



- How to Build a Colonial Bunkbed
- Weekend Project: The Teddy Bear Rocking Chair
- Add a Set of Primitive Elephants to Your Folk Art Collection



TODAY'S

Issue 18

\$3.95

WOODWORKERTM

PROJECTS, TIPS AND TECHNIQUES



TODAY'S WOODWORKER™

PROJECTS, TIPS AND TECHNIQUES



8 Bunk Bed

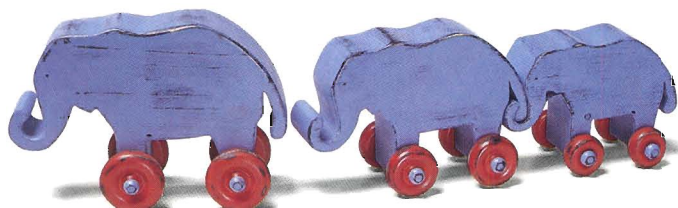
By Rick White

Build our sturdy bunk bed and it will still be around for your great grandchildren to use.

13 Teddy Bear Chair

By Larry Stoiaken

Every child needs a favorite chair they can call their own.



20 Elephants On Parade

By Jeff Jacobson

Need a last minute gift? Build this "instant heirloom" in one afternoon.



16 Cafe Table

By Chris Inman

Try your hand at cutting graceful leg tapers while building this versatile occasional table.

3 On the Level

Happy Holidays!

4 Tricks of the Trade

Improved jig for making a CD tray, protecting your tools and gluing edging on shelves.

6 Techniques

Bruce Kieffer looks at using and sharpening cabinet scrapers.

7 Hardware Hints

Coping with wood movement.

22 What's In Store

Hugh Foster reveals his holiday wish list for woodworkers.

23 Today's Wood

Take a closer look at our most common cabinetmaking wood —Red Oak.

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 Today's Woodworker. We in no way recommend using this equipment without safety guards and urge readers to strictly follow manufacturer's instructions and safety precautions.

LARRY N. STOIAKEN
Editor

JOHN KELLIHER
Art Director

CHRIS INMAN
Associate Editor

STEVE HINDERAKER
Associate Art Director

NANCY EGGERT
Production Manager

JEFF JACOBSON
Technical Illustrator

GORDON HANSON
Copy Editor

DAN JACOBSON
Project Designer

ANN JACKSON
Publisher

JIM EBNER
Director of Marketing

VAL E. GERSTING
Circulation Director

DEB HOLM
Circulation Coordinator

NORTON ROCKLER
RICK WHITE
STEVE KROHMER
Editorial Advisors

HUGH FOSTER
BRUCE KIEFFER
JERRY T. TERHARK
Contributing Editors

Today's Woodworker, (ISSN: 1041-8113) is published bimonthly (January, March, May, July, September, November) for \$21.95 per year by Rockler Press, 21801 Industrial Blvd., Rogers, MN 55374-0044. Second class postage paid at Rogers, MN and additional mailing offices.

POSTMASTER: Send address changes to Today's Woodworker, PO Box 6782, Syracuse NY 13217-9916.

One year subscription price, \$21.95 (U.S. and possessions); \$28.95 (U.S. currency — other countries). Single copy price, \$3.95; (other countries, \$5.50, U.S. currency). Send new subscriptions to Circulation Dept., Today's Woodworker, PO Box 6782, Syracuse NY 13217-9916. Subscribers are welcome to submit project proposals, tips and techniques to the editor, Today's Woodworker, Box 44, Rogers, MN 55374. For purposes of clarity, illustrations and photos are sometimes shown without proper guards in place. Today's Woodworker recommends following ALL safety precautions while in the shop.

Today's Woodworker is a trademark of Rockler Press.

Copyright 1991, by Rockler Press.

Make Time for Woodworking

Woodworkers all over the country will soon be burning the midnight oil putting final touches on their holiday gifts. In this issue we have two last minute ideas for those unchecked names remaining on your list. Our other two projects might take you a little longer to complete, but they really aren't that much more difficult. Our goal in designing projects is to use simple joinery and readily available tools. Even though a project like the bunk bed in this issue is larger in scale than the others, its construction

is well within the reach of the hobbyist woodworker. Sometimes the scale of a project can seem intimidating, but if you go slow and take one step at a time, you'll do fine. It might take a little longer, but there's nothing quite like the feeling when you complete a major piece! This issue wraps up our third year in publication. We've had a lot of fun and always appreciate hearing from you. The whole staff would like to wish you all a happy holiday.

Larry N. Stoaken

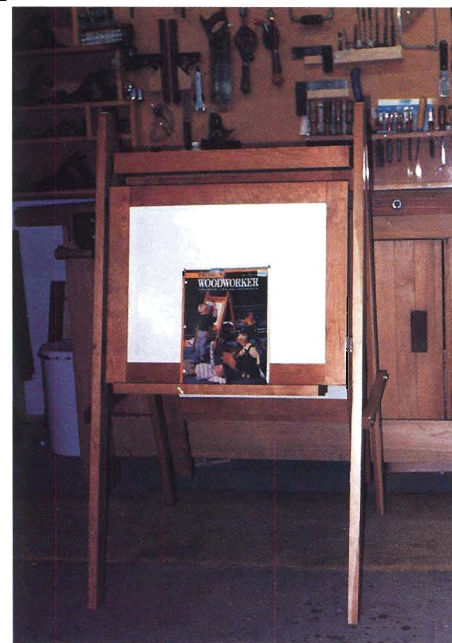
The Butternut Bureau in issue #12 is very good. It has a simple elegance that is appealing. The woodworker who does a careful job of making this bureau will have a useful piece of furniture that will last for generations. Please continue to include one truly significant project in each issue of Today's Woodworker. Many of your subscribers are interested in making furniture that we can be proud of and display and use in our homes for the rest of our lives. We want our hobby to be productive, not just something to putter away time. We like a challenge but need a bit of guidance.

R. K. Winkleblack
Arroyo Grande, California

I agree with Robert Berkey's comments in issue sixteen's Letters to the Editor. Many of us "part-time" woodworkers have a hard time completing projects in your magazine because we lack tools and time (weekends and some few evening hours). Also, many of the projects are rather exotic for the normal woodworker. I do like the uncluttered look of Today's Woodworker.

Don Deitz
Belleville, Illinois

If I had to choose only two woodworking magazines I'd choose Woodsmith and Today's Woodworker. Furthermore, if I had to select only one, I'd probably pick yours. Other than the balance of projects and overall quality of both of these publications there is one rare distinction: neither carries advertising! A reader knows that while your magazine may not have the heft of some of the others, it isn't padded by advertising. If you take the 'average' magazine and remove all the advertising, it will come out a sorry second to yours. In addition, those editors are so concerned with the



Just a quick note of thanks. The easel project was fun! (Dan Jilek; Beloit, Wisconsin)

advertising revenue that the caliber of the publication suffers. I would rather see an honest subscription price for a quality magazine than a lesser price for one with junk throughout the pages.

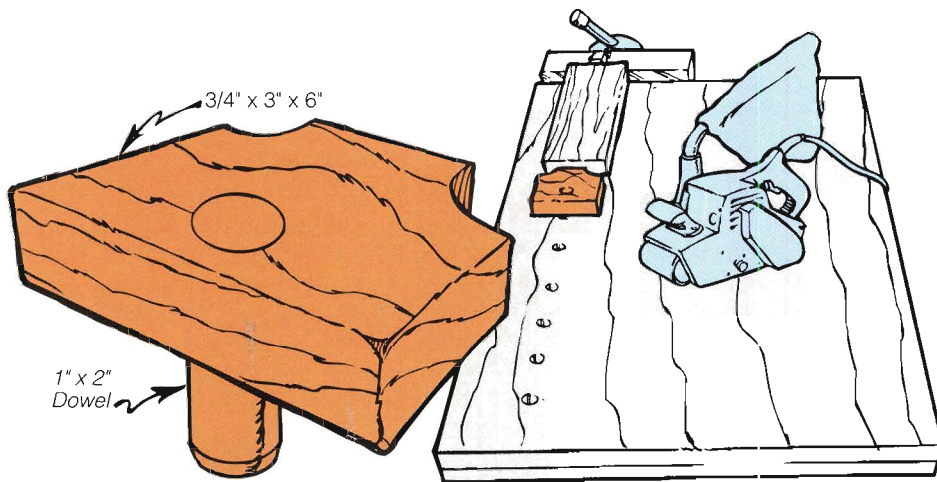
Thanks for sending me last issue's reader's survey. It's good to know that at least some of the publishers care about their readers' opinions.

Robert E. Lane
Raytown, Missouri

I am very pleased with my subscription to your magazine. I built the router table in issue #13 and have been turning out some precision routed small boxes thanks to the table's use of the Inca Jig.

John Sherry
San Luis Obispo, California

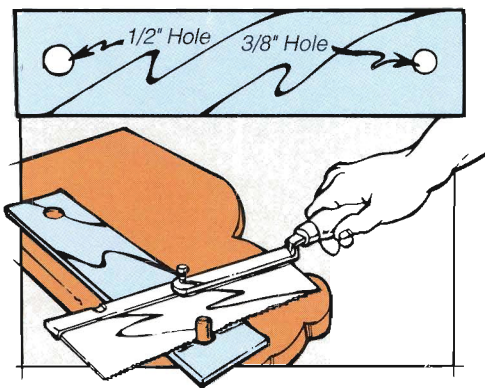
Clamping Jigs and Tool Protectors



Low Budget Bench Dogs

I have a workbench top made of plywood and wanted a cheap bench dog system. I cut 3/4" x 3" x 6" pieces of wood, drilled a 1" hole through them, then glued 1" x 2" long dowels into the holes. I then drilled 1" holes in my table top for the bench dogs to slip into. The system works great and was a snap to make.

*Jeff Williams
Laurel Bay, South Carolina*



Cutting Dowels Flush

Here's a very simple way to cut dowels almost flush with the surface when plugging screw holes. In one end of a short length of aluminum flashing drill a 1/2" hole, and in the other end drill a 3/8" hole. Slip the appropriate hole over the plug and the flashing will protect the surrounding area while you cut off the excess dowel.

*Robert O. Wendell
Marlboro, New Jersey*

Tool Protection

To protect their sharp edges, slip foam rubber bicycle handlebar grips over your expensive lathe tools or chisels.

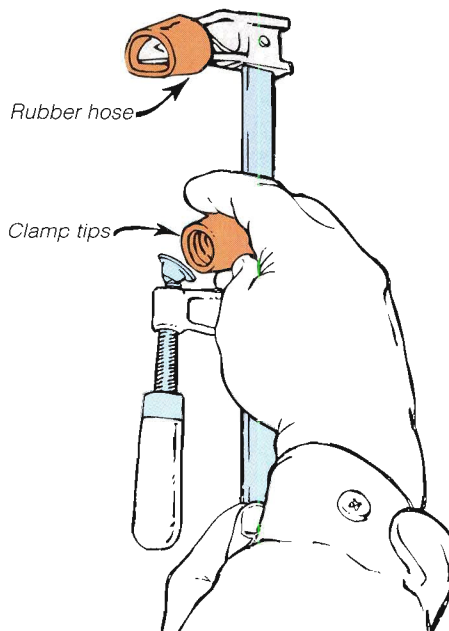
*Arthur Mendel
White Bear Lake, Minnesota*

Clamp Cushions

Prevent damage to your workpiece by cushioning the jaws of your clamps with rubber chair tips and a short piece of rubber hose. We fit 3/4" chair leg tips on the tightening screws of our clamps and use a short piece of 3/4" rubber hose to slip over the fixed ends of the clamps.

Chair tips are available in a variety of sizes and, along with the rubber hose, can be found at local hardware stores.

*Alice & Robert Tupper
Canton, South Dakota*

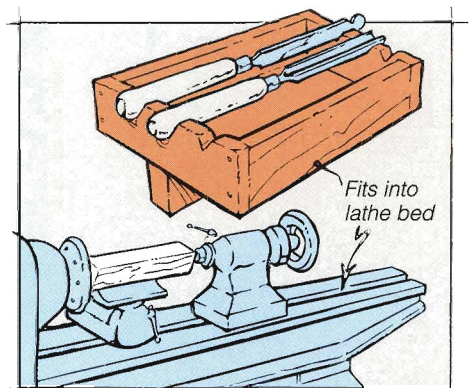


Darkening Cherry Wood

If you'd like to achieve several years worth of darkening on your new cherry furniture, give it a very dilute coating of sodium hydroxide. Sodium hydroxide works by changing the pH of the wood and is most readily available as household lye or saw blade cleaner, both caustic alkalines.

It doesn't take much to do the job, but you'll have to work quickly and wear rubber gloves. Be sure to sand off the raised grain caused by applying the solution before you proceed with the finish of your choice.

*Hugh Foster
Manitowoc, Wisconsin*



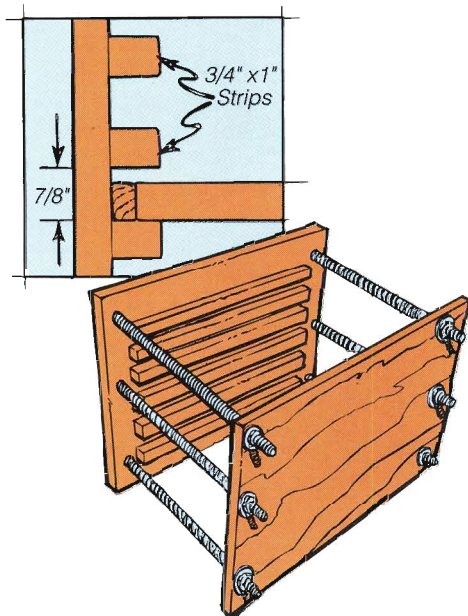
Turner's Tool Rack

Here's a tip for woodturners. Tools left on or nearby an operating lathe will rattle and fall off very easily, often damaging their tips or cutting edges. A simple tray, like the one sketched above, can be very helpful in keeping these tools where you want them.

I use a piece of 3/4" plywood for the base and 1/4" stock for the supports. I find that most of my turnings only require the use of four tools, so my rack is notched for these, but you can make a larger rack or set two smaller ones side by side if you use a greater variety of tools.

Thanks for the good magazine. Keep 'em coming.

*Palmer M. Sharpless
Newtown, Pennsylvania*



Multiple Edge Jig Gluing

The front edge of a plywood shelf is usually edged with a 3/8" thick wood strip. Using pipe clamps to do this to a lot of shelves is very time consuming. A better way is to make a jig that will hold several shelves at one time.

I made a large gluing jig with 3/4" plywood and 3/8" diameter threaded rods. First I cut two panels, then I glued and nailed a series of 3/4" by 1" strips to them, leaving 7/8" gaps between each strip. Next, I drilled a number of 3/8" holes in the panels, each hole about 6" apart, for the rods to pass through.

To use the jig simply cut your shelves and edging strips, put glue on their mating edges and slip the assemblies into the jig. Once all the shelves are resting on the strips, use a wrench to tighten the nuts on the threaded rods to operate the panels like a giant clamp.

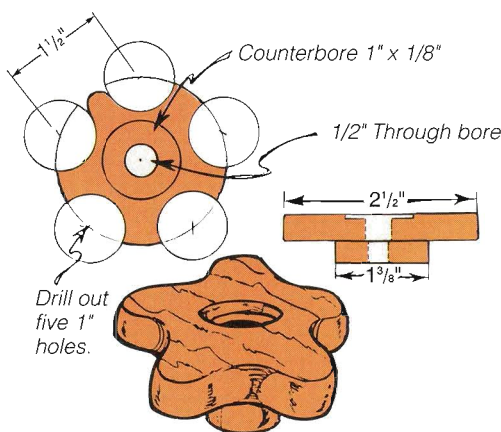
*William B. Timberlake
Richmond, Virginia*

Today's Woodworker pays from \$20.00 (for a short tip) to \$100.00 (for an elaborate technique) for all Tricks of the Trade published. Send yours to Today's Woodworker, Dept. T/T, Rogers, MN 55374-0044.

Preventing Laminate Trim Burn

When trimming plastic laminate on a table top, the pilot on a solid carbide router bit can burn the laminate already applied to a panel's edges. To overcome this problem I cover the edges with vaseline. This keeps the pilot cool and creates a thin, slippery layer for the pilot to ride on. The excess vaseline can be wiped away with a dry cloth.

*Larry Bedaw
North Swanzey, New Hampshire*



Make Your Own Clamping Knobs

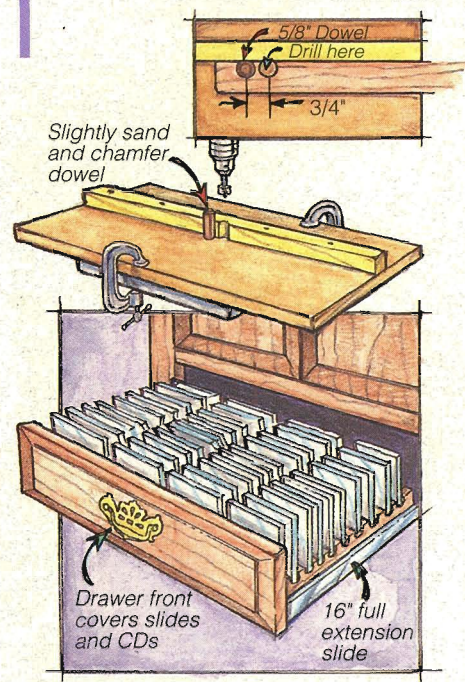
I built the router table shown in issue 13, but decided to make my own clamping knobs rather than buy them. I used a 3 1/2" x 12" piece of 1/2" maple to make two complete knobs.

Set your compass at 1 1/4" to draw 2 1/2" circles, then set the compass at 1 1/2" to space out five equal sections around the perimeter of the circles. Now use a 1" drill bit to bore through the maple at the five perimeter marks and counterbore the center of the circle to a depth of 1/8". Continue through at the center mark with a 1/2" bit, then cut the knobs from the stock with a band saw. Sand their edges smooth with a 1" drum sander.

Flatten the prongs on two 3/8" t-nuts and epoxy them into the center holes of the knobs. Next, make two 1 3/8" circles with a hole saw and drill their centers with a 3/8" bit. Line up the center hole on a knob with the hole in a circle and glue the two together, drawing them tight with a 3/8" bolt. When you remove the bolts you'll have a pair of clamping knobs.

*Robert K. Fentzke
Peoria, Arizona*

PICK OF THE TRICKS



An Improved Drilling Jig

I thoroughly enjoyed the design of the CD holder in issue 14. With a few modifications it worked great in my old stereo cabinet.

I changed the drilling jig slightly (as shown above), which led to a much easier production set-up. There was no longer any need to lay out each drilling location and the registration dowel I installed gave me an anchor so I didn't need clamps. This greatly improved my speed of operation. I've been woodworking a long time and always use clamps or jigs to anchor my material when using power equipment. I'm a clarinet player in a five piece combo so it's especially important to protect my fingers!

*Liam Moriarty
Shiremanstown, Pennsylvania*

Prizes for Your Best Trick

Thanks, Liam, for the great idea. You'll receive a set of layout tools for your winning trick. For the January/February issue, we're giving away a router bit set—nine carbide tipped bits from Amana in a special wood case.

Send us your tricks by December 15.



How to Sharpen and Use Cabinet Scrapers

By Bruce Kieffer

A cabinet scraper can be a woodworker's best friend, or a cast aside, seldom thought of old chunk of steel. One's opinion seems directly related to their ability to sharpen the tool's edge. Until recently I never used scrapers; they just didn't work for me! Then I asked a woodworking friend to show me how to use one. She sharpened the edge, handed me the tool, and to my amazement it worked great! Now that I'm converted, I use scrapers all the time and love them. After you learn how to sharpen them, I'm sure you'll love them too.

How Scrapers Work

Simply put, cabinet scrapers are thin, flat pieces of medium hardened steel with a burnished edge. They're available almost anywhere woodworking tools are sold. The most common shape is rectangular, about $2\frac{1}{2}$ " x 5", and about $1/32$ " thick. Curved scrapers, for scraping curved surfaces, are also available. You should sharpen them the same way you do the rectangular ones.

Once sharpened and properly held in your hands, scrapers will easily slide across a wood surface, quickly removing small amounts of wood in the form of shavings. Essentially, you "scrape" away wood in very small amounts to smooth and flatten the wood's surface.

Experienced woodworkers generally use a cabinet scraper after belt sanding and prior to finish sanding. They quickly remove scratches and gouges created by the belt sander, scraping all around the defect to leave the surface flat and smooth. Then a quick finish sanding with 150 or 180 grit sandpaper and they're ready to apply a finish.

Other uses for scrapers include smoothing highly figured woods like birds-eye and curly maple, flattening delicate veneered surfaces, and leveling uneven joints that have changing grain directions. You're better off

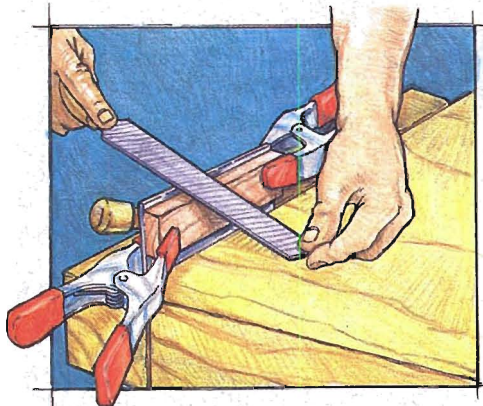


Figure 1: Push the mill file along the scraper blade's edge to flatten the steel. Use a wood block as a guide to keep the file square to the edge.

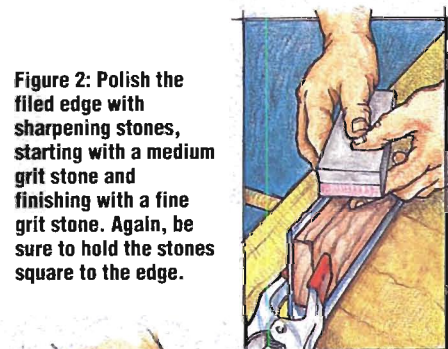


Figure 2: Polish the filed edge with sharpening stones, starting with a medium grit stone and finishing with a fine grit stone. Again, be sure to hold the stones square to the edge.

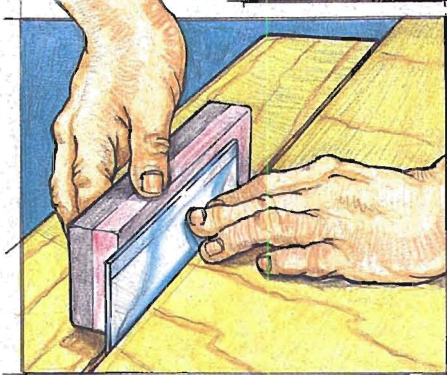


Figure 3: Remove any burr that resulted from draw filing the edge by honing the scraper's faces with a fine grit sharpening stone.

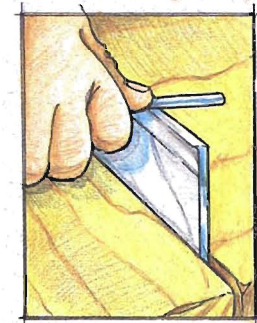


Figure 4: Roll the cutting burrs on the edge with a burnishing tool. Stroke each corner of the edge several times to get the proper burr angle.

scraping woods that are difficult to plane, like bubinga, since this tool will cut no matter which direction it's pushed across the grain.

The quality of a scraper's burnished edge will only be as good as the quality of the blade's steel. Purchase a more expensive name brand scraper blade with polished faces. You won't be sorry you spent the extra money!

Sharpening the Edge

The burnished edge is applied with a mill file, sharpening stones, and a burnisher. A burnisher is a hardened polished steel rod with a handle. Three burnisher shapes are available—round, triangular, and oval. They all work equally well to create the burred edge, and most cost under \$15. Once again, the quality of the tool is relative to its cost. There are also a few mechanical burnishers on the market costing \$35 to \$45. They work fine and produce an edge equal to the quality produced by the less expensive rod type burnishers.

Start the sharpening process by filing the scraper blade's edge square to its faces with a mill file. Placing a square edged piece of hardwood behind the blade will help guide you to file a square edge. Align the scraper blade edge just slightly above the square edge of the hardwood and clamp them both in a vise. File the edge of the blade using a technique known as draw filing (See Figure 1). Push or pull the file down the length of the edge, not over the edge, until the scraper's edge is flush with the hardwood.

Raise the blade in the vise and polish its edge with sharpening stones. I use oil stones starting with a medium grit and finishing with a fine grit. Be sure to keep the blade square to the stones as you polish the edge (See Figure 2). Now remove any burr that remains from the draw fil-

Planning For Wood Movement

ing by honing the blade's faces with the sharpening stones (See **Figure 3**). Carefully feel the edge (it will be razor sharp!) to make sure the burr is completely gone.

Now you're ready to burnish the edge. Clamp the blade in the vise again. Hold the burnisher flat on the blade's edge and stroke it back and forth 2 to 3 times while applying moderate pressure (See **Figure 4**). Now "roll" one edge over by slightly increasing the burnishing angle and making another 2 to 3 strokes on each side. The final burnishing angle should be 10 to 15 degrees.



Figure 5: To produce fine shavings with a scraper, firmly hold the blade so it curves slightly in the middle and keep it at a 45° angle to the wood.

Using the Scraper

Now that you've got your scraper sharp, you're ready to try it out. Using a scraper requires a fair amount of force, so clamp the wood you'll scrape to your workbench. Hold the scraper blade with both hands and place your thumbs in the middle of the blade. Apply a little pressure with your thumbs so the blade curves slightly. Put the sharpened edge on the wood and gently push it across the wood holding the blade at a 45 degree angle (See **Figure 5**). The results will be fine shavings if you're holding the blade properly. With a little practice you'll find yourself reaching for your cabinet scraper and wondering how you ever managed without it.

Bruce Kieffer, a professional furniture builder, is a contributing editor with Today's Woodworker.

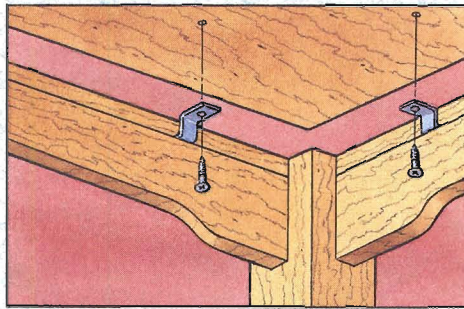
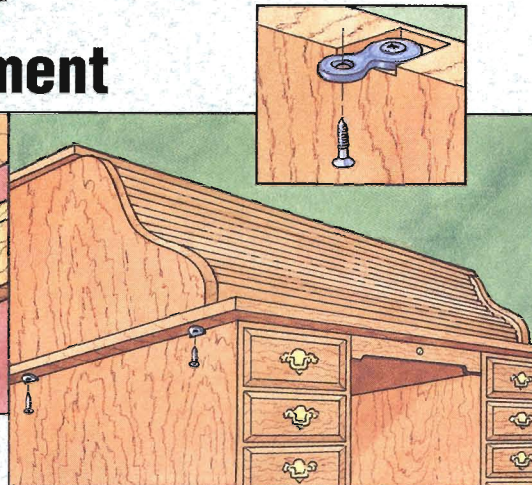


Table top fasteners are screwed to the top at one end and float in a kerf at their other end, which allows the top to expand freely.

Most of us have heard the classic horror story about the beginning woodworker who spent dozens of hours and beautiful material to build his first table. When it was finished, he proudly put his new piece of furniture to use. In a few months the top split a little, and pretty soon the joints were coming completely apart. Within a year the beautiful table was a glaring eye sore and a sad reminder of what happens when you fail to plan for wood movement.

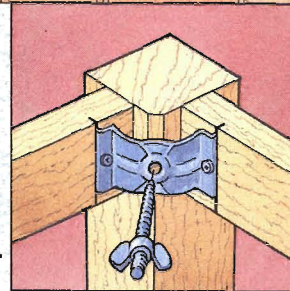
Fortunately, mechanical fasteners have been developed that allow the wood to move while still holding the furniture together. Metal table top fasteners are designed to screw to the underside of a table at one end and to slip into a kerf in the table's apron at the other end, securing the top to the base. As the top expands and contracts with humidity changes, the bracket slides in the kerf.

Another piece of hardware designed to allow for natural wood movement is a desk top fastener. These are often used on roll top desks to connect the upper portion of the desk to the lower drawer cases. To install these, a shallow recess is cut in the top edge of the base sides. The recess should be the same depth as the thickness of the fastener to allow the top to rest fully on the sides. The smaller end of the figure eight is then screwed into the recess and the larger end is left hanging out of the side. When the top is set onto the base the open end of the fastener



Desk fasteners are secured at each end, but twist when the wood expands or contracts.

Use steel corner braces to best advantage for knock down joints on tables with plywood tops.



can be screwed to the overhang of the top. As the top or sides move with moisture changes, the fastener swivels.

If your top is made with stable material, then the hardware industry also has a device for you. A steel corner brace slips into kerfs cut in the aprons to provide a platform for leg bolts to grab onto. These brackets also allow the legs to be easily removed. Unlike the first two items, this bracket is best used with completely stable tops, like plywood or particleboard. The problem with using corner braces on solid wood tops is that, if the the aprons are properly connected with table top fasteners, there is no rigid joint in the entire structure. As the wood moves, the table can distort in a variety of ways. With a plywood top, the aprons should be glued into place, thus keeping the table square.

Despite their simplicity and the fact that they resolve basic wood-working challenges, these fasteners are often unknown to beginning woodworkers. Visit the shop of a professional however, and you'll find a whole drawer full.

Build A Colonial Bunk Bed

To make this bunk bed the author selected a style that could stand the test of time and then got busy machining all the parts ...twice.

By Rick White

For the growing family, saving space always seems to be a top priority. There's just never enough room for all the stuff kids collect these days and the most crowded place in the house is usually their bedroom. A bunk bed helps solve this problem by opening up more floor space and permitting greater flexibility in positioning furniture.

While designing this project I decided that, besides safety, choosing a timeless style was most important, especially since this bed will most likely be used by my grandchildren

some day. I decided on a combination of spindles and frame and panel construction since both styles have already stood the test of time.

Red oak is ideal for bunk beds since it will stand up to the rough and tumble ways of any kid, and it's always a nice wood to work. The 56 spindles and the hardware used in this project are available from The Woodworkers' Store (21801 Industrial Blvd., Rogers MN 55374). In addition, you'll need 50 board feet of 3/4" thick stock, another 20 board feet of 2 1/2" thick stock and two sheets of 3/4" birch plywood. The

project took me about 40 hours to complete at a cost of about \$390.00, not counting the two mattresses.

Machining the Posts

Get started by ripping the eight posts (pieces 1 and 2) from 2 1/2" thick stock, cutting them a little wide, then plane the newly sawn edges clean and square so the posts are 2 1/2" by 2 1/2". Crosscut the pieces to length and lay-out the mortises for the rails and bed rail fasteners following the **elevation drawings on page 10**. The four tall posts will be used for the headboards while the shorter posts will be used for the footboards.

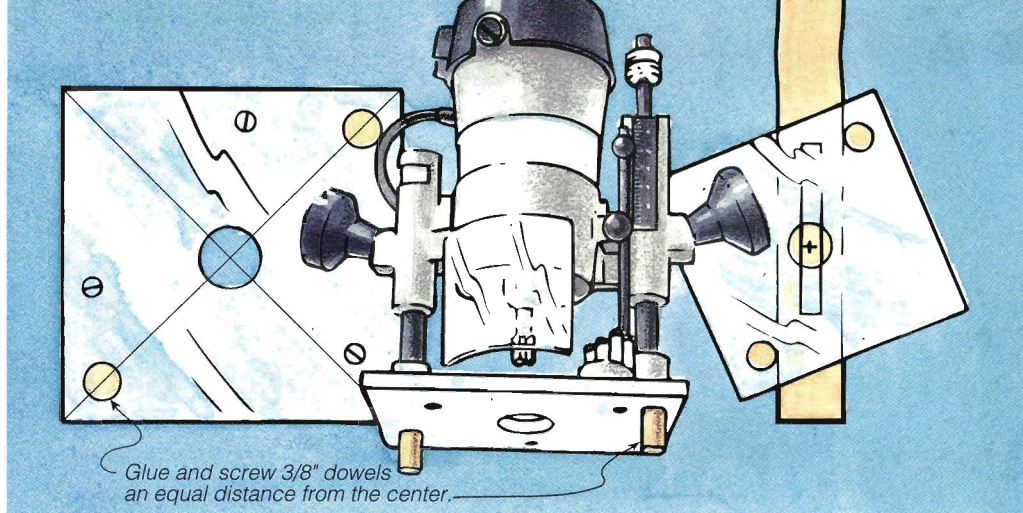
For routing the mortises in the posts, I made a special base for my plunge router that centers the bit on the edge of a board (See **Figure 1**). This jig was Paul L. Williams' winning trick in our September/October issue, and it works like a charm! Once you've made the jig, mount it to your router and install a 1/2" straight bit. Adjust the router to cut 1 1/4" deep for ploughing out the mortises that will join with the rail tenons. Set the router on a corner post and turn it until the guide dowels on the jig contact the stock. By keeping the dowels bearing against the sides, you can rout perfectly centered mortises in two or three passes.

Now, rout 3/16" deep mortises for the eight bed rail fasteners (pieces 9) with a 5/8" straight bit, then square the corners with a chisel. Next, use a 1/4" straight bit to rout a 1/2" deep channel in the center of each mortise. Those deeper channels will accommodate the hooks when the fasteners are connected.

When the beds are stacked the posts are connected with short dowels (pieces 12). For the dowels to fit, drill 3/4" diameter by 1 1/2" deep holes in the top end of the tall posts and the bottom end of the short posts. While you're at it, drill 3/4" diameter by 1/2" deep holes at the top of each short post for holding the decorative oak buttons (pieces 13). When the beds aren't



Figure 1: Use 3/8" thick polycarbonate and two short pieces of dowel to make a router base jig for cutting perfectly centered mortises in your bed posts.



stacked, you'll use four more of these buttons to fill the dowel holes in the headboard posts.

I finished up the posts by routing 1/4" chamfers on all their edges and ends. The reveal created by chamfering the ends makes a nice accent and hides any slight misalignment between the posts when the beds are stacked.

Headboard and Footboard Rails

If you can't find wide stock for the top rails (pieces 3) glue narrower boards into panels and rip the panels to width. Next, rip the lower rails (pieces 4) and the middle rails (pieces 5) to size, along with the raised panels (pieces 6) and the stiles (pieces 7). Once everything is the right width, cut all these pieces to length.

Grooves must now be cut in some of the edges of the rails and stiles to hold the raised panels (see **elevation drawings on page 10**). Cut the grooves with a 1/4" dado blade raised 1/2" in your table saw. Adjust the fence to center the blade on 3/4" thick stock. Mark one side of all your rails and stiles with an "X" and keep that side against the fence during these cuts. This way, if your cuts aren't exactly centered, you'll still be consistent.

Cut the 1 1/4" long tenons on the rails with a 3/4" dado blade raised 1/8". Clamp a set up block to the fence, then adjust the fence so the set up block is 1/2" from the edge of the blade. Screw a 24" long auxiliary fence to your miter gauge so that one end just touches the blade when the miter gauge is in its slot. Set your rails onto the miter gauge and butt them against the set up block. Make the first pass to define the tenon shoulder, then take several more passes to remove the remaining waste. Do this to the ends of every rail, making cuts on both the front and back sides. Complete each tenon by cutting 1/2" notches with a sharp handsaw. Be sure to test your set up on a scrap piece to insure that the tenons will fit properly.

Cut the tenons on the headboard

stiles with a 1/2" dado blade raised 1/4". Move the saw fence to align the set up block with the edge of the blade, then cut a sample piece to test the tenon fit in the rail grooves. Once you're satisfied with the fit, cut the stile tenons.

The next step is drilling the holes for the spindles (pieces 8). Chuck a 1/2" bit in your drill press and clamp a 4" tall fence to the drill press table so it centers the bit on 3/4" stock. Layout the fourteen hole locations on the appropriate edges of the upper and lower rails of the footboards and on the upper and middle rails of the headboards (see **elevation drawing on page 10**). Since the rails are different widths, you need to adjust the drill press table to keep all the holes 5/8" deep.

The pattern on page 11 shows the curves for the upper and lower rails. Enlarge these patterns and lay them out on your stock. After cutting them out with a saber saw or band saw, sand the inside curves with a drum sander and use a belt sander for the outside curves. Now you can notch the top edges of each upper rail tenon with a handsaw.

The Panels

The two narrow panels (pieces 6) in each headboard are raised on a table saw. This method is perfect for producing simple, flat angles. Raise your saw blade 1/8" and set the fence 1 3/8" from the blade. Now cut four kerfs into one side of each panel (See **Figure 2**). Next, angle the blade 12° and raise it 1 3/8". Set the fence 3/8" from the blade and cut the panel edges.

In order for the panels to fit into the grooves in the rails and stiles, the back of the panel edges must be rabbeted. Install a 1/2" dado blade and raise it 3/16". Clamp a

piece of wood scrap to the rip fence and move this assembly so the blade just grazes the wood, then cut the rabbets on the back of the raised panels.

Temporarily assemble the panels and stiles between the rails. The panels should fit snugly without being forced. If everything fits properly, take apart the pieces and sand them thoroughly. Next, spread glue in the grooves where the stile tenons join the rails (don't put glue anywhere else or the panels won't float) and reassemble the structures. Make sure the outside edge of the side stiles are flush with the rail tenon shoulders, and check the assemblies for squareness.

Assembling a piece of furniture is one of the most rewarding steps in a project, and the key to its success is organization. Collect the pieces you need for each endboard, and assemble them one at a time. First squirt glue in

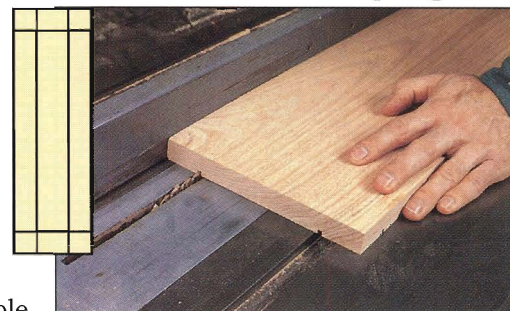


Figure 2: Raising the panels is a two step process. First cut 1/8" deep kerfs on the face of the panel (shown above), then raise the blade and angle it 12° to cut the sloped edges (shown below).



the spindle holes and insert the spindles, then draw the rails further onto the spindles with bar clamps. Once the rails and spindles are together, spread glue in the post mortises and set the posts onto the rail tenons. When both posts are mounted on the assembly, draw the joints tight with bar clamps. Follow this basic sequence for each endboard assembly, and always remember to check for squareness.

After the endboards are assembled, place the rail fasteners into their mortises in the posts. Drill $5/32''$ pilot holes and secure the fasteners.

The Side Rails

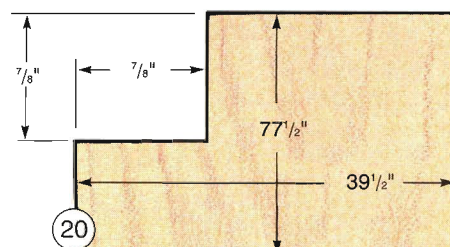
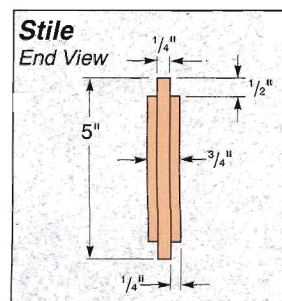
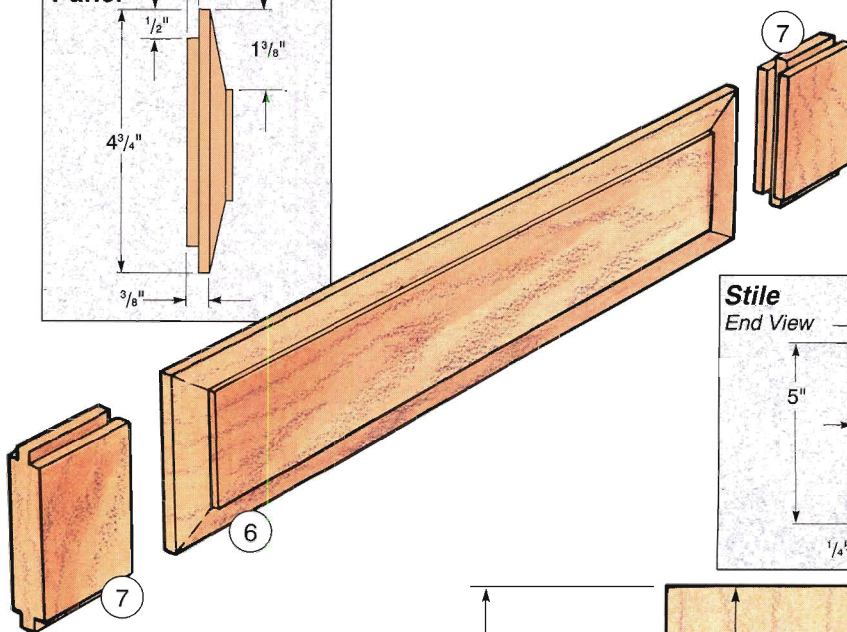
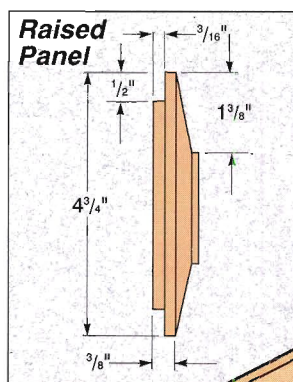
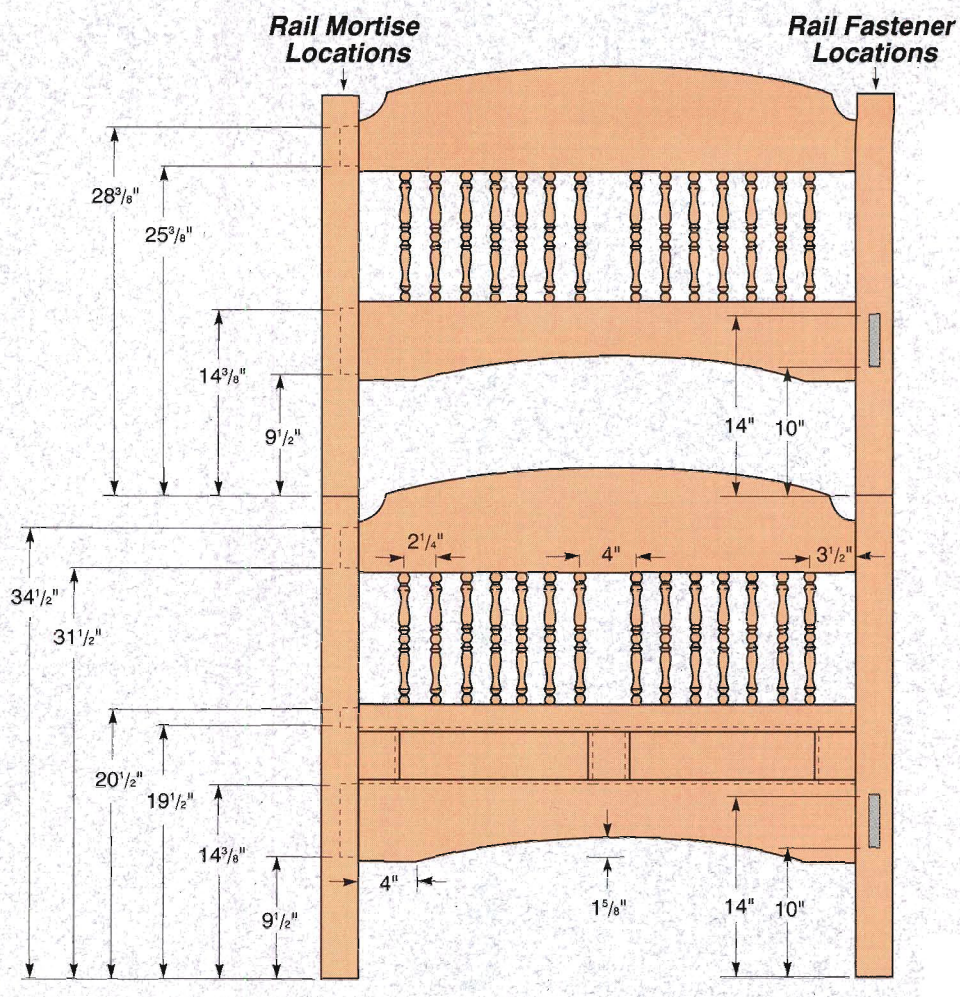
Rip four side rails (pieces 10) and cut them to length, then layout the mortises (see page 11) for the bed rail fasteners (pieces 9). Rout the $4''$ long by $3/16''$ deep mortises with the help of the centering base you made earlier and the jig shown in **Figure 3** on page 12. Clamp the jig to a rail end and hold it in a vise. Set up your router with a $5/8''$ straight bit, rout the mortises, then square the corners with a chisel.

Set the fasteners in place and give each hook a whack with a hammer. When you remove the fasteners you'll see two marks where the hook stampings project from the back plates. Install a $1/4''$ straight bit in your router and rout small channels in the mortises at the indentation mark locations. The deeper channels will allow the bed rail fasteners to sit flush with the ends of the rails. Set the bed rail fasteners into the mortises and drill $5/32''$ pilot holes.

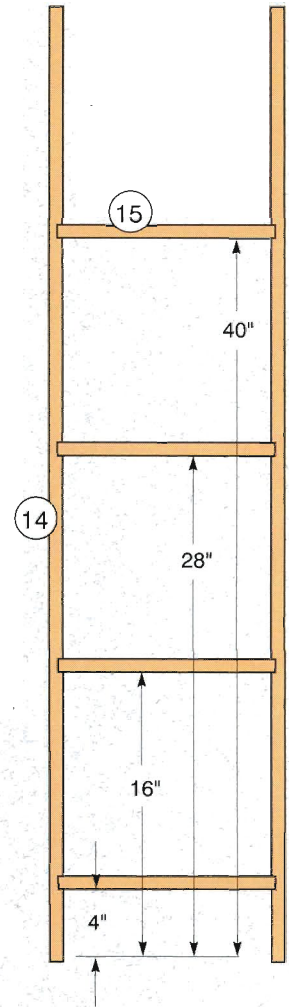
Before moving on to the ladder and guard rail there are a few details to complete. First cut the four ledger strips (pieces 11), then glue and screw them to the inside face of the rails (see **elevation on page 11**). For the dowel connectors (pieces 12), cut four pieces of $3/4''$ diameter dowel, then sand them and round over their ends so they slip into the post holes easily. Finally, glue a post cap (pieces 13) into the hole in the top of each footboard post. Store the remaining oak buttons in a safe place until you're ready to unstack the beds.

The Ladder and Guard Rail

Rip stock for the ladder stiles (pieces 14) and cut the pieces to length, then layout the dado positions on their outside faces (see **elevation drawing at far right on page 11**). Make a handy



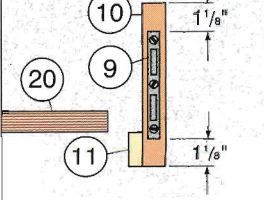
Ladder Dado Locations



MATERIAL LIST

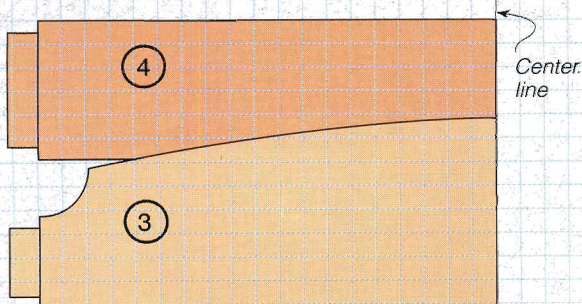
	T x W x L
1 Tall Corner Posts (4)	2½" x 2½" x 37"
2 Short Corner Posts (4)	2½" x 2½" x 31"
3 Top Rails (4)	¾" x 8" x 40½"
4 Lower Rails (4)	¾" x 5⅝" x 40½"
5 Middle Rails (2)	¾" x 2" x 40½"
6 Panels (4)	¾" x 4¾" x 15¼"
7 Stiles (6)	¾" x 3" x 5"
8 Spindles (56)	7/8" x 10"
9 Bed Rail Fasteners (2 sets)	4"
10 Side Rails (4)	¾" x 6⅞" x 76"
11 Ledger Strips (4)	¾" x 1⅝" x 76"
12 Connecting Dowels (4)	¾" x 1½"
13 Post Caps (8)	¾" dia. oak buttons
14 Ladder Stiles (2)	¾" x 2¼" x 52¼"
15 Ladder Steps (4)	¾" x 2⅝" x 12"
16 Oak Plugs (20)	3/8" diameter
17 Ladder Hooks (3 pairs)	Vinyl coated steel
18 Guard Rail (1)	¾" x 6" x 36"
19 Guard Rail Supports (2)	1⅞" x 1⅝" x 15½"
20 Mattress Boards (2)	¾" x 39½" x 77½" (ply)

Side Rail End View



Use the grid below to make a template of the arc for pieces 3, 4 and 18.

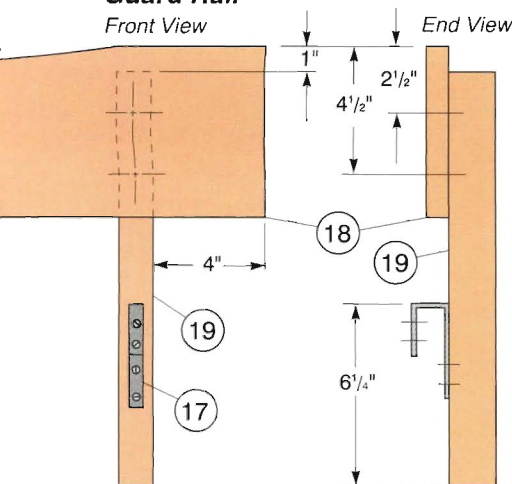
Each square = 1"



Guard Rail

Front View

End View



alignment tool for cutting the dados by screwing a 2" tall auxiliary fence to your miter gauge that extends well past the blade, and run it over a 3/4" dado blade raised 1". Now you can align each dado location with the cut in your auxiliary fence. Lower the blade so it projects 1/4" above the table saw surface and make your cuts. For a finished look, rout a 1/8" chamfer on all the edges of the stiles.

Each step is held in the dados with screws, so chuck a 3/8" bit in your drill press and drill two 1/4" deep counterbores in the outside face of each stile at the step locations. Next, cut the four steps (pieces 15) to size and chamfer their front edges. Now dry assemble the ladder and drill 3/32" pilot holes through the stiles and into the steps. Take the ladder apart and spread glue in each dado, then reassemble it and drive #8-2" screws into all the pilot holes. Sand the ladder thoroughly and glue 3/8" oak plugs (pieces 16) in the counterbores. Set the ladder hooks (pieces

17) in place on the stiles and drill 3/32" pilot holes. (NOTE: The Woodworkers' Store has just introduced the ladder hooks that were used on this project.) Don't secure the hooks until after the finish is applied.

The guard rail is made from just three pieces; the rail (piece 18) and two supports (pieces 19). Rip stock for each piece and cut them to length. Following the **elevation drawing at left**, layout the screw hole locations on the guard rail and drill the counterbores. Now position the supports and drill the pilot holes with a 3/32" bit. Assemble the supports to the guard rail, then position the two ladder hooks and drill their pilot holes. Again, don't attach them until after the bed is finished. Cover the support screws with 3/8" oak plugs and sand them flush.

Cut the two mattress boards (pieces 20) to size from the plywood, notching the corners so they fit around the bed posts (see **elevation drawing**).

The Final Act

Sand the bed thoroughly through 150 grit, being sure to ease any sharp edges or corners. I applied two coats of polyurethane because it will hold up the best under the heavy use kids will put the bed through. Once the finish is dry, screw the hooks to the ladder and the guard rail.

For bunk beds, use the headboards on the lower unit and the footboards on the upper unit. (If you want individual beds, use one headboard and one footboard for each unit and add the oak buttons to the top of the headboards.) Connect the side rails to the headboards and footboards, then slip the connecting dowels into the headboard posts. Now get someone to help you lift the upper bed into place.

Once the holes in the upper

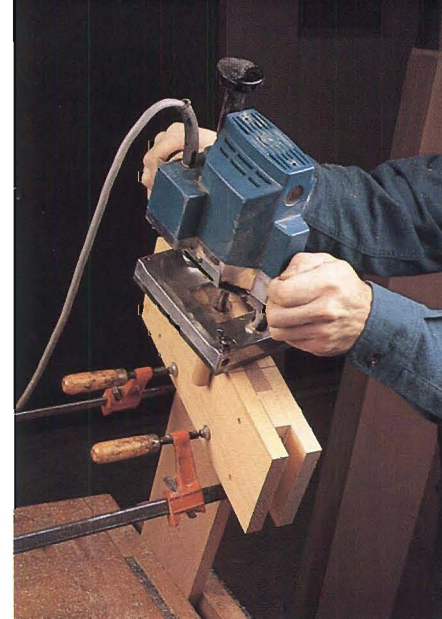
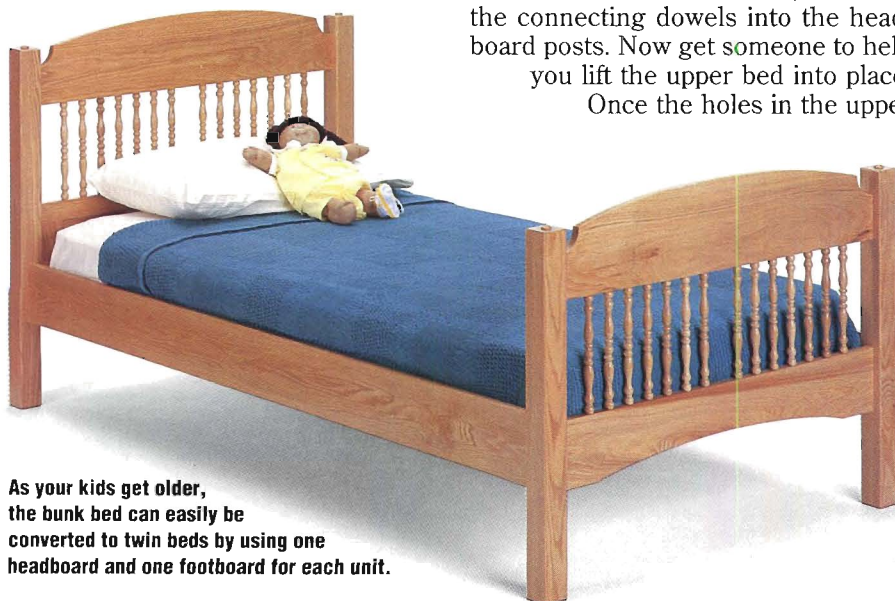


Figure 3: Make the jig shown above to wrap around the side rails. Use it with the post mortising jig to rout the shallow bed rail fastener mortise in the end of each rail.

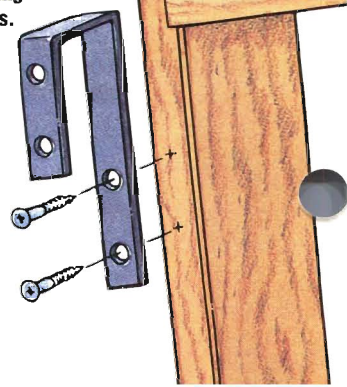
unit's posts engage the connecting dowels, set your mattress boards into place. Slip the hooks on the guard rail and the ladder over the bed rails. For added safety, these hooks are bored so you can screw them to the rails. This is a good feature as it prevents younger kids from accidentally knocking off the ladder or guard rail. I know that with my rambunctious youngsters it will definitely prove to be a necessary precaution.

Add your mattresses and bedding, and you're all set. You'll find more floor space available in the kids' room, and they'll have a great time with their new furniture.

Screw two hooks to the ladder so their tops are even with the top step. Attach the lower hooks so they grab the bottom side rail. Using four hooks in this way gives lots of support, and you can make the bunk bed even safer by screwing the hooks to the rails.



As your kids get older, the bunk bed can easily be converted to twin beds by using one headboard and one footboard for each unit.



The Teddy Bear Rocking Chair

Little kids just love sitting in this friendly little rocker. Get started gluing up your panels on Friday night and you'll have the completed chair on Sunday afternoon!

By Larry N. Stoiaken

Anyone who's tried to get a little one to sit still for a while knows what a daunting challenge that can be. Perhaps if the chair itself was just a little more inviting this wouldn't be such a difficult task.

That's what we had in mind when we asked Dan Jacobson, our project designer, for a kid's rocking chair that could easily be made in one weekend. The result has been a big hit with kids aged two to five, who all seem eager to test it out.

You can build this rocking chair with simple hand held power tools, including a circular saw, saber saw, router and drill. You'll find scale drawings of all the shaped pieces on page 15. If you take your time and do your routing before cutting the shapes on these pieces you'll breeze right through the project in just a couple of days.

Glue up the Seat and Back

The first step is making a panel for the seat and back (pieces 1 and 2). Select a couple of 7½" wide boards about 28" long and joint both edges on each board. When you're ready, spread glue on the joining edges and put the boards in clamps for a few hours.

When the glue dries, cut the panel in two, allowing 17" for the back and 11" for the seat. Now transfer the drawings on page 15 onto these two pieces, including the layout lines for the dadoes.

Clamp a straight-edge to the bottom of the seat panel and rout the three stoppered dadoes using a ¾" straight bit set to cut ⅜" deep.

When you're done routing, drill a ⅜" pilot hole through the seat at the center of each arm post hole, followed by a ⅜" diameter by ¼" deep counterbore. Now flip the panel right side up and drill the 1½" diameter by ¼" deep post holes with a Forstner bit at the two pilot hole locations. Finish the seat by cutting its outside shape with your saber saw.

On the back panel use your glued on template to locate and drill the six pilot holes for attaching the back to the sides, arms and seat. Finish up

by carefully cutting out the shape with your saber saw and drum sanding the edges of both of these pieces.

Machine the Sides and Stretcher

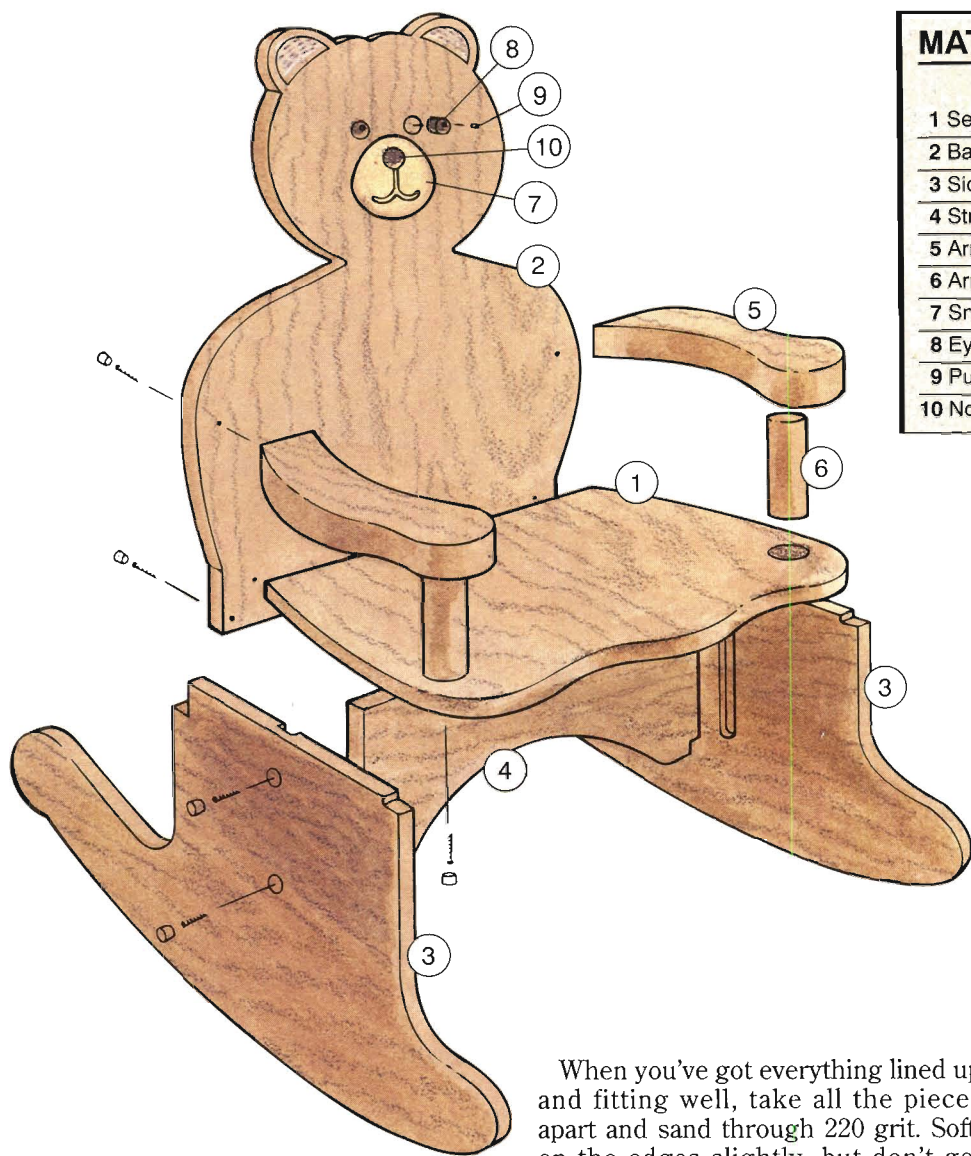
If you're building your rocker with white oak, you'll probably need to join a couple of boards for the sides (pieces 3) to get the necessary width. You should glue a 5½" wide piece to a 3" piece, keeping the smaller board to the top so the rocker portion of the sides will not contain a joint. Once your glued up panel dries, transfer the side layout to the wood and rout the ¾" wide dadoes. Be sure to use a straightedge to guide your router, and this time set the bit depth at ¼".

Now cut the stretcher (piece 4) to size and notch its bottom corners with a fine cutting handsaw. You should also notch both upper corners of each side piece at this time. Use a saber saw to cut the sides to shape and to cut the curve on the bottom edge of the stretcher. After these pieces are cut to shape, clamp the sides together and drum sand their curved edges, making sure that they rock smoothly.

The Arms and Posts

To look more like a bear, the arms (pieces 5) are cut from thicker stock. Start by locating and drilling the holes for the posts prior to cutting the arms to shape. These two 1½" diameter holes should be drilled ¾" deep to insure a strong joint. Once the holes are drilled, layout the arm shapes and cut them to final size with a saber saw, then sand the edges with a drum sander.





MATERIAL LIST

	T x W x L
1 Seat (1)	3/4" x 14 3/8" x 10" (White oak)
2 Back (1)	3/4" x 12 5/16" x 15 3/16" (White oak)
3 Sides (2)	3/4" x 8" x 20" (White oak)
4 Stretcher (1)	3/4" x 5 3/4" x 9 3/4" (White oak)
5 Arms (2)	1 1/2" x 3 1/8" x 8 1/2" (White oak)
6 Arm Posts (2)	1 1/4" x 3 3/4" Oak dowel
7 Snout (1)	1/8" x 4" x 3 3/8" (Maple)
8 Eyes (2)	5/8" Walnut dowel
9 Pupils (2)	1/4" Maple dowel
10 Nose (1)	1" Walnut dowel

Set the snout into position on the back and lightly trace around it with a pencil and, at the same time, mark the nose hole location on the back. Remove the snout and drill a 1" diameter by 3/8" deep hole for the nose and the two 5/8" diameter holes for the eyes. Glue in walnut dowels for the nose (piece 10) and eyes (pieces 8) and sand the eyes flush when the glue dries, but leave the nose protrude for now. Next, drill the holes in the eyes for the pupils (pieces 9) and glue these maple dowels in place.

Final Assembly and Finishing

Reassemble the chair, gluing and clamping as you go. It's best to assemble the sides and seat stretcher first and then add the other pieces after the glue dries. Plug all the counter-bored holes and sand the plugs flush.

Now apply a brown stain everywhere on the chair except the snout area. Let the stain dry, then glue and clamp on the snout, using the nose to line it up on the bear's face. While the glue is drying use an X-acto knife to outline each ear, then relieve the ears to a depth of about 1/16" with a small, sharp gouge. By not restraining the ears you'll create an interesting contrast with the rest of the bear. Once the glue on the snout dries, use a very small gouge to soften the edges of the mouth kerf and a palm sander to sand the nose flush with the snout.

Complete your teddy bear rocker by applying two coats of polyurethane. A tough finish like this will protect the Teddy Bear rocking chair from the dings and dents that kids will inevitably inflict on it, helping to guarantee its long life. It's now time for the test crew to take over, so stand back while the real professionals make their first inspection.

Dry Assembling the Rocker

Now that you've completed the major machining for the rocker you can drill the 3/8" diameter counterbores; there are two on each side, six on the back and two on the bottom of the seat (see the patterns on page 15).

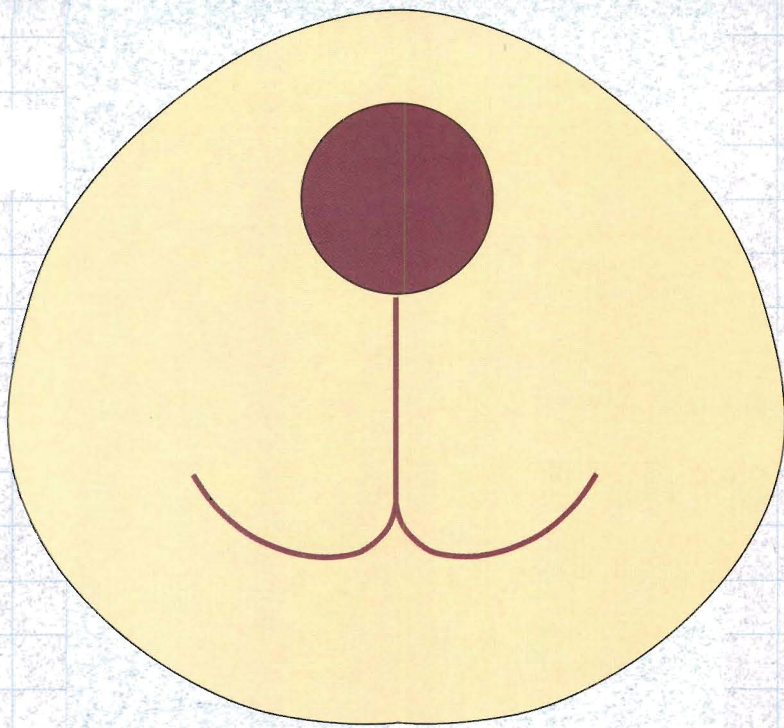
Assemble the sides and stretcher and drill the 3/32" pilot holes, then temporarily screw these pieces together. Now set the seat in place and carefully sand its edges so they meet the notches in the sides. Next, position the back and extend the pilot holes into the seat and sides, then screw the back in place. With the basic structure assembled, insert the posts into the holes in the seat and set the arms in place. Extend the pilot holes into the arms and drive a screw into each one. Finally, taper the outside edge of the arms with a sharp chisel and sandpaper so they blend into the shoulder of the back piece.

When you've got everything lined up and fitting well, take all the pieces apart and sand through 220 grit. Soften the edges slightly, but don't get carried away.

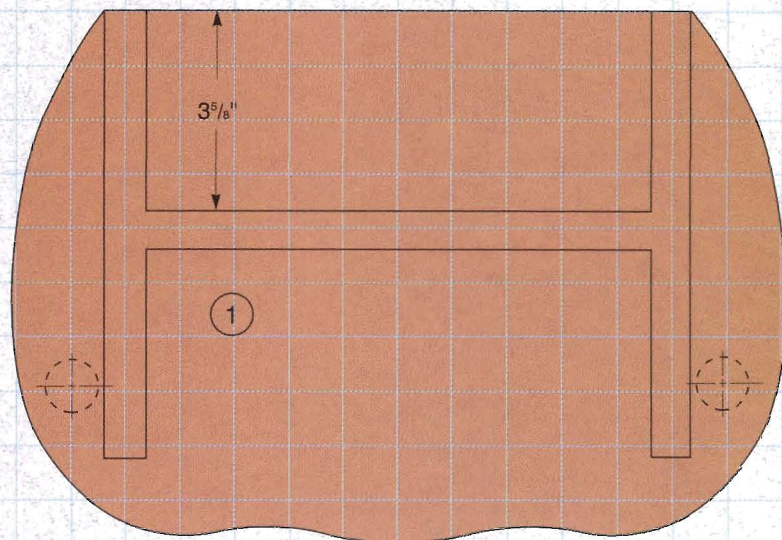
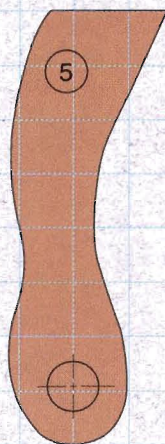
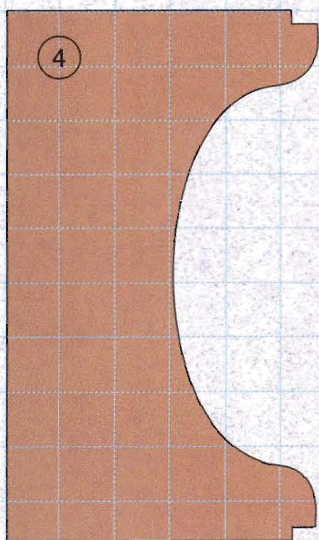
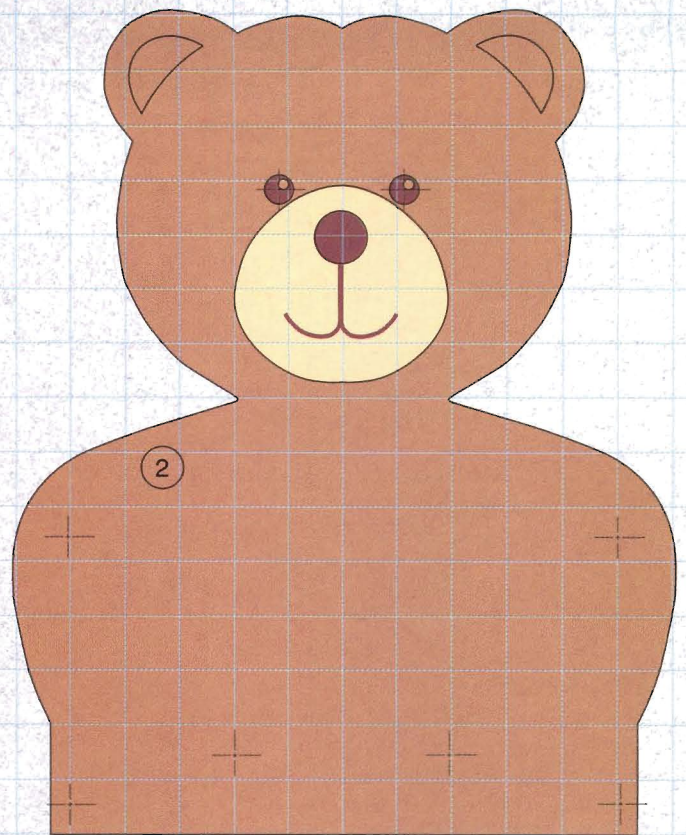
The Snout, Eyes and Ears

There's really two ways to go with the bear's snout and ears. You can simply use our scale drawings and some enamel paint or you can do a little extra work and end up with the bear shown in the photo. The snout position falls right in the small of most kids' backs so it won't bother them while they sit, and we've had no complaints from our seasoned testers.

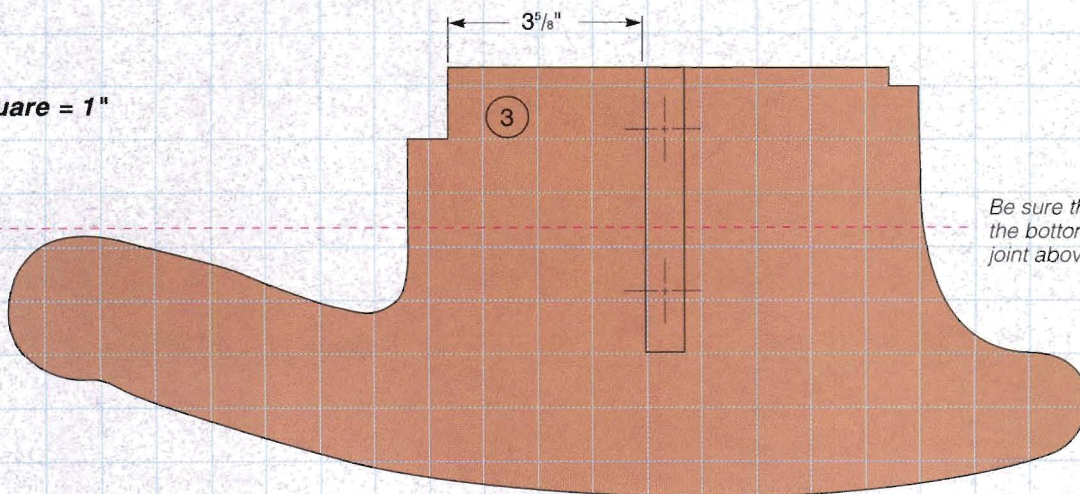
If you choose to make the snout (piece 7) from wood, the first thing to do is transfer the scale drawing to a piece of 1/8" thick maple, making sure that the grain will run parallel with the grain of the back. Locate and drill the hole for the nose, then use a saber saw to cut the mouth kerf and the outside shape. Now use a palm sander with 80 grit paper to slope the outer inch or so of the snout.



Full Size Template



Each square = 1"



Be sure the larger board is on the bottom to keep the glue joint above the rocker section.

Build A Cherry Cafe Table

Here's the perfect introduction to table making. With a couple of simple jigs you'll be able to make a perfectly round top and elegant tapered legs.

By Chris Inman

The right size cafe table can add the perfect touch to just about any room in the house. Small tables like these are commonly used for decorating living rooms or larger entryways, as bedside tables and as game tables. They also make great display areas for your plants, collectibles and artwork. Finding one the right size to fit into its surroundings is the real key. This round table design is ideal because the diameter of the top can easily be changed to fit any situation and its clean styling blends well with most other furniture.

Constructing the table will take about ten hours in the shop and about \$75.00 worth of materials. I used 12 board feet of 3/4" thick cherry for the top and aprons and 3 board feet of 1 3/4" thick cherry for the legs. And if you've never made a project with tapered legs, don't worry. It's easy to do and the jig you need is described in the short article on page 19.

Joining the Top

Get started by sorting out your 3/4" cherry, choosing the best stock for the top (piece 1) and the rest for the aprons (pieces 3). Organize the boards for the top so their color and grain flow into one another, trying to keep the end grain directions alternating from board to board. The more you alternate the end grain patterns the less likely it is that the top will cup.

Once their order is set, joint the boards' edges and glue up the panel. When clamping a broad panel like this it's best to use half the clamps under the panel and half on top, alternating every one. This evens out the pressure on the panel and reduces the chance of cupping.

Mortising and Shaping the Legs

Rip the 1 3/4" thick stock into 1 7/8" strips for the four legs (pieces 2), then plane the thicker sides until the legs are 1 3/4" square. Now cut the legs to the length shown in the material list.



Two edges at the top end of each leg must be mortised with the router to accept the apron tenons (**see elevation drawing at right**). Set the router table fence 7/8" from the center of a 1/2" straight bit so that the mortises will be centered on the legs. Now clamp a stop block to the fence 3 1/2" beyond the center of the bit to limit the length of the mortises to 3 3/4".

Clearly mark the two inside faces of each leg with an "X", then take several passes to rout 1 1/8" deep mortises. When they're completed, the two mortises should form an "L" at the top of each leg. Now square the rounded end

of each mortise with a sharp chisel.

The apron tenons will be secured in each mortise with glue and square pegs. To prepare for the pegs, drill two 1/4" diameter by 1 3/4" deep holes into the two outside faces of each leg, as shown in the drawing at right. Wait until the aprons are made to square the holes for the pegs in the legs.

The next step is tapering the legs to a 1 1/8" square point. This operation is described in the short article on page 19, and the elevation drawing at right will help with laying out the cuts. After you've completed the tapers you can sand the legs smooth.

Forming the Aprons

The four aprons (pieces 3) are identical, so rip enough 3/4" thick stock to make the pieces, then crosscut them to 17", which allows for a tenon at each end. Now install a 1/2" dado blade in your table saw and raise it 1/8" to cut the apron tenons. Clamp a set up block to the saw's fence and move the fence so the block is 5/8" from the edge of the blade (this will yield a 1 1/8" long tenon). Using your miter gauge, butt the end of one apron to the set up block and push the piece over the blade several times to remove the waste, then flip the stock over and do the same thing to the other side. Follow this routine for cutting both ends of each apron.

The apron tenons will actually meet in the middle of the leg mortises, so it's necessary to cut their ends at a 45° angle, as shown in the drawing at right. By allowing the tenons to reach into the legs this deeply you increase the gluing area in the joint, which insures that you'll have a very sturdy table. When you miter the ends, take 1/16" off the tenon length for glue relief and to allow the pegs to do their job when the base is assembled.

Now you need to cut a 3/4" shoulder on the bottom edge of each apron tenon so they'll fit into the leg mortises. Use a tenon saw or Japanese saw to first cut down the tenon shoulder (see elevation drawing at right) and then to cut in from the end of the tenon to remove the small block of waste. Clean up the cuts with a chisel, and use a web clamp to dry assemble the aprons and legs to insure that the top edge of each apron is flush with the top of the legs. If the aprons sit high, trim the tenon shoulders until they're flush.

Next, slip a 1/4" brad point bit into each leg hole to mark the tenons (See Figure 1), then, as you take the base apart, number each tenon and mortise so you can assemble the legs and aprons in the same order later. Drilling holes at the points marked on the tenons would allow the pegs to hold the aprons securely, however, if the

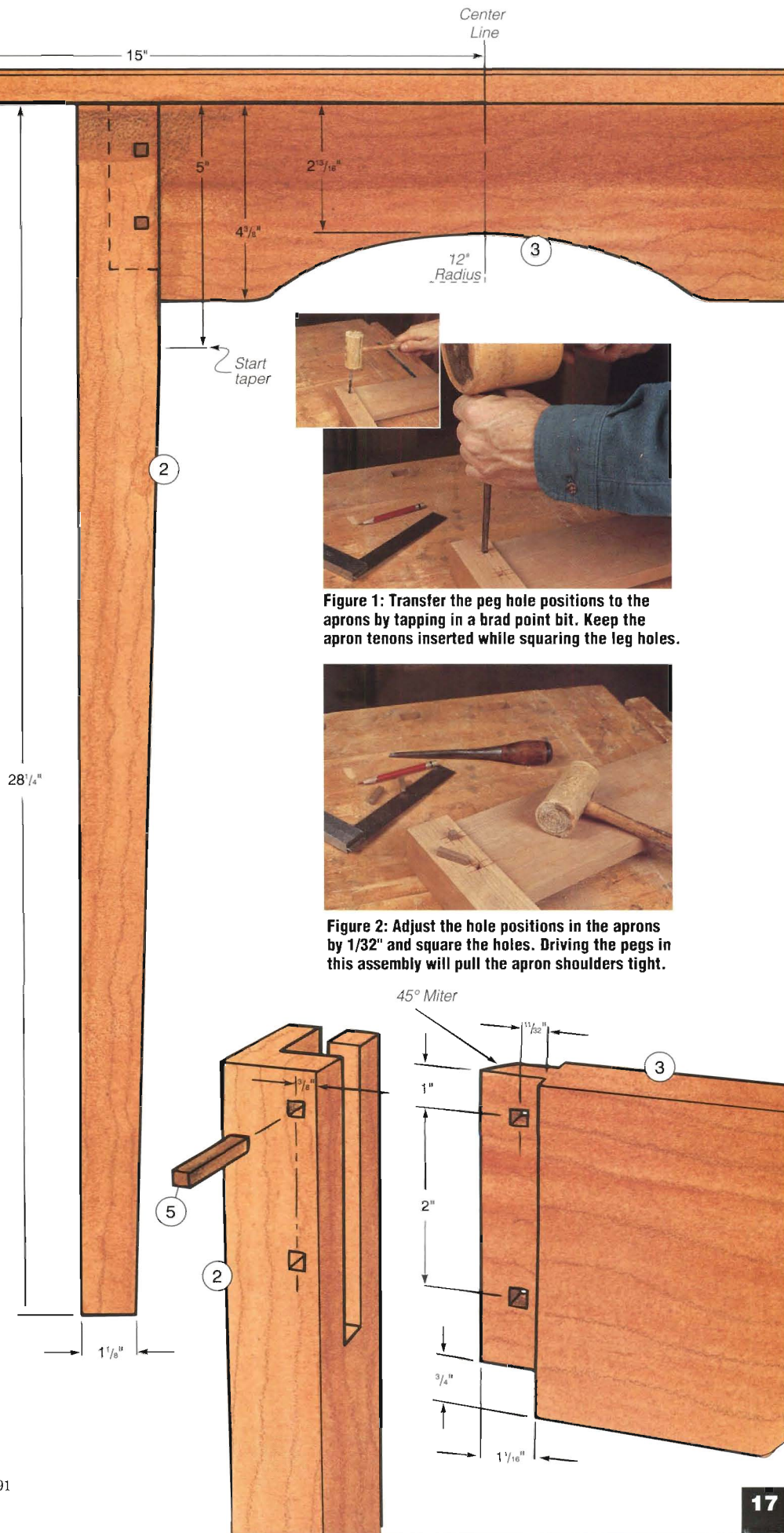


Figure 1: Transfer the peg hole positions to the aprons by tapping in a brad point bit. Keep the apron tenons inserted while squaring the leg holes.



Figure 2: Adjust the hole positions in the aprons by 1/32" and square the holes. Driving the pegs in this assembly will pull the apron shoulders tight.

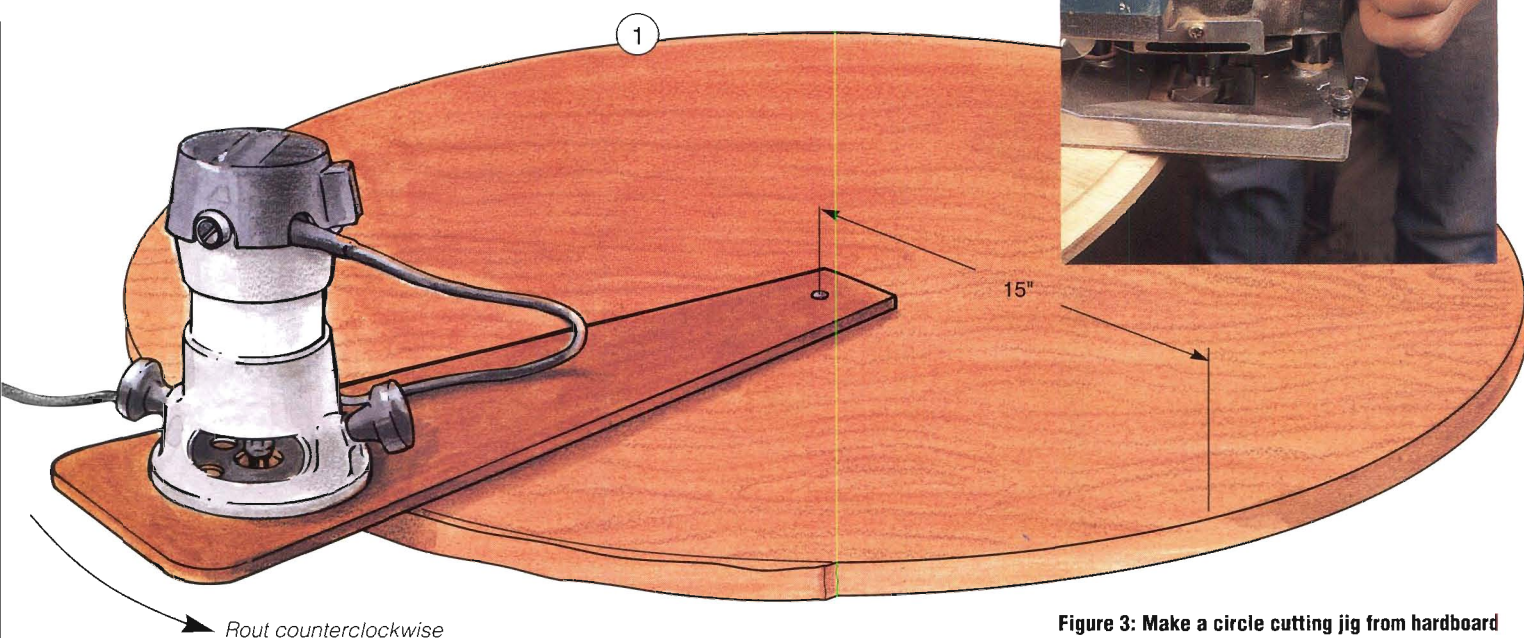


Figure 3: Make a circle cutting jig from hardboard and drill the pivot point 15" from the inside edge of the bit to get a 30" diameter top. Remember to work on the underside of the top for this operation. Once the circle is cut, flip the top right side up and rout a decorative edge with a piloted chamfer bit.

holes are drilled $1/32$ " closer to the tenon shoulders you'll get even better results—as the pegs are driven into the joints they will force the tenon shoulders tightly against the legs, making clamps unnecessary during the assembly (**See Figure 2**). Use an awl to make new marks $1/32$ " closer to each tenon shoulder, then drill $1/4$ " holes at these points.

Once the holes are drilled begin squaring them for the pegs. Use a square to layout lines around each hole, then remove the waste with a $1/4$ " chisel. Be sure to insert the tenons into the legs to prevent your chisel from tearing away the inside face of the mortises as it passes out the peg holes. When the chisel reaches the tenon, separate

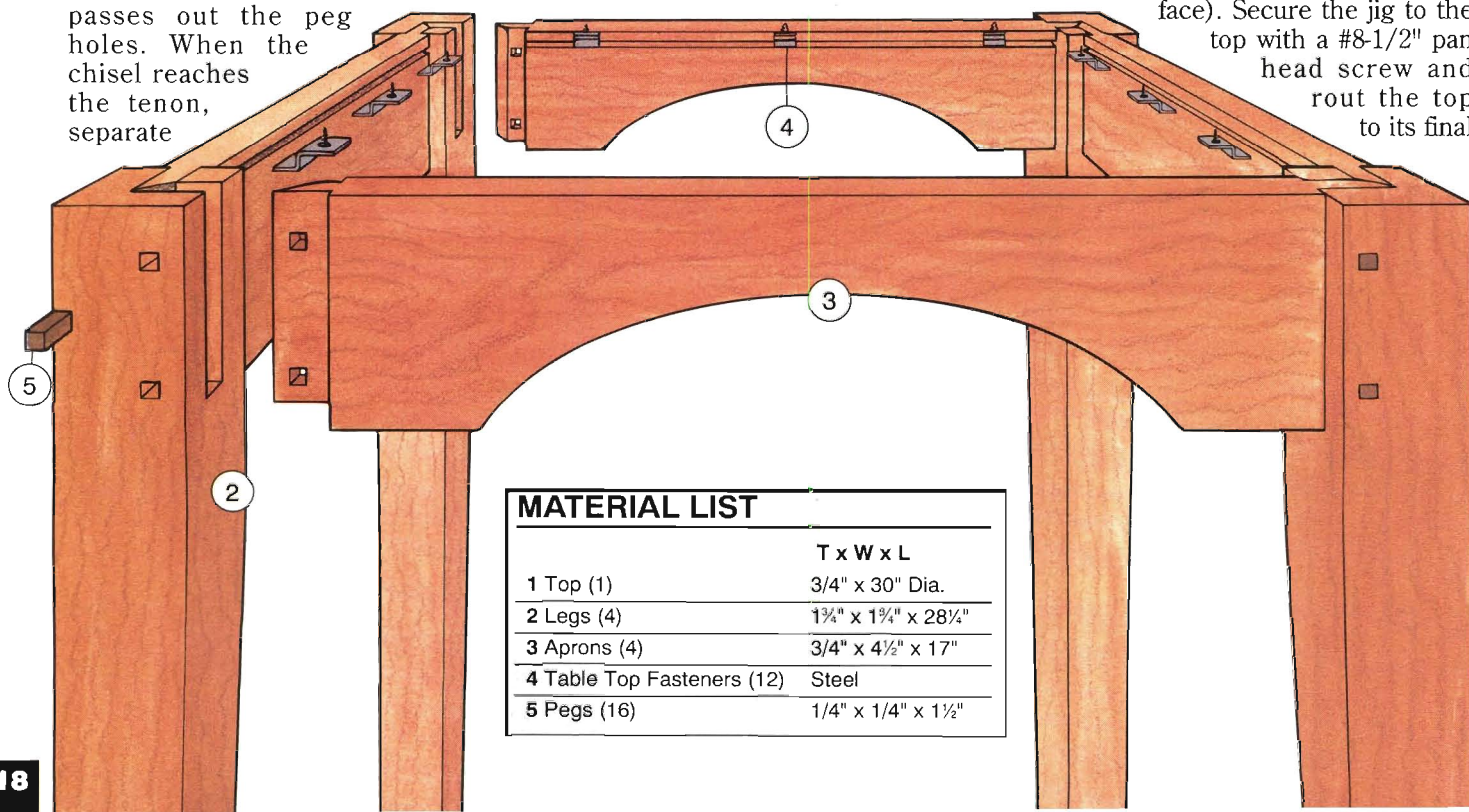
the apron from the leg to square the apron holes, again backing up the exit side of the tenons to prevent tearout.

The top will be secured to the base assembly with table top fasteners (pieces 4). These devices (**See Hardware Hints, page 7**) are inserted in a kerf cut on the inside face of the aprons. Replace the dado blade in the table saw with a ripping blade and cut a $3/8$ " deep kerf $7/16$ " from the top edge of each apron.

Following the measurements shown on page 17, layout the 12" radius curve on the aprons and cut them with a band saw. Once the curves are cut, sand them smooth with a drum sander.

Getting Back to the Top

Now that the glue in the top is dry, plane its surfaces flat and sand to 120 grit. Layout a 30" diameter circle on the underside of the top, making sure to mark the center point clearly. Use a saber saw to cut $1/8$ " outside this line. To get the top perfectly round, make the simple jig shown in **Figure 3**, then screw it to your plunge router base and install a $1/2$ " straight bit. Drill a pilot hole in the jig 15" from the edge of the bit and another in the center of the table top (on its bottom face). Secure the jig to the top with a #8- $1/2$ " pan head screw and rout the top to its final



MATERIAL LIST

	T x W x L
1 Top (1)	$3/4$ " x 30" Dia.
2 Legs (4)	$1\frac{3}{4}$ " x $1\frac{1}{4}$ " x $28\frac{1}{4}$ "
3 Aprons (4)	$3/4$ " x $4\frac{1}{2}$ " x 17"
4 Table Top Fasteners (12)	Steel
5 Pegs (16)	$1/4$ " x $1/4$ " x $1\frac{1}{2}$ "

diameter. Remove the jig, flip the top over and rout a decorative chamfer around the top edge.

Final Assembly

The last parts to make before assembling the table are the pegs (pieces 5). Rip a 1/4" strip off a 1/4" thick piece of walnut stock that's at least 30" long, then cut the strip into sixteen 1 1/2" long pieces. To make driving the pegs easier, clamp your belt sander upside down in a vise and taper one end of each piece.

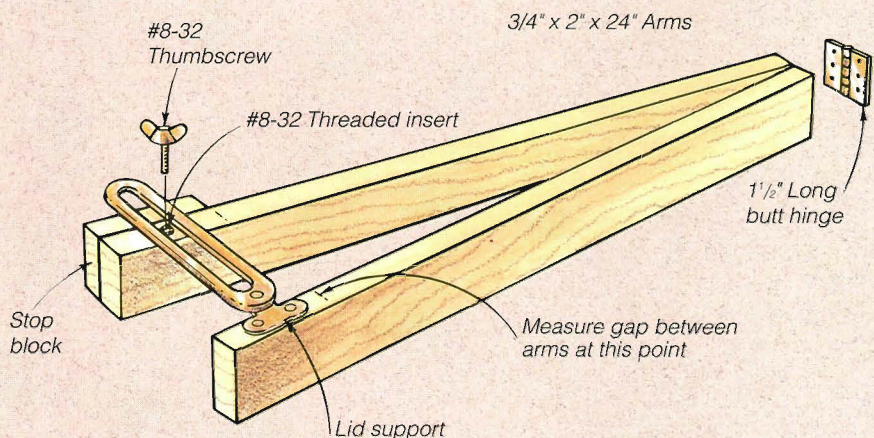
Before assembling the aprons and legs, sand all the pieces to 150 grit. When you've completed the initial sanding, organize the parts and spread glue in the leg mortises and on the tenons. Insert the tenons and put a little glue into the peg holes and on the first 1/4" or so of the pegs, then tap the pegs into place. It's best to assemble the base in stages. First put together two subassemblies consisting of a pair of legs and an apron. Once the pegs are driven, the structures should be strong, so you can add the last two aprons to complete the base. Immediately wipe away any excess glue with a damp rag. When the glue dries, cut off the extra bit of each peg still sticking out of the legs and sand them flush.

Now place the top upside down on your workbench and set the base assembly into position. Space three table top fasteners (pieces 4) along each apron, drill pilot holes and secure them with the screws provided. Turn the table upright to make sure the legs sit evenly on the floor. If the table rocks, take your belt sander and remove a little material from the longer legs, but be careful. You don't want to oversand at this point.

Remove the top and do a final sanding to 220 grit on the entire table, then apply several coats of a tung oil finish. After a few days, put the table back together and it's ready for use. In a short time, after the table has been exposed to air and sunlight, the cherry will begin darkening to a rich patina.

Chris Inman is the associate editor of Today's Woodworker magazine and a professional woodworker.

TAPERING LEGS ON THE TABLESAW



Tapered legs add detail and grace to a table design, and they're easy to make once you have a dependable jig. Basically, tapering jigs fall into two categories, the fixed angle type and the adjustable variety.

Adjustable taper jigs are much more versatile, and they're very easy to make. The jig consists of two lengths of very straight wood hinged together at one end. A lid support mechanism is positioned near the other end to allow the angle between the boards to change while keeping the jig rigid. Then a small block of wood is screwed to the side of one arm to act as a stop.

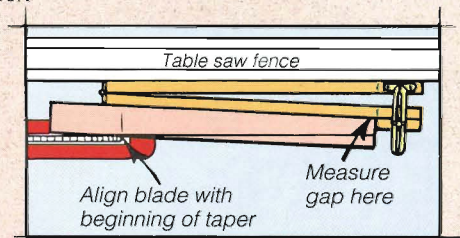
Inexpensive aluminum taper jigs are commercially available. Their principal advantage over wood jigs is that they always stay straight and stable no matter what the humidity conditions. However, one disadvantage with an aluminum model is that it's a costly mistake if you accidentally cut into the jig—replacing a wooden arm is easy and inexpensive.



Commercially made aluminum jigs are available from most mail order tool suppliers.

Cutting Tapers on Two Sides

To use an adjustable taper jig, separate the arms to the desired angle and set the jig against your table saw's rip fence. The easiest way to find the proper angle is to make the gap between the arms at the front of the stop block equal the amount you want removed from the bottom of the legs. For the legs in the cafe table,



For two-sided tapers the gap between the arms, when measured at the stop block, should equal the amount of wood you want removed from the leg.

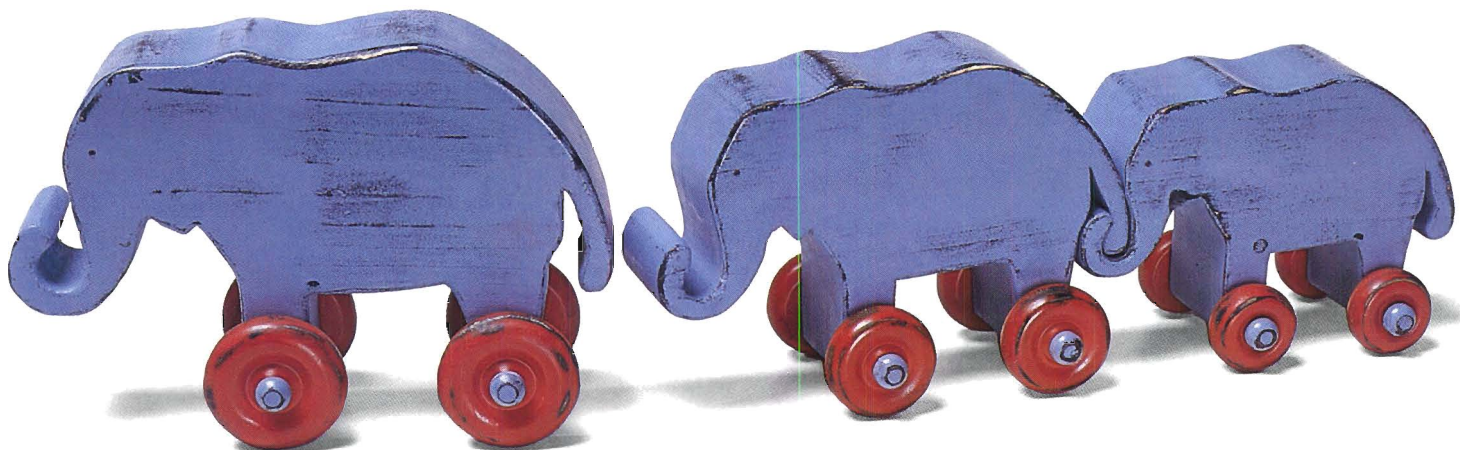
this distance should be 5/8". Next, place the stock against the jig and move the rip fence, jig and stock to align the saw blade with the starting mark for your cut 5" from the end of the leg. Always remember that the cut starts near the top of the leg.

Cutting Tapers on Four Sides

If you need to cut four evenly tapered sides on a leg, first set the jig to cut the angle on two adjacent sides of the leg, then double the gap between the arms to cut the remaining two sides. After the first two cuts are made and the jig is reset, remember to readjust the fence to line up the blade with the beginning of the tapers on the third and fourth sides of the leg.



For four sided tapers, double the arm gap and reset the fence to align the blade with the starting point on the last two sides of each leg.



Circus Elephants on Parade

Here's a perfect last minute gift for kids or friends who collect primitive folk art. A good band saw blade and some fancy finishing techniques are the keys to creating this instant heirloom.

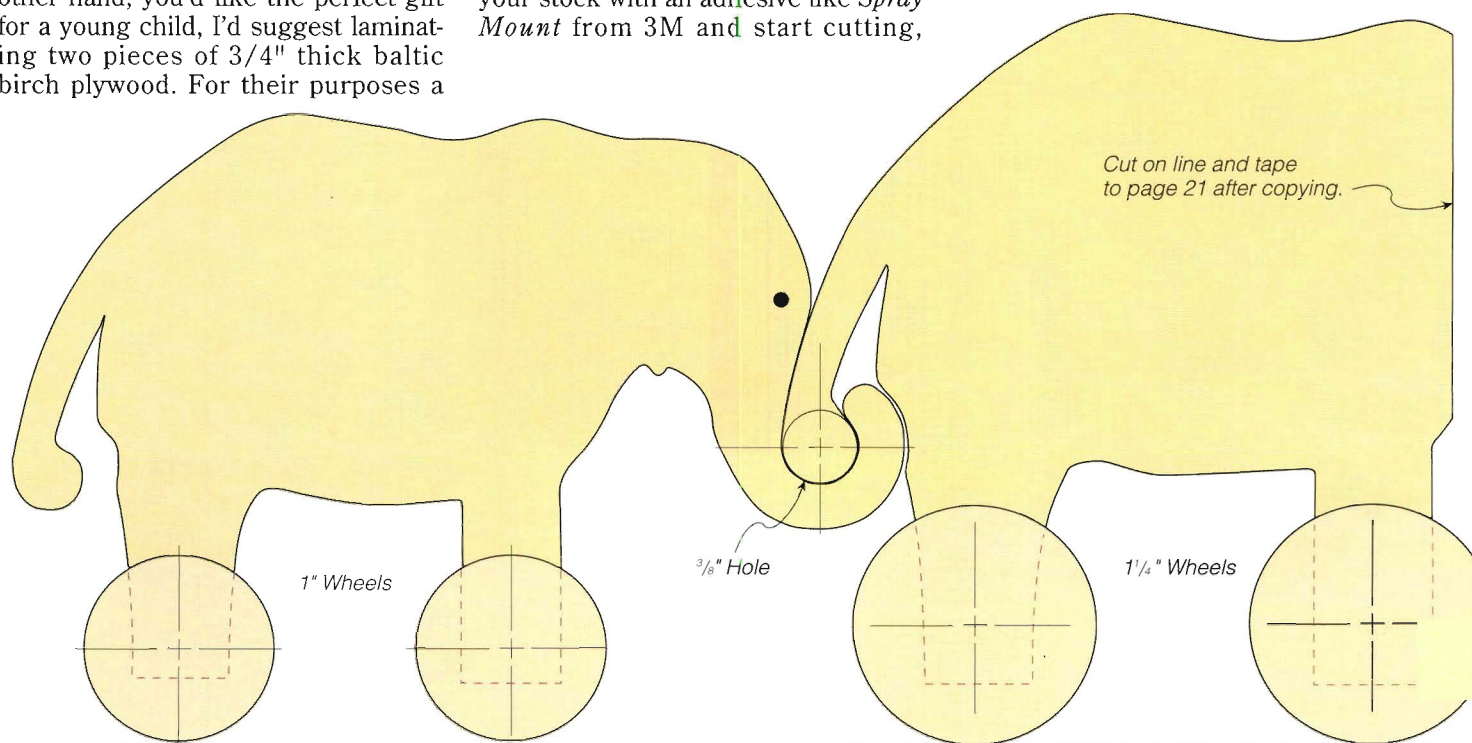
By Jeff Jacobson

Antique shops are full of old toys that most kids would just love to get their hands on. Instead, they're generally purchased by folk art collectors who use the pieces to decorate their homes. With my family of elephants you have a choice. If you're looking for an "instant heirloom" that will stay up on a shelf, you can use 2 x 6 pine from a local lumberyard. If, on the other hand, you'd like the perfect gift for a young child, I'd suggest laminating two pieces of 3/4" thick baltic birch plywood. For their purposes a

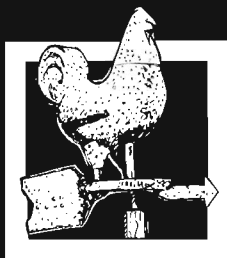
plywood elephant will be much stronger than a pine one, especially in the trunk and tail areas.

The first step in this project depends largely on the quality of your band saw and the blade you plan on using. I suggest a 1/8" hook tooth blade with 9-10 teeth per inch. If you can make the tight curves shown on the full size pattern below, simply make one photocopy, temporarily glue the paper to your stock with an adhesive like *Spray Mount* from 3M and start cutting,

making sure that you don't push too hard on the blade. If you can't cut the tighter curves, then make three photocopies of the pattern and use one for each elephant, temporarily gluing them to three separate pieces of stock. Before band sawing the elephants, drill out the inside curve of each trunk, using a 1/2" bit for the larger elephant and a 3/8" bit for the other



The American Folk Art movement reached its peak during the first half of the 19th century, generally featuring work by artists lacking formal training. The folk style was most evident in tavern signs, weather vanes, ship figureheads and children's toys. By the 1860s, as modern woodworking machinery became increasingly popular, the movement faded. Renewed interest today has helped to bring the style back to prominence.



two. With these areas drilled out, you've eliminated the toughest band saw cuts. The rest of the body can be cut easily, and a little filing will ensure a tight fit.

Once your elephants are cut out, drill a 7/32" hole completely through each pair of legs for the wheel axles. Follow the pattern for locating the hole positions, which are laid out to accommodate 1½", 1¼" and 1" toy wheels.

Finishing the Elephants

To prepare the wood for finishing, I sanded the elephants to 150 grit, and then carefully filed the interlocking joints until they slipped together very easily. My first coat of finish was a mixture of two parts black oil based enamel with one part flat urethane varnish. This mixture makes a tough finish with an antique, somewhat transparent appearance. For the second coat I mixed two parts of blue oil based enamel with one part urethane. When painting the red wheels (which also get the black undercoat first), try suspending them with some fishing line with a split shot weight at one end. This allows you to paint both sides at once. Complete the assembly by slipping the axle pegs through the

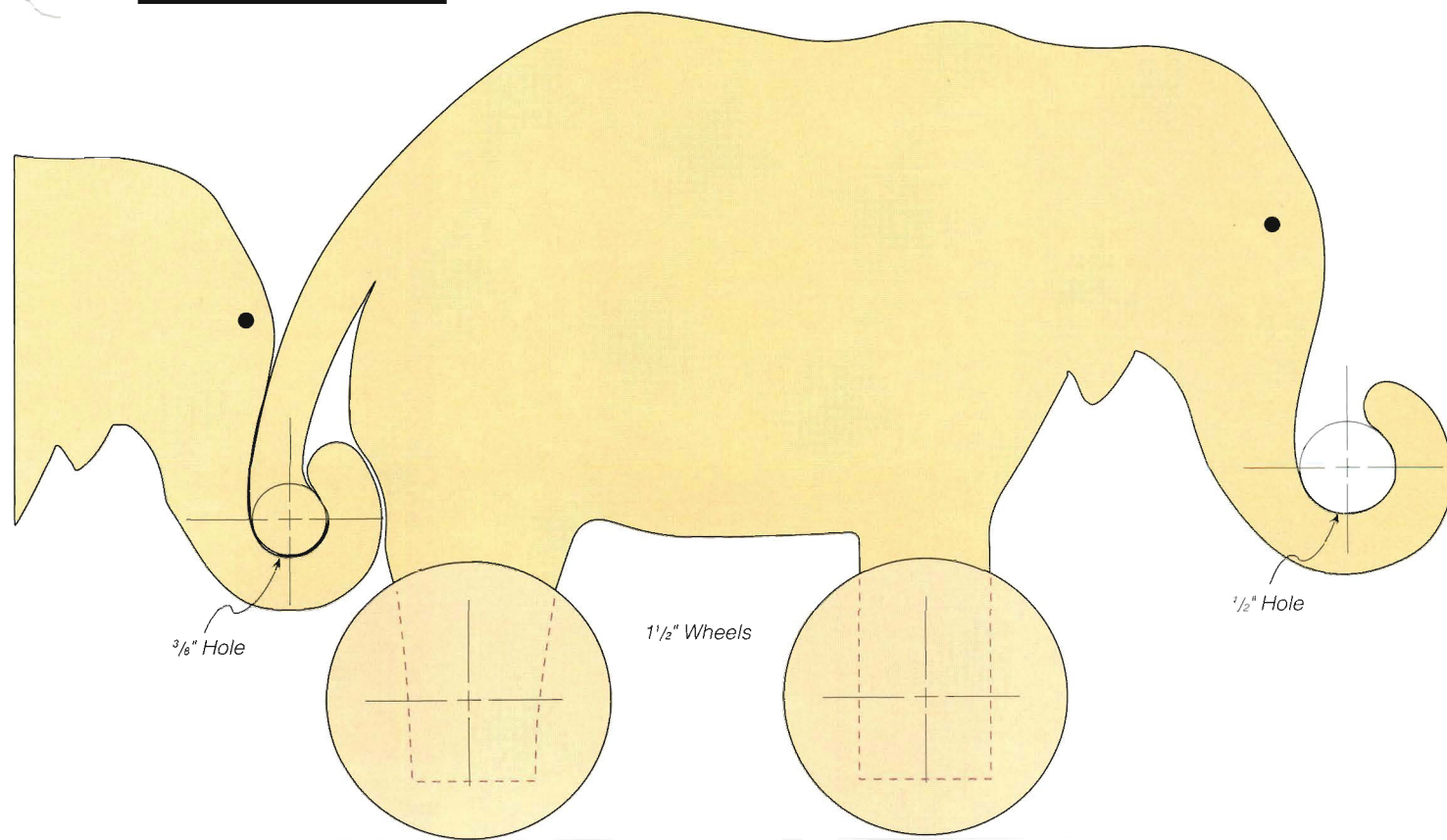


To get the antique look, use a base coat of black followed by a coat of blue. The paint for each coat should be mixed with urethane first.

wheels and gluing them to the legs. To give the elephants their antique appearance, I finished up by lightly sanding a few spots with 600 grit sandpaper and some 0000 steel wool. Limit your sanding to the edges and a few spots, particularly where you think normal wear and tear would occur.

This is a simple project requiring little time and scrap material. But remember, as Sharon Pierce says in *Making Folk Toys & Weather Vanes*, "...as long as there are children, there will be toys made from simple materials on a moment's notice."

If you're interested in more on folk toys, "Making Folk Toys & Weather Vanes", by Sharon Pierce, is available from Sterling Publishing Co., Two Park Ave., New York, NY 10016.



Shaker Masterpiece



Working only in his spare time over the course of three years, Bernard Resh invested more than 500 hours in completing his Shaker masterpiece. Even though he thought in the beginning that he was “biting off more than he could chew,” the results show that he was up to the challenge. Judging from this cherry cupboard’s exceptionally fine details, it’s clear that Mr. Resh has earned his place among the ranks of fine craftspeople.

The design was taken from an original in the Shaker Museum at Old Chatham, New York. A few dimensions were changed to accommodate the stock on hand, but details like the top moulding, the door and drawer configuration, the painted interior and the joinery were all true to the original. All the work was done in Bernard's garage with basic home shop tools. Even the latches were made by hand.

We're sending Mr. Resh a \$100.00 gift certificate to The Woodworkers' Store. If you have a project you'd like us to consider for the January/February issue, send us a few pictures by November 10.

Stocking Stuffers

By Hugh Foster

Here are several “giftable” items that might help Santa complete his tasks during this holiday season. These are items that will make your friends’ woodworking safer, more accurate and more pleasant.

During the Milwaukee Woodworking Show I stopped at the Woodhaven booth (5323 W. *Kimberly Road, Daventport, IA 52806*) and paid \$6.00 for a pair of American Optical **safety glasses**, which feature polycarbonate lenses with firmly secured side shields. I bought them for visitors to my shop, rather than for myself. They provide cheap insurance. If you already wear safety glasses, you need a pair or two for your visitors.

Brad Witt, founder of Woodhaven, is also the inventor of the **KNOW-bit**. These \$9.00 router bits are good for set-ups and nothing more. They permit me to layout more accurately for the center of a cut rather than for its edge. I bought bits to use in both my 1/4" and 1/2" routers.

I've seen small pry bars in catalogs before, and paid precious little attention to them. Now that I own one I'm constantly reminded of the dozens of times such a bar would have saved me both material and aggravation. The Japan Woodworker (*1731 Clement Ave., Alameda, CA 94501*) carries the **Kenzai Hagawshi** (nail puller) that does triple duty as a hammer, pry bar and scraper. At \$12.95 it's far handier than its ungainly appearance might lead you to believe. The scraper blade is nearly 1½" wide, and it takes a good

edge. When Santa brought this to me last year I was politely but not enthusiastically thankful. This year I'll be using a few as presents myself.

The Swedish made Nobex **adjustable folding square** first struck me as something which wouldn't work very well. The square folds out from 0 to 45-90-135 degrees. My luxury grade Bridge City square confirms that this Nobex is right on, and after nearly a year in use it's still exactly right. It's available for just \$18.95 from Garrett Wade (*161 Avenue of the Americas, New York, NY 10013*), so carrying this tool away from the shop seems a lot more sensible than carrying my expensive Bridge City tool, and it's a better fit in my pocket!

I've been filling half empty tung oil containers with marbles and buying photographic supply accordion bottles for years, but the new **collapsible storage bladder** from Lee Valley Tools is by far the best solution to the problem of storing finishing supplies I've ever seen, and it appears to be the least expensive. I especially like the "burp switch" on the screw cap, and the fact that the containers provide UV protection. The bladder is available from Lee Valley Tools Ltd. for \$1.50 (*1080 Morrison Dr., Ottawa, Ontario K2H 8K7, Canada*).

The Veritas **MK II edge trimming plane** (available from Gar-



Red Oak (*Quercus Rubra*)

By Gordon Hanson

rett Wade for \$115.00) is a real beauty; all the woodworkers who've seen mine have been unable to keep their hands off it. This large capacity version of the Lie-Nielson edge-trimming block plane doesn't fit my hand the way the original I've been using for upwards of a dozen years does—probably never will—but it will have a place in my arsenal.

Finally, there are three new items available from The Woodworkers' Store (21801 Industrial Blvd., Rogers, MN 55374) that will put the perfect touch on just about any woodworker's holiday. For \$17.95 their **Keyless Chuck** replaces any conventional chuck mounted on a 3/8" spindle and forever ends the search for lost chuck keys. It's a real asset on projects with lots of different size holes and, surprisingly, actually locks your bits in place tighter than you can with your old chuck key. And speaking of saving time with a drill, try out the new **Drill-N-Drive** for \$13.95. If you've got a bunch of holes to counterbore and screw, this is the ideal attachment. You insert your power drive bit in a standard chuck and the countersink bit slips right over it. Counterbore several holes, slide off the countersink and your power bit is ready to drive your screws. The attachment comes with either a counterbore or a Vix bit for installing hinges.

Finally, for \$28.95, The Woodworkers' Store has just introduced **Daito**, a foldable Japanese finish saw that's perfect for the woodworker on the move. It's under 10" long when folded and about 19" when locked open. Besides making for a compact design, the folding feature provides as good a blade protector as I've seen on a Japanese saw.

Something here surely belongs either on your own shopping list or in the stocking of some deserving woodworker friend or relative.

Hugh Foster is an English teacher, furniture builder and freelance writer based in Manitowoc, Wisconsin.

Oak trees have been a source of lore and mystery in many cultures. A story in *The International Book of Wood* tells how oaks provided shelter for Norsemen seeking protection from lightning, which was produced by the god Thor pounding his hammer. If an oak was shattered by this lightning, the pieces were often kept as good luck charms to ward off evil. Of course, today we know that standing under a tree during a lightning storm is one of the most dangerous places of all.

Red oak is legendary in its own right as a fine cabinet and furniture wood. Having an open grain, it accepts stains well, although today more people are using clear finishes to preserve its natural color. You'll find red oak used for many other purposes too, like flooring, paneling, and mouldings. When you move outdoors, however, where decay resistance is a concern, red oak is not a good choice. White oak is much better suited to facing the elements.

To distinguish red oak from white oak, look for color, pore distribution and the presence of tyloses, which is a bubble-like cell structure that fills the pores of white oak, giving it an



ability to retain and keep out water. A magnifying lens will reveal that the pores of red oak are empty. While you're looking for tyloses, you'll also see that red oak has larger, but fewer pores than white oak. Of course, the most recognizable characteristic of red oak is its pinkish hue.

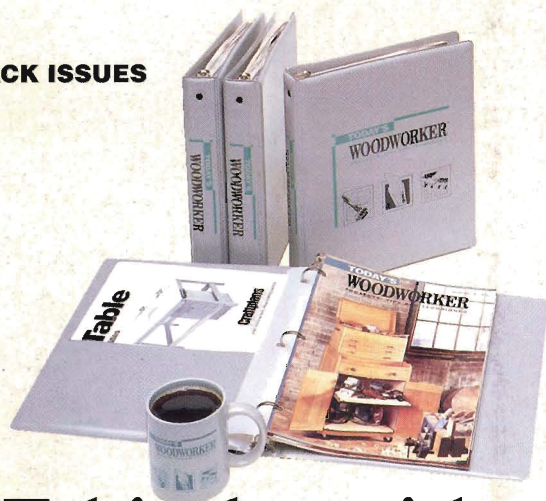
For a fairly hard wood falling between sugar maple (harder) and walnut (softer), red oak machines quite easily, and hand tool enthusiasts appreciate how well it planes. Turners, however, will discover that red oak tends to tear on the lathe. Red oak has excellent bonding properties, but its tannic acid content can cause unsightly black stains when iron clamps contact glue lines.

Red Oak
Quercus Rubra

STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION
(Required by Section 3685, Title 39, United States Code.) 1A. Title of publication: Today's Woodworker. 1B. Publication no. 10418113. 2. Date of filing: September 31, 1991. 3. Frequency of issue: bimonthly. 3A. No. of issues published annually: 6. 3B. Annual Subscription Price: \$18.95. 4. Complete mailing address publication office: 21801 Industrial Blvd, Rogers MN 55374-9514. 5. Complete mailing address of the headquarters: 21801 Industrial Blvd, Rogers, MN 55374-9514. 6. Full names and mailing address of publisher and editor: Ann Rockler Jackson, publisher and Larry Stoiaken, editor; Rockler Companies, Inc., 21801 Industrial Blvd, Rogers, MN 55374-9514. 7. Owner, names and addresses of stockholders: Rockler Companies, Inc.; Ann Rockler Jackson and Norton Rockler, 21801 Industrial Blvd, Rogers, MN 55374-9514. 10. Extent and nature of circulation is:

	Average no copies each issue during preceding 12 mo.	Actual no. copies of single issue published nearest filing date - Sept. 31, 1991
A. Total no. copies (net press run)	46,018	44,000
B. Paid and/or requested circulation		
1. Sales - dealers, carriers and counter sales	1,428	1,105
2. Mail subscription	32,607	34,436
C. Total paid and/or requested circulation	34,035	35,541
D. Free distribution by mail, carrier or means, samples, complimentary, and other free copies	5,736	5,420
E. Total distribution	39,771	40,961
F. Copies not distributed		
1. Office use, left over, unaccounted, spoiled	6,247	3,039
2. Return from news agents	0	0
G. Total	46,018	44,000
I certify that the statements made by me above are correct and complete. Ann Rockler Jackson, C.E.O. - 10/1/91.		

BACK ISSUES

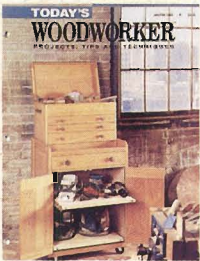
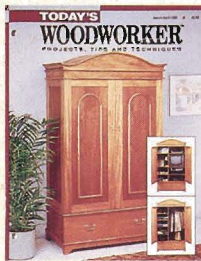
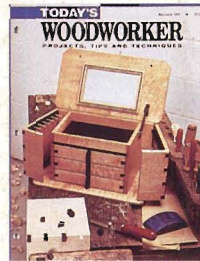
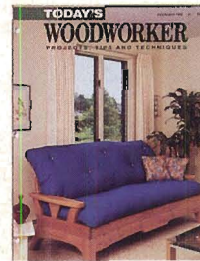
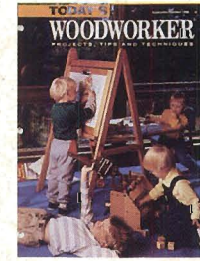
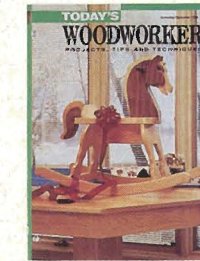
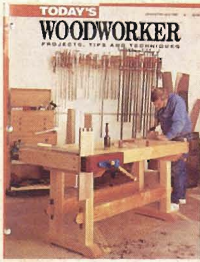
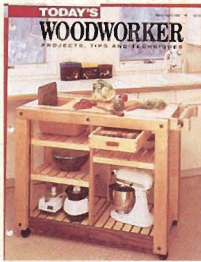
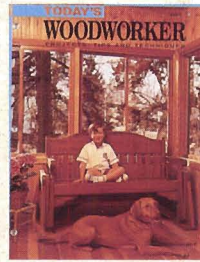
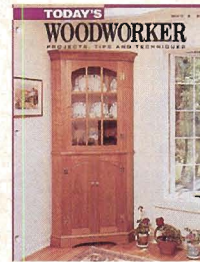
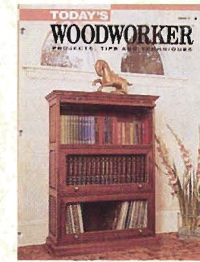
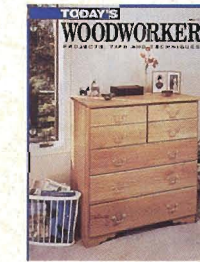
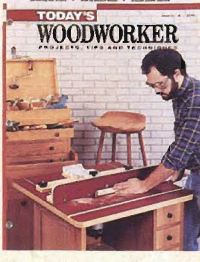
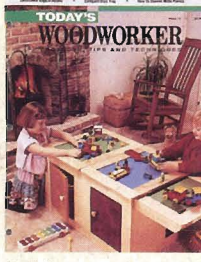
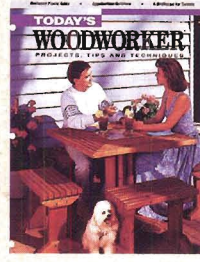
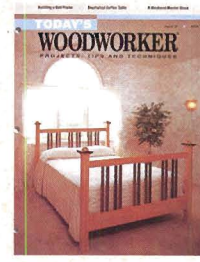
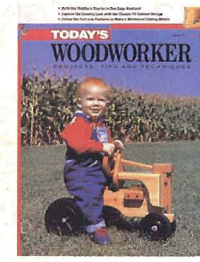


Binders\$7.95
(Order two or more for \$6.95 each.)

Stoneware Mugs\$5.95

(See order form on page 12 please.)

FREE binder with any six back issues!

1	2	3	4	5	6
					
Issue 1\$3.95	Issue 2\$3.95	Issue 3\$3.95	Issue 4\$3.95	Issue 5\$3.95	Issue 6\$3.95
7	8	9	10	11	12
					
Issue 7\$3.95	Issue 8\$3.95	Issue 9\$3.95	Issue 10\$3.95	Issue 11\$3.95	Issue 12\$3.95
13	14	15	16	17	
					
Issue 13\$3.95	Issue 14\$3.95	Issue 15\$3.95	Issue 16\$3.95	Issue 17\$3.95	

To order back issues, binders or Craftplans™, please use the order form on page 12.