Points are awarded after all bocce balls have been thrown. A point is awarded for each ball closer than any of the opponents' to the pallino. Games are played to 12, 16, or 21. Often the winner must win by at least two points.
- Yes, you may hit the pallino, your own team's previously thrown bocce or the bocce of the opposing team!

For more information, go to www.sportcraft.com



MOUNT the rough ball between the two holding chucks with the red centerline turned 90 degrees so it's parallel to the bed or axis of the lathe. Rotate the lathe by hand a few times to be sure both sides of the red line are in alignment. When all seems right, firmly secure the block by tightening the tailstock.



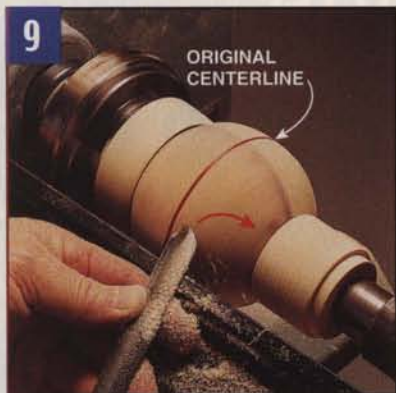
A "GHOST BALL" is revealed when you turn on the lathe. By experimenting with your shop lamp and different angles of viewing, you should see a definite ball with a ghost-like appearance inside the spinning blank. With light-colored woods, a dark background often helps to make the ghost more visible. Keep your lathe in the slower speed ranges (400 to 600 rpm).

TURN down to the ghost ball, using a 1/2-in. detailing gouge with a fingernail shape. Work from smaller to larger diameters on both sides of the centerline (the ball now has the same grain orientation as a face-grain bowl). Go slowly and gently, with a mixture of cutting and light scraping actions to remove waste surrounding the ghost ball.

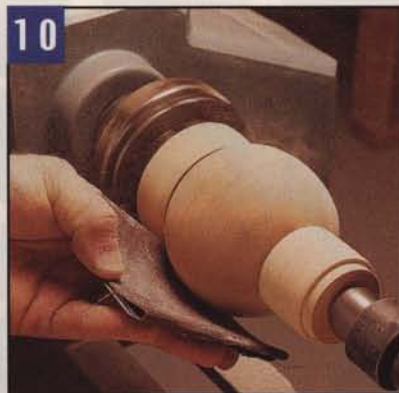


DRAW a new centerline (the blue line) when you're finished turning.





9 CONTINUE TURNING with the blue line positioned parallel to the lathe's axis. The grain is again as we started (indicated by the red line), so work from larger to smaller diameter in order to work with the grain. Gently turn away the waste that was held in the holding chucks. Again, use the ghost ball as a guide.



10 SAND to further refine the shape and remove minor imperfections. Randomly reposition the ball five or six times, sanding lightly between each change of position.



11 CUT narrow grooves on the larger balls with the long point (toe) of the skew chisel. Create a crisscross pattern by changing the axis of the ball. With the lathe spinning, color the grooves with unthinned acrylic paint applied with a stiff brush. Light sanding removes excess paint.

The single pallino (smaller ball) is usually not grooved and can be dyed a bright color for high visibility. **AW**

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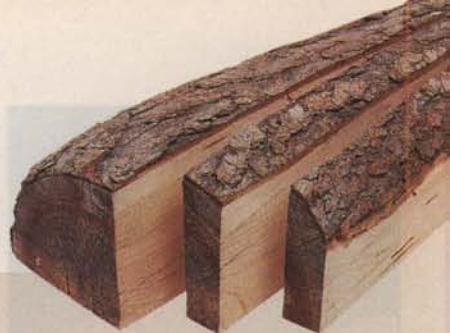
Rustic Picture Frame

Picture this: your favorite family photo in a frame made of wood harvested from your own backyard. Believe it or not, there are some real diamonds in the rough to be found in firewood or even fallen limbs, and the best part of all—it's free! Turning logs into lumber is a lot of fun. Logs 6-in. or more in diameter are best. (See "Bandsaw Resawing" page 46 for more on harvesting your own wood.) Accept a certain degree of defect in

the wood and if a piece doesn't work out or you blow it the first time through, no big deal, you can never have too much kindling!

PREPARE THE STOCK

First, run the flat of the log on your jointer to create a reference surface for sawing the log on the bandsaw (Photo 1). Then, create a 90-degree edge to use against the fence of your bandsaw. Mark each piece in the



SLICE UP A LOG before you burn it. You may find buried treasure!



1 SAW THE LOG into 1-in.-thick slices. After each cut, joint the edge of the log to smooth the face of the next piece. Set the slices aside to dry.



2 MARK INSIDE EDGES for trimming, while holding the outer edges flush at the corners. You can shoot for a perfectly straight inside edge or follow the grain for a more natural look. Letter each miter joint for easy identification.

Your Ideas

If you have an original One-Day Project, send it to us with a sketch or photo. We pay \$200 for each one we print. Send to: **One-Day Projects, 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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One-Day Project

order it comes off the log. This helps you orient the grain when you build the frame. Chances are the wood will need to dry, so sticker your best pieces indoors and let them dry. Use a moisture meter and test for a moisture content of around 8 percent before using your wood. (See Q & A, issue # 79, page 14 for more on moisture meters.)

BUILD THE FRAME

Once your wood is dry you can start to build the picture frame. Joint and plane each piece to a uniform thickness. On the bandsaw, rip the pieces down so they are somewhat equal in width. Then joint the inside edges so they can register against the fence of a miter box. Cut miters on all the ends. With a bark edge it's hard to take precise measurements, so a little bit of trial and error is required to get good miters on all four corners.

Dry fit the frame and even up the inside edges (Photo 2). Cut the inside edge profile on the bandsaw and sand it smooth.

You'll have to cut a rabbet on the back of the frame to hold your picture. Use a router table and a rabbeting bit set deep enough to accommodate glass, matting, picture and backing (approx. 3/8 in.).

ASSEMBLY

Glue one joint at a time using a quick-setting glue like Titebond's Wood Molding Glue. To avoid damaging the bark edge, use the specialized clamps featured in Photo 3.

Sand and finish the frame. Attach screw eyes and picture wire. Mount the picture and hang it on a wall near your fireplace for all to enjoy. **AW**



3 CLAMP THE JOINTS with the most versatile clamps in your shop, your hands. Usually a few minutes of hand pressure results in a good initial tack set. Let the glue cure a good half-hour before moving on to the next joint. **Tip: A piece of waxed paper under the joint keeps the frame from sticking to your bench.**

Sources

Titebond Molding Glue
Highland Hardware, (800) 241-6748,
Item # 16.50.24, \$3.50.

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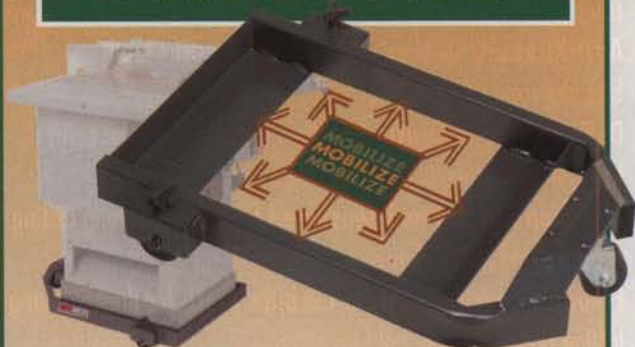
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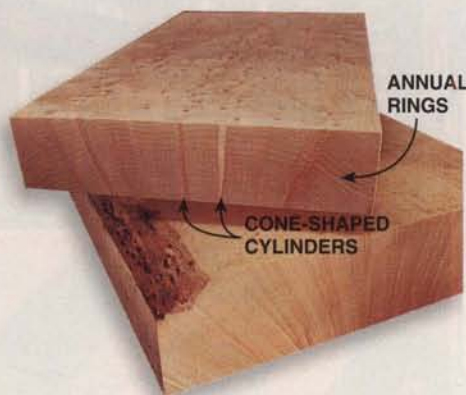
Birdseye Maple



Desk by Joel Simon, Bloomington, MN



BIRDSEYE FIGURE is caused by craters of wild grain that recur in successive layers of growth. On the face of a board you see the "birdseyes," on the end grain you see cone-shaped cylinders.



Birdseye maple is captivating, but has a reputation among woodworkers of being hard to find and miserable to work with. These are myths. Actually, birdseye is readily available in staggering varieties. I'll tell you where to find it and how to choose the best boards. And surprisingly, birdseye is easy to work with. I'll show you how to tame its unruly grain. And to top it off, I'll give you a recipe for a great-looking finish.

The Truth About Birdseye

"Birdseye" describes a figure pattern that occurs in the sugar maple tree (*Acer saccharum*). It's also found occasionally in several other varieties of wood. Individual birdseyes are ran-

domly located pockets of irregular growth. Nobody knows what causes a tree to produce them, despite decades of research. We do know they have nothing to do with birds!

Birdseye's occurrence in sugar maple is not rare. In fact, a recent field study of old growth stands in the upper Midwest suggests that, because it occurs so frequently in old growth, birdseye could be considered the *normal* growth pattern for sugar maple. However, it typically occurs in such small amounts that its presence is considered a defect that actually reduces a tree's value. What's rare are trees with enough birdseye to make them commercially desirable.

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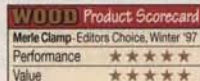
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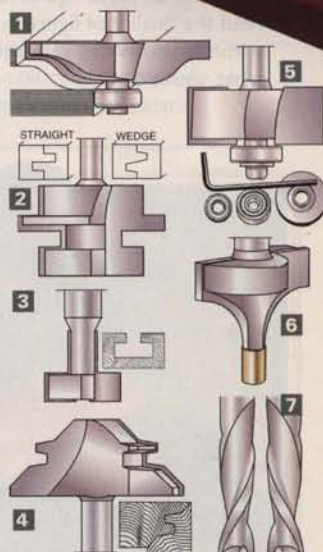
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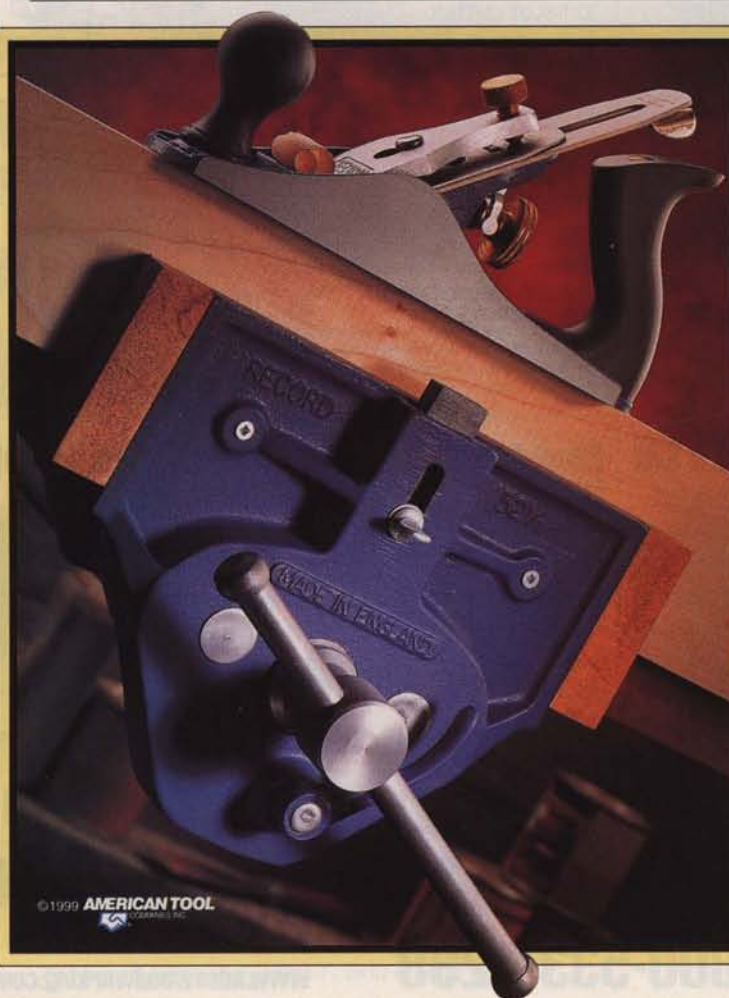
The Way Wood Works



BIRDSEYE VENEER HAS MANY ADVANTAGES over solid wood. Logs chosen for veneer are the cream of the crop, so you'll have access to the very best birdseye figure. You won't have to try to read the quality of figure in rough lumber or deal with tear-out. With veneer, you can see exactly what you're buying.

Tips for Buying Birdseye

- Buy surfaced material. It's hard to pick good birdseye from rough lumber, which is the way you're most likely to find it. Even if you're accustomed to looking at rough-sawn material, it'll be tough to see the figure. Sometimes it's even hard to differentiate between light-colored sapwood and dark-colored heartwood. It's easier to choose from birdseye that's been planed "hit-and-miss." This light planing sacrifices a bit of the board's working thickness so you can see what you're buying, but the trade-off is worthwhile.
- Look for flat boards. Birdseye's ornery grain gives it a tendency to warp or cup as it dries. If you can't find boards that are flat, look for ones that are extra thick so you can plane them flat and still end up with the thickness you want. You may need to buy thicker stock (5/4 instead of 4/4, for example).
- Order from a specialist. Few lumberyards stock birdseye. The only way to get it may be through a mail-order supplier. There are several that specialize in figured woods (see Sources, page 33). These suppliers have experience, knowledge and inventory.
- Consider using birdseye veneer, especially for large surfaces like tabletops and cabinet sides. The color and figure varies so much in solid birdseye lumber that it's hard to find boards that look good together. Sheets of birdseye veneer have a consistent appearance because they're sawn sequentially from the same log. You'll save money, too. "AAA" grade veneer costs about \$6.50 a square foot,



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compared to \$8 per bd. ft. of "AAA" 4/4 rough stock, and it's much cheaper to ship.

Learn About Grading

Specialty suppliers see more birdseye in a day than most of us see in a lifetime. Take advantage of their experience. They grade their inventory board by board, according to several factors. When talking to them, it's helpful to know the criteria they use:

- Figure quality is determined by the density of the birdseyes and the consistency of their pattern across the board.

- Consistent light color is desirable, as it is with regular maple.

- Wide boards and long boards cost more.

A long, wide board graded "AAA, sapwood both faces" will cost a pretty penny—up to \$10 a bd. ft., and you'll have to factor in the cost of shipping. For the strong of heart, some suppliers list even higher grades—up to "AAAAA" or "museum quality." Instrument makers often seek pieces in these superior grades. Usually, your wallet helps you choose which grade to buy.

The Way Wood Works



THE MORE DENSELY PACKED THE BIRDSEYE, the higher the grade. There are no industry standards, so the grading is somewhat subjective. Some suppliers use letter grades, others use words.



BOARDS THAT ARE LIGHT-COLORED on both sides are graded highest. In maple, this is the sapwood. The presence of dark-colored heartwood degrades the board, even though the birdseye figure may be spectacular.

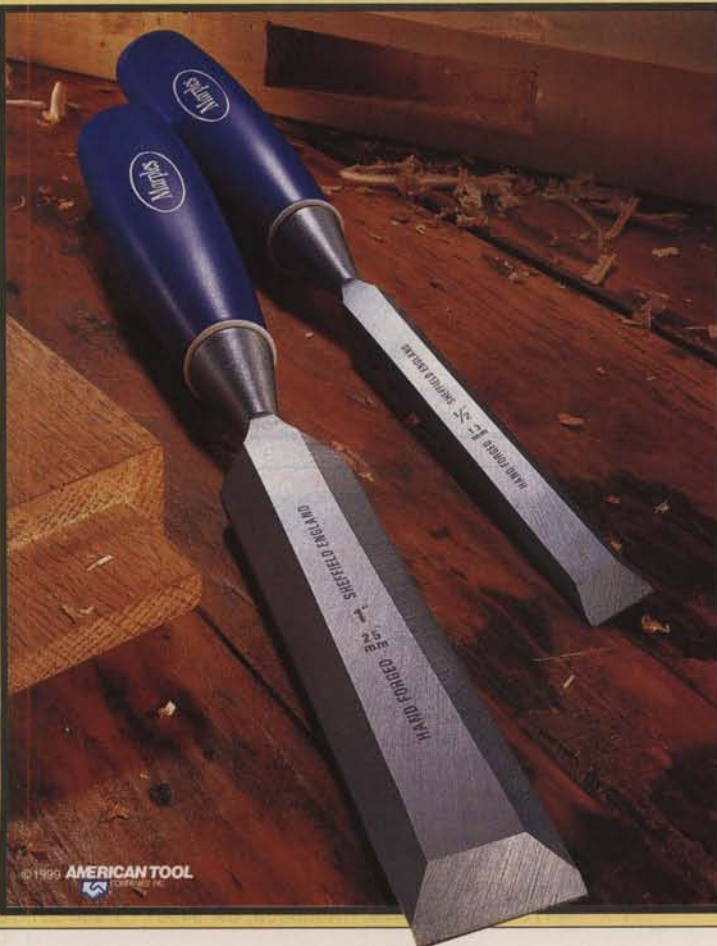
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The Way Wood Works

Plane Birdseye Without Tear-Out

Planing rough-sawn birdseye is a challenge because the eyes are pockets of swirling grain scattered all over the surface. When you run it through a planer, the birdseye figure tears out dramatically—usually with disastrous results. The commonly recommended alternative is to take the rough lumber to someone who has a drum sander for surfacing. Technical schools and cabinet shops often rent time on their machines, but you have to pay a minimum of \$25 per hour. And it's a hassle.

Here's a much easier solution. Wet the surface before you joint or plane it. Don't worry about warping. Planing removes the wet layer before the moisture affects the board.

The effect of wet-planing on your machines will be negligible if you follow these simple maintenance procedures. *Be sure to unplug the jointer or planer before performing any maintenance.*

- Moisture causes rust. Keep cast iron tables and fences protected with paste wax or a metal sealer.
- Use a dust collector to draw the wet shavings away from the machine—they contain all the moisture.
- After you've finished running the birdseye, wipe the cast iron tables dry with an absorbent cloth. Then run a dry board through the machine. The friction-generated heat helps evaporate any remaining moisture.

■ Wipe the pressure roller, cutterhead, knives and other effected surfaces with denatured alcohol. *Don't cut yourself on the knives.*

Sand or Scrape

After wet-planing you have to remove mill marks and minor tear-out before the birdseye is ready for finishing. It's too risky to try doing this with a hand plane—even one that's finely tuned. One bad pass can cause enough tear-out to ruin everything. It's safer to sand or scrape.

A random-orbit sander helps make sanding less tedious, but sanding dust is a problem. It lodges in torn-out areas, making it hard to know when to quit. A scraper is better. It makes shavings instead of dust, so you can see when the tear-out is gone. The best time to use a random-orbit sander is for final smoothing, after scraping.

Easy Finishing

Even the simplest wipe-on finish makes birdseye look good. Here's how to make it look great:

- A coat of penetrating oil, like tung or linseed, brings out the birdseyes and adds a warm amber tone.
- A thin coat of dewaxed shellac on top of the oil makes the figure shimmer.

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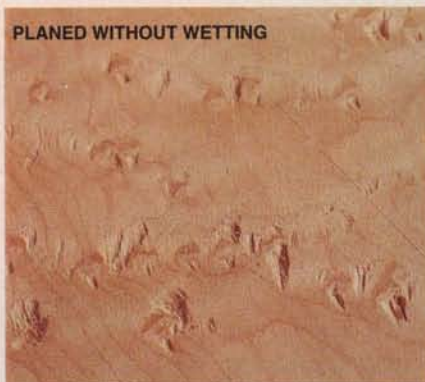
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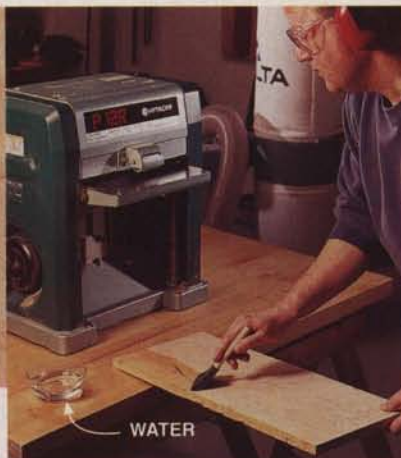
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PLANED WITHOUT WETTING



TEAR-OUT IS TYPICAL when you run a birdseye board through a planer. The grain changes direction around each birdseye, so it doesn't matter which way you run the board. It's gonna tear out in chunks.



WATER

GET BIRDSEYE BOARDS WET before you plane them. Let the water soak in for a couple seconds before you run it through the planer. Make shallow passes, removing only 1/32 in. at a time.

WETTED, THEN PLANED



TEAR-OUT IS DRAMATICALLY REDUCED when a birdseye board is wetted just before planing. (Look at the birdseye pattern—this is the same board as the one on the left!)

■ For non-wear surfaces, buffing the shellac with wax adds luster. Protect tabletops and other wear surfaces by topcoating with lacquer or varnish. These finishes adhere to dewaxed shellac that's been lightly sanded.

■ To minimize yellowing (a problem with all maple), skip the oil. Start with a seal coat of dewaxed super-blond shellac and top it with waterborne polyurethane. Waterborne finishes are clear and don't yellow with age.

■ If you want to color birdseye, don't use traditional wood stains—they're made with coarse pigments that obscure the figure. Dyes are a better choice, but over time they can fade. Woodburst brand stains are made from high quality pigments that are transparent, like dyes, and more colorfast. **AW**

REMOVE MINOR TEAR-OUT with a scraper or by sanding. Scraping is best because it's fast, quiet and dust-free. Sanding is effective, but tedious. Hand planing birdseye's swirling grain is likely to cause as much tear-out as it removes.



#80-STYLE SCRAPER

A THIN COAT OF PENETRATING OIL (one part oil, two parts mineral spirits) followed by a seal coat of shellac and topped with varnish is a great finish for birdseye. It warms the color, brings out the figure and protects the surface.



PENETRATING OIL

Sources

Solid birdseye maple:
Mid Maine Hardwoods
(207) 736-2396
www.birdseyemaple.com
Sandy Pond Hardwoods
(717) 284-5030
www.figuredhardwoods.com

Birdseye maple veneer:
Certainly Wood
(716) 655-0206
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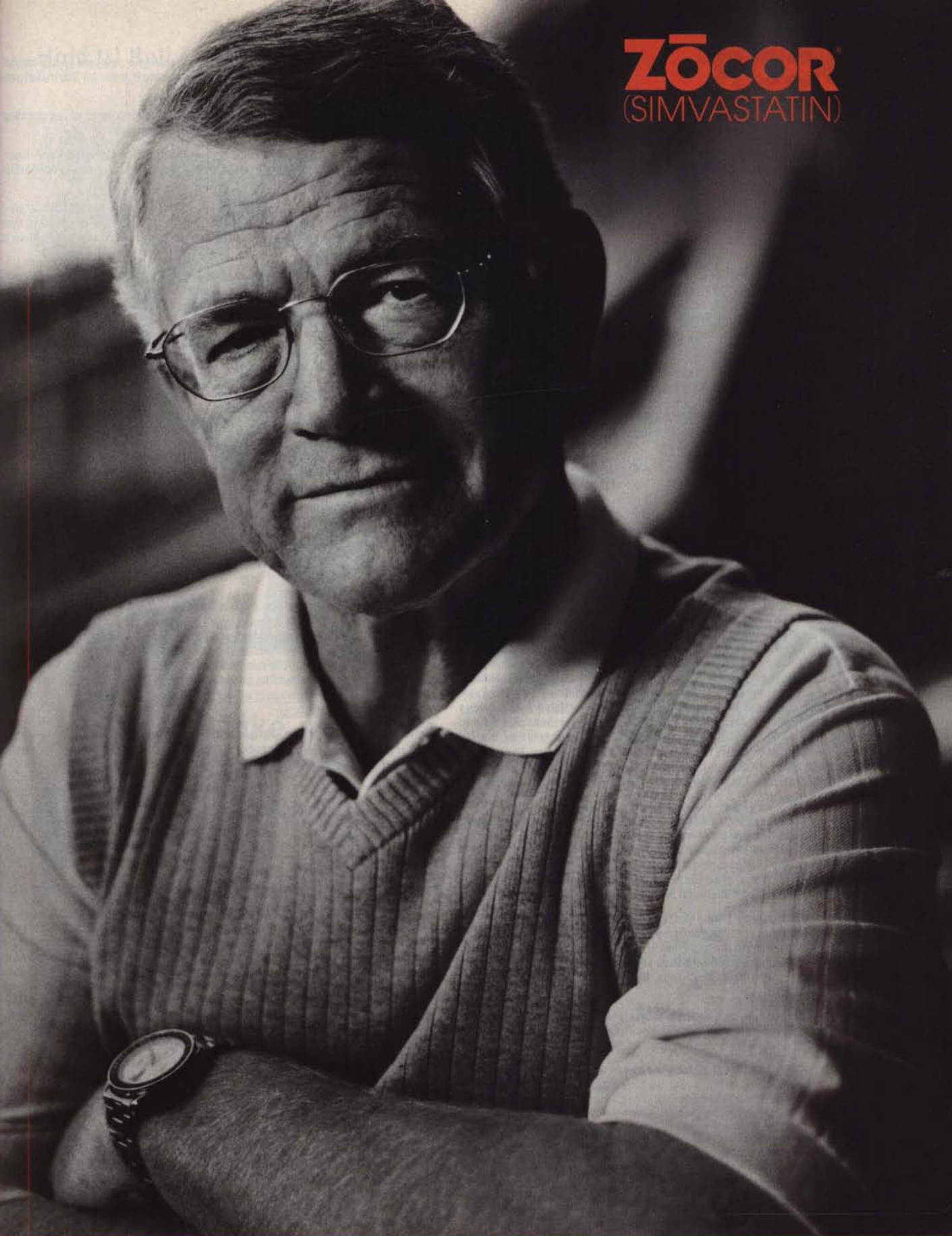
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Suddenly, lowering my high cholesterol became even more important than football.

—Head Coach Dan Reeves

Only six weeks before one of the most important games of my life, I felt a strange pain in my chest — and wanted to ignore it. I mentioned it to my doctor, who encouraged me to get it checked out the next day. What they found was unlike any opponent I had ever faced: three of my arteries were more than 90 percent blocked. I was suffering from heart disease and had to undergo emergency bypass surgery. Fortunately, I had a full recovery, and was even able to coach my team in the biggest game of the season four weeks later. Looking back, I wish I had done some of the things I am doing now to take better care of myself. Some of those things include a better diet, regular exercise, and taking ZOCOR to help significantly lower my total cholesterol. When diet and exercise are not enough, ZOCOR can help people with high cholesterol and heart disease live a longer life by reducing the risk of a heart attack. Important considerations: ZOCOR is a prescription medication, so you should ask your doctor or healthcare professional if ZOCOR is right for you. ZOCOR isn't for everyone, including women who are pregnant or nursing or who may become pregnant, people who are allergic to any of its ingredients, or anyone with liver disease. Unexplained muscle pain or weakness could be a sign of a rare but serious side effect and should be reported to your doctor right away. Your doctor may do simple blood tests before and during treatment with ZOCOR to check for liver problems. Be sure your doctor knows about medications you may be taking in order to avoid any serious drug interactions. With so much to look forward to, don't let high cholesterol and heart disease take you out of the game. For more information call 1-888-850-5526 or visit www.zocor.com. Talk to your doctor to see if ZOCOR is right for you.



ZOCOR
(SIMVASTATIN)

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It's your future. Be there.

ZOCOR[®]

(SIMVASTATIN)

PLEASE READ THIS SUMMARY CAREFULLY, AND THEN ASK YOUR DOCTOR ABOUT ZOCOR. NO ADVERTISEMENT CAN PROVIDE ALL THE INFORMATION NEEDED TO PRESCRIBE A DRUG. THIS ADVERTISEMENT DOES NOT TAKE THE PLACE OF CAREFUL DISCUSSIONS WITH YOUR DOCTOR. ONLY YOUR DOCTOR HAS THE TRAINING TO WEIGH THE RISKS AND BENEFITS OF A PRESCRIPTION DRUG FOR YOU.

USES OF ZOCOR

ZOCOR is a prescription drug that is indicated as an addition to diet for many patients with high cholesterol when diet and exercise are inadequate. For patients with coronary heart disease (CHD) and high cholesterol, ZOCOR is indicated as an addition to diet to reduce the risk of death by reducing coronary death; to reduce the risk of heart attack; to reduce the risk for undergoing cardiac procedures (coronary artery bypass grafting and percutaneous transluminal coronary angioplasty); and to reduce the risk of stroke or transient ischemic attack (TIA).

WHEN ZOCOR SHOULD NOT BE USED

Some people should not take ZOCOR. Discuss this with your doctor.

ZOCOR should not be used by patients who are allergic to any of its ingredients. In addition to the active ingredient simvastatin, each tablet contains the following inactive ingredients: cellulose, lactose, magnesium stearate, iron oxides, talc, titanium dioxide, and starch. Butylated hydroxyanisole is added as a preservative.

Patients with liver problems: ZOCOR should not be used by patients with active liver disease or repeated blood test results indicating possible liver problems. (See WARNINGS.)

Women who are or may become pregnant: Pregnant women should not take ZOCOR because it may harm the fetus. **Women of childbearing age should not take ZOCOR unless it is highly unlikely that they will become pregnant.** If a woman does become pregnant while on ZOCOR, she should stop taking the drug and talk to her doctor at once.

Women who are breast-feeding should not take ZOCOR.

WARNINGS

Muscle: Tell your doctor right away if you experience any unexplained muscle pain, tenderness, or weakness at any time during treatment with ZOCOR so your doctor can decide if ZOCOR should be stopped. Some patients may have muscle pain or weakness while taking ZOCOR. Rarely, this can include muscle breakdown resulting in kidney damage. The risk of muscle breakdown is greater in patients taking certain other drugs along with ZOCOR, such as the lipid-lowering drug Lipid (gemfibrozil), and other fibrates; lipid-lowering doses of niacin (nicotinic acid); Sandimmune (cyclosporine); itraconazole, ketoconazole, and other azole antifungal drugs; the antibiotics erythromycin and clarithromycin; HIV protease inhibitors; and the antidepressant nefazodone. Interruption of therapy with ZOCOR should be considered if you are going to take an azole antifungal medication, such as itraconazole, or macrolide antibiotics, such as erythromycin. Patients using ZOCOR along with any of these other drugs should be carefully monitored by their physician. The risk of muscle breakdown is greater in patients with kidney problems or diabetes.

Because there are risks in combining therapy with ZOCOR with the drugs listed above, your doctor should carefully weigh the potential benefits and risks. He or she should also carefully monitor patients for any muscle pain, tenderness, or weakness, particularly during the initial months of therapy and if the dose of either drug is increased. Your doctor also may monitor the level of certain muscle enzymes in your body, but there is no assurance that such monitoring will prevent the occurrence of severe muscle disease.

If you have conditions that can increase your risk of muscle breakdown, which in turn can cause kidney damage, your doctor should temporarily withhold or stop ZOCOR. Also, since there are no known adverse consequences of briefly stopping therapy with ZOCOR, treatment should be stopped a few days before elective major surgery and when any major acute medical or surgical condition occurs. Discuss this with your doctor, who can explain these conditions to you.

Liver: About 1% of patients who took ZOCOR in clinical trials developed elevated levels of some liver enzymes. Patients who had these increases usually had no symptoms. Elevated liver enzymes usually returned to normal levels when therapy with ZOCOR was stopped.

In the ZOCOR Survival Study, the number of patients with more than one liver enzyme level elevation to greater than 3 times the normal upper limit was no different between the ZOCOR and placebo groups. Only 8 patients on ZOCOR and 5 on placebo discontinued therapy due to elevated liver enzyme levels. Patients were started on 20 mg of ZOCOR, and one third had their dose raised to 40 mg.

Your doctor should perform routine blood tests to check these enzymes before you start treatment with ZOCOR and periodically thereafter (for example, semiannually) for your first year of treatment or until 1 year after your last elevation in dose. Patients titrated to the 80-mg dose should receive an additional test at 3 months. If your enzyme levels increase, your doctor should order more frequent tests. If your liver enzyme levels remain unusually high, your doctor should discontinue your medication.

Tell your doctor about any liver disease you may have had in the past and about how much alcohol you consume. ZOCOR should be used with caution in patients who consume large amounts of alcohol.

PRECAUTIONS

Before starting treatment with ZOCOR[®] (simvastatin), try to lower your cholesterol by other methods such as diet, exercise, and weight loss. Ask your doctor about how best to do this. Any other medical problems that can cause high cholesterol should also be treated.

Drug Interactions: Because of possible serious drug interactions, it is important to tell your doctor what other drugs you are taking, including those obtained without a prescription.

ZOCOR can interact with cyclosporine (Sandimmune), itraconazole, ketoconazole, Lipid, niacin, erythromycin, clarithromycin, HIV protease inhibitors, and nefazodone. (See WARNINGS, Muscle.)

Some patients taking lipid-lowering agents similar to ZOCOR and coumarin anticoagulants (a type of blood thinner) have experienced bleeding and/or increased blood clotting time. Patients taking these medicines should have their blood tested before starting therapy with ZOCOR and should continue to be monitored.

Central Nervous System Toxicity; Cancer, Mutations, Impairment of Fertility: Like most prescription drugs, ZOCOR was required to be tested on animals before it was marketed for human use. Often these tests were designed to achieve higher drug concentrations than humans achieve at recommended dosing. In some tests, the animals had damage to the nerves in the central nervous system. In studies of mice with high doses of ZOCOR, the likelihood of certain types of cancerous tumors increased. No evidence of mutations or of damage to genetic material has been seen. In one study with ZOCOR, there was decreased fertility in male rats.

Pregnancy: Pregnant women should not take ZOCOR because it may harm the fetus.

Safety in pregnancy has not been established. In studies with lipid-lowering agents similar to ZOCOR, there have been rare reports of birth defects of the skeleton and digestive system. Therefore, women of childbearing age should not take ZOCOR unless it is highly unlikely they will become pregnant. If a woman does become pregnant while taking ZOCOR, she should stop taking the drug and talk to her doctor at once. The active ingredient of ZOCOR did not cause birth defects in rats at 3 times the human dose or in rabbits at 3 times the human dose.

Nursing Mothers: Drugs taken by nursing mothers may be present in their breast milk. Because of the potential for serious adverse reactions in nursing infants, a woman taking ZOCOR should not breast-feed. (See WHEN ZOCOR SHOULD NOT BE USED.)

Pediatric Use: ZOCOR is not recommended for children or patients under 20 years of age.

SIDE EFFECTS

Most patients tolerate treatment with ZOCOR well; however, like all prescription drugs, ZOCOR can cause side effects, and some of them can be serious. Side effects that do occur are usually mild and short-lived. Only your doctor can weigh the risks versus the benefits of any prescription drug. In clinical studies with ZOCOR, less than 1.5% of patients dropped out of the studies because of side effects. In a large, long-term study, patients taking ZOCOR experienced similar side effects to those patients taking placebo (sugar pills). Some of the side effects that have been reported with ZOCOR or related drugs are listed below. This list is not complete. Be sure to ask your doctor about side effects before taking ZOCOR and to discuss any side effects that occur.

Digestive System: Constipation, diarrhea, upset stomach, gas, heartburn, stomach pain/cramps, anorexia, loss of appetite, nausea, inflammation of the pancreas, hepatitis, jaundice, fatty changes in the liver, and, rarely, severe liver damage and failure, cirrhosis, and liver cancer.

Muscle, Skeletal: Muscle cramps, aches, pain, and weakness; joint pain; muscle breakdown.

Nervous System: Dizziness, headache, insomnia, tingling, memory loss, damage to nerves causing weakness and/or loss of sensation and/or abnormal sensations, anxiety, depression, tremor, loss of balance, psychic disturbances.

Skin: Rash, itching, hair loss, dryness, nodules, discoloration.

Eye/Senses: Blurred vision, altered taste sensation, progression of cataracts, eye muscle weakness.

Hypersensitivity (Allergic) Reactions: On rare occasions, a wide variety of symptoms have been reported to occur either alone or together in groups (referred to as a syndrome) that appeared to be based on allergic-type reactions, which may rarely be fatal. These have included one or more of the following: a severe generalized reaction that may include shortness of breath, wheezing, digestive symptoms, and low blood pressure and even shock; an allergic reaction with swelling of the face, lips, tongue and/or throat with difficulty swallowing or breathing; symptoms mimicking lupus (a disorder in which a person's immune system may attack parts of his or her own body); severe muscle and blood vessel inflammation; bruises; various disorders of blood cells (that could result in anemia, infection, or blood clotting problems) or abnormal blood tests; inflamed or painful joints; hives; fatigue and weakness; sensitivity to sunlight; fever, chills; flushing; difficulty breathing; and severe skin disorders that vary from rash to a serious burn-like shedding of skin all over the body, including mucous membranes such as the lining of the mouth.

Other: Loss of sexual desire, breast enlargement, impotence.

Laboratory Tests: Liver function test abnormalities including elevated alkaline phosphatase and bilirubin; thyroid function abnormalities.

NOTE: This summary provides important information about ZOCOR. If you would like more information, ask your doctor or pharmacist to let you read the complete prescribing information and then discuss it with them.

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 **MERCK**
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Small Shop Tips



SAW TABLES
AND BENCHES
AT THE SAME
HEIGHT

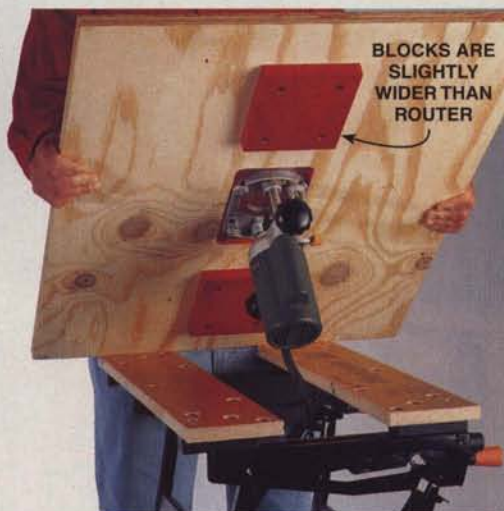
TABLESAW
ON
CASTERS

WORKBENCH
ON CASTERS

Make a Level Playing Field

I have to share my shop with a couple of cars—not always easy. But I've made the most of it with workbenches and tool tables built at the same height. My radial-arm saw is the center of my woodworking universe and stays against the wall, but everything else is on casters. When I'm ready to work, I arrange tools and benches so the table of one acts as a table extension for the other. After I'm done, the tablesaw and benches get pushed back against the walls leaving plenty of room for the cars.

Nathan Peterka



BLOCKS ARE
SLIGHTLY
WIDER THAN
ROUTER

Workmate Router Base

A Black & Decker Workmate (\$70 at home centers and hardware stores) makes an easy-to-store stand for your router table. Screw a pair of blocks that are wider than your router under the router table for the Workmate to grasp. The 8-3/8-in. opening of the Workmate is big enough to handle any router and the 31-in. high table is an ideal working height. When you're done routing, the Workmate folds flat and the router table can be hung on the wall.

Phil Rippentrop

Self-Stick Pushstick

A pushstick is an essential piece of safety equipment for your tablesaw. But, it can't do its job if it's not right there when you need it. I use magnets to keep my pushstick from getting lost. Just drill a couple shallow holes into the handle so the magnets are flush with the surface and epoxy them in. Now your pushstick can be conveniently fastened to any nearby metal surface (like the back of your fence) and is always within reach.

Magnets available from: Woodcraft Supply, (800) 225-1153, www.woodcraft.com, #128473, \$5, pack of 10.

Sophie Kish

Small Shop Tips

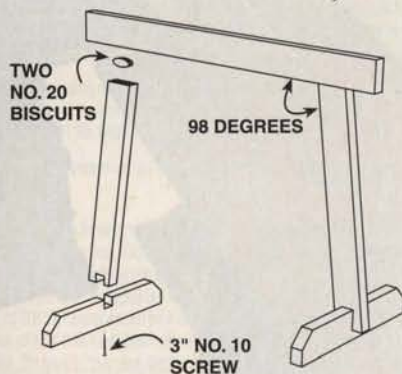
Nesting Sawhorses

Here's a real lifesaver in a small shop. These horses are lightweight, strong and designed to nest tightly together for easy storage. They can be built from 2x4s and put together with biscuits for less than \$10 a pair. (Mill the 2x4s to 1-1/4 in. by 3-in. so they're flat and square.) I've been using a pair of horses like these for years and they continue to serve without complaint. Size your horses however you



like, keeping the angle of the legs at 98 degrees for stability. Cut the notches that join the foot to the leg on your bandsaw. Attach the foot with glue and a screw run up through the bottom.

Randy Winter



Perf-Board Extenders

Here's an easy way to expand the capacity of your perf-board hangers:

Drill the ends of several 3-in.-long dowels (1/2-in. dia. works great) and glue them on the metal hangers with epoxy. Now bulky items like extension cords and rolls of tape can join the smaller tools on your wall.



Walt Clauson

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Swing-Up Grinder

Grinders are great tools, but if your shop is as cramped as mine, their occasional use doesn't justify a permanent spot on your workbench. Try hinging your grinder to keep it handy but out of the way when not in use. A pair of 6-in. strap hinges and a 12-in. hook and eye with an extra eyebolt is all you need to build this swing-up grinder base.

First, bend one strap around the end of the bench. Just mark the bend and clamp it in a vise so the mark is just above the jaws. Now hammer it over. Mount the grinder on a block of wood and mortise in the hinges so the block sits flat on your bench. Add an eyebolt toward the back of the block and mount the hook and eye under the benchtop to hold the grinder in place when it's stored. **AW**

Darrel Schulstad

If you have an original Small Shop Tip, send it to us with a sketch or photo. We pay \$200 for each one we print. Send to: **Small Shop Tips, 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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Basic Bed Design

There are some things you just have to get right when you design a bed. Whether the bed is a reproduction of a classic style or a crazy work of modern art, I've learned that there are three basic rules to follow:

■ **Fit:** Size a bed so a standard box spring and mattress fit comfortably within it.

■ **Sturdiness:** Rely on tried and tested methods of joinery that'll survive your tossing and turning, pillow fights and hours of trampoline practice.

■ **Portability:** Build your bed so it can easily knock down into units that can be moved around the house, especially up and down stairs.

Basic Measurements

How big is a queen-sized mattress? There are standards for length and width, but the answer depends on who made it. Here's a chart of the minimum distances between rails for average mattress and box spring sets (Fig. B). Your bed frame will outlast its box spring and mattress, so if they are on the small side, don't design the frame so it will be too small for the next set.

There's no standard for the thickness of a mattress, but most manufacturers design beds so that the top of the mattress is 30 in. above the floor. To design your bed and locate the position of the rails, you'll have to work backward from the top of your mattress on down (Fig. C).

Your headboard design must take into account the 30-in. mattress height, too. The lower rail should be out of sight behind the mattress. The top rail can be as high as you want, but most commercial beds use a minimum height of 16-in. above the mattress to support your head and pillows (Fig. A).

continued on page 43

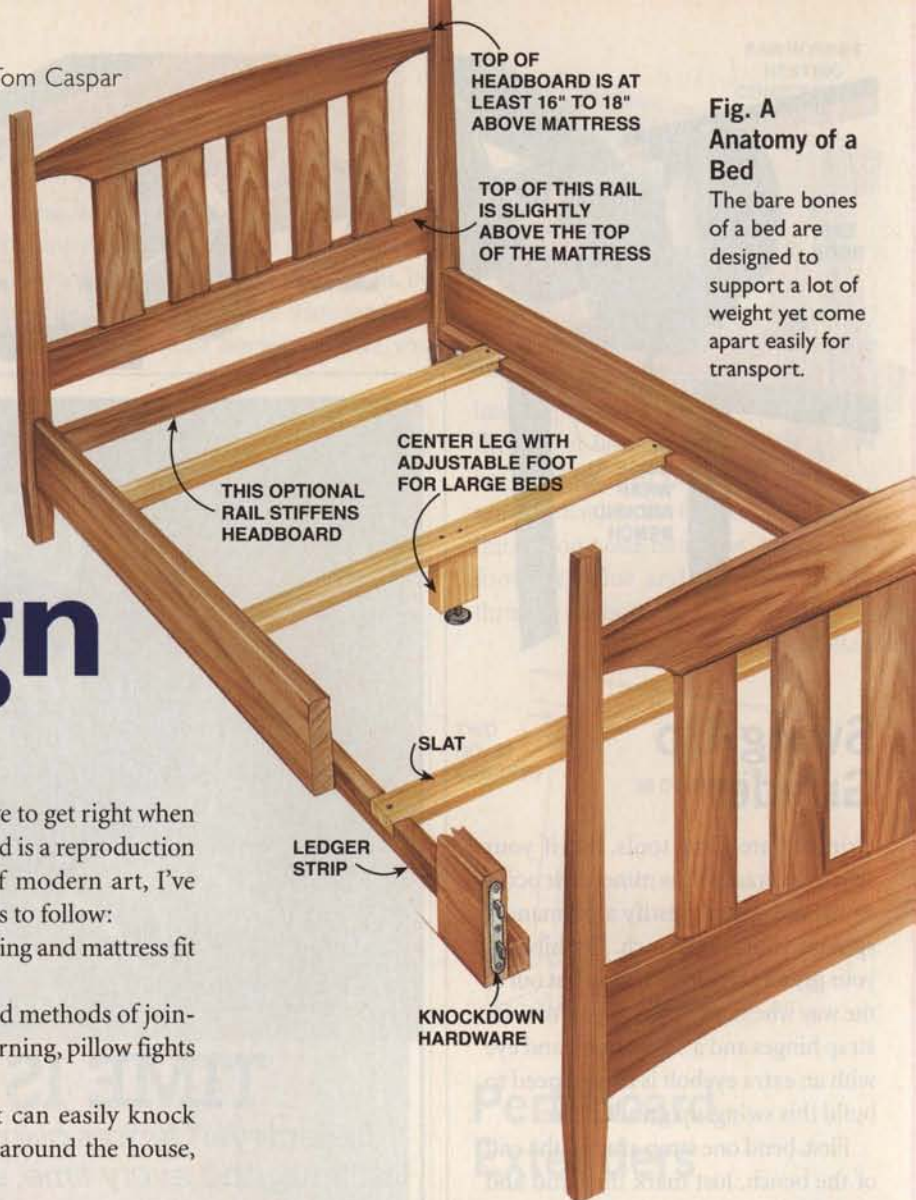


Fig. A
Anatomy of a Bed

The bare bones of a bed are designed to support a lot of weight yet come apart easily for transport.

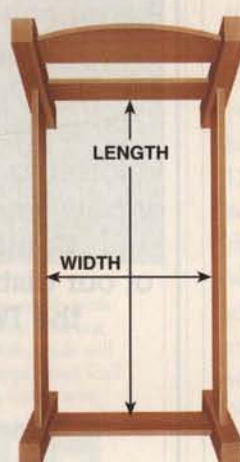


Fig. B
Overall Bed Measurements

This chart gives the dimensions between rails, including a clearance space, for standard-size beds. Measure your mattress and box spring before you build, however, because its actual size may vary from the average.

	W*	L**
Twin	38-1/2"	76"
Twin extra long	38-1/2"	81"
Double (Full)	53-1/2"	76"
Double extra long	53-1/2"	81"
Queen	60-1/2"	81"
King	77"	81"

*Width includes 1/4-in. clearance between each side rail and mattress.

**Length includes 3/4-in. clearance between each end rail and mattress.

Source: Sleep Products Voluntary Guidelines, published by the International Sleep Products Association.

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New Laser Level provides pinpoint accuracy for precise measurements...for almost any home improvement task.

Do you ever watch home renovation shows on TV and wonder how they manage to complete their projects so quickly? In about the time it takes me to find my missing screwdriver, they've installed eight ceiling fans and built a deck. Maybe it's all those

people behind the scenes, but I know one thing that helps them complete jobs so quickly: laser technology. Now, an innovative company has introduced a space-age level that is the ultimate in precision.



Measure like the professionals

Laser provides ultra-accurate measurements up to 1500 ft.



- Lay perfectly straight floor tiles



- Ensure that walls are level



- Never hang a crooked picture again

Do-It-Yourselfer's dream. The Laser Level is a 16-inch machined aluminum level with an incredible laser light. It can project a dot or a line on any surface... at a distance of up to 1500 feet! That means that anytime you need to line something up or make it perfectly level, all you do is turn on Laser Level and mark the spot. It features high quality horizontal and vertical bubble levels. The handy lens refractor clips onto the end of the unit, letting you select the line or the dot image. The level includes a threaded tripod mount and is inscribed with a ruler with indications to 1/8 inch. It's perfect for everyone from contractors and engineers to interior designers and home craftsmen.

Risk-free precision. Now you don't have to be a TV Tool Guru to use the latest measurement technology. The Laser Level comes with a 90 day manufacturer's limited warranty and TechnoScout's exclusive home trial. If you are not satisfied for any reason, simply return it within 30 days for a complete "No Questions Asked" refund.

Years of research and testing result in electro-magnetic pest control breakthrough

PestContro™ uses electro-magnetic and ultrasonic technology to control a variety of pests in your home safely, silently and effectively.

PestContro combines electro-magnetic technology and ultrasonic waves to solve a variety of household pest problems. This amazing device uses your home's existing electrical wiring to create a shifting electro-magnetic field. This creates an environment that is uncomfortable for pests, driving them from their hiding places in walls, ceilings and floors. Simultaneously, a harsh, ultrasonic siren blasts sound from the unit's dual speakers. This sound is inaudible to humans, but it creates an incredible disturbance for pests.

Versatile Pest Control

- Roaches
- Mice
- Rats
- Squirrels
- Other pests...



the dual speakers each blast 120 dB of ultrasonic sound.

Safe and effective. PestContro is harmless to children and household pets, such as cats, dogs, fish and birds. The unit features a two-setting intensity selector that allows you to adjust the setting for those household pets that may be affected by certain pitches, like lizards, hamsters and gerbils.

Just plug it in. Simply place the PestContro unit in a centrally located area and it goes to work immediately, using a new technology called "phase-shift-current." By shifting the electro-magnetic field throughout the home's wiring, it controls pests in the walls, ceilings and floors, where the majority of pests live. This interference covers an area of up to 5,000 square feet. Then,

Practical features. The Random On/Off setting automatically turns each speaker on and off randomly to keep pests from becoming accustomed to the ultrasonic sounds. There's even a Floor Night Light for placement in a hall or dimly lit area. PestContro is registered with the EPA and is UL approved. Since it uses less electricity to operate than a 40 watt light bulb, it costs just pennies a day to operate.

Repel pests from your home...risk-free. PestContro comes with a two-year manufacturer's limited warranty and TechnoScout's exclusive risk-free home trial. If you are not satisfied for any reason, simply return it within 90 days for a full "No Questions Asked" refund.

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Practical Design

Supporting Weight

Have you ever had a bed collapse under you? It's not a pretty sight, lying on the floor with bed parts all around you and the whole house in an uproar wondering what in the heck was that awful noise! A bed has to carry a lot of weight, and a constantly shifting weight at that. A bed can fail either at the connection between the rails and slats or at the joint between the rails and bedposts. Here are some design tips to help you prevent a derailment.

■ Screw the slats and ledger strips together (Fig. D). Notch the ledger strips to receive the slats. This keeps the slats from twisting sideways when you move around in bed. Then run screws through the slats into the ledger strips. This makes the slats and rails into one large unit. If you push down in the center of a slat, it can't be pulled out of the notch.

■ Make strong slats. Box springs are generally strong enough without slats, but they will last longer if slats support them. Three slats made of a stiff wood such as Southern yellow pine, yellow birch or soft maple are usually enough. Add a fifth leg under the center slat of king- and queen-size beds to further support your box spring (Fig. A). Install an adjustable foot on the leg to compensate for an uneven floor.

Knockdown Hardware

Beds should be easy to take apart, but absolutely rigid when put together. My favorite knockdown hardware never comes with installation instructions (see Sources, page 45). If it's not put in the right way, you'll end up with a bed that may be easy to put together but wobbles like crazy.

The trick is to make the hardware force the rail tight up against the post (Fig. E). The more you push down on the rail, the tighter the joint should get. Install the hooked plates on the ends of the rails first, then experi-

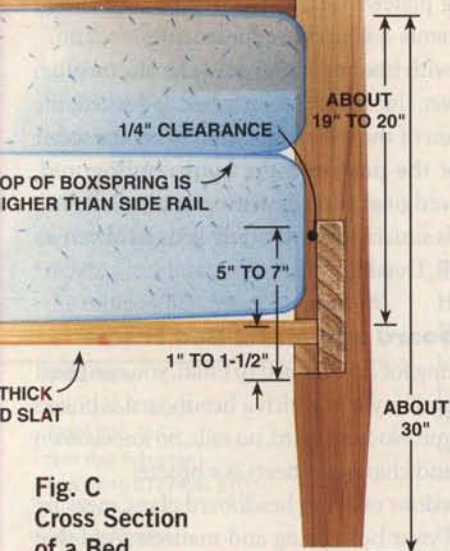


Fig. C
Cross Section
of a Bed

To locate the height of your bed rails, measure from the top of the mattress down. Mattress thicknesses vary so much that you won't be able to use a standard number, so base your measurements on the actual box spring and mattress you'll use on the bed.

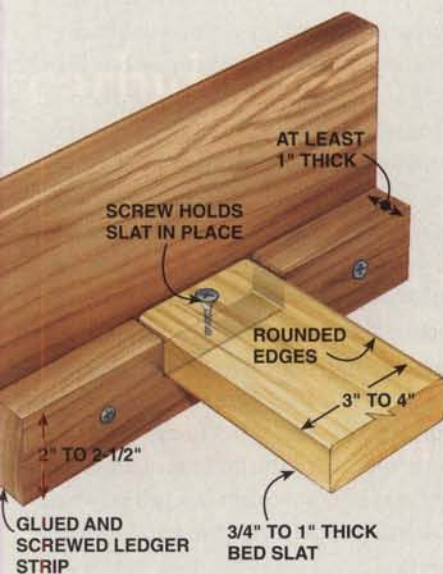


Fig. D
Bed Slats

Bed slats should be flush with the top of the ledger strips so both can directly support the box spring. A notch and screw keep the slat securely in place. Round over the slat's edges so they're comfortable to handle.



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MORTISE RECEIVING PLATE
ABOUT 1/16" BELOW
SURFACE OF POST

Practical Design

Fig. E Hooked Bed Rail Fasteners

Commercial fasteners are cleverly designed to tighten up as you put more weight on them. There's a bevel on the inside of the hook that wedges the bed rail tight to the post.

USE 2" LONG
#10 SCREWS IN
END GRAIN

MORTISE
HOOK PLATE
FLUSH WITH
END OF RAIL

Detail: The hook shouldn't bottom out, so mortise the receiving plate slightly below the surface of the bedpost.

BEVELED
HOOK

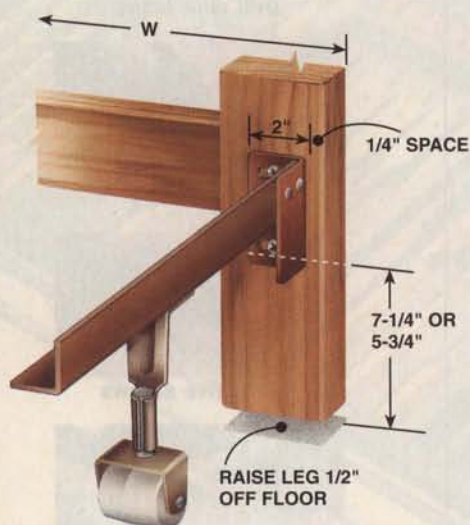


Fig. F Dimensions for a Hollywood Bed

The easiest kind of bed to build is a simple headboard attached to a metal frame. Frames come in two standard heights. When you install your headboard, leave a 1/2-in. space under the legs so they don't drag on carpeting when you move the bed for cleaning.

Headboard Width*

Twin	39"
Double (Full)	54"
Queen	61"
King	77"

*Width is approximate. Measure your metal frame before building your headboard.

Fig. G Traditional Canopy Bed

The rails of old high-post beds were thick and stout to withstand the strain of tightened ropes.

TIGHT ROPES
SUPPORT
MATTRESS

COVER PLATES
HIDE BED BOLTS

ment with a mock-up post to find the correct depth for the receiving plate's mortise. Deepen the mortise in small increments—it's a fine adjustment.

Old beds with hooked knockdown hardware often loosen up over the years. When a bed is rocked, the hard end grain of the rail crushes and dents the softer face grain of the post, and the hooks bottom out. There's no wedging and tightening action left. You can avoid this situation by installing your hardware as shown (Fig. E, Detail).

Headboard and Metal Bed Frame

If you're looking for an easy bed to build, you can't beat the "Hollywood" style in which a headboard is bolted to a metal frame. No foot board, no rails, no knockdown hardware—and changing sheets is a breeze!

Before you draw out your headboard plans, measure the height of your box spring and mattress. Add that number to the standard height of a metal frame (Fig. F) to calculate the height of the lower rail of the headboard (it's even with the top of the mattress) and the headboard's top rail. Use the chart to determine the width of the headboard.

Beds with Narrow Rails

Reproducing a traditional bed with narrow rails presents two design problems (Fig. G). First, the rails are so high off the ground that ledger strips would raise a modern box spring and mattress up way too high. Second, the bed has to come apart, but standard hooked knockdown hardware won't fit on the end of the rails.

Those old rails were narrow and thick for a good reason. Mattresses were once supported by a network of ropes that wound through holes in the rails or around pegs attached to the top of the rails. The ropes were tightened regularly with a wooden winch to provide a springy support for the mattress (from which comes the good night wish to "sleep tight"). Tight ropes bow the rails inward, so that's why they were so thick.

I don't suppose you'll want ropes under your mattress, but you may want to imitate the look of those classic beds. Or you may have a modern design that would look best with narrow rails. Here are two solutions to the design problems:

■ Support the box spring and mattress with iron hangers (Fig. J). Use at least three on each side. You can have an ornamental ironworker make them for you or buy them commercially (see Sources, page 45). Mortise them into the rail to protect your fingers from sharp edges when you make the bed. Lock each slat in place by dadoing its bottom face and running a screw through the hanger.



Practical Design

■ Join together all the rails and posts with nuts and bolts (Fig. H). You can buy hardware very similar to what was used 200 years ago (see Sources, below) or use standard nuts and bolts from the hardware store. The specialty hardware is expensive and requires a special wrench, but the bolt comes with a tapered end that easily threads into the trapped nut. Sweet dreams. **AW**

Sources

Woodcraft Supply
(800) 225-1153
Bed Rail Fastener
(set of 4), #127456, \$10.

Horton Brasses
(800) 754-9127
www.hortonbrasses.com
Bed Bolts, #H-73, 6 in., \$3.50; 7 in., \$4.
Bed Wrench, #BW-3, \$9.
Bed Irons, #H-550 (6 sizes),
\$5 to \$8 ea.
Bed Bolt Cover Plates, many
available, \$3 ea.

Fig. H
Bed Bolt Fasteners

Traditional bed bolts provide a strong joint for a narrow rail. A stub tenon on the end of the rail carries the weight. A long bolt pulls the joint tight.

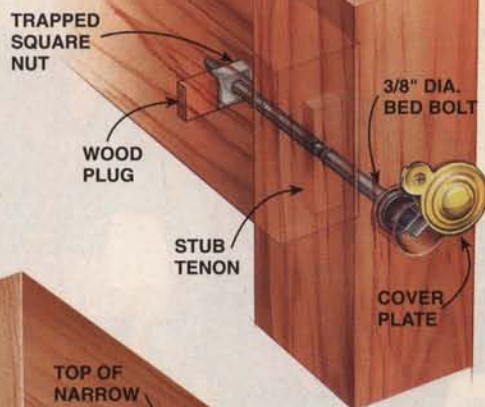
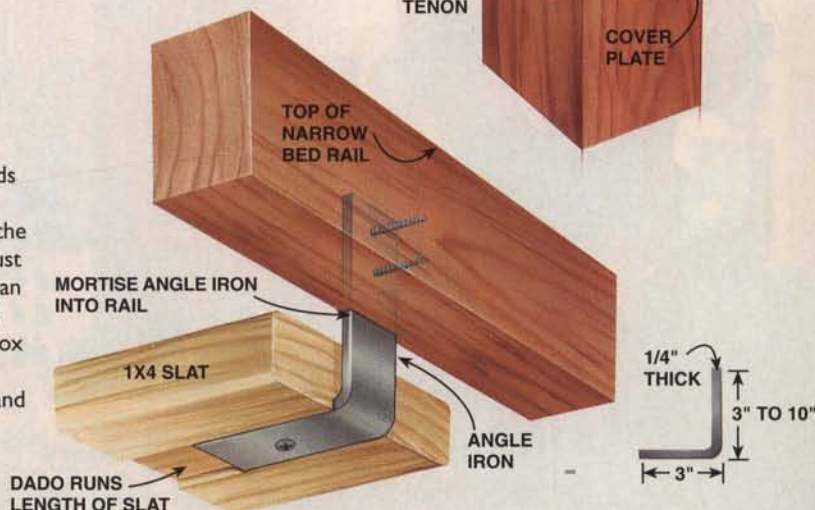


Fig. J
Hanging Bed Slats

Use metal hangers on traditional beds with narrow rails because the box spring must hang lower than the rail. A bed skirt on the box spring hangs over the rail and hides the hardware.



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Like this extension table? See page 104.



by George Vondriska

BANDSAW RESAWING

**Cut logs into lumber,
make thin boards from thick
and cut your own veneer.**

Perhaps you want to cut 3/4-in.-thick material down to 3/8 in., or make veneer from that one precious figured board. Or maybe you want to get useful lumber from a gorgeous piece of wood in your firewood pile. The technique that makes this possible is resawing. Although it just plain baffles some woodworkers, once you get the hang of it, you'll be surprised at what you can do, even on a small bandsaw. Here's what you need to make it all happen: blade selection, shop-made jigs, setup and cutting tips.

Why Resaw?

One big reason: money. If you want thin stock for small boxes or drawers, it's a lot cheaper to make your own than to buy it. Some wood dealers actually make thin stock by planing down 4/4 material, so it ends up being *more* expensive to buy less wood!

With wood prices going through the roof, making veneer can stretch your woodworking dollars. Slicing veneer on your bandsaw can change one bd. ft. of

precious, expensive wood into six sq. ft. of veneer.

You can also transform those dusty chunks of apple or crotch wood out in your garage into free lumber by resawing. You could make a project entirely from a tree felled in your own yard. Resawing gives you access to the marvelous possibilities of free or cheap local logs.

Tool Up:

Blade Selection and More

Just about any bandsaw will do acceptable resawing. For example, all the cuts made in this story were done on an inexpensive, 14-in. bandsaw with a 3/4-hp motor. All we did to the saw was add a riser block to increase its capacity. Granted, pushing a saw too hard can bog it down, or even pop a circuit breaker. So take it easy. If you plan to do lots of resawing, see page 51 for more on larger and souped-up machines.

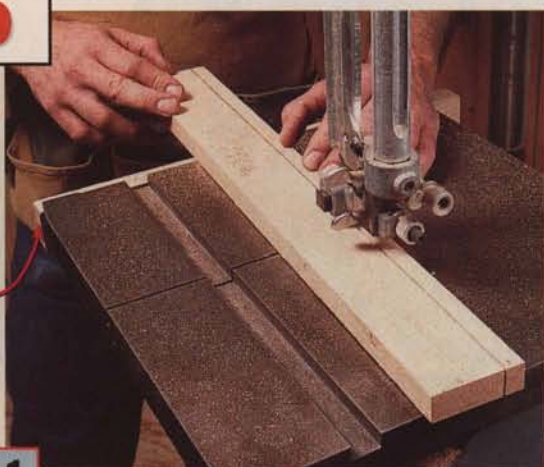
Use the widest blade your saw can handle: 1/2 in. or 3/4 in. for most saws. Wide blades make it easier to cut a straight line.



RESAWN DOOR PANELS of spalted maple.
"Owl" cabinet by Rich Gotz, Minneapolis, MN
photo by Popular Front Studio

Tip

IF THE FRONT OF YOUR BANDSAW TABLE ISN'T STRAIGHT, screw on a strip of hardboard or aluminum bar. This will make it much easier to move and adjust a shop-made fence.



1

FIND THE DRIFT angle by drawing a line parallel to one edge of a 16-in.-long scrap piece. Saw the line freehand. Notice how much you have to angle the wood in order to follow a straight line. This is the drift angle.

Look for a blade with four teeth per inch and a hook tooth pattern. The hooked teeth give you big gullets (the valleys between the teeth) to clear the sawdust from the cut and help the blade run cool. Heat is a blade's biggest enemy. Resawing pushes your saw's motor to the max, so make it easier on your saw by always using a sharp blade.

I've had perfectly acceptable results resawing with bi-metal blades and *great* results resawing with silicone-carbide, low-tension blades (see Sources, page 50). These blades leave an excellent surface finish and, due to their thin kerf and low tension, don't take as much power to drive. These blades make it easier to resaw thick stock on any saw. If you need help adjusting your saw, see AW #74, August 1999, page 47.

An auxiliary table helps and is a must for cutting logs. Check out our shop-made table system on

The ABCs of resawing:
Allow the saw to make the cut.
Blades must be sharp and sized for the job.
Compensate for drift.
Don't overfeed.

When Good Cuts Go Bad

So you've mastered the setup, but you're still having problems? Here are some tips:

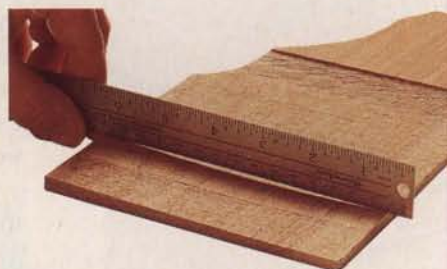
- Look for these symptoms when you make your test cut: If the board pulls away from the fence on the outfeed side (Photo 4), the outfeed end of the fence is angled too far away from the blade. If the board you're cutting binds as you're slicing it, the outfeed end of the fence is angled too close to the blade. Make an adjustment and try another test cut.
- Always use a sharp blade.
- Keep your feed rate slow. Listen to your saw and slow down if it's bogging down.
- Use a blade with the right tooth count. Too many teeth make it hard for the blade to clear the sawdust.

● Even with everything correctly set, your wood may not cooperate. Wood can sometimes be imperfectly dried, and react after it's been cut (photo, right). The only solution is cutting your stock thick enough to plane out the cup after resawing.

● Tension your blade. Too little tension can lead to barrel cuts (photo, right). Check the tension by unplugging the saw, raising the upper guide and pushing on the side of the blade. The blade shouldn't deflect more than 1/4 in.



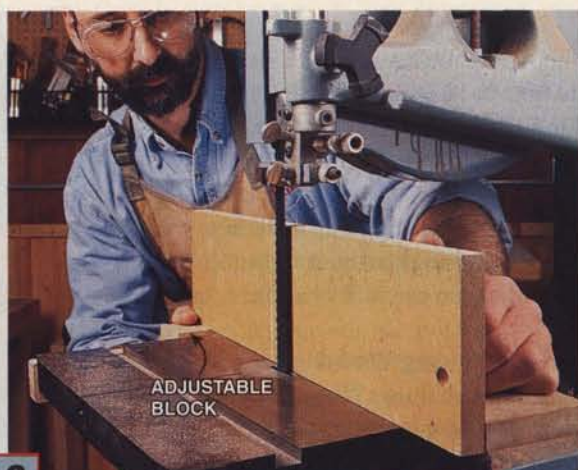
SETUP FOR THIS RESAW WAS PERFECT, but the wood warped after it was cut. It must now be carefully planed to remove the cup.



LOW BLADE TENSION can cause barrel cuts.



- 2 STOP** about halfway through the cut, hold the wood in place and shut off the saw. Trace the angle of the wood onto the bandsaw table.



- 3 SET YOUR FENCE** parallel to the line on the table. An adjustable block at the end of the fence allows you to hold this angle as you move the fence laterally. Make sure your table is square to the blade and your fence is square to the table.

page 104. Resawing also requires a fence. Some bandsaw manufacturers have fences available for their saws (\$75 to \$100), or you can make one (page 104). The fence should be high enough to support the material you're cutting and adjustable to compensate for blade drift.

Don't forget dust collection. Resawing produces lots of dust and it's typically pretty fine. Admittedly, dust collection attachments on most bandsaws aren't great, but whatever you have is better than nothing. If you find lots of dust buildup on your tires, unplug the saw and clean the tires with a rag moistened with mineral spirits. Clean tires help your saw perform better.

Get the Drift: Setup Tips

If you've tried cutting a straight line on your bandsaw, you probably noticed that your material has to be fed at an angle to the blade. This is called "blade drift." Any resaw technique that uses a fence requires finding and working with this drift angle. Drift varies from blade to blade, so follow this simple setup procedure (Photos 1 through 4) every time you change blades.

Logs to Lumber: Cutting Tips

If your firewood pile puts visions of potential projects into your head, use resawing to turn those logs into planks.

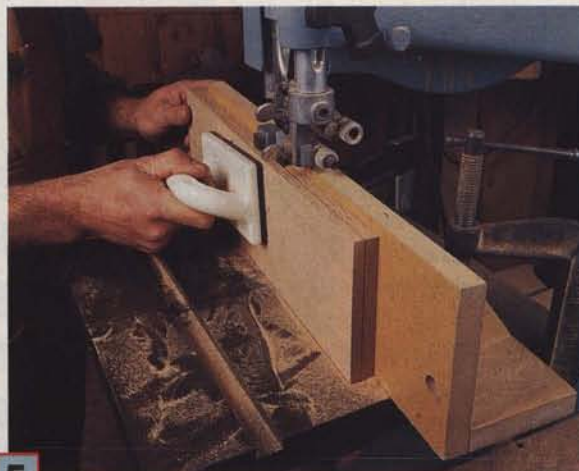
You can cut logs when they're wet or dry, but they'll be easier to cut when wet. Either way, you'll have to dry the lumber all the way before you use it for a project (see "Drying Wood," page 50).

The diameter of the logs you cut is limited by the capacity of your saw: 6 in. on most 14-in. saws. If you want to cut bigger stuff, see if the manufacturer of your saw makes a riser kit. It can increase the capacity of your saw by another 6 in.

A bigger table on your saw is almost a must when handling logs. It's nearly impossible to cut a straight line



- 4 CLAMP THE FENCE** and make a test cut. Watch for the wood pulling away from the outfeed side of the fence or binding. It can take a couple tries to get the drift angle perfect. Once the drift angle is correctly set, move the fence laterally to make the cuts you need.



- 5 POSITION THE FENCE** and resaw your board! Be sure to use a push block and pushstick to keep your fingers well away from the action.

without one. You'll also need a sled to hold onto the log and prevent it from rolling while you cut (Fig. A). Once you use the sled, you'll love the stability it gives you for these difficult cuts. Green logs measuring 11 in. in diameter and 36-in. long are about at the top end of what you can safely handle.

Drying Wood

Remember one thing: When it comes to drying, slower is better.

- Before cutting the log, paint the end grain. This seals it and slows down the drying process so you don't get lots of cracking. I use whatever extra paint I have around the house, though for green wood, latex is best.

- If the bark stays on the planks you cut, leave it on. Like painting the ends, the bark slows down drying.

- Stack the planks where air can flow over them, but not in direct sun. Place a couple stickers (1x2s) between each plank so the air can move freely around the wood.

- Be patient. Air drying can take as long as one year per inch of thickness. Follow initial drying with a year of storage indoors so the boards equilibrate to indoor moisture levels.

- With small planks, use the weighing technique to monitor drying. Weigh the planks after you cut them and use chalk or a marker to record the weight on the wood. Weigh them again every few months. When the weight stops changing, moisture is gone from the wood. Moisture meters are, of course, the most accurate way to gauge the moisture content (see Sources, at right).



SAWN AND STICKERED ASH
from the firewood pile.

STICKER



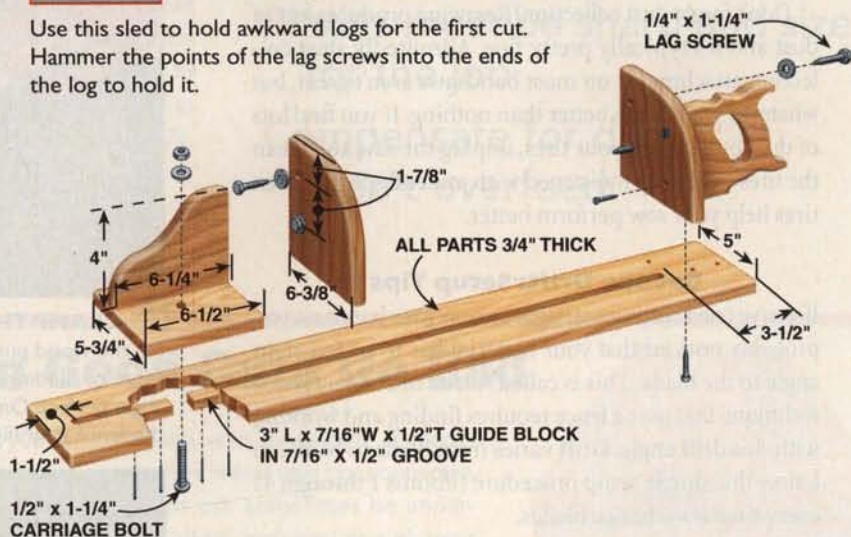
6 DRAW A LINE down the middle of the log using a pencil and straightedge, or snap a chalk line. With the log secured into the sled, saw the log in half.



7 SET UP A FENCE to resaw the boards. Run one face of your halved log against the fence, and keep going until you've cut the entire log.

FIG. A Sled for Resawing Logs

Use this sled to hold awkward logs for the first cut. Hammer the points of the lag screws into the ends of the log to hold it.



Sources

Low-tension blades, approx. \$25, depending on length; PS Wood Machines, (800) 939-4414.

Cool Blocks push pads; \$15 Woodworker's Supply, (800) 645-9292.

Motors; Grizzly, \$200 (800) 523-4777.

Guide bearings; Carter Products, \$150 (888) 622-7837.

Moisture meters; \$150 Electrophysics, (800) 244-9908; Protimeter, (800) 321-4878; Wagner, (800) 944-7078.

Medium-sized bandsaws; check the AW Buyer's Guide at americanwoodworker.com for complete specifications.



8 POSITION THE FENCE so the veneer is being cut from the side of the board away from the fence. Although this means moving your fence for each cut, it gives the best results. Use a push block and keep an eye open for the blade blowing out through the face of the veneer. After your first cut, smooth the face of the board with a planer or jointer, and re-position the fence. Repeat until the piece is down to 1/2-in. thickness. This is about as far as you can safely go.

Veneer

Resawing lets you cut your own veneer. This home-sawn veneer has many advantages. It lets you stretch your material by getting lots of sq. ft. out of a single board. Veneering a panel with shop-sawn veneer gives the stability and design options of commercial veneer, but with the appearance of solid wood. And because this veneer is thicker than commercial veneer, you can gently round over the edges without cutting into the substrate. You can make veneer from any unusual wood you find, including crotch, spalted and burl woods—stuff you may not be able to buy from the best veneer supplier. When cutting veneer, always be sure the wood is completely dry before you begin.

A good thickness for your shop-made veneer is 3/32 in. It's thick enough to work with, but thin enough to be stable. When sawing, use a fence that's as tall as your material is wide so you have good support, and make sure your fence and blade are perfectly set up. Bandsawn veneer can be edge glued with light clamp pressure.

RESAWN VENEER

from a precious board of burl.



Bandsaw Upgrades

For frequent resawing, consider getting a larger saw or souping-up the one you have.

You can upgrade to a 1-1/2-hp motor for about \$200. At that price, a motor upgrade only makes sense if a slow feed rate is absolutely killing you, or you have to replace the motor for other reasons. Be sure to maintain the same shaft diameter, rpm and rotation direction as your original motor.

Changing your guide blocks to bearing-style guides

(Photo 9) means investing about \$150. The bearings on these guides are designed to run in contact with the blade, eliminating the friction you get from guide blocks. Less friction means less heat and longer blade life. Most of the heat in resawing, however, comes from the blade's contact with the wood. Because bearings can be used in contact with the blade, they can help the blade run straighter, resulting in less drift.

Similarly, nonmetal Cool Blocks (\$15) can be run directly against the side of your bandsaw blade. While they won't help the blade run straighter like bearings can, they do make set-up easier. You don't have to worry about spacing the blocks away from the blade.

For increased capacity, look for a riser block (\$110) for your saw. These blocks aren't available for all saws, but if you can get one you can increase the saw's capacity by 6 in. They're available for some saws from Delta, Grizzly, Jet and Ridgid. Riser blocks are saw-specific, so be sure you get the one designed for your saw's specific make and model.

Before dropping too much dough on your bandsaw, remember that \$1,000 to \$1,800 gets you a brand new saw with big capacity, a monster motor, and guide bearings. These big boys are the ultimate resaw machines. **AW**



9 GUIDE BEARINGS INSTEAD OF GUIDE BLOCKS (shown here without the guard) can help bandsaw blades run straighter. They cost about \$150, and are available for virtually any saw (see Sources, page 50).



10 MEDIUM-SIZED BANDSAWS (16 in. and 18 in.) are excellent for resawing, with larger motors, wider blades and larger tables. Prices are generally \$1,000 to \$1,800.

Greene and Greene style



By Tim Johnson



Side Table



Why make an ordinary table when you can make this elegant one instead? The difference is in the details. That's the genius behind the furniture of Charles and Henry Greene, California architects and furniture designers active during the first quarter of the 20th century. Through thoughtfully designed details, they combined the flowing, organic curves found in traditional Chinese furniture with the hard-edged lines and pronounced joints of the popular Arts and Crafts style.

Eight Details

Transform an Ordinary Table



Protruding Joinery

Extending the ends of the stile and rail accentuates an ordinary slip joint.



Rounded Edges

The Greenes replaced sharp edges with rounded ones that are easy on the hands and eyes.



Carvings

Simple carvings done with ordinary bench chisels accent the lifts on the aprons.



Pronounced Pins

Pins, a hallmark of hand joinery, usually aren't functional in Greene and Greene pieces. They're purely decorative—made of ebony, square, left proud of the surface and gently rounded.

Joint Reveals

The edges of flush-fitting joints are rounded, creating shadow lines that catch the eye.



Marble

A piece of marble adds beauty, color and texture without being visually dominant. It's also a practical surface for drinks and plants.



Lifts

Lifts break the monotony of a straight line with S-shaped transitions.



Tapered Legs

The subtle, inverted taper on the outside edges of the legs is virtually invisible, yet it's responsible for the table's graceful appearance. Square, untapered legs would look out of proportion—they'd either be too wide at the top or too narrow at the bottom. Tapering gives the base a firm stance while keeping the top of the leg proportionate to the understated overhang of the top.

Although this table isn't a replica of a specific Greene and Greene piece, it incorporates many of the details they used—accentuated joinery, decorative pins, lifts and rounded edges. It's made from walnut, one of several woods they favored. Overall cost for the project is about \$150. You'll need at least 10 lineal feet of 2-in. square stock for the legs (about \$40). It's easiest to use 5/4 stock for all the other pieces—10 bd. ft. will be plenty (about \$60). As on original Greene and Greene pieces, the pins are ebony. A piece of ebony like the one in Photo 6 costs about \$35 (see Sources, page 61).

The marble inset in the top is a 12-in.-square floor tile. Marble tiles are available at flooring stores and cost about \$10 apiece. Have the marble in hand before you cut any of your lumber. Tiles can vary as much as 1/4-in. from the specified dimensions. You'll have to change the lengths of the stiles and rails for the top and the aprons and stretchers for the bottom if your tile is not exactly 12 in. by 12 in.

Make the Top

It's easy to make the protruding ends that accentuate the top's joinery. Just make the tenons longer and the slots deeper than the widths of the stiles and rails (see Photos 1 and 2, and Fig. B, Detail 1). Assemble the top pieces and mark the inside edges (they receive a smaller roundover). Then test the fit of the marble. The plan measurements allow 1/16-in. clearance for it. If you want a tighter fit, remove a bit more from the tenon shoulders and make the slots a bit deeper.

Mortise holes for the ebony pins in the top stiles and rails. You'll need only two fence settings to cut all of these holes (Photo 3 and Fig. B, Detail 2). Next, round over the ends of the rail tenons and the stile legs with a 3/16-in. radius bit (Photo 4). Use the same bit to round the *outside* edges of the stiles and rails, top and bottom (Fig. B, Detail 1). Create joint reveals between the stiles and rails by routing the rail shoulders and all top and bottom *inside* edges with a shortened 1/8-in. radius round-over bit (Photo 5). Then glue the top together.

Make ebony pin blanks (Photo 6). Seat them with a hammer and a bit of glue, saw them off (Photo 7) and round their tops (Photo 8).

Make the Legs

Rout lifts at the bottom of adjacent *inner* sides of the leg blanks (Photo 9 and Fig. B, Detail 3). Then taper the two *outer* sides (Photo 10 and Fig. B, Detail 2).

Cut mortises for the haunched apron tenons on the two inner sides of each leg (the sides with lifts). First, using the tablesaw, cut stopped dadoes. They provide room for the haunch of the tenon and guide the bit when cutting the mortises (Photo 11).

1



SAW TENON CHEEKS on the rails using a shop-made tenoning jig (Fig. A). Remove the waste with bandsaw cuts first. Then you can raise the tablesaw blade and clean the tenon cheek in one pass. Cut the slot mortises in the stiles with the same jig. **CAUTION:** This operation is difficult to do with the guard in place. Use extra care.

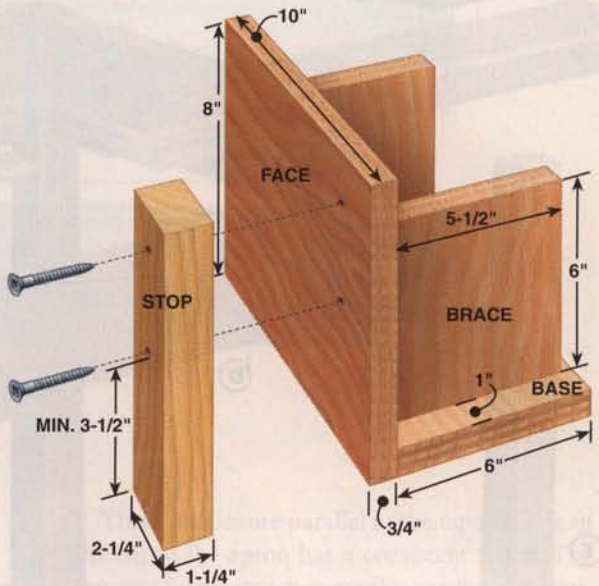
2



SQUARE THE TENON SHOULDERS using a miter gauge with a stop block. The critical dimension on the rails is end-to-end between the shoulders. On the stiles it's the distance between the slots. These dimensions must be slightly longer than the marble so it fits in place after the top is assembled. **CAUTION:** This operation is difficult to do with the guard in place. Use extra care.

FIG. A LOW-TECH TENONING JIG

Take half an hour and make this jig. It rides against the rip fence and allows you to make accurate tenons safely. Fasten the stop block with screws only so it's easy to replace.



3



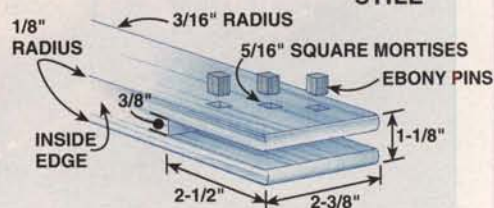
CUT SQUARE HOLES FOR THE PINS with a 5/16-in. mortising chisel and bit. Space the pins evenly on a diagonal that starts at the end of the slot mortise. Mortise through the upper leg of the stile. Stop in the sacrificial tenon. It keeps the chisel and bit from blowing out the inside surface of the joint.

FIG. B
EXPLODED VIEW

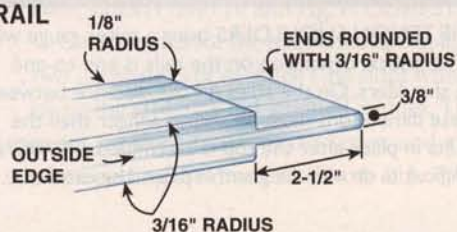


DETAIL 1: STILE AND RAIL
SLIP JOINT

STILE



RAIL



CUTTING LIST
DIMENSIONS: 17-1/6" x 17-1/16" x 25-1/8"

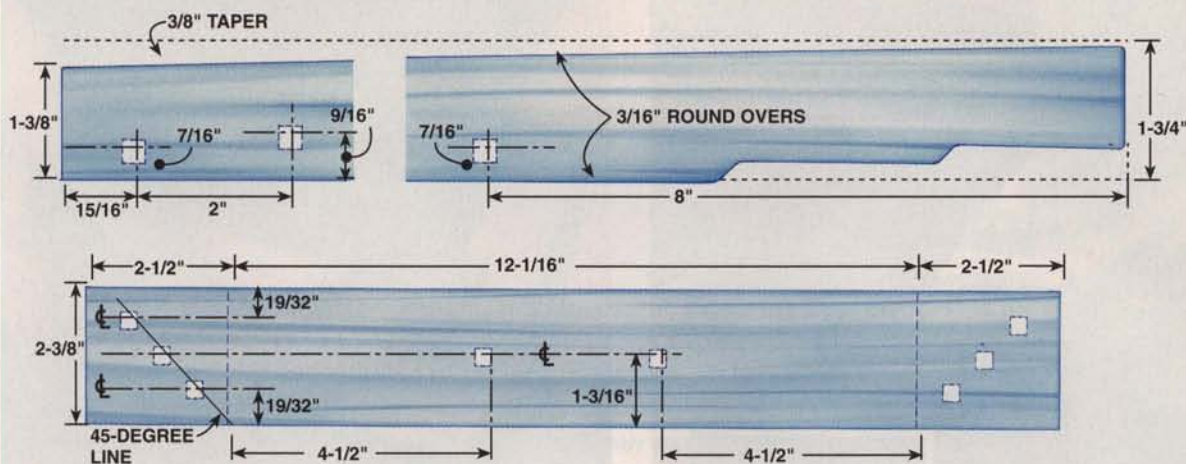
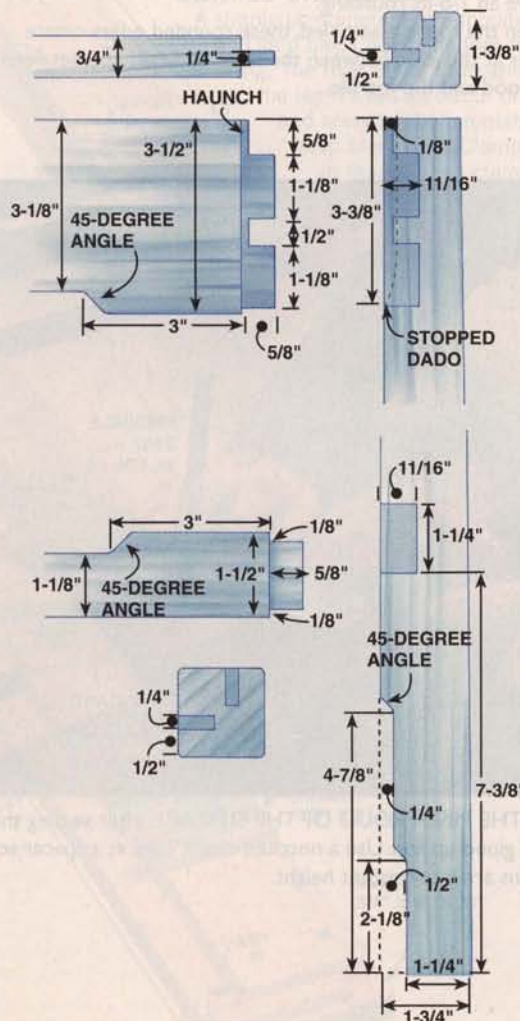
Part	Name	Qty.	Dimensions
A	Marble Tile	1	3/8" x 12" x 12"
B	Top Stiles	2	1-1/8" x 2-3/8" x 17-1/16"
C	Top Rails	2	1-1/8" x 2-3/8" x 17-1/16"
D	Aprons	4*	3/4" x 3-1/2" x 14-3/4"
E	Stretchers	4*	3/4" x 1-1/2" x 14-3/4"
F	Legs	4	1-3/4" x 1-3/4" x 24"
G	Pins	44	5/16" x 5/16" x 9/16" (approx.)
H	Ledger Strips	4	5/8" x 5/8" x 12" (trim to fit)
J	Screw Blocks	4	3/4" x 1" x 2-1/2"

Materials: Walnut, Ebony, Poplar

*Make 4 apron/stretcher blanks, 3/4" x 5-3/4" x 14-3/4" (length includes 5/8" tenons on ends).

DETAIL 2: PIN LOCATIONS AND LEG TAPERS

Note: In Greene and Green pieces, the pins were located by eye, so they weren't perfectly symmetrical. It's one reason their pieces look hand made.

**DETAIL 3: MORTISES AND TENONS, LIFTS**

These dados are parallel to the tapered side of the leg so the apron has a consistent reveal. The mortises for the stretchers are also parallel to the outside tapers, and have the same reveal as the aprons.

Mortise holes for the ebony pins (Fig. B, Detail 2). This time, position the legs with their straight *inner* sides against the fence. Level the faces using a tapered offcut, and protect the mortise cheeks with sacrificial plugs before cutting. Round the edges of the legs with the 3/16-in. radius bit. You'll have to round the inside edges, where the lifts meet, by hand.

Make the Aprons and Stretchers

Prepare four blanks with tenons on both ends. Rout the lifts using a template (Photo 12). Add the carvings to the aprons (Photo 13 and Fig. G). Round the bottom edges of the aprons and the top and bottom edges of the stretchers.

Assembly

Glue together two sides, each with two legs, an apron and a stretcher and install the ebony pins. Complete the glue-up, adding the remaining two aprons and stretchers. Then install the rest of the pins. Glue blocks on the insides of the aprons for the screws that hold the top.

Install the ledger strips for the marble, working from the underside of the top (Photo 14). Set the marble in place after the finish has cured (Photo 15). I used a glaze of burnt sienna and burnt umber over a seal coat of shellac, topcoated with varnish.



HOLD THE STILES AND RAILS UPRIGHT to round the ends. To reduce the risk of blowout, always cut into the rotation of the bit. Clamp a piece of hardboard with a 1-in. hole on top of your router table to support these short pieces while routing.



To fit inside the slot between the legs of the stile you'll need a bit with a 1/4-in. pilot (see Sources, page 61).

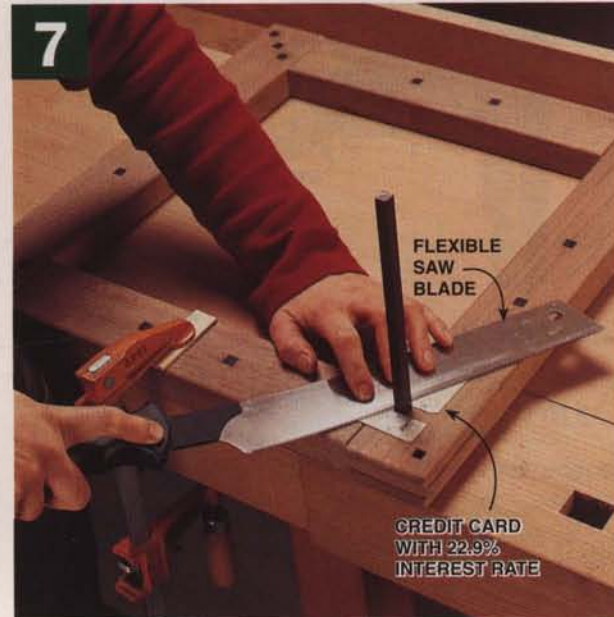


ROUND THE RAIL SHOULDERS with a 1/8-in. radius bit. Shorten the bit slightly, by grinding the tip of the pilot, so it fits under the tenon. The inside edges of the stiles and rails also receive an 1/8-in. rounding.

When the top is assembled, these rounded edges create reveals at the joint between the stiles and rails and between the wood and the marble.



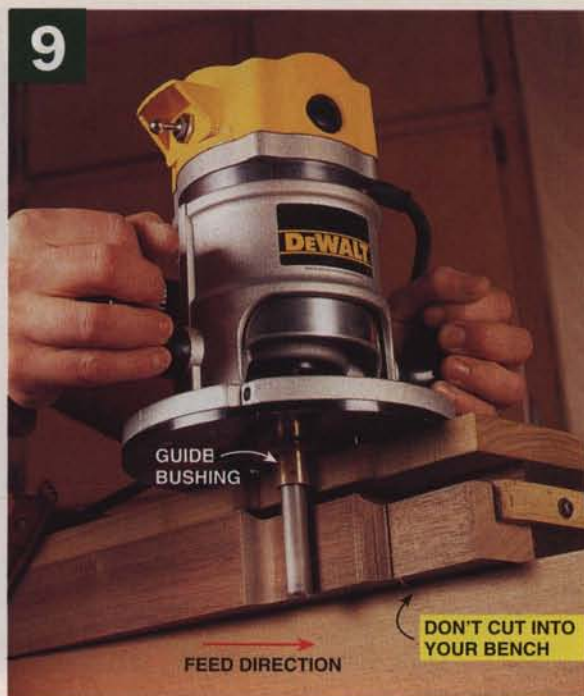
SAW SQUARE STOCK FOR THE EBONY PINS from a single saw set-up. First, cut a kerf in the face side of the board. Then, with the board on its edge and the kerfed face against the fence, make a second pass. A featherboard and push stick are mandatory when cutting small parts. This shop-made push stick includes a stop that prevents the newly cut square blank from kicking back. **CAUTION:** This operation is difficult to do with the guard in place. Use extra care.



SAW THE PINS PROUD OF THE SURFACE, after seating them in the glued-up top. Use a notched credit card as a spacer so all the pins are a consistent height.



8 SAND THE PINS BY HAND, leaving them rounded and slightly proud of the surface. Bear down with your fingertip on each side of the pin to cut down the edges and create the rounded shape. Tape protects the walnut from scratches.



9 ROUT THE LEG LIFTS using a jig (Fig. C) with a template and a router (outfitted with a 5/8-in. O.D. guide bushing and a 2-1/2-in. long, 1/2-in. dia. straight bit). To make routing easier, saw away most of the waste first. When you use this guide bushing and bit, the finished edge of the leg will be 1/16-in. away from the edge of the template, so be careful not to saw away too much.

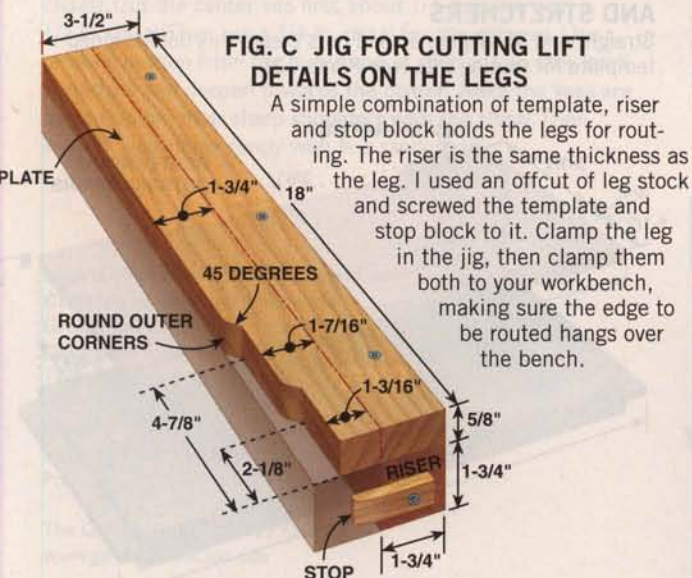


FIG. C JIG FOR CUTTING LIFT DETAILS ON THE LEGS

A simple combination of template, riser and stop block holds the legs for routing. The riser is the same thickness as the leg. I used an offcut of leg stock and screwed the template and stop block to it. Clamp the leg in the jig, then clamp them both to your workbench, making sure the edge to be routed hangs over the bench.

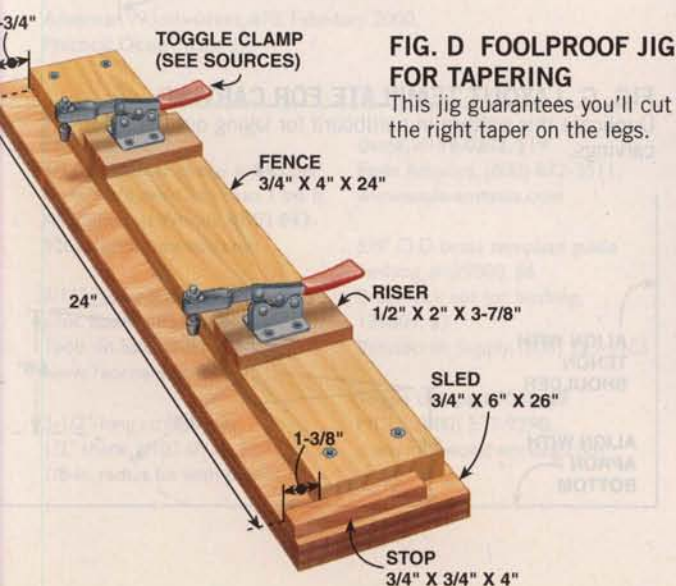


FIG. D FOOLPROOF JIG FOR TAPERING

This jig guarantees you'll cut the right taper on the legs.



10 CUT LEG TAPERS with this shop-made jig (Fig. D). It holds the legs securely and keeps your fingers away from the blade. Save the tapered offcut. It'll be used for mortising. **CAUTION:** This operation is difficult to do with the guard in place. Use extra care.



CUT MORTISES in the straight, untapered sides of the legs, using stopped dadoes to set and guide the bit. Make sure the leg's two tapered sides are against the base and the fence. You'll have to level the leg so the mortise is perpendicular (Fig. E). Use the scrap left from sawing the tapers for leveling, making sure it completely supports the leg. Cut the mortises for the stretchers the same way.



ROUT TWO LIFTS AT ONCE using a template (Fig. F) and a blank wide enough to contain both an apron and a stretcher. Saw away most of the wood to be removed on the bandsaw before routing. After routing, saw the blank into a separate apron and stretcher.

FIG. E LEVEL A TAPERED LEG FOR MORTISING

Mortising a tapered leg can result in angled mortises (upper illustration). Instead, shim up the leg with the offcut left from sawing the taper (bottom illustration).

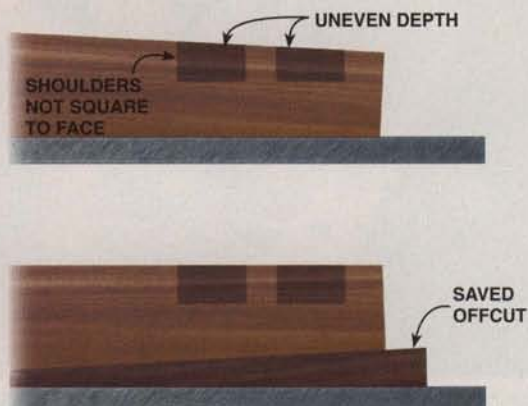


FIG. F TEMPLATE FOR APRONS AND STRETCHERS

Straight and 45-degree angled cuts create this double-sided template for routing lifts (see Photo 12).

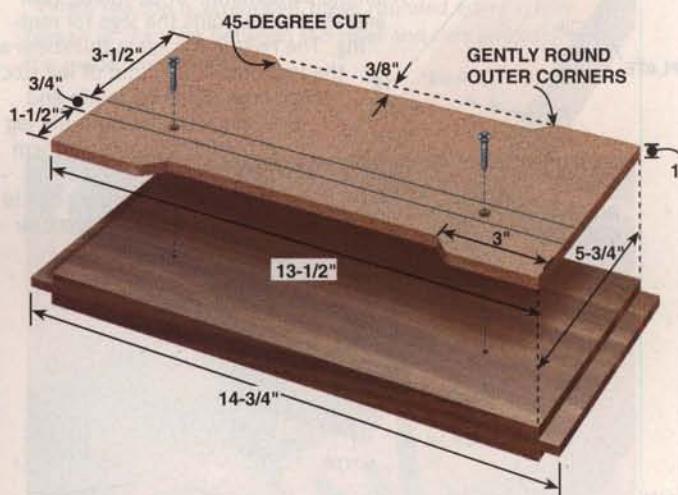
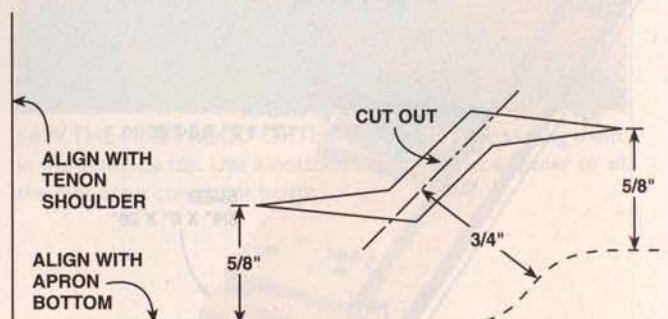


FIG. G LAYOUT TEMPLATE FOR CARVING

Duplicate this pattern in cardboard for laying out the apron carvings.





CARVE THE APRON DETAIL by making vee-cuts with two chisels. Cut the center vee first, about 1/4-in. deep, with a 1/2-in. chisel. Then use a 3/4-in. chisel for the tail vees. Use a pivoting motion from the outer end of each vee so they start at nothing and deepen towards the center. After the vees are carved, soften their sharp shoulders with the chisel. Then smooth everything gently with fine sandpaper.



FASTEN THE LEDGER STRIPS that hold the marble. It's easy if you flip the top upside-down. For the marble and top to be flush, clamp the top to two flat sticks and lay the marble in place on top of them. Put a bead of glue on one edge of the ledger strips and nail away.

Learn more about the work of Charles and Henry Greene

Greene and Greene, Furniture and Related Designs, By Randell Makinson, Peregrine Smith, Inc., 1979, www.amazon.com, \$24.

Greene and Greene Masterworks, by Bruce Smith and Alexander Vertikoff, Archetype Press, Inc., 1998, www.amazon.com, \$28.

The Gamble House, (626) 793-3334
www.gamblehouse.usc.edu

American Woodworker, #78, February 2000, Practical Design, page 24.

Sources

Ebony
4/4 Madagascar ebony is \$45 per bd. ft. You'll need less than 1 bd. ft.
All Righteous Woods, (877) 843-9265, righteouswoods.net

3/16" radius HSS router bit w/ pilot, Bosch #85117, \$11,
Tools on Sale, (800) 328-0457,
www.7corners.com

2-1/2"-long straight bit,
1/2" shank, #102-0975, \$27
1/8-in. radius bit with pilot, 1/4"

shank, #159-0202, \$19
Eagle America, (800) 872-2511,
www.eagle-america.com

5/8" O.D. brass template guide
bushing, #129800, \$6
Brass lock nut for bushing,
129804, \$3
Woodcraft Supply, (800) 225-1153

Toggle clamps, #9058, \$8
MCLS, (800) 533-9298,
www.mclswoodworking.com



SET THE MARBLE TOP in place with a bead of silicone caulk on the ledger strips. **AW**

By David Radtke

FOLDING WORKTABLE

This simple, roll-around worktable fits in tight spaces yet expands to a huge work surface.

Here's a work space that's huge and accessible from all sides, yet folds up and stows away easily. If you don't have room for a full-size, permanent table for glue-up, assembly and finishing, this worktable is the ticket. It opens to a solid 4-ft. x 7-ft. surface with both side tables up, yet closes and rolls into a small 4-ft. x 18-in. space on 3-in. lockable casters. It's made from two sheets of 3/4-in. plywood and costs about \$120, including hardware.

It's a perfect work space for the garage or basement and can be used for everything from assembling projects to laying out a baby quilt.



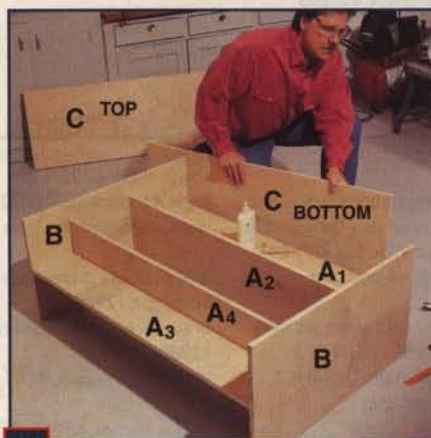
IN FOLDED FORM, it's a mere 19-1/2-in. deep and 48-1/2-in. long.

ASSEMBLE WITH GLUE AND NAILS

I used 3/4-in. birch plywood from a home center, but any flat plywood sheet will do. Avoid construction-grade plywood because it often has bows or warps that make precise fitting impossible.

Once you cut all the plywood pieces, rip the 1/4-in.-wide edge banding from 3/4-in.-thick boards and set them aside. The thin hardwood edging is a necessary component of the table; without it, the hinge screws won't hold and the plywood could easily delaminate along the edges.

Assemble the upper and lower shelves as shown in Fig. A and Photo 1 with carpenter's glue and 6d finish nails. The large shelf supports



1 GLUE AND NAIL the anti-rack shelf supports (A1, A3) to the shelves first, then nail these assemblies to the sides (B). Next, align, glue and nail the top and bottom pieces to the sides.



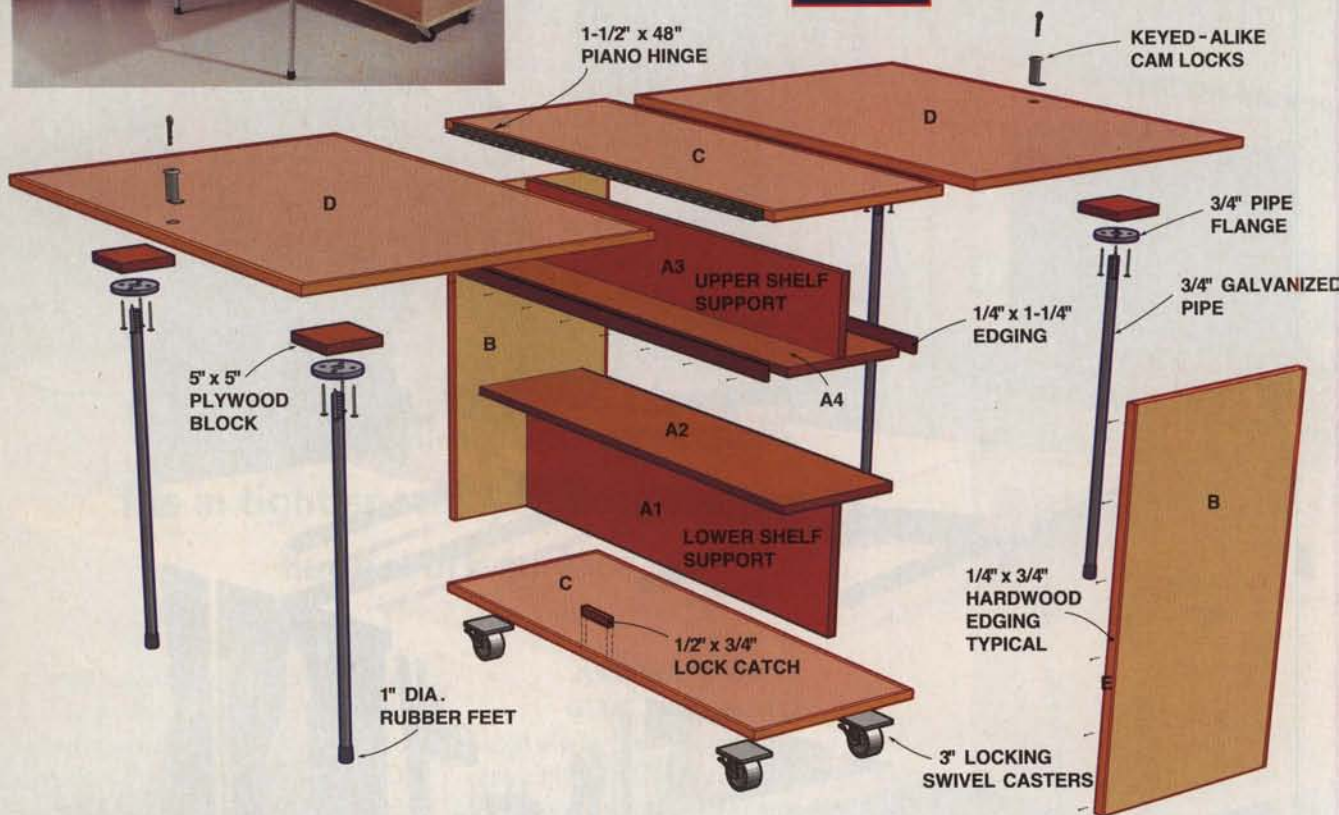
ART DIRECTION: JOEL SPIES • PHOTOGRAPHY: BILL ZUEHLKE AND RAMON MORENO • ILLUSTRATION: CRAIG ENSLIN

FOLDING WORKTABLE



SCREW-ON PIPE LEGS give the flip-up side tables rock-solid support. Unscrewed, they store on one of the interior shelves.

FIG. A EXPLODED VIEW



(A1 and A3) on the bottom and top of the shelves keep the table from racking out of square. Glue and nail the sides to the shelf ends, then let the assembly sit for an hour to allow the glue to dry before attaching the casters, as shown in Photo 2.

ATTACHING THE HARDWOOD EDGING

Cut to length the edging for the long sides of the top and bottom and the flip-up side tables. Start a few brads into each piece of wood edging, put glue on the plywood and tack each piece into position (Photo 3). Overlap the short pieces and run them a bit long. After you glue and tack them in place, trim them to length with a handsaw. Nail all the edging every 6 in. with brads. When the glue is dry, sand the sharp corners of the edging.

THE PIANO HINGES

Like 'em or not, all those piano hinge screws give continuous support along the joint for a sturdy worktop. Be sure to align one hinge blade with the top (C) and the other with the top of panel D. It's simple to align the top and side panels if you tip the assembly on its side, as shown in Photo 5. Use a hinge center punch like the one shown or a Vix bit (a special self-centering drill bit), see Sources, page 65. Securely mount the hinges in place with the screws provided.

CUTTING LIST

Overall Dimensions
Closed: 37" H x 19-1/2" D x 48-1/2" W
Open: 37" H x 83" D x 48-1/2" W

Part	Qty.	Dimensions	Name
A1	1	3/4" x 12" x 46-3/8"	lower shelf support
A2	1	3/4" x 12" x 46-3/8"	lower shelf
A3	1	3/4" x 7-1/4" x 46-3/8"	upper shelf support
A4	1	3/4" x 12" x 46-3/8"	upper shelf
B	2	3/4" x 17-1/2" x 31-7/8"	sides
C	2	3/4" x 17-1/2" x 47-7/8"	top and bottom
D	2	3/4" x 31-7/8" x 47-7/8"	flip-up side tables
E	68 ft.	1/4" x 3/4"	hardwood edging (strips cut from boards)

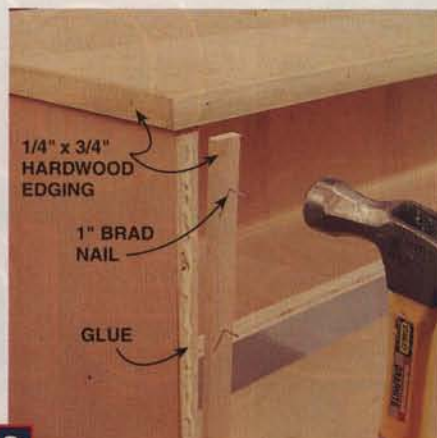
THE FLANGES AND LOCKS

Glue and screw the blocks to the underside of each panel (D) to support the 3/4-in. pipe flanges and pipe legs. I bought 3-ft. lengths of pipe, threaded on one side, and found that I needed to cut (with a hacksaw) about 1 in. off the length. This allowed room for the

ATTACH casters while the table is upside down. Align the caster bases with the outer edges of the bottom. Use 1-1/4-in.-long lag screws (drill a 3/16-in. pilot hole) on the outer edge and 1-1/4 in. carriage bolts (drill a 1/4-in. pilot hole) with nuts and washers for the inner fasteners.



2



3

GLUE AND NAIL the 3/4-in. by 1/4-in. hardwood edging to the exposed plywood edges, with the table right-side up.

flanges and the rubber feet (available at home centers).

The locks serve a dual purpose. First, they keep kids out and second, they keep everything inside from tipping out if the table is jarred. To install them, drill the holes for the lock and glue a wooden catch to the bottom of the shelf, as shown in Fig. A. Measure the shaft of the lock once it's installed to get the correct thickness for the block. We used a 1/2-in.-thick block for ours.

FINISH WITH A URETHANE VARNISH

Remove the hardware to make painting or varnishing a whole lot easier. Label the panels in a hidden spot so you get the table together again easily. Small variations from one panel to the next can show up on your hinge placement and locks.

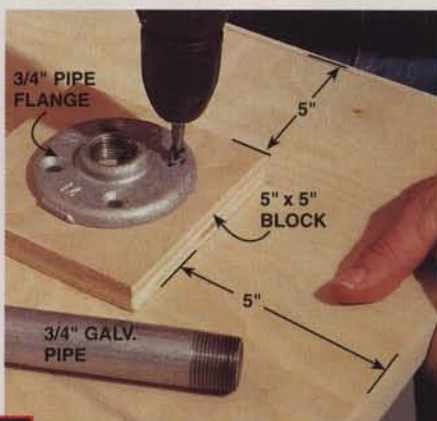
Sand the entire table with 150-grit sandpaper and use a power sander

to knock down any high spots on the hardwood edging. Vacuum the dust, wipe the table down with a tack cloth and apply your finish. We used two coats of oil/varnish (Minwax Antique Oil Finish). Wait a few days after the last coat of finish to let it cure before you put the first scratches on your new worktable. **AW**

SOURCES

You can buy keyed-alike cam locks, #98998, \$5.50 and Vix bits, #91995, \$7 from Rockler Woodworking and Hardware, (800) ROCKLER; www.rockler.com

You can buy a hinge center punch #23K05.01 from Lee Valley Tools, (800) 871-8158; www.leevalley.com



4

SCREW the 3/4-in. pipe flanges onto 5-in. square reinforcing blocks cut from scrap plywood. Glue and screw the blocks to the underside of the front panels, as shown in Fig. A.



Self-centering punch.



5

ATTACH the flip-up side tables (D) with the table on its side. Align each flip-up side table with the table's frame so the 1-1/2-in. piano hinge fits, as shown, and clamp in position. Align your screw holes perfectly with a center punch or a Vix bit (see Sources, above).

SHOPPING LIST

Qty.	Item	Qty.	Item
2	3/4" x 4' x 8' hardwood plywood	1 pint	Carpenter's glue
2	3/4" x 6" x 8' hardwood boards*	4	1" rubber feet
4	3" locking casters	8	1/4" x 1-1/4" lag screws and washers
1 pkg.	1" brad nails	8	1/4" x 1-1/4" carriage bolts and washers
1/4 lb.	6d finish nails	2	1-1/2" x 48" piano hinges
4	3/4" pipe flanges	2	Cam locks (see Sources, above)
4	3/4" x 36" galv. pipe (one end threaded)		

*Rip on tablesaw to make edging.

Garden Bench

By Jean Bartholome



You've weeded and watered, sprinkled and spaded, and now your garden is a thing of beauty. You deserve a place to relax and enjoy it. The perfect spot is on our classic English garden bench.

Materials

Traditionally made of teak, benches like this grace hundreds of parks and gardens, aging beautifully through years of use and weather. Our version is made of white oak, which is almost as decay resistant as teak but less expensive and easier to find. You could also use decay-resistant softwoods such as cedar, redwood and cypress, which are even cheaper than white oak.

The thick legs and rails for this bench are glued up from standard 3/4-in. boards that you can buy at a lumberyard or home center. Inspect the boards carefully, because they must be flat and straight to be laminated together into a thick sandwich. I prefer to mill my own boards from 1-in.-thick rough lumber, which saves money and guarantees good glue joints.

You'll need about 50 bd. ft. of 3/4-in. wood. That's about \$150 for white oak and \$100 for cedar. If you use rough lumber you'll need about 50 board feet of 4/4 (1-in.) wood. The total lumber cost for rough white oak is about \$125.

Tools and Glue

You'll need a tablesaw, jointer, bandsaw, belt sander and a router with a fence. A plunge router is the perfect tool to make the mortises, but you could use a drill and a chisel instead. You'll also need a doweling jig. Accessories required include 3/16-in. and 3/4-in. round-over bits for the router, a 1/2-in.-dia. straight bit, a 3/8-in.-plug cutter and some long pipe clamps.

For assembly, use a water-resistant glue (like Titebond II) or a waterproof glue such as slow-setting epoxy or polyurethane (see Sources, page 69).

Making the Legs

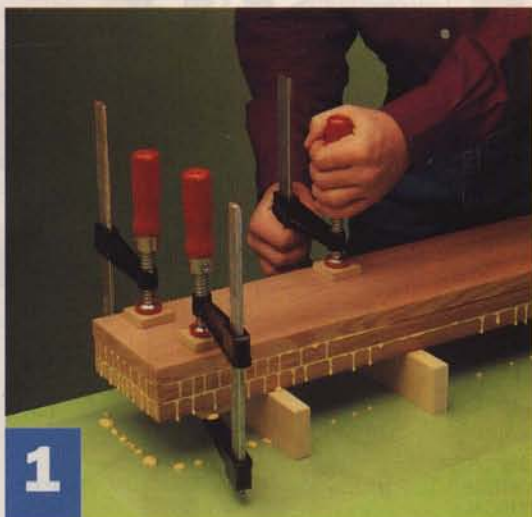
Thick white oak is expensive and prone to internal checking in the kiln-drying process, so it's both economical and smart to build up the legs from three pieces of thinner wood. You can get two legs from one lamination (Fig. B). Be sure to use plenty of clamps, ideally no more than 6-in. apart (Photo 1).

Scrape off the dried glue along one edge of the laminated leg blank and joint the edge straight and square. A jointer works best, but you can also use a straightedge and a router (See Q&A, page 8). Rip the leg blank to size and trim the ends, then saw out one back leg and one front leg (Fig. B). Clean up the rough bandsawn surfaces with a jointer and belt sander.

Mortise the front and back legs for the side rails using a plunge router, a template guide and Template A (see "Mortising with a Plunge Router and Template," page 70 and Fig. D). You'll cut the front and back rail mortises later, after the sides of the bench are glued up. Note that the front leg is turned so the laminated edges face to the side. That way you won't see the glue lines from the front of the bench. The mortises should be at least

text continued on page 71

Complete plans for a sturdy lawn seat made from 3/4-in. lumber

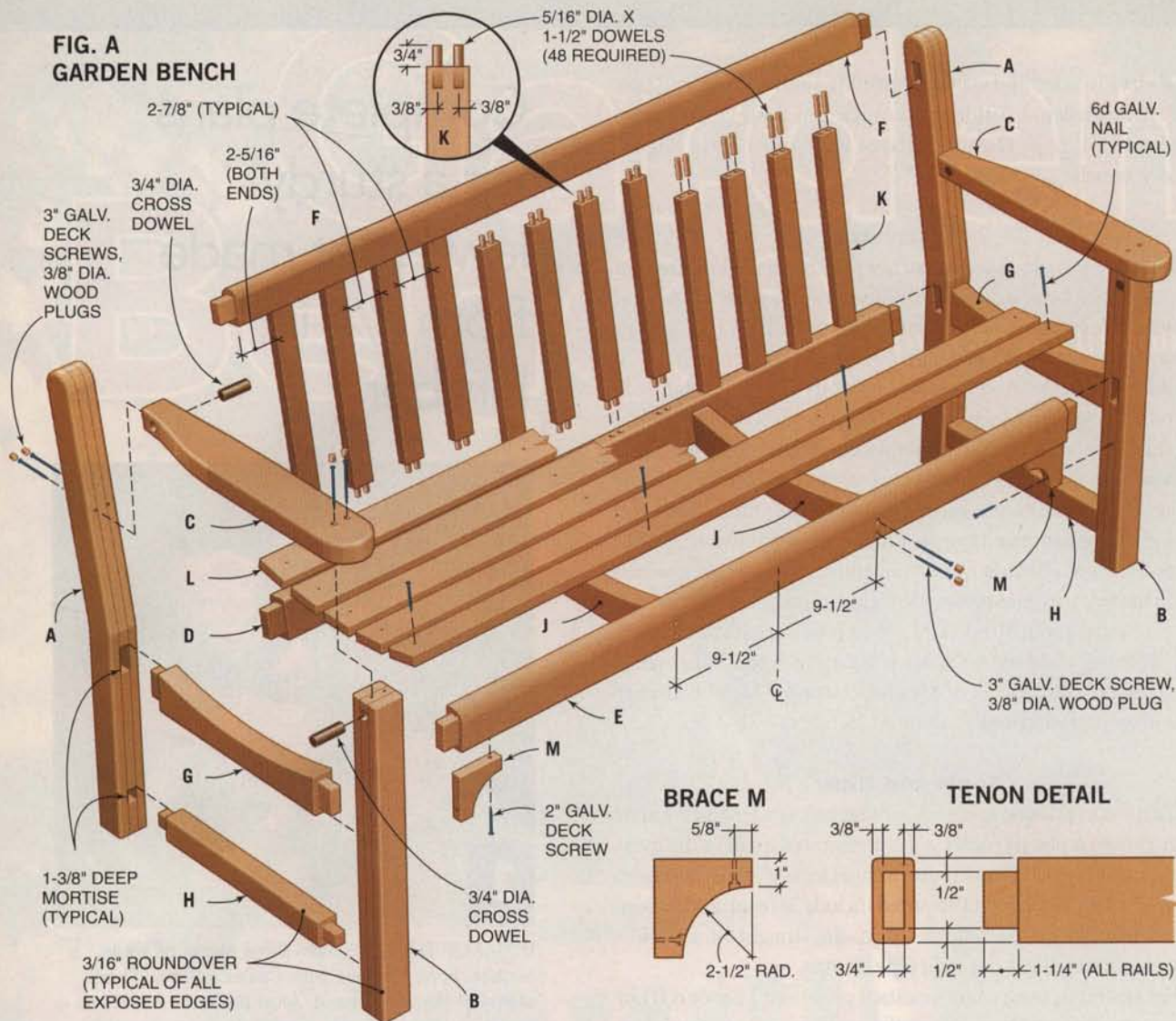


BUILD UP THE LEGS from three pieces of 3/4-in. lumber. Apply the glue with a paint roller and have plenty of clamps on hand. Align the three boards so the grain along the edge runs in the same direction. This makes jointing the laminated leg much easier.

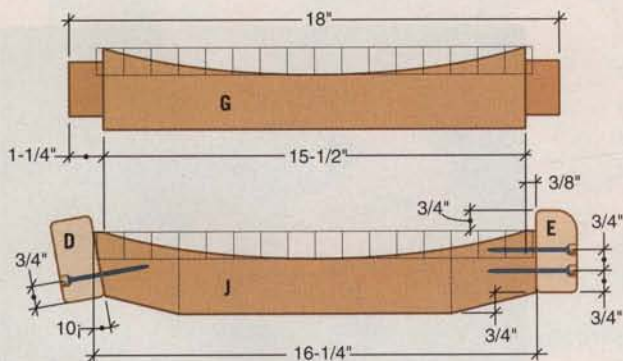


ROUT THE TENONS. Set the fence so the distance between it and the far side of the straight bit is the length of the tenon. Cut all of the front cheeks first, then adjust the router's depth of cut on the back cheeks until you have a perfect fit into the mortise.

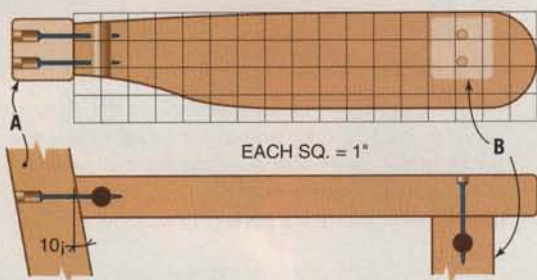
**FIG. A
GARDEN BENCH**



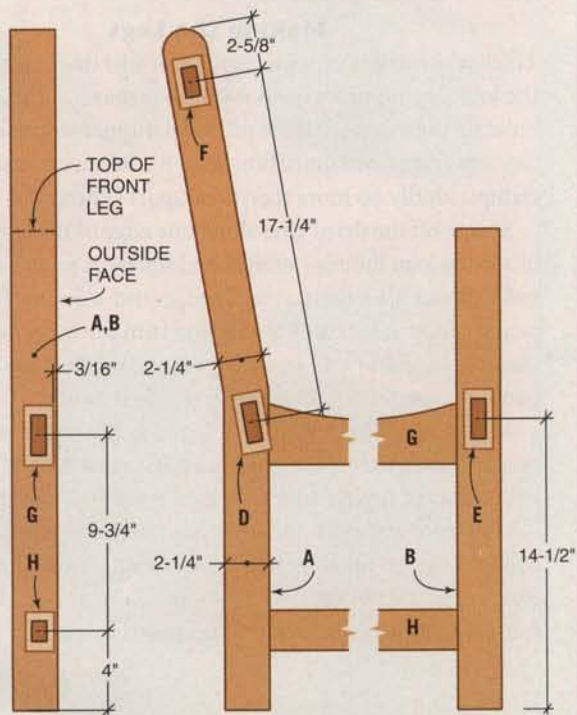
DETAILS OF SEAT RAIL AND SUPPORT



ARM DETAIL



LOCATION OF MORTISES



Garden Bench

FIG. B

LAYOUT OF FRONT AND BACK LEGS

Mill the leg blank to dimension, then lay out the legs. Remove waste piece X first, then joint the rough bandsawn face of the leg. Set the fence of your bandsaw to the width of the leg (or clamp a board on your bandsaw table) and rip the back leg starting at both ends of the blank and stopping at point Y.

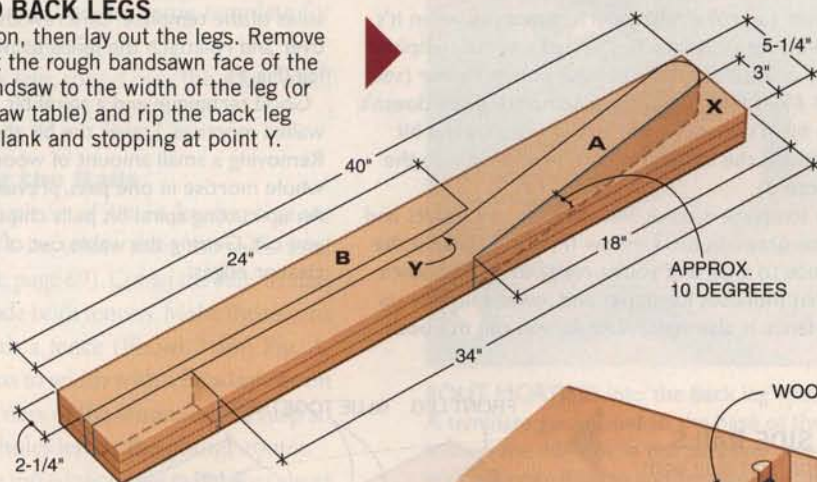
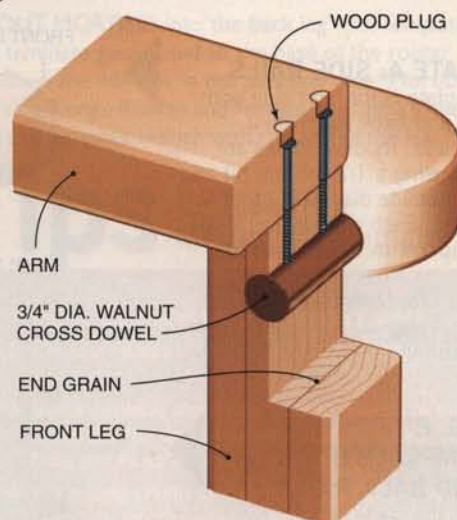


FIG. C

CROSS SECTION OF SCREWS AND CROSS DOWELS

Cross dowels hold screws that pass through end grain. The side grain of the dowel holds screws better than the end grain of the leg.

Dowels made from a dense, decay-resistant hardwood work best. (Birch is commonly available, but rots quickly. Walnut dowel rod lasts longer. White oak is difficult to find.) If the dowel fits fairly tight, don't glue it in place. Gluing the dowel might cause the leg to crack by restraining the leg's seasonal expansion and contraction.



CUTTING LIST

DIMENSIONS: 34" H x 62" W x 24" D

Part	Name	Qty.	Dimensions (TxWxL)	Comments
A	Back Legs	2	2-1/4" x 5-1/4" x 34"	Rough leg blank is made of 3 pieces, 3/4" x 5-1/2" x 42"
B	Front Legs	2	2-1/4" x 2-1/4" x 24"	
C	Arms	2	1-1/2" x 3-1/2" x 21"	
D	Back Seat Rail	1	1-1/2" x 3" x 58"	Length between shoulders is 55-1/2"
E	Front Seat Rail	1	1-1/2" x 3" x 58"	
F	Top Rail	1	1-1/2" x 2-1/2" x 58"	
G	Upper Side Rails	2	1-1/2" x 3" x 18"	Length between shoulders is 15-1/2"
H	Lower Side Rails	2	1-1/2" x 2" x 18"	
J	Seat Supports	2	1-1/2" x 3" x 16-1/4"	
K	Back Slats	12	3/4" x 1-1/2" x 14-1/2"	
L	Seat Slats	5	3/4" x 2-1/2" x 60"	
M	Braces	2	3/4" x 3-1/2" x 3-1/2"	
N	Cross Dowels	4	3/4" dia. x 2-1/2" L	Walnut

Materials: White Oak

Sources

Woodcraft Supply

(800) 225-1153:

#124315 Doweling Jig, \$50

#17U11 3/8-in. Dia. Oak Tapered Plugs, \$4/100

#06J11 3/8-Dia. Plug Cutter, \$12

#127110 Bushing Set (Template Guides) for

Porter-Cable and DeWalt Routers, \$32.50

(Contact your dealer for guides for other routers.)

#50C04 3/4" x 36" Walnut Dowel Rod, \$4.50

#03K52 Upcut HSS Spiral Bit, \$17.

Lee Valley Tools

(800) 871-8158:

62K14.03 Excel One Polyurethane Glue,

\$8.75 for 8.5 oz.

07J08.20 Extra-Long Taper Point Drill Bit for #8 Screws, \$7 (bits for #9 & #10 screws also available)

56Z1.03 G2 Epoxy, \$15 for 375 ml.

56Z78.01 Anti-Sag Powder, \$5.50 for one liter.



Mortising with a Plunge Router and Template

A plunge router can cut a nearly perfect mortise when it's guided by a wooden template. You'll need a set of template guides that fit into the sub-base of your plunge router (see Sources, page 69). Unlike a bearing, a template guide doesn't spin with the bit. It's a fixed collar that surrounds the bit and travels around the inside of a "window" built into the template (Photo 3).

Aligning the template is quick and easy. You can use its end or a centerline drawn in the window (Photo 4). Clamp the template's fence to a leg and you're ready to go. The fence guarantees that mortises for upper and lower rails line up on a leg. The fence is also removable so you can use both

sides of the template. Unscrew the fence, flip the template over and re-attach the fence to mortise the opposite leg (Fig. F).

Good technique and a spiral bit make clean, smooth-walled mortises. Lower the bit about 1/4-in. at a time. Removing a small amount of wood, rather than cutting the whole mortise in one pass, prevents the bit from chattering. An up-cutting spiral bit pulls chips out of the mortise as you cut. Getting the waste out of the way also results in cleaner edges.

FIG. D
TEMPLATE A: SIDE RAILS

This template is for mortising both the front and back legs with a plunge router. Its dimensions are based on using a 1/2-in.-dia. bit and a 3/4-in. outside dia. (O.D.) template guide. Each window is 1/4-in. longer and 1/4-in. wider than the mortise.

See "Tips for Making a Mortising Template," page 71, for instructions on assembling this type of template.

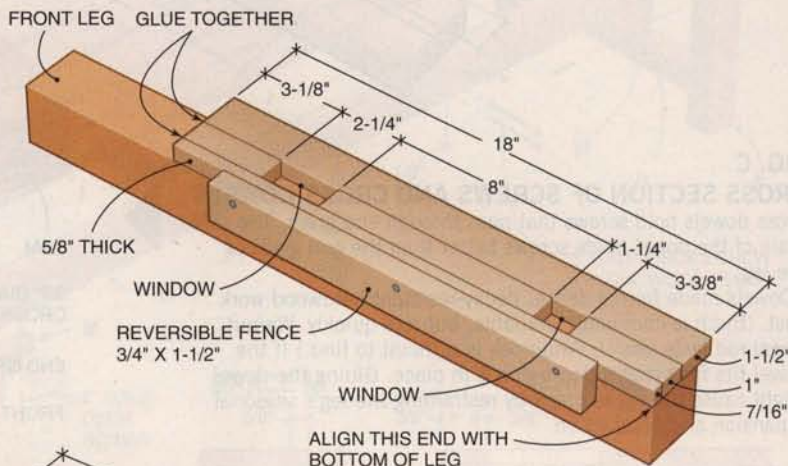


FIG. E
TEMPLATE B: FRONT AND BACK RAILS

Use the same bit and template guide in your plunge router as in Template A. Note that the distance between the fence and the window is greater than that for the other template. Mark a centerline in the large window.

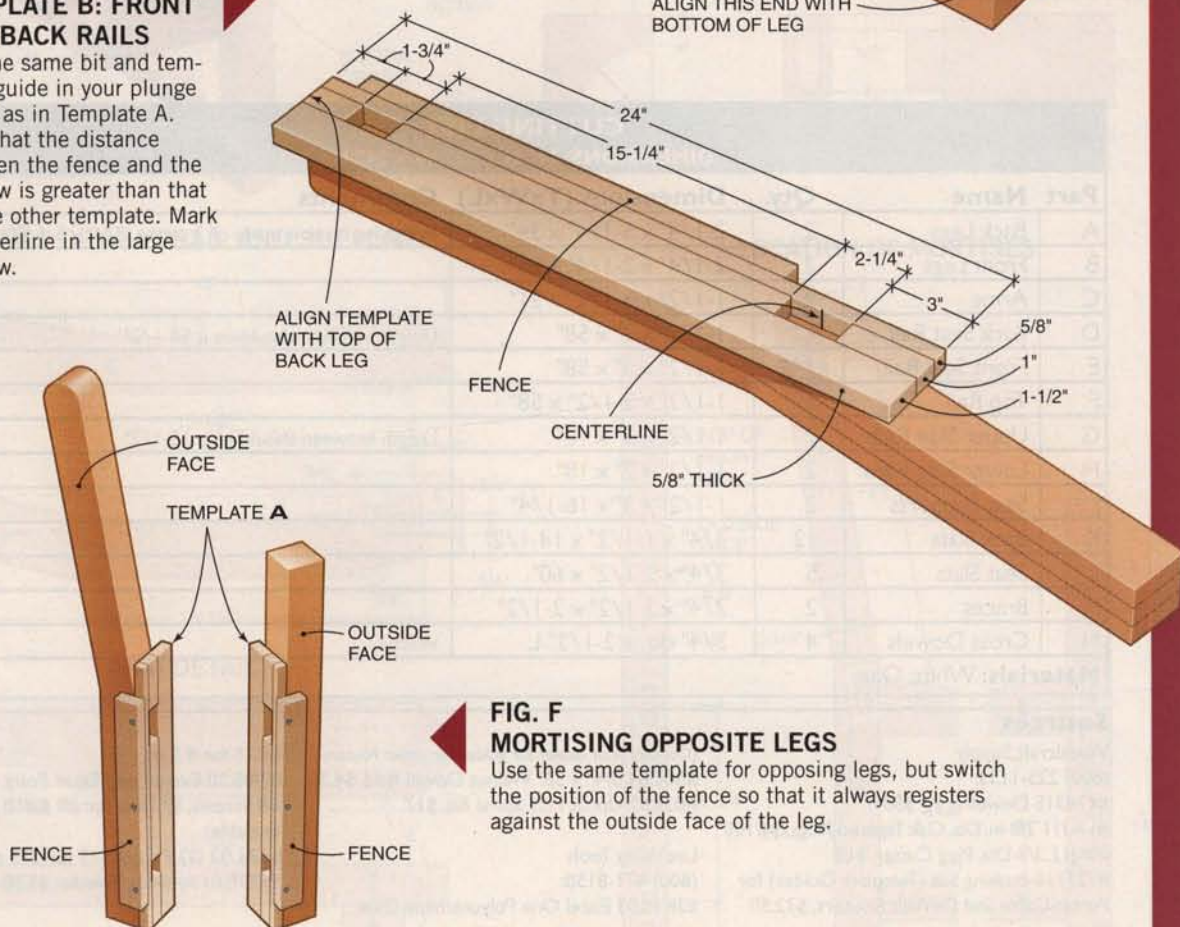


FIG. F
MORTISING OPPOSITE LEGS

Use the same template for opposing legs, but switch the position of the fence so that it always registers against the outside face of the leg.

Garden Bench

continued from page 66

1/8-in. deeper than the tenons in order to leave room for surplus glue and wood shrinkage. Use the same template for mortising opposing pairs of legs (Fig. F).

Round the top of the back legs, round over the edges of all the legs and sand the faces.

Making the Rails

Laminate each rail from two pieces of 3/4-in. lumber that are at least 1-in. longer and 1/4-in. wider than the rail's final dimensions (see Cutting List, page 69). Cut all the rails to size. Note that their lengths include both tenons. Make the tenons with a router equipped with a fence (Photo 2 and Fig. A, Tenon Detail). Cut the tenons to width with a handsaw or on the bandsaw. Round the corners of the tenons with a rasp so they'll fit into the rounded holes left by the plunge router.

Saw the seat curves on the top edges of the two upper short rails (Fig. A, Detail of Seat Rail and Support). Clamp them together, then smooth the curves with the nose of your belt sander. Round over the edges of all the rails and sand the faces.

Gluing Up and Mortising the Sides

Glue up each side of the bench, less the arms. After the glue is dry, use Template B (Fig. E) to rout the mortises in the back legs for the long rails (Photo 3). It's best to cut these mortises *after* assembling the sides because several pairs of mortises meet in the center of a leg. If you were to cut all the mortises at once, before assembling the sides, you'd have to chop away part of a tenon by hand in order to fit the long rails.

Mark the center of the front rail's mortise on the front leg (Fig. A, Location of Mortises). Then center the large window of Template B on the mark and rout the mortise (Photo 4).

Fitting the Slats, Arms and Seat Supports

Now that you've made the major components of the bench, clamp them all together *without* glue. Then cut the remaining bench pieces to fit.

- **Slats:** Cut them to fit between the back rails.
- **Arms:** Cut the end of each blank to fit the angle of your legs (Fig. A, Arm Detail). Then cut out the profile of the arm. Drill holes for the plugs and screws at the front of the arm.
- **Seat Supports:** Cut the blanks to fit between the front and back seat rails (Fig. A, Detail of Seat Rail and Support). Once they fit tight, slide each seat support over to the end of the bench and trace the curve of the side rail onto the seat support. Remove the board and cut its profile.

Assembling the Back

Take the bench apart and drill dowel holes in the slats and rails (Photo 5 and Fig. A). Round over the slats and seat rails. The front seat rail and the top rail have large, 3/4-in. roundovers for comfort. Take it easy with the large round-over bit when you shape the rails. Make three passes, lowering the bit each



ROUT MORTISES into the back leg with Template B. A template guide fixed to the base of the router follows the window in the template (see "Mortising with a Plunge Router and Template," at left). One end of the template is flush with the end of the leg.

Tips for Making a Mortising Template

1. Cut all the pieces from 3/4-in.-thick stock.
2. Cut short pieces the length of the windows to act as spacers.
3. Use a minimal amount of glue to assemble the template, but don't glue the spacer pieces. Wax their edges so they won't get stuck.
4. Put a long clamp across the length of the section that includes the spacer pieces. This keeps them from shifting. Then clamp across all three sections.
5. Remove the spacers once the glue is set.
6. Joint and plane the template to 5/8-in. thick.
7. Screw on the fence.



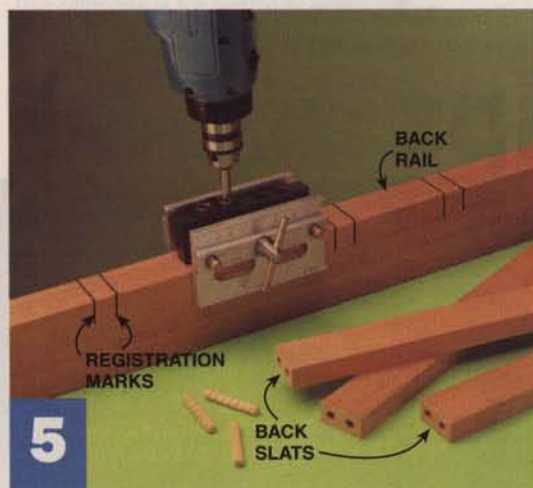
ALIGN THE CENTER MARK inside the template's window with a center mark drawn on the front leg. Clamp the template to the leg and rout the mortise for the front rail.

Oops!



Epoxy for Loose-Fitting Joints

Rats, my template slipped while routing this mortise! I've put a lot of work into making the leg so far, and I'm not about to throw it away and start over. I can rescue the leg and the poorly-fitting joint by using slow-setting epoxy glue, which fills gaps like nobody's business. The five-minute epoxy you'll find at the hardware store sets up way too fast. My favorite kind, G-2 by System III Resins, gives me at least a half-hour open time. I mix an anti-sag thickener with the glue so it won't leak out of the joint (see Sources, page 69).



5 DRILL DOWEL HOLES with a jig. Drill the slats first, then clamp the two back rails together and transfer the registration marks from the slats to the rails.



6 GLUE THE BENCH with long clamps. To extend the length of short pipe clamps you can join two pipes together with a threaded coupler (available at the hardware store) or hook two clamps together, as shown here.

time until you form the complete profile.

Glue up the back rails and slats as one unit. With so many pieces going together at once, you'll probably need a helper. Sight down your assembly to make sure there's no twist to it and place a straightedge across the ends to make sure the rails line up. Your back should be a perfect rectangle, not a parallelogram. You can clamp the assembly, without glue, between the ends of the bench before you clamp the slats to the rails. This helps make the back square.

Glue the whole bench together (Photo 6). Glue and screw the two corner brackets between the front rails and legs (Fig. A, Brace M).

Strengthening the Arm Joints

Use cross dowels to strengthen the arms (Fig. C). Arms take a lot of abuse in a large piece of furniture. After all, how will you move such a heavy bench around the yard? You'll pick it up by the arms. That puts a lot of strain on a fairly weak, screwed joint. Cross dowels reinforce the joint.

To locate the holes for the cross dowels, clamp the arm in place. Insert screws into the clearance holes in the back leg and front of the arm, then sight down the screws to judge where your dowels should go. Drill the holes and insert the dowels.

Final Assembly

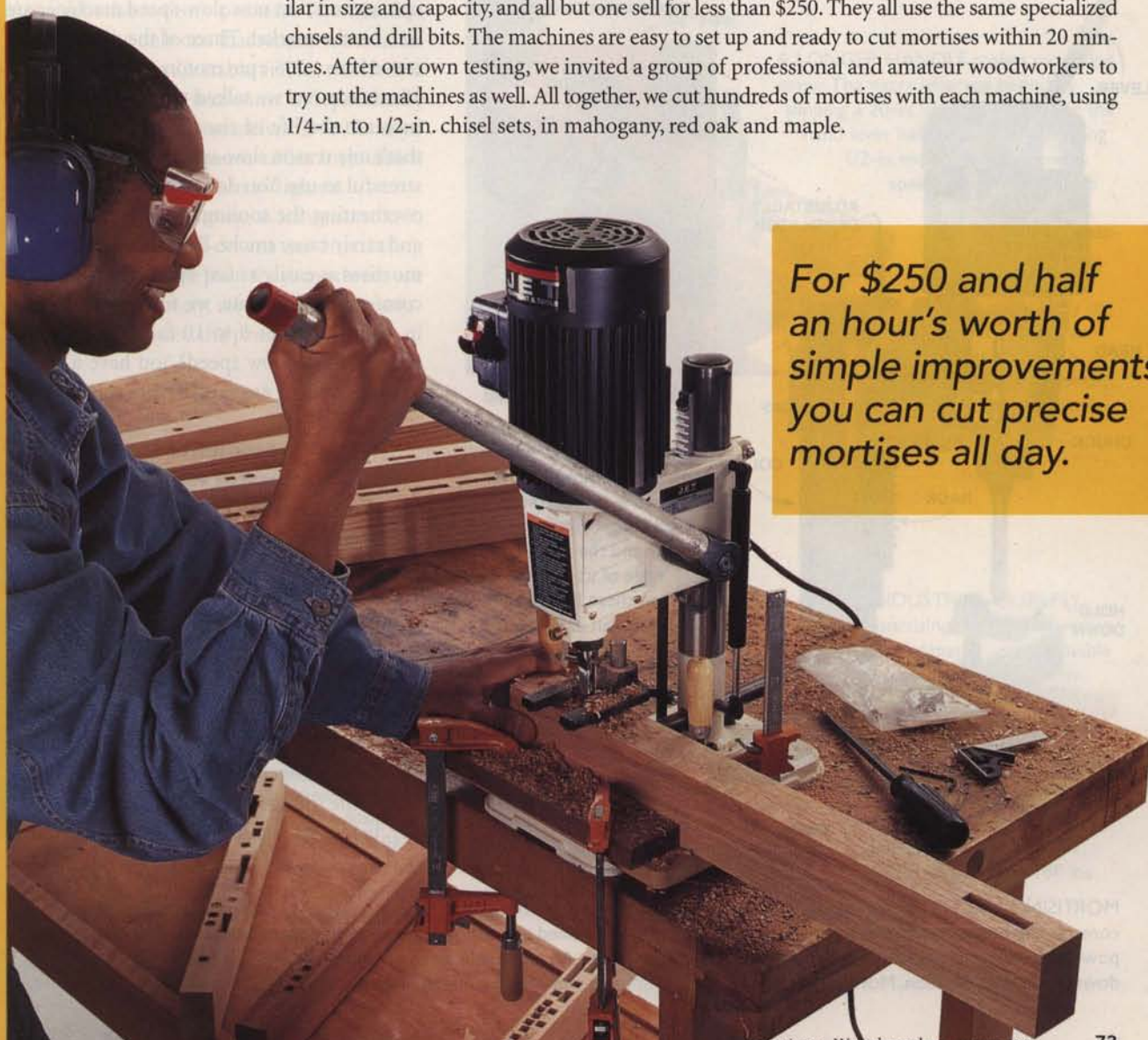
Insert the seat supports and drill pilot holes. Use an extra-long twist bit (see Sources, page 69) for these long screw holes so you don't have to remove the seat supports to drill them. Lubricate your screws with soap and drive them in. Glue in wood plugs over the screws. Install the arms the same way. Install the seat slats. You can use galvanized nails or stainless steel screws, which won't need plugs to cover them. If you're building in white oak, you must pre-drill holes for the nails.

Finish your bench with an outdoor oil, if you wish, but count on renewing the finish every few years. White oak doesn't require a finish, however. It will slowly turn a beautiful silver-gray. **AW**

Benchtop Mortisers

Mortising machines first answered the prayers of mortise-cutting woodworkers over 120 years ago. Today you can buy a miniaturized descendant of those old-timers. Though they're not the only powered option you have for mortising these days, their square mortises are the perfect match for tablesawn tenons.

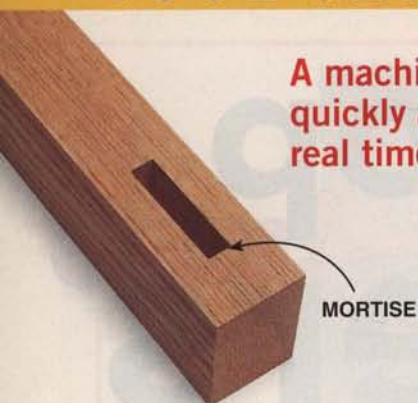
We tested eight benchtop machines designed to cut mortises up to 1/2-in. wide. They're similar in size and capacity, and all but one sell for less than \$250. They all use the same specialized chisels and drill bits. The machines are easy to set up and ready to cut mortises within 20 minutes. After our own testing, we invited a group of professional and amateur woodworkers to try out the machines as well. All together, we cut hundreds of mortises with each machine, using 1/4-in. to 1/2-in. chisel sets, in mahogany, red oak and maple.



For \$250 and half an hour's worth of simple improvements, you can cut precise mortises all day.

TOOL TEST: Benchtop Mortisers

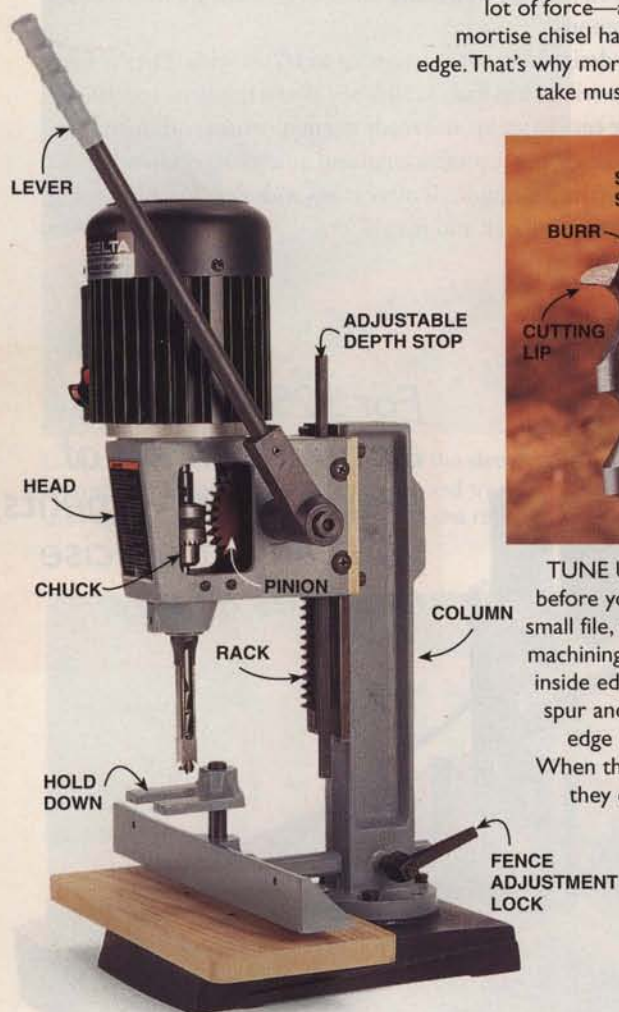
A machine that cuts mortises quickly and accurately is a real time-saver.



MORTISERS CUT square holes. Square holes cut side by side make a mortise.



A **HOLLOW CHISEL** with an auger bit inside is the secret to machines that cut square mortises. First the auger roughs out the mortise by drilling a hole and clearing the chips. To square the corners, you have to force the chisel through the wood. This can take a lot of force—a square 1/2-in. mortise chisel has a 2-in. cutting edge. That's why mortising machines take muscle to operate.



TUNE UP THE AUGER before you use it. With a small file, remove leftover machining burrs from the inside edge of its scoring spur and the angled top edge of its cutting lip. When these bits get dull they can easily be re-sharpened.

It's Okay to Buy Cheap Bits

For testing, each machine was outfitted with new chisel sets from the same manufacturer. We tried sets from British, American, Austrian and Japanese manufacturers before deciding to use the cheapest ones, which are made in Taiwan. You can spend a lot of money on chisel sets, but we think these inexpensive ones (usually less than \$20), are a good buy. Out of the box, they needed the least amount of sharpening. They cut clean mortises and we found them easy to resharpen. Besides, accidents happen, bits get ruined and it's less traumatic to replace a cheap set. Taiwanese sets are usually available from suppliers who sell benchtop mortisers.

The Major Difference Between Machines is Motor Speed

Traditionally, mortisers used fast-speed, 3,450 rpm motors, but now slow-speed machines are also on the market. Three of the machines we tested have 1,725-rpm motors. Why the change? Manufacturers we talked to say slower speeds increase the life of the chisel sets. We think that's one reason slow-speed machines are less stressful to use. You don't have to worry about overheating the tooling. They're also quieter and rarely cause smoke. However, they don't cut mortises as easily as fast-speed machines. At a comfortable feed rate, we found cutting 1/2-in. mortises takes 5 to 10 foot/pounds more effort. Fast or slow speed? You have a choice between cutting ease and ease of mind.

Ingredients for Successful Mortising

Mortisers aren't foolproof machines. First of all, the chisel sets have to be installed correctly, with clearance between the chisel and auger. Tightening the auger securely in the chuck is critical. If the auger slips during a cut, it gets pressed up against the chisel and both can be ruined in an instant.

Second, mortising requires technique, a combination of force and finesse. After all, the motor powers the auger bit, but it does nothing to square the round hole. Mortises are cut manually, using the hand lever to force the chisel

MORTISING MACHINES are lever-operated and require some arm strength to chop mortises. The lever, via a rack and pinion, controls the head's movement up and down the column. A gas-filled shock holds the head stationary in any position. The motor powers the auger bit, which extends through the hollow chisel. An adjustable fence positions the workpiece and a U-shaped hold-down keeps it in position. Mortises are made by advancing the workpiece along the fence while cutting successive squared holes.

through the workpiece. This can take a lot of effort. However, brute force isn't everything. It's important to match the chisel's advance into the mortise with the cutting rate of the auger. A feed rate that's too slow causes burning; one that's too fast jams the chisel.

Hold-Downs: The Achilles' Heel of Mortisers

Our tests revealed an unfortunate similarity between machines: The hold-down systems don't work, especially when large chisel sets are used. It's hard to withdraw the chisel after cutting a single four-sided mortise, especially in a hard wood like maple. If the hold-down allows the workpiece to twist, the chisel gets wedged in the mortise and is impossible to get out. Easy withdrawal requires a level of accurate machining and rigidity the hold-down systems on these mortisers don't possess. The Multico machine is the only one that separates the hold-down from the adjustable fence, which is a good idea. Instead, it mounts independently on the column. Unfortunately, this hold-down fails just as often because of its lock-down device, which is a real pain to tighten.

A chain is only as strong as its weakest link. The inadequate hold-downs are frustrating because, for the most part, these machines are well built. Fortunately, we found simple solutions that eliminated the problems.

Do you prefer smoking or non-smoking? Motor speed is an important consideration when you choose a mortiser.



SMOKING AND BURNING are normal, according to the owner's manuals of fast-speed mortisers. These machines are hard on chisel sets because they generate a lot of heat while mortising. When they get too hot, the chisel and auger turn blue and lose their temper (inset). Slow-speed machines are much less likely to ruin chisel sets. Fast-speed machines are noisy and nerve-racking to operate, but they cut mortises with less effort than slow-speed versions.



A LONGER HANDLE makes mortising easier. The extra leverage gained by slipping a 20-in. length of pipe over the hand lever helps most when cutting

1/2-in. mortises with slow-speed machines because they require more effort than their fast-speed counterparts. Slow-speed machines are also more likely to stall while cutting, so high motor amperage (min. 5 amps.) is important, especially when you lengthen the handle.

At less than \$250, benchtop mortisers are a bargain. Even so, you can spend a lot less for machine mortising, or you can spend a lot more.



CONSIDER AN ATTACHMENT for your drill press. It's inexpensive (less than \$40) and works well enough if you only need to mortise occasionally. However, your drill press wasn't designed for mortising. The head isn't rigid enough and the short handles don't give you much leverage. In hard use the tables flex considerably.



INDUSTRIAL-QUALITY mortising machines have large capacity and adjustable tables. Instead of cheaply made hold-downs held by a setscrew, they use a massive plate, threaded like a vise, to wedge the workpiece firmly in place. Although it costs \$650, our testers loved this Powermatic model #719, which weighs in at 188 lbs.

TOOL TEST: Benchtop Mortisers

Remember three things when you install chisel sets:

1. Allow proper clearance between the chisel and the auger.
2. Tighten the auger so it won't slip.
3. Square the chisel to the fence.

USE TWO SCRAPS OF WOOD when you install the chisel and bit. One acts as a spacer between the chisel and its bushing to assure proper clearance between the auger and the hollow chisel. Its thickness depends on the size of the chisel. Check the owner's manual. The other scrap protects your finger while you hold the auger in position for tightening. Tighten the chuck in all three holes so the auger won't come loose during a cut. Then remove the spacer and snug up the chisel against the bushing. Square it to the fence (inset) and tighten the setscrew.



The hold-down systems on these machines *stink!*



THIS HOLD-DOWN doesn't sit flat, so the workpiece it's supposed to hold is free to twist, or "rack," underneath it. Poor-fitting hold-downs are common and they're the weak link in these machines.



A POOR-FITTING HOLD-DOWN caused the chisel to bind in this mortise because it allowed the workpiece to rack. Once a chisel is stuck, it's a real pain to get loose. Some of our testers were so frustrated by hold-down failures they decided they wouldn't buy any benchtop mortiser.

Recommendations

At first glance, the machines appear quite different. But we found that few of the differences directly affect performance.

It doesn't matter whether the fence is cast iron or angle steel. What matters is that the fence is square to the table. Two machines came with fences that weren't square and needed replacing.

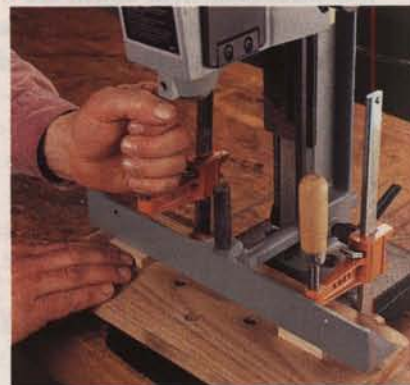
It doesn't matter how the head is mounted to the column. What matters is whether the head can be adjusted so it can move up and down the column without racking. Only one machine lacks this adjustability.

It doesn't matter whether the hold-down device is fastened to a post on the fence or mounted directly to the column. What matters is that it does its job. At best, the hold-downs on these machines are barely adequate.

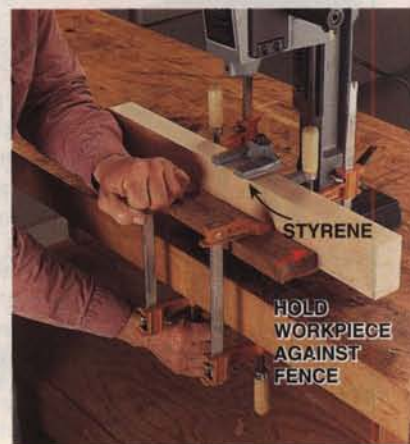
It doesn't even matter which motor speed you choose. Although we liked working with slow-speed machines better, fast-speed machines cut mortises just as well.

Fix the hold-down systems and these mortisers work great.

CLAMP THE FENCE to the mortiser's table, using spacers if necessary, so it stays put when the chisel is withdrawn.



CLAMP A BOARD in front of the workpiece so it can't rack. Sand or file the bottom of the hold-down so it sits flat. Then use cyanoacrylate (CA) glue to attach a piece of styrene to its bottom. (Both CA glue and sheets of styrene are available at hobby stores.) Styrene helps the workpiece slide back and forth more easily under the hold-down.



Editors' Choice

The hold-downs on these machines are a disappointment. The problems were so obvious and our fixes were so simple, it's puzzling that no manufacturer has bothered to come up with a better system. At the very least, the manufacturers should include a section in their owner's manuals titled something like "Getting the Most Out of Your Mortiser" that would show how to make these improvements. We bet most woodworkers would be willing to pay more for a machine that they didn't have to mess with. Because none of the machines was able to consistently cut 1/2-in. mortises without additional clamps and fences, we've decided not to give an Editors' Choice award. We'll wait for a basic machine with a hold-down system that's effective through the range of its capacity.

Best Buys

With improvements to their hold-down systems, six of the machines we tested consistently cut mortises effectively. Five of these mortisers are competitively priced and received our Best Buy award. The sixth, the Multico PM 12, costs \$300 more. The Delta and Jet machines run at 1,725 rpm. Mortisers from Bridgewood, Grizzly and Woodtek, which have similar castings and are virtually identical, have fast-speed motors. These machines are a definite improvement over mortising on the drill press. There are better ones on the market, but they cost a lot more. At less than \$250, all five of these mortisers are a bargain, and are winners of our Best Buy award. **AW**



Bridgework HM-11



Grizzly G3183



Delta 14-650



Jet JBM-5



Woodtek 876-775

Model:	Street Price Excluding Shipping	Chisel Sets Included	1/2 HP Motor Amperage	Motor Speed (rpm)	Fence Square to Table	Chuck Access	Comments	Supplier
Bridgewood HM-11	\$219	None	6A @ 110V	3,400	Yes	Right hand only	Good performance. Powerful motor. Adjustments require two Allen wrenches (supplied) and a screwdriver (not supplied). Machines from Bridgewood, Grizzly and Woodtek have similar castings.	Wilke Machinery Co. (800) 235-2100
Central Machinery 35570	\$150	1/4-in., 3/8-in. and 1/2-in.	2.3A @ 110V	3,580	No	Both hands	Underpowered, but will cut small mortises. Fit between head and column is not adjustable. Head racks under load. Fence adjustment very limited. Spring loaded return on hand lever is potentially dangerous.	Harbor Freight Tools, Inc. (800) 423-2567
Craftsman 351.219060	\$200	None	4A @ 120V	1,725	No	Both hands	Comes with tool caddy for bits and wrenches. 4-amp motor stalls under load. Fence doesn't work well because its mounting post is offset from the chisel.	Sears, Roebuck and Co. (800) 377-7414
Delta 14-650 Type 2	\$242	1/4-in. 5/16-in. 3/8-in. 1/2-in.	5A @ 120V	1,725	Yes	Both hands	Solid performance. One easy-to-use T-handle Allen wrench tightens everything but the chuck. Comes with tool caddy for bits and wrenches. Spring-loaded chuck key is a pain to use.	Delta Intl. Machinery Corp (800) 438-2486
Grizzly G3183	\$225	None	6A @ 110V	3,400	Yes	Right hand only	Good performance. Powerful motor. Adjustments require two Allen wrenches (supplied) and a screwdriver (not supplied). Machines from Bridgewood, Grizzly and Woodtek have similar castings.	Grizzly Industrial, Inc. (800) 523-4777
Jet JBM-5	\$239	1/4-in. 3/8-in. 1/2-in.	6A @ 115V	1,720	Yes	Both hands	Highest amperage slow-speed motor. Spring-hinged doors allow easiest access to chuck. Best chuck key of the group—large, with long shaft and T-handle Thumb-screw on hold-down is hard to tighten.	Jet Equipment and Tools, Inc. (800) 274-6848
Multico PM 12	\$549	1/2-in.	5.1A @ 110V	3,470	Yes	Both hands	Well-built machine, but costly. Column mounted hold-down is effective, but difficult to tighten. One easy-to-use T-handle Allen wrench tightens everything but the chuck. Supplied 13/16" chisel bushing won't work with inexpensive chisel sets. Manual needs improvement.	Garret Wade, Inc. (800) 221-2942
Woodtek 876-775	\$240	None	6A @ 110V	3,450	Yes	Right hand only	Good performance. Powerful motor. Adjustments require two Allen wrenches (supplied) and a screwdriver (not supplied). Machines from Bridgewood, Grizzly and Woodtek have similar castings.	Woodworker's Supply (800) 645-9292

by Andy Rae

Mitered Face Frame

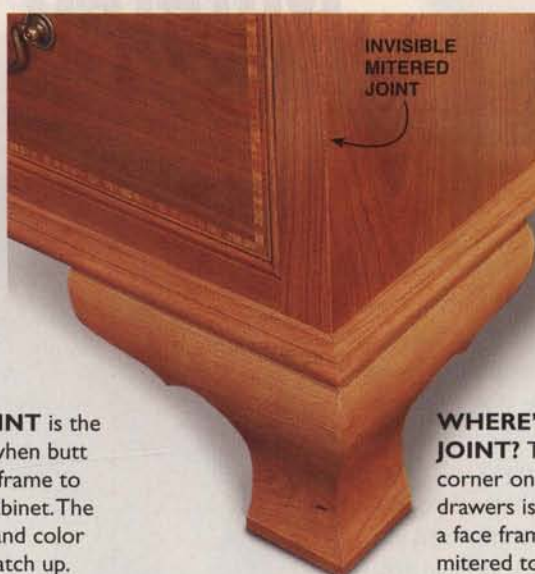


Butt Joint



A VISIBLE JOINT is the obvious result when butt joining the face frame to the front of a cabinet. The grain direction and color almost never match up.

Mitered Joint



WHERE'S THE JOINT? The clean corner on this chest of drawers is the result of a face frame that's mitered to the case.

for an Invisible Corner Joint

A face frame adds strength to any cabinet while providing a convenient anchor for attaching doors and drawers. But typical face frames are applied to the cabinet with a butt joint. The edge of the face frame almost never matches the grain or color of the cabinet side, creating a conspicuous corner joint (photo above, left).

That's OK for utilitarian cabinets in the kitchen or bath, but when you're building that one extra-special piece, wouldn't it be nice if that face-frame joint was invisible?

Fortunately, the solution is simple; miter the face frame to the cabinet. This technique provides a seamless intersection between the frame

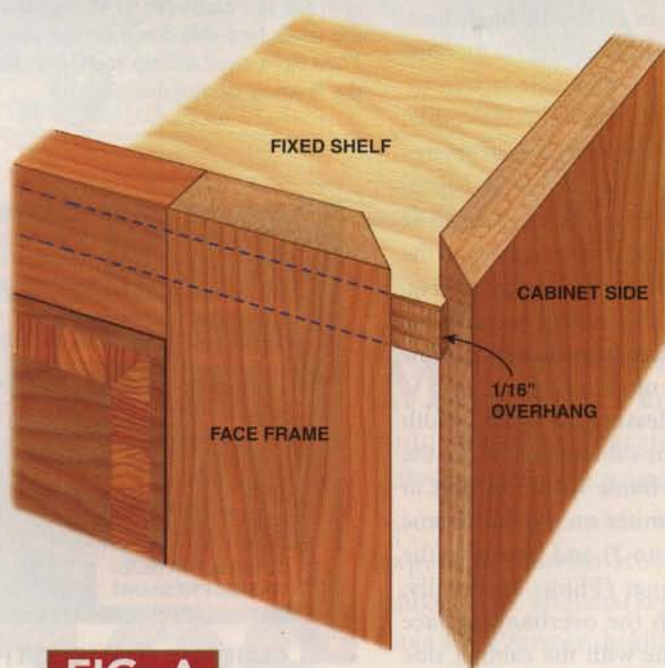
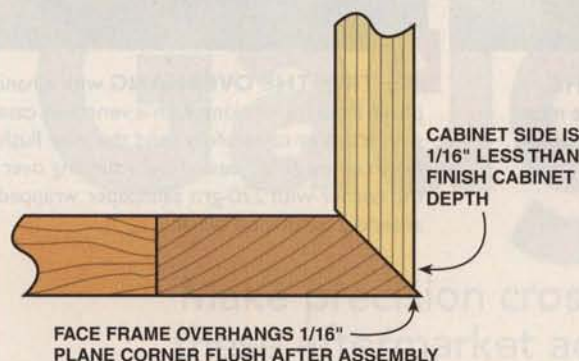


FIG. A

Lay Out the Correct Case and Frame Dimensions

Laying out your cabinet parts for a mitered face frame is different than for a conventional face frame. The fixed shelves are sized the same but the sides are cut to the finished depth of the cabinet minus 1/16-in. and the face frame is made an extra 1/8-in. wide overall, so it protrudes 1/16 in. on each side.



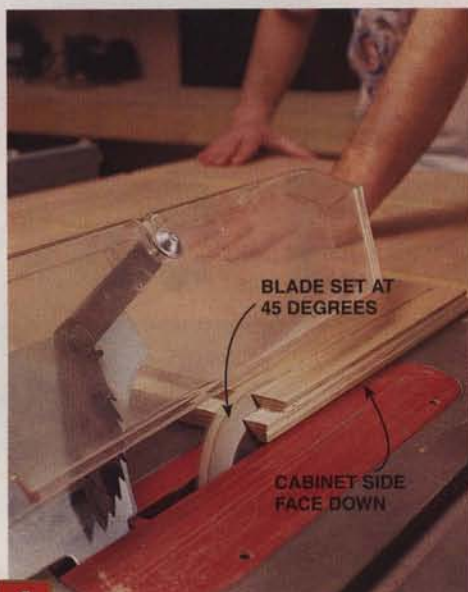
Mitered Face Frame

and cabinet. It also makes a self-aligning joint that's less prone to skating around as you apply clamping pressure. You can use this technique with either solid-wood sides or veneered plywood. Sounds like too much of a hassle? It's really a straightforward technique and I'll show you a couple of tricks that ensure good results.

First, cut the cabinet sides an extra 1/2-in. wide, then machine your dados and rabbets. Rip a 45-degree bevel on the front edge of each side (Photo 1). Set the blade back to 90 degrees and rip the back edge so each side is 1/16-in. less than the finished depth of the cabinet. The fixed shelves are cut to a normal depth, which results in each shelf extending 1/16-in. beyond the inside edge of the miter (Fig. A). This creates a cradle for the face frame to nest in. Now glue up the carcass.

Measure the overall width of the cabinet then make the face frame 1/8-in. wider. Cut the miter on the face frame (Photo 2) and glue it to the cabinet (Photo 3). Finally, flush the overhanging face frame with the cabinet side (Photo 4).

This is one of those details people may not notice right away, but subconsciously they'll recognize that little something extra in your work. **AW**



1

MITER THE CABINET SIDES

with the saw blade set to 45 degrees. Run the stock face-side down on the tablesaw. Then flip it over, and rip to 1/16-in. less than the finished cabinet depth.



2

SAW A MITER along the face frame so

it makes a knife-edge at the corner. A tall fence stabilizes the frame as you push it past the blade. To prevent the waste piece from kicking back, be sure to raise the featherboards above the offcut with riser blocks.



3

GLUE THE FRAME TO THE

CABINET. Prevent slippage at the miter joints by clamping both front to back and side to side.



4

TRIM THE OVERHANG with a hand

plane. If you're working with a veneered case side, it's safer to carefully sand the joint flush. Finish up by gently easing and rounding over the corner with 220-grit sandpaper wrapped around a hardwood block.



Woodhaven



Incra



AccuMiter



Vega



Osborne

Tool Test | by George Vondriska



ART DIRECTION: JOEL SPIES • PHOTOGRAPHY: BILL ZUEHLKE

Miter Gauges

Make precision crosscuts with these aftermarket accessories.

Manufacturer-supplied miter gauges are notoriously inaccurate. Aftermarket miter gauges address the problems experienced with stock gauges. The aftermarket has long fences, highly accurate stops for setting angles and well-made bars. But they cost over \$150. Are they worth it? We got 'em, tested 'em and found out we liked 'em.

Who Needs 'Em?

Accurate crosscutting usually comes down to a choice between a miter saw and a tablesaw with a good miter gauge. The tablesaw offers some advantages: you'll save space; you can do compound cuts; and an aftermarket miter gauge costs half as much as a compound miter saw.

There are some limitations, too. Without a doubt it's easier to crosscut a long board using a miter saw on a stand than on a tablesaw. But for accurately cutting pieces 4-ft. long or less, these miter gauges are great.

Using a miter gauge on your tablesaw allows you to crosscut boards up to 11-in. wide, depending on your saw. To get that capacity in a miter saw, it would have to be a sliding model at three times the price of a good miter gauge.

Keep in mind that if you primarily want to use your tablesaw to make accurate 90-degree cuts, you can do it with a shop-made crosscut sled (see AW issue #75, October 1999, page 38).

The main advantage to the aftermarket miter gauges is that the angle settings are precise and repeatable. Typically, a positive stop accurately locates the gauge's head at specific angles (usually 90, 45, 30 and 22.5 degrees). The Incra gives you more options, with stops every 1/2 degree. The manufacturers use different systems (Photos 1, 2 and 3), but all the miter gauges we tested consistently locked at the angles for which they had positive stops.

Three Features

Each component of a miter gauge must do its job for the whole system to work well. The most important features are: (1) the quality of the positive stops in the head; (2) a long and adjustable bar; and (3) a rigid fence with a good stop.

The Head

This is the heart of the tool. You want to set the dang thing to an angle and have it actually produce that angle every time.

Most miter gauges use a protractor-style head, much like the miter gauge that came with your tablesaw, but with a significantly higher degree of accuracy. Only the Osborne strays from the protractor design, using an arm that creates a triangle.

Some of these tools (the Woodhaven and Osborne), come preset with angles so

you won't have to calibrate them. Both tools were dead on. The other models need to be calibrated to 90 degrees (see "The Squareness Test," page 83). Once calibrated to 90 degrees, the preset stops are used to get other angles.

All of the gauges except the Incra can angle at least 45 degrees in both directions.



1

WOODHAVEN

provides a thumbscrew that goes through holes in the head to pin the protractor in the right spot.



2

THE ACCU-MITER AND VEGA

use an indexing pin that engages a hole in the protractor head to register the position.



3

INCRA'S indexing

finger positively engages a rack on the protractor head, allowing positive stops in 1/2-degree increments.

The Bar

If the bar of your miter gauge doesn't fit the slot in your table well, it won't matter how accurate the rest of the tool is. Any side-to-side play affects the accuracy of the angles you're trying to produce.

Some manufacturers have devices that allow you to custom fit the bar to your table (Photo 4). Others advise you to file or peen (hammer on) the bar to make it smaller or bigger. We prefer the adjustable bars.

In addition, long bars are better bars because they have more contact with the tablesaw slot.



4

THE BEST RESULTS

come from miter gauges with bars you can readily custom fit to your saw. The Osborne (left), Woodhaven (middle) and Incra (right) provide ways to do this.

The Fence and Stops

Each miter gauge we tested had a good, stiff fence and a stop block. All of the stops had a direct-read feature, which lets you set the stop to a measurement on the fence and cut a piece to that size. All the gauges can be set up to work on the left or right side of the blade.

While flip stops are great for cutting lots of parts to uniform length, they have one shortcoming. If you're cutting mitered parts, the point of the miter can cause the flip stop to climb (Photo 6). If this happens, cutting uniform lengths is impossible.

Incra and Woodhaven have addressed this. The Incra stop doesn't flip, it slides, so it rigidly registers mitered parts every time. The Woodhaven flip stop can be locked in a down position with a 1/4-20 bolt (Photo 5). Flip stops on other gauges need to be clamped.

Many woodworkers want to add a wooden sub fence to prevent splintering on the back of a cut. This is easiest on the Incra and Woodhaven tools because their fences are t-slotted. The other gauges require drilling through the fence; not too big a deal because they're all aluminum.

All fences but the Osborne can be adjusted close to the blade to provide maximum support. The Osborne fence is in a set position on the bar and can't be moved.

Recommendations

All five miter gauges are approximately the same price. Our favorites were the Incra and the Woodhaven. The Incra has an adjustable bar, a sliding stop with convenient top-reading scale and easily accommodates a wooden face. The Woodhaven has a simple, traditional design, with adjustable bar and a flip stop that still works when a wooden face is added. Both are fine tools. **AW**



5 WOODHAVEN'S FLIP STOP can be locked down so it doesn't climb up miters.



6 ALL OTHER FLIP STOPS will climb on miters, making uniform length impossible, unless the stop is clamped.

The Squareness Test

No matter how you're cutting parts, you need to know if your tool is cutting square. Instead of setting up the tool with a try square, I do it with test cuts. It's a simple process, and you can use it to set up the gauges in this test.



Step 1
Joint a reference edge on two pieces. Mark the edge with an X. Place this edge against the fence and cut one end of each piece.

Step 2
Place the reference edges on a flat surface, like your table saw table. If there's a gap, you don't have square cuts.

Step 3
Adjust the fence until you've removed the gap, producing perfectly square cuts.

Brand	Price	Fence	Bar	Comments
Accu-Miter	\$168	18" long (extends to 34").	20" with t-slot washer. File or peen to fit your slot.	Built-in stop system for cutting up to 34". Difficult to mount wooden sub fence. Ruler only works to left of saw blade. Harder to adjust fit of bar.
Incra The Miter Gauge	\$185	27" long. Uses an Incra rack to allow 1/32" adjustments. Micro adjust to dial in between. Attach wooden sub fence with t-slots.	21" with t-slot washer. Expand 6 nylon washers to fit slot.	Very easy to adjust bar. 1/2-degree positive stops. Great direct-read ruler. Stop block instead of flip block necessitates removing stop when not needed.
Osborne Miter Gauge	\$165	26" long. Abrasive strip on one side to prevent wood creep during cutting.	21" with t-slot washer. Two expansion slots adjust to fit slot.	Light weight and easy to handle. Difficult to calibrate ruler to blade. Easy to adjust fit of bar.
Vega PMG 24	\$195	24" long (extends to 42"). No direct-read ruler past 24". Includes hold-down clamp.	20" without t-slot washer. File or peen to fit slot.	Longest fence. Hard to adjust fit of bar. No t-slot washer.
Woodhaven Precision Miter Gauge	\$170	24" long. Attach wooden sub fence using t-slots. Flip stop locks so it won't climb miters.	17" with t-slot washer for both ends. Adjust bar using set screws and 4 plugs.	Lots of positive stops. Good flip stop. Bar must be out of table to adjust fit. Shortest bar.

Sources

Accu-Miter
(800) 382-2637
www.thejdscompany.com

Incra
(972) 418-4811
www.incra.com

Osborne
(800) 852-9655
www.osbornemfg.com

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16" x 100 T (1" hole)	243	219	206

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14" x 40 T x 1"	\$148	\$134	\$127
14" x 30 T x 1"	138	125	118
12" x 40 T x 1"	128	116	110
12" x 30 T x 1"	118	107	101
10" x 40 T x 1/8" or 1/32"	118	107	101
10" x 30 T x 1/8" or 1/32"	98	89	84
9" x 40 T	108	98	93
9" x 30 T	98	89	84
8 1/4" x 40 T x 1/32"	98	89	84
8" x 40 T x 1/32"	98	89	84
8" x 30 T x 1/32"	88	80	78
7 1/4" x 30 T x 1/32"	68	62	59
6" x 40 T x 1/32"	88	80	78
5 1/8" x 40 T x 10mm	88	80	78

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8 1/4" x 60 T Sears, Delta, Ryobi	108	98	93
8 1/2" x 60 T Hitachi, Dewalt, Ryobi, FreudTR125	118	107	101
9" x 80 T Delta & Others	128	116	110
10" x 80 T Delta, Bosch, Mitachi, Makita, Ryobi, AEG, & All	138	125	118
12" x 80 T Dewalt, Hitachi, Makita, B-D, Sears, & All	148	134	127
14" x 100 T Makita, Ryobi	188	170	161
15" x 100 T Hitachi, Ryobi	198	179	169

WOODWORKER I

7 1/4" to 14" diameter available

Designed for radial arm or tablesaws—fine crosscut.

	Sale Price	10% Off 1st Blade	15% Off 2nd Blade
8", 8 1/4", 7 1/4" x 60 T	\$108	\$98	\$87
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	Sale Price	10% Off 1st Dado	15% Off 2nd Dado
6" Set	\$269	\$242	\$229
8" Set	289	260	245
10" Set	349	314	297
12" Set	449	404	382

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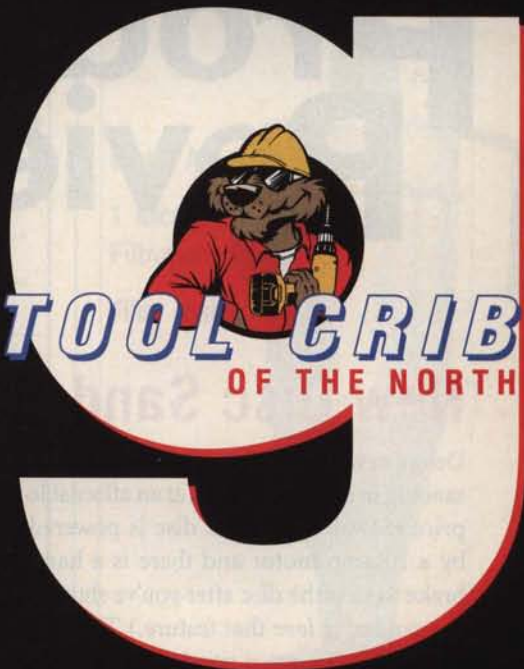


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Product Reviews

New Disc Sander

Delta's new disc sander offers serious disc sanding in a benchtop unit, at an affordable price (\$180). The 12-in. disc is powered by a 10-amp motor and there is a hand brake to stop the disc after you've shut off the sander. (I love that feature.) The disc runs at 1,725 rpm, a good slow speed to prevent burning.

The table tilts 45 degrees in two directions and includes a miter gauge slot. Although no miter gauge is included, any miter gauge with a 3/4-in. bar will fit.

The sander has a 2-1/2-in. dust collection port and dust pick up is effective, even with a shop vacuum. A 40-in. hose is included.

Delta, (800) 438-2486



Blade Height Tool



Setting the height of a dado head in a tablesaw can be a painstaking task. Unless you're sure your insert is perfectly aligned with the tabletop, you should measure blade height from the

table, not the insert. This can be awkward. Here's a device that takes out some of the guesswork.

The BladeGauge, \$40, has a magnetic base that holds it to the table, and steps that are precisely machined in 1/8-in. increments

from 1/8 in. to 2 in. Each step is labeled with a blade-height measurement. Locate the step for the blade height over the blade. Raise the blade until it contacts the step and an LED lights up.

I'd prefer to see steps in 1/16-in. increments instead of 1/8 in. (The manufacturer says they're working on this.) I'd also like to be able to use the BladeGauge on my router table, but you've got to be working on a conductive surface.

Although I'm not doing my wood-working through bifocals yet, I can see the usefulness of the BladeGauge. It's a handy tool, and will be even better if it gets the modifications mentioned above.

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2-1/2 x 24	7.75
2-1/2 x 36	9.50



SPRING CLAMPS

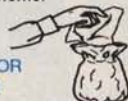
Clamps come with PVC tips and grips.

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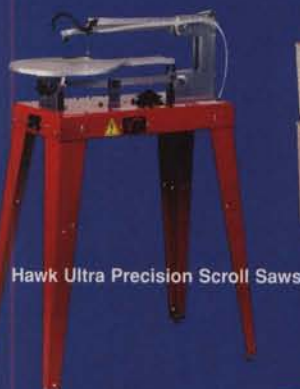
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Product Reviews

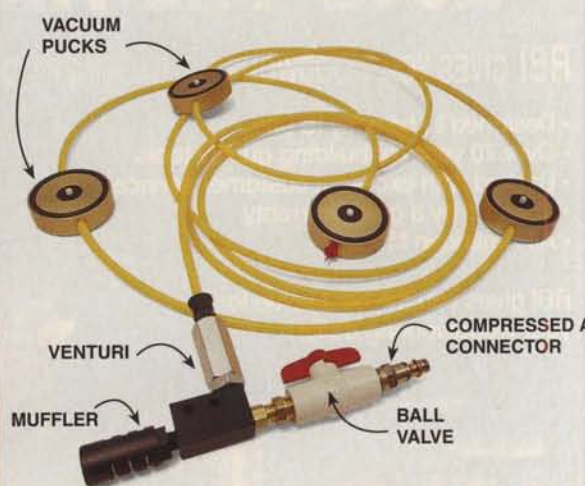
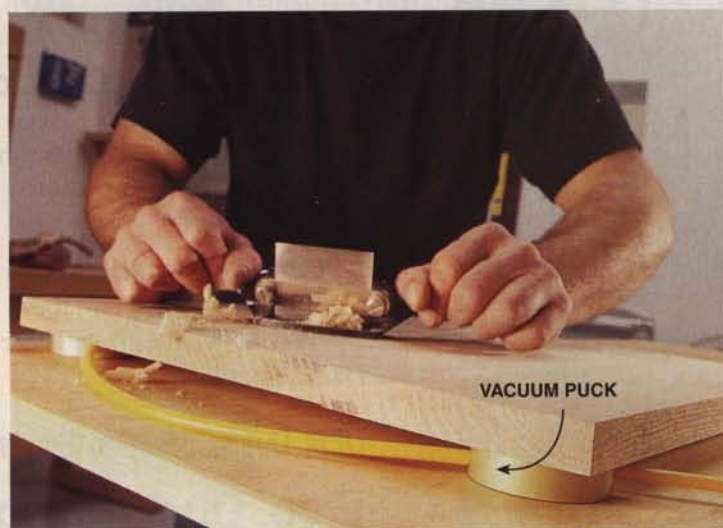
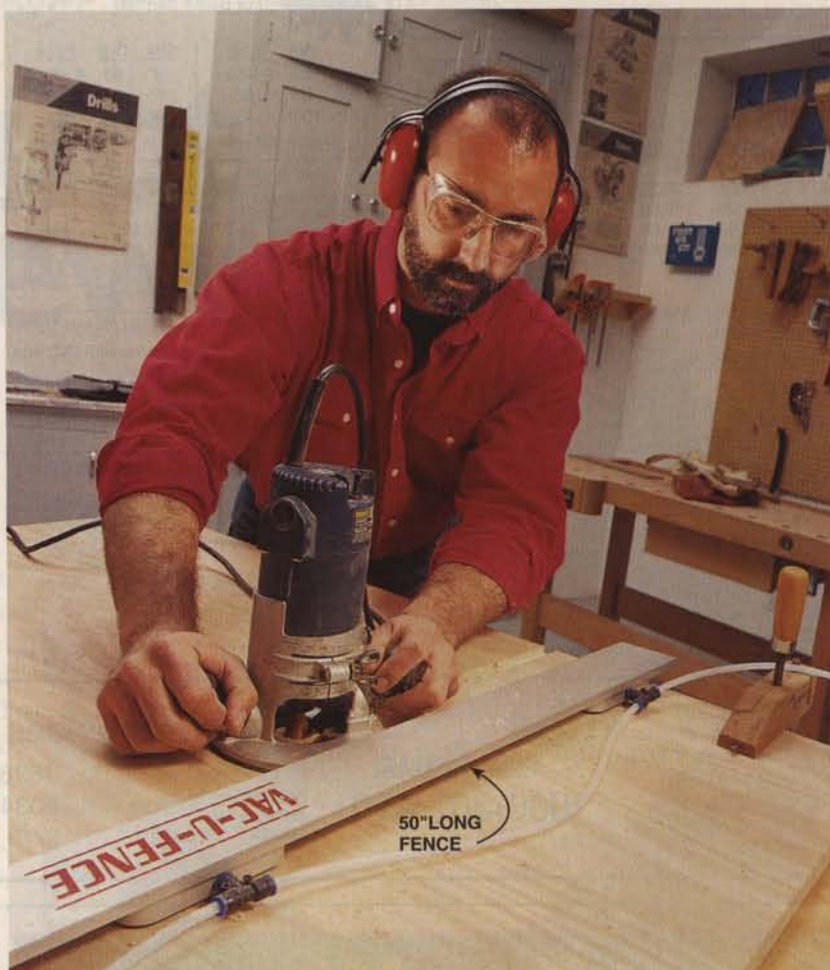
Vacuum Clamp

One of the powerful technologies trickling down from industry is vacuum clamping. Right now, vacuum clamps aren't cheap, so they're best suited to production shops, but they're great tools.

West Oak's K-B4 kit (\$250) provides everything you need to get to work, including four 2-1/2-in. diameter vacuum pucks, 15 ft. of air line, a venturi and a muffler. You don't need a vacuum pump, just your air compressor and the venturi.

When you provide air to the system, one face of the puck seals itself to your bench. The other has a spring-loaded valve that opens when you set your work on it. A high-quality gasket lets the puck hold onto all but the roughest materials. Planed solid wood and cabinet-grade sheet goods are held with ease.

The hold down power of these vacuum clamps is amazing. You won't have any trouble routing or sanding vacuum-clamped pieces. A router mat can



do some of the work that the vacuum clamp does, but you won't get the same hold-down power.

Another handy, though admittedly expensive, device is a vacuum fence. West Oak's Vacuum Hold-Down Fence

uses pucks similar to those in the K-B4 kit. This set-up works even under the pressure of routing a 3/4-in. dado.

The 50-in. fence sells for \$190. Add the K-C kit (\$124) to get the venturi and all the necessary parts to hook up

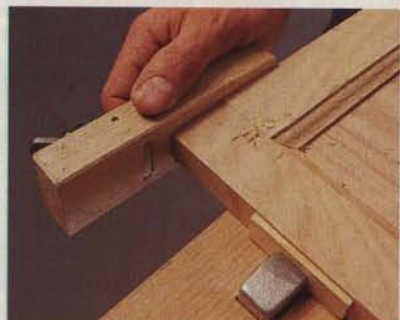
to your air compressor.

You'll need a compressor that can provide a minimum of 2 cfm at 75 to 95 psi for these clamps to work.

West Oak, Inc.
(515) 264-0014

Product Reviews

Japanese Planes, Great Price

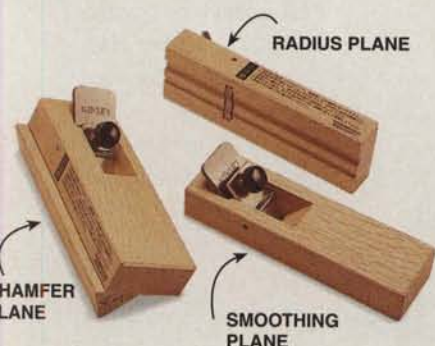


Here are three affordable (though well made) Japanese pull planes from Kakuri. They feature: incredibly sharp irons right out of the package; and comfortable-to-hold, rift-sawn white oak plane bodies. These planes handle best when cutting on the pull stroke.

The smoothing plane, \$25, can be used like you'd use a block plane. It works great to smooth end grain in hardwoods. The chamfer plane, \$35, has a fence for cutting 30, 45, and 60-degree chamfers. Long grain or cross grain, it cuts smooth. The radius plane, \$35, cuts 1/8-in. and 1/4-in. radii. Like the chamfer plane, it's effective across or with the grain.

You'll have to get the hang of tapping the plane body with a mallet to set the depth of the iron. Tap the front of the plane to increase the cut, tap the back of the plane to decrease the cut. But if you're interested in trying Japanese planers, here's an excellent place to start. **AW**

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Finishing Tips

No More Drip Shadows

When finishing a large flat surface, the temptation is to finish the top first. Inevitably, some varnish runs over the edge and soaks into the end grain.

Even after you finish the edge, the soaked in drips remain as dark shadows. No amount of re-coating takes care of it and you're faced with having to strip, sand and refinish.

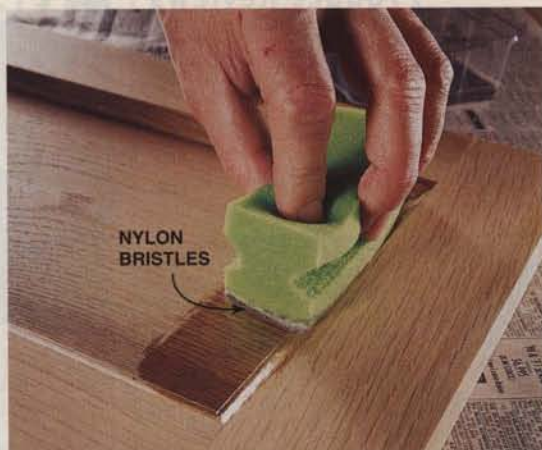
Fortunately, the problem is easily avoided. Coat the end grain with a thinned coat of varnish before tackling the top. A mixture of two parts varnish to one part mineral spirits works well. The drips won't be able to soak in and leave their shadow.

TOP FINISHED FIRST

D RIP SHADOW

EDGE FINISHED FIRST

CLEAN EDGE



The Perfect Pad for Waterborne Poly

Remember finger painting in kindergarten? Wouldn't it be great if finishing could be that fun and easy? It can be with paint pad sponges. No more tortured hand positions as you maneuver a brush handle around chair rungs or into panel corners. These soft pads conform to contours while the short nylon bristles lay down an even coat of finish. The ends are cut at an angle so getting into corners is a breeze. The sponges also hold a lot of material, which means fewer trips back to the pan when finishing a large, flat surface. Look for pad sponges in the paint department of home centers and hardware stores.

Bag Your Cartridge Mask

Organic vapor cartridges work great but they're useful life is only about eight hours. That's not very long. And what's worse, they're such dedicated little buggers they actually keep right on working even when you're not wearing the mask. Give them a rest and prolong their life by storing your mask in an airtight container when not in use.

A resealable plastic bag or an old ice-cream pail work great.



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Unclog Your Paper

When you're scuff-sanding between finish coats it's not unusual to get some loading on your sandpaper even when the topcoat is good and dry. It's frustrating when you know the grit is still good but those clumps of powdered finish ruin its effectiveness. Don't toss it out just yet. Clean the clogged paper with a nylon brush used for stripping. The stiff bristles knock off those pesky clumps and restore the paper to a useable condition.



No-Drip Thinner for Spraying Varnish

Oil-based varnish can be sprayed, although it should be thinned for good atomization. Rather than using mineral spirits or naphtha, try using acetone to thin the varnish. Acetone flashes off quickly and helps prevent runs and sags. Start with a mist coat over the entire piece. Wait a few minutes for the acetone to evaporate. Then spray on a thin wet coat. The tacky mist coat holds the wet coat and helps prevent runs and sags.



Iron Out Those Dents

Yes, these really are genuine before and after photos.

Here's a classic tip that *everyone* should know: It's not hard to make a dent in wood and fortunately, it's not hard to get one out, either. All you need is a household iron (don't worry, it won't get wrecked, but you may want to ask permission if it's not yours) and a damp cloth. Put a couple drops of water onto the dent and let it soak for a minute. Then lay the damp cloth over the dent and press the hot iron over it. The water in and around the dent is heated to steam which quickly swells the wood fibers back to their original shape. Don't over do it with the iron. Once you see the steam, remove the iron and cloth and give the fibers a little time to swell. If the dent isn't completely gone after the first try, repeat the process. A little light sanding completes the repair. **AW**



A HOUSEHOLD IRON and a damp rag are all you need to repair most dings and dents.



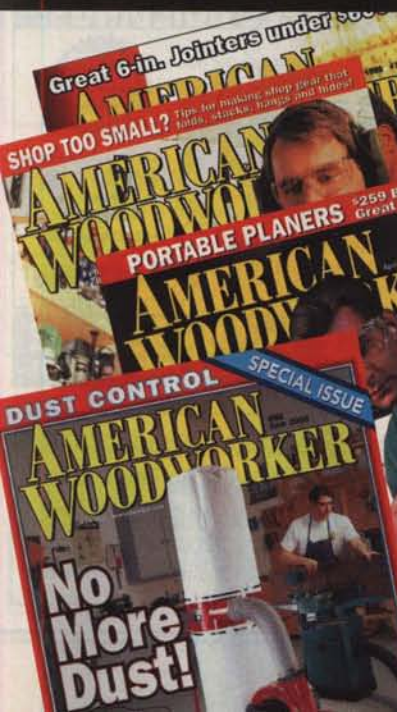
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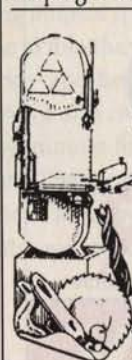
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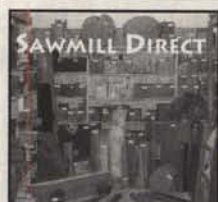
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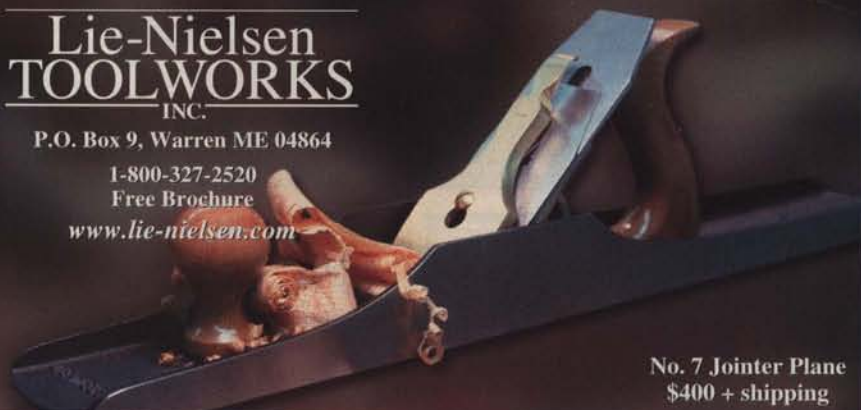
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by Sandra Brosberg

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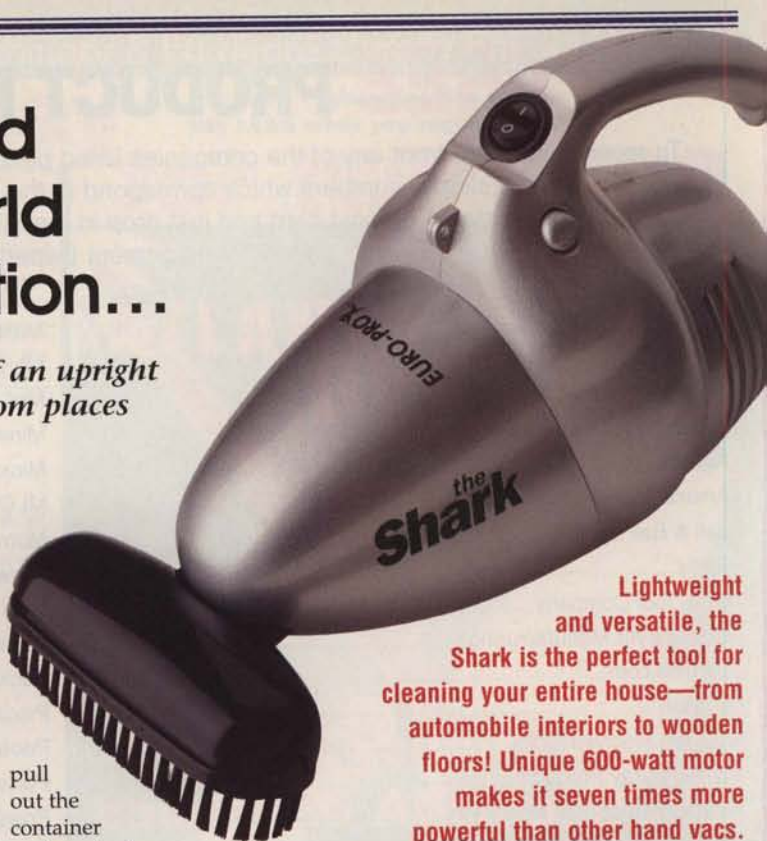


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continued from page 104

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B	Legs	2	22-1/4" x 28"
C	Fence	1	1" to 12" x 28"
D	Fence base	1	4" x 28"
E	Fence brackets	2	3-3/4" x 4" to 11"
F	Drift angle cleat	2	2" x 6"

3/4" Hardwood			
G	Edging	4	1-1/2" x 24"
H	Edging	4	1-1/2" x 22-1/2"
J	Ext. table brackets	2	1-1/2" x 8"
K	Cleats	2	(size to fit table)*
L	Guide brackets	2	1-1/2" x 12"

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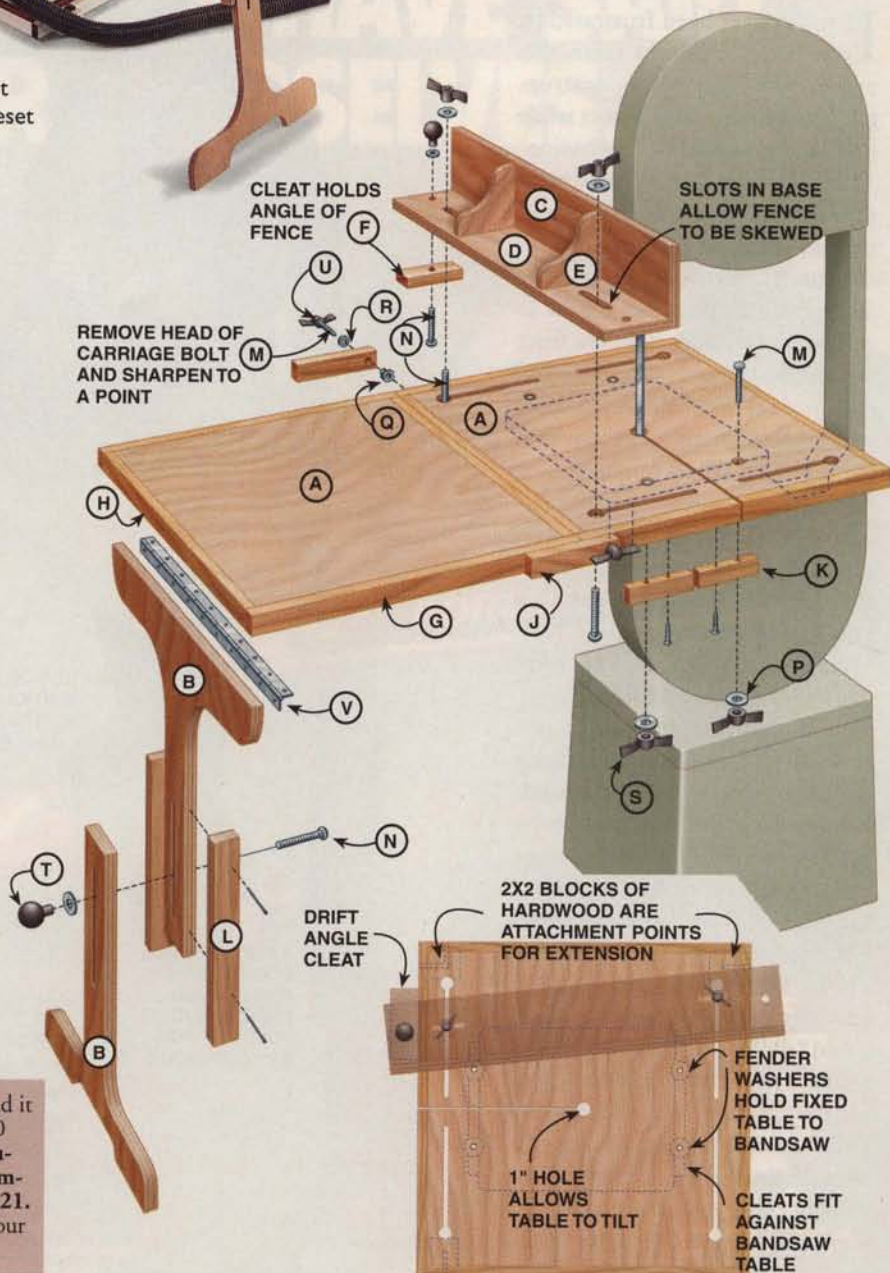
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This oversized table provides extra support for sawing or resawing plus the quick-set fence ends blade drift hassles.

If you've ever been frustrated by your small bandsaw table, this project is for you. No more struggling to balance large pieces while making intricate cuts or resawing.

Designed by George Vondriska, this two-part system features a table that triples the surface area of your old one. It comes tricked out with a fence that can be set at a skew to compensate for blade drift. The fence can be taken on and off, mounted on either side of the blade and adjusted in and out without losing the drift angle setting. When you need even more support, the extension table mounts in seconds. Fasten it outboard to support large stock (photo at right), or outfeed when resawing long boards (photo on page 103). When you're done, the extension table folds flat for easy storage.

To build the tables, cut the plywood and attach hardwood edging (G and H). Cut the slot for the bandsaw blade on the tablesaw. Center the plywood table on your bandsaw and screw on the cleats snug against the edge of your bandsaw's table. Countersink four 1-in. holes about 1/4-in. deep so the carriage bolt heads are just below the table surface. Then, drill four 7/16-in. holes through the tabletop and the cleats for the carriage bolt hold-downs. Drill the four 1-in. holes for the fence slots. All slots are cut with a 7/16-in. straight cutter in a router table.

continued on page 103 (That's right—go backward!)



THE OUTBOARD POSITION for the extension table provides extra support when cutting large stock. (Add a circle-cutting jig and you'll have the ultimate set-up for cutting round tabletops.) To reposition the extension table, simply unscrew the two T-style knobs and rotate it to the outfeed position (photo page 103).

Taking Band Saws to New Levels



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