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September 1998 #104

Popular Woodworking

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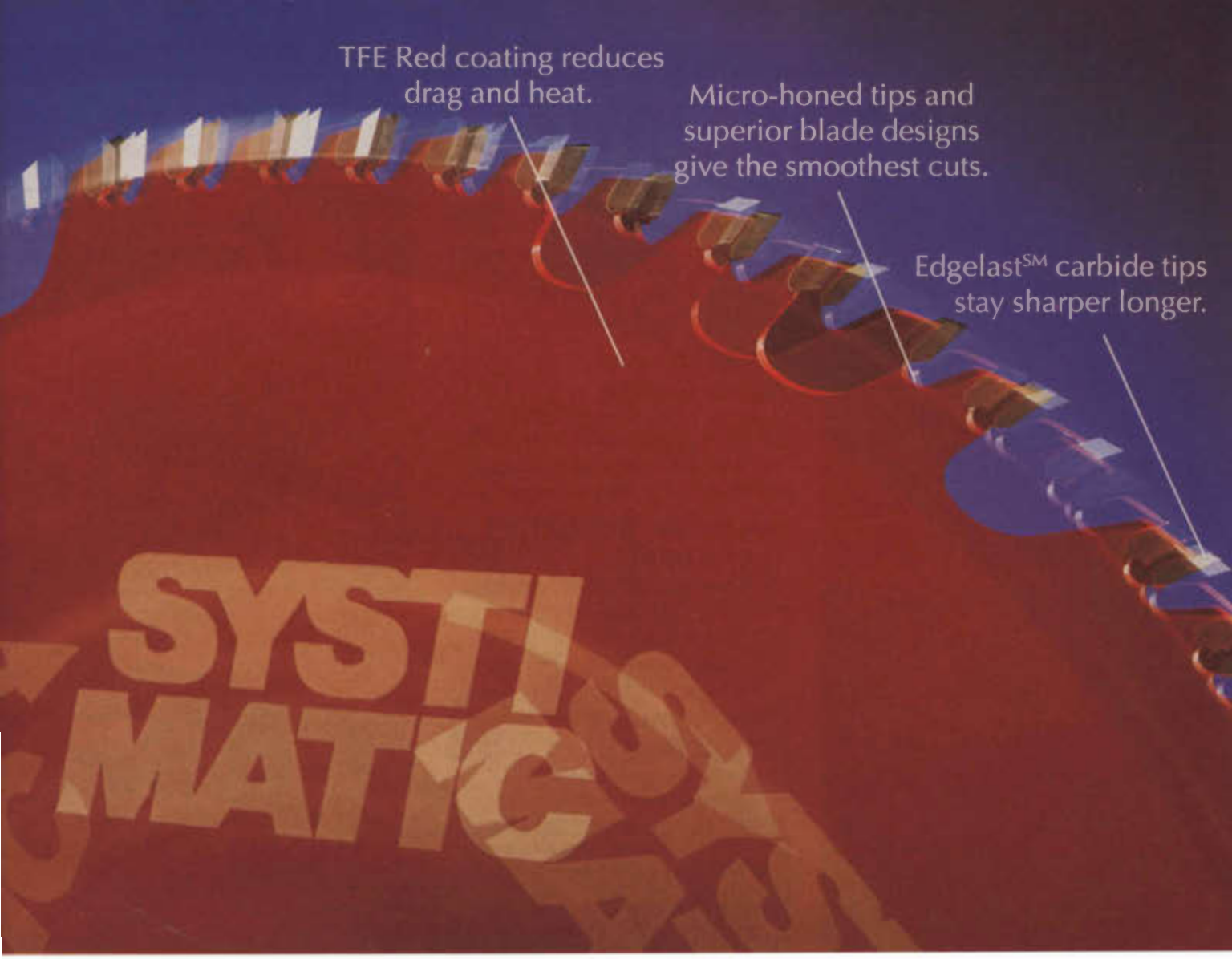

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Features

Project File

This special section, exclusive to Popular Woodworking, *features building basics for seven projects.*

Are we on target?

We want to know what type of projects you want to see in future issues of *Popular Woodworking*. If you like a particular project, simply circle that project's identification number on the postage-paid card located in the Resource Directory at the back of this magazine. We'll use this information to help plan future issues.

—Steve Shanesy, editor and publisher

Columns

Safety Note

Safety is your responsibility. Manufacturers place safety devices on their equipment for a reason. In many photos you see in *Popular Woodworking*, these have been removed to provide clarity. In some cases we'll use an awkward body position so you can better see what's being demonstrated. Don't copy us. Think about each procedure you're going to perform beforehand. Think ahead. Safety First!

The *Popular Woodworking* Crew • popwood@fwpubs.com

Steve Shanesy
Editor & Publisher
Specialties: Projects, techniques, article and project selection
(513) 531-2690 ext. 238

David Thiel
Senior Editor
Specialties: Projects, new products and tools, tricks of the trade
(513) 531-2690 ext. 255

Christopher Schwarz
Managing Editor
Specialties: Projects, article submissions, letters, reader contests
(513) 531-2690 ext. 407

Jim Stuard
Associate Editor
Specialties: Projects, carving, turning, project illustrations
(513) 531-2690 ext. 348

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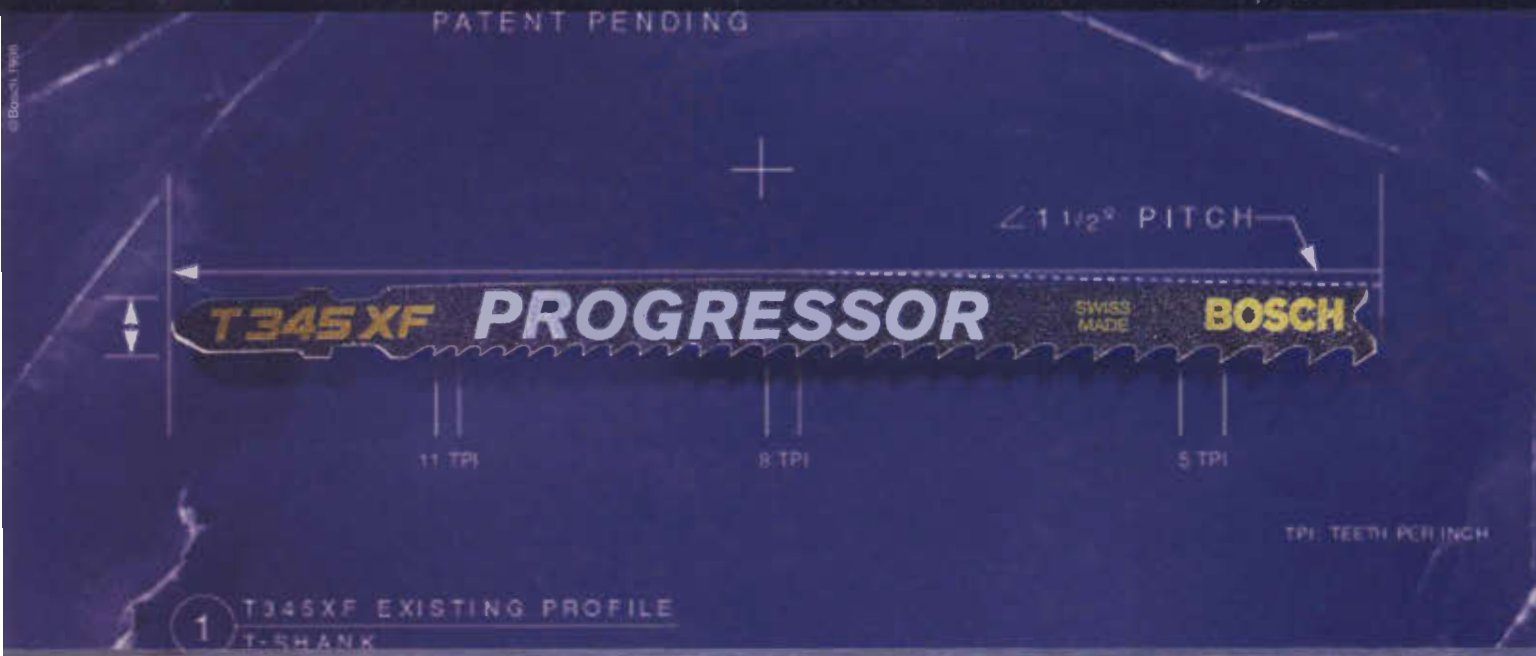

BOSCH

A UNIQUE TILT-BACK-ANGLE DESIGN THAT ELIMINATES BINDING ON THE DOWNSTROKE. VARIABLY SPACED TEETH FOR CLEANER CUTS AND THE VERSATILITY TO NEGOTIATE THROUGH ALL TYPES OF MATERIAL. WITH ONE SWIFT STROKE OF ENGINEERING PROWESS, THE NEW PROGRESSOR JIGSAW BLADES BREAK THE SPEED BARRIER AND PROVIDE OUR COMPETITION THE VERY MEANS TO EXIST. AVAILABLE IN METAL, WOOD AND ALL-PURPOSE, T AND U-SHANK.

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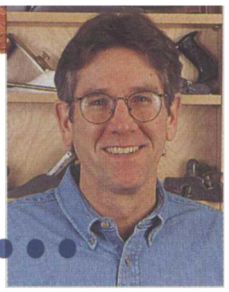
OUT ON A LIMB

My name is Steve, I have a problem . . .



FOR NEARLY 20 YEARS I've been working wood. And though I'm embarrassed to admit it, I've never learned to sharpen properly a plane iron or chisel. I've owned four planes and a modest set of chisels all these years. I've used the chisels regularly, but the planes, with the exception of the low-angle block plane, contributed more ambiance to my shop than purpose.

Oh, I could sharpen the chisels enough to do the job, and I sometimes think the low-angle plane would cut even if it had a piece of sheet metal in place of the iron. But my experience with these tools (or should I say lack of experience) led me to conclude that even though these were "sharp" tools, they performed like blunt instruments.

My first plane was a Stanley #5 jack plane, 14" long with a 2"-wide iron. I took it out of the box and went to work surfacing a 7' long by 14" wide piece of birch. It was a learning experience. I learned that I never wanted to do that again. It wasn't so much the hard work, which it was, as the finish on the board when I was done. To say it was alligatored would be an understatement. I put the plane on the shelf, where it stayed.

The next week I took the board to my tech-school night class where I used a 12" jointer and 30" planer to clean up my handwork. This was a learning experience, too! I believed that I had wasted money on the plane.

Over the course of the next few years I pulled the plane off the shelf to try it again (maybe that birch was just a knarly, hateful board). Ugh. Back on the shelf it went. I even bought a bench plane, figuring it wasn't the wood, it was the plane. Same results.

In the meantime, I became well versed in using a router. I purchased a small jointer and went to work in fully equipped shops with industrial-grade machinery. I found little reason to pick up those planes and chisels. With a few notable exceptions, most of the craftsmen I worked with, some of whom were truly gifted, weren't especially hand-tool junkies either.

Conclusion: You can make fine furniture and cabinets and never pick up a plane, though some use of chisels is required. Result: A hole in my woodworking education — I had no sharpening skills.

As the years went by I moved through a few more shops, one of which made antique reproductions. I observed that often the highly skilled workers were versed in the art of putting a nice edge on a blade and keeping it that way. They were just as likely to use a hand tool as a power tool. Planes and chisels were just other elements in their retinue of woodworking skills. An attitude adjustment was slowly taking place, from active dislike to a grudging acknowledgement of hand tools' practical purpose in a modern shop.

It really wasn't until Jim and Chris on our staff here started putting together the sharpening article in this issue **(page 60)** that I decided to take the plunge and fill that sharpening gap in my shop education. Jim, the expert, had taught Chris, the novice, in no time last year. So I figured that I'd dedicate a day or two to learning the ways and doing right by my old planes and chisels.

It's been a great experience, and I've enjoyed it. I really believe my future work will be better for it. And it's a liberating experience for me, and my planes, to finally be out of the closet. **PW**

Steve Shanesy

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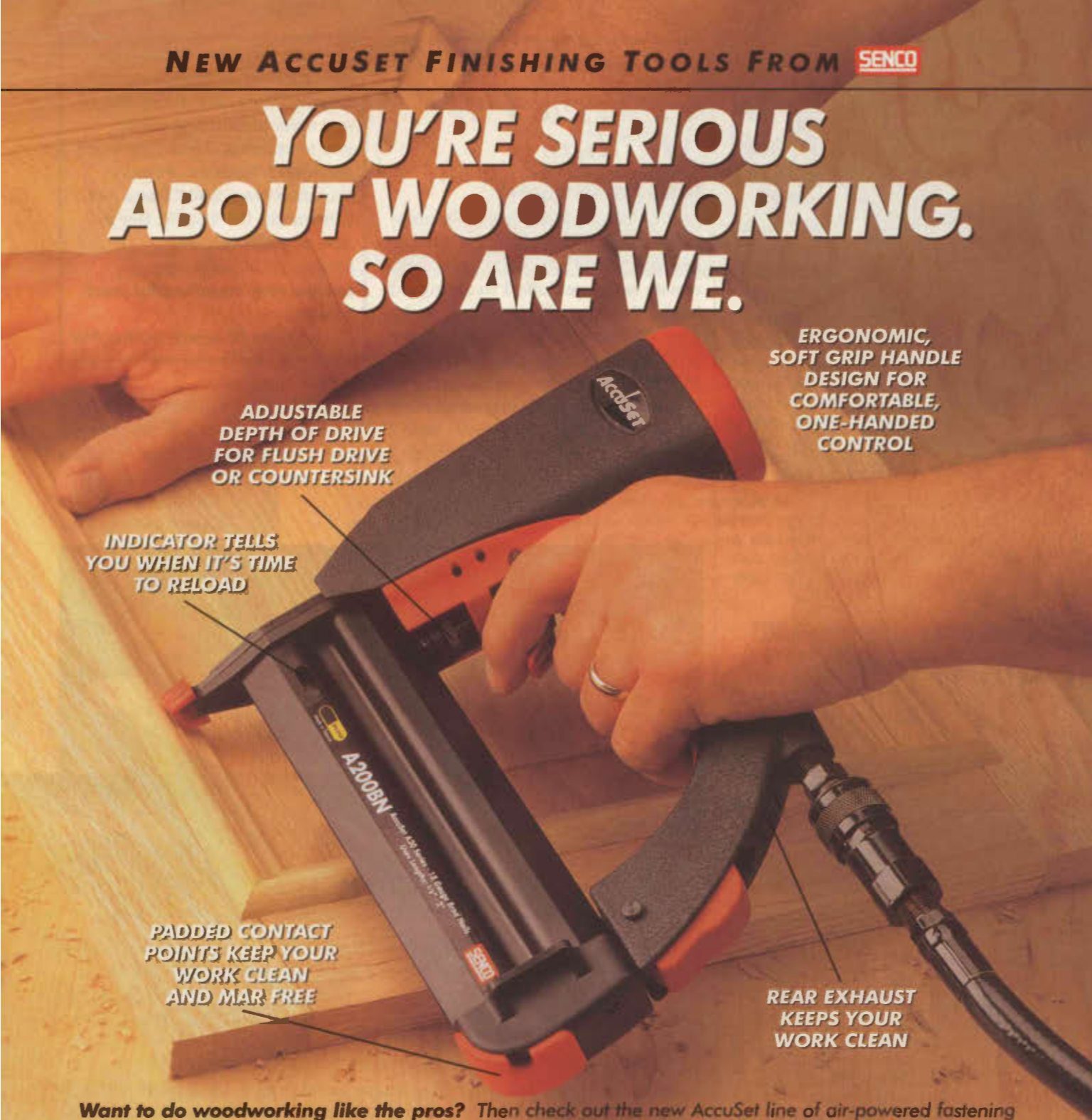

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INFEED/OUTFEED

From the **PW** *Mailbag . . .*

We welcome your comments about *PW* or anything related to woodworking. We'd also like to see color pictures of what you're building. Send your input to: Infeed/Outfeed, *Popular Woodworking*, 1507 Dana Ave., Cincinnati, OH 45207. Our e-mail address is: popwood@fwpubs.com Letters may be edited for publication.

— Steve Shanesy, editor, PW

What a swinger!

First, let me tell you that I enjoy your magazine. The PullOut™ Plans are particularly helpful to a self-taught woodworker with moderate skills. I was intrigued by the "Nostalgic Porch Swing" in the Sept. 1995 issue. As you can see from my photo, I completed the project in time for Mother's Day and have had several compliments on the project.

I did run into some problems, however. The Schedule of Materials called for 24 seat slats, when you actually need 28. The second problem was that the slats in the back would bow severely when someone would sit in the swing. So I cut a back support, which I added in the center of the swing.

Robert K. Schuler
Anderson, Indiana

You are correct, we used 28 slats and the schedule specifies only 24. As for the back support, we were satisfied with the strength of the slats and felt the flexibility made the back more comfortable, but you can easily add a center support for greater strength. *– David Thiel, senior editor*

Thanks from a working-class woodworker

I recently bought my first copy of your magazine (May 1998) because of my wife. It seems she found quite a few "honey-do's" in it. In fact, when she saw your upcoming projects in the next issue, she thought it would be a great idea to subscribe. Also, I am looking for plans for a bat house (not the baseball kind). I've seen pictures of them but haven't been able to find measured drawings. I would appreciate any info you might have. Keep up the good work for all of us working-class woodworkers.

Mike Adams
Gainesville, Georgia

Mike, we have a bat house project in the works right now and it will appear next issue. That's just in time for fall, one of the best times to hang a new bat house. We'll also have lots more tips on the do's and dont's of bat house building, placement and care.
— Steve Shanesy, editor

Continued on page 10

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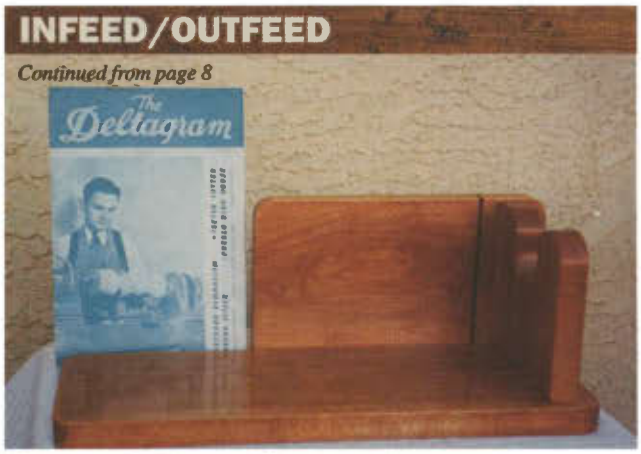
INFEED/OUTFEED

Continued from page 8



'Projects from the Past' brings back memories

Your "Projects from the Past" article, "Handy Tool Box," in the May 1998 issue (#102) really hit home. This past Christmas my father-in-law gave me about 25 Deltagrams from 1935 to 1947. I have enjoyed building a few of the projects from yesteryear. Enclosed is a picture of a bread slicer from the March 1943 Deltagram, which I'm giving to my father-in-law for his birthday. As you can see, the plans are still useful today.

You are right. These little magazines are more than nostalgia. The projects are still practical. Keep up the good work. All your projects are right "on target."

Bryan Tooley
San Diego, California

Please publish projects I can build with my grandkids

As a new subscriber, I find your projects to be right "on target." There is something for every skill level. Hobbyists, like myself, will continue to subscribe to *Popular Woodworking* as our skill levels increase.

In issue #102 (May 1998) I enjoyed the "Pipes of Pan" project for the following reasons: This is a simple project that a parent or grandparent can build with a child as young as 3 or 4. The project can be made in less time than it takes for their attention span to evaporate. They can participate in the project by hand-sanding the wood parts and the PVC tubing — as well as the staining or painting.

I do not suggest for even one moment that they be allowed to operate power tools, but the opportunity to explain and demonstrate tool and machine safety does exist.

Such projects create the opportunity to form a closer bond with that special child while building in them an appreciation for working with wood. I hope to see other such projects in the future as I have two and three-fourths grandchildren.

Ray Cox
Benton, Kentucky

Ray, you hit the nail on the head there. One of my fondest memories is building my first toolbox with my grandfather. I still keep a picture of me grinning while holding that just-completed project (which looked terrible, by the way).

— Chris Schwarz, managing editor

Continued on page 14

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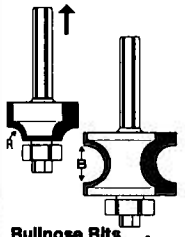
WL-1041	1/8"	$9.
WL-1042	3/16"	$9.
WL-1043	1/4"	$9.
WL-1044	5/16"	$10.
WL-1045	3/8"	$11.
WL-1046	1/2"	$13.
1/2" Shank		
WL-1049	1/8"	$9.
WL-1042-5	3/16"	$9.
WL-1050	1/4"	$9.
WL-1044-5	5/16"	$10.
WL-1051	3/8"	$12.
WL-1052	1/2"	$13.
WL-1053	5/8"	$16.
WL-1054	3/4"	$18.
WL-1055	7/8"	$25.
WL-1056	1"	$27.
WL-1057	1-1/8"	$30.
WL-1058	1-1/4"	$30.



Bullnose Bits
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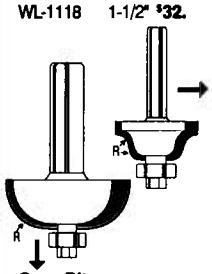
1/4" Shank • Bead Opening

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



Cove Bits
1/4" Shank • Radius

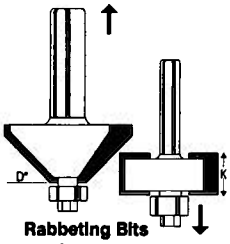
WL-1159	1/8"	$10.
WL-1160	3/16"	$10.
WL-1161	1/4"	$11.
WL-1162	3/8"	$13.
WL-1163	1/2"	$14.

Cove Bits (continued)
1/2" Shank

WL-1169	1/8"	$10.
WL-1170	1/4"	$11.
WL-1171	3/8"	$13.
WL-1172	1/2"	$14.
WL-1173	5/8"	$18.
WL-1174	3/4"	$20.

Chamfer Bits
1/4" Shank • Degree

WL-1180	15°	$10.
WL-1181	25°	$10.
WL-1182	45°	$12.
WL-1183	45°	$14.
(for up to 3/4" material)		
1/2" Shank		
WL-1184	45°	$10.
WL-1185	11-1/2°	$12.
WL-1186	15°	$12.
WL-1187	22-1/2°	$12.
WL-1188	30°	$14.
WL-1189	45°	$15.
WL-1190	45°	$22.
(for up to 1-1/4" material)		



Rabbeting Bits
1/4" Shank • Kerf

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

Roman Ogee Bits
1/4" Shank • Radius

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

Double Roman Ogee
1/4" Shank • Radius

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

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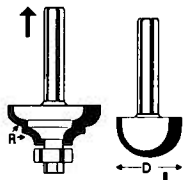
WL-1251	1/4"	$20.
1/2" Shank		
WL-1252	5/32"	$18.
WL-1253	1/4"	$20.

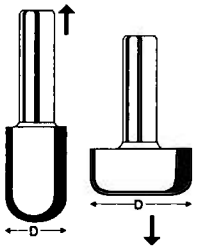


Core Box Bits
1/4" Shank • Diameter

WL-1370	1/8"	$10.
WL-1371	1/4"	$8.
WL-1371-1	3/8"	$9.
WL-1372	1/2"	$10.
WL-1373	3/4"	$12.

Roundnose/Core Box
1/2" Shank • Diameter

WL-1375	1/4"	$8.
WL-1375-1	3/8"	$11.
WL-1376	1/2"	$12.
WL-1377	3/4"	$14.
WL-1378	1"	$16.

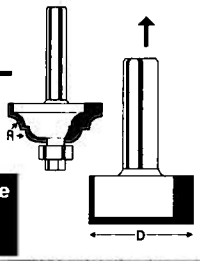


Bowl & Tray Cutter
1/4" Shank • Diameter

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

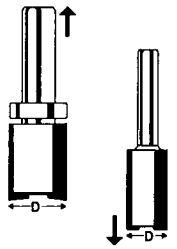
Dado & Planer Bit
1/4" Shank • Diameter

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



Pattern Cutting Bit
1/4" Shank • Diameter

WL-1400	1/2"	$12.
WL-1401	5/8"	$12.
WL-1402	3/4"	$12.
1/2" Shank		
WL-1405	3/4"	$15.
WL-1406	1-1/8"	$16.

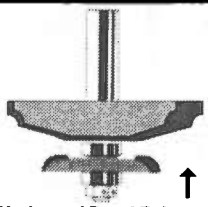


Straight Bits
1/4" Shank • Diameter

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

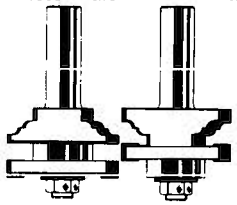
Corner Lock Mitres
For up to 5/8" material
WL-1420-2 1/4" shank $25.
For 1/2" to 3/4" material
WL-1420-1 1/2" shank $30.
For material 3/4" to 1-1/4"
WL-1420 1/2" shank $38.

For the Shaper Lock Mitre WL-1581 $40.



Horizontal Panel Raiser with Undercutter
• 1/2" Shank

WL-1346	Ogee	$49.
WL-1347	Traditional	$49.
WL-1348	Convex (Cove)	$49.
WL-1359	12° Facecut with Quarter Round	$49.
WL-1363	Wave	$49.

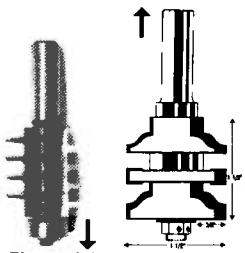


2-piece Rail & Stile Cutter Sets
1/2" Shank

		Set
WL-1360	Ogee Profile	$59.
WL-1361	Roundover	$59.
WL-1362	Cove & Bead	$59.

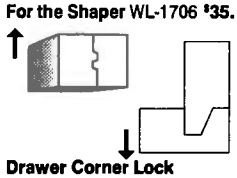
1-piece Rail & Stile Cutter Sets
Just raise the cutter to make the matching cut. No changing or reversing.
1/2" Shank

WL-1365	Ogee Profile	$49.
WL-1366	Roundover	$49.
WL-1367	Cove & Bead	$49.
WL-1368	Wedge	$49.
WL-1374	Dbl Roundover	$49.



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

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



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

SHAPER CUTTERS
3/4" BORE
Corner Round

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

Bead

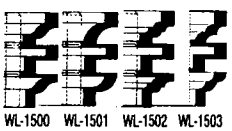
WL-1520	1/4"	$24.
WL-1521	3/8"	$26.
WL-1522	1/2"	$26.
WL-1523	3/4"	$28.
WL-1524	1"	$30.

Flute

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

Rabbeting/Straight

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



WL-1500 WL-1501 WL-1502 WL-1503

SHAPER CUTTERS 3/4" BORE
1-piece Rail & Stile
Just raise the cutter to make the matching cut. No changing or reversing.

WL-1500	Roman Ogee	$89.
WL-1501	Roundover	$89.
WL-1502	Cove & Bead	$89.
WL-1503	Dbl Roundover	$89.

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

Panel Raisers (Shaper Cutter)
3/4" Bore

WL-1600	Ogee	$59.
WL-1601	15° Facecut	$59.
WL-1602	18° Traditional	$59.
WL-1603	Convex (Cove)	$59.
WL-1604	12° Facecut with Quarter Round	$59.
WL-1605	Wave	$59.

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DRILL MASTER

TIN COATED FORSTNER BIT SETS

Titanium nitride runs cooler, cuts easier, and lasts longer than standard steel! Includes 3/8" shanks and individually organized wooden case. Rockwell hardness range from 55-65 HRC.

20 PC. SET
- 20 sizes from 1/4" to 3/4" by 16ths, 7/8", 15/16", 1" to 2" by 8ths

~~$42.99~~ **$29.99**
ITEM 31130-1SNA

16 PC. SET
- 16 sizes from 1/4" to 2-1/8" by 8ths

~~$39.99~~ **$27.99**
ITEM 32404-3SNA

RASK RADIAL ARM SAW KIT

RADIAL ARM SAW KIT

Award-winning patented design features easy setup with most 7-1/4" and 7-1/2" circular saws. Makes fast accurate bevels, rips, miters, and crosscuts. Ruggedly built and completely portable.
- Saw and table wood not included

Maximum miter & bevel: 45°; Rip capacity: 15-3/4"; Crosscut: 12-3/4"; Length: 24"; Height: 22"; Weight: 23 lbs.

~~$59.99~~ **$49.99**
ITEM 33576-1SNA

CENTRAL MACHINERY

4" x 36" BELT/ 6" DISC SANDER

Adjustable belt sands inside and outside curves. Cast aluminum sanding disc features a cast aluminum table that locks in any angle from 0° to 45°. Table can be repositioned for use with belt or disc.

Includes: 7-1/2" x 5" cast aluminum table, miter gauge, and adjustable backstop; 4000 FPM belt speed; 1725 RPM disc speed; 1/3 HP, 1725 RPM, 115V, single phase

~~$79.99~~
LIMITED QUANTITIES
$59.99
ITEM 05154-6SNA

SANDING BELT CLEANER
- Increase the life of your sanding belts and discs up to 500%
- 8-1/2" x 1-1/2" x 1-1/2"

$3.99
ITEM 30766-0SNA

DELTA® Delta 22-540

LIMITED QUANTITIES

12" PORTABLE PLANER

- Four precision ground columns to effortlessly raise & lower cutter head
- Long lasting high speed steel, reversible, double edged knives
- Precise thickness scale conveniently located for easy reference
- Includes removable table extensions, and fold away depth adjustment
- Factory reconditioned, factory perfect

Motor: 15 amp, 120V; Capacities: 12" width, 6" thick, 3/16" depth of cut; 26.2 FPM feed rate; 8000 RPM, 16,000 CPM; 27-1/4" x 20-1/2" x 15" overall dimensions;Table size with extensions: 12-1/8" x 26"; 68 lbs. tool wt.

ITEM 06177-2SNA **$289.99**

PLANER BLADES
ITEM 33075-3SNA **$29.99**

CENTRAL MACHINERY

INCLUDES STAND

6" INDUSTRIAL RABBETING JOINTER

SLASHED 28%

- Infeed table size: 22-1/2"
- Outfeed table size: 19-1/2"
- Motor: 1 HP, 110V, 4 amp, 4900 to 5900 RPM cutter head speed
- Max. depth of cut: 3/8"

~~$279.99~~ **$199.99**
ITEM 30289-4SNA

REPLACEMENT BLADE SET
ITEM 33271-2SNA **$15.99**

SLASHED 50%

CONTROLLED PRESSURE, NON-MARRING HARDWOOD CLAMPS

Hardwood jaws distribute pressure evenly and easily adjusts for non-parallel surfaces and odd shapes. Wood construction helps eliminate workpiece damage.

JAW LENGTH	OPEN JAW CAPACITY	ITEM	PRICE
8"	4-3/4"	04852-2SNA	$2.99
10"	6"	04853-2SNA	$3.49
12"	8-1/2	04854-2SNA	$4.49

CENTRAL MACHINERY

1" BELT/ 5" DISC SANDER

Remove the belt back plate and sand all types of curves and odd shapes. With the back plate in place, you can apply pressure for faster stock removal.
- Motor: 1/3 HP, 2.4 amp, 60 Hz, 110V, 3450 RPM • Dust collection
- Table: 5" x 5", tilts to 45°
- Belt length: 30", 3450 FPM belt speed
- Shipping wt.: 19 lbs.

ITEM 34951-1SNA **$49.99**

ABRASIVES • 80 grit

DESCRIPTION	(QTY)	ITEM	PRICE
1" x 30" belts	(5 pk)	04860-3SNA	$7.99
5" discs	(50 pk)	33930-0SNA	$9.99

TUNGSTEN CARBIDE TIPPED ROUTER BIT SETS

Both include individually organized storage cases. 15 most popular sizes. • 1/4" shanks

15 PC. ASSORTED BITS

Includes: 1-1/4" rabbeting♦, 1-3/8" cove♦, 1-1/16" roman ogee♦, 1-1/4" rounding over♦, 1/2" flush trimming♦, 1-3/16" 45° chamfer♦, 1/2" dovetail, 3/4" straight, 1/2" straight, 3/8" V-groove, 1/4" combination panel, 1/4" straight, 1/2" mortising,1/4" cove, 1/8" straight ♦Includes pilot bearing

ITEM 31164-3SNA **$36.99**

4 PC. ROUNDING OVER BITS
- Sizes: 1/8", 1/4", 3/8", & 1/2"
- Set includes 4 rounding over bits w/pilot bearing tips
- 2 flutes each
- 1-5/32" long shanks

ITEM 33078-5SNA **$19.99**

CONTRACTOR SERIES

18 GAUGE AIR BRAD NAILER

This unit has the features you need: safety trigger, durable aluminum magazine, and easy jam clearance.
- 55-95 operating PSI • 1/4" NPT inlet
- 3/8" to 1-1/4" brad length capacity
- 100 brad maximum capacity
- 18 gauge brads
- Stainless steel driver & cylinder
- Tool weight 2-3/4 lbs.

~~$45.99~~ **$35.99**
ITEM 31308-1SNA

18 GAUGE BRADS

SIZE	ITEM	PK. OF 5000
1"	33206-3SNA	$3.99
1-3/16"	33207-4SNA	$4.99

DELTA®
Delta 36-220

LIMITED QUANTITIES

10" COMPOUND MITER SAW

2-1/2 HP, 15 amp motor. D-handle with trigger switch for positive control. Electric brake automatically stops blade in seconds. Includes 10" blade with 5/8" arbor and retractable blade guard. Dust collection ready.
- Blade speed: 4900 RPM @ no-load
- Capacities: 2-3/4" x 5-3/4" crosscut; 2-3/4" x 4-1/8" 45° right & left miter; 1-3/4" x 5-3/4" 45° left bevel; 1-3/4" x 4-1/8" 45° x 45° compound
- Table diameter: 10-1/2" • Tool wt.: 60 lbs.
- Factory reconditioned, factory perfect

ITEM 06125-0SNA **$159.99**

CENTRAL MACHINERY

LIMITED QUANTITIES

16" SCROLL SAW

- Precision milled 14-1/2" x 8" table tilts 0° to 45° • 1/8 HP, 110V, .83 amps
- Uses pin end blades, 5-1/2" long
- Heavy duty cast iron frame and base reduce vibration • 7/8" blade stroke
- 1750 SPM blade speed

ITEM 36392-4SNA **$49.99**

5 PC. 5-1/2" SAW BLADES
- Pin end type

$4.99
ITEM 35024-0SNA

CHICAGO Electric Power Tools

3-1/4" PLANER

- Front base has a V-groove to help guide in chamfering • 2 blade cutter
- Depth adjustment knob
- Includes rabbeting guide plate/fence, sharpening holder, blade setting jig, replacement brushes, & replacement belt
- D-handle with lock-on button
- 110V, 5 amps, 17,000 RPM
- 34,000 cuts per minute
- 1/10" max. depth of cut; 3-1/4" planing width
- 6-1/4 lbs. tool weight

ITEM 32222-3SNA **$39.99**

2 PC. REPLACEMENT BLADES
$9.99
ITEM 33262-0SNA

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Ryobi OSS450

LIMITED QUANTITIES

AWARDED "BEST BUY" BY AMERICAN WOOD WORKER MAGAZINE!

OSCILLATING SPINDLE SANDER

Nothing beats this machine for contour and curve sanding. 1/2" to 3" drum sizes (includes 1/2" and 1") give you the control you need. Removes stock fast using the whole drum and prevents sanding burn marks.

- 120V, 3.5 amps • 1680 RPM
- 45 oscillations per minute
- Dust collection port
- 29 lbs. tool wt.

~~$139.99~~ **$129.99**

ITEM 30484-6SNA

CENTRAL MACHINERY

DOVETAIL MACHINE

Just place stock and pull cam handles to positively lock material in place. Allows cutting tails, pins, half blind, and standard dovetails. Accepts stock up to 12" wide and 1-1/4" thick. Includes 1/2" template.

~~$59.99~~ **$39.99**

ITEM 34102-8SNA

Pittsburgh

LIFETIME WARRANTY

2 PC. 3/4" HEAVY DUTY PIPE CLAMP

Constructed from heat-treated cast iron, these durable clamps keep your work rock steady. Just screw the handle side onto a 3/4" threaded pipe and slide the spring loaded end on. You're ready to go! Pipe not included.

- Handle screw operating range: 2-1/8"
- 1-1/2" throat depth
- Weight: 2-7/16 lbs.

$3.99

ITEM 31255-1SNA

1/2" PIPE CLAMP

- 1-1/2" throat depth
- Weight: 1-4/5 lbs.

$2.99

ITEM 37056-2SNA

CENTRAL MACHINERY

NO MORE LOST CHUCK KEYS!

5 SPEED BENCH DRILL PRESS WITH KEYLESS CHUCK

- 8-1/4" maximum distance spindle to table
- 1/3 HP motor • 2" stroke, 8-1/4" swing
- 620 to 3100 RPM • 1/2" chuck
- 22-1/2" high, 47 lbs.

ITEM 34231-6SNA **$49.99**

DRILL PRESS WITH KEYED CHUCK

ITEM 05901-0SNA **$48.99**

CENTRAL MACHINERY

DRILL 1/4", 3/8", & 1/2" SQUARE HOLES

MORTISING MACHINE

Easier layout for professional martise and tenon joints in furniture, cabinets, and restoration projects. Fence with hold down clamp keep workpieces from lifting off the table. Large capacity – up to 5" maximum height. Includes fence, workpiece clamp, and 1/4", 3/8", and 1/2" mortising chisels and bits.

- 10-7/8" x 7-3/4" base
- 13-3/8" x 6" table • 60 lbs. shipping wt.
- 3580 RPM spindle speed • 5" throat
- 5" maximum workpiece height
- Accepts .745" chisel shanks
- 1/2 HP, 110V, 2.3 amps

ITEM 35570-5SNA **$149.99**

CHICAGO Electric Power Tools

1/2 OFF!

HEAVY DUTY 4-1/2" DISC GRINDER

- High power to weight ratio
- 5/8"-11 spindle with 7/8" arbor adapter
- Motor: 3/4 HP, 115V, 5.18 amps
- High powered 10,000 RPM
- Spindle lock
- 11-7/8" long

~~$39.99~~ **$19.99**

ITEM 31135-6SNA

4-1/2" x 1/4" GRINDING WHEELS

- 24 grit, 7/8" arbor

FOR	ITEM	PK. OF 10
Metal	06674-0SNA	$8.99
Masonry	07422-0SNA	$9.99

FINEST HARDWOOD

SOLID HARDWOOD WORKBENCH

Includes large flush mounted vises. Twin rows of 10 bench dog holes hold just about any project. Tools shown sold separately.

- 2 vises: 13"W x 1-1/4"D x 7-1/2"L max.
- Trough: 47-3/8"L x 5-1/2"W x 2-3/4"D
- Overall: 55"L x 25"W x 32-3/4"H
- Work area: 49-1/4" x 13-1/2"
- 20 bench dog holes • Weight: 64 lbs.

~~$129.99~~ **$99.99**

ITEM 01635-0SNA

CHICAGO Electric Power Tools

3/8", 14.4 VOLT CORDLESS DRILL KIT WITH KEYLESS CHUCK

High voltage, heavy duty battery gives long run times between charges. T-Handle design makes this drill easy to use.

- Variable speed, reversible; 0 to 600 RPM
- 6 torque settings
- Includes 6 pc. drill bit set, 6 pc. screwdriver bit set, magnetic extension bit, charger, battery, *Jacobs®* keyless chuck, and carrying case

~~$69.99~~ **$39.99**

ITEM 34793-2SNA

14.4 VOLT BATTERY

ITEM 34794-0SNA **$29.99**

Windsor Design

8 PC. HIGH SPEED STEEL TURNING SET

A fine assortment of high speed tools run cooler longer for better results.

- Includes: 3/8", 3/4", 7/8" spindle gouges; 3/16" parting/bead tool; 1/2" round nose scraper; 1/2" and 1-1/8" skewed chisel; 1/2" diamond parting tool
- Wooden case with velvet lining
- Hardwood handles

~~$42.99~~ **$29.99**

ITEM 35444-6SNA

CENTRAL MACHINERY

FREE ACCESSORIES: Stand, 6" belt, 9" disc, open-end wrench, and hex key wrench

COMBINATION 6" x 48" BELT AND 9" DISC SANDER

Larger belt and disc provide excellent results for big jobs. Two position work table for disc or belt tilts to 45°. Easy tension adjustment. Cast iron base.

- Motor: 1 HP, 110V, 8 amps, 3450 RPM, all ball bearing • Table tilt 0° to 50°
- Table surface: 6-1/2" x 12-3/4"
- Disc speed: 1720 RPM
- Belt: 6" W x 48" L • Belt speed: 1280 FPM
- Stand: 16-1/2" x 14-3/4"
- Overall height: 40"
- Weight: 121 lbs.

ITEM 06852-2SNA **$169.99**

CENTRAL MACHINERY

6" x 12" MINI WOOD LATHE

Create projects from miniature to full-size. Heavy duty, cast iron construction for minimum vibration and high strength. Light weight and compact size allow bench top mounting or taking it on the job. Dual speed range for absolute cutting control.

- Distance between centers: 12-1/2"
- 3-1/8" wide tool rest with adjustable height • 120V, 60 Hz, 3.2 amp motor
- Swing over bed: 6" • MT1 spindle
- 25"L x 4-3/4"W x 9-1/2"D
- Speed range – Low: 275 to 3050; High: 400 to 4450

ITEM 34837-5SNA **$129.99**

CENTRAL MACHINERY

10", 2 HP BENCH TABLE SAW

Die cast aluminum table 25-3/4" x 16", has adjustable 17-7/8" x 2" rip fence and inch/metric scale for precise cutting.

- Max. depth of cut at 90°: 3-1/8"; at 45°: 2-1/2" • Blade sold separately, below
- Motor: 2 HP, 115V, 60 Hz, 10 amp, 4500 RPM • Shipping weight: 36 lbs.
- Miter gauge adjusts 0° - 60° left and right
- Blade capacity: 10" with 5/8" arbor

ITEM 35715-2SNA **$79.99**

10" CARBIDE TIP SAW BLADE

- 5/8" arbor • 40 tooth

ITEM 00529-4SNA **$9.99**

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Continued from page 10

Help! My finish looks like the surface of the moon

I have refinished many different types of furniture over the years. All that time I have never really had any problems with taking off the old varnish, shellac or stains. Then my parents moved from Monroe, Conn., back here to Rochester, N.Y. Two of their tables did not fair the trip well. The worst was an octagon-shaped coffee table. It had not only been scratched but also had some deep gouges. My father and I removed the old finish with little difficulty. The new stain went on evenly. Then we put on the polyurethane top coat. All it did was bubble up and separate. We found that even though we cleaned the table with mineral spirits and sanded all the old finish away, the years of my mother cleaning the table with spray wax must have penetrated deeply into the wood. What can you suggest to pull out the old wax from the wood? We still have to do the 40-year-old dining room table, which has delicate woodwork to it.

Scott Sardone
Rochester, New York

Scott, you've got a silicone problem, not a wax problem, although the silicone was deposited on the piece by years of spray wax use. Don't use any more mineral spirits, it just thins the silicone oil and spreads it around. If the wood is not too delicate, as in veneer or inlay, use TSP (trisodium phosphate) in water and lightly scrub the piece. Or, use thinned, fresh, de-waxed shellac to seal in the silicone by creating a barrier coat. Spray the shellac if you can since brushing may kick up the silicone and contaminate the shellac. Lastly, you might try a product called "Smoothie," which you add to your finish. In a nutshell, it makes the whole finish surface one big fisheye (the term used to describe the cratered look on the surface).

— Steve Shanesy, editor

Tobacco ad doesn't belong

I am writing to tell you that the advertisement inside the back cover of your fine magazine is not in keeping with the quality of the magazine, and I protest your use of tobacco or liquor ads in the strongest possible way.

As far as I can see, this is the only ad in your magazine that does not deal in some way with the very reason for the magazine — woodworking. Certainly no woodworker would even consider using cigarettes in the shop. And while the ad does not necessarily appeal to youth, it does nothing for the average reader except promote a product that is dangerous to his/her health.

Please refrain from insulting your readers with ads for products that will offer no long-lasting benefits except ruining our health and possibly shortening our lives.

C. A. Brown
Waterville, Vermont

Continued on page 16

NEW!

NAIL GUNS from Grizzly™ INDUSTRIAL, INC.

PROFESSIONAL SERIES PNEUMATIC NAIL GUNS & STAPLERS

Clearly the best on the market! From their rugged construction and good looks to their shot-after-shot dependability, these guns have what it takes to go through thousands of cycles everyday!

MONEY BACK GUARANTEE 30 DAYS

No questions asked!

Shoots 18 Gauge ¼" Crown Staples, ⅜" – 1"

18 GAUGE STAPLER KIT
MODEL G6042 ONLY $79.95

Shoots 18 Gauge ¼" Crown Staples, ⅜" – 1½"

18 GAUGE SUPER STAPLER KIT
MODEL G6043 ONLY $99.95

Shoots 16 Gauge 7/16" Crown Staples, ⅝" – 2"

16 GAUGE STAPLER KIT
MODEL G6044 ONLY $159.95

Shoots 18 Gauge Brad Nails, ⅜" – 1 3/16"

18 GAUGE BRAD NAILER KIT
MODEL G6045 ONLY $69.95

Shoots Full Head Framing Nails, 2" – 3½"

FULL HEAD FRAMING NAILER KIT (OIL-LESS)
MODEL G6050 ONLY $289.95

Shoots 18 Gauge Brad Nails, ⅜" – 1 3/16"

18 GAUGE HEAVY-DUTY BRAD NAILER KIT
MODEL G6046 ONLY $79.95

Shoots 18 Gauge Brad Nails, ⅜" – 2"

18 GAUGE SUPER BRAD NAILER KIT
MODEL G6047 ONLY $99.95

Each kit includes:

PNEUMATIC GUN, SAFETY GLASSES & A MOLDED, HIGH-IMPACT PLASTIC CASE.

All guns have safety triggers!

Shoots 16 Gauge T-Nails, ¾" – 2½"

16 GAUGE T-NAILER KIT
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Circle #126 on Resource Directory Coupon

INFEED/OUTFEED

Continued from page 14

Don't you like the people in the heartland?

Does anyone in the heartland have a chance to win your contests or get letters printed? It seems the bulk of your winners are in the northeast or even from other countries.

Oklahoma has its share of craftsmen. Remember: We don't sit around and read *Popular Woodworking* for the lack of something to do. We're working in our wood shops.

Woodrow Havens
Newcastle, Oklahoma

Another guy who didn't win a contest, but he's not mad

I had a battle with "sour grapes," and I won. I entered your Caption the Cartoon contest (#28). When I saw the winning captions, they did not amuse me. Indignation flooded my senses. My caption had to be far superior to those chosen. But after a second and longer look at the winners' captions, and a second and longer look at mine, I had to concur with your selections.

Now, if you can just direct me to the "sweet grapes," I'll try to improve my submittals.

Adam Rum
Huntington, New York

Adam, here are some secret tips to winning our popular Caption the Cartoon contest. We get hundreds (sometimes thousands) of entries. And a lot of them are almost exactly the same. They're funny, but they're the same. For example, let's look at cartoon #29, which was the cartoon of the guy being spun wildly by his cordless drill. We must have gotten 200 entries that read something like this: "It's OK Fred, the battery will run down in an hour or two." The winners were captions that were both funny and different. So think beyond the obvious when you enter.

— Chris Schwarz, managing editor
P.S. Perseverance pays off; Adam was the winner for contest #29, discussed above. **PW**

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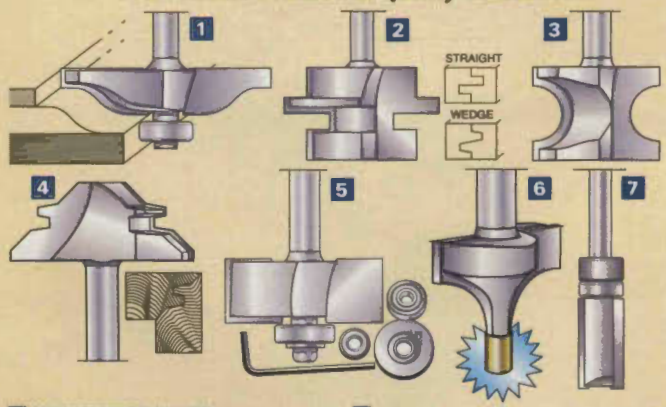

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Circle #108 on Resource Directory Coupon

Miter Saw Work Station

This is a must-have accessory for your chop saw, and it tucks nicely into almost any corner.

MITER SAWS ARE FINE TOOLS, but even the best of them — those that are equipped with extensions — don't provide adequate support surface for the jobs they are designed for. My favorite lumber yard has a chop saw set up on a sturdy stand with fixed wings so it can easily and safely support a 12' (or longer) 2 x 4. That's a fine setup for a barn-sized workshop, but when I thought about a similar setup for myself I had to consider space limitations.

It didn't take a brainstorm to envision a special stand for my miter saw that had hinged extension tables that would fold down when the saw wasn't in use. And there were some other features that came to mind, such as a stop that's usable on either side of the saw, a storage drawer and an accessory that makes it easier to produce accurate compound miter cuts.

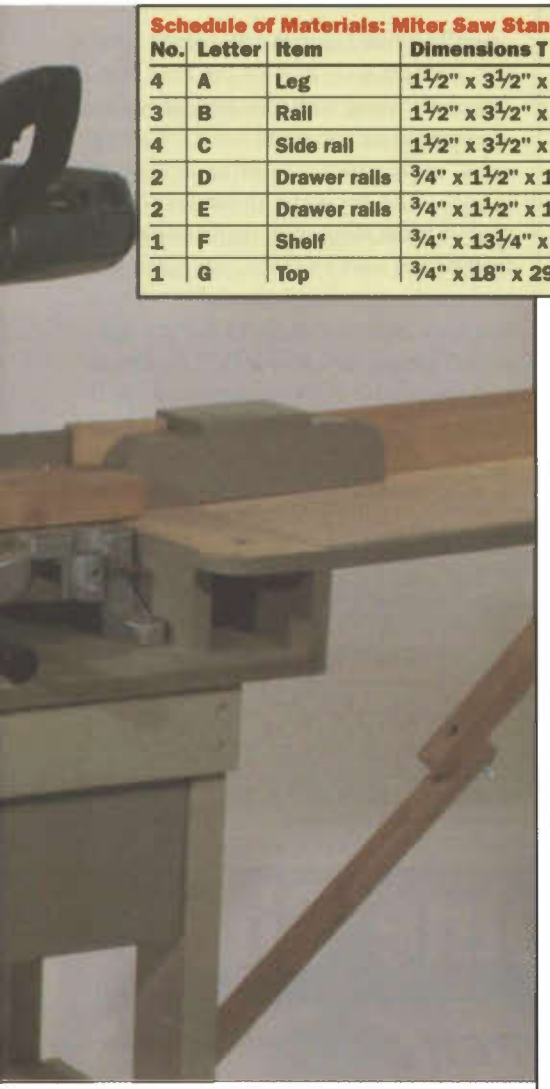
The size of the unit is suitable for most any saw (all that I've examined anyway) but you might want to check the width of your machine and, if necessary, change the width of the stand's top. It should be wide enough to accommodate the saw plus the two short extensions that are permanently attached to it.

STEP 1 **Make the Basic Base** • Begin by cutting the legs, the three longer rails and the four side rails to length. Cut a $\frac{3}{4}$" deep x $1\frac{1}{2}$" wide rabbet at each end of the rails. You can make the rabbets with a dado stack, but results will be better if you use a tenoning jig. Saw the shoulder cuts first, working in normal crosscut position, then use the jig to make the cheek cuts.

STEP 2 **Assemble the Base** • Start the assembly by applying glue to the rabbet cuts in the side rails and holding them in place against the legs with clamps. Then drill holes for and install the #10 x $1\frac{1}{2}$" fh screws. Before going further, attach the drawer rail (D) to the inside of the legs with glue and 6d finishing nails.

Next add the two rear rails and the front one, again after coating the rabbets with glue. While the assembly is "open," install the two top drawer rails. Glue alone is enough here if you keep the parts in place with clamps, but you can toenail through the top of the guides into the legs if you wish. The purpose of the top rails is to keep the drawer from tilting when you pull it out.

The final step for the substructure is to cut the shelf to

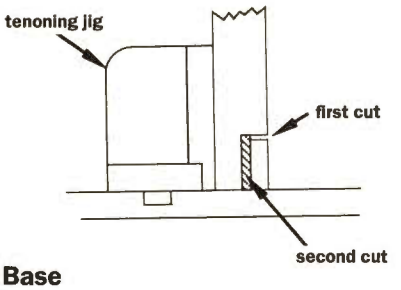


Work support increases to about 5' when one extension table is used. When both tables are up, your support increases to 7½'.

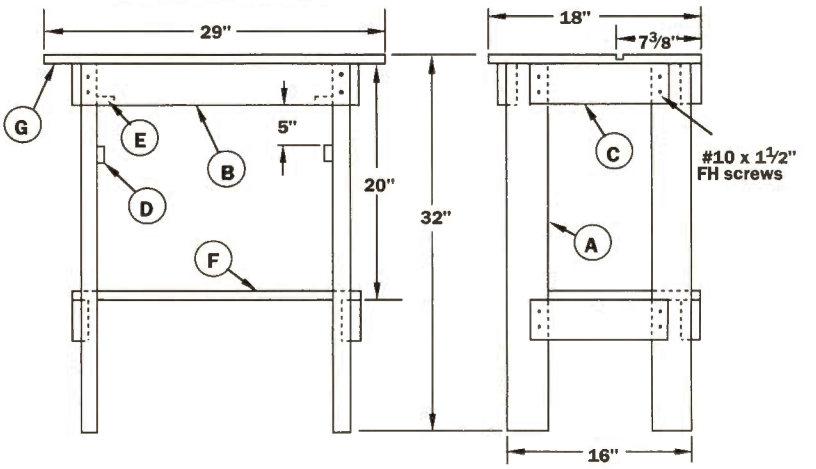
Schedule of Materials: Miter Saw Stand

No.	Letter	Item	Dimensions T W L	Material
4	A	Leg	1½" x 3½" x 31¼"	Fir
3	B	Rail	1½" x 3½" x 22½"	Fir
4	C	Side rail	1½" x 3½" x 12	Fir
2	D	Drawer rails	¾" x 1½" x 15¼"	Fir
2	E	Drawer rails	¾" x 1½" x 14½"	Fir
1	F	Shelf	¾" x 13¼" x 24"	Plywood
1	G	Top	¾" x 18" x 29"	Plywood

Diagram 1 Cutting the Rabbets



Workstation Base



Top Views of Base

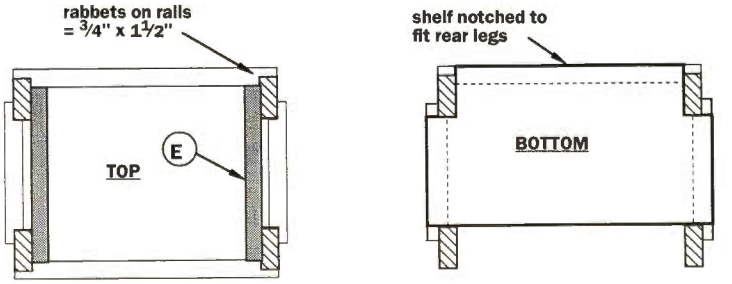
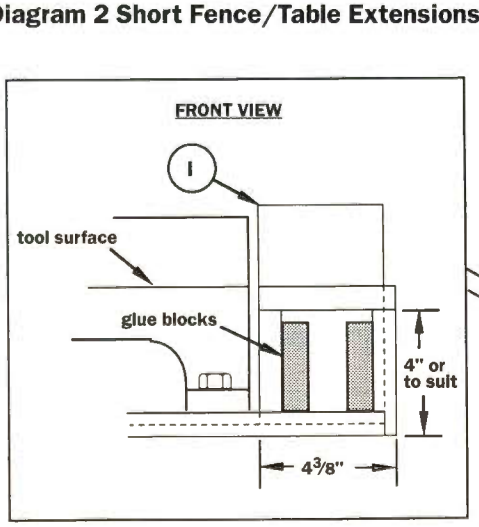
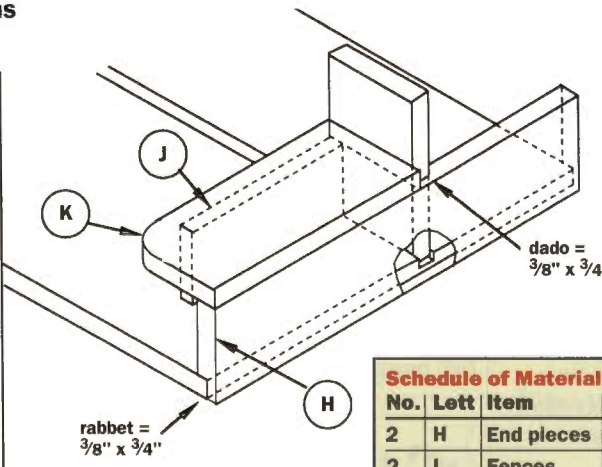


Diagram 2 Short Fence/Table Extensions

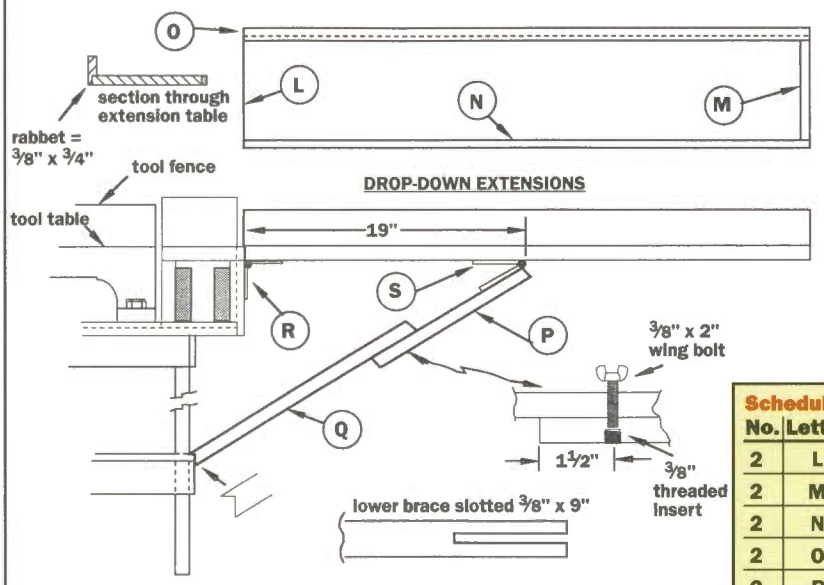




Schedule of Materials: Short Extensions

No.	Lett	Item	Dimensions T W L	Material
2	H	End pieces	¾" x 4" x 18"	Pine
2	I	Fences	¾" x 4" x 7"	Pine
2	J	Supports	¾" x 3¼" x 8½"	Pine
2	K	Tables	¾" x 4⅜" x 10⅝"	Pine

Diagram 3



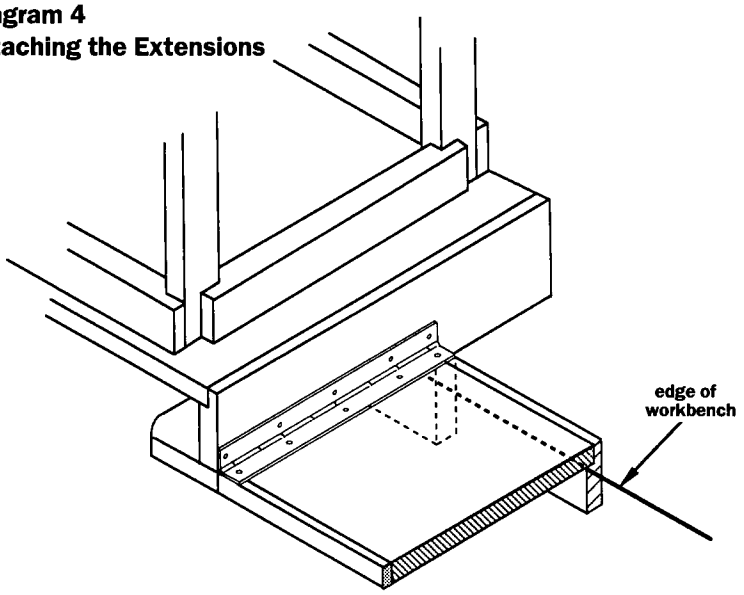
overall size and then notch it at the back two corners so it will fit the rear legs. Attach the shelf with glue and 6d nails.

The top for the stand has a 3/8" deep x 3/4" wide groove running across its length. The forward shoulder of the groove must align with the bearing surface of the tool's fences. So place the tool on the stand and check for correct position before you form the groove. Attach the top with #10 x 1½" fh screws and then, with the tool centered, drill the holes that are needed to bolt the tool in place.

Schedule of Materials: Folding Extensions

No.	Letter	Item	Dimensions T W L	Material
2	L	Tables	¾" x 10½" x 29"	Plywood
2	M	Trim pieces	½" x ¾" x 10½"	Fir
2	N	Trim	½" x ¾" x 29"	Fir
2	O	Fences	¾" x 3¾" x 29"	Fir
2	P	Top brace	1" x 1½" x 14"	Fir
2	Q	Bott. brace	1" x 1½" x 20"	Fir
2	R	Piano hinges	1½" x 10½"	
2	S	Flap hinges	1½" x 1½" x 2"	

Diagram 4
Attaching the Extensions



STEP 3 **Extension Tables** • The materials list offers dimensions for the components that make up the short extensions, but they should be checked against the tool's position and the height of its table. Start by preparing the end piece, making sure that its height above the top of the stand equals that of the tool's table less 3/4". Form the rabbet at the bottom edge of the end piece and then the dado that should mate with the groove that is in the stand's top. Attach the component with glue and 4d nails.

Using glue and 4d nails, attach the fence, which fits in the groove that is the stand's top and in the dado in the end piece. Cut the support short enough so it won't interfere with a full swing of the tool's indexing handle. Put the support in place with glue and 4d nails and then add the glue blocks to strengthen the assembly. The last step is to add the table with glue and 6d finishing nails. When forming the components for the short extensions, remember that the assemblies are left and right.

STEP 4 **Drop-down Extensions** • When you begin assembling the drop-down extensions, remember that like the short extensions, there are left and right wings. Cut the two tables to size and then add the trim strips with glue and 6d finishing nails. Form the 3/8" deep x 3/4" wide rabbet along the bottom edge of the fence and add it to the table with glue and 5d box nails. Be sure the angle between fence and table is 90 degrees.

STEP 5 **Install the Hinges** • Follow this procedure to make sure the fences of the project will be accurately aligned. First remove the tool from the stand. Turn the stand over and place it on the workbench so the fence of the short extensions butts against the edge of the workbench. Place the drop-down extension so its fence also butts against the workbench edge and use a clamp to keep the component in position.

Install the piano hinge and then add the backflap hinge. The project can remain in this position while you prepare the braces. Make the top one first and, after installing the 3/8" threaded insert, attach it to the backflap hinge. The bottom brace is slotted at one end and notched at the other end so it can rest solidly against the stand's shelf. The slot is needed for table-level adjustment and so the braces can be "folded" out of the way when the extensions are lowered. Details for the braces are shown in diagram three.

Schedule of Materials: Stop

No.	Letter	Item	Dimensions T W L	Material
1	T	Front	1 1/2" x 2 3/4" x 12"	Fir
1	U	Back	1" x 2 3/4" x 5"	Fir
1	V	Top	1/2" x 3 17/32" x 5"	Fir

Diagram 5 Adjustable Stops

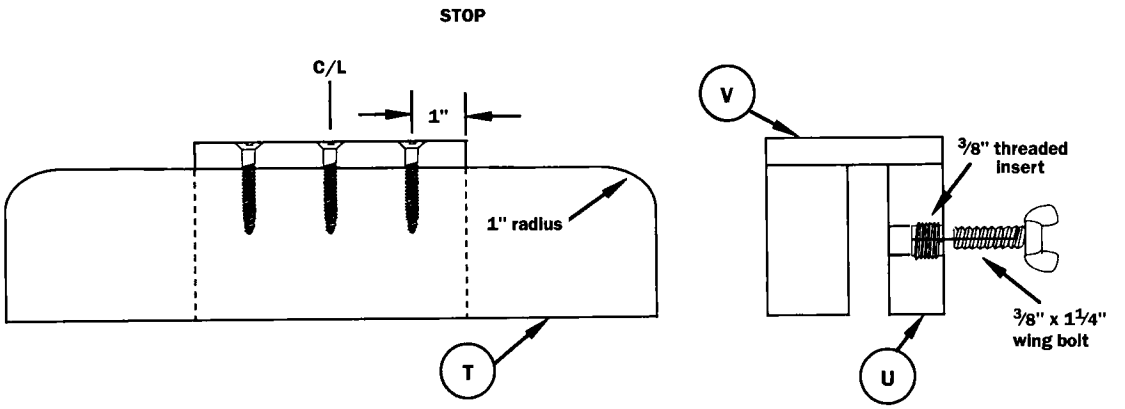
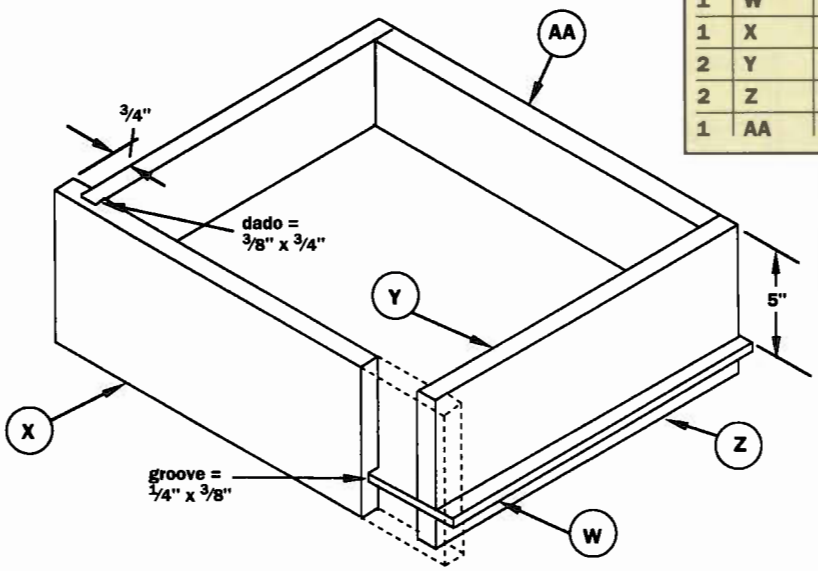
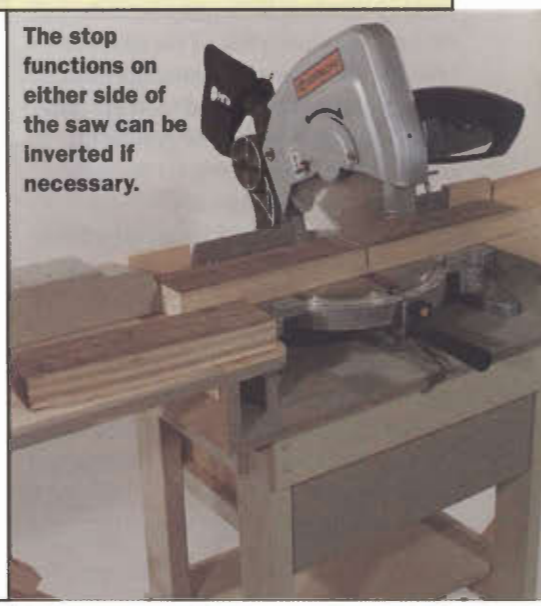


Diagram 6 Drawer



Schedule of Materials: Drawer

No.	Letter	Item	Dimensions T W L	Material
1	W	Bottom	1/4" x 15" x 19 1/2"	Plywood
1	X	Front	3/4" x 6 1/2" x 19 1/2"	Plywood
2	Y	Sides	3/4" x 4 3/4" x 15"	Plywood
2	Z	Guides	3/4" x 1 1/4" x 15"	Fir
1	AA	Back	3/4" x 4 3/4" x 16 1/2"	Plywood



The stop functions on either side of the saw can be inverted if necessary.

COMING NEXT ISSUE

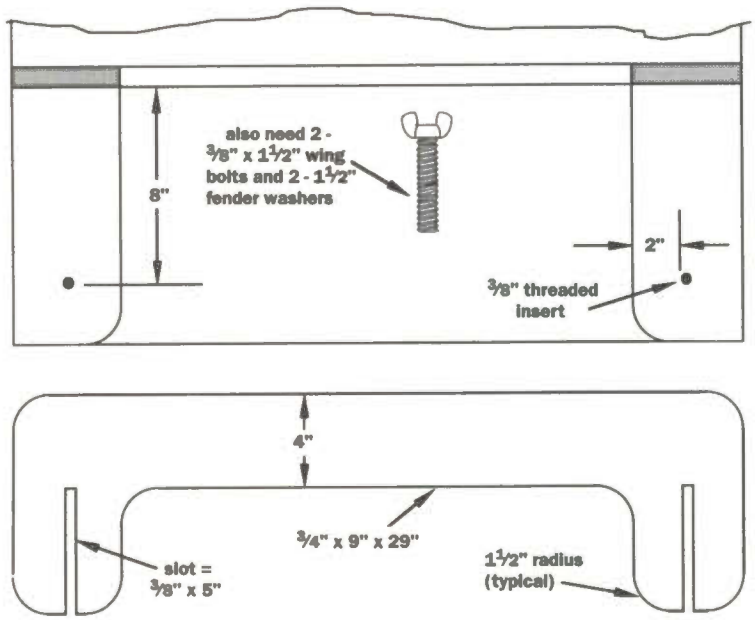
Just a few of the projects you will find in the October/November issue of *Popular Woodworking*. Look for it on the newsstands in late September.

Barrister Bookcases: You've probably seen these bookcases at auctions or in antique stores for hundreds or even thousands of dollars. Now you can build your own for a lot less money. We'll even show you the way to make the silky smooth sliding mechanism for the doors from scratch. It's easier than you think.

Bat House: Bats can eat their weight in mosquitoes in a day, so they're real handy to have around. But not all bat houses will attract bats. So we went to a renowned bat expert to help us design our exclusive bat house. It's easy to build, inexpensive and attractive. Plus it will give you the best chance to attract these bug-eating mammals.

Tavern Table: If you've ever been to Great Britain, you probably recognize this attractive pine table. Woodworker Blair Howard shares the plans for this project from his native country. **PW**

Diagram 7 Optional Hold-In

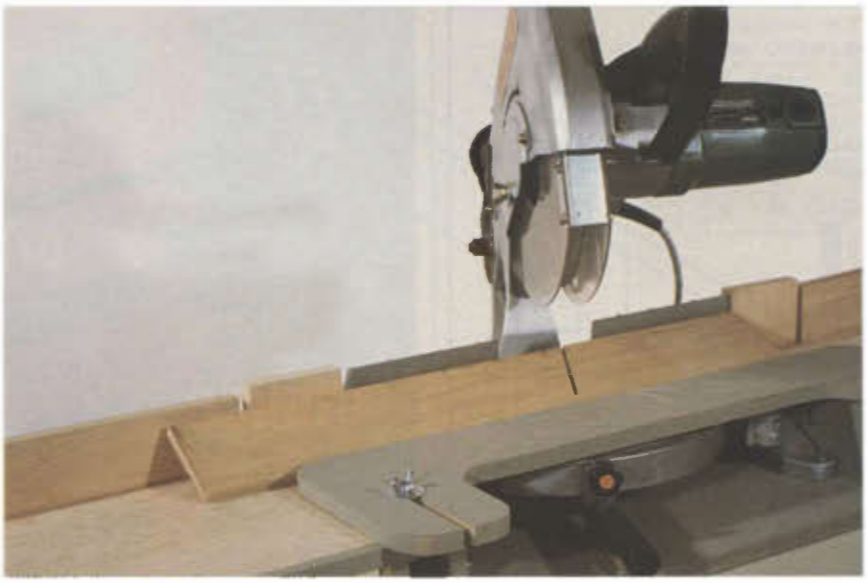


Step 8

Using the hold-in eliminates the need for one of the critical compound angle settings — the blade tilt angle. Cove moulding establishes its own slope angle.

STEP 6 Saw Stop • The stop is designed so it will function on either extension table and it can be inverted when necessary. Cut all the parts to size but adjust the width of the top so the gap between the front and back will be 3/4" plus about 1/32". Install the 3/8" threaded insert in the back component and then assemble the pieces with glue and #10 x 1 1/4" fh screws.

STEP 7 Drawer • The drawer design isn't fancy but the unit is sturdy and suits the purpose. Start with the bottom, making sure that it slides smoothly between the legs of the stand. Cut the front to size and form the groove for the bottom and the dadoes for the sides. Prepare the sides and then assemble the four pieces with glue and finishing nails. The guides are installed in line with the sides, but before attach-



The slope angle on flat stock can be established with a bevel, or set arbitrarily. For example, when making a picture frame with sloping sides it won't matter too much if the slope is off a few degrees so long as it's visually pleasing.

ing them permanently, check to see that they will slide smoothly along the drawer rails in the stand. Finally, use glue and 6d finishing nails to install the back. You don't need a handle because the lip below the bottom of the drawer serves nicely.

STEP 8 **Holding Jig** • This hold-in isn't essential for the table's normal functions, but you'll find it handy when making compound cuts. The hold-in acts as a brace so your work can be held at a sloping angle against the fence. For example, if the saw is set for a 45-degree miter, the result will be a compound cut regardless of the work's slope angle. Even if your saw can be tilted for bevel cuts, the hold-in is desirable because it eliminates one of the critical compound angle settings.

Anyway, the accessory calls for installing two 3/8" threaded inserts in the tables of the short extensions, locating them as shown in the drawing. Cut the hold-in to overall shape and form the slots before producing the final shape. **PW**

R.J. DeCristoforo is the author of more than 30 how-to books and a member of Popular Woodworking*'s advisory board.*

Install a CUSTOM ENTRY DOOR In a Day

Your tools and skills are good for more than just building furniture.

A NEW ENTRY DOOR can dramatically change the appearance of your home. They're available in a wide variety of styles, but the one thing they all have in common is a pretty hefty price tag. So when you add in the cost of installing the door, the project can become a financial headache. Most woodworkers have the basic tools needed to install a custom door but might be lacking in the skills or experience to do the job.

To get ourselves up to speed on this topic, we spent a day with Pat Lane, a project manager with Maile Custom Builders, a remodeling firm in Crescent Springs, Ky., that was named one of the 50 best remodeling firms in the United States by *Remodeling* magazine. Lane's tips can help you hang your own door, making it more affordable and a lot simpler.

Once you've measured and purchased your pre-hung door, read the instructions. While they won't tell you everything you need to know to install your new door, they include important information about your particular door.

STEP 1 **Make a Hole** • Begin the installation process with demolition. Start by removing any storm or screen doors and the moulding and trim. Next remove the old entry door and the casing — both inside and out. Before removing the door jamb, remove the door hardware. In most cases longer screws have been used in the deadbolt plates and in the hinges to strengthen the door.

1 WIRELESS DEMOLITION • Before you tear off the casing, check your doorbell. If it's attached to the casing, make sure you carefully remove the button, disconnect the wires and cap them off with wire nuts or electrical tape. Then tape them out of harm's way.

2 A REAL CUT-UP • Pat Lane shows us the fine art of using a reciprocating saw to remove the side jambs. Take an extra second to check for any wiring before cutting into the jams.

STEP **2** **Take Out the Jamb** • The easiest way to remove the jamb is to cut each side jamb in half using a reciprocating saw, a circular saw or a simple hand saw. If you try and tear the jamb out without cutting, you run the risk of doing some damage to the walls and wasting a lot of energy. After cutting, simply pry the pieces loose.

3 FITTIN' THE JAMB • On our particular job, not only did the drywall have to be trimmed flush to the jamb, but the new door frame ended up being a ½" taller than the opening. We were able to replace the 1½" header with a 1" piece and make up the difference. Measure twice!

STEP **3** **Open Wide** • Next, clean up the opening, removing any blocking, wedges, insulation and nails. If you have drywall that hangs over the framing studs, use a utility knife to cut it back flush to the frame. This will ease the shimming process once the new jamb is in place.

STEP **4** **Open the Door** • Remove any packaging on the new door assembly (usually nailed or stapled to the casing for shipping), and also remove the door from the jamb by removing the hinge pins.

STEP **5** **Fits Like a Glove** • Check the new door jamb in the door opening. If you've measured correctly you should have no surprises. On average there should be about ¼" to ½" of space between the new jamb and the studs at the top and on both sides. As you are fitting the new jamb, make sure to keep the sill plate clear of debris that will prevent the jamb from fitting and sitting square.

STEP **6** **Shim to Square** • With the new jamb spaced evenly side-to-side, place shims (one from either side of the jamb) behind the upper hinge location **(see photo)**. With the wedges snug, but not pushing, nail the jamb side to the stud through the wedges, keeping the interior edge of the jamb flush to the interior wall.

STEP **7** **Secure the New Jambs** • Again check the fit, checking the flushness to the interior wall, and the sill plate's fit against any interior flooring or tile **(see photo)**. Caulk the sill, nail the lower hinge and rehang the door. Shim the jamb as necessary to leave an even gap all around the door (the gap is called a "reveal"), then nail the opposite jamb side in place, nailing through the jamb at locations opposite the hinges. Continue nailing the jamb in place, shimming and checking the jamb's spacing as you go. Also check the door's fit against the weather gasket.

Five nail locations (including the original two) are sufficient for each side. One nailing location in the center of the

4 NAIL REMOVAL • The trim moulding is usually attached to the new door assembly. Be careful removing the moulding. It's almost always attached better than you'd like it to be, and it can easily be damaged during removal.

top plate will do well. Depending on the type of jamb purchased, it may not be necessary to nail the sill plate in place. So read your instructions.

With the center nails in place, go back and put two more nails in each location (one on either side or the original nail) to keep the jamb from twisting in the future. Then set all the nail heads and trim the shims flush to the interior and exterior walls. Usually a utility knife works well for this. Simply score the shim and bend it to break. You can use a saw, but you run the risk of damaging the wall's surface.

STEP 8 Fiberglass, my boy • Before nailing the trim in place, use a shim to push handfuls of wall insulation into the gap between the new jamb and the studding. Then cut, mark and hang the interior and exterior trim.

And your door is hung! I'd like to tell you that's all there is to it, but you still have to put in the lock set, reconnect the doorbell, put on any other door hardware such as a kickplate — oh yeah, you more than likely have to put a finish on the door as well. But these are tasks we'll tackle in future issues. **PW**

—David Thiel, PW staff

5 TEST FIT • This sounds like a quick step, but it's very important. Pat tested the new frame a number of times, and as he trimmed some of the drywall, he had to constantly check for debris under the door sill. It doesn't take a lot to throw off the door's fit.

6 HAMMERED HOME • A helpful hint on nailing: don't sink the nail flush to the work surface yet. In case you need to shift the jamb, the nail is a lot easier to pull free if ¼" of the head is left proud. Also, you should use a nail set to finish putting the nail in to avoid leaving a mark on the soft wood of the jamb from the hammer's head.

7 A LITTLE BEAD'LL DO YA • A bead of silicone caulk on the inside of the sill plate will protect against water damage. After caulking, shim behind the lower hinge plate and nail it in place with a single nail. Then rehang the new door and check the opening around the door.

8 KEEP OUT THE COLD • When installing insulation, don't overstuff the gap, but put enough in to fill the space and block any light. Usually pulling sections off a sheet of wall insulation works well. Gloves are a real benefit in avoiding fiberglass splinters.

3.5-HP,
VARIABLE-SPEED ROUTER

4-POSITION, 1/2-HP
ORBITAL-ACTION SAW

7.5-AMP,
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No More Miter Gauge!

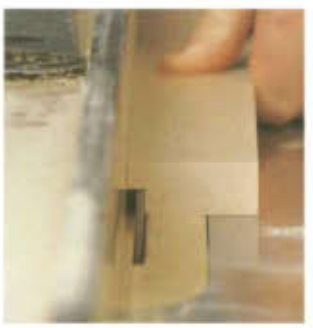
Make miter cuts with this sure-grip hold-down...

... or use the attachable featherboard for repeat cuts.

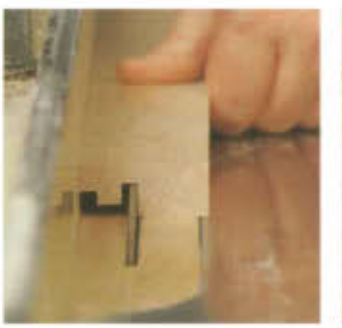
I'VE TRIED OUT dozens of table saws over the years, and the one thing I've come to expect on all makes and models is the miter gauge that barely serves its purpose. Catalogs have come to the rescue with many excellent after-market miter gauge replacements — but at what a price! I figured that I'm reasonably intelligent, so I should be able to make my own replacement for a lot less. Voila, for less than $35 in hardware and a modest amount of wood, I'm now set. You can do it too — just follow the steps.

STEP 1 **Split Rail Fencing** • I took the improved miter gauge concept a step further and turned it into a miter sled. This gives me the opportunity to add a stop block with measuring tape, as well as a hold-down attachment. The sled itself is simply a piece of ½" baltic birch plywood attached to the guide bar from my old miter gauge. The part that makes this table saw jig versatile happens at the fence.

Both the permanent fence and the miter fence are made the same way on the table saw. Start with four "halves" and



1 IN THE GROOVE • The first cut is made with the bottom of the piece against the table saw's fence, then the piece is turned around and the cut is finished to size.



The next three cuts follow the same routine, changing the depth of cut and distance from the table saw fence for each. The diagrams at right give the accurate dimensions.

mark the inside face and top surface. Next, set up the saw as shown in the photos and make mirror-image grooves the length of the fence parts.

To allow for some adjustability on the fixed fence, use a chisel to carefully cut matching notches on both fence halves. When the halves are glued together, the notches will allow a screw head to slide 1/2" to allow you to square up your fence to the saw blade.

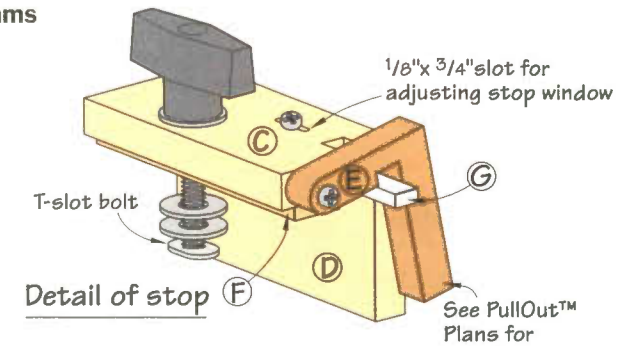
When done making those cuts, check the slots' fit against the hardware, then glue the halves together using the top surface as the reference point, rather than the bottom. When the glue has cured, run the bottom edge of each fence over the jointer to make a square and even bottom surface. Then reset the jointer fence to a 45-degree angle and take a pass (or two) off the inside bottom edge of each fence to make a dust slot. This slot keeps any chips or dirt from holding your work away from the fence.

STEP 2 Mending Fences • The next step is to prepare the fences for attachment to the sled. This is where the fences become different. The fixed fence is attached with machine screws slipped through clearance holes in the fence and fastened to tee nuts recessed into the underside of the sled. Location of the clearance holes isn't critical, but the fence should be clamped in place (flush to the right edge of the sled) before drilling the holes. Start by cutting the fences to length.

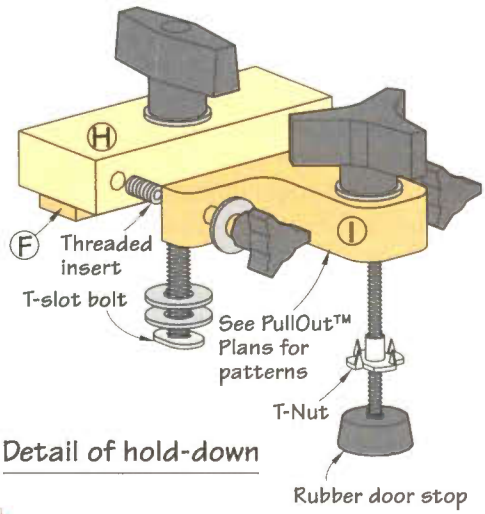
The hole necessary for the barrel of the tee nut is larger in diameter than the clearance hole for the screw, so you can drill a clearance hole straight through the fence and through the sled. The fixed screw hole at the right of the fence should then be counterbored to allow the screw's head to drop below the groove. The machine screw's head should be no larger than 3/8" to clear the fence grooves.

The adjustable screw (on the left of the fence) has already been notched in the previous step, so all that's left is to drill

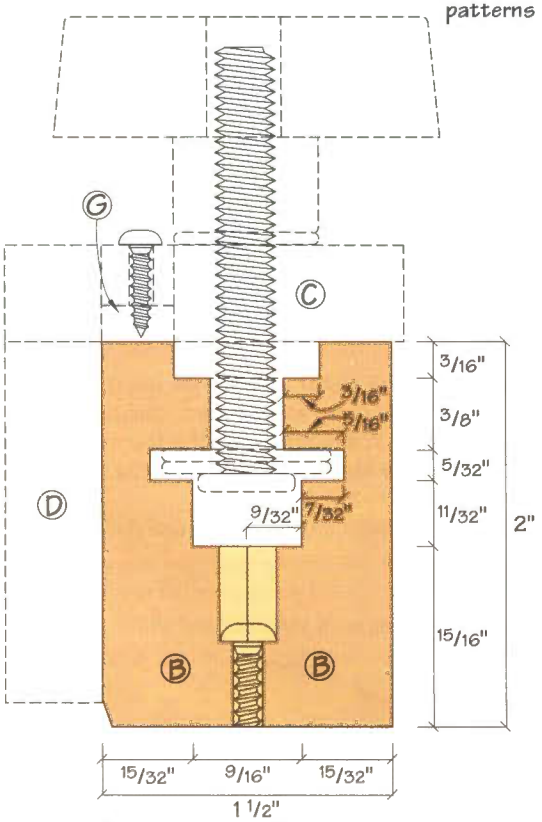
Diagrams



Detail of stop



Detail of hold-down



Full-size profile

Are we on target?

To see more projects like this in future issues, circle "P2" on the postage-paid card in the Resource Directory.

Schedule of Materials: Miter Sled

No.	Let.	Item	Dimensions T W L	Material
1	A	Sled	1/2" x 20" x 24"	Plywood
4	B	Fence halves	3/4" x 2" x 24"	Maple
1	C	Stop top	1/2" x 2 1/8" x 4"	Plywood
1	D	Stop face	1/2" x 1 7/8" x 4"	Plywood
1	E	Stop arm	1/2" x 2 1/4" x 2 1/4"	Plywood
2	F	Stop guides	3/16" x 3/4" x 4"	Maple
1	G	Stop window	3/16" x 3/8" x 4 7/8"	Plexiglas
1	H	Hold-down top	3/4" x 1 9/16" x 4"	Maple
1	I	Hold-down face	1/2" x 5 1/4" x 3 1/2"	Plywood

Hardware:

2 - 5/16" - 18 x 3 1/2" t-slot bolts*
1 - 5/16" - 18 x 1 1/2" furniture glide*
1 - 24" right-to-left read tape**
2 - 1/4" - 20, 1 1/4"stemmed knobs
2 - 1/4" - 20 threaded inserts*
2 - #6 x 3/8" RH screws
2 - 5/16" - 18 knobs*
7 - 1/4" - 20 t-nuts*
1 - 3/8" - 16 t-nut*
6 - 1/4" washers
2 - 1/4" - 20 x 1" knobs
1 - #6 x 1" RH screw

* Available from The Woodworker's Store - 800-279-4441
** Available from Woodhaven - 800-344-6657

2 T-NUTS FOR ME • Threaded inserts could be used to attach the fences to the sled, but they always seem to go in crooked. T-nuts are cheaper, easier to install and provide positive pull from the underside flange. One end of each fence and the recessed tee nuts are shown in the photo above. The last step on the fixed fence is to attach the right-to-left-reading adhesive measuring tape.

the tee nut holes to the proper diameter and recess the holes 1/8" from the underside using a Forstner bit.

The miter fence is a little easier. Angle-cut the ends of the fence to form a tongue on each end and then round them. The 1/4" clearance holes are drilled in the center and 3/4" in from the ends. The t-nuts are then inserted as before with locations on the sled for 15-, 22.5-, 30- and 45-degree stops.

STEP 3 **Adjustable Stop** • The stop attachment is designed to be used on either the fixed or mitering fence. Shown in a detailed diagram on the preceding page, the stop is simply four pieces of wood and a clear plastic insert. The stop's top is first grooved and notched for the Plexiglas™ window, then two slots are formed by connecting drilled holes to allow the Plexiglas to be adjusted on the measuring tape as necessary.

Glue the face plate to the underside of the top and glue a guide to the underside of the top to fit into the groove in the fences. Some fine adjustment may be necessary to allow the stop attachment to move freely. Use the full-size plan of the stop arm in the PullOut™ Plans to cut and shape the arm. Then lightly clamp the arm in place, drill a clearance hole and screw the arm to the stop. With the arm in place, use a scratch awl to cut a groove the Plexiglas, then use a dark putty stick to fill in the groove, wiping away the excess.

STEP 4 **Hold Down** • Sometimes a stop block isn't what you want. What you need is a hold-down device. To provide the most versatility, I opted for a convertible hold-down attachment. Using a top assembly similar to the stop attachment, I mounted two threaded inserts into the facing edge of the top and made two different hold-down attachments for different applications (see PullOut plans for a full-size pattern). The featherboard adjusts up and down to hold the work in place for repeat passes such as dadoes, while allowing enough play to tap the piece over for the next pass. A rubber door stop on a piece of threaded rod with a handle works locks the piece in place and keeps it there. Again, the handy t-nut comes into play.

I'm fairly certain some of our readers will take the ideas presented here and make them even better. If you do, let me know. And even if you don't make any changes I guarantee you'll find this sled more useful than your "factory" miter slot gauge. **PW**

— David Thiel, PW staff

3 TWO-STAGE STOP • A feature we enjoy on this stop is the swing-up stop arm. This allows you to square cut one end of your piece (arm up), then swing the arm down and make the final length cut. No resetting necessary. The hash mark on the window is set to the final cut size.

4 TWO-IN-ONE HOLD DOWN • By using optional add-ons for the hold-down attachment, this hold-down serves two functions. You might think of a few more add-ons to make the miter sled even more versatile.

Thievin' BOX

Drive the younger members of your family crazy with this tricky box. Put a dollar in the drawer, close the drawer and the money "disappears."

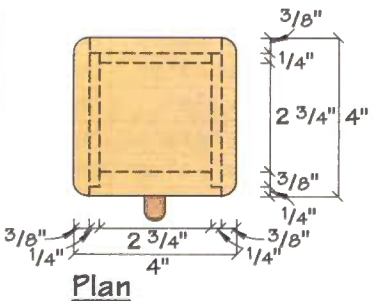
STEP ONE: Start by cutting the parts to size. Cut a 1/8" roundover on the inside top edge of the front, then glue the drawer guides to the sides in line with the front opening. Nail the box together, then rout a 3/8" quarter-round detail on all the outside corners.

STEP TWO: The tricky part in building the drawer is to have the bottom look plain enough to fool the casual inspection. Cut 1/4" x 1/8" deep rabbets in the bottom edge of the drawer sides and back. Cut 1/4" x 3/8" deep rabbets in the ends of the drawer front, and a 1/4" x 1/4" rabbet on the bottom inside edge. Notch the drawer bottom on both sides to leave a 1/4" x 1/8" deep pivot stub on both sides. This will be the pivot that allows the bottom to swing down and empty the drawer. After carving a round tenon on the stubs and drilling a hole in the drawer sides in a corresponding location, assemble the drawer with the bottom pivoting freely in the holes.

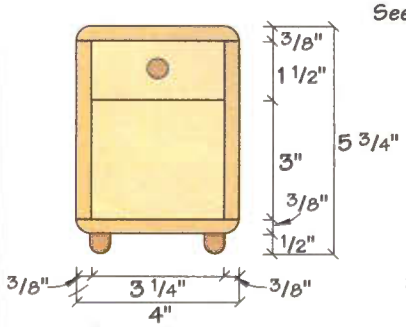
STEP THREE: Fit the drawer to the opening and make sure it is flush with the front of the case. Paint the box and cover it with two coats of clear finish. I turned the feet and knob on the lathe, but adequate substitutes can be bought at any craft store. Place an object in the drawer and shut the drawer. The object will fall into the bottom of the box. When the drawer is opened, the object will seem to have disappeared. To retrieve the object, remove the drawer, turn the box upside down and shake. **PW**

— Jim Stuard, PW staff

Diagrams

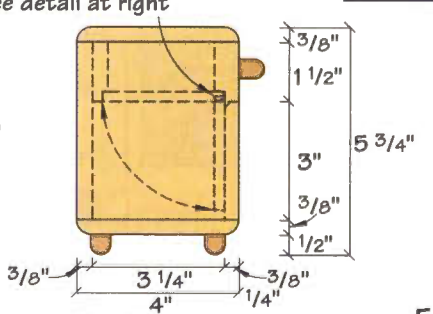


Plan

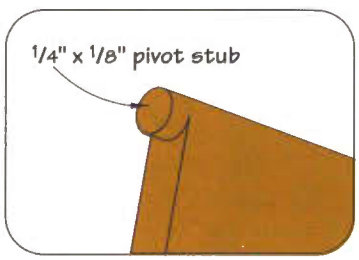


Elevation

See detail at right



Profile



Full-size detail of drawer bottom

Are we on target?

To see more projects like this in future issues, circle "P5" on the postage-paid card in the Resource Directory.

Schedule of Materials: Thievin' Box

No.	Item	Dimensions T W L	Material
2	Top & bottom	3/8" x 4" x 4"	Pine
2	Sides	3/8" x 4" x 4 1/2"	Pine
1	Back	3/8" x 3 1/4" x 4 1/2"	Pine
1	Front	3/8" x 3 1/4" x 3"	Pine
1	Drawer front	5/8" x 1 1/2" x 3 1/4"	Pine
1	Drawer sides	1/4" x 1 1/2" x 3 3/8"	Pine
2	Drawer back	1/4" x 1 1/2" x 2 3/4"	Pine
2	Drawer bottom	1/4" x 3 1/8" x 3 1/8"	Pine
1	Drawer back	1/2" x 5" x 4 3/4"	Pine
2	Drawer guides	1/8" x 1/4" x 3 1/8"	Pine

Spice Cabinet

Though members of your family aren't likely to store spices in a cabinet like this, you can bet that it will be an oft-requested item for you to build. So you might want to think about making more than one when you begin.

STEP ONE: Cut the sides and ends to size, then cut 1/2" finger joints on the ends of each piece.

STEP TWO: Next cut 1/4" x 1/2"-wide dadoes on the sides and ends as located on the diagrams. Also cut a 1/4" x 1/2"-wide rabbet on the back edge of each side for the back.

STEP THREE: Next, cut the three dividers to size, and with the case dry-clamped together, check the dimensions of the dividers against your case. Trim them to fit, then cut 1/2"-wide bridle joints to fit the dividers together. Glue up the case, holding the dividers' front edges flush to the case front. When dry, sand the joints flush to the outside surfaces.

STEP FOUR: Cut the hanger to shape from the diagrams, then glue and nail the hanger in place at the back of the cabinet. Now cut the back to size and nail it in place.

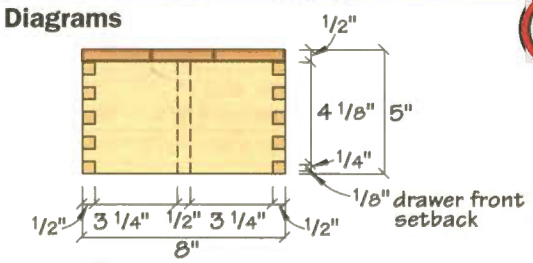
STEP FIVE: Next cut the drawer box pieces to size. Then cut 1/8" x 1/4"-wide rabbets on the ends of the sides and cut 1/8" x 1/4"-deep dadoes for the bottoms on the ends and sides, starting 1/8" up from the bottom edge. To assemble, glue and nail the drawer boxes together.

STEP SIX: Cut the drawer fronts to size, then make the knobs. Cut a 3/8" x 1" x 8" strip of cherry, beveling the sides at a 25-degree angle. Then cut the knobs off at 1" intervals, again beveling the sides at 25 degrees. Use either a band saw to cut the knobs to shape, or sand them to shape after separating. Attach the knobs to the drawer fronts with #4 flathead screws and glue. Then glue the fronts to the drawer boxes.

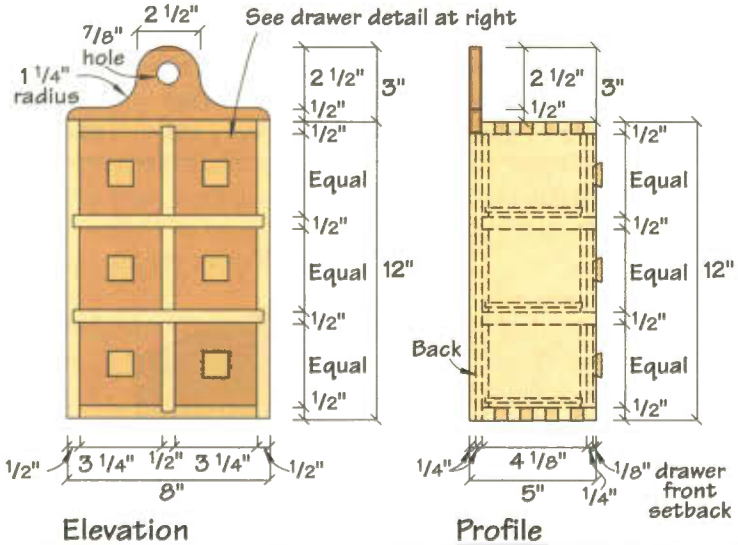
STEP SEVEN: Before finishing the piece, distress the cabinet with keys, screwdrivers and a hammer. I then applied brown mahogany gel stain; when the stain was dry, I then applied a coat of wax. **PW**

— David Thiel, PW staff

Diagrams



Plan



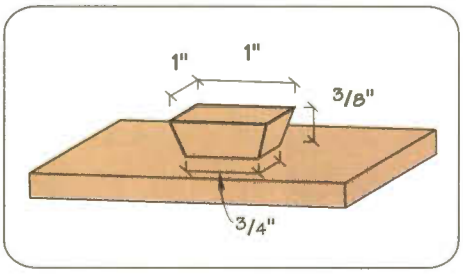
Elevation Profile

Are we on target?

To see more projects like this in future issues, circle "P9" on the postage-paid card in the Resource Directory.

Schedule of Materials: Spice Cabinet

No.	Item	Dimensions T W L	Material
2	Sides	1/2" x 5" x 12"	Cherry
1	Bottom	1/2" x 5" x 8"	Cherry
1	Top	1/2" x 4 9/16" x 8"	Cherry
1	Center	1/2" x 4 1/2" x 11 1/2"	Cherry
2	Dividers	1/2" x 4 1/2" x 7 7/2"	Cherry
1	Hanger	1/2" x 8" x 3 1/2 "	Cherry
1	Back	1/4" x 7 1/2" x 11"	Plywood
6	Drwr fronts	1/4" x 3 1/4" x 3 5/16"	Cherry
12	Drwr sides	1/4" x 3 3/16" x 4 1/8"	Plywood
12	Drwr ends	1/4" x 3 3/16" x 3"	Plywood
6	Drwr bottoms	1/4" x 2 15/16" x 3 7/8"	Plywood
6	Drwr knobs	3/8" x 1" x 1"	Cherry



Detail of drawer front

When Can You Have It?
WHEN PIGS FLY!

You've probably heard, or used, this expression before, and now you can use your Flying Pig Clock to give friends a more accurate time estimate of when you'll finish a project! Beware, if you're anything like me, you'll be laughing pretty hard by the time you finish this project — because it's so clever and easy!

STEP ONE: Cut the face, sides, roof halves and braces from 1/2" pine. Cut the peak on the face piece and the 45-degree angle on the mating edges of the roof halves.

STEP TWO: Assemble the clock body using nails and glue. Set the face back from the sides by 1/4". Position the braces as shown on the diagram.

STEP THREE: Fashion the roof and leaf trim pieces from the patterns in the PullOut™ Plans. Paint the leaves and attach them using glue; then attach the roof trim pieces and paint the roof. Now paint the "door" on the face.

STEP FOUR: Next, cut out the pig wings, again using the plans provided. I shaped the pig head from a block of pine using an X-acto™ knife. A rough carving detail is in the PullOut Plans. Now paint the pig pink, add the facial details and glue it in place.

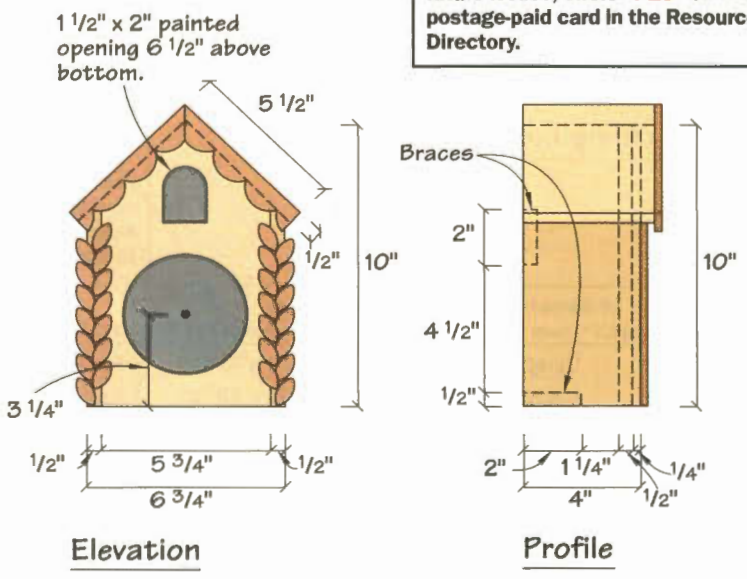
STEP FIVE: Drill the center hole for the clock mechanism, and glue the dial in place. Then cover the entire clock body with two coats of a clear finish.

STEP SIX: Make the two ears of corn from dowels and sand them to shape. Paint the ears yellow and green. To paint the "kernels," get one of those erasers you put on the ends of pencils after the original eraser is gone and dip the end with a hole in brown paint. Squeeze it slightly to form a kernel-shaped stamp and use a random pattern to create the kernel appearance.

STEP SEVEN: Hang the corn ears using simple brass chains and eye hooks located 2" in from either side. All that's left to do is find a good wall and put in the battery!

— David Thiel, PW staff

Diagrams



Are we on target?

To see more projects like this in future issues, circle "P13" on the postage-paid card in the Resource Directory.

Schedule of Materials: Flying Pig Clock

No.	Item	Dimensions T W L	Material
1	Face	1/2" x 5 3/4" x 10"	Pine
2	Sides	1/2" x 4" x 7 1/8"	Pine
2	Roof halves	1/2" x 4 1/2" x 5 1/2"	Pine
2	Braces	1/2" x 2" x 5 3/4"	Pine
2	Roof trim	1/4" x 1" x 5 1/2"	Pine
2	Leaf trim	1/4" x 1 1/4" x 7"	Pine
2	Wings	1/4" x 1 1/4" x 1 1/4"	Pine
1	Pig head	1 1/4" x 1 1/4" x 1 1/4"	Pine
2	Corn ears	1" diameter x 5"	Dowel
2	Corn end	1/2" diameter x 5/8"	Dowel

Clock #11924, with #66955 hands, $8.90
Cuckoo clock dial #26465, $8.95
Both available from Klockit, 800-556-2548

ROLLING CLAMP RACK

You can never have enough clamps, but when you've got so many that it's a problem getting them to where the work is being done, build this rolling clamp rack! It holds about 50 clamps, takes up a little more than four square feet of floor space and can honestly be built in an afternoon. The construction of the frame is simple, but the "hanging" part of the rack depends a great deal on the type and variety of clamps you own.

STEP ONE: Cut the ends of the four uprights and the two base support pieces at a 10-degree angle as shown.

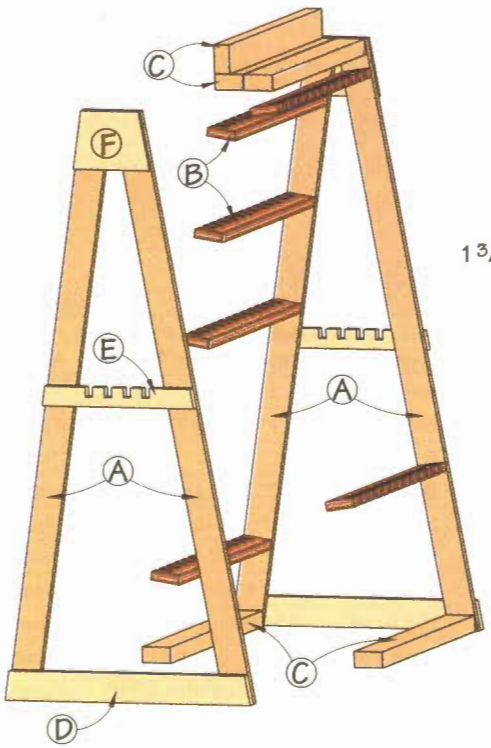
STEP TWO: Assemble the two side frames by screwing two cross supports between the pairs of uprights, holding the top inside edge of the support flush to the inside of the upright, and flush to the top or bottom 10-degree angles.

STEP THREE: Attach the two frames together to form the "A" by screwing the base supports and the top supports to the sides of the frames, holding them flush to the bottom and top of the frames. Now attach the casters to the outside ends of the two lower cross supports.

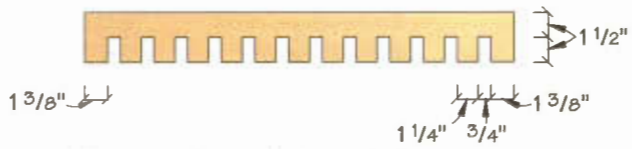
STEP FOUR: Consider your clamps and how they can best be stored on the two slanted sides of the rack, and notch the clamp supports accordingly. Then screw the supports between the uprights. I used an extra cross support screwed to the top of the rack for storing hand screws and spring clamps. I also added two notched strips to the sides for storing smaller clamps. **PW**

— David Thiel, PW staff

Diagrams



Each 3/4" x 1 1/2"notch is equally spaced from the given inset. Your clamps may require different notch sizes.



Plan of clamp holder "B"

Are we on target?

To see more projects like this in future issues, circle "P10" on the postage-paid card in the Resource Directory.

Schedule of Materials: Rolling Clamp Rack

No.	Lett.	Item	Dimensions T W L	Material
4	A	Uprights	3/4" x 3" x 61 1/2"	Poplar
6	B	Clamp holders	7/8" x 3" x 25 1/2"	Poplar
5	C	Cross supports	1 5/8" x 3" x 25 1/2"	Poplar
2	D	Base supports	7/8" x 3" x 26"	Poplar
2	E	Side clamp holders	7/8" x 2" x 16 "	Poplar
2	F	Top supports	1/2" x 8" x 6"	Plywood

Four - 4" locking swivel casters; available through Lee Valley Tools (800) 871-8158, item #00K20.01, $10.95 each.

PullOut™ Plans • September 1998 issue #104

Popular Woodworking

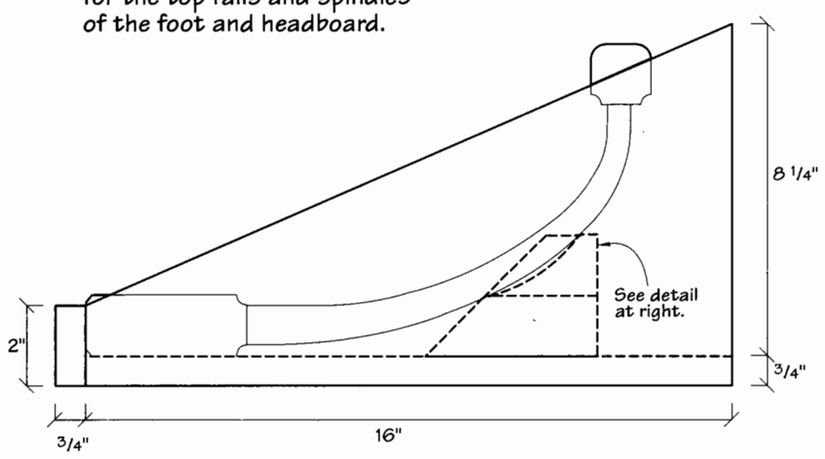
Carefully open staples to remove plans, then bend staples closed again.

Supplemental drawings for projects in this issue

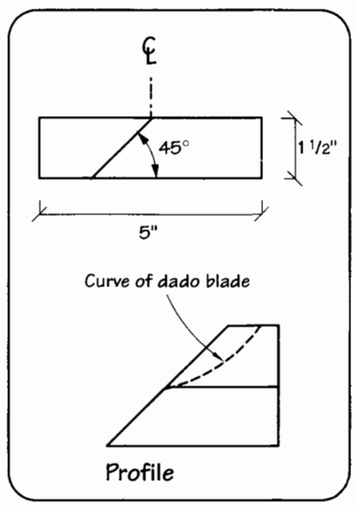
These plans incorporate pages 37 to 44 of this magazine

Sleigh Bed

Diagram of assembly jig for the top rails and spindles of the foot and headboard.



Profile

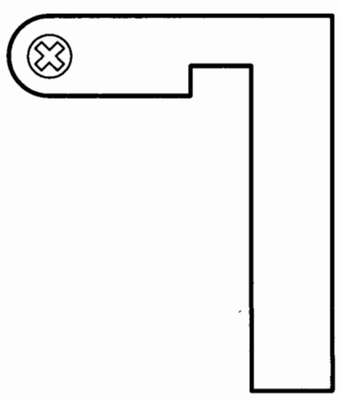


Detail of clamping jig

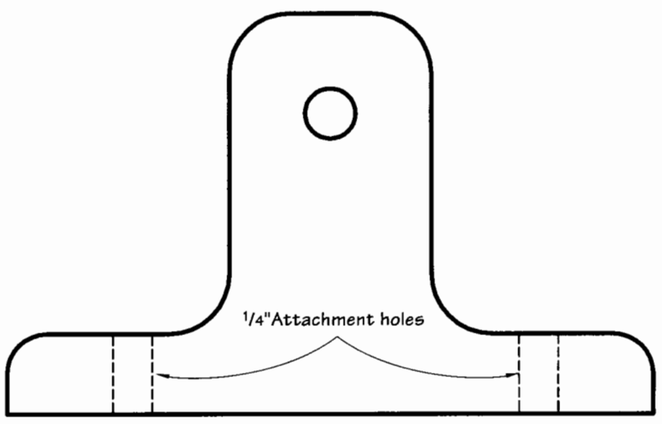
Miter Sled

Full-size diagram of stop arm, hold down face and fingerboard.

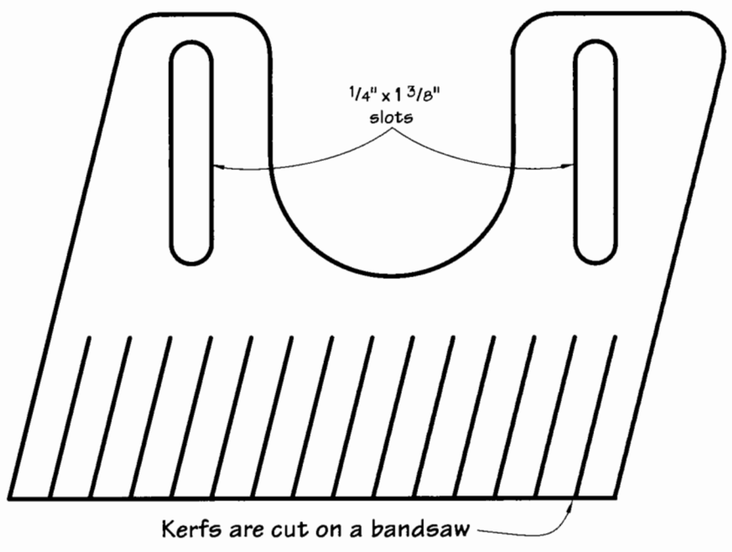
Stop arm "E"



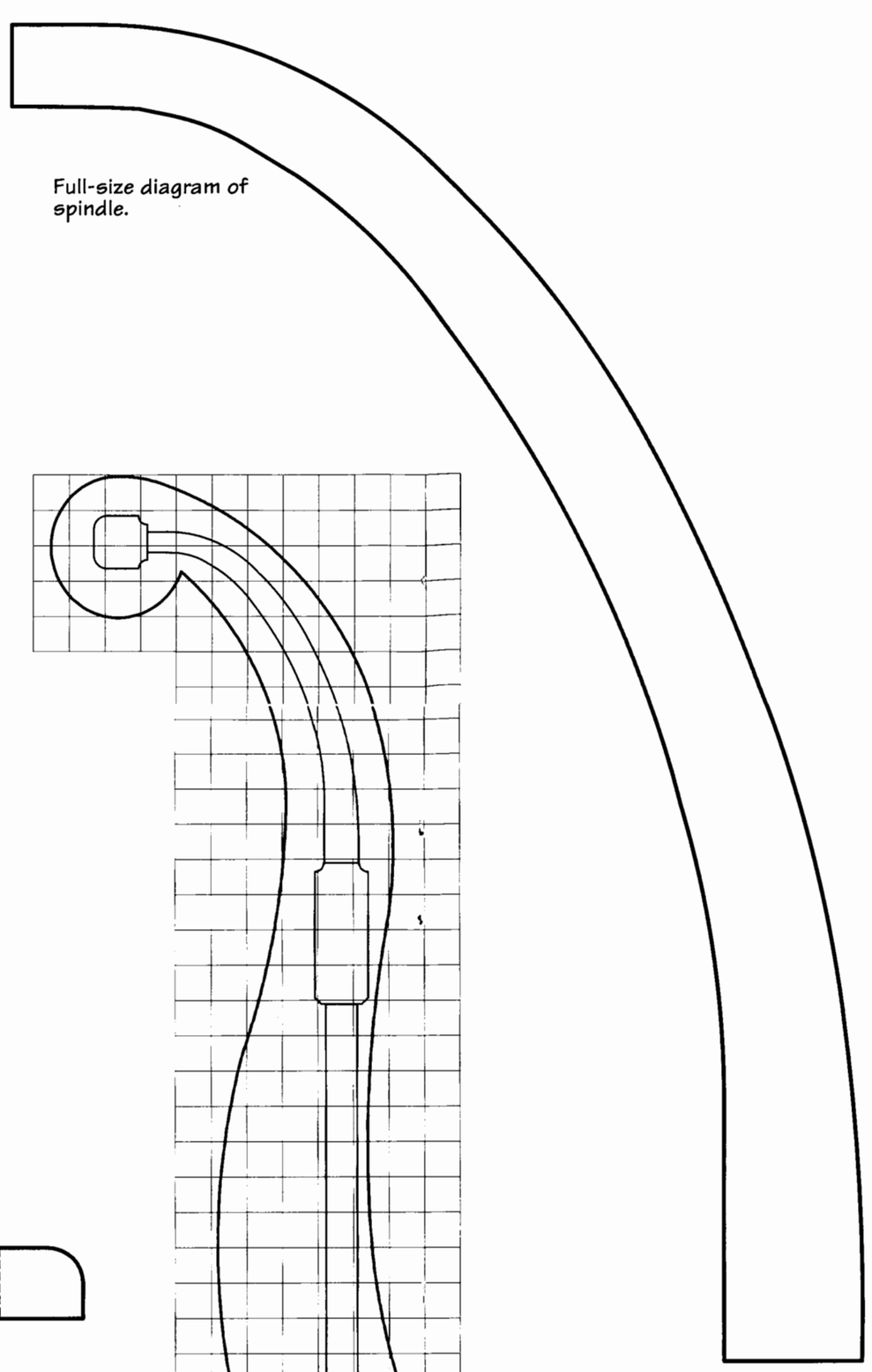
Hold down face "I"



Fingerboard

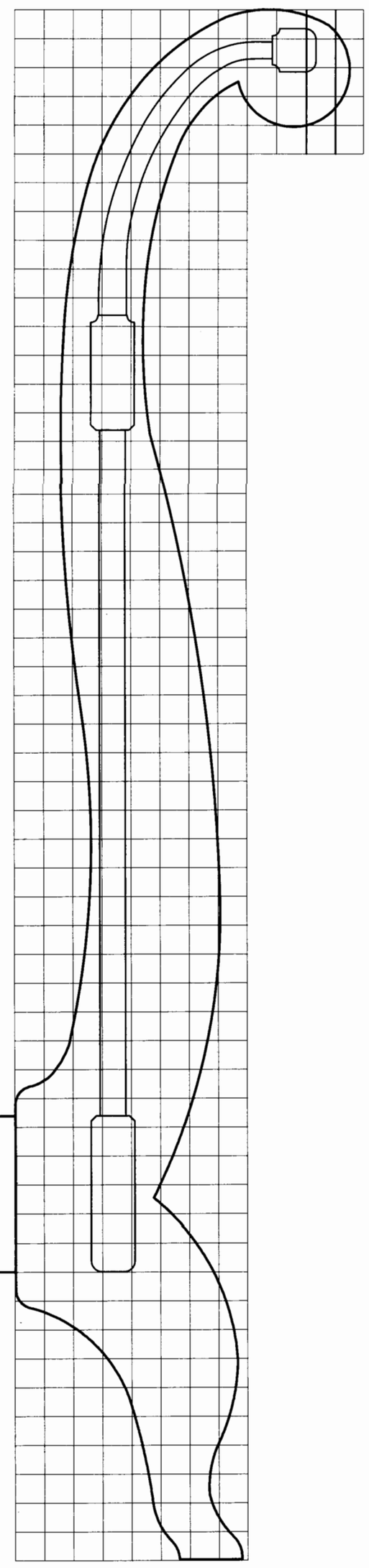


Full-size diagram of spindle.



Sleigh Bed

Scale drawing of bedposts and rail locations.
Scale 3" = 1'-0"

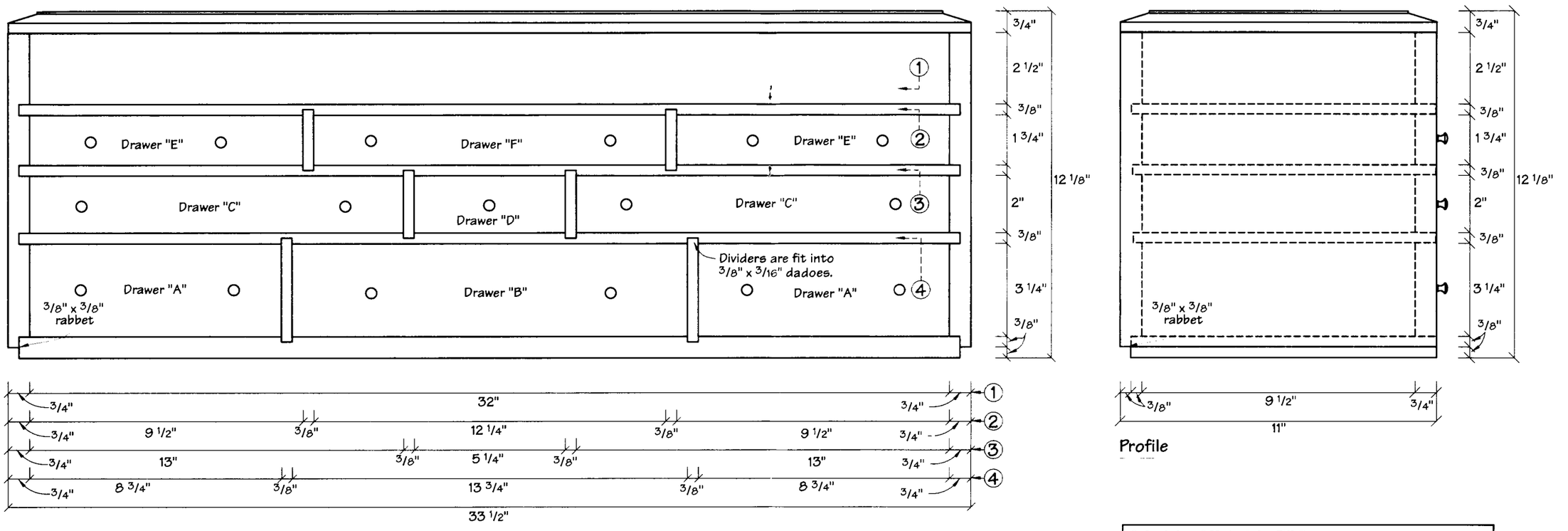


One square equals 1"

One square equals 1"

Tool Chest

Diagram of till with drawer dimensions
Scale 3" = 1'-0"

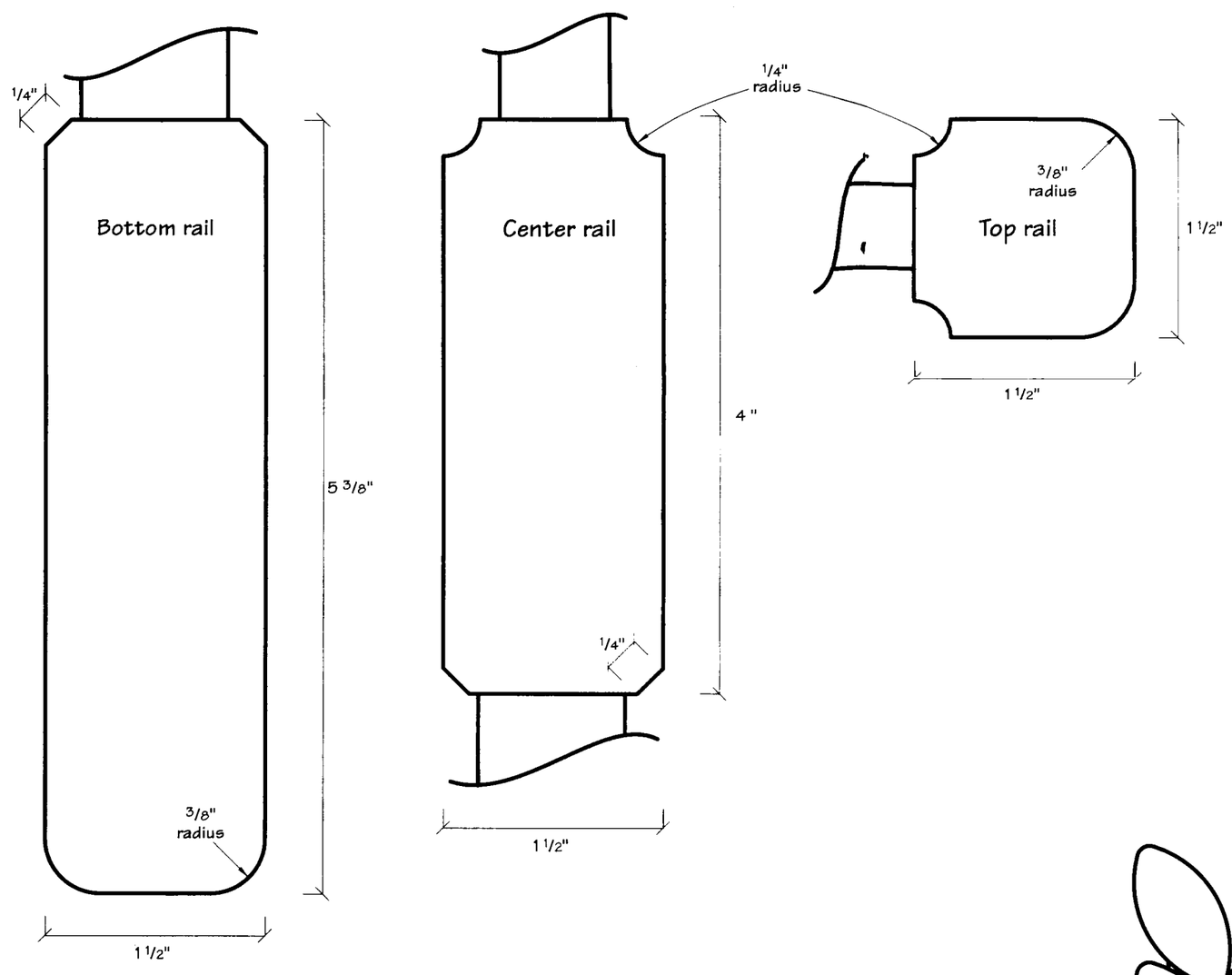


Elevation

Profile

Sleigh Bed

Full-size diagrams of all the rails.



Schedule of Materials: Till Drawers

Drawer A (two drawers)

No.	Item	Dimensions T W L	Material
2	Drawer front	3/4" x 3 1/4" x 8 3/4"	Maple
4	Sides	3/8" x 3 1/4" x 9 7/8"	Pine
2	Back	3/8" x 2 5/8" x 8 3/8"	Pine
2	Bottom	3/8" x 8 1/8" x 9 1/2"	Plywood

Drawer B (one drawer)

No.	Item	Dimensions T W L	Material
1	Drawer front	3/4" x 3 1/4" x 13 3/4"	Maple
2	Sides	3/8" x 3 1/4" x 9 7/8"	Pine
1	Back	3/8" x 2 5/8" x 13 3/8"	Pine
1	Bottom	3/8" x 13 1/8" x 9 1/2"	Plywood

Drawer C (two drawers)

No.	Item	Dimensions T W L	Material
2	Drawer front	3/4" x 2" x 13"	Maple
4	Sides	3/8" x 2" x 9 7/8"	Pine
2	Back	3/8" x 1 7/16" x 12 5/8"	Pine
2	Bottom	3/8" x 12 5/8" x 9 1/2"	Plywood

Drawer D (one drawer)

No.	Item	Dimensions T W L	Material
1	Drawer front	3/4" x 2" x 5 1/4"	Maple
2	Sides	3/8" x 2" x 9 7/8"	Pine
1	Back	3/8" x 1 7/16" x 4 7/8"	Pine
1	Bottom	3/8" x 4 7/8" x 9 1/2"	Plywood

Drawer E (two drawers)

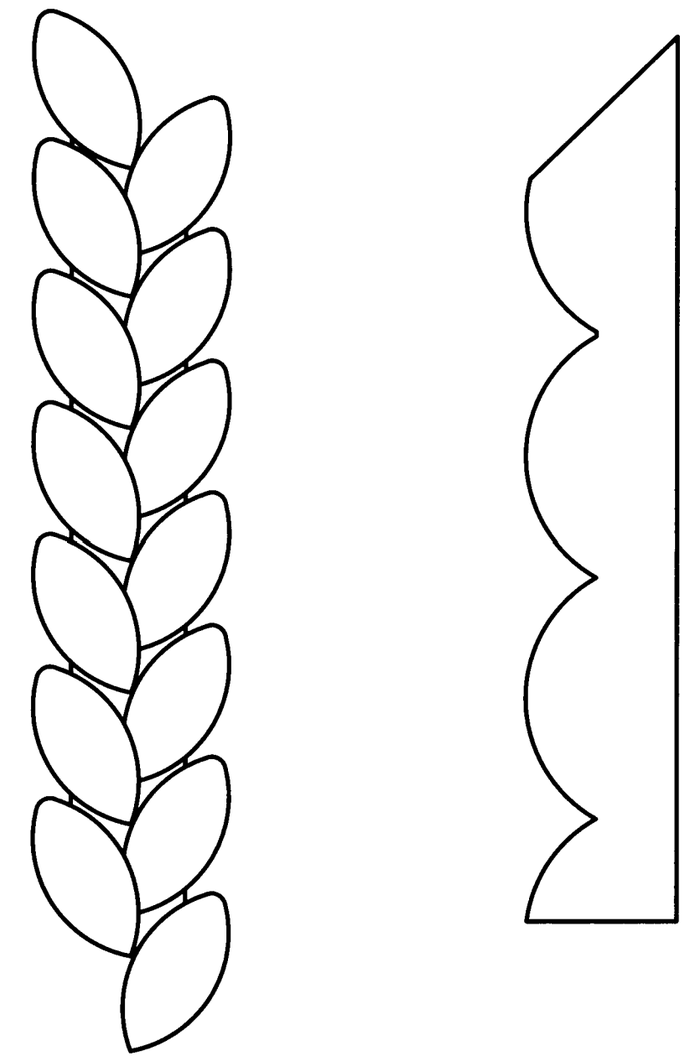
No.	Item	Dimensions T W L	Material
2	Drawer front	3/4" x 1 3/4" x 9 1/2"	Maple
4	Sides	3/8" x 1 3/4" x 9 7/8"	Pine
2	Back	3/8" x 1 1/8" x 8 1/8"	Pine
2	Bottom	3/8" x 8 1/8" x 9 1/2"	Plywood

Drawer F (one drawer)

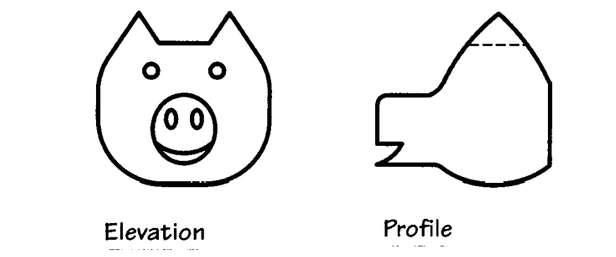
No.	Item	Dimensions T W L	Material
1	Drawer front	3/4" x 1 3/4" x 12 1/4"	Maple
2	Sides	3/8" x 1 3/4" x 9 7/8"	Pine
1	Back	3/8" x 1 1/8" x 11 7/8"	Pine
1	Bottom	3/8" x 11 7/8" x 9 1/2"	Plywood

Flying Pig Clock

Full-size diagram of leaf trim and roof trim.



Full-size diagram of pig's head and wings.



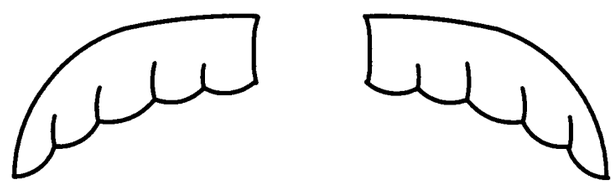


TABLE SAW ORGANIZER

Have you ever begun a project with the tidiest of intentions and then found yourself digging on your table saw for some tool that ended up on the bottom of the pile? This organizer will make you more productive and safe.

STEP ONE: Start by cutting the parts out according to the Schedule of Materials. Nail the top and bottom to the edge of the back, and nail the shelf to the back in the location shown in the diagram. Nail the sides on and iron on maple veneer tape to all the front edges.

STEP TWO: Glue and nail wood edging to the drop front. Install the hinges and mount the door to the main assembly. Attach the chains to the door and the main assembly. Use a magnetic catch to hold the door closed.

STEP THREE: Drill and glue the 1/2" dowels for the saw blades into the back. Put the case on its back and place your odds and ends in their future resting places. Mark the nail and screw locations for hanging these objects and install them. Two special tips for hanging a tape measure and a square are as follows: For the tape, screw a piece of old belt leather to the back and the tape measure's clip should slide right in. For the square, cut a small rabbet in scrap that is the length of the square's blade. Screw the wood piece to the back and hang the square by the blade.

STEP FOUR: Attach the pull, then remove the hardware. Apply two coats of clear finish. Hang it, load it and get to work!

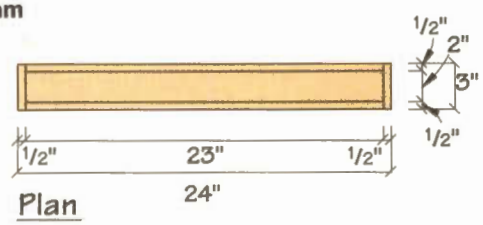
— Jim Stuard, PW staff

Schedule of Materials: Table Saw Organizer

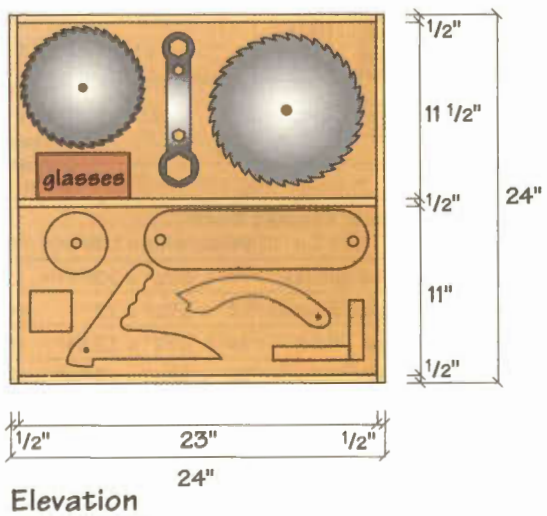
No.	Letter	Item	Dimensions T W L	Material
1	A	Back	1/2" x 23" x 23"	Plywood
2	B	Top/bottom	1/2" x 3" x 23"	Plywood
1	C	Shelf	1/2" x 2 1/2" x 23"	Plywood
1	D	Sides	1/2" x 3" x 24"	Plywood
1	E	Drop front	1/2" x 10 3/4" x 22 3/4"*	Plywood
1	F	Dowel rod	1/2" x 12"	Hardwood
1	F	Wood trim	1/8" x 5/8" x 72"	Maple

*Sized without trim

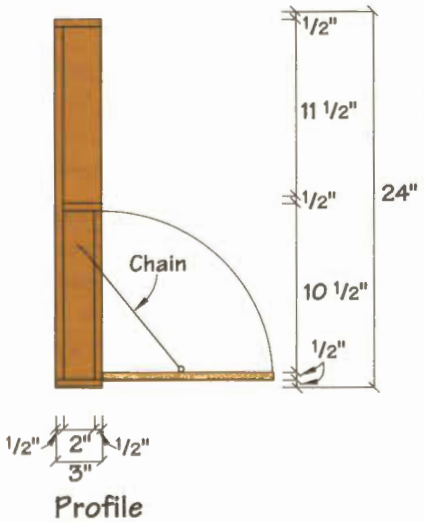
Diagram



Plan



Elevation



Profile

Are we on target?

To see more projects like this in future issues, circle "P8" on the postage-paid card in the Resource Directory.

Stacking Storage BOXES

In any workshop, efficient storage is very important, especially if your workshop space is at a premium. These storage boxes can snuggle up against a wall in an otherwise useless corner of your workshop. While they are a good, solid box that you can tote from one place to another — unlike most storage boxes — once these are stacked you still have access to the contents of the lower boxes.

STEP ONE: Assemble the ends by placing a 5½"-wide end piece in the middle of two 3½" end pieces. Separate them slightly by placing a business card between each piece at the top and bottom. Offset the middle piece ¾" higher than the two side pieces, using a scrap piece of wood as a guide. This "notch" is used to lock the storage boxes together when they are stacked. Screw two battens to the ends so they are flush to the front and back edges and even with the top and bottom of the 3½"-wide pieces.

STEP TWO: For the backs, screw a bottom ledger onto one 5½"-wide side piece so that it is centered and flush with the bottom edge. Then, lay out first a 1½"-wide piece and another 5½"-wide piece, and screw the three together using two battens. The battens are held ¼" down from the top and 2" in from the ends.

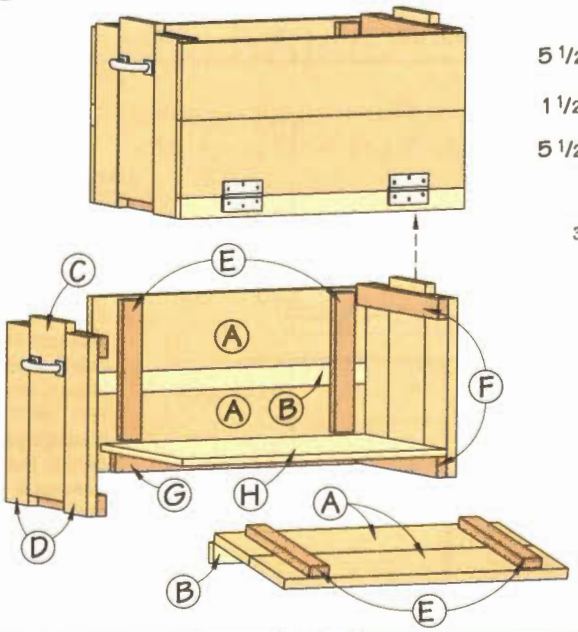
STEP THREE: To make the doors, use two 5½"-wide pieces and attach the battens ¼" from the top and 2" from the ends. Screw the bottom ledger to the 1½"-wide front piece, flush to the top and bottom and centered end to end. Place the two front parts face up and attach the hinges.

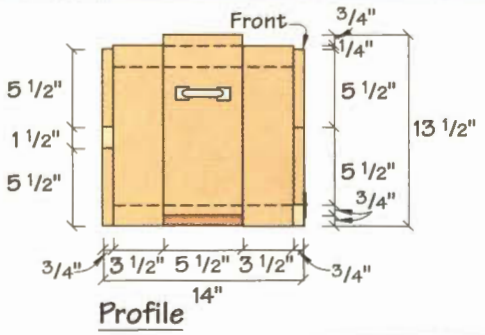
STEP FOUR: Glue and screw the back to the outside of the ends, then glue and screw the lower front to the ends. Finally screw the bottom in place, making sure it rests on the ledgers on all sides.

STEP FIVE: The door is held closed by eye hooks attached at the ends, and handles are screwed to both ends of the box. You can leave the box natural if desired, or give it two light coats of polyurethane varnish for extra protection. **PW**

— Michel Theriault

Diagrams





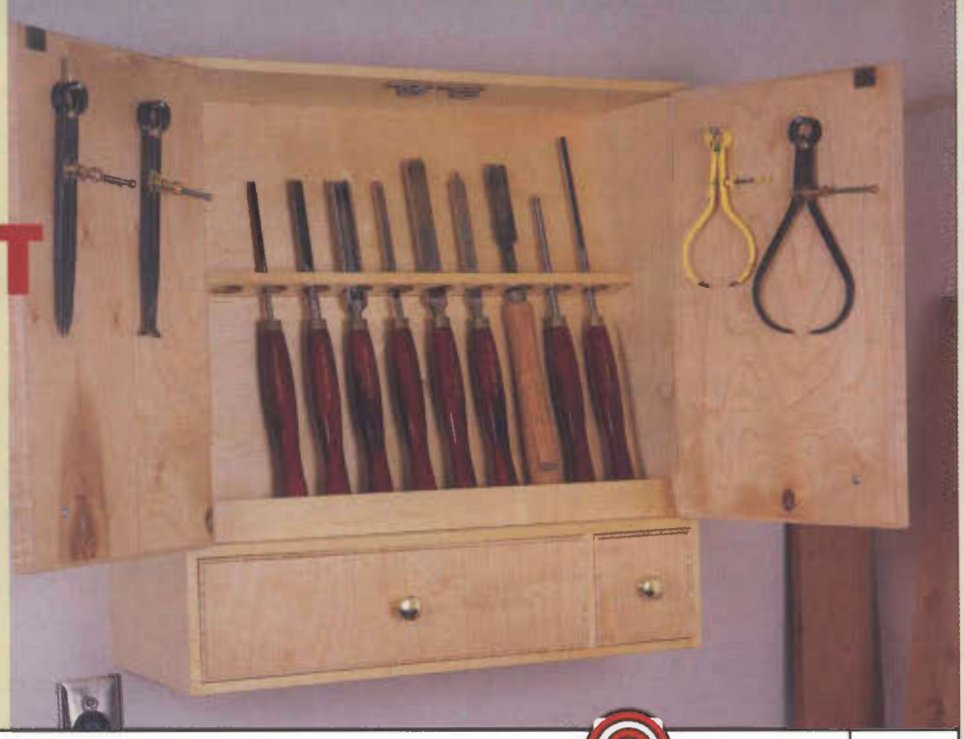
Are we on target?

To see more projects like this in future issues, circle "P12" on the postage-paid card in the Resource Directory.

Schedule of Materials: Storage Boxes

No.	Lett.	Item	Dimensions T W L	Material
4	A	Back & door pieces	¾" x 5½" x 22"	Pine
2	B	Back & front pieces	¾" x 1½" x 22"	Pine
2	C	End pieces	¾" x 5½" x 12¾"	Pine
4	D	End pieces	¾" x 3½" x 12¾"	Pine
4	E	Back & door battens	¾" x 1½" x 10"	Pine
4	F	End battens	¾" x 1½" x 12½"	Pine
2	G	Bottom ledgers	¾" x 1½" x 19"	Pine
1	H	Bottom	½" x 12½" x 20½"	Plywood

LATHE TOOL CABINET



Don't store your lathe tools in sawdust-covered boxes under your lathe. This cabinet keeps all your skews, gouges and calipers within easy reach.

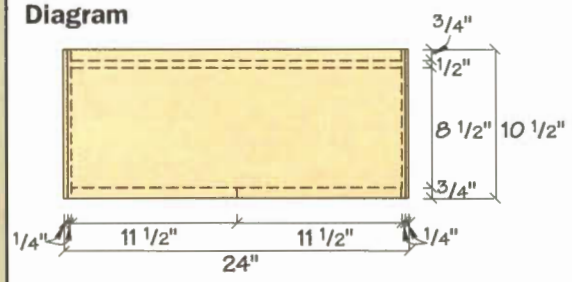
STEP ONE: Start by cutting the parts according to the Schedule of Materials. Cut a 1/2" x 1/4" deep groove in the top, bottom and sides for the back as shown in the diagram. Then cut a 1/2" x 1/4" deep rabbet in the top and bottom edge of both sides. Next cut a 1/2" x 1/4" deep dado in the sides for the horizontal divider, located as shown. Assemble the case, back and horizontal divider; then nail in the drawer divider.

STEP TWO: Apply birch veneer tape to the front edges of the case. Make the tool divider by drilling 1" holes in a piece of stock, then assemble the tool-rest parts and drawers according to the diagram. Attach the tool rest to the case with screws.

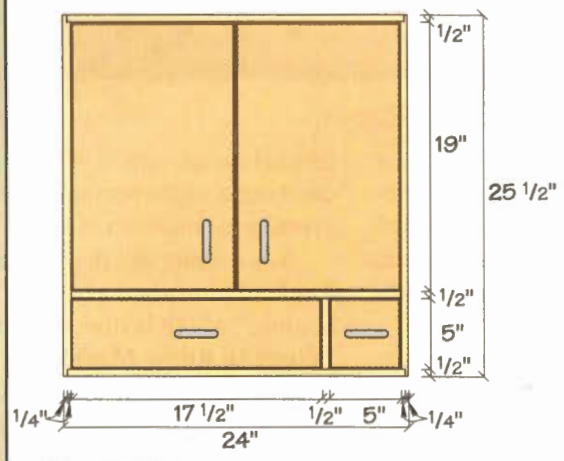
STEP THREE: Miter and attach the cockbeading to the doors and drawer fronts. Make the drawers, then attach the drawer fronts to the drawers. Hang the doors using butt hinges with the hinge barrels in-line with the cockbeading. Attach the pulls and disassemble the cabinet. Apply three coats of clear finish and you're ready to hang it on the wall and store your tools. **PW**

— Jim Stuard, PW staff

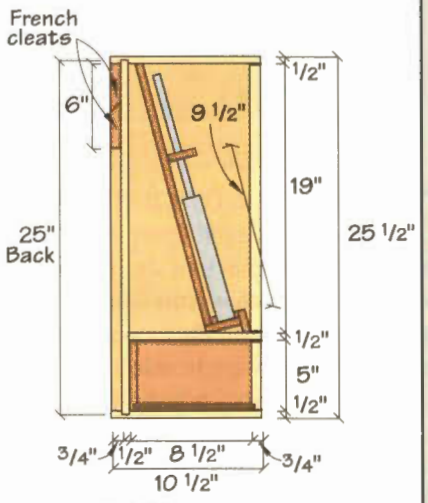
Diagram



Plan



Elevation



Profile

Are we on target?

To see more projects like this in future issues, circle "P11" on the postage-paid card in the Resource Directory.

Schedule of Materials: Lathe Tool Cabinet

No.	Item	Dimensions T W L	Material
2	Top & bottom	1/2" x 10 1/2" x 23 1/2"	Birch Ply
1	Horiz. divider	1/2" x 9 1/4" x 23 1/2"	Birch Ply
2	Sides	1/2" x 10 1/2" x 25 1/2"	Birch Ply
1	Back	1/2" x 23 1/2" x 25"	Birch Ply
2	Doors	3/4" x 11 1/4" x 18 3/4"	Birch Ply
1	Drawer front	3/4" x 4 3/4" x 4 3/4"	Birch Ply
1	Drawer front	3/4" x 4 3/4" x 17 1/4"	Birch Ply
4	Drawer sides	1/2" x 1 1/2" x 12"	Birch Ply
1	Drawer back	1/2" x 5" x 17 1/4"	Birch Ply
1	Drawer back	1/2" x 5" x 4 3/4"	Birch Ply
2	Drawer bottoms	1/4" x 4 1/2" x 9 1/4"	Birch Ply
2	Drawer bottoms	1/4" x 17 1/4" x 9 1/4"	Birch Ply
2	Tool dividers	2 1/2" x 2" x 23"	Birch Ply
1	Tool rest back	1/2" x 19 1/2" x 23"	Birch Ply
1	Tool rest base	1/2" x 2 1/2" x 23"	Birch Ply
1	Tool rest lip	1/2" x 1 3/4" x 23"	Birch Ply
2	French cleats	3/4" x 3 3/4" x 23"	Birch Ply
	Cockbeading	1/8" x 13/16" x 15'	Maple

Benjamin Seaton's TOOL CHEST

Our redesign of this historic tool chest brings it up to date for today's power tools.

THIS 18TH CENTURY ENGLISH TOOL CHEST is one of the more interesting mysteries in the history of woodworking. Unlike other tool chests of its day, this chest and its tools — which are now in the Guildhall Museum in Rochester, England — went virtually unused and are in the same condition as when they were new in 1796.

How did this chest survive? Why didn't Benjamin Seaton, the maker of the chest, ever use his tools? Was he planning to come to the New World to begin a cabinetmaking business? While historical records cannot fully answer these questions, they do tell an interesting tale of a would-be woodworker.

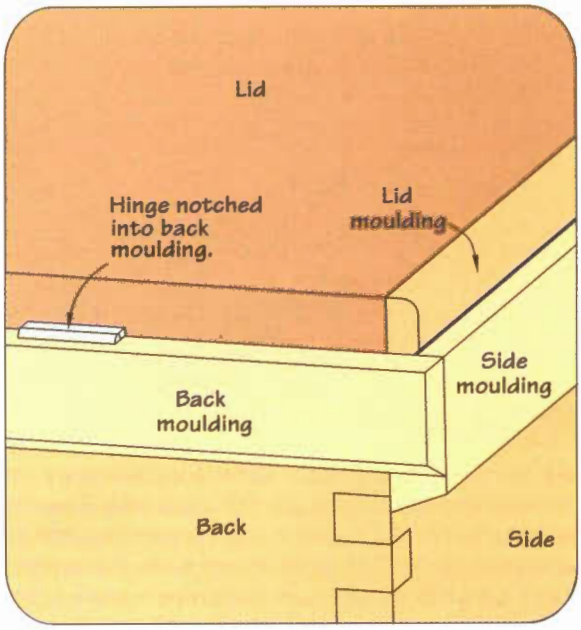
Benjamin was born in 1775, the son of a cabinetmaker and church elder. When Benjamin turned 21, his father bought him a complete and very expensive set of woodworking tools, and Benjamin began building this chest to house them on Jan. 1, 1797. He finished it April 15. Three months later, Benjamin made an inventory of the chest's contents (which survives to this day). The Guildhall Museum suggests that Benjamin was preparing to emigrate to America. However, Benjamin remained in Chatham and tended to his father's business after he died in 1811.

Benjamin died in 1830, and his will describes him as a cabinetmaker, upholsterer, auctioneer and undertaker. His chest remained in his family, with the tools intact, until it was given to the museum in 1910.

A few years ago the Tool and Trades History Society in England published a book, "The Tool Chest of Benjamin Seaton," which is now available in the United States (see **"Want to Know More?"** for information on ordering the book). After reading the book, I became convinced that this tool chest would be great for a set of 20th century tools — with a few modifications. So I built one. And it didn't take three-and-a-half months.

The large outer case holds many of my modern hand-held power tools: a jigsaw, drill, router, circular saw, random-orbit sander, belt sander and biscuit joiner (with room to spare). The removable case (called a till) with its lids and drawers holds just about every hand tool a well-equipped shop needs. If I wanted to go overseas and set up a cabinet shop, I could load the chest on a steamer and go. Instead, the large case now sits on the floor next to my bench, protecting my power tools until I need them. The till sits on top of my bench, keeping my hand tools at arm's length. It's a perfect system for a small shop that's low on both space and built-in cabinets.

Diagrams



Detail of back corner of case

Schedule of Materials: Seaton's Case

No.	Item	Dimensions T W L	Material
2	Sides	7/8" x 23 1/4" x 23 1/2"	Pine
2	Front & back	7/8" x 23 1/4" x 35 1/2"	Pine
1	Top	7/8" x 23 1/2" x 35 1/2"	Pine
1	Bottom	7/8" x 22 5/8" x 34 5/8"	Pine
2	Cleats	1 1/2" x 4 3/4" x 14 3/4"	Pine
2	Runners	1 1/4" x 3 1/16" x 21 3/4"	Pine
Bottom moulding		11' of 3/4" x 2 5/8" moulding	
Top moulding		11' of 7/8" x 2 1/2" moulding	
Lid moulding		11' of 1/2" x 1 3/8" moulding	

Schedule of Materials: Seaton's Tool Till

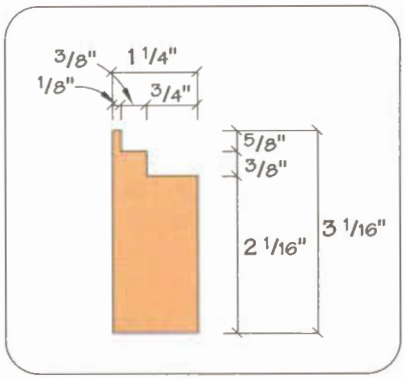
No.	Item	Dimensions T W L	Material
2	Sides	3/4" x 11" x 11"	Veneered pine
1	Back	3/4" x 11" x 32 3/4"	Veneered pine
1	Top	3/4" x 11" x 33 1/2"	Walnut
1	Bottom	3/4" x 10 5/8" x 32 3/4"	Pine
1	Front	3/4" x 2 1/2" x 32"	Veneered pine
3	Horz. dividers	3/8" x 10 5/8" x 32 3/4"	Pine
2	Vert. dividers, top	3/8" x 2 1/8" x 5"	Pine
2	Vert. dividers, mid	3/8" x 2 3/8" x 5"	Pine
2	Vert. dividers, bot	3/8" x 3 5/8" x 5"	Pine

NOTE: The Schedule of Materials for the drawers is in the PullOut Plans, as is the construction drawing for the tool till.

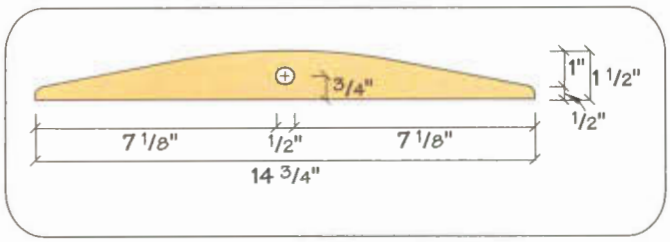
SUPPLIES: Lee Valley Tools 800-871-8158. Chest lock $10.95, item# 12K04.01 • Case hinges $20.25 a pair, item# 00D03.04 • Till hinges $17.50 a pair, item# 00D06.02 • Flush ring pull $12.50, item# 00L02.02

Are we on target?

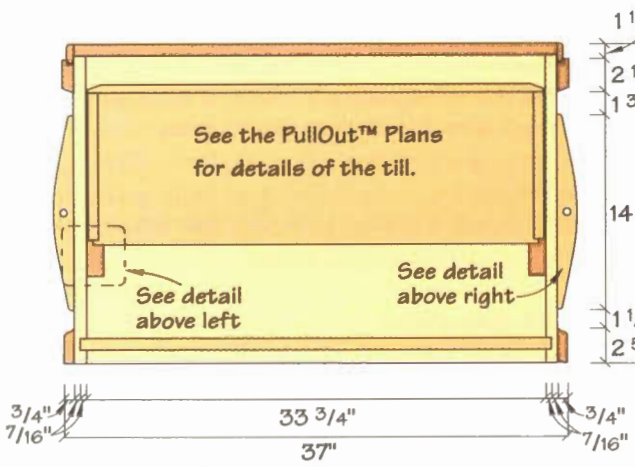
To see more projects like this in future issues, circle "P3" on the postage-paid card in the Resource Directory.



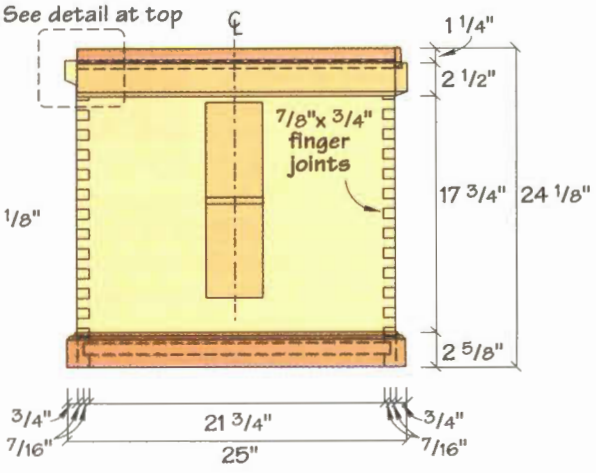
Detail of till runner



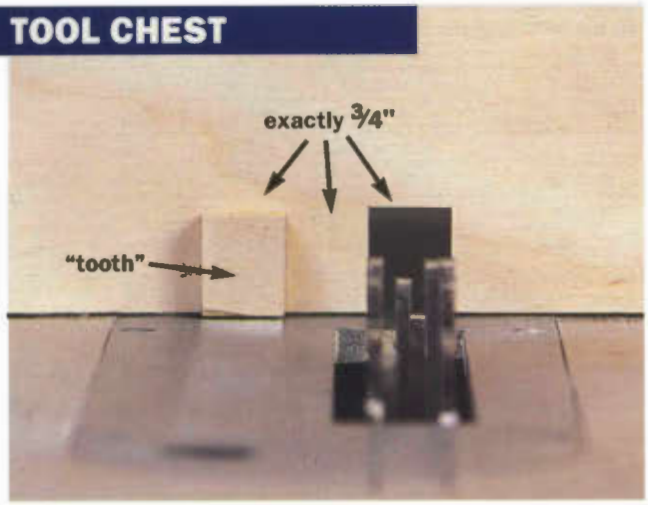
Detail of cleat



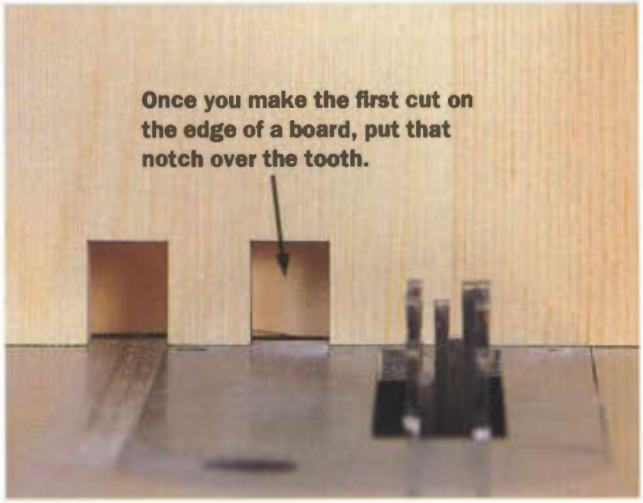
Elevation (Cut away to show detail)



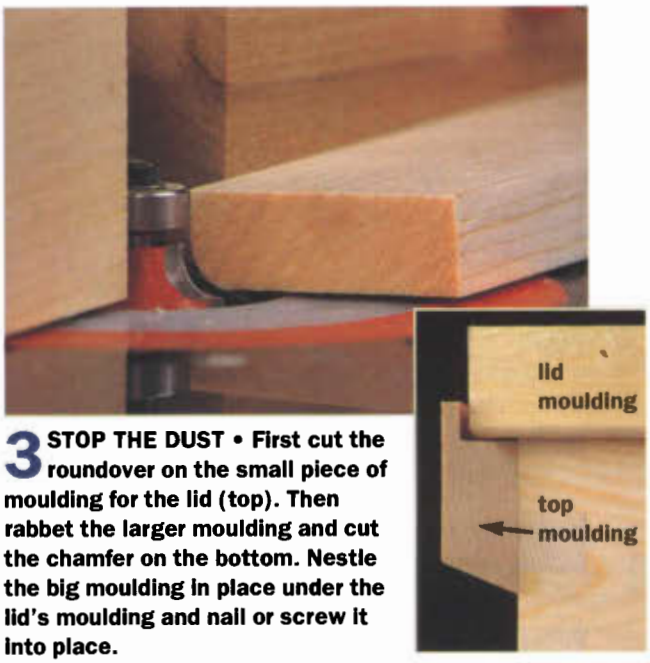
Profile



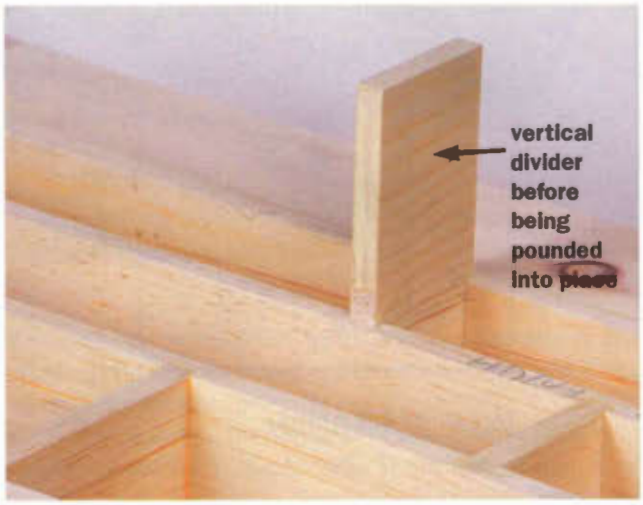
1 FINGER JOINT JIG • The trick to finger joints is to make sure the width of your dado stack is precisely the same as the space between the dado stack and the stop, which I'll call the "tooth" in this article. The tooth should also be exactly as wide as your dado stack. Begin by screwing a large piece of plywood (8" high; about 25" long) to your table saw's miter gauge. Set up your dado stack to the desired dimension and run your jig through the saw. Take the jig off the saw and attach the tooth to the jig with glue and screws. A good bond is essential.



2 CUT THE JOINTS • It might seem a little scary to hold 39" long boards on edge on your table saw. Feel free to clamp your work to the fence you screwed to your miter gauge, though this will slow you down a bit. If you proceed slowly and carefully — and your table saw's table is sufficiently waxed — you shouldn't have a problem. Once you cut the first space, pick the board up and place that space over the tooth in your jig. Then run the work through the saw again.



3 STOP THE DUST • First cut the roundover on the small piece of moulding for the lid (top). Then rabbet the larger moulding and cut the chamfer on the bottom. Nestle the big moulding in place under the lid's moulding and nail or screw it into place.



4 VERTICAL DIVIDERS • Add these after your till is assembled. Try to make the grain run up and down on these pieces to minimize the chances your case will break open when the wood begins to move. A little glue on the front ends of these dividers is all you need.

STEP 1 **Finger Joints** • Constructing the outer case is pretty simple. Finger joints join the four sides; the bottom is captured by a groove in all four sides. The moulding is nailed or screwed to the exterior. The lid has a small piece of moulding attached to it that acts as a dust seal.

Begin building the case by gluing up the 7/8"-thick panels for the sides, top and bottom (Benjamin was lucky enough to have some 24" wide pine boards and didn't have to glue up his sides). Now make the jig to cut your 3/4" x 7/8" deep finger joints. Take your time with the jig because a little precision and patience will result in joints that won't split or beg for putty.

STEP 2 **Cut Your Joints** • Now that the jig is built, it's time to cut the joints. The trick with finger joints is to get all of the "fingers" and "spaces" to line up and mate correctly. If one board begins with a finger, then its mate must begin with a space. To make a board that begins with a finger, place it on end on your table saw against the tooth on the jig and make your cut. To begin a board with a space, place a

5 MORTISE YOUR HINGES • Using a straight bit in a router or trimmer is a great way to cut the mortises for your hinges. You just have to be careful not to go over the edge you marked, which is an easy mistake to make. The easiest way to prevent this problem is to pare the edges with a chisel or a knife. When your bit gets near the pared edge it shears away, leaving a square edge.

spacer between the dado stack and tooth. I used some scrap finger joints that I ran as a test with this jig; these worked great. Then place your board on end against this spacer and run it through the saw. Remove the spacer and cut the remainder of the joints on that edge.

Now cut the 7/16" deep by 7/8" wide grooves in the sides that hold the bottom in place. The grooves should be 1" up from the bottom edge. You can stop these grooves before you cut into your finger joints and finish the grooves with a chisel. Or you can just run these grooves right through your joints — after all, they will be covered by the moulding on the outside of the case.

Assemble the case using glue on the finger joints. Allow the bottom to float in its groove. Clean off as much glue squeeze-out as you can. Clamp and allow your case to dry.

Begin making the moulding by routing a small ogee profile on the bottom moulding pieces. Miter the pieces, then attach them with nails or screws (Benjamin used screws that he recessed into the wood and then covered with putty).

STEP 3 Dust Seal • Dust and grime has never been good for tools, and 18th century cabinetmakers went to extreme lengths to keep their tools separated from dirt. Benjamin used a simple but effective seal. Begin making the seal by cutting the lid to size and mortising the hinges into the case and lid.

Now rout a 1/4" roundover on the three pieces of moulding for the lid. Miter and nail this moulding to the front and sides of the lid.

The second piece of moulding adds another layer of protection. Begin by cutting a 9/16" by 1/2" rabbet into one edge of the moulding. You also could use a roundnose bit in a router to cut a profile that will nest with the roundover on the lid's moulding. Next cut a 25-degree bevel on the bottom of the four pieces of moulding. Miter three pieces of moulding and nail or screw them to the front and sides of the case.

WOOD´WORDS (wood´wurds) n.

Swage: Swaging your hinges is done by compressing the two leaves, eliminating the space between them, usually by putting the hinge in a metal vise.

Ogee moulding: Any moulding that has a serpentine — or S-shaped — profile.

Gel stain: A stain that has the consistency of peanut butter. On woods that tend to blotch, such as pine, gel stains are great because they aren't absorbed into the wood as much as regular stain.

Do not miter the back edges of the moulding that goes on the sides. Cut these flush with the case. Now make the moulding for the back. This moulding is different because it helps seal the back of the case and acts as a stop for the lid. It's pretty ingenious. Take a piece of moulding back to the table saw and rip off the rabbet. Now attach this moulding to the back, flush to the top edge of the case. You'll have to cut notches in the moulding for the barrels of the three hinges that hold the lid. Screw and glue this moulding to the back.

Now cut the cleats for the sides that hold the rope handles. Use a band saw to cut them to rough shape and sand them down. Then drill a 1/2" hole through the center for the rope. Attach the cleats with screws.

If you want to add a lock to your chest, now is the best time. I used a small full-mortise chest lock. You can now add the dividers for your power tools at the bottom of the case. Fill all your screw holes with water putty and finish sand the exterior of the case to 120 grit. Paint the exterior blue. Now it's time to turn your attention to the till.

STEP 4 Build the Till • The till is a box that's divided into four "stories" by wide 3/8"-thick pine boards that are dadoed into the back and sides. You access the top level by opening the lid of the box. The bottom three levels are for nine drawers. I wanted my till to weigh as little as possible, so I made the case from pine veneered with walnut (have lots of clamps). The top is solid walnut; the bottom is plain pine.

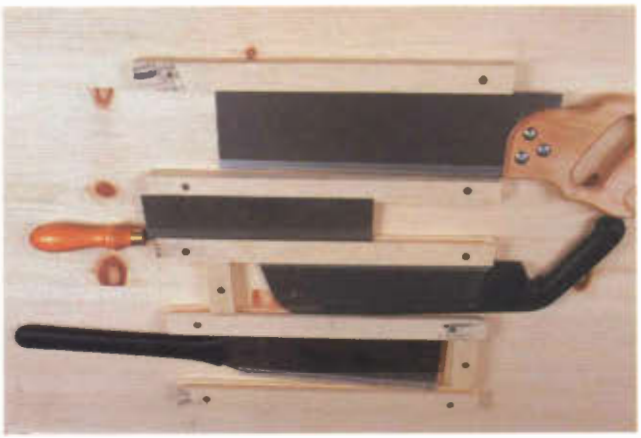
Begin building the till by cutting the boards to size and then cutting 3/8" x 3/4" rabbets in the sides for the back. Now cut 3/8" x 3/8" rabbets in the sides and back to capture the 3/4" bottom. The bottom sticks out of the case 3/8", which allows the till to slide on runners in the large case.

Now cut the 3/8" x 3/8" grooves in the sides for the three horizontal dividers in locations shown in the PullOut™ Plans. Then cut the 3/16" x 3/8" grooves for the six vertical dividers that separate the drawers.

Dry assemble the case. When everything fits, assemble the till with nails and glue. Attach the vertical dividers last. Use only nails when attaching the horizontal dividers to allow for wood movement. Attach the vertical dividers with a little glue and a dead blow mallet.

Now, using nails and glue, attach the front piece at the top that encloses the top tool area. Cut your top to finished size and cut a detail on the top edge to soften the look. I routed a

6 RUNNERS • When your runners are finished they should look like three steps. The top step is 1/8" thick and 5/8" high. The second step is 3/8" thick and 3/8" high. The third step is the remainder of the board. See the diagram for all the dimensions for the runners.



7 SAW HOLDER • Make sure when you set up your strips that you position your saws with the teeth facing up. This prevents them from getting damaged when you open the lid.

3/8" deep by 1" chamfer on all four edges. A table saw also would do this job nicely. Finally, I mortised a flush ring-pull into the lid to make opening the lid easier.

STEP 5 **Till Details** • Swage your hinges and then mortise them into the till and the lid. Then start dividing up the top tool area for the hand tools that you reach for most often. I made a rack for my chisels and cubbyholes for my small planes. Finally, I built two holders that flip up. One holds my drill bits, the other holds my screwdrivers and a marking gauge.

If you've veneered your case, now is the time to add a piece of veneer to the front piece and to cover all the other pine edges that show. I used walnut veneer tape for all the dividers. This tape costs about $3 for an 8' length. After you've veneered the entire till, fill your nail holes with putty and sand the case.

Now cut your drawers. Mark all your pieces because you'll have 40 pieces to keep track of. The nine drawers are all assembled in the same manner. On the 3/4" thick drawer fronts, cut a 3/8" x 3/8" rabbet on each end. On the 3/8" thick sides, cut a 3/16" deep by 3/8" wide dado for the back. Then cut a 3/16" deep by 3/8" wide groove in the front and sides for the bottom. Sand your pieces and then assemble the drawers with nails and glue. Fit your drawers into the till. Finish sand everything and cover the till with two coats of clear finish. Add a chain to the lid to prevent it from opening too far.

Want to Know More?

If you like old tools, you'll enjoy reading "The Tool Chest of Benjamin Seaton," which is published by the Tool and Trades History Society. The book gives a brief overview of the Seaton family and then delves quickly into the chest's 200 fascinating tools. The book is available in this country through Astragal Press, 973-543-3045 in Mendham, N.J., for $14.95.

STEP 6 **Build the Runners** • The till rests on runners screwed into the inside of the large case. These runners are made by using your table saw to cut two rabbets in 1 1/4" pine. Screw the runners to the inside of the case. Make sure that you leave a couple inches of space above the top of the till to allow room for the saw holder.

STEP 7 **Saw Holder** • Make the saw holder by screwing strips of 1" thick pine to the lid of the large case. Position the strips for your own set of saws. You might want to cut rabbets or dadoes in the strips depending on your particular saws. I made the front face of the saw holder from pine and leftover walnut veneer. After cutting the panel to size, cut a 1/2" x 1/2" rabbet on all four edges. Miter and glue four strips of maple into the rabbet.

Screw the front face to the strips and cover the screw heads with caps. I cut my own diamond-shaped caps from some scrap maple. Stain the interior of the large case and lid. I wanted to make the inside look old and weathered. So I first put down a coat of walnut oil stain and allowed that to dry. Then I applied a cherry gel stain. Finally, I covered the interior and saw holder with two coats of clear finish, sanding lightly between the coats.

Even though the tool chest is made almost entirely of pine, it weighs quite a bit. In fact, when the chest is fully loaded, it takes two strong backs to move it. And after lugging it around it made me think that maybe this is the reason Benjamin Seaton decided to stay in England.

One side note about this tool chest. Even though Benjamin never made it to the New World, his tool chest made the trip a few years ago. Colonial Williamsburg, Va., displayed his chest for two years as part of its exhibition that was named — somewhat ironically — "Working Wood in 18th-Century America." **PW**

—Christopher Schwarz, PW staff

PRIZE-WINNING

Sleigh Bed

This heirloom project is surprisingly easy to build with a unique clamping fixture.

Photo by Orlando Diaz/futons courtesy of The Natural Bedroom

SOMETIMES you get an idea for a piece that so intrigues you, you just have to build it — even though, when you start, you may have no idea how you're going to complete the project. My bride-to-be wanted a sleigh bed with spindles across the top of both the headboard and footboard that curved outward. I figured the spindles could be bandsawn from a plank and rounded over with a router, but how in the heck would I clamp the assembly? Those spindles would require pressure in two different directions, and there were so many of them. How would I keep them all lined up?

The best-laid plans

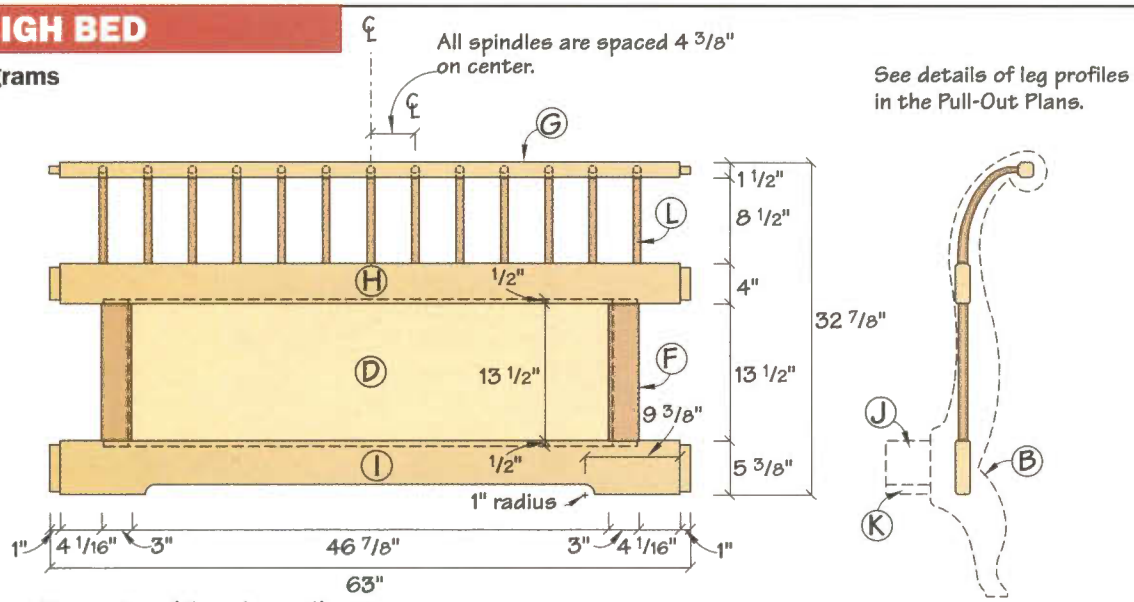
The first step in designing the bed was to determine the mattress height from the floor. Standard height to the top of a mattress is between 24" and 27". With that in mind I then estimated the thickness of a mattress and box spring combination and counted down from there to position the bed rails. The box spring, I decided, would sit on slats that rested on a ledger along the bottom of the rails.

I sketched the headboard legs on a piece of graph paper, making the portion below the rails somewhat animal-like. Next I curved the upper portion inward, then flared it outward and ended it with a violin-like scroll. I shaped this S-curve as dramatically as possible, while containing the straight rail-and-panel section within its sweep. From this section the spindles would arch upward and outward. They ended at a top rail that was set at 90 degrees to the rail from which they began.

I made the legs for the footboard similar but shorter, and therefore a bit thicker at the neck. I recommend making the legs from 8"-wide stock and gluing on a small block to provide the material you need for the knob on the end. Try to match the color and grain at this joint so it won't be glaringly obvious.

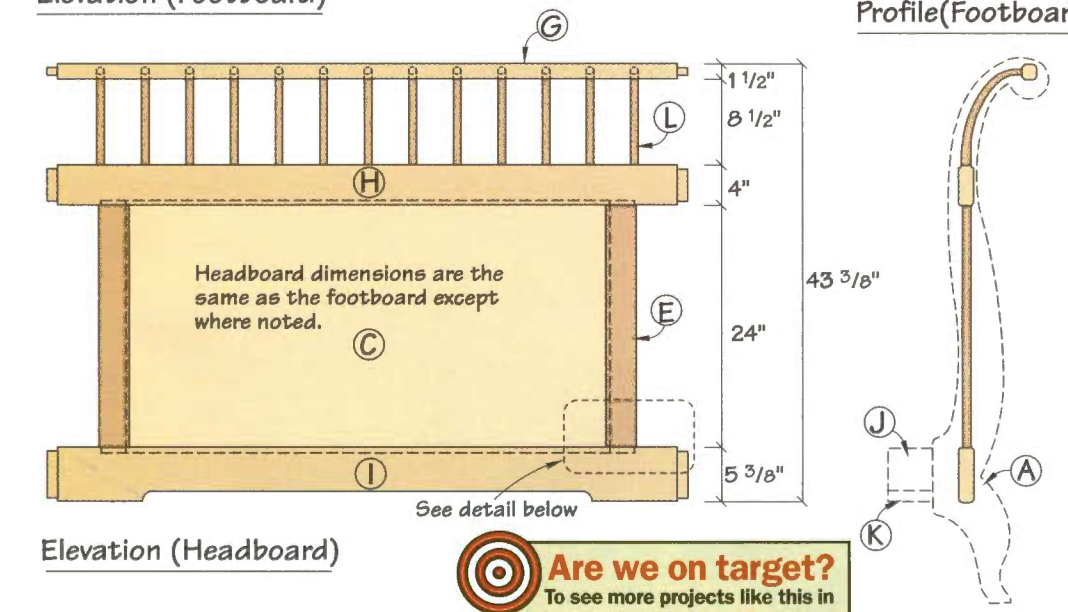
SLEIGH BED

Diagrams



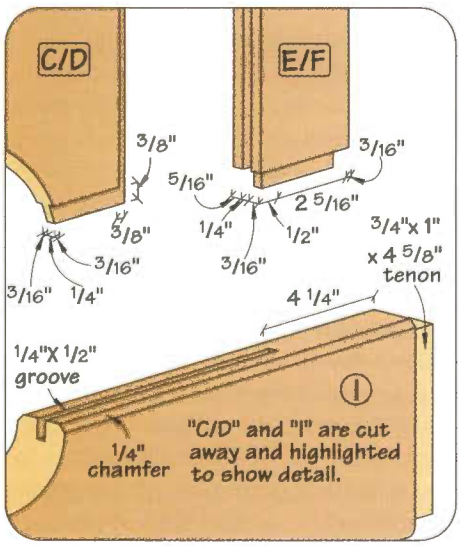
Elevation (Footboard)

Profile(Footboard)



Elevation (Headboard)

Profile(Headboard)



End assembly detail

Are we on target?

To see more projects like this in future issues, circle "P4" on the postage-paid card in the Resource Directory.

Schedule of Materials: Sleigh Bed

No.	Letter	Item	Dimensions T W L	Material
2	A	Headboard legs	1½" x 8" x 54"	Walnut
2	B	Footboard legs	1½" x 8" x 44"	Walnut
1	C	Headboard panel	⅝" x 24¾" x 47⅝"	Alder
1	D	Footboard panel	⅝" x 14¼" x 47⅝"	Alder
2	E	Headboard stiles	⅞" x 3" x 25"	Walnut
2	F	Footboard stiles	⅞" x 3" x 14½"	Walnut
2	G	Top rails	1½" x 1½" x 63"	Walnut
2	H	Center rails	1½" x 4" x 63"	Walnut
2	I	Bottom rails	1½" x 5⅜" x 63"	Walnut
2	J	Mattress support rails	1½" x 5⅜" x 77"	Walnut
2	K	Ledger strips	¾" x ¾" x 77"	Walnut
28	L	Spindle blanks	¾" x 4" x 14"	Alder
20	M	Slats	¾" x 2⅜" x 60⅞"	Hardwood
3	N	Ribs	1½" x 2½" x 79¾"	Hardwood

Bed rail fasteners (#125-062, $10 a package) from Woodworker's Supply, 800-645-9292.

1 CUT THE TONGUE • Attach a sacrificial fence to the existing rip fence and position the blade next to the fence. Cut 1/2"-thick, 1/2"-long tenons on the stiles, then reset the saw to form 3/8"-long tenons on all the panels.

2 MORTISES FOR THE DOWELS • A drill press is the best tool for making straight holes for the dowels. With the size of the rails involved here, a set of roller stands helps a great deal.

Stack the two headboard legs together and the two footboard legs together with double-sided carpet tape in between. Enlarge the patterns for these parts from the PullOut™ Plans, and chalk them onto the leg blanks. Cut out each pair simultaneously, then use a drum sander and disk sander to refine the shape while the pairs are still together.

STEP 1 **Frames and Panels** • Aside from the spindles, the head and foot of the bed are relatively standard frame-and-panel assemblies. I resawed some 1 1/2"-thick planks of spalted alder then planed them to thickness, creating book-matched panels. After gluing, sand the panels and then cut the tongues on the panels by setting up a 1/2" dado in the table saw adjusted to a height of 3/16".

If it's uncomfortable to cut tenons on the longer rail pieces on your table saw, a dado assembly on a radial arm saw may be better. Cut the tenons to the sizes shown in the diagrams on all the rail ends.

Next lay out and cut the two mortises on the bottom edges of the center rails and the top edges of the bottom rails. Position the mortises to locate the edge of the interior stiles 3 7/8" from the shoulders of the rails, placing them directly underneath where the spindles will start.

I used a 1/4" straight bit in a table-mounted router to cut the grooves for the panels in the stiles and rails. First set the bit to make a 1/2"-deep cut and clamp a tall fence to the router table to center the cut in the thickness of the stiles.

Then reposition the fence to center the groove in the rails, and make these cuts by plunging the mortise down over the bit and moving the workpiece along the fence until you feel it reach the mortise for the stile.

Test fit these two frame-and-panel assemblies and make any necessary adjustments.

Don't assemble them yet, though; there's still more work to do on the rails. Besides, it will be easier to clamp the spindle assembly if you don't have the panel in place. At this point, it's a good idea to finish sand the panels and apply your finish. I used two coats of Watco (natural) oil, applied 24 hours apart, followed with Johnson's paste wax a day later.

Spindle Fixture

Cut a two-by-six the length of the rails (including the tenons). Then with the blade set to 45 degrees, position the fence to rip the board so the blade comes through the center of the top face. Make the cut, then glue the smaller piece to the wider piece to create a 3"-thick timber with a 45-degree angle.

Next set up the radial arm saw with a 3/4" dado stack, approximately 1" off the table. With the angled side of the timber facing the saw, position the timber next to the blade and pull the saw forward to the point where the blade just reaches the back side of the timber. Tighten the carriage lock, then use a large hand screw clamped to the arm to stop the travel of the carriage at this point.

Next mark the first channel on the timber starting 4 7/8" from the end. The 3/4" channels are spaced 3 5/8" apart, and rather than lay out all the in-between spaces, tack a piece of 3/4" scrap to the fence 3 5/8" from the blade's edge. This scrap extends out to the slope of the timber and acts as a stylus to reference the previous cut. The curve of the blade carves out a channel that, while not entirely matching the curve of the spindles, comes close enough to provide the necessary support.

After the channels are cut, glue and screw the timber to a plywood base. Dry-assemble some spindles into a center rail and lay this assembly in the fixture to determine where to position the timber for the best support.

Make the ends of the clamping fixture using a 16" x 12" piece of 3/4" plywood cut diagonally as shown, and glue and screw them in place. The last step is to attach a 3/4" x 2" x 64 1/2" piece to the front of the fixture.

3 QUICK DETAIL • Measuring in 9 3/8" from the shoulders, use a sabre saw to cut a 1" radius from that point, then cut in a few inches, 1" up from the bottom edge. Then set the table saw fence to 4 3/8" and bring the running blade up into the piece to complete the cut.

4 DETAILS SOFTEN THE LOOK • A chamfer-cut on one of the bottom rails is only one of the simple router details that help soften the overall look of the piece.

STEP 2 **Dowels Secure the Spindles** • The next step in preparing the rails is to mark the locations of the dowels that will secure the spindles to the center rail. Mark the center of both center rails and the "back" edge of each top rail, then clamp them together as a unit with the marked surfaces up. Now lay out the dowel hole centers in 4 3/8" increments in either direction from the center of the rails. This will give you 3 5/8" spacing between the spindles and 3 7/8" at each end. Drill the holes 1 1/4" deep.

STEP 3 **Lighten the Look** • Because the bottom rails and the mattress support rails meet perpendicular to each other at the legs, I designed them to be the same width. However, when I dry-assembled the frame I felt that the bottom rails looked too massive and blocky. To lighten the rail design I decided to remove an inch of material in the middle, but keep the same width where they joined the legs.

STEP 4 **Another Design Change** • All that remains on the rails is to rout the decorative edge treatments. While you're at it, rout the same detail on the side support rails. I chose a 3/8"-radius on the outside bottom edge of the support rails, both bottom edges of each bottom rail and the "front" edges of the top rails. The remaining three edges of the support rails got 3/16" roundovers. Both top edges of the bottom rails and both bottom edges of the center rails were chamfered, as were the outer edges of the stiles. I used a 1/4" cove detail on the top edges of the center rails and the "back" edges of the top rails.

The final touch on the side support rails was to chop a shallow mortise centered on each end for the bed rail fasteners. I then cut the ledger strips to size, and glued and screwed them in place. At this point I was reporting to "My Intended" about the project's progress when she said, "You know, I really prefer sleeping on a futon instead of a box spring and mattress." She then went on to tell me about the health benefits of sleeping on all-natural materials. As I listened, I considered the pawn-shop value of her engagement ring, recalling that the support rail height, indeed the very shape of the legs, was based on using a mattress and box spring.

"No problem," I replied.

I'm happy to report that the bed works just fine with a ledger strip attached 1" from the top edge of the support rails; with the right futon in place, it's nearly the planned mattress height. So you have the option of using either kind of bedding.

STEP 5&6 **Starting the Spindles** • To create a template for the spindles, transfer the pattern in the PullOut Plans onto a piece of 1/4" plywood, then use this template to lay out the spindle shape on 3/4" stock, being careful to orient the grain to provide the most strength.

I cut out 28 (two extra) spindle blanks on the band saw, staying fairly close to the line, then sanded to the finished shape. I carefully sanded the bottom ends straight, but left the tops a bit long so I could trim them precisely at 90 degrees, I then drilled holes for the dowels in the ends.

STEP 7 **Shape the Spindles** • I had been thinking that I'd shape the spindles' edges with a router, so I mounted a 1/4" roundover bit in the router table to try it. Unfortunately, I couldn't keep from gouging out huge chunks from the spindle blanks — especially at the top ends. After wasting my two spare pieces, I concluded this method wasn't going to work. My spindles were going to have to be shaped with a spokeshave.

When done, I glued in dowels that I had shortened on the disk sander. To finish the spindles, I drilled holes in a scrap two-by-six and stuck the spindles in upright.

Now I had to figure out how the heck I was going to clamp those puppies. I'd thought about it, dreamed about it for weeks, and now it was time to try it out. I needed a fixture that would secure the center rail, cradle the spindles, and direct the pressure applied to the top rail into two different directions. The accompanying story, **"Spindle Fixture,"** shows what I built.

To use the fixture, place a center rail upright in the front and put glue in all the holes. I bought a set of dowel pin glue spreaders especially for this task (available from the Hartville Tool catalog, 800-345-2396). It's a set of glue-bottle nozzles sized to apply an even amount of glue to the sides of dowel holes, and it

5 A QUICK JIG • To trim the spindle blanks, trace the fixture pattern from the PullOut Plans onto ¾" plywood. Use a band saw to cut to the line, then clamp it in place on the radial arm saw with the top edge against the fence and the left edge snug against the right side of the blade. With a modification, the fixture proves helpful in drilling the dowel holes at each end of the spindles.

6 HOLES IN THE ENDS • Use the same jig to make the dowel holes in the spindles by screwing another scrap of plywood to the back to create a cradle for the blank. Center a doweling jig over the end of the spindle and screw a stop to the fixture to reposition the doweling jig precisely. Drill all 26 holes. To drill the other ends, unscrew the stop and cut off the end of the fixture. Then screw on a stop to contain the top end of the spindle and another stop to position the doweling jig; then drill 'em all again.

7 A LITTLE HAND WORK • A sharp spokeshave did the trick. I really liked the results of this approach because I was able to make the spindles completely round, instead of just rounding over the corners. The look makes the time-consuming process definitely worthwhile.

8 FOR THE FASTENERS • Once the rail mortises were cut, I flipped the leg over in the vise and cut a shallow mortise in the flat area on the back to accept the bed rail fasteners. Repeat this step on all the legs.

made this assembly job fast and stress-free. Fit the spindles in place, pushing them down all the way into their holes, then lay the assembly down in the fixture and position the spindles in the channels. Secure the rail at the front of the fixture with a couple of hand screws. Next, put glue in the holes in the top rail and fit it down over the dowels in the other ends of the spindles. The plywood ends of the fixture will align the two rails. All that's left is to lay a board over the top rail and apply a few bar clamps. After a few hours, you can put together the other rail and spindle assembly. Then it's an easy task to add the panels, stiles and bottom rails to these completed assemblies.

STEP 8 **Carved Legs** • After shaping all the spindles by hand, it seemed imperative that I also carve the legs instead of just rounding them over with a router. I waited until this point to shape the legs because I wanted to lay out the mortises from the frame-and-panel-and-spindle subassemblies, and I didn't want to accidentally carve away material from where the rail shoulders would meet the legs.

Dry-fit the legs to the subassemblies, and trace around the shoulders of the rails. Now sharpen the spokeshave again and start shaping the legs; just be sure to leave the areas flat where the rail shoulders will join.

When you're done carving and sanding, assemble the headboard and footboard. Oil and wax, and wax, and wax. But wait — you can't go to sleep yet. If you're going to use a box spring, you need to cut four or five one-by-sixes to fit between the support rails, resting on the ledger strips. If you want to use a futon, you'll need to make a more elaborate support platform. I used hardwood slats spaced 1⅜" apart, then made half-lap cuts in the slats in three places for support ribs. Glue and screw this assembly together, and you're ready for nap time. Go ahead, take a snooze. You've earned it. **PW**

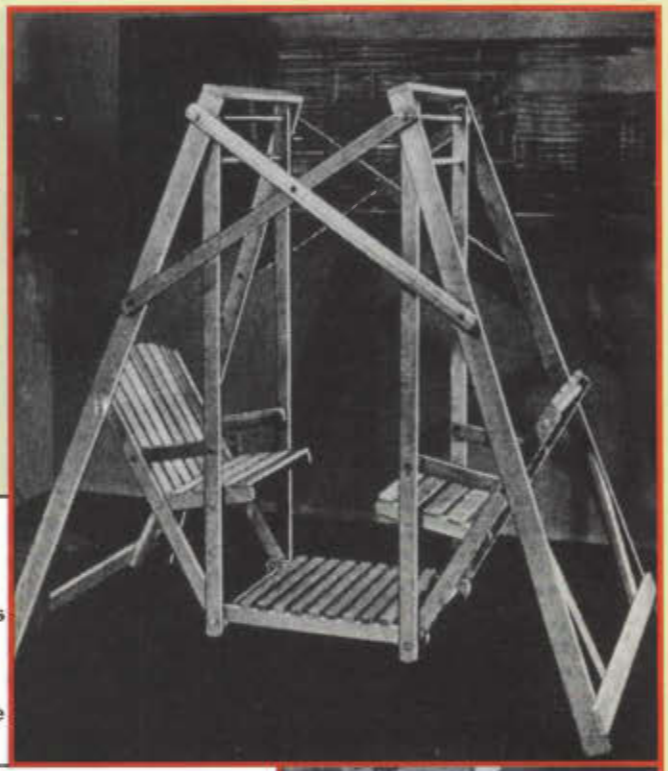
David Camp, a former editor of Popular Woodworking, *builds custom furniture at his shop in La Cienega, New Mexico. This sleigh bed won him the Grand Award at the 1995 New Mexico Woodworker's Exhibition.*

PROJECTS FROM THE PAST

CHILD-SIZED

GLIDER SWING

This two-seated glider swing is sized for children (but could be scaled up) and is pretty simple to build. Use an outdoor wood such as white oak. Assemble the seats separately and then attach them to the frame. **PW**



The Deltagram

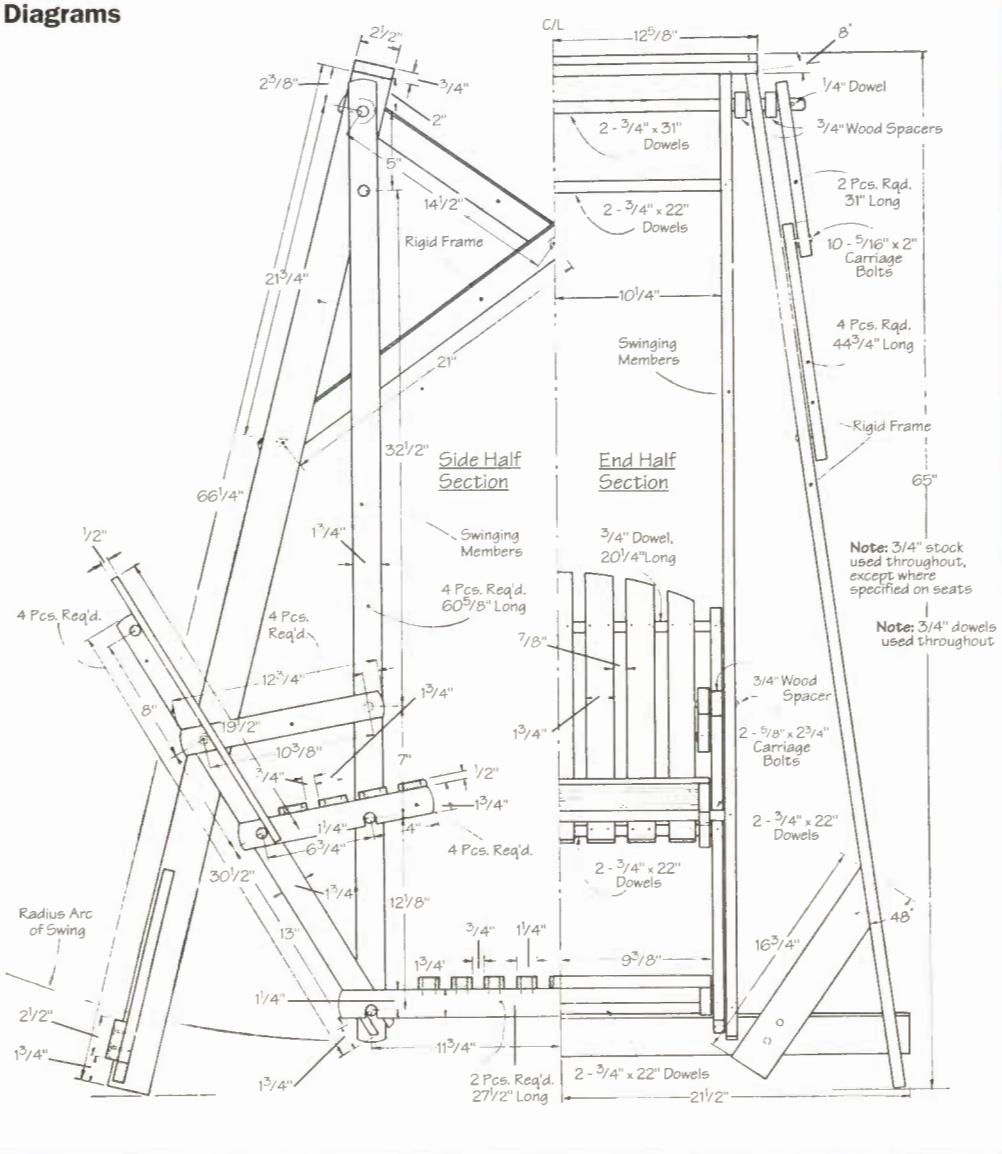
Vol. 16, Issue 2
1946-1947

Earlier this century, Delta Machinery published a magazine filled with woodworking plans. These magazines are more than nostalgia — the plans are darn good! In the interest of history, we're happy to offer this project from yesteryear.

Are we on target?

To see more projects like this in future issues, circle "P1" on the postage-paid card in the Resource Directory.

Diagrams



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This one will handle just about anything you've got to joint. The Delta DJ-30 12" Jointer (Models 37-360/1) stands ready to take on a whole tree if you've got one.

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Sharpening for Dullards

If you don't use chisels or planes because you can't get good results, this is the article for you.

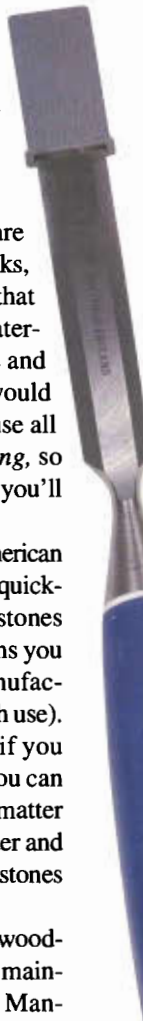
MOST WOODWORKERS own some sort of plane. And for many people this tool generates fits of cussing, spitting and moaning instead of what it's supposed to make: beautiful shavings. You run the plane over your board and the wood looks like leftovers from a gator's lunch. So you put the plane on your shelf and vow to never use it again.

Most likely the problem is that your blade is dull. So the plane will, at best, chew up your work. And the blade is dull because you never learned to sharpen it correctly. And you never learned to sharpen it because you don't use the plane. Because it chews up your work.

You get the point.

Don't worry, you're not alone. There are thousands — perhaps millions — of skilled woodworkers out there who never use a chisel or a plane because they've never learned to sharpen the tools. Sharpening takes practice (your first efforts will likely feel like failure) but the rewards are substantial. Sharp chisels can cut a few mortises faster than you can set up your plunge router. A sharp plane can quickly level joints and save you untold hours of sanding. And once you get the hang of it, sharpening can actually be enjoyable.

So where do you begin? If you've never picked up a sharpening stone, then you need to first decide what sort of sharpening system will work for your budget. Then you should go buy a cheap $3 chisel at a hardware store and practice a few times on an edge that you won't be afraid to mess up. Finally, put your skills to the test on a real set of chisels or plane irons.



Which stone to buy?

First you need to choose a sharpening system. There are some real strange methods to get an edge (using sidewalks, sandpaper and even stranger ways), but it's fair to say that today there are three dominant sharpening systems: waterstones, oilstones and diamond stones. Each has its ups and downs, and all seem to have fanatical followers who would sooner die than sharpen using a different system. We use all three systems here in our shop at *Popular Woodworking*, so we can tell you that no matter which system you choose, you'll be OK.

Man-made waterstones have become popular with American woodworkers in the last couple decades because they cut quickly and aren't terribly expensive. The downside to waterstones is that they wear much faster than oilstones, which means you have to spend a lot of time flattening them (some manufacturers recommend you flatten your waterstones after each use). Plus they are messy. You have to store them in water if you want them to be ready to use at a moment's notice (or you can soak them for 15 minutes before you sharpen). And no matter how careful you are, you are going to get puddles of water and slurry on your bench. And if your shop isn't heated, your stones will disintegrate if the water they're in freezes.

For years oilstones were the choice of the American woodworker. They wear slowly, so they don't require much maintenance, and they cut fast enough to get the job done. Man-made oilstones are inexpensive, though the hard stones used for honing can be pricey. The downside is that oilstones don't

WOOD´WORDS (wood´wurds) n.

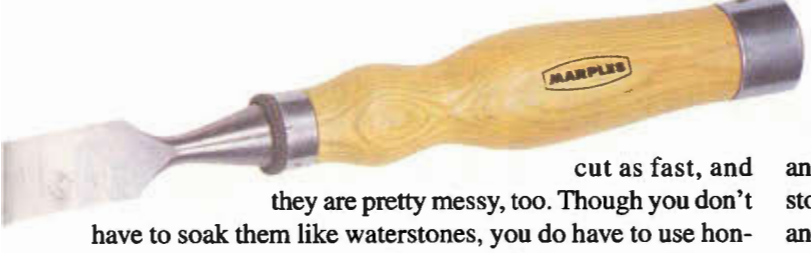
Primary bevel: The large triangular end of a cutting tool. You form this by grinding with a coarse stone.

Secondary bevel: The small tip of a cutting tool that has been honed to a razor sharpness.

Wire edge: After you hone the secondary bevel, this is a tiny nib of metal on the end of the cutting edge. It is removed by polishing.

Temper: This is the hardness of the steel. Heating steel will cause it to lose its hardness and become too soft to sharpen effectively.

Honing compound: An abrasive material (usually a powder or clay-like substance) used in polishing.



cut as fast, and they are pretty messy, too. Though you don't have to soak them like waterstones, you do have to use honing oil or mineral oil as a lubricant while sharpening. Plus, as waterstones have become more popular, oilstones have become harder to find in the catalogs and specialty woodworking stores.

Diamond stones are the new kids on the block. These use a man-made diamond that's fused to a metal plate to create an abrasive surface. In the last five years, diamond-stone manufacturers have introduced finer grits that make them great for honing woodworking tools. The nice things about diamond stones are that they are super-aggressive and that there isn't much maintenance. After you're done sharpening, just clean them off with water and a rag, and that will keep the slurry from clogging up the abrasive surface. (If the stuff does get caked on, you can remove it with a brush and mild household cleaner.) Another advantage to diamond stones is they don't ever need to be flattened like waterstones and oilstones do. The downside is that diamond stones are more expensive than the other systems discussed here.

Once you choose a system, it's time to try to make a cutting edge on a cheap chisel.

Look sharp

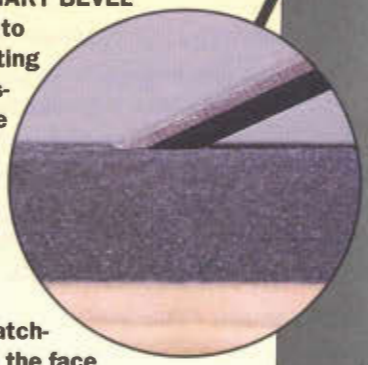
Many sharpening gurus recommend that beginners use a honing guide when learning to sharpen (see our accompanying story on the topic). We think you'll get good results faster if you do buy one, but it's definitely an added expense ($13 to $30).

The first step is to flatten the back of your blade. This is easy and has to be done only once. Rub the back on your coarsest stone until the back is scratched evenly. This might take a while, but it's hard to mess up. Clean the blade with a rag.

The Four Steps to a Good Cutting Edge

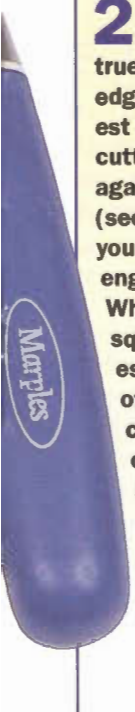
1 FLATTEN THE BACK • You're not going to be able to cut very straight if the back of your blade is crooked. You will probably only have to do this once for each tool you buy. Rub the back of the chisel or plane iron against your coarsest stone until the back is reasonably flat. You'll know you're there when the scratches on the back are uniform.

3 MAKE THE SECONDARY BEVEL • Adjust your chisel or plane iron so only a small amount of the tip of the blade contacts your sharpening stones. Do this by raising the rear of your blade 1 or 2 degrees. Now rub your blade against your smoother stones. Rub it about six times, then turn the tool over and rub the back against the stone once. You'll feel a small burr begin to form on the edge. The more you repeat this process, the smaller the burr becomes. Switch to your finest grit stone and repeat this process.



2 MAKE THE PRIMARY BEVEL • Next you need to true up the main cutting edge. Use your coarsest stone and rub the cutting edge flat against the stone (see photo). Check your work with an engineer's square. When your tip is square and the scratches are even across the face of the cutting edge, you're done. You can also do this operation much faster on a grinder. Your edge is now sharp. Some people stop here, but a few more minutes of work will make your tool razor sharp. So go to step three.

4 POLISH • This step removes the tiny burr you've been grinding on the edge and gives your blade a mirror sharpness. Apply a small amount of honing compound to your strop. Using the same angle you used for honing the secondary bevel, start the blade at the far end of the strop and pull the blade toward you. Repeat. Do not push the blade forward because the sharp edge will gouge the leather in the strop. Clean off the blade and try cutting some wood. We think you'll be amazed.



Now it's time to grind your primary bevel. Your tool is already ground at a certain angle, but this may or may not be the right angle for that particular tool. As a general rule, your garden-variety chisels and plane irons should be ground at a 25- or 30-degree angle. Mortising chisels should be ground at 35 degrees. Check the angle of your bevel and set your honing guide (if you are going to grind on a bench stone) for that angle (the instructions for the honing guide will tell you how). If you are using a bench grinder or belt sander for grinding, you'll need to set that tool's guide appropriately. This step takes off a lot of metal, so it can take a while. After a minute of rubbing the blade back and forth on the stone, check your edge to make sure it's square. If you are using a bench grinder, make sure you go slowly so you don't heat up the edge to the point where it changes color and loses its temper. Never cool a blade by dipping it in water.

Grinding is a pain. Luckily you don't have to do it every time you sharpen your blade. Unless you've nicked the blade, after you've ground this primary bevel, you can just touch up the secondary bevel to renew the edge for a good long time.

The secondary bevel is easy. First raise the back of the blade up 1 or 2 degrees so only the tip contacts your stone (see the photo in the chart to see what this looks like). Now rub the blade back and forth on one of your medium-grit stones. Check to make sure you are cutting a uniformly shaped bevel — about 1/16" wide. After six or seven passes, feel the blade with your fingernail (you'll cut your fingertip). You'll find that you've made a small burr on the back of the edge. Now rub the back of

Are Honing Guides for You?

Most veteran sharpeners will tell you that honing guides are for wussies — the training wheels of the woodworking world. That may be so, but if you're a beginning sharpener, there isn't an easier way to get consistent results than to use one of these honing guides.

That's because one of the hardest things to learn when you're beginning is how to hold your chisel or plane iron at exactly the correct angle while you move it back and forth over your sharpening stone. It's kind of like learning to rub your stomach and pat your head at the same time.

Granted, it's a little bit faster if you can hone your tools without having to set up a honing guide. But until that day comes, here are some of the pros and cons of some of the more popular honing guides.

Veritas Precision Honing Guide

Stanley Honing Guide

"Vise-Type" or "Eclipse" Honing Guide

General's "Off-Stone" Honing Guide

Veritas Precision Honing Guide • This heavy-duty honing guide is my favorite all-purpose guide, but it's also the most expensive. The guide is great for wider blades, and even narrow chisel blades are held firmly in place by the large brass screw, if you use some care. The screw is easy to tighten with an oversized knob. The guide is sold as part of a sharpening system that includes a jig that sets the angle of the tool in your honing guide. Lee Valley Tools 800-871-8158 • item# 05M02.01 • $29.95.

Stanley Honing Guide • This guide works best for honing plane irons and short blades, such as those in a spokeshave. You have to tighten two thumbscrews to tighten the clamp on your blade, which is sometimes a bit awkward. Finally, while the guide will clamp a blade so it cannot move forward or backwards in the guide, the blades can drift to the left or right if you're not careful. Garrett Wade Tool Catalog 800-221-2942 • item# 23M01.01 • $15.95.

"Vise-Type" or "Eclipse" Honing Guide • This guide works like a vise: The two clamps close on your blade when you turn a threaded bolt. The screw slot on the bolt makes tightening easier on your fingers. The downside to this guide is that it won't sharpen some irregularly shaped blades, such as those found in some rabbet planes. And narrow chisel blades, 1/4" and smaller, have a tendency to twist in the clamps. But because the price is reasonable, this guide is great for beginners. Lee Valley Tools 800-871-8158 • item# 60M07.01 • $12.95.

General's "Off-Stone" Honing Guide • This guide is different from the others because the rollers roll on your bench, instead of your stone. While this keeps oil and slurry off your rollers, this feature can be inconvenient if you own more than one sharpening stone. If you switch stones when you switch grits, you have to reset the guide for the thickness of that stone. If you have only one stone, though, this isn't a problem. Made of high-impact Lexan™. Woodcraft 800-225-1153 • item# 03E42 • $21.50. PW

—Christopher Schwarz, PW staff

SETTING UP SHOP: How to Buy a Basic Sharpening Kit

If you are just getting into sharpening, or you are thinking of switching to a different sharpening system, you're probably bewildered by the amount of sharpening equipment on the market today.

You could easily drop $300 on what seems like a basic system. That's a daunting price tag for a sharp chisel. We recommend you buy the basic equipment, become comfortable with that stuff, and then expand your toolbox as you become more experienced. The following is a list of the bare-bones equipment you need for each type of sharpening system:

Waterstones

Waterstones come in grits from 200x, which is great for removing nicks or gouges from blades, up to 8000x, which can produce a beautiful mirror finish on a blade. A basic system requires a 200x stone, a 1000x/4000x combination stone, the lapping accessories that will flatten your stones and a strop. (If you own a grinder you don't need to buy the 200x stone). You'll also need to buy some Tupperware™ from the grocery store to store your stones in. Here's a list of the equipment and prices from Lee Valley Tools, 800-871-8158.

Waterstones

Item#	Item	Price
60M60.01	200x Green Stone	$37.95
60M50.04	1000x/4000x Stone	$24.50
05M20.12	Glass Lapping Plate	$7.95
05M24.01	90x Lapping Grit	$3.95
70M03.50	Hand Strop	$12.75
05M08.01	Honing Compound	$6.95

Total price $94.05
($56.10 without the 200x stone)

Oilstones

Oilstones have both grits and names, so things can get confusing. For the basic oilstone user, we recommend a Washita stone for removing nicks and gouges, a combination stone for basic honing, the lapping accessories that will flatten your stones and a strop. (If you own a grinder you don't need to buy the Washita stone, and you can wait on purchasing the lapping equipment because oilstones wear much more slowly). You'll also need to buy some mineral oil from your drug store (about $4 a bottle). Here's a list of equipment and prices from Woodcraft, 800-225-1153.

Oilstones

Item#	Item	Price
07016	Washita stone	$15.99
07A02	Combination stone	$21.99
see Lee Valley	Glass Lapping Plate	$7.95
see Lee Valley	90x Lapping Grit	$3.95
18H21	Bench Strop	$17.50
09L85	Honing Compound	$6.99

Total price $74.37
($58.38 without the Washita stone)

Diamond Stones

Diamond stones come in grits between 220 (coarse) and 1,200 (extra-fine). For the basic user, we recommend you buy a fine stone, an extra-fine stone and a strop. Diamond stones come flat from the factory and stay that way, so you don't need any flattening equipment. And if you have some extra money, we'd recommend you also buy a coarse stone to speed up your work. Here's a list of equipment and prices from Woodcraft, 800-225-1153.

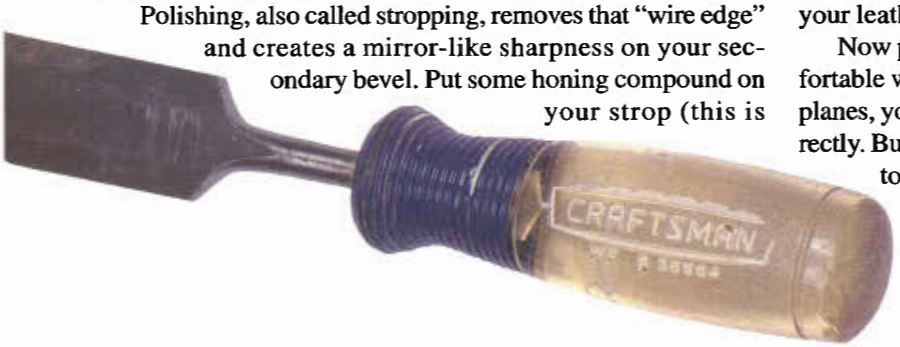
Diamond Stones

Item#	Item	Price
09C42	Fine 6" stone	$47.50
07W76	Extra-fine 6" stone	$47.50
18H21	Bench Strop	$17.50
09L85	Honing Compound	$6.99

Total price $119.49

the blade once or twice on your stone and you'll feel the burr move to the front of the blade. Repeat this whole process and the burr will get smaller. Move to a finer-grit stone and the burr will get even tinnier. When the burr won't get any smaller, it's time to polish.

Polishing, also called stropping, removes that "wire edge" and creates a mirror-like sharpness on your secondary bevel. Put some honing compound on your strop (this is called "charging"). Using the same angle you used for honing the secondary bevel, place the blade on the far end of the strop and pull it back towards you. Do this five or six times and feel the result. Never push the blade away from you as you strop. Move in only one direction. Otherwise you'll cut your leather strop.



Now practice this a few times until you start to feel comfortable with the process. Once you sharpen your chisels and planes, you're still going to have to learn how to use them correctly. But you've conquered the first step towards using these tools, instead of just hating them. **PW**

— Christopher Schwarz & Jim Stuard, PW staff

FIRST AID KITS

Here's what you need for accidents big and small.

Where to Buy

Two good first-aid kits for the shop.

- **Grizzly's (800-541-5537 west of the Mississippi; 800-523-4777 east) is $19.95 in a plastic case (item# G2648)**
- **Duluth Trading's (800-505-8888) is $32 in a sealed metal case (item# 99902)**

What You Need In Your Kit

- **First-aid instruction booklet**
- **Gauze pads**
  2) 2"x 2"
  2) 3" x 3"
  2) 4" x 4"
- **A box of Band-Aids™**
- **A 2"-wide roll of gauze**
- **Eye pads**
- **Antiseptic towelettes**
- **Alcohol prep pads**
- **Antibiotic ointment**
- **Scissors**
- **Tweezers**
- **Adhesive tape**
- **Latex gloves**
- **Aspirin/Ibuprofen**
- **An Ace™ bandage**
- **Instant ice pack**
- **Cotton-tipped swabs**
- **Eye wash**
- **Resealable plastic bags, (for ice packs, amputation care)**

I'M HAPPY TO TELL YOU that the first-aid kit in our shop sees more business from other people in our building than our staff. The pair of tweezers is the most popular item in the kit — and that's the way we like it. But we know that shops can be dangerous places: scrapes, cuts and sawdust in the eyes are almost unavoidable. So having proper first-aid supplies on hand is important.

At a minimum, even the smallest home shop should have a kit containing a box of bandages, tweezers, a roll of 2"-wide gauze, scissors and adhesive tape. This short list falls well below the first-aid kit contents usually recommended for the woodworking shop.

You'll notice that there is a booklet on first-aid techniques included in most first-aid kits. The best time to sit down and read it isn't after the accident happens. Take it out and familiarize yourself with the relevant parts, and pay particular attention to the sections dealing with "woodworking-type" accidents.

But even a complete first-aid kit isn't all you need to have for some emergencies. First off, the old rule of never working alone is still one of the best. Even if you don't have a helper with you in the shop, someone should be within earshot. That someone should also have read the first-aid manual in the kit!

You should have the nearest emergency room's address and phone number posted prominently near a handy phone, and please, don't work in a hurry and don't work when you're tired. It can always wait till tomorrow.

Remember, if you prepare ahead of time and work a little smarter, you can keep an unforseen accident from getting more serious because you didn't have a first-aid kit. **PW**

—David Thiel, PW staff

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by Sal Maccarone, published by Popular Woodworking

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DeWalt 8-1/2" & Ryobi 8-1/2"x60Tx5/8"	$179	$109
Delta 9"x80Tx5/8"	$204	$119
Ryobi–Makita & all 10"x80Tx5/8"	$207	$129
DeWalt, Makita, B&D, Hitachi 12"x80Tx1"	$229	$139
Ryobi–Makita 14"x100Tx1"	$266	$179
Hitachi 15"x100Tx1"	$277	$189

For good general purpose cuts use Woodworker II 30T & 40T or Woodworker I. Use small stiffener where possible.

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5/8" holes, boring thru 1-1/4" add $7.50. Larger at Time Basis—Shipping $4.50

Outperformed 36 other premium blades both foreign and domestic! WOOD® Magazine test, Sept. '93, pg. 45

WOODWORKER II	LIST	SALE	10%	20%
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14"X30TX1"	$195	$139	$125	$111
12"X40TX1"	$183	$129	$116	$103
12"X30TX1"	$162	$119	$107	$ 95
10"X40TX1/8" or 3/32"	$156	$119	$107	$ 95
30T 1/8" or 3/32"	$135	$ 99	$ 89	$ 79
9"X40T	$146	$109	$ 98	$ 87
30T	$125	$ 99	$ 89	$ 79
*8-1/4"X40TX 3/32"	$136	$ 99	$ 89	$ 79
8"X40T 3/32"	$136	$ 99	$ 89	$ 79
30T	$115	$ 89	$ 80	$ 71
7-1/4"X30T 3/32"	$112	$ 69	$ 62	$ 55
**6"x40T 3/32"	$136	$ 89	$ 80	$ 71

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8-1/4"X60T	$150	$109
8"X60T	$150	$109
7-1/4"X60T	$150	$109

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Faster feed rates & absolute splinter control. Stops splintering on OAK/BIRCH PLY VENEERS & MELAMINE

SIZES AVAILABLE	LIST	SALE	SIZES AVAILABLE	LIST	SALE
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8" × 80T × 1/8" & 3/32" K	$202	$169	12" × 100T × 1-1/8" K	$253	$215
220mm × 80T × 1/8" & 30mm	---	$167	14" × 80T × 1"	$232	$197
9" × 80T × 1/8" & 3/32" K	$207	$179	14" × 80T × 1"	$266	$226
10" × 80T × 1/8" & 3/32" K	$207	$159	16" × 100T × 1"	$262	$223
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See *American Woodworker* April 1998, pp. 64-69.

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Jointer Safety Quiz

CAUTION: This is definitely not the right way to use the jointer. How many safety violations can you find? There are at least six.

BESIDES THE CIRCULAR SAW, the jointer is the most dangerous machine in the woodshop, according to the National Safety Council. A floor-model jointer makes about 15,000 cuts per minute — or 250 cuts per second — which is more than enough to get you in trouble in the blink of an eye.

And don't think that the guard on a jointer is going to save you. Many of the kickback injuries we've seen occurred with the guard in place. So before you head back into your shop to straighten some more lumber, take our jointer safety quiz and find out if you need a refresher course in the safe operation of this basic woodshop machine.

TRUE OR FALSE:

1 If my board snags on the outfeed table after passing over the cutterhead, I should lift the board off the jointer and try the cut again the same way.

2 When jointing boards, follow the 1" rule, which means I should always keep my hands at least 1" away from the cutterhead at all times.

3 Always apply firm pressure directly over the cutterhead, otherwise the board might kick back because it's not being held securely against the cutterhead's blades.

4 Never surface stock less than 12" long because it's too easy to tip your board into the blades and cause an accident.

5 You can hone the knives in your jointer by holding a sharpening stone on the outfeed table, turning on your jointer and carefully moving the stone back and forth over the blades.

6 As a general rule, never make a cut deeper than 1/16".

7 When you're jointing curly or irregularly grained wood, one way to avoid tearout is to take light passes and feed the stock slowly.

8 When making a bevel cut with your jointer, it's best to have the bottom of the fence tilted toward you to avoid getting the wood wedged in against the fence and outfeed table.

9 When beveling the four edges of a panel, make the long grain cuts first to avoid tearout on the corners.

10 When surface planing burled or curly woods, it's best to skew the fence at an angle (but still square to the tables) to avoid tearing out the figured wood. **PW**

Answers

1. True. Just be careful.
2. False. Keep your fingers at least 3" away from the cutterhead at all times.
3. False. Always adjust your hands so they are never over the cutterhead.
4. True.
5. False. Though some manuals say you can do this, it is very dangerous.
6. False. Actually, for most operations, you can take as deep as 1/8" cut. And for some operations, such as rabbeting, you can take an even deeper cut.
7. True.
8. False. It is much safer to have the bottom of the fence tilted inward or away from the operator.
9. False. Make the end grain cuts first.
10. True. If you have the room to do this, it's a sound operation.

Thanks to the National Safety Council for their help in assembling this quiz.

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WOOD TALES

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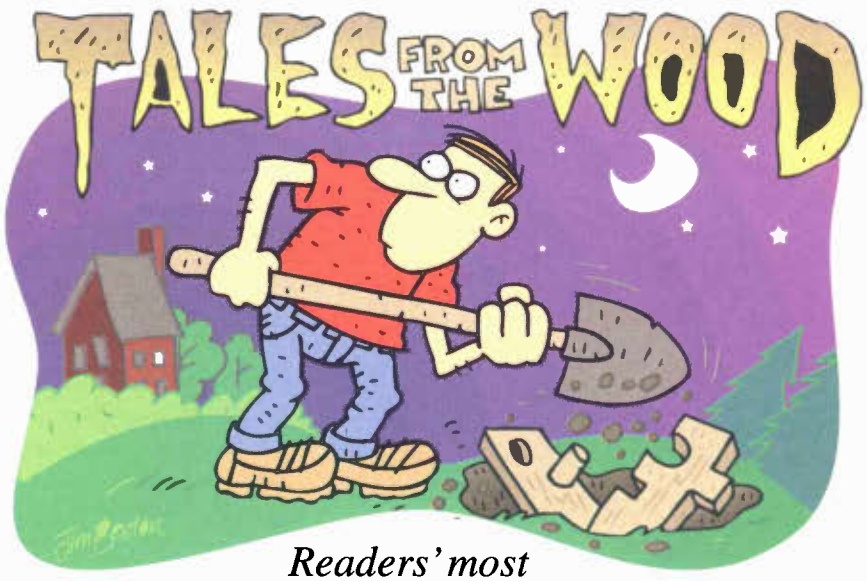


Readers' most amazing stories from their workshops.

WINNER!

He's So Stuck on Turning, He Needs Help

One Saturday, my wife and daughter were off early for a day of shopping. I was looking forward to spending the day at my lathe. About mid-morning, a bowl I was working on developed a crack and I reached for the cyanoacrylate glue to repair it. I had not used the glue for awhile and the tip was clogged. Rather than find something to unplug the tip, I squeezed harder on the bottle. I watched the top sail into the air and felt the glue oozing over my right hand. As I set the bottle down and reached for a towel, I braced myself with my gluey hand against the lathe. My hand bonded instantly. I knew my wife would not be home for hours, and I began to despair at the thought of spending the rest of the day stranded in the garage. I considered calling out to my neighbors but what was I to say? "Help, I've glued myself to a 400-pound lathe!" I finally (and painfully) freed myself by rolling a dowel under my palm and prying my hand away bit by bit.

Rick Harrell
Alpine, California

Share Your Story & Win!

Turn your favorite tale from the woodshop into a $150 gift certificate from Lee Valley Tools in *Popular Woodworking's* "Tales from the Wood" contest. We're looking for your funniest, most embarrassing or incredible story. And if we can learn something from your yarn—even better.

Each issue, our editors choose the best tale and print it here. Runners-up receive a Veritas Sliding Square (shown at right) from Lee Valley Tools, the catalog company that features an impressive array of quality woodworking tools, supplies and accessories. One final rule: Please, no stories about people getting hurt. That's not funny.

To make things easier, you don't even have to write your story down. Just call our hotline anytime at (513) 531-2690 ext. 587 and leave your tale and daytime phone number. Or you can e-mail your story to us at popwood@fwpubs.com or mail it to: Tales from the Wood • *Popular Woodworking* • 1507 Dana Ave. • Cincinnati, Ohio 45207

Press This Button to Get CNN or 1,600 CFM

I am the young dog who got fooled by the old dog who had figured out a new trick. I recently used some old electronic parts to create the illusion of automation in my workshop. I assembled a shop-vac dust collection system, and as an extra special touch I made it remote controlled.

I used an older cable/VCR remote switch and its remote control to turn the collector on. Little did I realize I had used pretty much the same system that everyone else in the neighborhood uses to turn on their televisions.

The older gentleman who lives behind me has a television against his back wall, and every now and again I'd hear my dust collection system running when I was nowhere near the shed. I often wondered how that happened, but I never made the connection until one day. Every time I started to make a cut on my table saw, the dust collection system would shut down.

After several confused moments I walked outside to find my neighbor standing near the fence just laughing until it hurt. He explained that he had realized some time before there was a problem because every time I started "that con-founded" machine, his TV turned off.

A quick adjustment in frequencies solved the problem. I guess the old man got a few laughs. Me, I felt a bit stupid for letting the old man push my buttons like that.

Ed McAdam
Fredericksburg, Virginia

Hey, Some Jerk Stole My Project!

We were living in Alaska when I decided to build my first grandchild a crib. I'm one of those weekend warriors, so it took me quite a while to get the crib built. But when I was finished I was very proud of it and presented it to my daughter for her first child.

Some time later I was convinced to go to the Alaska State Fair, and of course I went straight to the woodworking exhibits. I looked down the line of projects that people had entered into the contest at the fair.

"Look," I said, "someone built a crib like mine." I looked a little closer. "Look, they even routed the edges like mine."

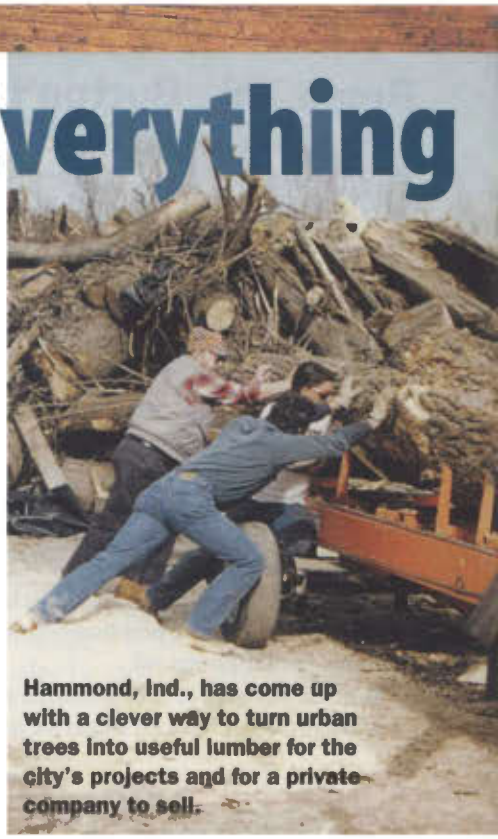
Then I saw the blue ribbon attached to the crib with my name on it. My wife and daughter were cracking up. Right then I was the proudest weekend wood smasher that existed. **PW**

John McIntyre
Grand Junction, Colorado

TREES TO FURNITURE

Trees to Everything

How a few people in Indiana turned a thorny environmental problem into a bountiful supply of lumber for everyone.



Hammond, Ind., has come up with a clever way to turn urban trees into useful lumber for the city's projects and for a private company to sell.

EACH YEAR the city of Hammond, Ind., located 33 miles southeast of Chicago, removes nearly 400 trees as a service to residents. In the past, these renewable resources would end their life cycle rotting in the city landfill.

The cost of disposing these trees, estimated at $500,000 a year, was enough for the city to begin recycling programs and to find other ways to reduce the landfill's intake. The city's Department of Recycling increased its public education programs on ways to recycle yard waste, and by 1995, the total tonnage going to the landfill was down by 10,000 tons. It was a good start, but not enough to satisfy new state legislation that required cities to reduce the amount of yard waste going to landfills by 50 percent by 2001. Hammond Mayor Duane Dedelow Jr. began looking for a solution.

He and other city and county officials found it with the help of a small, private company called Hoosier Sawmill in the nearby town of Westville. The city now sends its trees to Hoosier Sawmill, which cuts the trees into lumber using a Wood-Mizer sawmill. In return, Hoosier Sawmill gives the city enough wood to build picnic tables for its parks — saving the city more than $3,000 a year. Hoosier Sawmill then sells the rest of the lumber to a local pallet-making plant.

This fledgling operation is run by Rachel and Kenneth Beschinski and Leo Turner. Located on the outskirts of Hammond, the sawmill has a backdrop any sawyer would envy: a plentiful supply of logs waiting to be converted to lumber. After trees are removed for the city's 85,000 residents, they are brought to the site and wait for their turn on the mill.

The city's Parks Department passes its needs onto Hoosier Sawmill, which then processes the lumber and stacks it aside for air drying or for use as green lumber.

Cottonwood, maple, elm, ash, sycamore and a bit of mulberry and oak are split on a 70-30 basis between Hoosier Sawmill and the city of Hammond. Hoosier Sawmill sells their split to Calumet Pallet. "They (Calumet Pallet) use between 12,000-15,000 board foot a day," says Eric Beschinski, who is Ken's son and operates their Wood-Mizer LT40 sawmill at the Hammond site.

The city's portion of the lumber goes to the Parks and Recreation Department. Mark Narantic, the general foreman for the parks department, says a plentiful, free, cut-to-specification supply of wood enables new benches and picnic tables to be produced at a fraction of the cost they were paying.

"Eight or nine years ago, it would cost us $10,000 to manufacture 100 picnic tables. Now we're able to produce them for the cost of manpower," says Narantic. "We can also keep a stockpile of them for community use, such as block parties and church events."

The city saves an additional $15,000-$20,000 each year by using 8" x 8" tim-

bers from Hoosier Sawmill along the roadways and waterfronts to indicate perimeters and driveways, which are in constant need of replacing.

In addition to the lumber supplied by Hoosier Sawmill, whose mill investment was less than $26,000, the city puts almost every piece of wood from every tree to use. A grinder converts limbs 5" or less into mulch for landscaping, path materials and playgrounds. A chipper provides residents and businesses free material for beautification projects or composting.

The unusable slabs, which are available as firewood, are used by some Hammond residents as craft pieces.

The sawdust produced by the Wood-Mizer is used for the city's 30 snowplow trucks as an absorbent for oil and water spills. Residents may also directly purchase lumber at the Hammond site for furniture and other uses.

Currently the Parks Department has a waiting list of close to 1,000 trees that need to be removed. "We have a seemingly endless supply; it's nice to know we can't keep up," says Eric Beschinski. "We're looking at getting a second Wood-Mizer so that we could branch out and extend the program. We've worked through winter this year, and are looking at other markets for the green wood. Right now, we're selling the good rough-sawn green to a facility that has (wood)-drying capabilities."

And the governments in that part of Indiana are starting to think of other ways to use waste trees.

"If the city had a drying kiln, it could go into drying and manufacturing things like a garden shed — a simple post-and-beam frame using 12 x 12's. It could be sold to the public at a savings but still make a profit for the city," says Jeff Langbehn, director of the Lake County Solid Waste Management District, who helped start the Hammond program. "This is really a pilot program for us. If the success continues as it has in the past months, we have 17 other cities and towns this program could be established in."

Government officials aren't the only ones who have been impressed with the success of the program. The owners of Hoosier Sawmill have also been amazed at their success.

"I first bought my Wood-Mizer as a sideline. With five years to go before retirement, I thought it would be a good supplement to my income," says Ken Beschinski. "Things have moved way faster than I ever dreamed, but I love it.

"We prayed about it before we bought the mill, and looked at the market where we could sell. We weren't looking to get rich, but our prayers have been answered — and more. Everything with this mill has just snowballed and it's just unbelievable." **PW**

— Nora Loechel, managing editor,
Wood-Mizer News

Editor's note: For more information on "Trees to Furniture" and to find people in your area who also are interested in this program, please e-mail us here at **popwood@fwpubs.com** *or send a self-addressed stamped envelope (with two stamps) to Trees to Furniture, 1507 Dana Ave., Cincinnati, OH 45207.*

By the way, if you think your town might benefit from what Hammond has done, we encourage you to photocopy this article and send it to your town's council.

ADVERTISING GUIDE

WOOD TYPES

Baltic Birch

Normally we write about solid wood in this column, but because this is the shop issue, we thought it might be useful to discuss a versatile material for everything from jigs to drawer parts and scroll saw projects.

What is baltic birch?: It's a stable, high-grade plywood with many layers (or "plys"). A 3/4"-thick piece of baltic birch will have 13 layers. Each layer is made of one solid piece of wood, so there are no gaps (called "voids") in the plywood. Large knots are patched.

Why is it called 'Baltic' birch?: Baltic birch is produced in the Baltic region of the former Soviet Union from birch or alder trees and shipped to this country. Two similar products are Finnish Birch, which is made in Finland, and ApplePly™, which is made in the United States from Western Red Alder

What it is good for: In addition to being great for jigs, baltic birch is used for drawer sides, hockey sticks, chair backs, jigsaw puzzles, bed rails, skateboards and the interiors of rescue vehicles.

How it is graded: There are three grades of the plywood, B, BB and CP. A grade of "B" means the face is generally clear, with small pin knots and brown streaks but no patches. The grade "BB" allows larger knots and some patches. The grade "CP" allows more patches and some hairline splits. The wood is stamped with two grades, one for each face. For example, the highest-grade baltic birch is stamped B/BB.

Characteristics of baltic birch: The plywood is easy on your cutting tools, and it machines easily. Screws hold extremely well, and you can drive screws and nails very close to the edges of the plywood without fear of the material splitting.

Are the metric thicknesses a problem?: Not really. The 3mm thickness is almost exactly 1/8". The 6mm is just shy of 1/4". The 12mm is just shy of 1/2", and the 18mm is a hair short of 3/4". The standard width and length of sheets of baltic birch is 60" x 60".

Midwest price: A 1/2" x 60" x 60" sheet costs $31. **PW**

Abrasives

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Woods

ADAMS WOOD PRODUCTS is a manufacturer of solid wood furniture components. They make a variety of table bases, Queen Anne table legs, claw & ball table legs, turned legs, plus a variety of ready-to-assemble and finish dining chairs & occasional tables. These items are carried in stock in a variety of woods. There is no minimum order size as they can be purchased one at a time. **Circle #100.**

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NEW PRODUCTS

Popular Woodworking endeavors to provide readers with accurate, useful information on the newest woodworking tools and products by testing most of them in the *Popular Woodworking* shop. We consider cost, design and benefit, and add our comments about tested items to help you make future purchasing decisions.

"If you're an oilstone user, you'll be amazed at how quickly Norton's compact diamond stones sharpen tools." — PW

Norton's Diamond Sharpening Stones

Contact: Norton Co. 508-795-5709

Retail Price: $20-$120

Available through catalogs and woodworking stores.

Features:

- New monocrystalline diamond sharpening stones are designed for wet or dry sharpening, honing, deburring, filing and abrading tasks on many materials
- Will maintain precision flatness to a tolerance of ±.002 and won't groove, cup, hollow or break. Norton tests indicate a stock removal rate up to 10 times faster than aluminum oxide or silicon carbide stones
- Available in five sizes and four grits (220 grit to 1200 grit)

For more information, circle #144 on the Resource Directory Coupon.

Makita Tool-less Jigsaw

Contact: Makita USA 714-522-8088

Retail Price: $179 Available in catalogs and stores.

Features:

- An upgrade on the existing 4304 variable-speed orbital jig saw, the 4304T now requires no tools to change the blade or to adjust the bevel of the base from 0-45° to either the left or right
- Also, a new style lock-on lever on either side of the tool offers easy use for right- or left-handed users

For more information, circle #145 on the Resource Directory Coupon.

TOOL SCOOP

- As we go to press we have word on a new 16" scroll saw from Makita (SJ401). Priced in the $200 range, this variable-speed tool should be quite popular.
- We've seen a new cordless power tool in testing from a major manufacturer that should be very interesting ... when introduced, expect more competitive prices
- Two new jigsaws from Bosch, scheduled for fall release, will add a new catch to an already legendary tool design. The new feature improves on an already user-friendly tool — more info to follow.

GOT A QUESTION ABOUT A TOOL?

If you have questions about tools, you can reach our tool expert, David Thiel, at (513) 531-2690 ext. 255.

Veritas® Cyclone Lids

Contact: Lee Valley 800-871-8158 (www.leevalley.com)

Retail Price: $29.95, through Lee Valley's catalog.

Features:

- Cyclone lid removes 90% to 99% of dust and debris before reaching vacuum
- Lid fits on any round container with top diameter between 20" and 24"
- Lid design swirls incoming air and debris around the walls of the container, while outlet air is drawn from the top center allowing only the finest dust into your vacuum
- Lids are available pre-drilled for 2½" or 4" hose

For more information, circle #146 on the Resource Directory Coupon.

HTC Offers Universal Mobile Base

Contact: HTC Products Inc., 800-624-2027

Retail Price: $79.95

Features:

- The HTC-2000 is a universal mobile base designed for use with light to medium duty, open or closed base machines weighing up to 400 lbs
- Adjusts to accommodates bases from 12" x 12" to 36" x 36", or will expand to a 20" x 52" rectangle
- Cam action lifts machine ½" onto two 3" swivel casters for moving, and lowers to non-skid levelers
- Requires no extra parts and includes a lifetime warranty

For more information, circle #147 on the Resource Directory Coupon.

"The new fixed-base design makes base removal and precise height adjustments a snap. A pleasure to use. As for the Skil wrenchless-chuck router — it's about time!" — PW

New Routers from Skil-Bosch

Contact: S-B Power Tools 773-286-7330 (www.boschtools.com)

Availability: At most woodworking stores

Features:

- Models 1617 ($160), variable speed 1617EVS ($185) and D-handle 1618 ($175) feature a magnesium body and housing combination offering quick and accurate height adjustment with a micro adjustment capability. The 11-amp routers (12 amp on the 1617EVS) accept ¼" and ½" collets

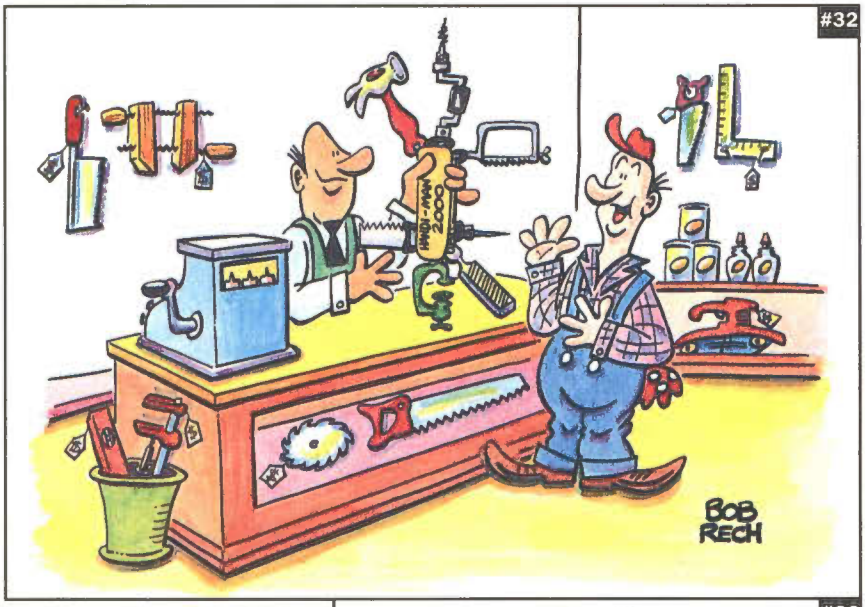
- The Skil model 1845.02 plunge router is the first router to include Jacobs' wrenchless Router Chuck™. Available in a ¼" collet, this 10-amp router features variable speed, fine adjustment knob and sells for $129 with case

For more information, circle #148 on the Resource Directory Coupon.

CAPTION the CARTOON

RYOBI

#32



TIMOTHY G. WHITE

from Ramsey, Minnesota, is the winner of our "Caption the Cartoon Contest #30" from the May issue and recipient of the Ryobi 6v drill kit.

Congratulations Timothy!

The runners-up receive a one-year subscription to *Popular Woodworking*.

#30

"I'm not worried. Like everything else you make, it'll break on the first try."

"Gee Dad, can't we vote for a smaller 'Board of Education?'"

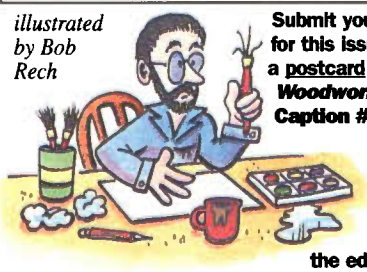
Frank Desiderio, from Russellville, Arkansas

"Dad, is that mere coincidence you made that out of weeping willow?"

Bruce Zikeli, from Ellwood City, Pennsylvania

"But Dad, my class project was Earth Science, not Applied Science."

Joe Sullivan, from Laguna Niguel, California



illustrated by Bob Rech

Submit your caption(s) for this issue's cartoon on a postcard to *Popular Woodworking*, Cartoon Caption #32, 1507 Dana Ave., Cincinnati, OH 45207 by August 24, 1998. Winners will be chosen by the editorial staff.

The winner will receive Ryobi's 10" Compound Miter Saw. The TS230 has a 13-amp motor and 30-tooth carbide blade. The die-cast aluminum base has positive miter stops at 0, 22.5 and 45 degrees left and right, and the motor has positive bevel stops at 0 and 45 degrees.

The runners-up each win a one-year subscription to *Popular Woodworking*.

WIN Me!

Each issue of *Popular Woodworking* offers tips and tricks for the woodworker that we've accumulated from readers, contributors and from our own workshop and woodworking experiences. We want to encourage the free exchange of these time-saving and safety ideas for all woodworkers. If you have a good trick, we'd love to hear about it. Send your trick, whether it's one your father taught you or one you came up with on your own, to *Popular Woodworking*, Tricks of the Trade, 1507 Dana Ave., Cincinnati, OH 45207.

Add Magnetism to Your Shop

Magnets have been around a long time, but it wasn't until recently that a new breed of magnet was developed that is extremely useful in the workshop.

Neodymium Iron Boron magnets (more commonly known as rare earth magnets or REMs) have properties and powers far beyond those of "regular" magnets. For example, a 1/4" diameter x 1/8" thick rare earth magnet lifts a 2 lb. block of steel; and a 1/2" diameter magnet lifts a 10 lb. block; a 3/4" diameter magnet holds a 20 lb. block of steel; and a 1" diameter magnet lifts a 35 lb. block!

They are called "rare earth" magnets because until recently it was difficult to separate and refine the raw elements used to give these magnets their almost magic power. Created under pressure in an oriented magnetic field, then fused and heat-treated, these magnets have exceptional resistance to demagnetization, and they have outstanding stability and power. As a woodworker you might recognize the term from a few years ago when Porter-Cable introduced their Magna-Quench cordless drill/drivers that used rare earth magnets. The magnets' surprising strength has now made them useful in many other ways.

We came across rare earth magnets in a Lee Valley Tools catalog a couple of years ago and just had to order some to try them out. We've been using them in projects and around the shop ever since. We've listed a number of shop and woodworking uses for rare earth magnets that we've come up with, and hope you'll let us know of any others you've found. **PW**

— *The* Popular Woodworking *editors*

15 Woodworking Applications For Rare Earth Magnets

1. Use a REM to attach your chuck key to your drill press
2. Use a REM to attach blade wrenches right to your saw
3. Use REMs as catches for doors in small projects
4. Use REMs as connectors for toy trains and puzzles
5. Glue a REM to a stick or old car antenna and easily retrieve a lost table saw nut from the sawdust
6. The same stick will chase router bits, screws and small tools out from under workbenches
7. Use a REM to check for nails in "found" wood
8. Use REMs as tool hangers in shop cabinets
9. Make a dust collection hood which fits on all your machinery (no matter what diameter hose required) by using REMs to attach the hood to the machine
10. Make your own high-power magnetic feather boards
11. Use REMs to locate metal studs in walls
12. Use REMs to attach plywood faces to a metal vise
13. Use REMs to attach shop drawings or cutting lists to the machine you're working at
14. Reverse the polarity on two REMs for spring-open lids in boxes or cases without handles or pulls
15. Make a powerful nail/screw holding wristband as seen in the catalogs using a REM and a strip of Velcro™

Sources

Lee Valley Tools Ltd.
800-871-8158

Woodcraft
800-225-1153

Blades

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Books & Catalogs

FREE CATALOG of woodworking and craft books. Includes coupon for $5 off your first order! Call toll free 1-800-289-0963 or write to: Betterway Books Catalog, 1507 Dana Avenue, Cincinnati, OH 45207.

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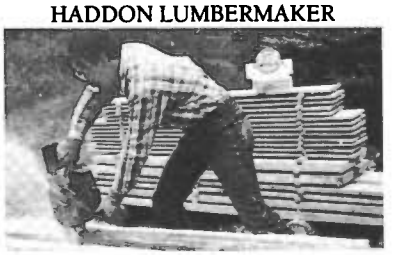

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Miscellaneous

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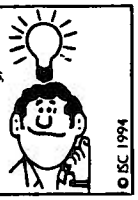

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Miscellaneous

POST OFFICE BOX DOOR FRONTS. No.1 $7.00; No.2 $8.00; No.3 $8.50; plus UPS. Coin/plates, etc. to make banks, etc. Sase: for info - Woodcrafts, P.O. Box 1415, Fletcher, NC 28732; (828) 687-0350.

Plans & Kits

TWENTY BIRDHOUSE PLANS (DESIGNED 100 YEARS AGO!) Bluebirds, Martins, Songbirds, $5.00. Woodartist, Box 80003 PW-32, Charleston, SC 29416-0003.

2000 WOODCRAFT PATTERNS. Fun/profit Catalog $2.00 (refundable). E-Z Design, P.O. Box 284, Dept.C, Washington Mills, NY 13479.

COUNTRY FURNITURE PATTERNS Easy to build and read. Send $2.00 for catalog to: Patterns, Dept. 110, 402 W. Washington Street, Alexandria, IN 46001, www.hoodswood.com 1-800-886-1686.

WATCH YOUNGSTERS SMILE. Make a circus wagon for their bean bag animals. Pull toy and storage. Plans $8.00. Goetz Enterprises, 218 Bramber Drive, Broomall, PA 19008-3701.

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Popular Woodworking

The Violin Maker

You don't need a lot of tools or money to make a beautiful violin, just pure determination.

MY GRANDFATHER was an old-time barn dance fiddler; I am a professional violinist. It seemed perfectly natural that my father, Mike McMahan, would turn to the violin in his retirement years. His urge to play was stymied by the lack of an instrument, but that didn't stop him. He had made a violin once about 40 years before, but "it wasn't very good," he said. "So why not try another one?" he mused.

At 74 it was a fascinating challenge that involved the most basic of needs. Like wood, for instance. Dad didn't have any, and he couldn't spend the $100 for seasoned violin-making blocks. He saw a solution, however, at Suvie's Island on the Columbia River. He spotted an old oak log there, and on his next fishing trip he brought a saw to cut a slab for the violin's back. Then he remembered the apple tree stump behind his house for the top. For the rest of the violin he relied on old baseball bats.

Dad measured a violin borrowed from his son-in-law. And soon, with the help of a jigsaw, he cut the outline of the back and the top. First he tackled the top by making wooden guides that fit over the borrowed violin to help his violin mimic that shape. "How am I going to keep the goldarned thing from moving?" he pondered. He bolted the violin forms to a bread board to hold them in place while he gouged out the wood with rasps and scrapers, checking every so often to see if the guides were touching. The oak was hard to work, and he learned later that it is poor for violin-making.

A violin is incomplete without ribs. He cut these out of oak. He soaked the strips and bent them on metal forms heated with an electric hot plate. Each time the wood would bend slowly until it would inevitably break. So he used a metal filler for car body work to complete the ribs. Dad carved the neck and scroll with a knife; he then shaped a bass bar and glued it to the inside of the top.

Sections of that violin lay on his work table like pieces of a puzzle. Ribs must be put into position upright, so he invented a caul to hold them while he glued on the top and bottom. From his baseball bats he whittled the fingerboard, the tail piece and string pegs. He finished the instrument with stain and floor varnish and carved a bridge to hold up his only new purchase, the violin strings. To the carved-out button on the end of his violin he attached the tail piece with fishing line. He tuned up, not expecting too much. With a borrowed bow he drew a soft, sweet tone.

This inspired him to seek out books at the library on making violins, to probe the lumber yards for wood — and when he couldn't find the traditional wood for violin-making (spruce), he turned to redwood. His expertise improved with each of the nine violins and two violas he made. The tone quality became better and better. He finished the last two instruments with linseed oil and shellac, a French technique. He learned that thicker wood produces weak tones and thinner wood produces harsh tones. Dad aimed for a middle ground.

I took his violas to a rehearsal of the Oregon Symphony. The section violinists all declared that they had fine tones.

"There is a satisfactory feeling in just doing, even if it isn't good," dad said. "It's great when they turn out with good tones. Making violins is something that will survive."

Dad learned the old tunes of his youth. And he conquered a real crowd-pleaser with "Pop Goes the Weasel," with a loud plucked "E" at the climactic spot where "pop" comes in the words. In his 90s, dad still liked to fondle one of his instruments and could still do a tune or two for his family members or acquaintances at the retirement home. **PW**

Marian Fox lives in Yacolt, Washington, and is a violinist for the Oregon Symphony.

GPC

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Huge 6-1/2" Blade for Cutting 2x's at 45°

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