

Michael Dunbar: Prince of Windsors



WOODWORKER'S JOURNAL

April 1999
Volume 23, Number 2

the magazine
for today's
woodworker

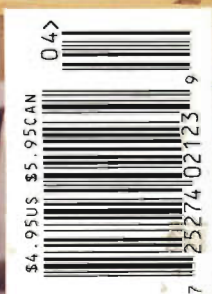
Mission dining chairs:
Are you ready to mortise?

Step-by-step plans:
Federal secretary desk

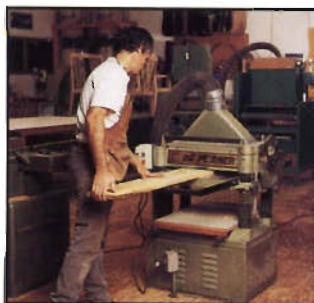
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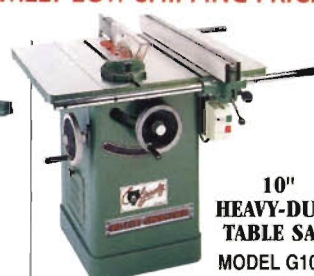
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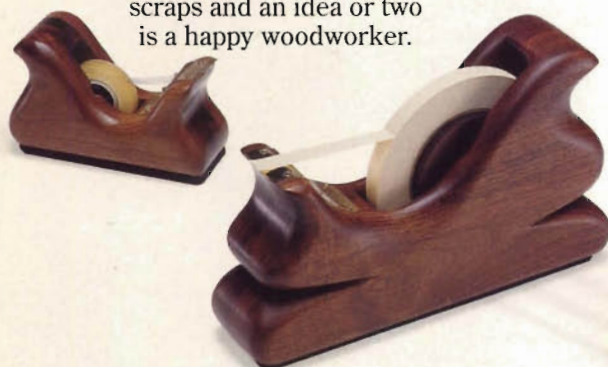
Projects



43 Walnut Weekend Wonders

By Dick Dorn and Rick White

A woodworker with shop scraps and an idea or two is a happy woodworker.



28 Dining Room Chairs

By Rick White

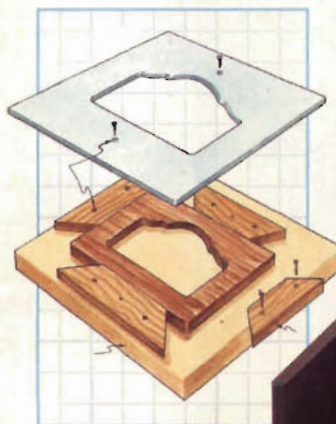
Stickley-inspired chairs with housed tenons, pyramid plugs and the accessibility of the Arts and Crafts movement.



52 Federal Secretary Desk

By Dick Coers

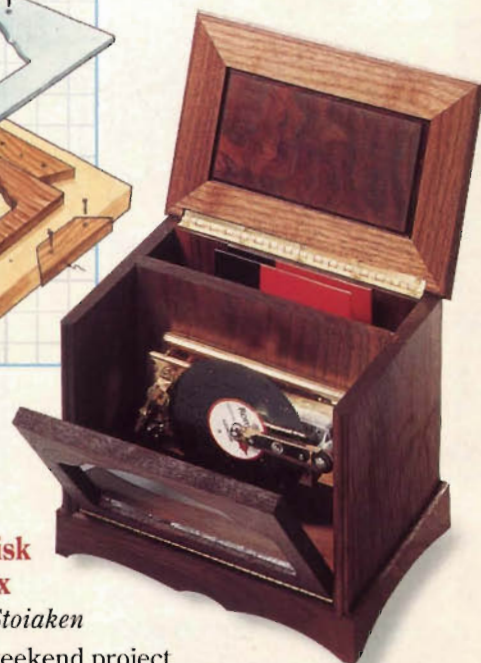
New hardware breathes fresh life into a classic design. Brush up on all your shop skills, including veneering, leg tapering, dovetailing and inlaying and banding.



48 Walnut Disk Music Box

By Larry Stoiaken

Here's a weekend project that provides a little primer on template routing.



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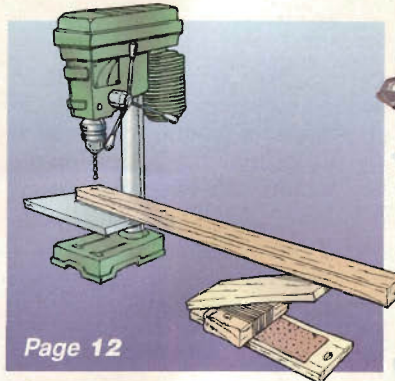
Charles Self tests jig saws from around the globe.

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Woodworkers build our projects in their own ways.



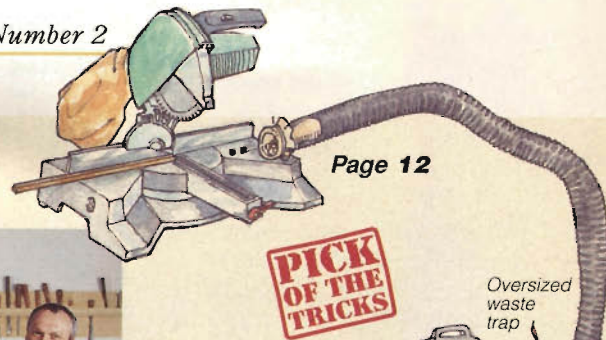
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Page 12

PICK OF THE TRICKS

Oversized waste trap



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Safety First

Learning how to properly operate power and hand tools is essential for developing safe woodworking practices. For purposes of clarity, necessary safety guards have been removed from the equipment shown in some of the photos and illustrations in *Woodworker's Journal*. We in no way recommend using this equipment without safety guards and urge readers to strictly follow manufacturers' instructions and safety precautions.



Chairmaking with Your Award-winning Magazine

Making a chair is a challenging project for most woodworkers.

There ... I said it! I just can't bring myself to insult you with that song and dance about how making chairs is easy.

If it's so easy, how is it that **Michael Dunbar**, this issue's *Today's Woodworker*, has managed to make a living for all these years teaching woodworkers the intricacies of making Windsor chairs? (See page 10.)

So ... for those of you who aren't already running for the nearest weekend project (check the music box on page 48 or the two projects starting on page 43), I've got some encouraging news. Chairmaking goes a lot more smoothly with detailed drawings and photos and well conceived step-by-step instructions. In that regard, I asked editor **Rob Johnstone** and art director **John Kelliher** to pull out all the stops with the Stickley-inspired chair project in this issue (see page 28); right down to the chamfered screw hole plugs.

Providing readers with the level of detail necessary to instill confidence and ensure success is a source of considerable pride here at *Woodworker's Journal*. And that's exactly why I couldn't be



Winners: Usually, it takes a wedding to get so many artists and editors dressed up! From left to right: Joanna Werch, Jeff Jacobson, Sarah Greer, Steve Hinderaker (behind Sarah), yours truly, Rob Johnstone, John Kelliher and Mike Birawer.

happier our colleagues in the publishing business think we're hitting the mark.

Against some solid competition, *Woodworker's Journal* won the award for "Best Technical How-To Magazine" at the 1998 Minnesota Magazine & Publications Association's Excellence Awards. It was, as you can imagine, the award we coveted most!



I don't want to wrap up without mentioning **Dick Coers'** beautiful Federal style secretary desk starting on page 52. Dick did such a fine job that he wasn't willing to trust a moving company to drive it from Illinois to our offices in Minnesota. So, along with a beautiful project, we had the pleasure of a weekend visit from one of our favorite woodworkers.

Larry N. Stolaken



MARCH/APRIL 1999
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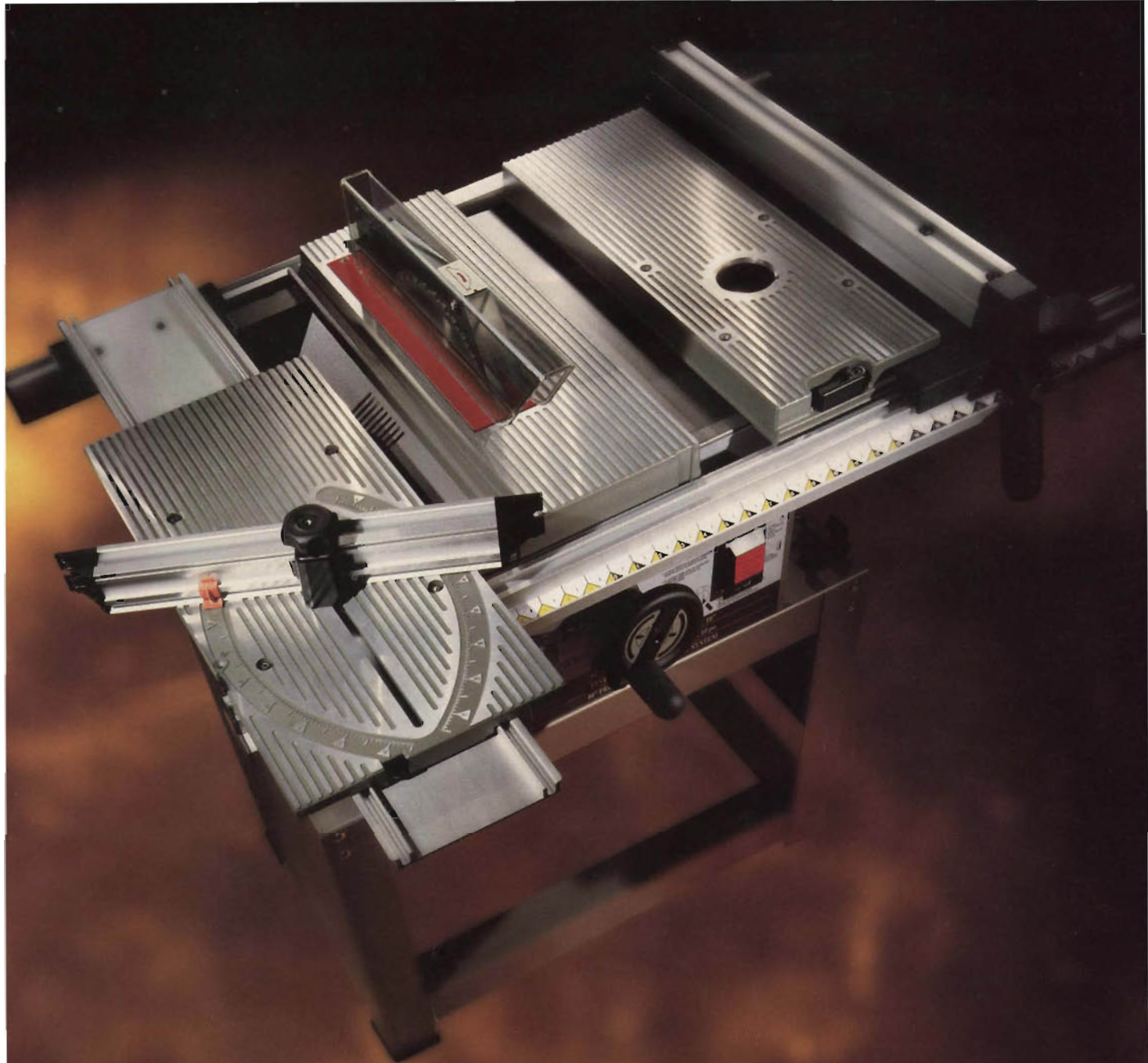
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Woodworker's Journal, January/February 1998



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The Crown Prince of Windsors

By Joanna Werch

Mike Dunbar describes himself as "the Typhoid Mary of Windsors": he caught the bug, and now he's spreading it. Mike's first bout with the Windsor bug occurred years ago, when he bought a chair at a yard sale while still in college. He loved the chair so much he wanted more and started haunting antique shops looking for them. He soon discovered that his taste exceeded his pocketbook, so, being an enterprising young college student, he did the next best thing: taught himself to make chairs.



The sack back Windsor is Mike's signature chair. He teaches its construction in his introductory class.

Then someone bought one from him, and he found himself a chairmaker. This wasn't his original plan. Mike had intended to get his Ph.D. in French and "be an egghead. I didn't even know people worked with wood."

That discovery came when woodworkers started asking for instructions on Windsor

Three different styles of Windsors: the sack back, oval back side chair and continuous arm have all been popular since the 1700s.



chairmaking after the publication of his first book — written for an audience of antique collectors.

For 13 years, he was an itinerant teacher of chairmaking. With the birth of his son in 1992, Dunbar Workshops stabilized into one location near his New Hampshire home. In addition to teaching classes, Mike, his wife, Sue, and their staff are involved with tool design and testing, chair design, marketing and more. Because of these many facets, they've decided they're more of an institution than

a workshop and changed the name accordingly: as of summer 1998, they're now the Windsor Institute.

What's the appeal of Windsor to Mike and his students? It's a question he's wrestled with often. He concludes it's the element of line in the design. "The element of line is dynamic, moving the eye from one point to another along a predetermined path," he said. "A Windsor chair done well is a composition in line."



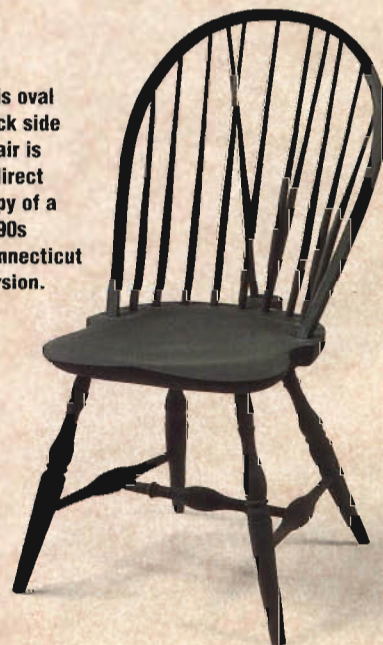
For more info on classes and the Windsor Institute, call Mike at 603-929-9801.



"The element of line is dynamic, moving the eye from one point to another along a predetermined path. A Windsor chair done well is a composition in line."

Mike Dunbar

This oval back side chair is a direct copy of a 1790s Connecticut version.



April 1999 Woodworker's Journal

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A Shop Hold-up (and Hold-downs)

Eliminating Lacquer Blushes

When you spray lacquer in humid weather, sometimes a white blush reaction will show up. In our shop we take care of this by spraying a light mist of lacquer thinner on the blushed area. The blush disappears instantly — but keep in mind this trick may give the surface a slightly greater sheen.

*Roman D. Hershberger
Millersburg, Ohio*

Top Five Uses for Old Toothbrushes in the Shop

Here are my top five uses for old toothbrushes in the shop. (Just remember not to use them for cleaning your teeth anymore!)

1. Mini-glue spreader (they clean up with a little soap and water).
2. Clearing deep joints of wood shavings after router cuts.
3. As a soft-backed sander. Try gluing a small piece of sandpaper to the bristles. It makes a great detail sander.
4. Painting, especially in those hard-to-reach concave areas.
5. Greasing or lubricating tools in tight and hard-to-reach areas.

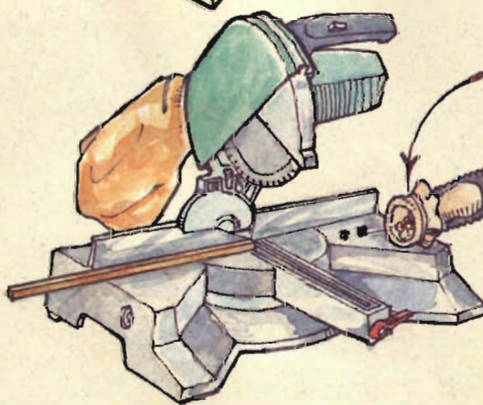
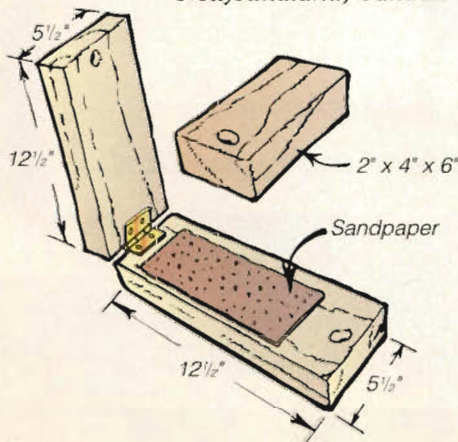
*Vern Guischart
Allentown, Pennsylvania*

Drill Press Support

When using my bench model drill press on long pieces of wood, I often run into trouble holding the stock level as I drill one end. This adjustable support jig is my answer.

I use two pieces of 3/4" plywood joined at one end with a butt hinge. This covers more than the range of adjustment on my 8" drill press. A 6" long piece of 2x4 serves as the adjusting block. Turn the block on its short edge and put it lengthwise in the jig when adjusting the support to higher levels. Glue a piece of sandpaper onto the lower flap of the jig to keep the block from slipping when you put the weight of the stock on it.

*Bob Kelland
Newfoundland, Canada*



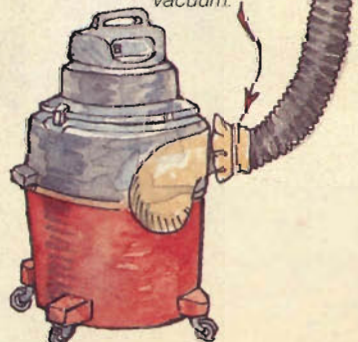
It's in the Bag: Catch Small Parts and Dust

When cutting several small pieces on my miter or table saw, I put a mesh bag in the body of my shop vacuum and hold it in place with one end of the hose. I attach the other end close to my saw blade. When I turn on the vacuum and the saw, the vacuum pulls the sawdust into the body, while the mesh bag traps the small parts. I can cut all the pieces without stopping the saw or getting my fingers close to the blade. If I only need a few pieces, I put the mesh bag in the end of the hose.

*Stanley H. Pulaski
Cedar Springs, Michigan*

**PICK
OF THE
TRICKS**

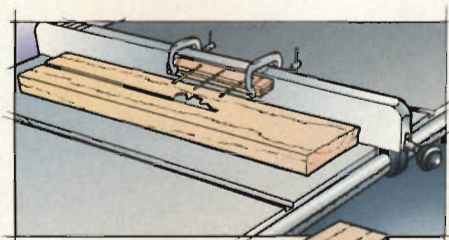
When you're cutting more than 10 pieces, position a larger mesh bag in the body of the vacuum.



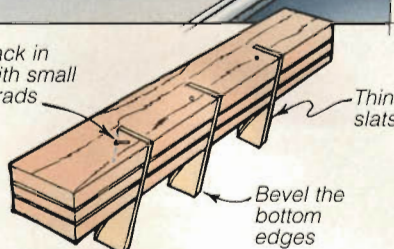
Shop Made Hold-downs

Tricks to keep lumber safely tight to a machine while cutting or routing are always helpful. Here are a couple of ideas I find useful.

1. Simply slice a piece of 3/4" plywood with a thin saw kerf cut at about a 30° angle. A flexible blade putty knife is then secured in the kerf, and the unit is clamped on the table saw's rip fence at the desired height.
2. This is also a piece of 3/4" plywood with kerfs long enough to hold wooden slats about the thickness of paint stirring paddles. (I bevel the bottom edge for better contact with the wood.) The slats are slid into the



Tack in
with small
brads



Thin
slats

Bevel the
bottom
edges

kerf, then glued and tacked into place. This hold-down can be made any length or width needed. Longer models are great for controlling really long pieces as they're being ripped on a table saw.

R.B. Himes
Vienna, Ohio

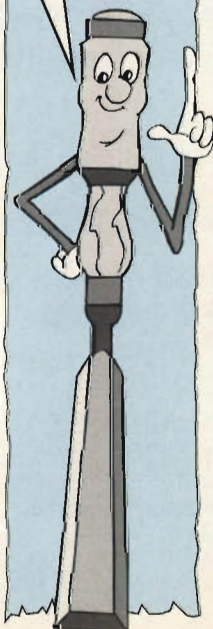
Sweeping Change in Your Shop

In many of my wood shop projects, I find it's difficult to clean out corners — both around the bench itself or while in the midst of a project. I solved my problem by purchasing a small whisk broom and reforming its flat bottom edge into a point. This little custom broom works great for those hard-to-reach corners and usually saves me from dragging out the vacuum cleaner. I keep mine hanging close to my workbench.

Howard E. Moody
Upper Jay, New York

Tricks continues on page 14 ...

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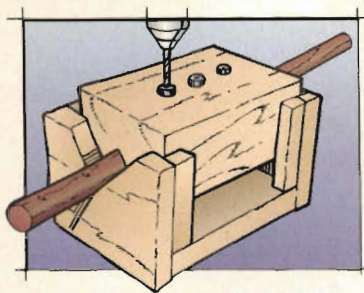


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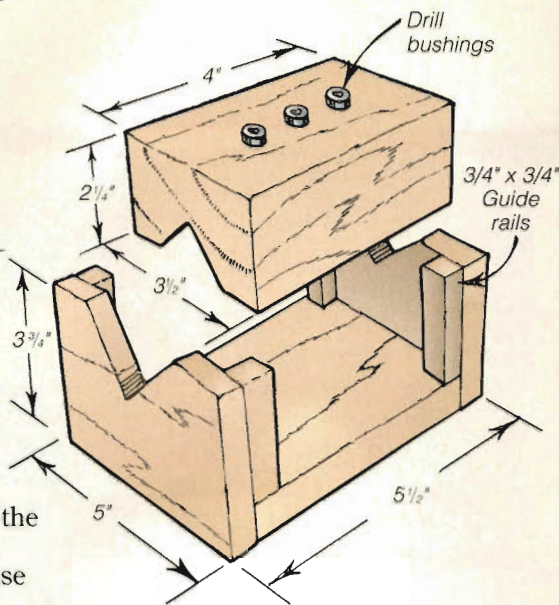


Drilling Center Holes

Here's an easy-to-make jig for drilling centered holes in round stock. It consists of two parts; a drill guide block and a base.

Start by constructing the base, cutting 90° openings in the center of both end pieces. Glue the end pieces to the base and add the four guide rails, equal distance from the apexes.

Form the drill guide block by gluing up three pieces of stock. Cut the block to size so it fits snug but freely within the guide rails. Now cut a 90° centered V-groove the long length of the block. Use a slightly undersized drill bit to



ensure a tight fit when the bushings are pressed into place. I used 1/4", 5/16" and 3/8" diameter bushings on mine. Other sizes are widely available.

Salvatore F. Pontecorvo
Fort Wayne, Indiana



Winner! Stanley H. Pulaski will receive a Makita 14.4 volt cordless drill with carrying case for submitting this month's Pick of the Tricks. **Woodworker's Journal** will pay from \$50 to \$150 for all Tricks of the Trade published. In addition, the reader whose trick is selected as our "Pick of the Tricks" will receive a free tool. Just submit your original, unpublished trick to the editor. Include photos or drawings needed to explain your idea. Send all tricks to **Woodworker's Journal**, Dept. T/T, P.O. Box 261, Medina, Minnesota 55340. E-mail: editor@woodworkersjournal.com.

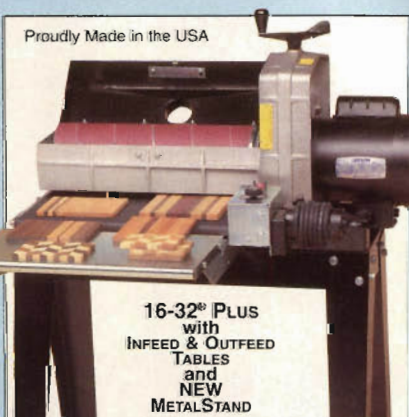
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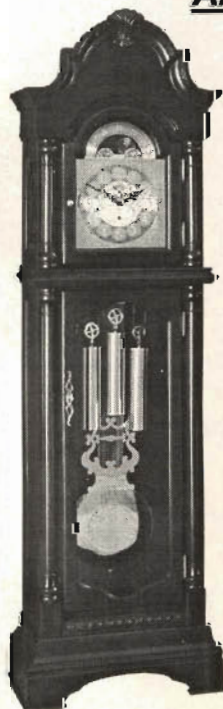
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Old Tools, Teachers and Yurts (yes, yurts)

By Joanna Werch



Cold cash for old tools: ReTool is banking on a market for tool recycling. The original carton or instructions can make the payoff from your personal scrap heap even bigger.

New Life for Old Tools

Old Tools: the Hot New Thing?

Waiting for your old tools to become antiques and make you (or your grandchildren) rich? If the new ReTool™ stores catch on, you might not have to wait so long.

ReTool stores (there are only five at this writing) will buy, sell and trade tools. For something large and bulky, they'll even send someone to your shop. "We wouldn't come out if somebody wants to sell a screwdriver," spokesman Richard Brill said, but that doesn't mean your tool has to be beautiful. "It can have dirt and dust and scratches, as long as it's in good working order," Brill

explained. If the ReTool examiners like your tool, they'll make an offer, write you

a check, and take it away. It's the same deal if you bring your tools to one of their stores.

ReTool was the brainchild of Michigan brothers Steve and Dennis Kopitz. Dennis owns several Play It Again Sports® franchises. "He knew used sporting goods have a nice marketplace, and he said, 'Gee, I bet this would work with tools as well,'" Brill said. In 1998, the brothers sold the business to Grow Biz International, Play It Again Sports' parent company. Grow Biz's goal is 500 franchises nationwide. They hope to have 45 stores up by the end of 1999 and 100 more by the end of 2000. Info on store locations is available at 800-445-1047. Interested in a franchise? Call 800-269-4075.



Hardwood Questions

Free Booklet has Answers

Did you know that to grow a pound of wood, a tree uses 1.47 pounds of carbon dioxide and gives off 1.07 pounds of oxygen? (That's a little more oxygen than the average person breathes in a day.) Or that hardwood forests today cover more than 269 million acres of the United States? (Red and white oak are still most abundant, accounting for 52% of total U.S. production.)



These facts, and a host of other hardwood details, are yours for free in a new 36-page booklet available from the Pittsburgh, Pennsylvania-based Hardwood Manufacturers Association.

Hardwood Expressions, says HMA executive vice president Susan Regan, grew out of the answers her group has been providing to consumers for the past decade. "We get a lot of questions about how to care for hardwood furniture and a lot of questions about hardwood species in general — applications and

Shop Talk continues on page 18 ...

Get More

The new MultiMaster is three tools in one: detail sander, scraper and flush-cut saw.

Detail Sander

The MultiMaster's patented oscillating motion and special triangle sanding pad permit aggressive sanding along delicate edges and in tight corners.



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Smoothly undercuts door jambs for floor coverings. Plunge cuts into wall board. Cuts wood, plaster and PVC. But because it oscillates, it won't cut you.



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Oscillation

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Until now, a Fein detail sander plus scraper and flush-cut saw would have cost you over \$300. Now, while supplies last, the MultiMaster package includes all of these accessories, and the price

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Segment Knife

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The Fein MultiMaster is a true multi-purpose tool that saves hours of time. With the MultiMaster, finishing is just the beginning.



Finishing is just the beginning.



suitability for different uses," she explained. One section describes popular U.S. hardwood species such as alder, ash, birch, beech, cherry, hickory, maple, oak and walnut. Illustrations and photos demonstrate joinery techniques, and a chapter on moldings tells you how to create a custom look with stock molding by stacking. Pictures also clarify the origin of character marks such as knots, streaks and grain patterns. For a free copy, call 800-373-9663, or check the HMA's web site at <http://www.hardwood.org>.

Woodworkers' Mentor

by Tricia A. Theis

Thirty years of dedication warrants a dedication. That was the consensus of a group of former students who made some of their first serious sawdust under Gib Taylor's watchful eye. Taylor,

founder of the woodworking program at Marlboro College in Marlboro, Vermont, retired in style last year. A show of his former students' work honored his dedication in teaching. During his many years, he inspired a diverse group. One now makes wooden



Gib Taylor's students produce an eclectic body of work, including this pedestal table by Scott Hausmann.

parts for pipe organs; another built the violin used by John Mellencamp's violinist. Turner and carver Michelle Holzapfel, whose work has been featured in the Boston Museum of Fine Arts, summed up students' feelings for their teacher: "There's so much about Gib to appreciate: his talents, his modesty, the long-haul dedication to his work and his teaching — and his dimples."



Carter Sio (right), a rustic furniture builder, joined other students in paying tribute to their retiring teacher and mentor, Gib Taylor.

photos by Jessica Lucier

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Yurts — truly

by Natalie Cosby



Californians — they're always on the cutting edge. In their latest design, a group of Golden State woodworkers have combined two of the most contradictory aspects of their craft: tradition and innovation. Bob Galbreath and his crew now build "modern yurts."

The traditional yurt is the portable home design Mongolian nomads have used for 2,000 years. Its wooden element is a collapsible frame, generally constructed with willow. The tent-like covering is felt. Galbreath and his cohorts at Geo-Lite Systems in Los Angeles call their modern yurt the Eco-Lodge. This one has a lot more wood: the walls and floors are a combination of roughsawn T-111 plywood and Douglas fir or spruce. The wooden panels are interlocking, held together with cables.

As you can probably guess from the Eco-Lodge name, Galbreath and Geo-Lite are concerned about the environment. The treatment for their pressure-treated lumber is the environmentally sensitive ACQ, instead of arsenic and chromium. They offer the Eco-Lodge equipped with solar electric panels and a battery and a system that filters water for irrigation. "We're assuming there will be trees or plants ... or something to water," Galbreath said.

They also think the Eco-Lodge itself will be an asset for ecotourism. "It can be used in remote locations, but it's plush enough that city people would want to come and stay there," Galbreath said. In fact, two people can set up an Eco-Lodge in two days with only basic hand tools, he said.

The original purpose of the design, however, was self-centered. Geo-Lite designs and installs things in remote locations — for example, satellite dishes in Yemen. "They've always provided us with housing, but inevitably it's a dilapidated trailer," Galbreath said. Now, he — and the Maine Buddhists who recently bought one — can relax in a modern yurt.

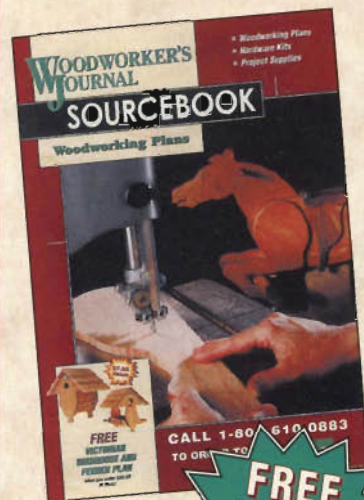
To find out more, you can e-mail Galbreath at bg4gls@loop.com, or call him at 310-216-0410.

Bob Galbreath and others at Geo-Lite use roughsawn plywood, spruce and Douglas fir to build the "modern yurt."



photos courtesy of Jonathan S. Selig

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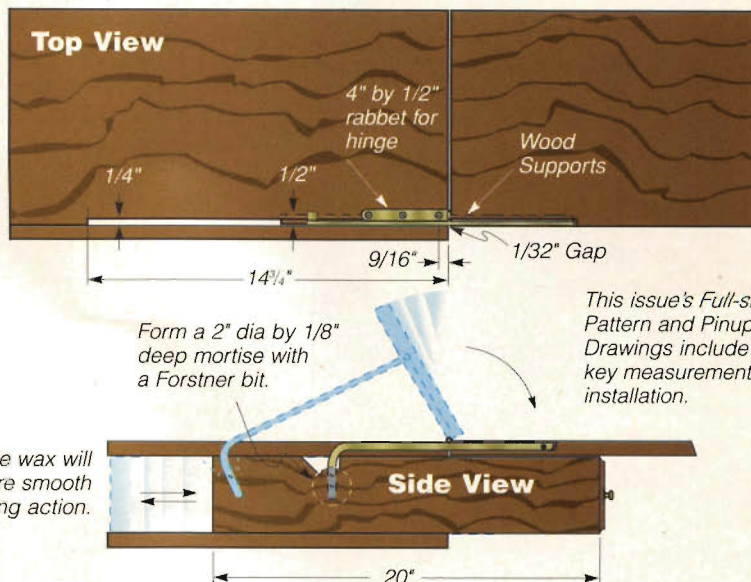
Secretary Sliding Door Support Hinges

This specialized hardware (which is used in Dick Coers' Secretary Desk in this issue) is designed both to hinge the door of a secretary desk and to pull sliding door supports out as the door descends. Combining an articulating arm with an elongated, knuckled hinge, it's very smooth and quite durable.

Installing these hinges is easier if you envision the relationship of all the pieces affected. For example, the distance the articulating arm (and door supports) will slide is directly related to the angle of the door: a door that is closed at 45° will have a longer arm travel than a door that is closed at 50°.

The L-shaped portion of the articulating arm attaches to the door support when you screw it into a slight mortise created with a 2" Forstner bit. A wedge-shaped notch cut into the top of the same support allows clearance for movement of the arm as the door opens and closes.

A rabbet routed into the edge of the door creates space for the arm and one plate of the hinge. Then, a screw driven into the edge of the door brings the arm, hinge and door together. The door rabbet matches a notch on the secretary desk's writing top, under which the door support slides back and forth.



The easiest task in installing this hinge is routing the mortises for the surface-mounted hinge plates. Screws secure these plates to the writing top, and the plates hold the whole assembly firmly in place. Use a sharp chisel to pare a 30° bevel around the hinge knuckle — the swing of the hinge is eccentric and would bind if you tried to close the door without this bevel.

Since the weight of the door is transferred to the supports, these ingenious hinges should give you years of trouble-free service.

The articulating nature of this door support hardware is a delight to watch in application. If you follow the elevation drawings and steps above, it will provide years of useful service in a family heirloom.



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- Elevation drawings
- Complete material list

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Steamer Trunk

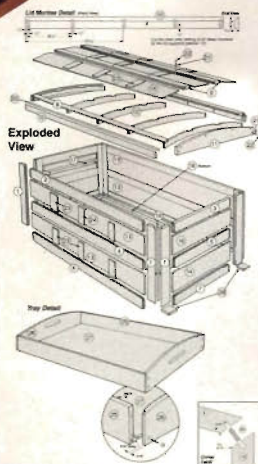
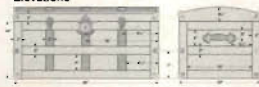
Blow away your fears in this authentic, handcrafted steamer trunk.

Instructions

Bill of Materials

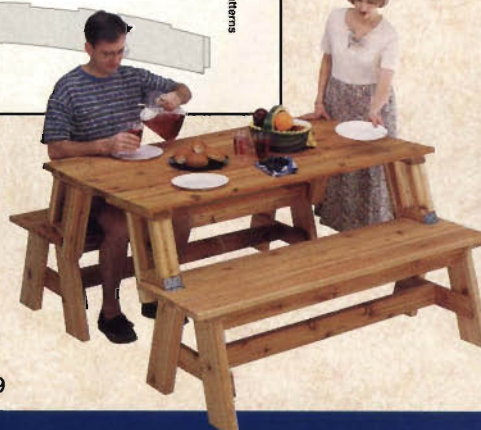
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Striking the Right Answer

Q I have had this tool for about three years. I picked it up at a junk shop, but I can't identify it. The tool is 5¼" in length and fits the hand with comfort. The large end has five flat machined surfaces on the outside. The smaller end is shaped like a small pry bar. I would really appreciate it if someone could help me identify it.

Philip Flesland
New London, Minnesota



A It also reads "Welch Bros. Co. N. Chicago Ill." on one side and "Pat. Pend. On the Job" on the other. Not that this information helped us. The Welch Brothers company that currently exists in Illinois doesn't know anything about this tool. One guess around our office is that it's a glazing tool for applying putty to



windows. Or, it might loosen and then pry out a specific kind of bolt. But what? Help us solve this month's mystery.

Q In our December 1998 issue we asked you to solve the mystery of a strangely shaped router base Jeff McVey of Boise, Idaho had purchased at a flea market. The bottom of the base was 7½" in diameter, open at the front, with a 1/2" hole in the back.

The Editors
Woodworker's Journal

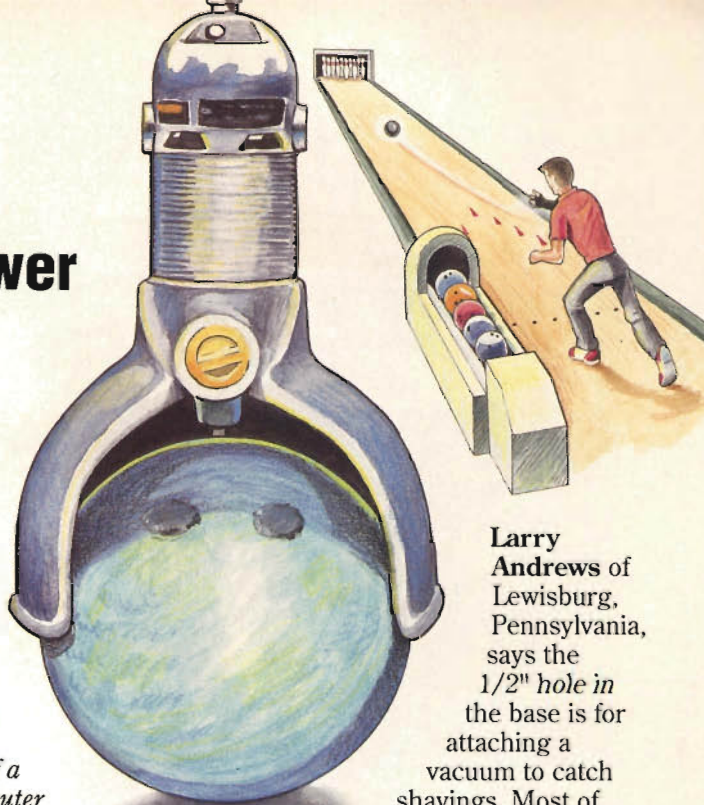
A "It did strike me as a tool used sparingly, although you won't be bowled over with this answer," wrote Terry Rencher of Annapolis, Maryland.

Gary Skibbe of Scott City, Kansas, told us that when a bowler wants to change a ball's finger holes, the pro shop plugs the old ones with epoxy. When it sets, the plugs are proud of the surface. "Bowling balls are a little more than 7½" in diameter, so the tool you pictured fits snugly on the curved surface, and then you adjust the bit to surface plane off the plugs," Gary said.

"When the surface is smooth, you just redrill the ball with new holes."



Bowling ball
plug cutter



Larry Andrews of Lewisburg, Pennsylvania, says the 1/2" hole in the base is for attaching a vacuum to catch shavings. Most of these tools now have

a clear base.

Redrilling the holes can change spin characteristics, says Mike Duff of Hastings, Michigan, or accommodate a different hand span, adds Donald Fairfield of Matsonville, California.

Stumpers continues on page 24 ...



Winner! For taking time to respond to Stumpers, A.J. Countryman of Peru, Indiana wins a collection of American Tool's Quick Grip clamps. We toss all the Stumpers letters, published and unpublished, into a hat to select a winner. If you have a question or answer, send it to the editor: Stumpers Department, Woodworker's Journal, P.O. Box 261, Medina, Minnesota 55340. Or e-mail us: editor@woodworkersjournal.com

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Tavern table, mortise and tenon mirror, weaver's chest of drawers, tissue box cover, band-sawn napkin holder, grasshopper pull toy, compact disc holder, shop-built spindle sander, wall-hung ironing board.

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Santa Fe bench, Early American mirror, shop-built sanding blocks, cookie jar holder, hourglass, candle holder, toddler cart, folk fiddle, plant stand.

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Connecticut River Valley highboy, Santa Fe chair and table, clamp rack, Provincial bench, step stool, wall desk, Marquetry top box, fork lift toy.

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Colonial bench, shop-built mortising/tenoning table, pine wall cabinet, gun/curio cabinet, tilt-action dump truck, four easy kitchen projects: cooling rack, salad tongs, serving board, recipe box.

March/April '97 (Item #33003)

Contemporary dining table, garden arbor, sunrise door mat, Craftsman-style outdoor lantern, personalized home plaque, garden gate.

July/August '97 (Item #32977)

Kaleidoscope, Arts and Crafts-style baby crib, mahogany entry door, computer facelift, small workbench.

November/December '97 (Item #32951)

Little red rocker, crow chaser, desktop bookshelf, humidior, scroll sawn Christmas puzzles, pen and pencil case, five turned projects, photo stand, carved band saw box, train display cabinet.

January/February '98 (Item #32925)

Top-drawer humidior, pine display cabinet, carved picture frame, mahogany corner shelf, Prairie-style wall sconce, rolling tool caddy.

March/April '98 (Item #32899)

Garden pergola, frame and panel chest, baker's bench, plywood storage cart, Craftsman-Style outdoor lantern.

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Garden Pergola (March/April '98)

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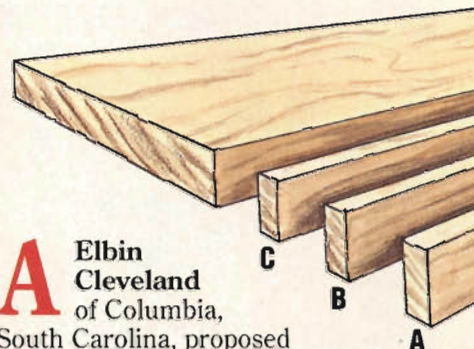
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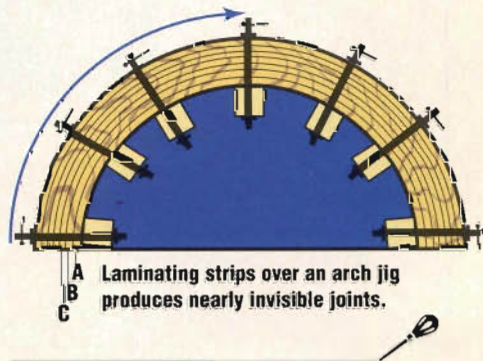
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... continued from page 22

Q You may remember Mark Smith from our October 1998 issue: he wanted to know how to make grain flow around the radius of an arch. Our method involved mitering the stock and gluing its end grain, but one of our readers had some other ideas.



A Elbin Cleveland of Columbia, South Carolina, proposed three different solutions. The first: use a fine blade to cut the 7" width into strips about half an inch wide. Laminate the strips, in the order in which they're cut, over an arch jig. For an arch with mitered segments, Elbin suggests dowel joinery to reinforce the glue. Elbin's favorite method is the blind spline joint. Mark could cut it on a table saw or plow it out with a router and a straight veining bit. "A spline joint is stronger than a dowel joint because there is more physical interlock at the joint line and more surface area for a glue bond," Elbin reminds us.



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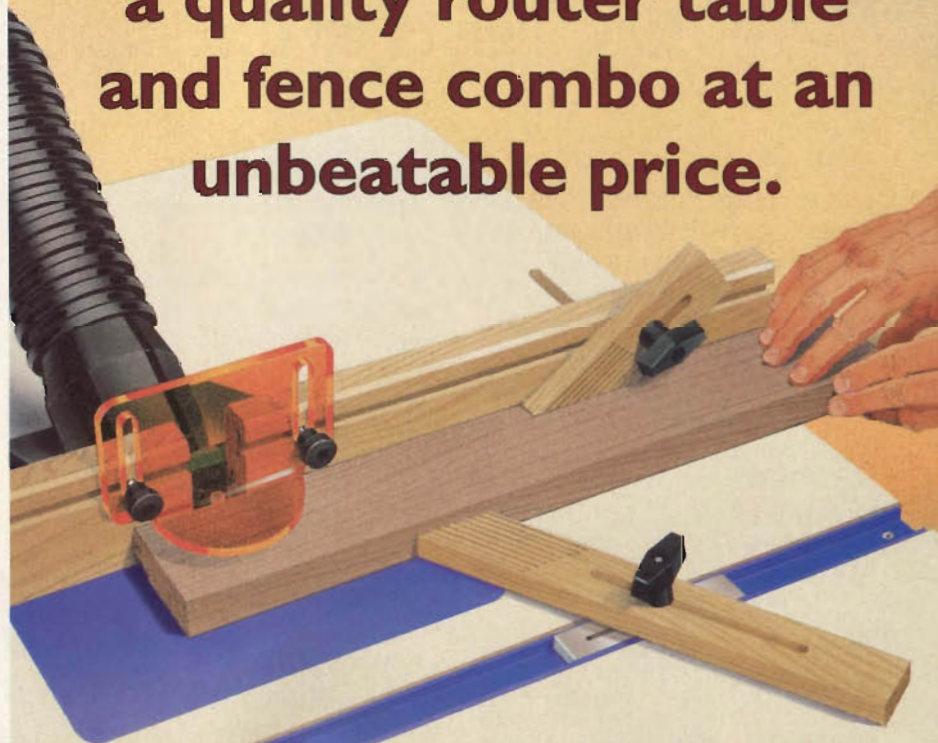
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BLOxygen works on finishes, oil stains, oil-based paint, paste wood fillers, varnishes or anything that spoils when it reacts with oxygen. Each can contains a nontoxic, nonflammable, blend of nitrogen, oxygen and carbon dioxide.

BLOxygen retails for \$8.95. For more info, call 805-542-9219.

QuickBlade: the quickest change anywhere!

Pacific Handy Cutter, the makers of QuickBlade utility knives, will tell you they're the fastest blade change in the West ... or anywhere else.

A patented release knob opens the one-piece, hinged design: no tools necessary. The DuraTip Blades reduce the risk of puncture wounds and tip breakage while maintaining strength to the leading edge of the blade.

The QuickBlade grip is ergonomic, designed to reduce fatigue when you're using this handy lightweight. Suggested retail price is about \$10. For more info, call 800-229-2233.



Just twist the knob to open QuickBlade's knife and easily change a blade — in either a retractable or a fixed blade model.



Help for Finding Your Center

Feeling off-center lately?

The CenterPoint™ line from Baklund-Hellar might help. Their new 16' construction tape, stainless steel flat rule and 12' adhesive-back bench tape recently joined the original 25' carpenter's tape as the only products on the market with a patented center-finding scale.

To use one of these tools, simply measure the distance using the top scale, then find the same number on the bottom scale: you've found the center of the work. It increases your accuracy, and saves your time.

The stainless steel flat rules are a replacement for the 0 centering rules patented in 1889, Baklund-Hellar says. The adhesive-back bench tape is a response to customers who wanted a centering rule for their work tables and chop saw and table saw fences. Retail price for both of these options is about \$10.

The 25' tape retails for \$16.95 and the 16' tape for \$15.95. For more info, call 800-540-6604.



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Dremel adds unique features

Like its name suggests, Dremel's new "Professional" high speed rotary tool is high quality, designed to last through heavy use. The unit features a soft-start system to ease the tool up to the speed a user selects with the separate on/off variable speed buttons. Operating speeds range from 5,000 to 30,000 rpm, and a digital LCD readout lets you make adjustments in 1,000 rpm increments. An electronic feedback controller gives you enhanced torque and powerful performance at low- and mid-level speeds.

A unique fan design keeps the motor cool even when it's used for an extended period of time, and the tapered, ergonomic design keeps your hand comfortable. The flexible 10' power cord lets you maneuver freely around your shop as you work with the more than 150 bits, flex-shafts, router attachments and drill press stands from the Dremel system.

The Professional comes in different kits with retail prices ranging from \$109 to \$149. All kits have a five-year warranty. For more info, call 800-437-3635.

These tools really are kid's stuff!



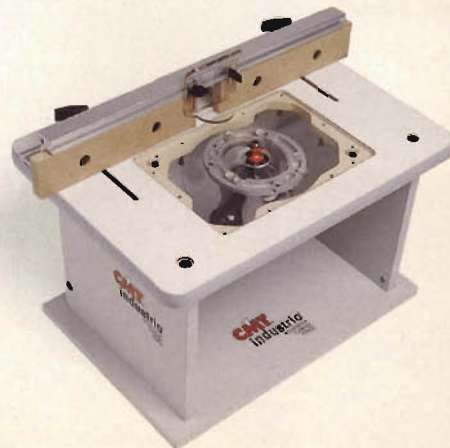
Little builders will really make the "sawdust" fly with terrific, pretend tools from Little Tikes, a Rubbermaid® company. The ActionPower™ Tools circular saw whirs like the real thing.

The nail gun makes a loud knocking sound, and the drill simulates drilling action. These toys are meant for future woodworkers, ages two and up. Each retails for approximately \$3.99. For more info, call 800-321-0183.



CMT USA Introduces New Router Table Line

CMT's industrio™ and industrio portable™ router tables have a unique offset router opening near the front edge that gives you more room to work on the tabletop — a smooth, flat surface of 1" thick MDF substrate with high-pressure laminate on both sides. Mounted in the CNC-milled top is a 3/8" insert plate and router base extender. Both tables have fences with front and back T-slots and adjustable sub-fences. The industrio table also has a miter track with T-slot compatibility and a second integral T-slot. Both tables feature a built-in dust port. Approximate retail prices are \$561 for the industrio and \$249 for the industrio portable. For more info, call 888-268-2487.





ARTS & CRAFTS STYLED DINING ROOM CHAIRS

By Rick White



THIS GUSTAV STICKLEY
INSPIRED SET OF CHAIRS
INCORPORATES SEVERAL
ELEMENTS OF HIS
CRAFTSMAN STYLE:
QUARTERSAWN OAK, HOUSED
TENONS, PYRAMID PLUGS
AND LEATHER UPHOLSTERY.



here's a well-founded belief among woodworkers that chairs are the most challenging projects to complete. While that's true, the simple lines of these classic Craftsman-inspired pieces are well within the scope of most hobbyists' abilities. That's due, in large part, to the overriding philosophy behind their original inspiration, the Arts & Crafts movement.

In the early 1900s, the Arts & Crafts philosophy swept Britain and the Americas, inspiring woodworkers to recreate the simplicity and function of medieval craftsmanship while adapting it to modern living. One of its greatest and most prolific practitioners in America was Gustav Stickley (1858-1942), a native of Wisconsin who learned his craft in Pennsylvania and upstate New York.

Stickley's early years were spent among the last vestiges of Victoriana — excessively ornate parlors hung with layered draperies and furnished with carved, gilded and inlaid furniture. In reaction to the ostentatious Victoriana style, Stickley created furniture that was sound in structure, aesthetically pleasing and yet affordable to the newly emerging middle class.

A MATCH MADE IN
HEAVEN, OR
MAYBE JUST THE
MIDWEST. GUSTAV
STICKLEY AND
ARCHITECT
HARVEY ELLIS
WERE FLINT AND
STEEL FOR EACH
OTHER ...
CREATING THE
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OF THE AMERICAN
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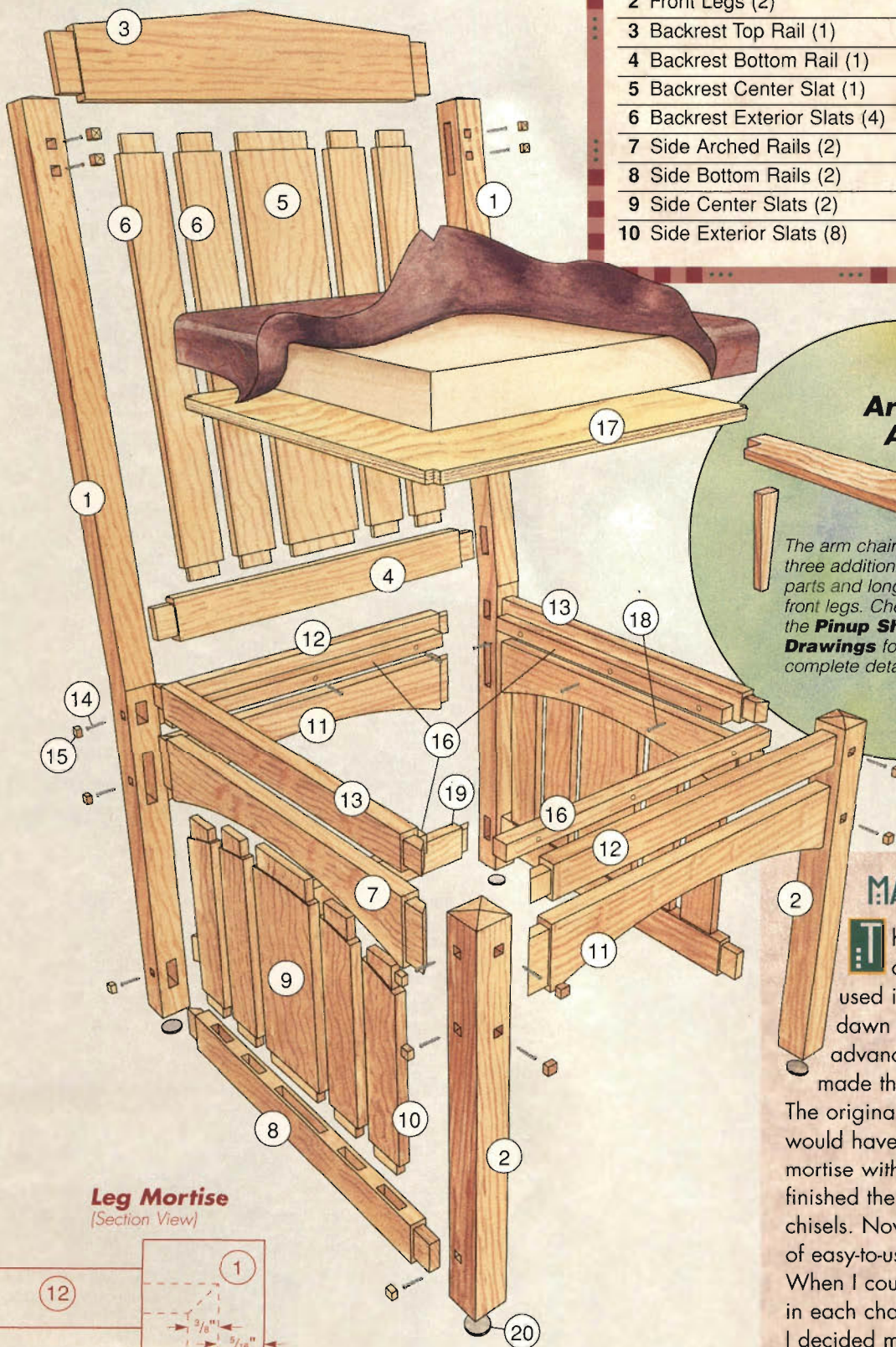


Stickley

Ellis

MATERIAL LIST

	T x W x L
1 Back Legs (2)	1 1/2" x 3" x 42 1/4"
2 Front Legs (2)	1 1/2" x 1 1/2" x 17 5/8"
3 Backrest Top Rail (1)	3/4" x 3 1/2" x 18 5/8"
4 Backrest Bottom Rail (1)	3/4" x 2" x 18 5/8"
5 Backrest Center Slat (1)	1/2" x 4" x 18 5/8"
6 Backrest Exterior Slats (4)	1/2" x 2" x 18 5/8"
7 Side Arched Rails (2)	3/4" x 3" x 18 5/8"
8 Side Bottom Rails (2)	3/4" x 2" x 18 5/8"
9 Side Center Slats (2)	1/2" x 4" x 10 1/16"
10 Side Exterior Slats (8)	1/2" x 2" x 10 1/16"



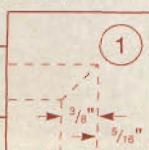
Arm Chair Add-on

The arm chairs have three additional parts and longer front legs. Check the **Pinup Shop Drawings** for complete details.

MAKING MORTISES ...

There's no great secret to cutting the stopped mortises used in this project. Since the dawn of the 20th century, advances in power tools have made the process a whole lot easier. The original Arts & Crafts builders would have bored out most of the mortise with a bit and brace, then finished the cuts with finely sharpened chisels. Now there is a new generation of easy-to-use mortising machines. When I counted the number of mortises in each chair and multiplied by four, I decided my shop could finally afford one of these timesaving machines. Perhaps there is a new mortising machine in your future.

Leg Mortise (Section View)



	T x W x L
11 Front and Back Arched Rails (2)	3/4" x 3" x 18 ⁵ / ₈ "
12 Front and Back Seat Rails (2)	3/4" x 1 ¹ / ₂ " x 18 ⁵ / ₈ "
13 Side Seat Rails (2)	3/4" x 1 ¹ / ₂ " x 18 ⁵ / ₈ "
14 Tenon Screws (20)	#6 x 5/8"
15 Tenon Screw Pegs (20)	3/8" x 3/8" x 1/2"
16 Seat Support Cleats (4)	3/4" x 3/4" x 15 ⁵ / ₈ "
17 Plywood Seat (1)	3/4" x 17 ¹ / ₄ " x 17 ¹ / ₄ "
18 Cleat Screws (12)	#6 x 1 ¹ / ₂ "
19 Back Bottom Rail (1)	3/4" x 2" x 18 ⁵ / ₈ "
20 Leg Pads (4)	1" Dia.

Our chair is a prime example of the pieces Gustav Stickley created after 1905, under the influence of noted architect Harvey Ellis. For a brief bit of time, Ellis worked for Stickley's *The Craftsman* magazine. During that short period, these two friends refined the earlier versions of Craftsman furniture and developed the look the world has come to admire: taller, more slender pieces that combine style and function.

Selecting Stock

While Stickley almost exclusively used quartersawn white oak, the same cut of red oak is quite acceptable. I settled on quartersawn

sawn board is tight at the edges and can be quite wide down the center. A quartersawn board, on the other hand, features tight grain across its entire width. This makes for a very stable piece of lumber. Whichever species you choose, let it acclimate to the humidity of your shop for at least a week before milling it to size.

Begin with the Back

The first step in construction is to lay out and cut the back legs (pieces 1) to size and shape. The legs are cut from 1¹/₂" thick by 3" wide stock. Start with 8/4 rough stock and plane it until you reach the correct thickness.

red oak because my supplier had some excellent stock featuring very dramatic ribbon effects.

The grain in a



Figure 1: Mortise and tenon joinery is the key to this chair's durability. Different mortise locations create right and left chair parts. Some of the tenons are mitered to meet inside the uprights.

Follow the profile on the **Pinup Shop Drawings** (found on the center pullout) to lay out the back legs, then band saw them to shape. Next, slice the front legs (pieces 2) from the same 1¹/₂" stock. Belt sand all four faces of each leg, then refer to the **Drawings** to establish and mark the locations of the leg mortises. These mortise locations (see **Figure 1**) create right and left chair pieces. Now is the time to

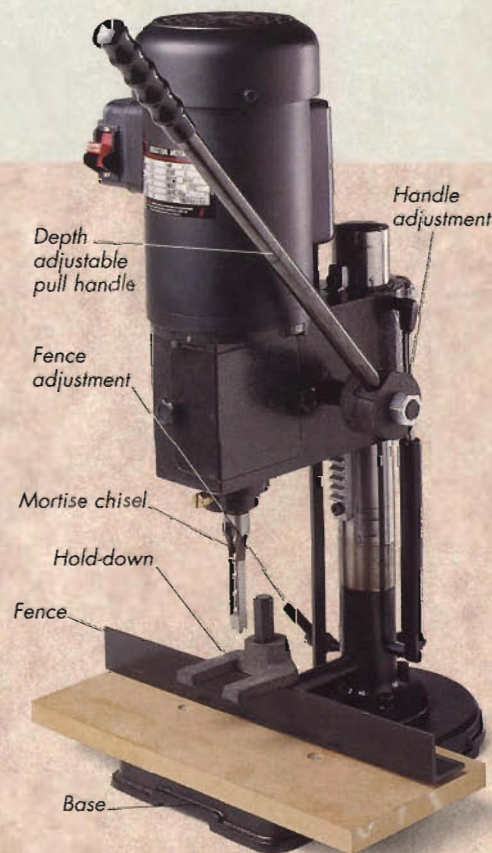
MECHANICALLY: IS IT TIME TO MAKE THE MOVE?



Drilling square holes is a snap with a mortising machine. Here's how it works: an auger-like drill bit is housed inside of a square hollow chisel. Available in many standard sizes — and able to create mortises in hardwood and softwood alike — these machines are true time savers.



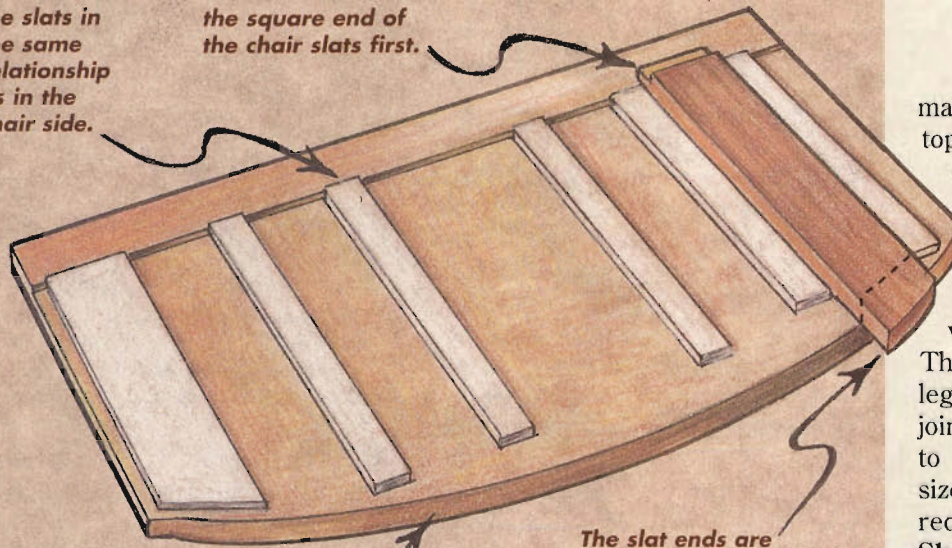
A lever locks the fence on this model in place. A hex nut secures the U-shaped hold-down. The key advantage of a mortising machine over a mortise attachment on your drill press is the longer stroke of the machine, allowing for deeper one-step mortises.



TEMPLATE TENONING: EASIER THAN IT LOOKS!

Spacers hold the slats in the same relationship as in the chair side.

Make the tenons on the square end of the chair slats first.



Create the base of the jig from 3/4" MDF.

The slat ends are shaped to match the curve of the top arched rails.



Use a routing jig and a flush trimming bearing bit to cut the gentle arc onto each chair slat.



To start the tenons on the curved tops of the side slats, use a 3/8" piloted rabbeting bit.

I made the curved tops of the side slats with this simple jig. The spacers hold the slats in position while you form the curves on their tops. Before clamping them into the jig, cut the tenons on the bottom end of each slat on your table saw. Now run a flush trimming bearing bit around the curved end of the jig to create the gentle arc on the top of each slat. Move to your router table and use a 3/8" piloted rabbeting bit to form the cheeks on the curved ends of the slats. Finish the tenons by notching their shoulders on the band saw.

make the pyramid details on the top of the legs. See the sidebar on the opposite page for the proper technique.

The backrest of the chair is comprised of two rails (pieces 3 and 4) and five vertical slats (pieces 5 and 6). The rails are joined to the back legs with mortise and tenon joinery, just as the slats are joined to the rails. Cut these pieces to size. Form mortises and tenons as required, following the **Pinup Shop Drawings**.

Build the First Subassembly

With the backrest rails and slats milled, there's only one detail to address before you can complete your first subassembly. Following the profile shown on the **Pinup Shop Drawings**, lay out the angular cut on the top edge of the backrest top rail, then trim it to shape on your band saw. Belt sand the saw marks until they are gone, then give the rails and slats a thorough sanding to 180 grit.

Dry fit the slat tenons in the rail mortises and, when everything fits perfectly, glue and clamp them together (see **Figure 2**). Make sure the subassembly is perfectly flat and square, then set the backrest aside to dry.

The Four Arched Rails

Perhaps the most challenging aspect of this chair is forming the side subassemblies. Each of these is composed of an arched top rail (pieces 7), a flat bottom rail (pieces 8) and five slats (pieces 9 and 10).

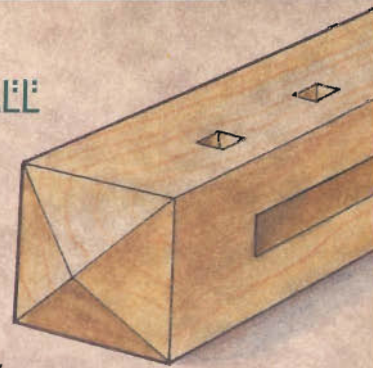
After cutting these parts, along with the final two arched rails (pieces 11) to the dimensions shown on the

PYRAMIDS: THE GREAT ... & SMALL

In a reflection of the medieval origins of his style, Stickley often softened the tops of his chair legs by milling mild chamfers that met to form a four-sided pyramid. You can duplicate this effect by setting a sharp, fine tooth, crosscut blade to 15°, then using your table saw's miter gauge to help you make these cuts. If your saw table is too big for the crooked back leg to lie flat, simply raise the blade,



reverse the piece, and run the gauge in the opposite slot. To make the small pyramid plugs, sand long thin pieces of stock on your stationary sander with the miter gauge set at 15°. Trim them to length with your band saw.



Material List, follow the **Pinup Shop Drawings** to lay out the mortises in the side arched rails. Chop these mortises, then transfer the arched profile from the **Full-size Pattern** to all four of the chair's curved rails, and band saw them to shape. Clean up the cuts with a drum sander chucked in your drill press.

Follow the procedure shown at left to mill the curved tenons on the top of the side slats. Create the bottom rails and arched rails with mitered tenons as indicated on the drawings. The tenons on the bottom rail penetrating the front leg are not mitered. When they fit snugly, glue and clamp them together, again checking to be sure they are flat and square. While the glue dries, mill mitered tenons on the final two arched rails and the four seat rails (pieces 12 and 13).

Preassembly Details

While mortise and tenon joinery is extremely strong, a dining chair is subject to a lot of use and movement. To help prevent the joinery from ever loosening up, most of the tenons are locked into their mortises with short screws driven through the shoulders into the mortise walls. These screws (pieces 14) are set below the surface in their own small mortises, then plugged with square hardwood pegs (pieces 15). Locate all twenty of these small mortises on the **Pinup Shop Drawings**, then chop them to the dimensions shown in the **Elevations** on the pullout.

Four cleats (pieces 16) support the plywood seat (piece 17). Cut these to size, then refer to the **Pinup Shop Drawings** for the locations of the screws (pieces 18) that will hold them in place. Predrill countersunk pilot holes for these screws, then cut the back bottom rail (piece 19) to size and mill mitered tenons on its ends (see **Pinup Shop Drawings**). Sand all the chair elements to 180 grit before starting the final assembly.



Figure 2: Glue up the subassemblies of the back and chair sides. Make sure they are flat and square. After the glue has cured, move on to the final assembly.

It's essential that assembly takes place on a flat, stable surface, and that each component is checked for squareness and plumb as the clamps are tightened.



Dining Room Chair Project Supplies

The following supplies are available from Woodworker's Journal.

Mortise Machine #13718\$249.99
 3/8" Mortise Bit and Chisel #13744\$16.99
 Leg Pads #62513\$3.99
 Bartley Walnut Gel Stain #76968.....\$8.49
 To order your supplies, call 800-610-0883.

UPHOLSTERY BASICS:



To complete your seats, trim the leather to a 24" x 24" square. Then, on the rough side of the leather, mark a 3 3/4" square in each corner. Next, mark a 1" strip diagonally from the inside marked corner to the outside edge of the leather. Trim on your lines to create the shape shown above.



Cut 2" thick high density foam on your band saw with the table set at 30°. The smaller face of the foam should match the size of the plywood. Round over the plywood edges.



Gently pull the side flaps up and secure the leather with staples. Keep the tension across the seat even. Pull the strip up snugly and staple as shown below. If the corner is too bulky, you may need to trim a bit of foam.



Assembling the Chair

There's a logical order to the assembly process: you'll work from the back to the front. Begin by laying out all the parts and subassemblies, so you're not searching for pieces while reaching for clamps. Dry fit everything to make sure there are no problems before you start gluing.

Lay one of the back legs on its side, then glue the seat back subassembly, the back seat rail, the back arched rail and the back bottom rail snugly in place. Turn them upside down and glue their tenons into the mortises in the other back leg, clamping the entire subassembly so it is flat and square. Drive home the four small screws in the top, front screw mortises. Let the glue cure before proceeding.

When the glue is dry, lay the back subassembly on its back and glue the two side subassemblies in place, along with the two side seat rails. Working quickly now, glue the front seat rail and arched rail into the front legs, then glue and clamp the front subassembly to the sides. Snug up your clamps and stand the chair on a flat, level surface before tightening them. Make sure everything is square and true as you apply pressure, then drive home the rest of the small tenon screws.

After the glue dries, plug all the screw holes. The easiest way to do this is to rip a long piece of stock to

the thickness and width of the plugs, then trim them a little longer than you need them. Four of the plugs are sanded to small pyramids and glued in place. The rest are glued in place and sanded flush. Level the legs if needed (see below) and move on to finishing.

Finishing Thoughts

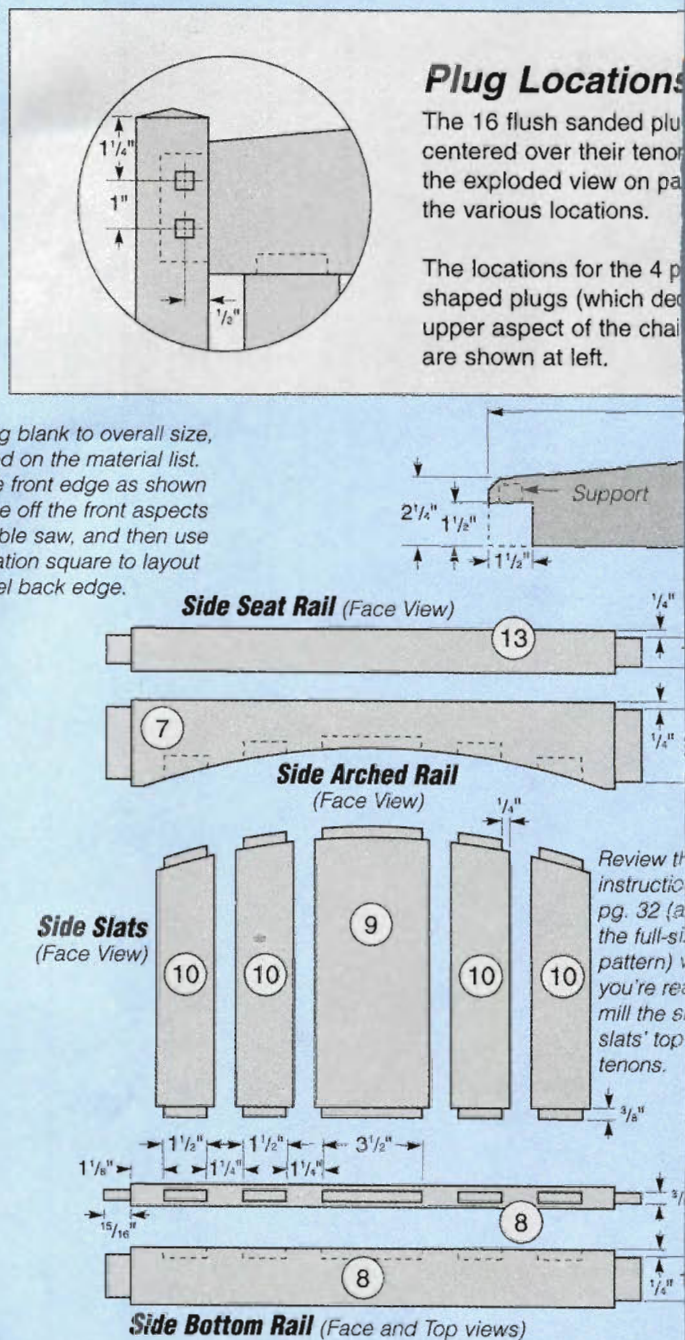
After a final sanding, I applied Bartley's dark walnut stain, then sealed it with three coats of a compatible low luster finish. Polyurethane is a good choice, because it's rugged enough to endure the constant handling and use of a dining room chair.

Stickley's seats were often upholstered in soft, brown leather. For instructions on completing that task, refer to the sidebar at left. When you're done, screw the seat support cleats in place and attach the plywood seat to them with screws. Then stick a felt pad (piece 20) to the bottom of each leg, and you're ready to start seating guests at your celebration dinner party.

On a level surface, check to see if your chair rocks. If so, make a line exactly the same distance up from the surface on all four chair legs. Sand carefully to the lines, and your chair will sit flat.

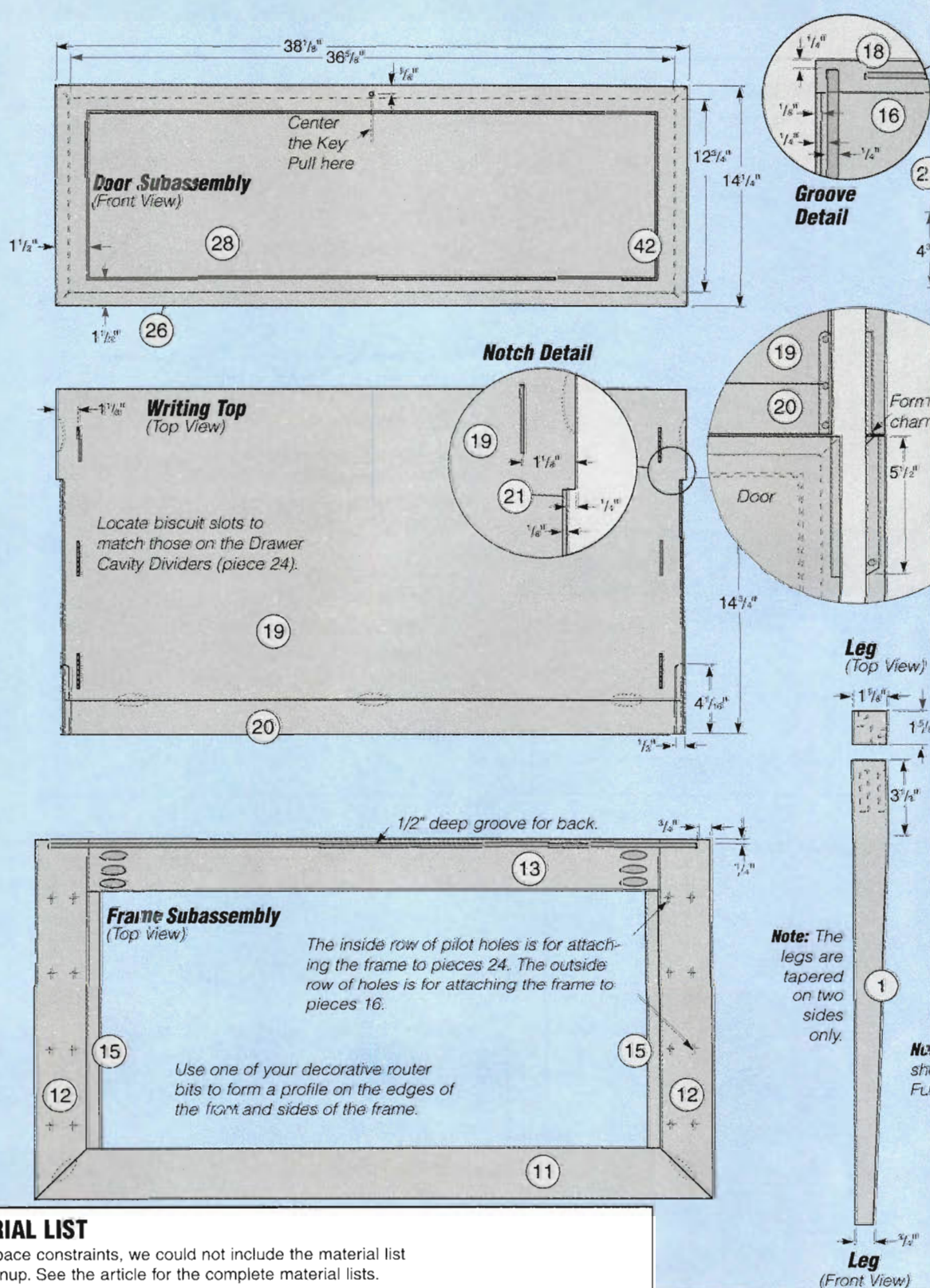


Dining Room Chairs



T x W x L

1 Back Legs (2)	1½" x 3" x 42¼"	8 Side Bottom Rails (2)	3/4" x 2" x 18½"
2 Front Legs (2)	1½" x 1½" x 17⅝"	9 Side Center Slats (2)	1/2" x 4" x 10½"
3 Backrest Top Rail (1)	3/4" x 3½" x 18⅝"	10 Side Exterior Slats (8)	1/2" x 2" x 10½"
4 Backrest Bottom Rail (1)	3/4" x 2" x 18⅝"	11 Front and Back Arched Rails (2)	3/4" x 3" x 18½"
5 Backrest Center Slat (1)	1/2" x 4" x 18⅝"	12 Front and Back Seat Rails (2)	3/4" x 1½" x 18½"
6 Backrest Exterior Slats (4)	1/2" x 2" x 18⅝"	13 Side Seat Rails (2)	3/4" x 1½" x 18½"
7 Side Arched Rails (2)	3/4" x 3" x 18⅝"	14 Tenon Screws (20)	#6 x 5/8"

Federal Secretary Desk

Secretary Desk

Form notch
with your
band saw.

Attach
arm he

25

Door Supports

Form this 2"
diameter by 1/8"
deep mortise with
a Forstner bit.

42

Large Tape Dispenser

Small Tape Dispenser

Inner Laminations (2)

2

Drill ballast holes
in the inner
laminations only.

Outer
Laminations (2)

1

Use a file to
taper these
channels on
each side.

3

Tape
Wheel

Bullet catch location (wheel
and outer laminations). Use
countersink bit to form slight
mortise for bullet catch.

Dining Room Chairs

Use this pattern to scribe the curves on the
four arched rails and to lay out the curve on
the tenon template (details at right).

7

11

Arched R

Form the mortises in
two of the arched rails
before cutting the
curve on their bottoms.

Don't worry
void above t
tenons on th

Full-Size Patterns

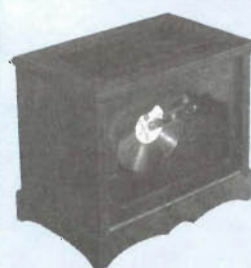
- Open staples carefully, remove pattern and fold staples back in place.
- Use graphite paper (available at art supply stores) or cut and trace full-size patterns onto your stock.
- Cut out the elevation drawings and pin them to your shop wall.



Federal Secretary
Elevations of joinery and construction details, plus info on building the inlay jigs. Full-size pattern for the door supports.



Dining Room Chairs
Mortise and tenon locations, arched rail details (and a full-size pattern) and elevations for the additional arm chair parts.

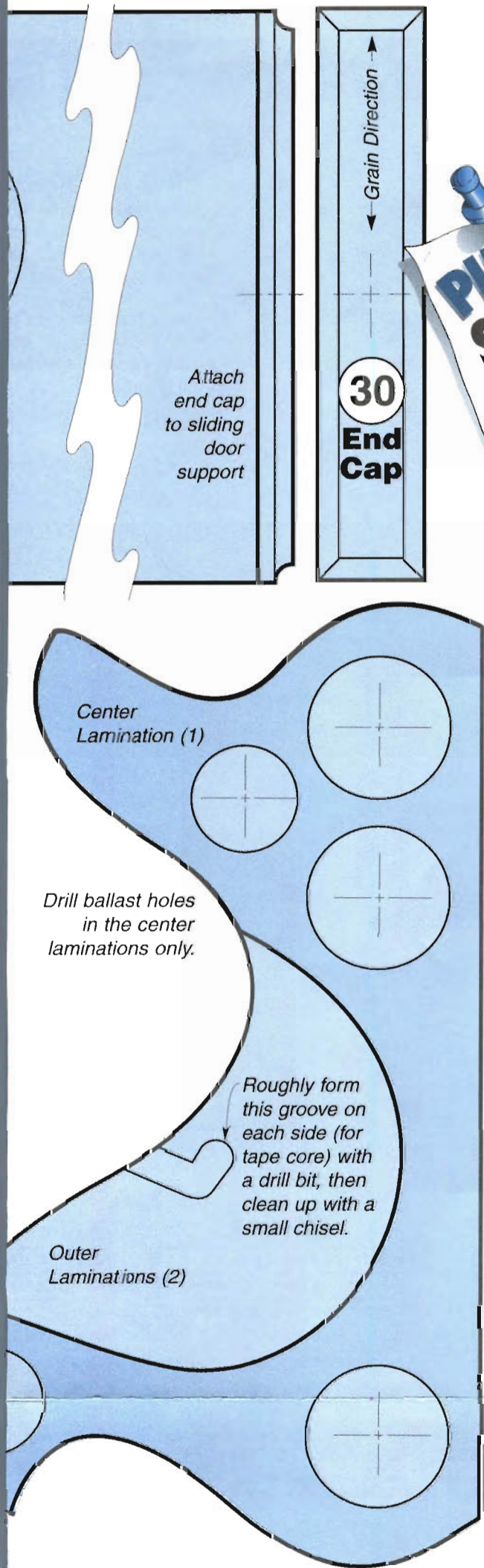


Disk Music Box
Full size patterns to layout the templates for the music box door.



Weekend Wonders
Complete full-size patterns of the tape dispenser parts.

WOODWORKER'S JOURNAL
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Square outer pattern for door glass.

The corners are chopped square after routing.

Use these two full-size patterns to lay out the templates for the music box door. The shaped inner pattern is for the through cut and the square outer pattern (with rounded corners) is for the 1/4" deep cut that houses the glass.

5

6

Base Molding Pattern
Transfer these profiles to the lower edges of the base moldings.

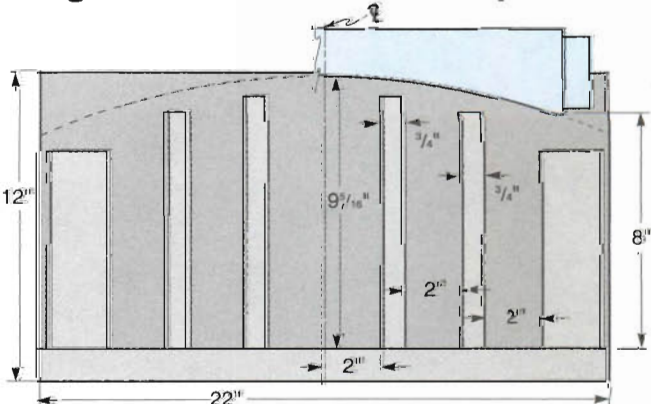
Music Box

See page 31 for template routing instructions.

Use a 3/4" brad point bit to precisely locate these inside corners on your template material, then cut close to the lines with your jig saw. Finish the template by filing and sanding to the line.

Shaped inner pattern for through cut.

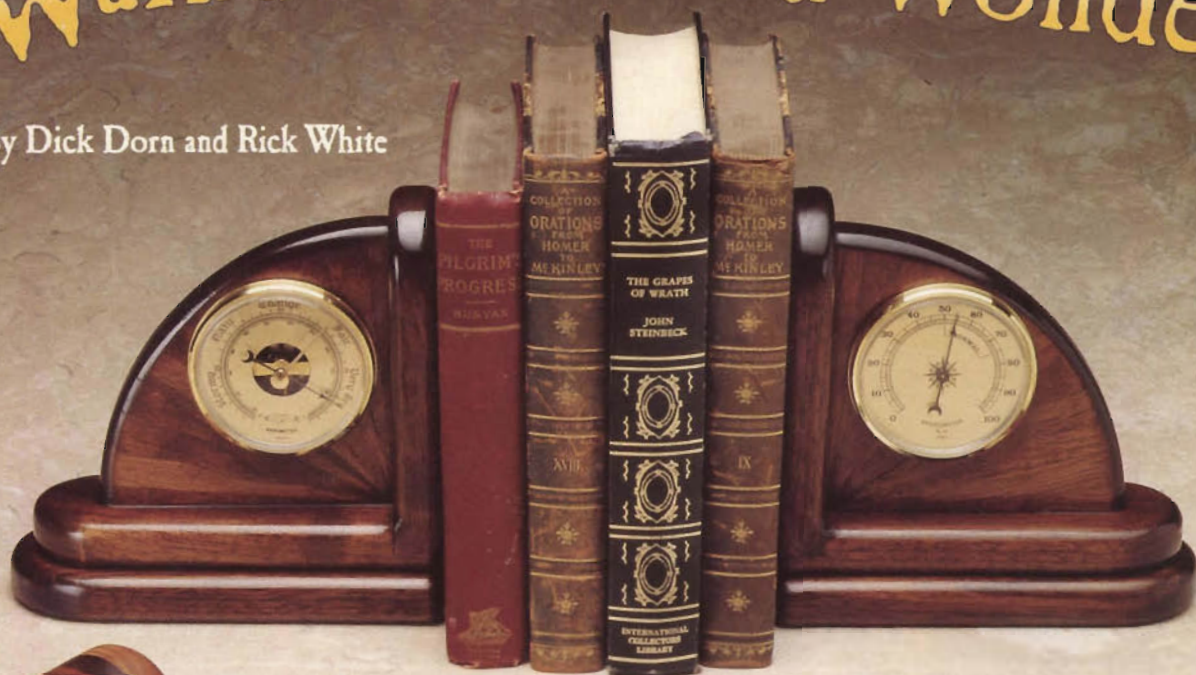
Making the Curved Tenon Template.



Use the bottom shape of the pattern at left to transfer the curve of the arched rails to the top edge of your **Curved Tenon Template**. See the sidebar on page 32 for the routing instructions.

Walnut Weekend Wonders

By Dick Dorn and Rick White



One of the great joys of our craft is the ability to turn shop waste into usable, even treasured items. We've all spent a Saturday going through the scrap bin and coming up with a great kid's toy or a new shop jig, using stock that other people might consider to be nothing more than kindling. With that in mind, we asked Dick Dorn and Rick White to do a little rummaging and see what they could come up with.

Two of our contributing editors dip into their scrap bins to create projects that can be completed in a weekend. 🐾



Rick White's Barometrical Bookends

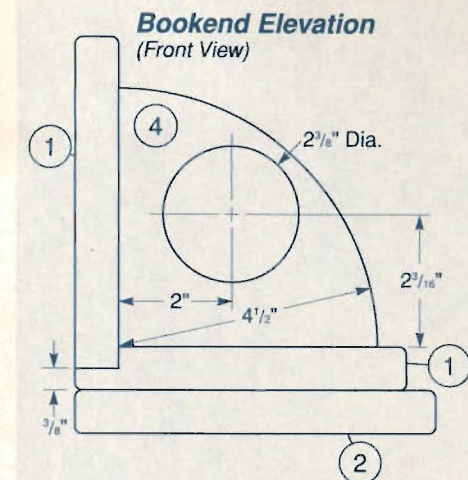
When I'm not in the shop, my hobby is fishing. So, the weather plays a major role in determining where you'll find me. On stormy Saturday mornings, I like to sit at my shop desk, catch up on the latest woodworking articles and keep one eye on the clouds. As you might guess, bookends that help me decide when it's time to go fishing were just about the perfect choice for my weekend project.

There are only eight parts to each bookend, and their dimensions are given in the **Material List** at right. Select some straight, close-grained, knot-free stock (I chose clear walnut), then you can start building.

The core of these bookends is the right angled subassembly comprised of two identical blocks (pieces 1). After cutting all four to size, use your table saw and miter gauge to nibble away the rabbet on two of the pieces. Refer to the **Elevation Drawings** at right for the dimensions.

Dry fit the blocks to make sure they form a perfect right angle, then use the **Elevation Drawings** to lay out the arc at the end of each block. Band saw the arc, then sand out the saw marks for a perfect curve, stacking the pieces to keep them symmetrical.

The two bookend bases (pieces 2) are made in much the same way as



the slightly smaller blocks. Lay out the pattern, then band saw and sand them to shape. Instead of rabbets, the only milling required here is to drill out a few stopped holes in each base, as shown above. These are for the lead shot (piece 3) that will provide the necessary ballast for the completed bookends.

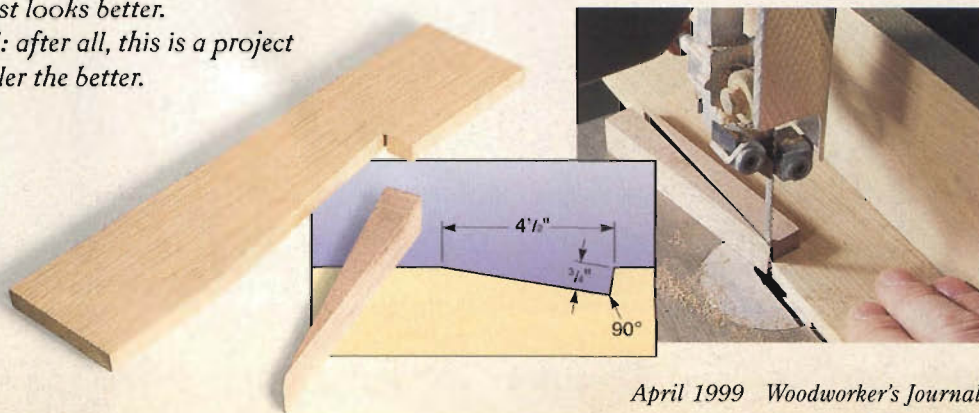
Follow the instructions below to cut, glue and trim the two quarter circles of walnut wedges (pieces 4). When the glue dries, use the **Elevation Drawings** to lay out the opening for the instruments. Form them with a hole saw mounted in your drill press, and you're ready to start assembly.

Cutting Wedges and Gluing Up a Quarter Round

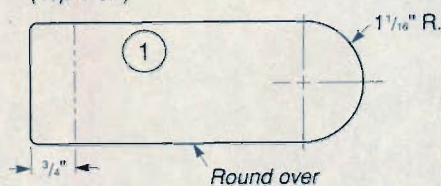
The only difficult process in this project is creating the quarter circles for the barometer and thermometer. While you could simply cut them to shape from a single board, there are two good reasons for taking a little more time and building them up with wedges. The first is that it just looks better. The second is more practical: after all, this is a project to use up scraps — the smaller the better.

To cut the wedges to shape, band saw the simple jig shown below from a length of scrap stock (I used 1/2" thick material so I could get a good grip on the 3/4" thick workpieces). Set your table saw fence 2 3/8"

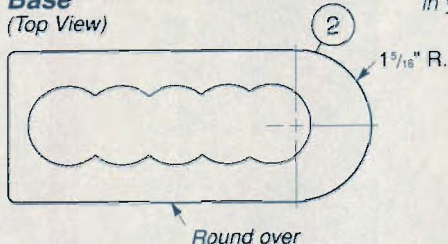
Make your wedge cutting jig 2 3/8" wide and cut the notch exactly 3/4" deep and 4 1/2" long.



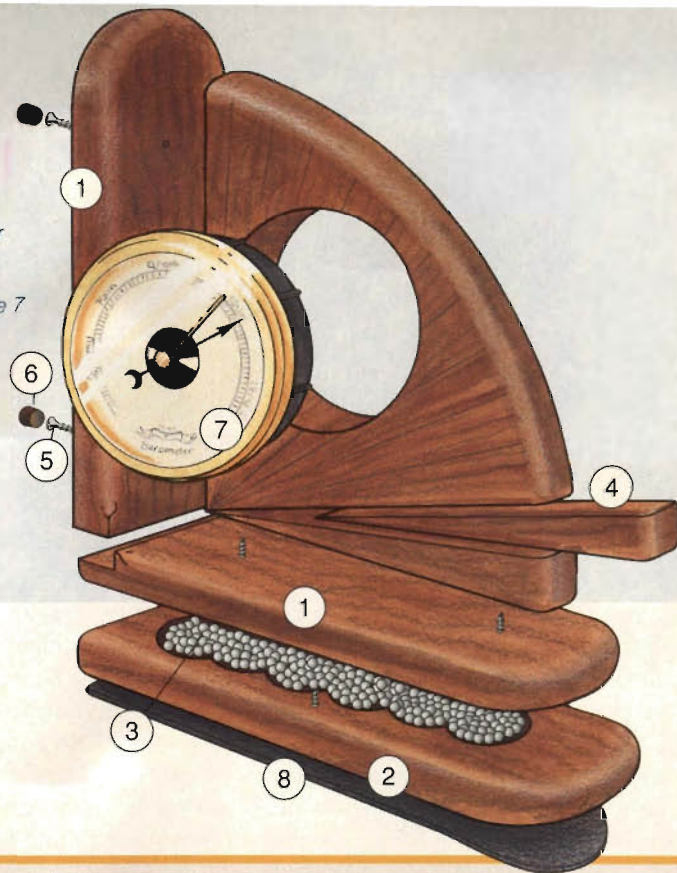
Right Angle Block (Top View)



Base (Top View)



You can choose to forecast the weather with a thermometer, barometer or hygrometer as piece 7 in your bookend.



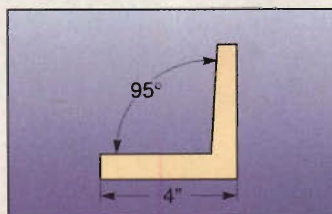
Dry fit the rabbeted blocks and wedge subassemblies together, then predrill and counterbore for the screws (pieces 5: see **Elevations** for locations and bore dimensions). Apply glue and drive the screws home. Take a quick trip to the bait shop (always a good idea) to get enough split-shot to fill the base holes. Screw and glue the bases to the bottom blocks, and cover the exposed screws with hardwood plugs (pieces 6), glued in place and trimmed flush. After sanding, apply three coats of clear, satin finish, install your instruments (pieces 7), and cut a rubber, non-slip pad (piece 8) for the bottom of each bookend.

Material List — Two Bookends

	T x W x L
1 Right Angle Blocks (4)	3/4" x 2 1/8" x 5 3/4"
2 Bases (2)	3/4" x 2 5/8" x 6 1/4"
3 Ballast	Lead shot
4 Wedges (24)	3/4" x 3/4" x 4 1/2"
5 Screws (12)	#8 x 1 1/4"
6 Plugs (4)	3/8" dia.
7 Weather Instruments (2)	2 3/8", Brass finish
8 Bottom Pad (1)	Rubber, cut to fit

from the blade, and trim 24 wedges from the edges of wider scrap boards. Be sure the blade has come to a full stop before reaching for small parts.

Gluing up the cut wedges isn't as simple as it looks. You must keep all the points lined up while you apply clamping pressure against the sides. Another simple jig (shown at right) helps you accomplish this. Band saw the clamping jig from 3/4" scrap, then apply glue to the wedges and set their points in the jig's inside corner, as shown. Apply pressure with a band clamp.



The clamping jig is cut a little over 90° so the band clamps can draw the wedges together. Trim the 1/4 circle to final size on the table saw.

After the glue dries, sand the faces of each wedge assembly before trimming to size. Band saw the outside radius (see **Elevations** above for dimensions), then trim the straight edges to 90° on your table saw.





Dick Dorn's Masking Tape Dispenser

Since retiring, I'm finding more time to chat with visitors. With that in mind, I designed this large masking tape dispenser as both a useful desk accessory and a fun conversation piece. The body is comprised of four laminations (pieces 1 and 2), allowing you to work around large knots and other irregularities

commonly found in your scrap bin.

Photocopy the **Full-size Pattern** found at the center of the magazine and, after face gluing stock for the interior laminations and the tape wheel (piece 3), attach copies of the pattern to your blanks. Band saw all four parts to shape as shown in **Figure 1**. Then drum sand and file away the saw marks. Now bore 1"

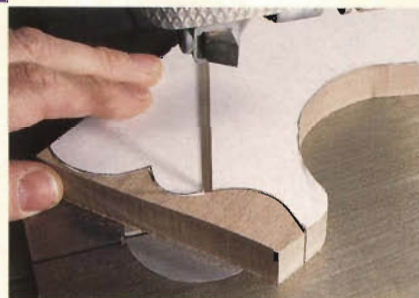


Figure 1: Band saw the laminations to size using the **Full-size Pattern** as your guide. Use your drum sander to clean up the saw marks.

15/16" thickness. It should rotate freely between the laminations.

The wheel is mounted in the dispenser by a pair of bullet catches (pieces 4). Following the **Pattern**, drill a hole through the center of the wheel, then dry fit the catches. Use a countersink bit to set their lips flush with the wood, then remove them with a pair of pliers. Drill a pair of shallow, stopped holes for the bullet catch strike plates, then attach them with epoxy. Align their mouths with the tapered lines on the **Full-size Pattern**.

Tapering the channels which guide the bullet catches to their strike plates is a simple filing operation: check the **Pattern** for dimensions and stand the exterior laminations together as you work to ensure the tracks line up with each other.

Assemble the Dispenser

After a dry fit, mark the locations of the tape opening on the outside laminations, then round them over at the opening with a 1/4" radius bit. (Note: You'll shape and feather the corners of this recess later.)

Glue and clamp one outside lamination to the interior core and, when the glue is dry, fill the holes with small lead shot (piece 5,

Material List — Masking Tape Dispenser

	T x W x L
1 Outside laminations (2)	3/4" x 6 1/8" x 10 1/8"
2 Inside laminations (2)	1/2" x 6 1/8" x 10 1/8"
3 Tape Wheel (1)	1" x 3" Diameter
4 Bullet Catches (2)	Brass
5 Counterweight (1)	Lead shot
6 Brass Tape Cutter (1)	1/32" x 1 1/2" x 3"
7 Bottom Pad (1)	Cut to fit

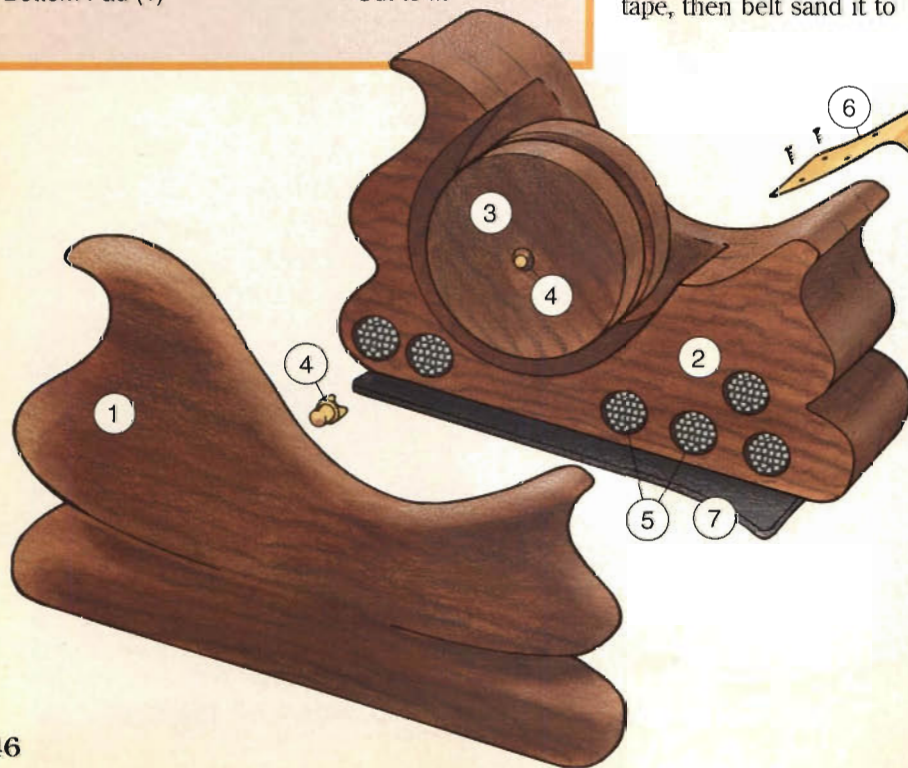




Figure 2: Use a Forstner bit to form the holes for the lead shot counterweight. After filling the holes with shot, pour a little epoxy over it to eliminate any trapped air.

available at hardware stores). Then glue and clamp the second exterior lamination in place.

Final Shaping

Round over the outside edges of your glued-up dispenser using a 1/4" radius roundover bit in your router. The router bit won't reach into every nook and cranny, so you'll have to do a little hand filing in the corners. Start with a coarse rasp, then finish up with a milled bastard file and sandpaper. Work down through the grits from 60 to 320.



Figure 3: A rotary tool is perfect for forming the teeth on your brass tape cutter. Leave the protective plastic in place until you're done working the brass.

Use the same sequence to shape the four deep V-shaped cuts that separate the top of the body from the base. I cheated a little here and started each with a short 1/4" deep table saw kerf. This kept the cuts parallel with the bottom of the dispenser and guided the rasp during initial shaping.

The Brass Tape Cutter

A brass cutter has a couple of advantages over other metals. Brass is soft enough to work, and it really complements the finished walnut. The plate (piece 6) can be purchased at a jewelry store and comes with a peel-off plastic coat that shouldn't be removed until it is installed on the dispenser. Trim the plate to size with a tin snips, then clamp it in a vise and form the teeth with a three-corner file or a rotary tool cut-off disk (see **Figure 3**).

Form the sharp bends on this piece by clamping it in a vise and using a scrap of wood to exert equal pressure across its width. Form gentler curves — to match the contour of the dispenser — by bending the plate around a large dowel. Drill the pilot holes and set the brass tape cutter aside.

Finish and Final Assembly

A rubbed or sprayed finish works best on this piece, because a brush can't reach into all the nooks. Steel wool or sand between finish coats until you achieve a rich, deep luster. After the finish is dry, glue a felt or rubber pad (piece 7) to the bottom, then screw the brass plate in place. Install the catches in the wheel and secure them with a drop of epoxy — making sure you don't lock the bullets in place.



Cellophane Tape Dispenser

You can build a smaller version of the masking tape dispenser to handle Scotch tape. The construction process is almost identical, except it only requires three laminations and no tape wheel. Instead, this dispenser uses an inexpensive plastic core, available at office supply stores. Drill a series of holes (see the Full-size Pattern) in each exterior lamination to create a path for the core's axle pins, then complete the paths with a carving knife.



Instead of bullet catches, the smaller tape dispenser features a drilled and refined path for the tape core's axle pins.

The small dispenser requires a lot less shaping. Its edges are still rounded over, but there's no need to form deeply sculpted cuts on the exterior faces. The shot loading, assembly and finishing steps are virtually identical to the masking tape dispenser process.

Project Supplies

The following supplies for both the bookends and tape dispenser are available from Woodworker's Journal. Please call 800-610-0883 to order.

Hygrometer #16841.....\$6.99

Barometer #16867.....\$12.99

Thermometer #16859.....\$5.99

2 3/8" Hole Saw #90303.....\$11.49

Arbor* (3/8" shank) #90301.....\$12.99

5/16" Bullet Catches** #28472.....\$5.99

* Hole saw requires an arbor. ** Eight strikes and pins per package.

Historic Music Box

The disk music box, a forerunner of the phonograph, caused quite a stir when it was invented in 1870. Cylinder musical movement manufacturers cried foul over the newfangled invention that actually allowed owners to change tunes whenever the spirit moved them. Imagine!

By Larry Stoiaken



Antonine Favre, a young watchmaker from Geneva, Switzerland, is credited with the invention of the mechanical musical movement, back in 1796.

Today's novelty item was something entirely different back then. For the first time in history, people could listen to mechanically reproduced music in the privacy of their own homes. Close to 100 years would pass before the invention of the phonograph in 1877.

The 1870s also saw the introduction of disk musical movements, which allowed music connoisseurs to actually change tunes. Cylinder music movements narrowly avoided the fate later dealt to eight track tapes because, fortunately, someone developed interchangeable cylinders just in time.

Swiss musical movement manufacturer Reuge Music still makes both of these styles today. Once you

see their movements in action, you'll understand our basic design premise — the last thing you want to do is hide this beautiful hardware.

Start with the Frame and Base

This is a relatively easy project that can be completed in one weekend. Get started by forming the top frame (pieces 1 and 2) from one 36" length of 1/2" stock. Glue French provincial molding (piece 3) to the outside edge of this stock and then use a zero-clearance insert in your table saw to plow a groove on the inside edge for



In 1865 Charles Reuge moved to Sainte-Croix, Switzerland to make musical pocket watches. Twenty years later his son Albert (below) opened the first workshop of musical movements under the Reuge name.



the top panel (piece 4), as shown in the **Elevation Drawings** on the next page. (Note: French provincial molding is available in the supplies box at the end of this project.)

Form the base moldings (pieces 5 and 6) from a 36" length of 1/2" stock. Cut a rabbet along the inside top edge to accept the box carcass and add a 45° chamfer on the top outside edge, as shown on the **Elevation Drawings**. Miter the pieces to length and turn to the band saw to form their shaped edges (see the **Full-size Pattern** at the center of the magazine). After using a drum sander to smooth your band saw cuts, glue the base molding together, using a web clamp to keep equal pressure all around. Be sure to check for squareness as you tighten.

Machine the Box Pieces

Cut the sides, bottom, back and divider (pieces 7 through 10) to overall size. Follow the **Elevation Drawings** on the next page to form the various rabbets in the sides and the back. Dry fit these parts into the glued-up base subassembly to be sure everything fits correctly.

Now form a long mortise for the piano hinge that will attach the top to the back (see **Elevation Drawings**). I made this mortise the full depth of the piano hinge to avoid a matching mortise on the top.

Once you are sure the box is sized correctly, chuck a 9° by 3/8" dovetail bit in your router table and plow a dovetail groove down the inside face of each side, as shown on the **Elevation Drawings**. Adjust your fence to form the tails on the divider (piece 10). You'll want a snug fit — I recommend making these cuts on a scrap piece first, adjusting the fence until your setup is perfect.

Top Assembly

Select a particularly fine piece of 1/2" walnut for your top panel. Use the table saw to form a 1/8" tongue (with beveled shoulders) around its edge. This tongue will be inserted into the frame grooves you made earlier (see **Elevation Drawings**). Sand your panel through 220 grit now, since it will be hard to get at the bevels later. (Just be sure you don't turn your bevel into a roundover.) Now miter the frame pieces to size, testing the fit on your panel as you go. When the fit is perfect, glue the frame around the panel, keeping the glue out of your grooves so the panel can expand and contract with the seasons. I recommend epoxy for small miter joints like this.

Box Assembly

Now that your top is completed, it's time to bring the box and base together. Gather the sides, bottom, back and divider. Glue and clamp the box pieces, keeping the glue

Reuge Music SA:

A different kind of sound

With a history dating back over 100 years, Swiss-based Reuge Music SA has had plenty of time to get their sound right. The company remained in the hands of the Reuge family until 1988, when a group of Swiss investors took over. They promised to modernize the plant while keeping intact the traditional craftsmanship and Old World skills responsible for Reuge's reputation as the top musical movement maker in the world. After completing my first project with one of their movements, I'd have to say that the Reuge name is in good hands.



Musical Project Supplies

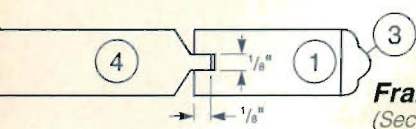
The Reuge disk musical movement used with this project is available from *Woodworker's Journal*, along with a selection of eight 4 1/2" disks. Fully wound, each movement will play a disk for about five minutes.

Disc player #50060.....	\$229.99
Lara's Theme #50072.....	\$12.99
Edelweiss #50084.....	\$12.99
The Magic Flute #50108.....	\$12.99
Silent Night #50132.....	\$12.99
All I Ask of You #50144.....	\$12.99
Swan Lake #42951.....	\$12.99
Blue Danube #42964.....	\$12.99
Spring Song #42977.....	\$12.99

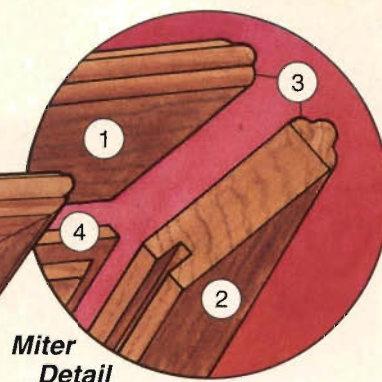
To order your supplies,
call 800-610-0883



A price tag of over \$200 is your first hint that Reuge's disk musical movements are something special.



Frame and Panel
(Section View)

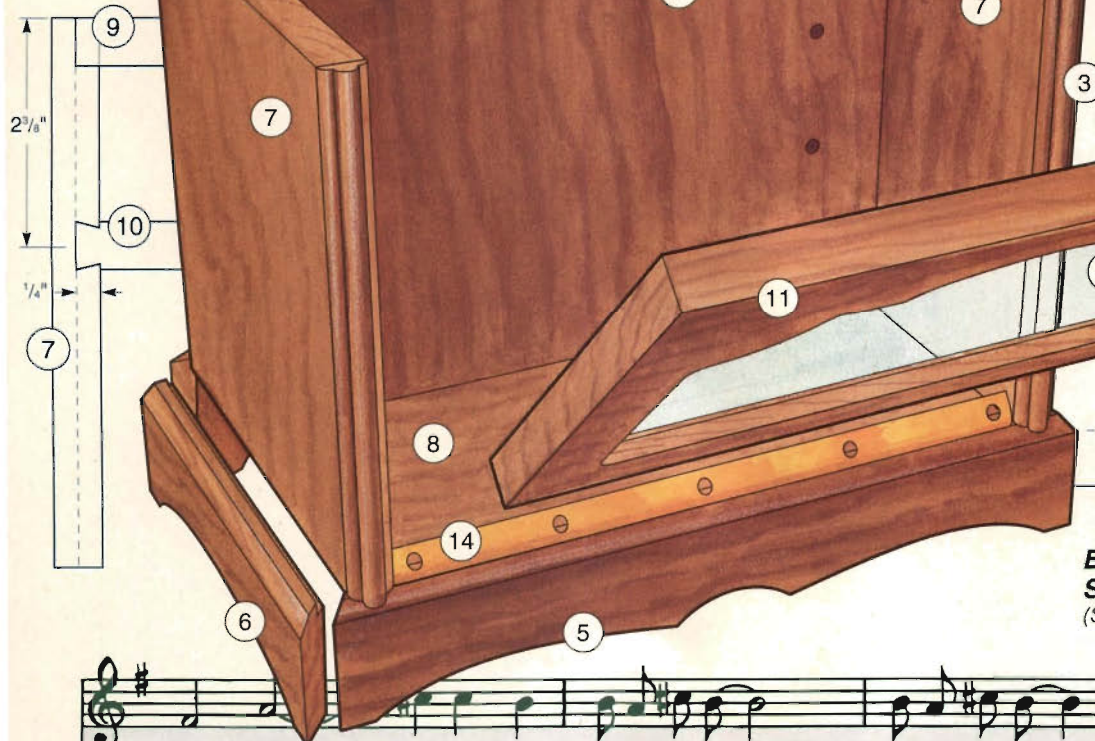


Miter Detail

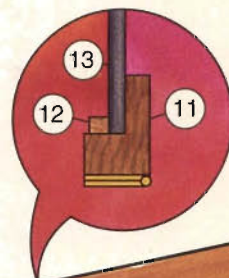


Piano Hinge Mortise
(Side View)

Divider Location
(Top View)



Retainer Strip Location



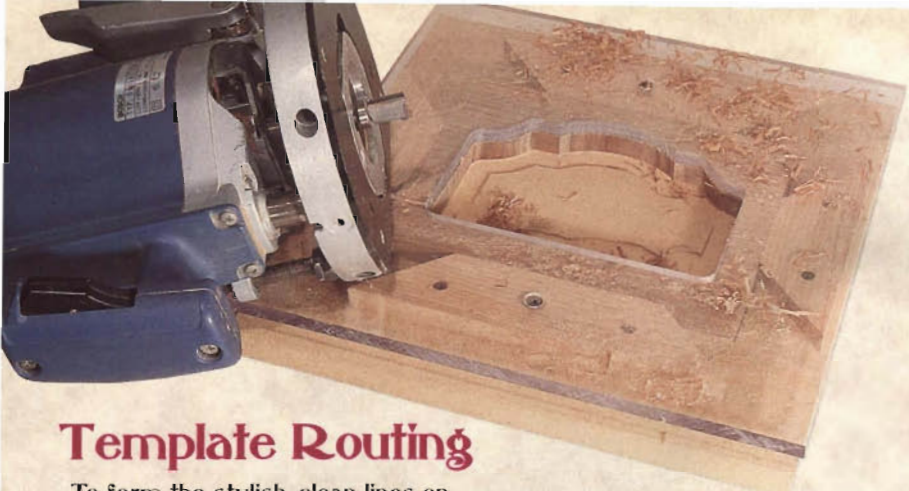
Base Subassembly
(Section View)



MATERIAL LIST

	T x W x L		T x W x L
1 Top Frame, Front/Back* (2)	1/2" x 1 1/8" x 9 1/2"	8 Bottom (1)	1/2" x 5 3/16" x 8 1/2"
2 Top Frame, Sides* (2)	1/2" x 1 1/8" x 6 1/4"	9 Back (1)	1/2" x 8 1/2" x 6 1/2"
3 Provincial Molding (1)	48"	10 Divider (1)	1/2" x 8 1/2" x 6"
4 Top Panel (1)	1/2" x 3 5/8" x 7"	11 Door (1)	1/2" x 5 7/8" x 8"
5 Base Molding, Front/Back (2)	1/2" x 1 1/2" x 9 1/2"	12 Retainer Strips (1)	1/8" x 5/32" x 26"
6 Base Molding, Sides (2)	1/2" x 1 1/2" x 6"	13 Glass Panel (1)	3/32" x 5" x 7"
7 Sides (2)	1/2" x 5 3/4" x 6 1/2"	14 95° Stopped Piano Hinges (2)	1/2" x 8" Solid brass

* Size includes the applied molding.



Template Routing

To form the stylish, clean lines on the music box door, use a set of templates and a piloted bearing bit in your router to form both the shaped opening and the square rabbet for the glass.

Start by cutting the door (piece 11) to size. While you're at the saw, rip some scrap walnut to create your retainer strip stock (piece 12). Transfer the shaped opening (see Full-size Pattern) to your template material. Cut the opening, using a scroll saw, file and sandpaper. Now do the same for your second, square template.

Center the first template on your door, trace the opening onto your stock and use your scroll saw to remove most of the waste. Screw the template to the cleats on your jig and rout the door opening, as shown in Figure 1. Before switching to the square template, cut four scraps to use as spacers (see Figure 2). With this setup you'll only go halfway through as you form the rabbet for the glass (piece 13). Use a sharp chisel to square up the corners and wrap up by attaching the hinge (piece 14) to the door's bottom edge.

Shaped Template

Rabbet Template

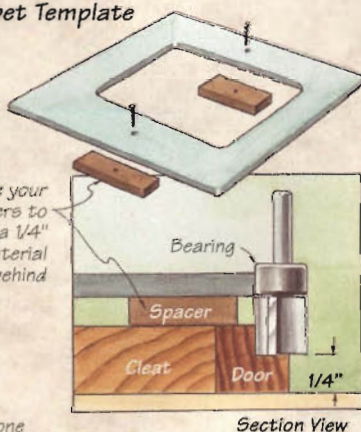
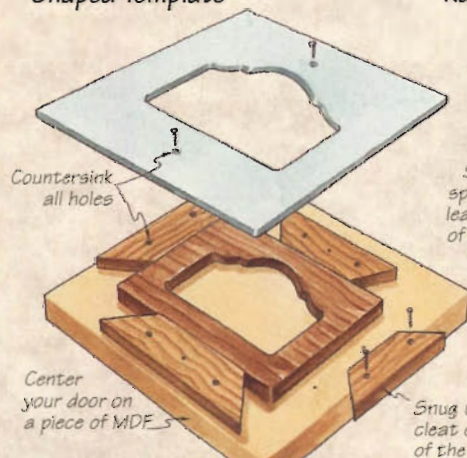


Figure 1: Remove most of the waste from the door opening with a scroll saw before routing with the first template: it makes for an easier cut with the top bearing pattern bit.



Figure 2: Using spacers with the second template keeps the bearing riding against the template while the cutter forms the rabbet for the glass and retainer strips.

away from the divider; it's designed to be removable. Check the box for squareness before the glue sets.

Now glue the base molding subassembly to the box subassembly. Lay the hinge in place and drill the pilot holes you'll need to attach it to the back and top. A Vix bit works great for this operation. Before you turn your attention to the door (see sidebar at left), glue a strip of French provincial molding to the front edge of each side. You'll have to use a back saw to form-fit the molding over the base chamfer before gluing them in place. Use some pads to prevent the clamps from denting this molding while the glue dries.

Final Assembly

Once you've completed the door, remove both hinges and gather your finishing supplies — this music box deserves a rich finish. Start by sanding everything to 220 grit. Apply a coat of oil and continue rubbing out the finish with 0000 steel wool. Repeat this process until the beauty and depth of the grain is revealed. Install the glass panel into the door with the retainer strips and then mount the movement on the divider. Attach the hinges and wind up the movement. You won't believe how well Mozart and walnut get along!



Music Box Project Supplies

Along with the movement and disks shown on page 29, the following supplies are also available.

95° Stopped 8" Piano Hinges* (solid brass) #10314\$7.99

French Provincial Molding (1/2" x 48" strip) #22798\$2.69

*Two required.

To order supplies, please call
800-610-0883.

Federal Secretary Desk

By Dick Coers



Federal styling, an American response to various European influences, relies on a combination of simple elements to create an elegant complete design. With that goal in mind, our secretary features oval inlays and book-matched burl veneer, together with tapered legs and slender, light-colored inlay strips.



n a project like this, with many details and complicated steps, you need an organized approach. Two good pieces of advice before you get started: first, work from the floor up and, second, have all your various materials, including the burl veneer and specialty hardware, on hand before you make your first cut.

Take your time when choosing stock for the four legs (pieces 1). They'll look best if there are no cathedral spikes in the grain, especially after the inlay is applied. To keep a uniform appearance, use stock with growth rings running at a 45° angle across the bottom face.

After cutting the legs to the dimensions shown in the **Material List** on page 54, orient them so the best color and figure face forward. Then follow the **Pinup Shop Drawings** on the center pullout to lay out the tapers. These can be cut on a table saw with a standard tapering jig as shown at right. Note all eight tapers stop shy of the top of the legs, where the desk aprons (pieces 2 and 3) will be attached.

Rip the aprons to size from walnut veneered plywood. The bottom of the aprons are accented with a solid piece of 3/8" molding (piece 4). Glue it in place and then shape the bead profile on your router table, as shown in the detail on page 54.

Mortise and Floating Tenon Joinery

The aprons are secured to the legs with mortise and tenon joinery, but in this case the tenons (pieces 5) float: that is, they aren't an integral part of either piece. As such, it is necessary to form matching mortises in both the legs and aprons.

Follow the **Pinup Shop Drawings** to lay out the mortises. Now, install a 3/8" straight bit in your router table and set the fence to the dimensions shown on the drawings. Use a stop block and a piece of masking tape to give you the proper size mortise (as shown in **Figure 1**), then test your setup on some scrap before milling the leg and apron mortises in several passes. Be sure to clamp on a tall fence to help steady the aprons as you rout their mortises. Make the floating tenons to snugly fit the mortises. Next, use a pocket hole jig and bit to drill pocket holes in the top edges of the aprons (see **Pinup Shop Drawings** for locations). These holes will eventually hold face frame screws (pieces 6) to attach the legset to the rest of the desk. With this done, move on to the sidebars on pages 54 and 55 and work on completing the inlay and stringing in the legs.



Figure 1: Floating tenons are a unique feature in this design. Use a stop block and masking tape to start and stop your mortises.

Legset Assembly

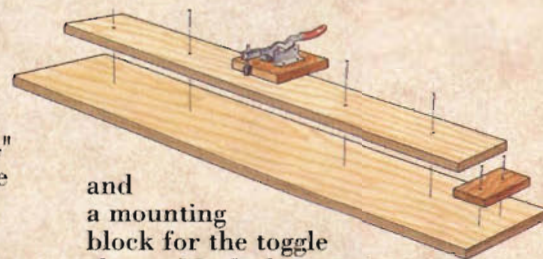
With the inlay and decorative stringing completed (pieces 7 and 8), block sand the aprons and legs, starting with 100 grit and finishing with 220 grit papers. Dry fit and temporarily clamp the legs and aprons together. With the assembly square and plumb, cut the corner braces (pieces 9) to size and predrill and countersink for their screws (pieces 10). When everything fits, remove the clamps and glue and screw the legset together. As you reinstall the clamps, be sure the assembly stays square as pressure is reapplied.

Quick and Easy Leg Tapering

Make a bed from 3/4" plywood, 10" longer than your workpiece and wide enough to accommodate a toggle clamp. Rip another 4" wide piece for the jig's fence and cut two small pieces to make a stop for the jig bed



The nicely tapered legs on this classic design were produced using this simple jig.



and a mounting block for the toggle clamp. Mark the starting and finishing points for a taper on one leg (see **Pinup Shop Drawing**), and place it on the bed with the stock you wish to remove hanging over the edge. Mount the fence and stop block against the edge of the leg. Toggle clamp the leg in place and set the blade height and fence to remove the overhanging stock.

Forming the Oval Accents

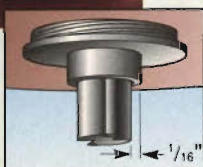
Federal styling relies on simple elements combined to create an elegant complete design. To that end, our secretary uses oval inlays together with tapered legs

and slender, light-colored inlay strips. The key to getting the ovals and strips to fit well is a jig to guide your router. However, the space between the outside edge of the rub collar and the router bit must be accommodated (see inset). A slick trick is to use a machine nut to keep your pencil close to the proper offset as you trace a line around the outside of the oval. The flat surface of the nut holds the

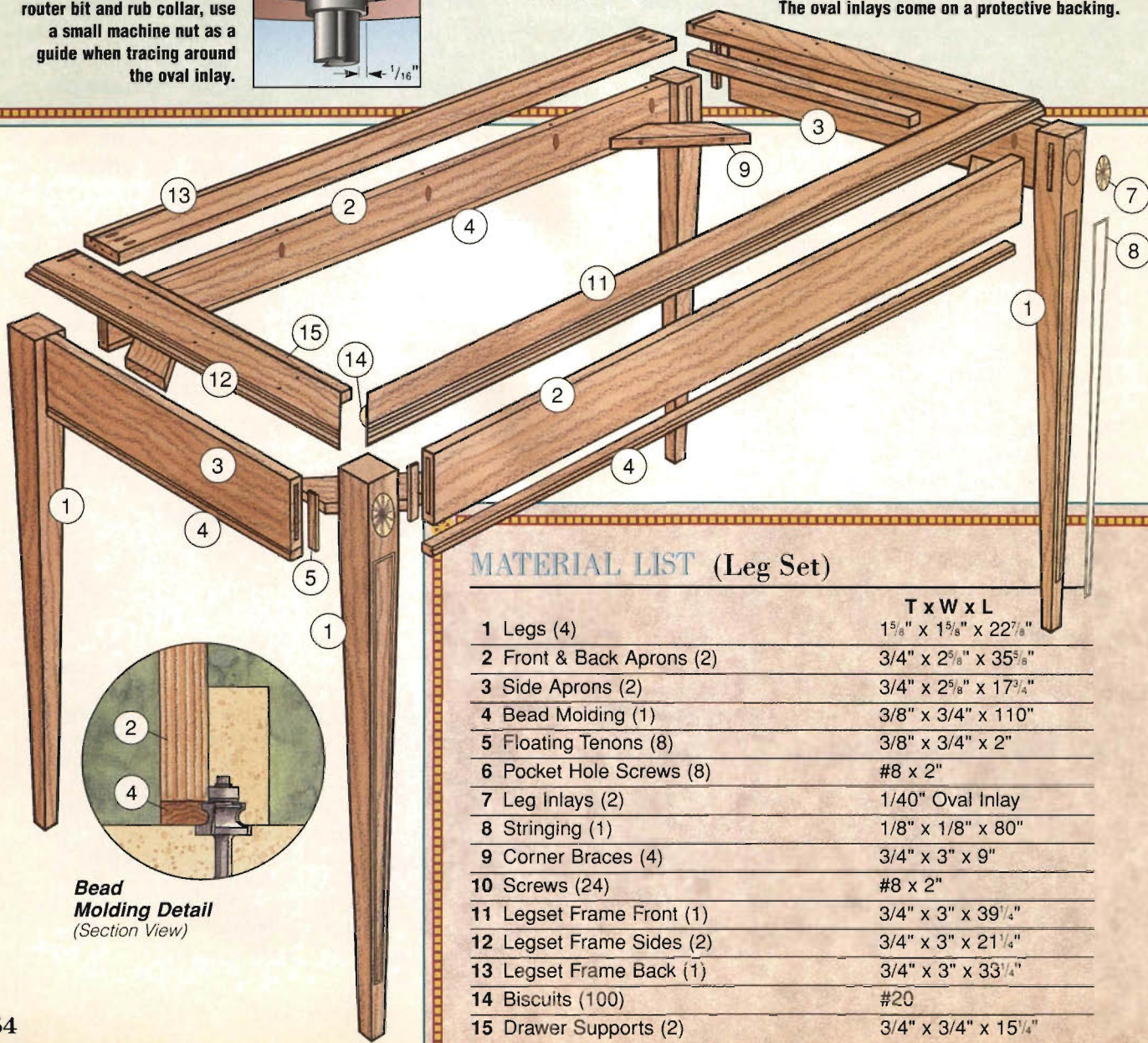
scroll saw and form a few oval shapes with your new jig to test the fit. You should expect to make a few adjustments before your oval inlay fits perfectly.



To allow for the offset of the router bit and rub collar, use a small machine nut as a guide when tracing around the oval inlay.



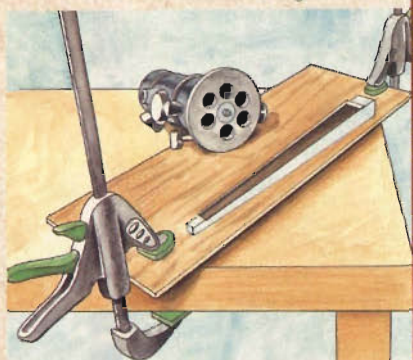
After a few adjustments to the jig, the ovals fit perfectly in the scrap wood test piece. The oval inlays come on a protective backing.



MATERIAL LIST (Leg Set)

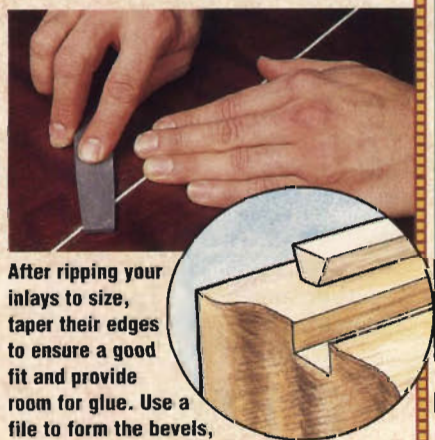
	T x W x L
1 Legs (4)	1 5/8" x 1 5/8" x 22 7/8"
2 Front & Back Aprons (2)	3/4" x 2 5/8" x 35 5/8"
3 Side Aprons (2)	3/4" x 2 5/8" x 17 3/4"
4 Bead Molding (1)	3/8" x 3/4" x 110"
5 Floating Tenons (8)	3/8" x 3/4" x 2"
6 Pocket Hole Screws (8)	#8 x 2"
7 Leg Inlays (2)	1/40" Oval Inlay
8 Stringing (1)	1/8" x 1/8" x 80"
9 Corner Braces (4)	3/4" x 3" x 9"
10 Screws (24)	#8 x 2"
11 Legset Frame Front (1)	3/4" x 3" x 39 1/4"
12 Legset Frame Sides (2)	3/4" x 3" x 21 1/4"
13 Legset Frame Back (1)	3/4" x 3" x 33 1/4"
14 Biscuits (100)	#20
15 Drawer Supports (2)	3/4" x 3/4" x 15 1/4"

Leg, Door and Drawer Inlays



Use a router bit with a rub collar and a jig to form the grooves on the tapered legs, drawer and door. As with the jig at left, be sure to make some cuts on scrap wood first.

As with the decorative ovals at left, forming the grooves for the slender inlays is easy with a router, rub collar and a jig. Use the Pinup Shop Drawings to make the jigs for all of the inlays. To form the long thin inlays, start with a piece of 3/4" stock, slicing it on your table saw a hair wider than the groove it will fill. Lower the blade and rip strips to the depth of the groove, test fitting as you go. It is imperative to use a zero clearance insert in the table saw for this operation. Anytime you fit a strip of inlay into a tiny groove, try slightly tapering the edges of the strips to ensure a better fit. Use a file to remove just a bit of wood.



After ripping your inlays to size, taper their edges to ensure a good fit and provide room for glue. Use a file to form the bevels, as shown in the inset.

Federal Secretary Desk Project Supplies

The following supplies are available from Woodworker's Journal.

Desk Support and Hinge Set #31040.....	\$17.99
Drawer Pulls* #73388	\$7.99
Door Support Pulls* #68593	\$1.99
Keyhole Pull #11578	\$2.99
Oval Inlays* #18440	\$10.99

*Two required.

To order, call 800-610-0883 and mention code WO499.

A Walnut Frame

A flat frame (pieces 11, 12 and 13) serves as a transition between the base and desktop. The front joints are mitered, while the back ones are simple butts held with screws. The miter joints are reinforced with #20 biscuits (pieces 14). Dry fit the frame, then glue and clamp it together, making sure it's perfectly flat as you tighten the clamps. After the glue cures, add the drawer supports (pieces 15) with glue and clamps (see Exploded View).

With a belt sander, smooth the frame to 220 grit before routing the ogee profile on the front and side edges. Set the frame upside down on the workbench and center the legset (side-to-side) on it. Align the back edges so they're flush with each other, then extend the pocket screw holes into the frame and set this assembly aside for now.

The Carcass Sides

I cut the carcass sides (pieces 16) and top (piece 17) from a single sheet of veneered plywood, to preserve their grain pattern. Use a plywood blade in your table saw to make these cuts (see Pinup Shop Drawings) following the dimensions provided in the Material List.

Use two-sided tape to temporarily hold the sides together, taping them in the same orientation they will appear on the desk. Attach a long, sacrificial fence to your miter gauge, set the angle (see Pinup Shop Drawings) and make the angled front edge cuts on the sides.

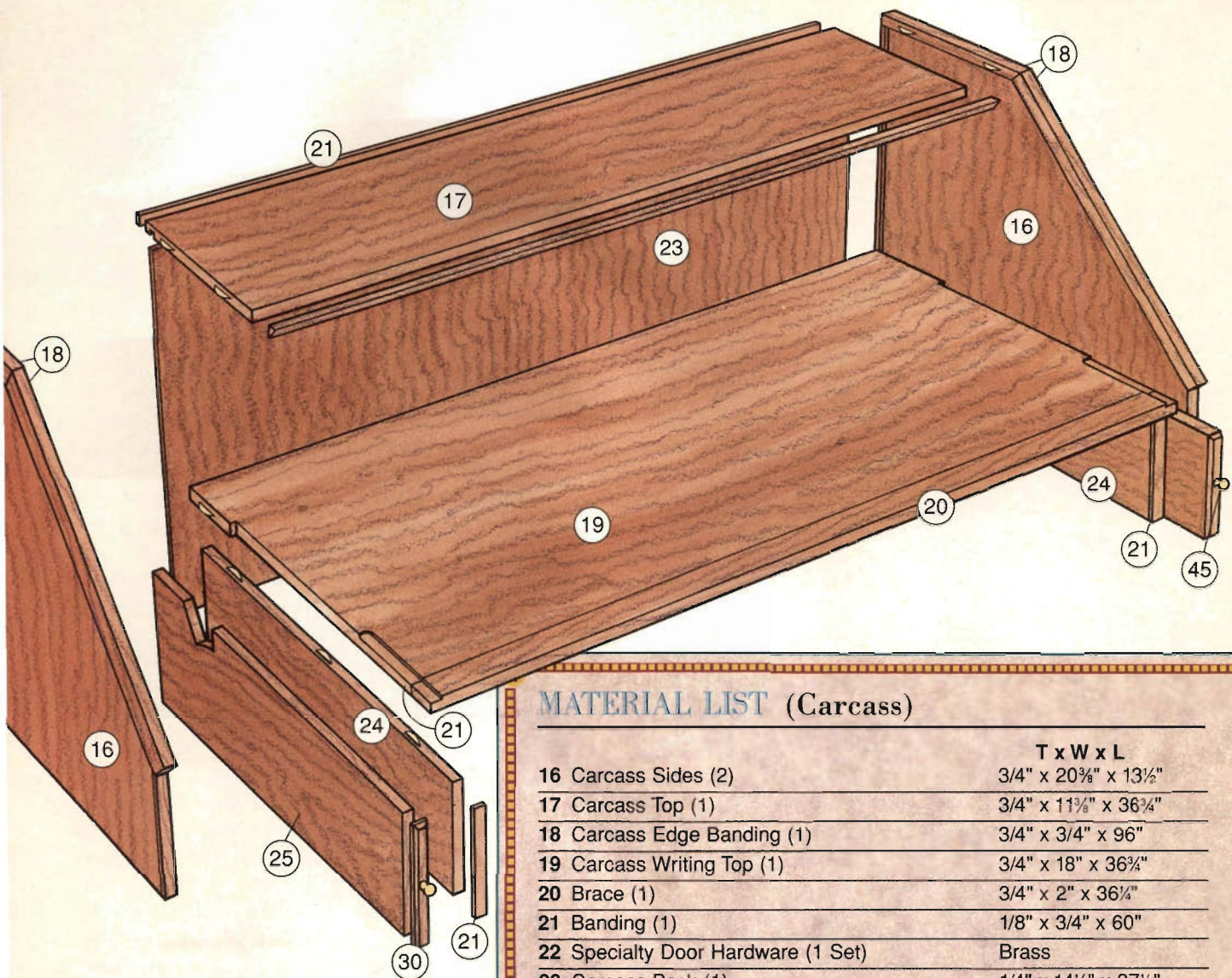
Specialty brass hardware combines with classic inlay and dovetail details on this Federal-style Secretary Desk.

Solid Hardwood Edges

The exposed edges of the top and angled edges of the sides are covered with hardwood banding (piece 18) that is mitered to length (see Pinup Shop Drawings) and applied with glue and clamping pressure. I used stretchable plastic packing tape, and it worked great. Apply glue to both surfaces and rub the banding back and forth slightly. This forces out most of the air. Then, using a tape applicator, wrap one edge of the tape around the opposite edge of each panel and press the first few inches firmly so it gets a good grip on the plywood. Stretch the tape as much as you can as you apply it across the face, over the banding and down the other face of each piece.

When the glue is dry, trim the banding flush with the plywood. A sander may be a little heavy-handed here: it's easy to sand through the hardwood veneer. A sharp cabinet scraper will do a better job. When you have the hardwood flush to the plywood, cut the proper angle on the front edge of the top.





Some Minor Milling

The sides are attached to the legset frame with screws. The writing top (piece 19), and the carcass top are joined to the sides with biscuits. Refer to the **Pinup Shop Drawings** before laying out and machining these biscuit slots, then apply a hardwood brace (piece 20) to the front edge of the writing top with glue and biscuits. Hardwood banding (piece 21) is then applied to all the exposed edges of the walnut plywood, as shown above.

You'll find dimensions on the **Pinup Shop Drawings** for a notch in each side of the writing top: these notches are for the door hardware (pieces 22) and they can be cut on the band saw. Apply hardwood banding to the sides of these slots

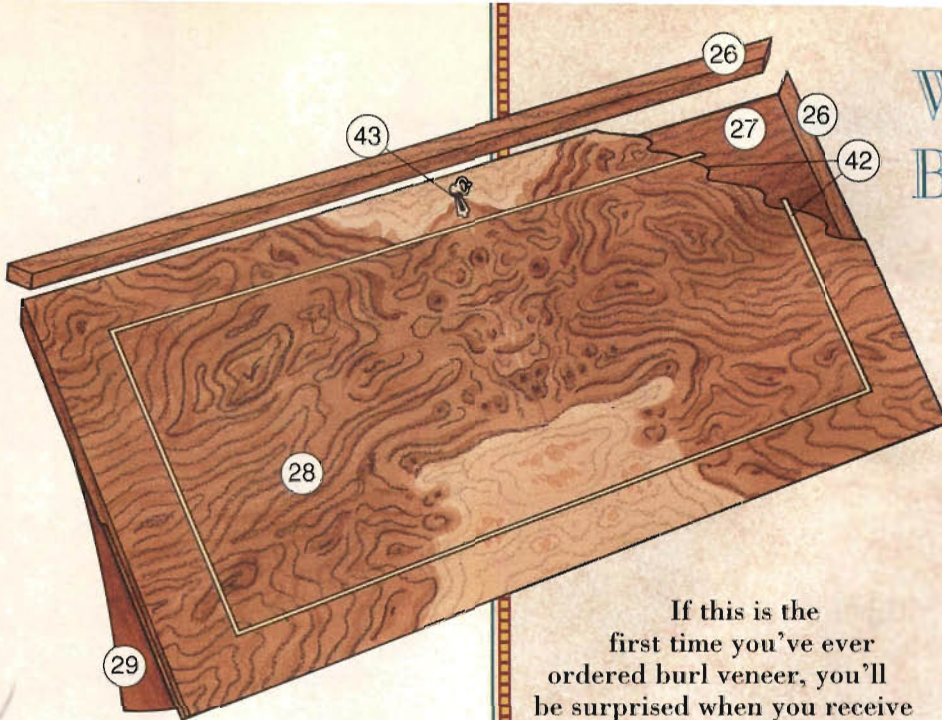
too, then machine biscuit slots in the ends of the writing top. The last bit of machining for the writing top is to rout mortises for the door hinges. You will also need to pare a chamfer into the leading edge directly in front of the hinge mortise. Check the **Pinup Shop Drawings** and *Hardware Hints* (see page 20) for more details.

I recommend walnut plywood for the carcass back (piece 23). It may be undersize in thickness, so select a special router bit to match. Refer to the **Pinup Shop Drawings** for the groove locations and dimensions, then mill them in the carcass sides and top, and also in the frame. Make sure to end the stopped grooves at the correct locations.

MATERIAL LIST (Carcass)

	T x W x L
16 Carcass Sides (2)	3/4" x 20 3/8" x 13 1/2"
17 Carcass Top (1)	3/4" x 11 3/8" x 36 3/4"
18 Carcass Edge Banding (1)	3/4" x 3/4" x 96"
19 Carcass Writing Top (1)	3/4" x 18" x 36 3/4"
20 Brace (1)	3/4" x 2" x 36 3/4"
21 Banding (1)	1/8" x 3/4" x 60"
22 Specialty Door Hardware (1 Set)	Brass
23 Carcass Back (1)	1/4" x 14 1/2" x 37 1/4"
24 Drawer Cavity Dividers (2)	3/4" x 4" x 19 7/8"
25 Door Supports (2)	3/4" x 3 5/16" x 20"
26 Door Edge (1)	3/4" x 3/4" x 124"
27 Door (1)	3/4" x 11 1/8" x 35 5/16"
28 Door Burl Veneer (2)	1/32" x 13" x 19"
29 Door Plain Veneer (1)	1/32" x 13" x 37"
30 Door Support Endcaps (2)	1/4" x 3/4" x 3 5/16"

Working with Burl Veneer



Dry Assembly

Cut the drawer cavity dividers (pieces 24) and door supports (pieces 25) to size. In order to mount the door hinge hardware to the door supports, you need to drill a shallow mortise into the sides of the supports with a large Forstner bit (this will create right and left pieces) and finish by cutting the shaped notch onto each support (see the **Pinup Shop Drawings**). Now you're almost ready to start dry assembling the carcass.

The drawer cavity dividers are joined to the writing top by biscuits. Use the **Pinup Shop Drawings** to locate and cut the biscuit slots in the drawer cavity dividers, writing top and the carcass sides and top.

Final sand all the inside surfaces, then dry fit and clamp the carcass together. It's a good idea to apply finish to the inside surfaces before gluing up the carcass. Be sure not to get stain or finish on any area you will need to glue up later. After a dry fit, glue and clamp the carcass together, checking for squareness. When the glue cures, secure the carcass to the frame by extending the frame's pilot holes into the sides and drawer cavity dividers.

If this is the first time you've ever ordered burl veneer, you'll be surprised when you receive it. Burl veneer is definitely not ready to use right out of the box. Because of the many different grain directions, there's a tremendous amount of stress in the veneer. Never fear – waves, and even holes, are quite acceptable. But the first step in readying the veneer for use is to get it flat.



Fill larger holes in the burl veneer with cut-outs of similarly colored veneer. Place a piece of masking tape behind the hole and glue the new piece in place.

You do this by soaking your wavy panels in glycerine-based veneer treatment. Once it's saturated, start forming a big sandwich. This begins with a piece of flat 3/4" melamine-covered MDF, cut at least 1/8" bigger all around than the sheet of veneer. On top of this, place six sheets of newspaper and a sheet of Fiberglas™

window screen to prevent bonding between the paper and burl. Place the wet veneer on the screen, then complete the sandwich with more screen, newspaper and plywood. Clamp everything tight with a set of curved cauls.

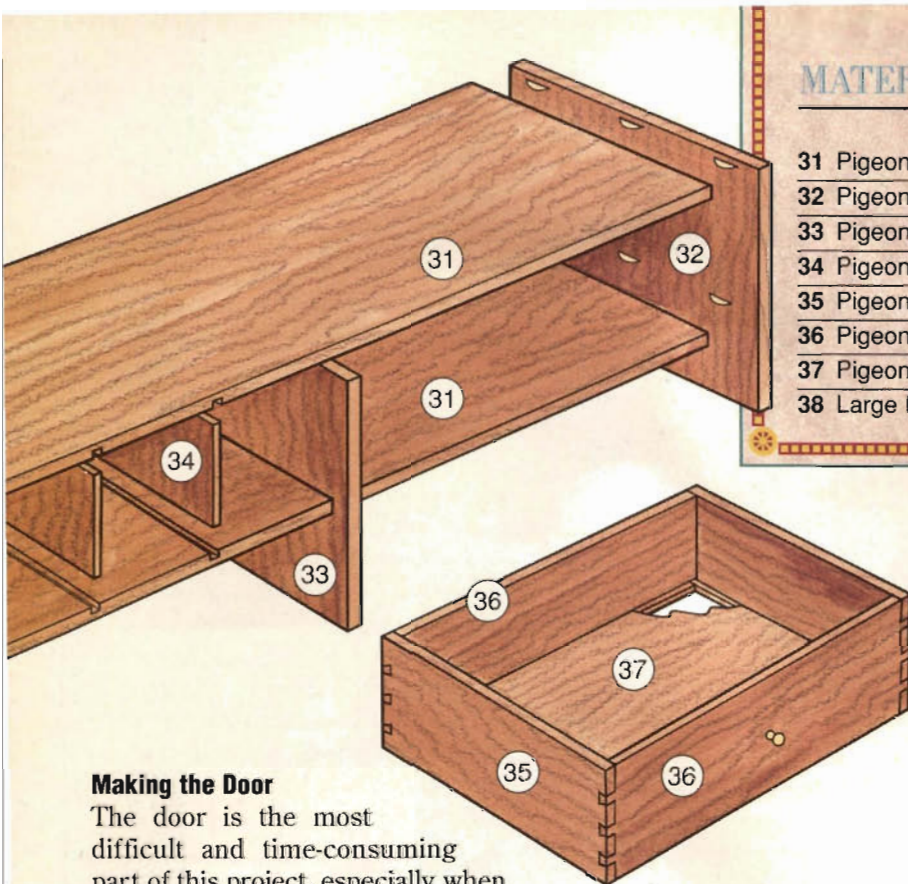
Replace the newspaper after four hours and again after another eight. Do this twice a day for about a week. In extreme cases I've had to go through this entire process twice, but it's well worth the effort as it makes the rest of the veneering work much easier.



A slick way to book-match the veneer with a straight, clean joint is to sandwich the two piece between MDF panels. Hold them tightly together and slice them off on the table saw.

When the veneer is dry, fill any holes, holding your piece up to the light to spot them. Filling them now prevents them from trapping gobs of glue later. On larger holes, take trimmings from the edge of the sheet where it will be cut off, and place them on your bench. Align the hole over them, match the colors and trim to fit. Use masking tape on the top side to hold these trimmings in place.

Once you've completed this process, clamp your veneer back in its press and keep it there until you're ready to glue the veneer to the plywood panel.



MATERIAL LIST (Pigeon Hole Unit)

	T x W x L
31 Pigeon Hole Top & Shelf (2)	1/2" x 10" x 35 1/8"
32 Pigeon Hole Sides (2)	1/2" x 10" x 8 13/16"
33 Pigeon Hole Large Dividers (2)	1/2" x 10" x 8 5/16"
34 Pigeon Hole Small Dividers (3)	1/4" x 10" x 4 3/8"
35 Pigeon Hole Drawer Sides (4)	1/2" x 3 7/8" x 10"
36 Pigeon Hole Drawer Frt & Bk (4)	1/2" x 3 7/8" x 11 1/16"
37 Pigeon Hole Drawer Bottoms (2)	1/4" x 9 5/8" x 11"
38 Large Drawer Sides (2)	1/2" x 3 7/8" x 19 7/8"

Making the Door

The door is the most difficult and time-consuming part of this project, especially when you consider the veneer work involved. You don't want to make any mistakes here, so I suggest you make a 6" wide template the same dimension as the door from the writing top to the carcass top. This piece will help you test the fit of the hinge leaf and the lid support linkage before you get started on your burl veneered masterpiece.

Apply solid hardwood door edging (piece 26) to the edges of the door blank (piece 27), securing it with glue and clamps. Miter the corners of this banding so no end grain shows. Flush up the banding with the plywood after the glue dries, using scrapers and a sanding block to avoid rounding over the edges. The veneer will telegraph any errors, so take your time. Leave the lid oversized by 1/16" all around (that's the way it's listed in the **Material List**), for final trimming after the veneer work is completed. Your final trim will leave a 1/16" gap on each side.

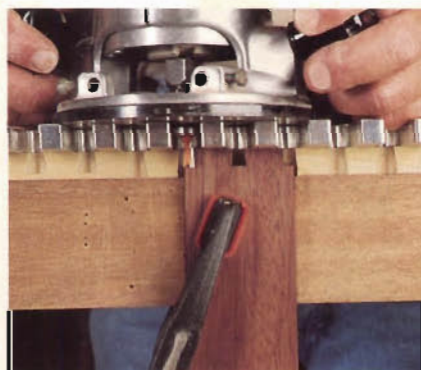
Balance the door construction by gluing veneer (pieces 28 and 29) to both sides of the plywood. Use urea formaldehyde glue for best results.

Cover each side of the door with a sheet of wax paper and one of the plywood cauls you used earlier (see sidebar on page 57) to make the veneer drying press. Apply equal pressure to all areas of both faces. As you tighten your clamps, work from the center out to the edges. Scrap wood crossbearers with curved bottom edges will help you keep the pressure evenly applied.

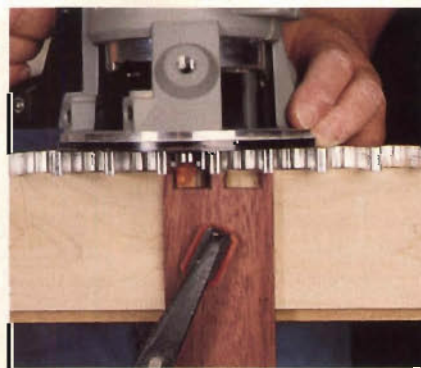
Prepping for the Hardware

After the veneering glue is dry, flush trim the veneer with an ultra sharp knife. Set your table saw to 22 1/2° to trim the top edge and 90° to trim the sides. Then sand the edges smooth with just a hint of a roll back where the veneer meets the edge.

Using the scrap template you made earlier as a guide, trim the sides of the door for the door hinge support hardware (piece 22), as indicated on the **Pinup Shop Drawings** and in *Hardware Hints* (see page 20). Cut the rabbets for the support linkages on your router table, using an extra tall fence for good support. Use a sharp chisel to pare out the recess to 30° from vertical, (providing clearance for the hinge knuckle when the door closes). Connect the hardware to the door support pieces you prepared earlier. There is a bit of hand work involved when final fitting the hinge support hardware, so dry fit the hinges as you go.



Use a Keller Dovetail jig or similar jig to create the dovetails on the drawers. Be sure to use different size dovetail bits on the large and small drawers.



Both drawers have through dovetails and plywood drawer bottoms. Test your set-up on scrap lumber of the same dimensions.

	T x W x L
39 Large Drawer Front & Back (2)	1/2" x 3 3/8" x 33 1/16"
40 Large Drawer Bottom (1)	1/4" x 33 3/16" x 19 5/8"
41 Large Drawer Face (1)	3/32" x 4" x 33 3/8"
42 Large Stringing (1)	1/8" x 1/4" x 168"
43 Key Pull (1)	Brass
44 Drawer Pulls (2)	Brass, 5/8" Dia.
45 Drawer Support Pulls (2)	Brass, 3/8" Dia.



Cut the door support endcaps (pieces 30) to size and sand them. Use two-sided tape to temporarily attach each endcap to a large piece of scrap while you mill the cove profile (see the **Full-size Pattern**) on their front faces. This is done on the router table with a low clearance insert and a bearing-guided bit. When they're completed, epoxy the two endcaps in place.

The Pigeon Hole Unit

Most of the pigeon hole assembly elements (pieces 31 through 34) are joined with lap joints in the center and simple butt joints and biscuits at the ends and top. The three small dividers are contained in small dadoes. Use your table saw to nibble out the six dadoes that hold the small dividers in place, and your router table to mill the interlocking slots. Before moving on, cut the biscuit slots. All of these dimensions are shown on the **Pinup Shop Drawings**. Again, it is a good idea to pre-finish this unit before you glue it up (mask off the joints). When the finish is dry, glue the assembly together, checking for squareness as you tighten the clamps. Give the outside a final sanding, then apply finish here, too.

Building the Drawers

Cut stock for the drawers (pieces 35 through 40) and join the sides to the fronts and backs with through

dovetails. I used a Keller fixture with two different sizes of bits (see the **Pinup Shop Drawings** for the dimensions), but any similar fixture will work just as well. If you don't own a dovetail jig, you can cut them by hand. Use a 1/4" bit in your router table to cut stopped grooves for the bottoms (see the **Pinup Shop Drawings**), then glue up and clamp all three drawers.

For aesthetic reasons, I decided to cover the dovetails on the front face of the large drawer. After planing some walnut (piece 41) to 3/32" thickness, I centered it on the drawer front before gluing and clamping it in place. When the glue was dry, I used a flush trim bit to clean the edges.

Final Touches

To continue the striping theme established on the front faces of the legs, follow the same technique used there to apply stringing (piece 42) to the door face and the face of the large drawer. All the locations and dimensions are shown on the **Pinup Shop Drawings**.

As you open the door on the Secretary, the door supports slide smoothly out into position.

Now you're ready to finish. Remove all the hardware and thoroughly sand the project. Apply three coats of finish, sanding between coats with 400 grit wet/dry paper.

When the finish is dry, locate the key pull according to the **Pinup Shop Drawings** and follow the manufacturer's instructions to install it. Drill pilot holes for the key pull, the drawer support pulls and the drawer pulls (pieces 43, 44 and 45), and screw them in place at the locations shown on the **Pinup Shop Drawings**. Finally, apply a little wax to the door supports, sit down at your new desk and drop us a line. We'd love to hear from you!



The Abrasives Chase

By Tom Jackson

You can produce flawless joinery with the simplest of tools, but a poorly sanded surface will always look amateurish. If you've been buying sandpaper over the counter, you'll appreciate what some specialty products can do — especially in the tricky area of sanding finishes. But before we dive into a discussion of specialty products, let's take another look at the old standbys.

Garnet Sandpaper

The orange sandpaper found in most stores is coated with a relatively soft, naturally occurring mineral called garnet. Garnet is not as aggressive as other abrasives, but it does leave a smoother finish and a finer scratch pattern. This milder sanding action also allows you to switch from 100 to 150 to 220 grit paper without adding intermediate grades (120 and 180 grit).

Garnet does a fine job of sanding raw wood, both in hand and power tool applications, although under the heat and stress of power

sanding it doesn't last long. I also avoid using garnet sandpaper on finishes: the easily worn edges of



Aluminum-oxide sandpaper is tough and durable, helpful in power machinery.

garnet particles quickly load up with finish, forming "corns" which can scratch the surface.

Aluminum Oxide

A hard-edged mineral, aluminum oxide, stays sharper longer than garnet which makes it very aggressive and durable. It's used widely in both hand sheets and sandpaper for power equipment. Since it is aggressive and sharp, it's better to include the intermediate grades (such as 120 and 180 grit) as you steadily move up through the grit sequence.

Silicon Carbide

Even harder and sharper than aluminum oxide, silicon carbide is used most often in a closed coat application on wet/dry sandpapers.

It works well in this application, but has one drawback: small bits can dislodge and be carried by the slurry into the pores of open grain woods, creating black lines that are almost impossible to remove.

You can prevent the problem by filling the pores first. The problem is less critical on tight-grained woods like maple. Silicon carbide in an open coat configuration is the mineral of choice on many papers which are designed for orbital sanding.



Wet/dry silicon-carbide sandpaper is acceptable for finishes, particularly on tight-grained woods.

Ceramics

These are offered on sanding belts in the coarser grits only, and under a wide variety of trade names. They cost more than regular belts, but hold up well under the heat and abuse created when you strip off paint and finishes or surface stock with a belt sander.



Garnet is a soft, man-made mineral that's adequate for hand sanding and light duty machine sanding.



Along with a few other recent innovations, flexible sanding sponges, like the one shown at left, have helped to elevate the art of sanding to new levels.



Man-made ceramic abrasives, such as the ones that coat this 3M blue belt, help sanding belts hold up to heavy heat and friction.

Stearated and Coated Sandpapers

Stearated coatings form a slippery surface on an abrasive and prevent sawdust or particles from sticking to the paper or clumping together to form corns. Although they're primarily used to sand finishes, they are particularly helpful when sanding resinous woods like pine. I prefer stearated random orbit disks to uncoated disks on wood. They cut faster, deliver a more uniform surface

texture and generally last a little longer than uncoated paper.

Where stearated paper really helps, though, is in dry sanding finishes. They make it much easier to gauge your progress than when you have a wet slurry. The abraded finish lays down as a fine white powder, giving you a very accurate gauge of where you have and haven't sanded. When you're ready to check the scratch pattern, one quick wipe reveals the surface. Stearated sandpapers may leave trace amounts of the stearate on the surface of the

Today's Shop continues on page 62 ...

Hardwood Showcase

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(Circle No. 107 on PRODUCT INFORMATION form)

... continued from page 61

Sanding sponges and non-woven pads can be rinsed and reused; they provide a cushion behind the cutting action of the abrasive.



wood or finish, causing adhesion problems with water based finishes. One solution is to use Professional's Choice sandpaper from 3M. As an extra precaution, I thoroughly clean any surface that has been sanded with a steartated paper, using mineral spirits or a suitable solvent.

Sanding Sponges

These consist of a layer of abrasive grit bonded to a thin, synthetic sponge. When you're wet sanding a finish, the sponge absorbs some of the solvent and cuts down on slop. The flexibility of sanding sponges lets you sand curved profiles: they evenly distribute pressure, resulting in less gouging, glazing and heat buildup — ideal attributes for sanding on the lathe. Sanding sponges come in three grits. The roughest is suitable for stripping

Discs with silicon carbide or aluminum oxide backing can give you a matte, satin or glossy finish, depending on the grit you use to complete your sanding.

paint. The finest yields a surface comparable to about 320 grit sandpaper.

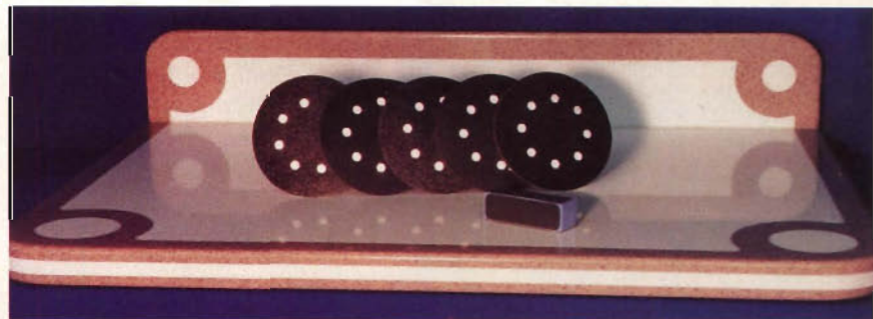
Non-woven Pads

Also known as synthetic steel wool or Scotch-Brite pads, these pads consist of a mat of nylon fibers coated with a crust of tiny abrasive particles. They can be used wet or dry and rinsed out and reused. You'll find a variety of grits and sizes in catalogs and woodworking specialty stores.

Steel Wool

The chief complaint against steel wool is that it sheds. If its slivers embed in the finish, they will sprout a crop of tiny rust blooms some humid day. A high-quality #0000 steel wool, however, produces an acceptable matte finish. You can also rub out a finish using steel wool and a carnuba-based wax, then buff the wax to increase the gloss.

Today's Shop continues on page 64 ...



One thing's for sure. You don't mess with success. The massive cast iron table and trunnion and power and precision are right where they've been since the day we built the first one of these critters. And we're still building them right here in the good ole US of A.



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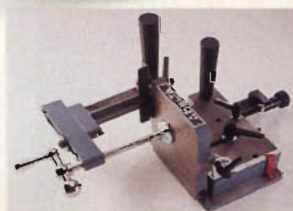
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(Circle No. 40 on PRODUCT INFORMATION form)

Micro Mesh

At best, traditional sandpapers and abrasives leave you with a matte finish. To create a glossy finish without wax, you have to polish. Traditionally this was done with pumice and rottenstone, but

today there are new, high-tech methods that deliver uniform, controllable results. The two I like are Micro Mesh and 3M's Finesse-it.

Reading Labels

The back of a piece of sandpaper tells you all you need to know about the size and composition of the grit, the type of backing and other details. The size of the grit is listed

numerically,

and there are several different grading systems, but most woodworkers need not bother to learn these Byzantine systems. All the grading standards

are relatively uniform up to about 240 grit. If you're working with finer grits, then just stick with the same brand of sandpaper to avoid

problems as you progress up through the grit

sequence. The backing on a piece of sandpaper is either paper or cloth. Paper backings are designated by the letters

A through F, with A being the lightest and most flexible paper. The letters E and F designate heavy duty paper used on sanding belts.

Cloth backings are designated by the letters J, X, or Y: J is the lightest and Y the heaviest. On cloth backings, the letter E following J, X, or Y indicates a rayon-reinforced belt.

ALUMINIUM OXIDE
ABRASIVE PAPER
ELECTRO COATED

The letter F indicates a polyester reinforced belt. In most cases, you don't have to concern yourself with the composition of the backing, as the manufacturers do

a good job of matching the backing to the requirements of

the sandpaper sheets, disks, or belts. You'll also usually see the term open-coat printed on the

back of sandpapers designed for sanding wood. On open-coat sandpapers, the grains of abrasive

are spread out to prevent sawdust from clogging the paper. By contrast, the abrasive particles on closed-coat sandpapers are packed tightly together.

Closed coat sandpapers clog up quickly on wood but work well on finishes, metal and hard plastics like Corian™ where the abraded particles are very fine.

ALUMINIUM OXIDE
ABRASIVE PAPER

Micro Mesh is offered as a kit with a hard rubber block and 18 abrasive sheets — two each of 9 different grits. The abrasive sheets have a special, cushioned, flexible backing, and the grit sizes range from coarse (1,500) to the finest (12,000). You simply start wet sanding with the coarsest grit and keep moving up the grit sequence until you achieve the desired gloss. The biggest advantage to using Micro Mesh is that it gives you precise control over the degree of gloss. If you stop between 3,600 and 6,000 grit, you'll get a satin finish. I usually stop at 8,000 grit, which results in a highly reflective gloss finish. At 12,000 grit the scratch pattern



With Micro Mesh, you can choose to work up as much or as little gloss as you have the time and inclination for.



Finesse-it from 3M produces a piano-quality high gloss finish. Most woodworkers apply the liquid compound with a vibrating sander; a rotary buffer creates a higher sheen. Either way, Finesse-it is more popular among industrial users than hobbyists. A variety of formulas provide differing gloss levels: to achieve a specific finish, you may need to consult with a 3M representative.

becomes invisible to the naked eye, and the surface takes on a mirror-like quality. For more information, call 319-732-3240.

Finesse-it

3M's approach to a high-gloss finish employs an abrasive liquid compound called Finesse-it, applied with Scotch-Brite pads and a buffer. The Finesse-it polishing compound comes in five gradations. Each one will produce a different degree of gloss, allowing you to control the sheen. Since Finesse-it is applied with a buffer or sander, it is less labor intensive than hand rubbing a finish, particularly on large projects like table tops. For more information, call 800-742-9546.

Tom Jackson is a woodworker and writer who makes his home in the Blue Ridge Mountains of North Carolina.

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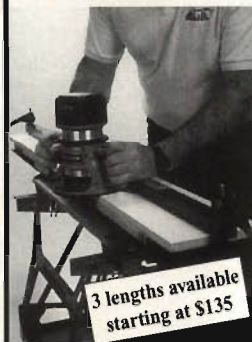
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Gentlemen:

My brother and I each bought one of the smaller JOINT A-billi-T units and we also bought one larger unit to share for those rare (for us) projects that require the large model. These were purchased some years ago at the Columbus, Ohio woodworking show.

I judge any tool that I purchase by how easily it works into my normal woodworking routine and ultimately how often that I use the tool or device. I am pleased to tell you that the JOINT A-billi-T was instantly a tool that I used as regularly and as easily as my table saw. The glue joints that I was able to obtain when preparing stock were nothing short of amazing compared to my old method using the jointer. I recently completed a trestle table with a top that is 81 inches long and 31 inches wide and was constructed of full 2 inch white pine. Obviously this project required the use of the large size JOINT-A-billi-T to prepare the edges of the boards for gluing. It worked perfect and by using the method described with the A and B edges in the operating instructions, I was able to obtain joints that are impossible to see except for the change in grain pattern.

I simply had to write and inform you of how pleased that I am with your product. I recommend it to any serious woodworker.

Best Regards,
Robert K. Wallace

unsolicited

Joint A-billi-T the new matched edge joiner

(Circle No. 72 on PRODUCT INFORMATION form)

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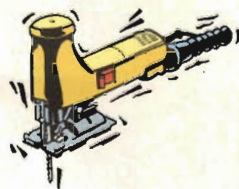
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(Circle No. 61)

Jig Saws Grow Up

By Charles Self



Bosch 1589EVS

Bosch 1588EVS

— Dust Shield

Both saws have:
5.95 amperes
500 - 3,000 spm
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Whether you choose to call them jig saws, saber saws or bayonet saws, these shop standards always pay their way.

For this shop test, I gathered most of the jig saws on the market today. The first thing I discovered is that, in this market, country of origin is going to be a real head-pounder for the "buy U.S.A." among you. The Porter-Cable and the Craftsman are U.S.-made. The top handle DeWalt is made in Italy. Otherwise, the Hitachi comes from Ireland, the Freud from Spain, the Makita from England, the Milwaukee from Germany, the Fein and Festo from Germany, and the Bosch from Switzerland. Globalization is a fact.

Bosch is a good starting place for first impressions. Almost vibration-free compared to some of the other

saws, the Bosch's blades are incredibly easy to change, with no need to even touch the old blade (and if you've dulled the blade in heavy cutting, this means less chance of burning a finger getting it out). The base needs a hex key for adjustment. Both the barrel grip and the top handle are easy to control, and a small blower (with an off/off switch) helps keep the sight line clear of sawdust. (This feature, also offered by Porter-Cable, makes a modest difference in keeping the sight line clear). Bosch's models are soft-start, which may be an advantage for some, but it didn't please me. The delayed power surge is a bit of a surprise, though after 10 or 15 minutes, the lag wasn't noticeable. The tools are otherwise superb: the top handle 1589EVS is rated at 5.95 amperes — second highest among those tested. It is very

smooth in its action, as is the barrel handle model, the 1588EVS. Its base is constructed from cast aluminum, with a plastic insert to reduce scratching on finer materials. Both saws employ an effective connection for dust pick-up, and a couple of no-splinter inserts. They work at 500 to 3,000 strokes per minute (spm), with an adjustable orbit to increase or reduce the aggressiveness of the cut as needed: a bigger orbit has greater aggressiveness.

Craftsman is up next: the 27510 is listed as a Craftsman Industrial saw and offers 0 to 3,100 strokes per minute, with a 4.5 ampere motor. It is a top handle design, with a pressed steel baseplate, no dust collection, and the speed adjustment dial on the trigger.



Craftsman 27510

4.5 amperes
0 - 3,100 spm
Street Price \$125
Sears stores

Craftsman: 888-809-7158



**DeWalt
DW321**



**DeWalt
DW323**

Both saws have:
5.8 amperes, 500 - 3,100 spm
Catalog Price \$164.95
Tool-Free Systems
DeWalt: 800-433-9258



It has no easy-adjust or blade change features, but offers four-orbits for more or less aggressive cutting. Overall, at \$125 in the catalog, this jig saw may be a shade pricey for what it offers, but it is a sturdy feeling unit, with moderate vibration, and should serve you well (particularly if you have the luxury of waiting for one of Sears' large sales).

DeWalt seems to have started the tool-free craze. The barrel grip DW323 and the top handle DW321 are both totally tool-free, once you get the hang of locking the blades in. The directions, and this is unusual for DeWalt, are less than precise. They say turn the top knob until it clicks: the knob actually clicks several times before the blade locks in. Their base adjustment is one of the three easiest to use — a steel lever with a plastic cap. Move it and adjust the base, lock it ... you're ready. (Note: With all these tools, if the base is adjusted to an angle over 25 degrees, you'll need to

remove the splinter guard.) These two saws have 5.8 ampere motors and offer 500 to 3,100 spm speeds. The orbital action is adjustable; no dust collection port is provided, but the dust shield is a good one. Both DeWalt models have slide-on anti-scratch plastic covers for their cast bases. Both are low on vibration, cut cleanly and straight, and offer good value for the buck (they were recently being offered at \$164.95 in a Tool Crib of the North catalog).

Fein, which is made in Germany, is the price champ of all the tools tested and offers features similar to



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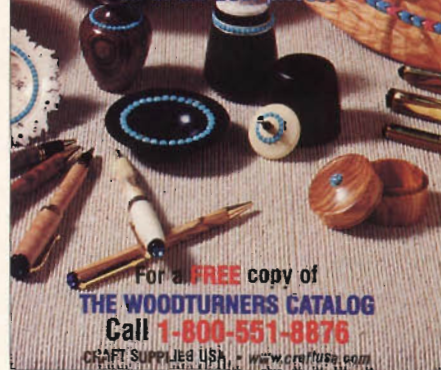


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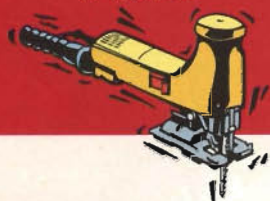
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Porter-Cable and the Craftsman are U.S. made. DeWalt is made in Italy. Hitachi comes from Ireland, Freud from Spain. Globalization is a fact ...



Porter-Cable's barrel grip model. That is to say, the base of the Fein ASTe 638 is solid and does not adjust. The motor is a 4.7 ampere unit. Stroke range is from 1,050 to 2,600 per minute, adjusted by a dial at the rear of the motor. The base is a substantial chunk of formed aluminum sheet. The top

models. I found vibration to be exceptionally low and ease of use exceptionally great. It also has a super long cord (about the same length as the Festo's 16+ feet). A shoe plate cover comes with the saw, but no carry case: a metal case is available as an option. Anti-chip inserts are included, and are sold in five-packs as options. Dust collection is a nice feature, aided by the effective half-shield in front of the blade, and the shoe plate can be turned 180 degrees to allow close cutting against walls or in other tight spots. This jig saw readily cuts soft metals over 1/2" thick and powers through 2X wood, including hardwood. Its cut is very close to perpendicular to the material, much like the Bosch's. While the price of this machine may put it out of reach for many, it is a solid lifetime tool, which of course it should be, selling for just under \$500.

Freud's FJ85 is a top handle model, with four orbital settings and a speed control dial on the trigger with a left side lock on. A hex wrench from the factory is stored on the cord near the base. The FJ85 uses standard hex key adjustments for blade lock and base changes and has a heavy pressed steel base and a slide-in adapter for dust collection, along with a decent clear shield in front of the blade. The 4.8 ampere motor works from 500 to 2,800 spm, and the unit has acceptably low vibration. A friend has been using this saw for years: it is amazingly sturdy, though in my opinion not as clean-cutting as the Bosch, Fein or Porter-Cable.



Hitachi
CJ65V2

Hitachi
CJ65VA2

Both saws have:
5.2 amperes, 700 - 3,200 spm
Street Price \$160

Hitachi: 800-546-1666

On the other hand, at a street price of just about \$100, it is a good value at less than two thirds the price of those jig saws. The Freud is made in Spain.

Festo is fairly new to the U.S. market. It is a European barrel grip model, with a ton of accessories to help make it more useful in precision applications. It is also the second priciest of all the jig saws tested: street price is about \$290. The PS2E comes in an unusual case that lifts flat, with a top center



freud FJ85

4.8 amperes
500 - 2,800 spm
Street Price \$100
freud: 800-334-4107

screws out and contains the hex key for the blade lock. It is among the heftiest of the tools, though it is also among the easiest to handle, because the body is slimmer than most barrel grip



Festo PS2E

4 amperes
1,200 - 3,300 spm
Street Price \$290

Festo: 888-463-3786

handle. I found it odd at first, but then came to like it almost as much as the DeWalt cases. The PS2E has a 450 watt motor (about 4 amperes as figured here) and has a four-stage "pendulum" adjustment (the same as the U.S. orbit adjustment). Speed control is electronic. There is a plastic base runner in the cast aluminum base, and the bevel adjustment on the base is made with a hex key (stored on the machine). Blade changes also require a hex key. This tool cuts smoothly, performing at 1,200 to 3,300 spm (adjustable by a wheel at the rear of the motor, which is the same place the rest of the barrel grips placed their adjustment wheels). Controls on this German-made tool operate easily and it comes with the longest cord of the bunch, at a shade over 16 feet.



Hitachi's "Irish Cream" jig saws (both are manufactured in Ireland) are solid tools. The CJ65VA2 is the barrel grip model and offers a 5.2 ampere motor (570 watt), with a cast aluminum baseplate, a left side slide switch on the barrel, speed adjustment at the back of the saw and a hex key lock for blade removal and installation. The base, with a long-wearing steel insert, is also adjusted with a hex key.

There is no provision for dust collection. The saw operates very smoothly and makes a very efficient cut. The tool feels solid and gives the impression it will last a long, long time, even under the toughest use. The CJ65V2 is the top handle version of the Hitachi jig saw and has a lock-on trigger, with the speed dial just in front of the trigger on the handle. Again, no provision for dust collection is

Both saws have:
5.5 amperes
500 - 3,000 spm
Street Price \$170
Tool-Free Systems
Makita: 800-462-5482

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made, but the dust shield works well: in almost all cases, dust shields will coat and need cleaning because of static cling. This is another saw worth its price — selling for around \$160.

Makita has popped up with two new models. The 4305T barrel grip is replacing the 4305, with the only difference being tool-free base adjustment and blade installation and removal. The 4305T features a 5.5 ampere motor, with a slide switch at the top front of the barrel and the speed control dial on the back of the motor. It has a dust shield but no dust collection hook up and a plastic insert for the cast aluminum base. Again, this is a hefty, stable, clean-cutting tool. Along with its other features, the 4305T has a lever action base adjustment, and a screw down blade lock that is easy to use. It offers a four-orbit adjustment and has a 500 to 3,000 spm speed range, with changes made through a dial at the rear of the motor. The 4304T has been around a bit longer, presenting pretty much the same picture in the top handle version, a preference in the U.S. The speed dial is on the back of the handle, a preferred location: speed dials on the trigger are okay, but it is easier to immediately and effectively change speeds when you don't have to remove your finger from the trigger.

The heft present in most of the other tools is also present in the Makita models, as one would expect. The cuts are fast and clean, depending on the orbit chosen. Even in thick stock, the cuts remain very near perpendicular. This is another good value, at around \$170. The saws are made in England.

Milwaukee's 6276 barrel grip saw has a left side slide switch, four orbital positions, a dust collection port and the speed selector on the back of the barrel. It is nicely made, easy to grip, and has one of the easiest to use blade change systems with its Quik-Lok lever. You do need to use some care to make sure the blade doesn't twist as it goes in, but otherwise, the change is quick and easy. The base is steel, with a plastic cover. The motor is a powerful 5.7 amperes,

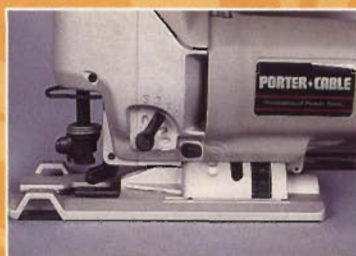
providing 450 to 3,100 spm through a speed adjustment dial on the back of the motor. There is no easy base adjustment, but with a hex key, adjustment is quick and accurate. The top handle version, the 6266, has similar features, but has the speed dial to the front of the handle, although still on the side. The switch has a lock-on feature. Four orbits are offered on each model. The tools feel great, cutting straight, true and as splinter-free as the blade choice and orbit angle allow. With a price of around \$155 for the top handle model (with a case), and \$160 for the barrel handle style (without case) this will prove to be a mighty good buy for many woodworkers. The tools are made in Germany.

Porter-Cable showed off their new 543 jig saw at the Chicago hardware show this past summer. With a 6 ampere motor that operates at 500 to 3,100 spm, the unit features a pinch style quick change for the blade and a slick base adjuster. Pull out one end of the lever, move it at an angle to the tube and twist to unlock. Set the base and twist to lock. Slide the handle back onto the rod and start cutting. Slick, fast, and really nice to use. The pinch style blade release/lock is not as easy to use as the Bosch lever, but is not difficult: first,

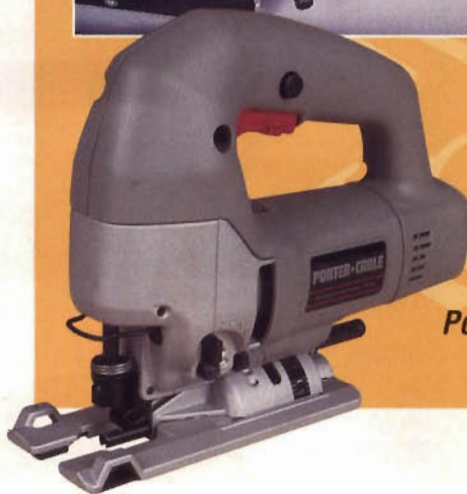


6 amperes
500 - 3,100 spm
Street Price \$165
Tool-Free

Porter-Cable: 800-487-8665



Porter-Cable 543



Both saws have:
5.7 amperes
450 - 3,100 spm
Street Price \$155 - \$160

Milwaukee: 800-732-4578



Milwaukee 6276

Milwaukee 6266

move the blade holder down close to the bottom of its stroke; next, pinch the lock; rock the blade forward and it comes out. Slip the new blade in, release and go.

The saw is the most powerful — though not by a lot — of the bunch, and performs exceptionally well, with cuts as clean as those from the Bosch. Vibration is exceptionally low. A plastic no-mar insert fits in the cast aluminum base, and there is a chip blower with an on-off switch. The speed dial is on the trigger. There is no provision for dust collection (but it is an option for an additional \$15). Later models might include all the extras, but I got a pre-production model for my test. The Porter-Cable is made in the United States. Street price is about \$165, making the new Porter-Cable a fine value.

With all these tools, if the base is adjusted to an angle over 25 degrees, you'll need to remove the splinter guard.



This is not an exhaustive list of jig saws.

One company alone offers at least three more top quality models, and others offer more, but this array of saws gives you a selection that provides just about every feature available today in the classification.

There is good quality out there for buyers, with the two lower cost saws (Craftsman and Freud)

offering decent performance for about two thirds the price — or a bit less — of the top of the line saws from other companies. The Hitachi saws represent tradition, with hex key adjustments and blade lock. Fein is tradition the old-fashioned way: solidly aimed at perfection. The Bosch models represent a step to the tool-free side, with the best of the blade release/insert systems. DeWalt, Makita and Porter-Cable have gone all the way tool-free, all successfully, but with varying features. That means you really do need to get out there and handle the tools yourself before deciding which you prefer. One thing's for sure: you won't suffer from a lack of fine choices in today's competitive jig saw market.

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Good Times from Woodworking Projects

Time for a Project

This is my version of the wall clock featured in the February 1995 edition of Woodworker's Journal. The height and depth were reduced to fit the wall space where it hangs, and the bottom panel of the door was replaced with glass to show off the pendulum. The plans were clear, concise and easy-to-follow. Thanks for a great publication, and keep up the great work!

*George K. DeHaven
Long Beach, New York*



A Sweet Dream of a Bed

I had been contemplating building a bed for some time, and the design in issue 16 of Today's Woodworker seemed to synthesize my ideas. I replaced the maple and padauk with quarter-sawn white oak and walnut and fiddled with the pattern of the slats, but the biggest alteration was the substitution of an arch for the straight top rail in the headboard and footboard. I spent two years completing it, but I am very pleased with the results. The design proved a springboard for the bed frame I'd always wanted to make. Thank you.

*Kyle Hageman
Tampa, Florida*

chestnut beams salvaged from an old barn. I found the wood was sound and had not been attacked by worms, indicating it was cut before the end of the last century. I had never attempted to build much in the furniture line, but I decided to attempt a pair of side tables. The photo shows the finished products as well as the raw material.

*Nick Kolbrick
Mercer, Pennsylvania*

WJ responds: What a nice way to make an antique reproduction: with antique wood!

WJ responds: We're always glad to help make a dream come true.

Wood Stands the Test of Time

The antique reproduction side table in Today's Woodworker issue 26 caught my eye. I had some American

WJ responds: Good job on the clock, George! Looks like you're ready to tackle John English's Irish parlor clock featured in our December 1998 issue (see page 32).



Winner! Nick Kolbrick will receive a Bosch 1617 EVS router for his contribution to End Grain. You can send your letters and photos to: End Grain, Woodworker's Journal, P.O. Box 261, Medina, Minnesota 55340. If we publish yours, we'll throw your name in a hat for our free tool drawing. Photos of projects from both Woodworker's Journal or Today's Woodworker are eligible.

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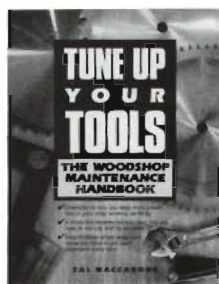
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See American Woodworking April 1998, pp. 64-69.

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DeWalt 8-1/2" & Ryobi 8-1/2"x60T/5/8"	\$179	\$119
Delta 9"x80T/5/8"	\$204	\$129
Ryobi-Makita & all 10"x80T/5/8"	\$207	\$139
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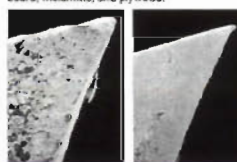
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BUSINESS OPEN ACCOUNTS AVAILABLE



FL, NJ, NY Residents Please Add Sales Tax
Shipping and Handling Charges with book:
Sawblades \$6; Dado \$6; Stiffener \$2
SATISFACTION GUARANTEED OR FULL CASH REFUND.

EXTENDED

by popular demand, until March 31, 1999.

Wanted for sawing, planing, drilling, molding and jointing in all 50 states. JET's band of woodworking tools was last seen in the company of the legendary contractor's style tablesaw. Anyone with information leading to the

purchase of these tools is advised to follow the stampede to your local JET dealer to round up the tools you've always wanted. JET is offering rewards of up to \$100 for the purchase of these notorious tools.

REBATES
up
to **\$100**

Deadline extended to March 31, 1999.
See your JET dealer for details.

JET
EQUIPMENT & TOOLS



JSL-12BS
SHOPLINE™
Bandsaw
\$20
REBATE



JWP-15HO
Planer
\$100
REBATE



JWBS-14 Bandsaw
Open or Closed Stand
\$25
REBATE



JJ-6CSX
Closed Stand Jointer
\$20
REBATE



JPM-13
Planer/Molder
\$50
REBATE



DC-650 Dust Collector
\$15
REBATE



JTAS-10
Left or Right
XACTA SAW™
\$100
REBATE



JSL-10TS
SHOPLINE™
Tablesaw
\$20
REBATE

DC-1200 Dust Collector
\$20
REBATE

JDP-17MF
Drill Press
\$20
REBATE



JWTS-10
Contractor's
Style Tablesaw
\$549 MSRP
-\$50 mfr. rebate
\$499
after mfr. rebate

For the name of your local JET dealer, call (800) 274-6848 or go to www.jettools.com.
Amounts shown are manufacturer's rebates. Rebates also apply to 40th Anniversary Limited Edition tools.

(Circle No. 85 on PRODUCT INFORMATION form)