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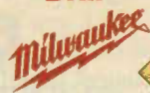
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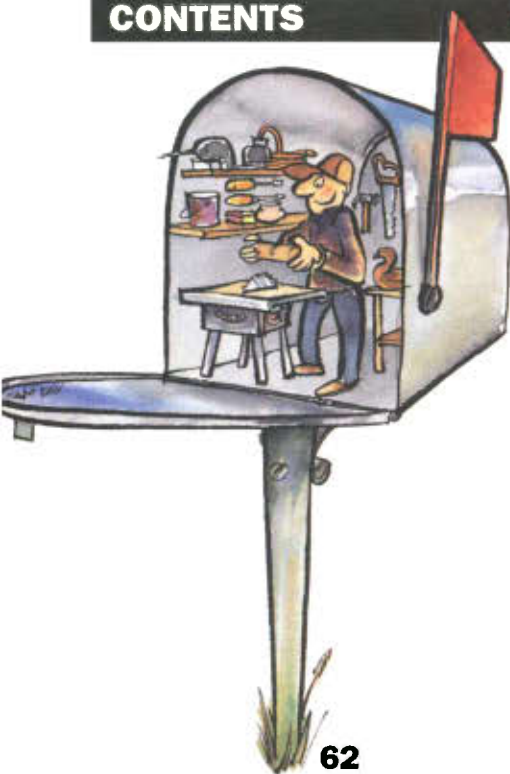


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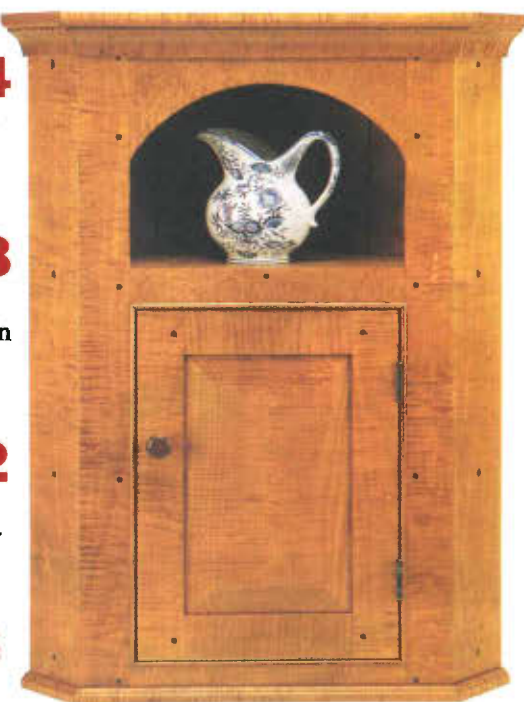
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### The 10 Commandments of Finishing 74

by Steve Shanessy

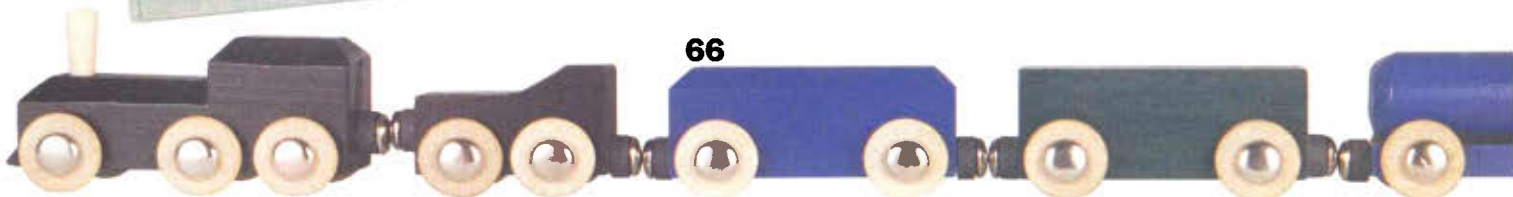
It's easier to cut a dovetail with a pocketknife than it is for the uneducated to get into the Kingdom of Heavenly Finishes. We give you the 10 things you'll need when you stand at the Curly Maple Gates.



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Little girls across the country will be pleading for these armoires, which store the clothes for the popular American Girls dolls.

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45

Hold almost 50 pairs of earrings with this simple rack that mounts easily on the back of any door.

### Christmas Decorations

46

Our intarsia angels and scroll-saw decorations make perfect accents for your holiday home.



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### Small Boxes

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These two small boxes are perfect containers for gifts — or they stand alone as gifts themselves.

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Firewood and dowels are all you need to put together this fellow, who will faithfully hold your Christmas cards by your favorite chair.

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*Cover photo: Pam Monfort/Bronze Photography*

## Safety Note

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

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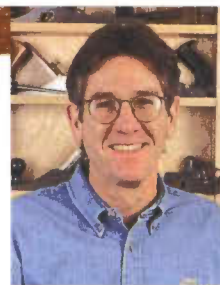
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## OUT ON A LIMB

# Our Gift to You: ALMOST-FREE WOOD!



IT ISN'T OFTEN that a magazine editor can give every one of his readers a holiday gift. But in this issue of *Popular Woodworking*, we're giving you a way to get thousands of feet of lumber for only pennies a board foot through a program we call "Trees to Furniture." This program, which is sponsored by this magazine, Wood-Mizer Products and two industrious and creative university professors, salvages urban trees that would otherwise end up clogging our cities' landfills or polluting our air. It is perhaps one of the best gifts I've ever been a part of giving.

There are many reasons you should read about the program and start one in your town. Not only will you get quality hardwoods for as little as 50 cents a board foot, but you will keep trees that have for years shaded your parks and neighborhoods from ending up as trash. You also will meet and work with other woodworkers, who in my experience are almost always a great group of people to know. You'll meet property owners with trees to remove that their children and grandchildren climbed and now would like to see that "old friend" converted to furniture so it can continue to give pleasure for decades to come.

You'll also preserve forests for future generations. That's because for every tree you make into lumber, an equal number of trees are spared in our forests across the country, preserving habitat for woodland creatures, plants and even some pesky insects.

By harvesting your own lumber, you'll learn more about wood and come to appreciate the material more than you ever imagined. You'll experience a special feeling when you work on lumber you've harvested, whose history is linked in some small way to your own life. As woodworkers, we should realize our role as custodians of our materials. We should understand that we have some responsibility for its care and use.

And as your community gets to know about your Trees to Furniture program, it will appreciate more the craft of woodworking. You'll likely inspire others to take up the craft and learn the wonderful pleasures you have come to enjoy.

On a final note about the Trees to Furniture project, I'd like to thank Michael Romanos and Sam Sherrill at the University of Cincinnati, and Bill Metzger and Dee Dee Zigler at the Wood-Mizer Products company. From the first time I met Bill and Dee Dee and outlined the program, their help and enthusiasm has not waned. For a program where there are no dollar signs attached, such corporate commitment is refreshing. I've also learned that Wood-Mizer is committed to projects around the world that benefit folks who need a helping hand. Wood-Mizer goes about this work selflessly and seeks no recognition — something we all might reflect on and consider in our community work.

As always, we've got lots of projects in this issue. As your holiday gift making and decorating swings into high gear, you'll find projects from the somewhat silly to the simply sublime. Of special note is *Popular Woodworking's* contribution to the already overdone subject of building a futon sofa bed. When the staff brought this project idea to me I said, "Every magazine has already done one!" Then I threw down the gauntlet saying, "Figure out how to build a futon that looks like real furniture, not crate furniture, and we'll do it." They met the challenge — a Chippendale futon! It's not as crazy as it sounds. In fact, it looks so good you can be sure any young adult setting up housekeeping would reject it as stodgy. Yes, it's that good.

Happy Holidays! **PW**

*Steve Shansky*



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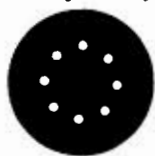
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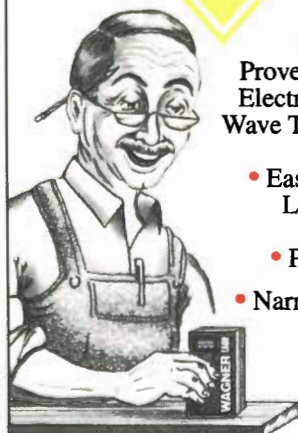
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8 Popular Woodworking

## INFEED/OUTFEED

We welcome your comments about **PW** or anything related to wood-working. We'd also like to see color pictures of what you're building. Send your input to:

Infeed/Outfeed, *Popular Wood-working*, 1507 Dana Ave., Cincinnati, OH 45207. Our e-mail address is: [popwood@earthlink.net](mailto:popwood@earthlink.net). Letters may be edited for publication. —  
Steve Shanesy, editor, PW

## Humidity in the Humidor



Associate Editor David Thiel enjoys a good smoke — and the humidor he built.

I will gladly purchase books or magazines for a single "nugget." An idea, concept, technique, whatever.

Your article "JFK's Humidor—Almost" (July 1997 #97) "paid for" a year's subscription. It is just what I have been thinking about doing for two years but haven't gotten around to. I'm making a small modification to mine. Instead of using a commercial humidifier as shown in the article, I'm going to allow a space at the bottom for a foam mat. Using distilled water in a sponge creates 100 percent humidity in a humidor, which will cause the cigars to swell and split, and the draw will be way too tight. Using propylene glycol and distilled water in a 50/50 solution will ensure a 70 percent relative humidity in your "whatever-dor." Do not over-saturate the sponge. Just damp will be fine. Thanks for the project.

Joe Atkinson  
Dresden, Maine

We like to hear from readers who tinker with design. More power to you! However, I'm kind of fond of the store-bought humidifiers (Credo brand, for example) that maintain a 70 percent relative humidity. I'd rather spend my time smoking my cigars than checking the humidity.

—David Thiel, associate editor



## Help Me Find That Vise

I recently completed and, may I add, enjoyed issue #97's article on the "Bullet-Proof Bench" by Jim Stuard (July 1997). Jim, if I may quote you, "Sure, every magazine says they'll show you how to build the ultimate workbench. After years of research, we really do it." Then you go on to say, in step one, "Choose your metal. Before you cut the first piece of wood, make sure you have all the hardware you need." My question to you is this: After all those years of research, you think you could have at least given your readers some of what I feel to be the most valuable information? Where do we get all of this nifty hardware, just like you got for your bench? Let's face it, the average reader isn't as well connected to the woodworkers' hardware highway. So please set me in the right direction by sharing this pertinent information. Because you see, Jim, I want my bench to be just like yours!

Michael Verhault

Chester, New Hampshire

Sorry Michael! The number for AMT is 800-435-8665. The model number for the patternmaker's vise is C334, and it costs \$249. The soft jaws sell for \$19.50, and that model number is C366.

—Jim Stuard, associate editor

## Now That's Service!

In our July issue we ran a photo of an old Delta table saw belonging to Frank E. Crawford of Ridgecrest, California. He was wondering if anyone knew how old it was. According to Mark B. Schiefer, director of marketing for Delta Machinery, it looks like Frank's table saw is probably a 1936 or a 1937. Mark at Delta also sent us a copy of the operating manual for that saw and a complete parts list. And he said that if Frank needed any parts for his saw, Delta most likely still stocks them.

—Steve Shanesy, editor and publisher

Continued on page 10



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## INFEED/OUTFEED

Continued from page 8

### Stuard Lovers of America Unite!

As I passed the magazine stand the other day, I saw your picture on the cover of *Popular Woodworking* and the marvelous bench you built ("Bullet-Proof Bench" July 1997 #97). I must say I admired it for quite a while.

You have put the "wood" back in woodworking. If there is a Bob Vila and a Norm Abram, then there is a "Jim Stuard, the Woodworking King." I know that sounds sort of corny, but you should have your own television show.

I hope you're not embarrassed by what I say, but you have just wonderful hands. I really admire a man with strong hands, it shows a lot of character about a person. Hard-working, strong, sensitive, and I'm sure you are very gentle. Unfortunately (for me) I see that you are married. And since you are, I thought about what else I could do to show my admiration.

I could be your biggest fan by starting the "Stuard Fan Club." Sounds great, doesn't it? Maybe with some support from us you could get a TV show of your own.

Anyway, I'm having the bench made, and please don't be offended, but I'm using it for an island in my kitchen. I don't have much use for a workbench, but I will always tell others this was your work.

**Shyna Cabinet**

**Oakwood Village, Ohio**

Dear Ms. Cabinet, We have to admit that at first we thought your letter was a fake sent in by Associate Editor Jim Stuard to boost his reputation here around the office. But then Jim pointed out (with his strong, sensitive, almost supple hands) that the letter was postmarked on a day he was on vacation, and the postmark was from a town 1,000 miles from where he was lounging in Massachusetts. So it must be real! —The Editors

### A Slap on the Wrist

Speaking of safety, or the lack of. In your July 1997 issue in the article "The Woodworker Who Came in From the Cold," (#97) is a picture of a wood furnace with a stack of firewood piled about 8" from the side and extending beyond the front door of the stove. It's obvious from the scorch marks in the paint on the side and top that he needs more clearance from combustibles to be safe, not to mention meeting code.

As much as your magazine stresses safety (and rightly so), I am amazed you would publish a photo showing such a blatant disregard for common-sense safety.

**Arnie Fenske**

**Eldon, Missouri**

Well, Arnie you're right. According to Andy Morgan at Buck Stoves in Bright, Indiana, wood should not be stacked anywhere near the stove, but if you do stack it in the same room as the stove, it should be at least 10 feet away.

— The Editors

### Kindness Does Pay, Though Not \$6,000

I read your article in the July issue about the \$6,000 box ("A \$6,000 Box" #97). I would like to make a few of them. But that is not my way. I have never charged anyone for anything that I have made and given to them.

Back in the 1930s I made small boats and gave them away. Of late, a neighbor saw the cherry mantle my son and I made for our fireplace, and he said he would like one just like it.

I told him I would help him and let him use my woodshop. I had to show him how the power tools worked and how to handle them safely.

Two weeks before Christmas I put the mantle up for him. He said, "What do I owe you?" I told him that a thanks and a handshake were all I wanted.

A month after Christmas he came to my home and brought me a 2-horsepower router. I asked why he did this, and he said he and his wife felt they had to give me something. They really loved the mantle. I just like to do for others.

**James W. Mahon**

**New Egypt, New Jersey**

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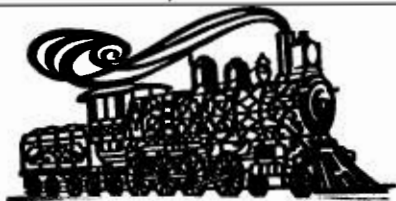
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## Improve the Fireplace Matchbox

Your Fireplace Matchbox project (January 1997 #94) was just what I needed to provide the finishing touch for my fireplace, plus I made several others as gifts.

However, I found that when it isn't full of matches, they tend to lean on the sides and interfere with closing the top. I solved this problem by dadoing two additional grooves in the front, back and side pieces, about 1 1/4" from the top and bottom. I then made two additional pieces similar to the bottom but with a circular hole in the center (photo), which fit the dados. Now the matches stay upright and centered.

I also veneered the top pieces' end-grain edges for a more finished appearance. Finally, instead of assembling the top and bottom sections separately, I made it up as a close-ended box and cut the top off in four passes on my table saw.

**Roland Maki**  
Rochester, Michigan  
*Continued on page 12*



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## INFEEED/OUTFEED

Continued from page 11

### Table Saw Safety Quiz

**Editor's note:** Lots of readers responded to our table saw safety quiz (July 1997 #97). Some of you wanted to point out how many things the woodworker in the article's accompanying picture was doing wrong while working on the table saw. We suggested in our caption he was making at least eight mistakes. The following reader gets the award for most mistakes found.

My wife and I were visiting family in the mountain town of Prescott, Arizona, where I purchased a couple of woodworking magazines to help pass the time.

I poured myself a hot cup of coffee, took off my shoes and started skimming through your July issue. I have recently retired and have taken up woodworking, so your article "21 Table Saw Safety Rules" caught my eye. You featured a staged photograph of a woodworker at a table saw.

I thought it would be fun to put my 30 years of training and experience in observation to the test, and I found 21 problems. I really enjoy reading your magazine.

**Editor's note:** Here are some of the best, some of which we didn't notice in the photo:

- Woodworker is not wearing hearing protection.
- Woodworker needs haircut. Loose hair may get into eyes, suddenly and unexpectedly, causing a temporary distraction or dangerous reaction.
- Woodworker is wearing jewelry. I can't for the life of me say what is wrong with this, but my grandpa always told me to never wear jewelry around machinery.
- Dust collection system in bottom of the saw is full, a dangerous condition.

**Lawrence W. Ingalls**  
Hawthorne, California



### What Wax Works?

I have quite an extensive library on woodworking and have yet to find any mention of the type of wax that is suitable for the table saw. I have used everything from car wax to furniture wax and do not get the free movement that I hear or read about.

**Eugene S. Cooper**  
Columbia, South Carolina  
Paraffin, used as a canning wax and available in most supermarkets, has been a staple in shops for years. Recently we've had the chance to use some of the Teflon™ spray coatings available in woodworking catalogs. They seem to do a good job and don't leave any wax on the lumber.

—David Thiel,  
associate editor PW

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## TRICKS OF THE TRADE

### Twelve Steps to Ouch-less Nailing

One of the constant fears in carpentry and woodworking is blackening a fingernail while starting a small nail. Below are our 12 favorite ways to avoid tenderizing your fingers.



1. Use a pair of needle nose pliers.
2. A bobby pin.
3. A soda straw with a notch cut in the end (see photo above).
4. A piece of scrap Plexiglass™/plywood/laminate with a notch cut in one edge.
5. A piece of scrap peg board (use the holes to guide the nail).
6. A soda straw with a loop of string run through the length and around the nail.
7. A medical hemostat (expensive from hospitals; cheap at flea markets).
8. A magnetic upholstery hammer (or magnetize your own).
9. Chewing gum.
10. A scrap of discarded garden hose with a notch in it.
11. A piece of double-sided tape stretched over the hammer's head.
12. Have your obnoxious, out-of-work brother-in-law hold the nail.

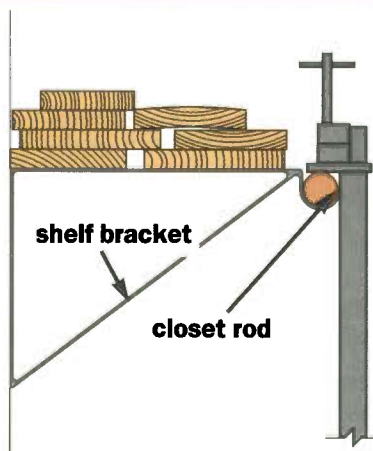
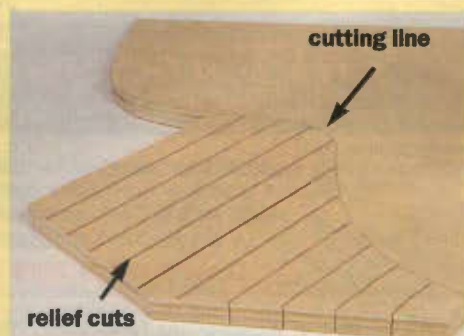
Each issue of *Popular Woodworking* offers tips and tricks for the home woodworker that we've gathered from readers, contributors and from our own workshop and woodworking experiences.

We want to encourage the free exchange of these time-saving and improved safety ideas for all woodworkers. If you have a trick you think would be a benefit to other woodworkers, we'd love to hear about it.

Send your trick, whether it's one your father taught you or one you came up with on your own, to *Popular Woodworking*, Tricks of the Trade, 1507 Dana Ave., Cincinnati, OH 45207.

### Relief from Awkward Fall-Off

When cutting a circle or odd shape from a square piece of lumber on a band saw, you've probably dealt with the annoying corners that try to pull the material out of your hands as they catch on the table of the saw. Then there's the additional annoyance of the blade binding in a weird curve. A few extra cuts can almost eliminate this problem. Make relief cuts in from the edge of the material right up to the edge of the finished shape. Space the cuts about an inch apart and parallel to one another. Then, as you make the cut on the shape itself, the fall-off will do just that — in small, manageable pieces, and without binding the blade.



### Clamp Storage Comes Out of the Closet

I've found closet shelf brackets are great for storing clamps. Screw six 12" brackets into the 16" center studs in your shop wall, which will give you eight feet of wood storage. Screw a 2" x 8' dowel on the front hooks for clamp storage.

**Ronnie Clark**  
Staples, Texas

*Continued on page 16*



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- ☐ **March** Nostalgic jelly cupboard; gyroscope from the past; ferris wheel parts caddy; Consumer Choice Awards for power and hand tools. #58036
- ☐ **January** Special survey: most wanted tools; kitchen chalkboard; walnut desk set; inlaid music box; faux fireplace and 20 more gift projects. #58125

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- ☐ **July** Mission style coffee table; french provincial corner cupboard; kids' chairs and table set; fundamentals of spindle turning; kit furniture review. #58065
- ☐ **May** Router bit basics; walnut buffet; sportsman's desk; carving luxury cars; finishing with wax; country farm table; authentic wooden drum. #58045
- ☐ **March** Preparing stock; traveling lawn chair; flap-top table; T. Rex whirligig; cedar-lined hope chest; pier table. #58035

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- ☐ **May** Turned spice canister; cedar blanket chest; tambour wall desk; woodworker's V-block; contemporary desk; nautical flower box. #58054
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PBAM



Continued from page 14



## Make Bowl Blanks From Flat Wood

There are lots of turners out there who have come across spectacular lumber they wished were thicker so it could make a decent bowl instead of a plate. Well now you can turn your band saw into a lumber stretcher. Start by driving a nail into the center of one

face of your board. Next tie a string to the nail (loosely) and a pencil to the opposite end of the string (tightly). Wrap the string around the pencil until you reach the outer diameter of your desired bowl. Then simply draw a spiral around the nail until you reach the center (or the diameter of what will be the base of your bowl).

The spiral is your cutting line for your band saw. Use a thin blade on the band saw and set the table to the desired angle (we used a 10-degree angle for the shallow bowl in the photo, but you may want to experiment to find what works for you). Start your cut from the outside and work your way in. With the cut complete, the spiral can be pushed out to form a cone. The cone can be glued in place and can then be shaped to form your bowl.

## Truing Your Squares

I didn't have to drop the last framing square I bought to knock it out of square — it came from the store that way. So I chocked it up to Murphy's Law, took it back and got another one from a different manufacturer. It too was out of square! While whining about this problem to a fellow woodworker, he looked at me like I was dumb and said, "You mean you don't know how to true up your square?" Ten minutes later I was in my shop and testing his advice.

First determine which direction the square is out of true — to the inside (89 degrees) or outside (91 degrees). Use a pointed steel punch (an old nail set also will work) and a good-sized hammer to strike the square at either the inside or outside corner of the square and check it again for squareness. Striking to the inside corner will widen the square, while striking to the outside corner will constrict the square. If it isn't fixed the first time, hit it again.

Now when I drop my framing square I don't get nearly as frenzied. I just head for the punch and hammer. **PW**



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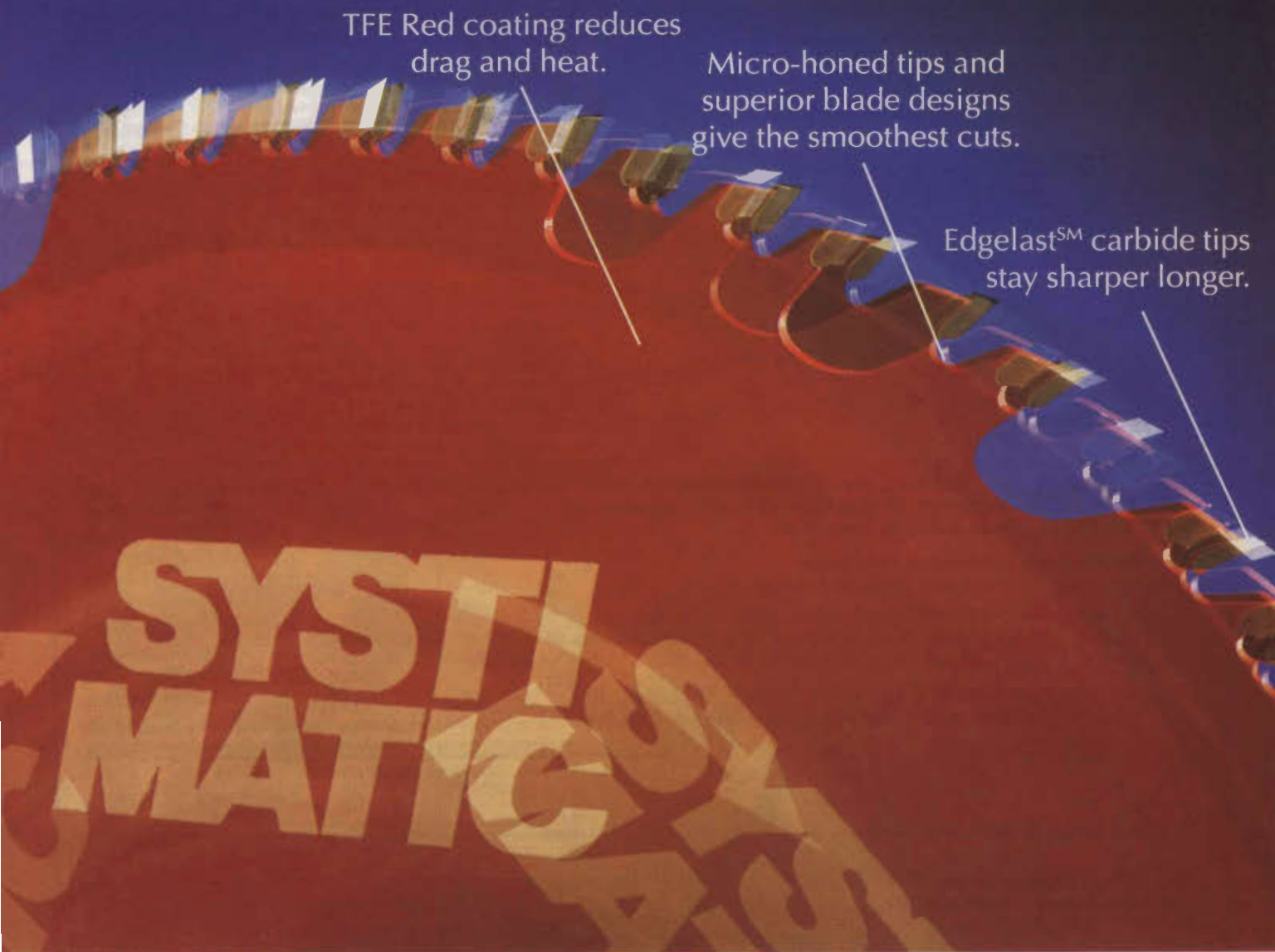
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the exceptionally smooth cuts SystiMatic has been known for since 1956.

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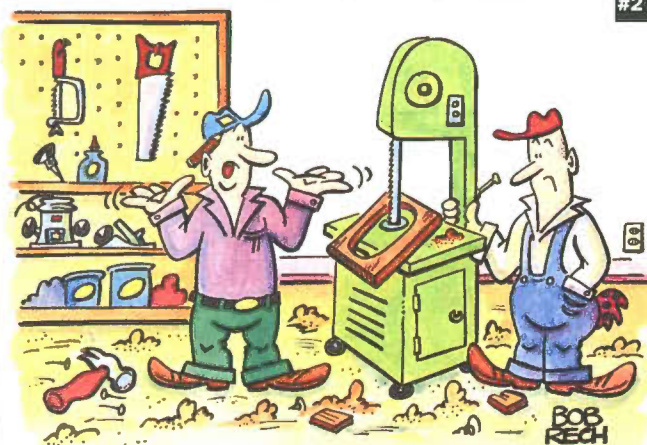
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## CAPTION the CARTOON

#27



**RYOBI**

illustrated by Bob Rech

Submit your caption(s) for this issue's cartoon on a postcard to **Popular Woodworking, Cartoon Caption #27**, 1507 Dana Ave., Cincinnati, OH

45207 by October 18, 1997. Winning entries will be chosen by the editorial staff.

The winner will receive a Ryobi Wood Drilling System (WDP1850) that we praised in our March issue as being a drill press that "can be appreciated by any woodworker." This bench-top tool offers an oversized table that rotates 360°, and includes an adjustable fence with built-in stops and a hold-down clamp. The drill system also offers simple-to-adjust speeds between 500 and 3,000 rpms.

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



The winner of our "Caption the Cartoon Contest #25" from the July issue and recipient of the Porter-Cable sander is:  
**Don Bruce, from Suffern, New York.**

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

**Mario Arena, from Scipio Center, New York, for:**  
*"When these bozos told me they could build beds in their sleep, I didn't think they meant it literally."*

**The staff of Motel 6, in Grand Rapids, Michigan, for:**  
*"That's the last time I tell them to 'make' the bed."*



*"Confucius always said, 'The easiest way to solve a problem is to sleep on it.'"*

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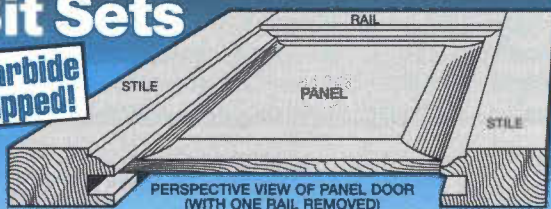
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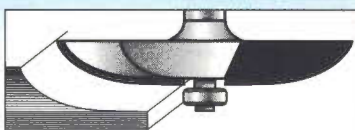
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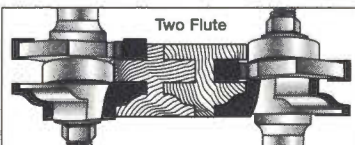


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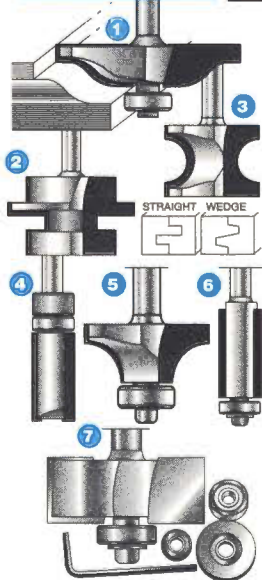
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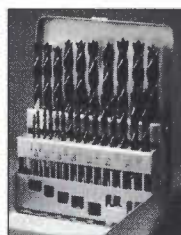
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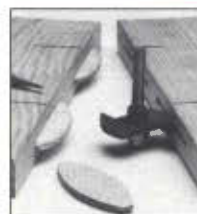
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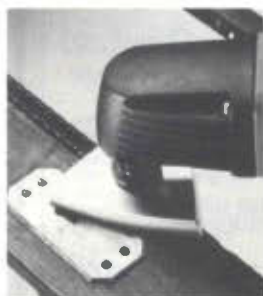
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## NEW PRODUCTS

*Popular Woodworking* wants to provide readers with accurate, useful information on the newest woodworking tools and products, so we test most of the products presented here in the *Popular Woodworking* workshop. We've considered cost, design and benefit, and added our comments about the tested items to help you make decisions about future purchases.

*"Two speed levels offer aggressive or fine finishing capabilities in a single palm grip sander. A nice system for home or shop." — PW*

### Bosch Two-Speed Palm Grip Sander

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*"This video is well photographed and offers an interesting and smooth presentation by the host. At 2 1/2 hours long, there's a lot of information for the price — for any woodworker." — PW*

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For more information, circle #152 on the Resource Directory Coupon.





## NEW PRODUCTS

# NEWS FLASH!

### CMT Tools Becomes Jesada Tools

After a recent court decision over trademark rights with its former supplier (CMT USA), CMT Tools has changed its name to Jesada Tools (800-531-5559). Jesada received a \$1.7 million settlement and retains the trademark Orange Fruit Logo but will be changing its orange non-stick bit coating to white.

CMT USA will continue to market Italian-made orange-colored router bits and tooling under the CMT USA brand from its North Carolina office.

### Help Is Only A Phone Call Away — From Sears

Teleparts, a department of Sears Home Services, is now offering expert, step-by-step help in performing home repairs and installation, and parts ordering for Sears and non-Sears brands. By calling 800-366-PART a Teleparts expert will walk the consumer through a repair or installation problem over the phone. The service is available seven days a week, from 7 a.m. to 7 p.m. in every time zone. There is a \$12 per-problem fee that can be charged to any major credit card, or a 900 number is available to directly bill a customer's phone.

### DeWalt's Magnetic Drill & Drive System

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Retail Price: \$30

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- Built in hex key allows for convenient adjustments any time
- Available in a variety of tools types and multi-sets, including a self-centering system



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"Just in time for Christmas, Stanley offers four specific home-use tool kits at a great price. These kits make sure you have all the tools for the job." — PW

### Stanley Home & Hobby Tool Kits

Contact: Stanley Tools 800-622-4393

Retail Price: \$10 to \$16

Available at home center stores.

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- General Repair Kit has: 12' tape measure; torpedo level; 7 oz. hammer; picture hanging fasteners; 4" std. and 2 pt. Phillips screwdrivers; 4" long nose and 6" slip-joint pliers
- Fastening Tools Kit has: 7 pc. hex key set; 3" cabinet and 4" std., #1 and #2 Phillips screwdrivers; and 6" slip joint pliers
- Precision Tools Kit has: 4" flat nose, 4" diagonal and 4" nipper pliers; 6 pc. precision screwdriver set
- Cutting Tools Kit has: 18 mm quick-point knife, utility knife, 6" diagonal cutting pliers, pruning shears and a razor blade scraper



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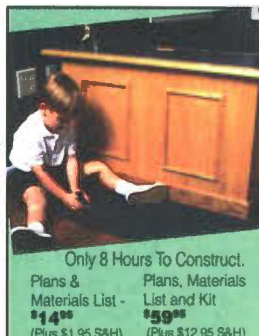
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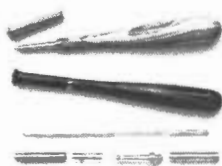
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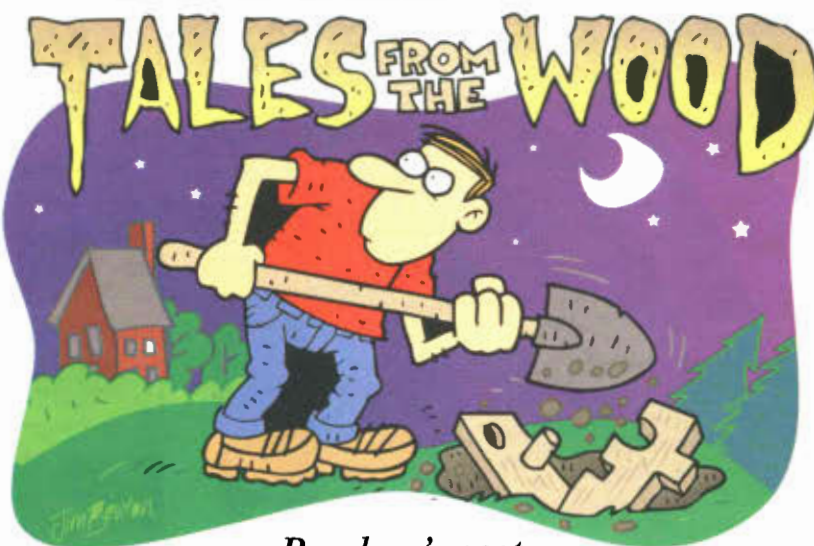
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## TALES FROM THE WOOD



*Readers' most  
amazing stories from their workshops.*

## WINNER! Table Saw vs. the Vacuum

**A**t age 67, having worked with wood all my life, and being a Korea veteran, I thought I knew it all. I was a real hot shot.

For many years I have had a 10" Craftsman Bench Table Saw. This saw has a switch with a yellow insert that renders the saw inoperable. Being a hot shot, and not having any small children around, I discarded the safety feature.

Recently I decided to vacuum my shop area. I have a hand-held brush attachment for the vacuum (borrowed from my wife's upstairs vacuum cleaner). I cleaned the legs and front of my saw, then I did the top. I knew I had a problem when plastic and bristles started to fly off into space. In cleaning the front of the saw, I had accidentally turned it on. Because of the noise from the vacuum, I didn't know that I was cleaning a moving 10" blade with a little hand-held brush. Seeing the flying bristles and feeling the rush of air on my fingers, I knew the old "hot shot" had goofed — big time. What more can I say?

**John G. Schurer**  
**Mount Laurel, New Jersey**

*Continued on page 24*

## Share Your Story & Win!

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

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

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





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## TALES FROM THE WOOD

Continued from page 22

### Murphy's Installation: Chapter One

The library in my house is about 12-feet square and has an entire wall of floor-to-ceiling bookshelves, which are very nice. Unfortunately we have two computer desks in the library, and having two computer desks wasn't working. My solution was to build a counter into the bookcases and replace the shelves under the counter with storage space behind three pairs of hinged doors. The design looked great on paper, and after the spouse's stamp of approval, I went ahead and measured up the spaces (twice). I then headed for my woodshop.

The countertop was almost 12-feet long with a doubling strip on the front and a nice roundover. I notched it into the bookcases to take advantage of the space. The dimensions were tight, but the top went in without a glitch.

That's when Murphy's Law took over the installation. After mounting the two high-quality keyboard trays to the underside of the top, my wife pointed out (correctly, as always) that the two outer pairs of hinged doors would open only about 6" before slamming into the keyboard trays. So...no problem, with only a little bit of hardware changing they became sliding doors.

The two pairs of doors in the center remained hinged, but they too ran into opening problems. When I was deciding how tall to make the doors, I measured to the underside of the countertop and forgot that the door would have to swing open below the front edge doubling of the top. So...after cutting  $\frac{3}{4}$ " off each door, rerunning the edge profile, restaining and finishing the pair, they were again hanging and looking great.

By this time I was ready for a drink. Instead I installed the knobs. Three of them looked great. The fourth ended up one inch higher than the others — of course. Luckily it was on one of the sliding doors. So after switching doors and a little wood putty the job was complete. And because no woodworker can keep from tattling on their mistakes, I thought I'd do it in a national magazine! **PW**

*Alfred Tiplerwait  
Mena, Arkansas*



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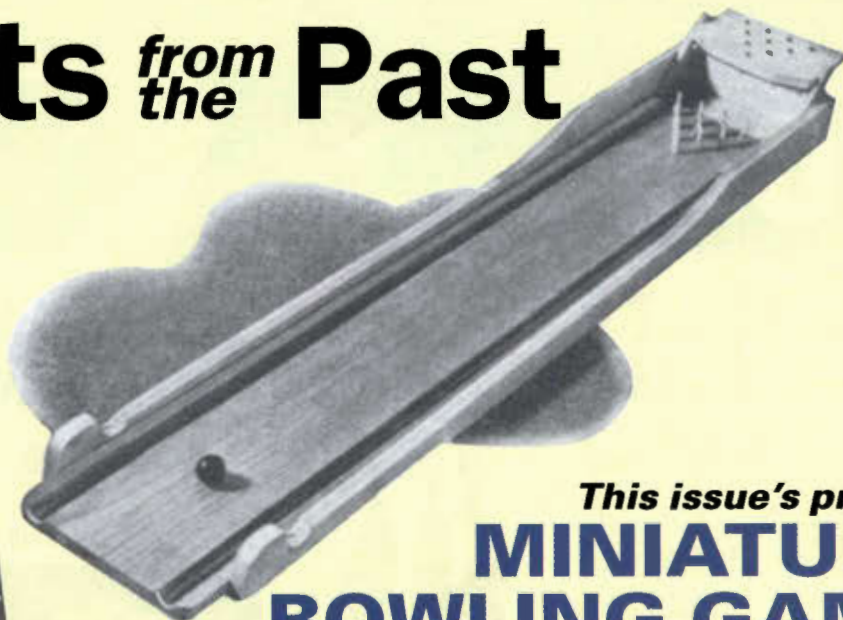
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# Projects *from the* Past



## This issue's project MINIATURE BOWLING GAME

This miniature bowling game features a clever pin-setting mechanism and a groove for returning the "bowling ball" to the bowler. Delta recommended using hardwood for this project, though pine would work fine for budget bowlers.

The gutters can be cut using the method shown in the drawing, though an easier way would be to use a router and a roundnose bit, which is expensive. Simplest and easiest would be to cut the grooves with a dado set.

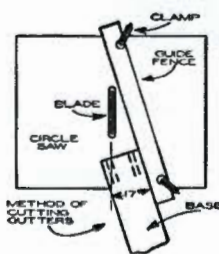
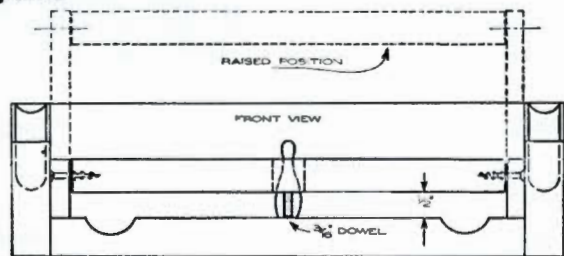
Cut a groove on the top of the side rails for returning the ball to the bowler. You can turn the bowling ball and pins on a lathe, or you can use a marble for the ball and whittle  $\frac{1}{2}$ " dowel stock for the pins. If you're not into whittling, try buying some small Shaker pegs and sanding them to size.

**Earlier this century,**  
**Delta Machinery**  
published a magazine filled  
with woodworking projects.  
These digest-style magazines are much more  
than an interesting bit of nostalgia — the  
plans are still pretty darn good! In the interest  
of history (and besides, we like them), you'll  
see an original project from yesteryear in  
upcoming issues. — PW

**The Delta Diagram**

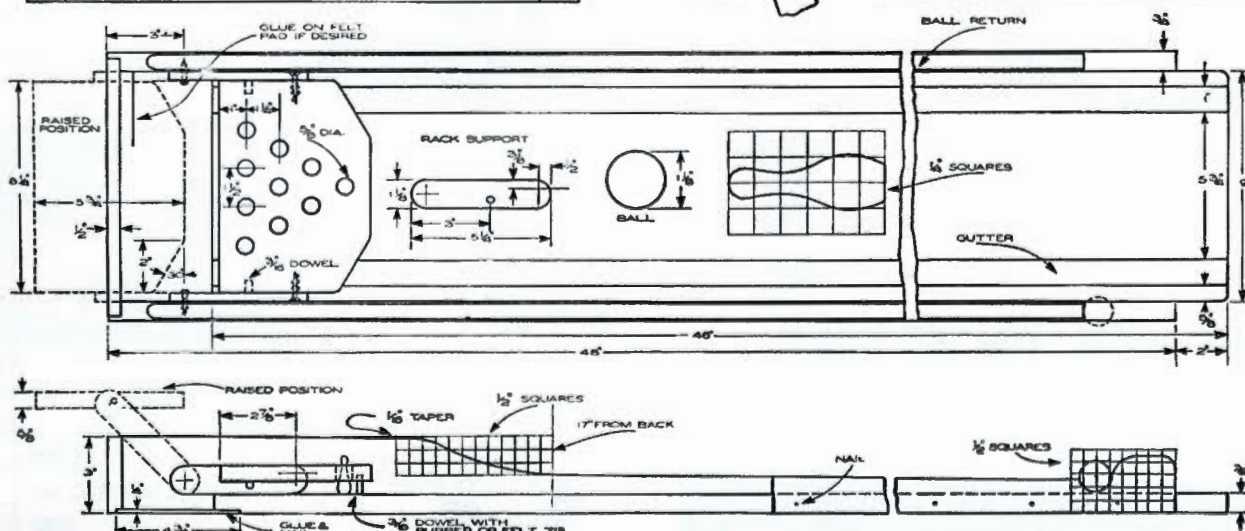
Vol. 17, Issue 1  
1947-48

### Diagrams



### Bill of Materials

1	Base	$\frac{3}{4}$ " x 9" x 46"
2	Sides	$\frac{3}{4}$ " x 3" x 48"
1	Backboard	$\frac{1}{2}$ " x 3" x 10"
1	Pin rack	$\frac{5}{8}$ " x $5\frac{3}{4}$ " x $8\frac{1}{4}$ "
2	Rack supports	$\frac{3}{8}$ " x $1\frac{1}{8}$ " x $5\frac{1}{4}$ "
1	Bottom board	$\frac{1}{4}$ " x $4\frac{3}{4}$ " x 9"
10	Pins	$\frac{9}{16}$ " x $\frac{9}{16}$ " x $2\frac{1}{2}$ "
2	Balls	$1\frac{1}{8}$ " x $1\frac{1}{8}$ " x $1\frac{1}{8}$ "
1	Felt pad	$\frac{1}{2}$ " x $2\frac{1}{2}$ " x 9"





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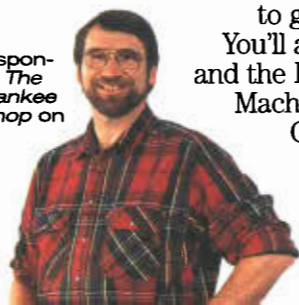
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# Pecan Hickory

(*Carya illinoensis*)

**P**ECAN IS PECAN and hickory is hickory, right? Well, not exactly. In many cases, pecan and hickory are actually the same wood. The species shown here, *Carya illinoensis*, is also known as pecan, bitter pecan, sweet pecan and hickory. Other species of hickory also have pecan-ish names: Water hickory (*Carya aquatica*) is also known as both bitter pecan and plain old hickory. So what's the lesson here? Don't pay more for pecan than you would for hickory without asking questions first.

**Other Common Names:** Sweet pecan, pecan, bitter pecan and hickory

**Growing Regions:** United States and Mexico.

**Characteristics of Tree:** Trees can reach a height of 170 feet with a trunk diameter of up to 84".

**Characteristics of Wood:** Pecan hickory is dense, tough and coarse-textured with white sapwood and reddish-brown heartwood. The grain is mostly straight, but sometimes is wavy or irregular. It is a heavy wood and sometimes has high shrinkage.

**Workability:** The dense wood can have a moderate to severe blunting effect on the cutting edges of hand and machine tools. Pre-bore for nailing; gluing is satisfactory.

**Common Uses:** Chairs and bentwood furniture, sports equipment, striking-tool handles, ladder rungs, drumsticks and decorative veneer.

**Availability:** Moderate.

**Wood Movement:** Pecan hickory seasons rapidly with little degrade but shrinkage can be fairly high. Small movement in service.

Unfinished

Finished

**Finishing Characteristics:** It sands, stains and polishes well.

**Special Features:** The wood has high bending strength and crushing strength, high stiffness and very high shock resistance. Excellent steam-bending properties.

**Midwest Price:** About \$3 a board foot. **PW**

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# All the Wood You'd Ever Want *AT 1947 PRICES*

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To loosely paraphrase Will Rogers, "Woodworkers always complain about the price of wood, but never do anything about it." Well, now you *can* do something about it, so long as you have trees within driving distance that would yield lumber worthy of your projects.

Not only can you supply yourself with all the material you might need at considerably less than \$1 a board foot, but as an added benefit you'll be doing your community a favor to boot.

Lumber prices are a real concern to those with an interest in woodworking. I know this magazine's readers are because the subject comes up regularly at workshops we hold with them.

But it's not just woodworkers. Manufacturers of woodworking equipment are also concerned because they fear, and rightfully so, that skyrocketing lumber prices drive people away from the craft or discourage newcomers. That means fewer customers for their products.

This very real problem prompted me to get in touch with a couple weekend woodworkers here in Cincinnati after reading in the local newspaper about their unique approach to sourcing lumber. Michael Romanos and Sam Sherrill, both professors at the University of Cincinnati, made an arrangement with the city's parks department to "salvage"



At the end of the day, nearly 2,000 board feet of black cherry has been cut from the logs felled on a suburban lot that needed clearing. Michael Romanos, left, and Sam Sherrill, right, stand before a small portion of the day's "catch." The two woodworkers originated the "Trees to Furniture" program that salvages prime logs from urban and suburban areas that otherwise would be dumped in a landfill or burned as firewood.

trees that were storm damaged, dead or had to be downed for some other reason.

So intrigued was I with their program that I felt compelled to share it with *Popular Woodworking* readers in the hopes that they might also benefit from the professors' model program and experiences.

Since first meeting Michael and Sam, I had the good fortune to meet Bill Metzger of Wood-Mizer Products who also found merit in our "Trees to Furniture" program. Thanks to Bill's interest, the Wood-Mizer company has become an active and important member and supporter of the project. Wood-Mizer has in fact generously donated one of their new, lower

cost, highly portable saw mills to the local program here in Cincinnati to help serve as the workhorse of our pilot project. The company also has graciously agreed to help with other administrative and technical support in the launch and ongoing development of "Trees to Furniture." The following pages explain how we do this in Cincinnati and how you might be able to set up a similar program in your community — with our help. **PW**

*Steve Shanesy*



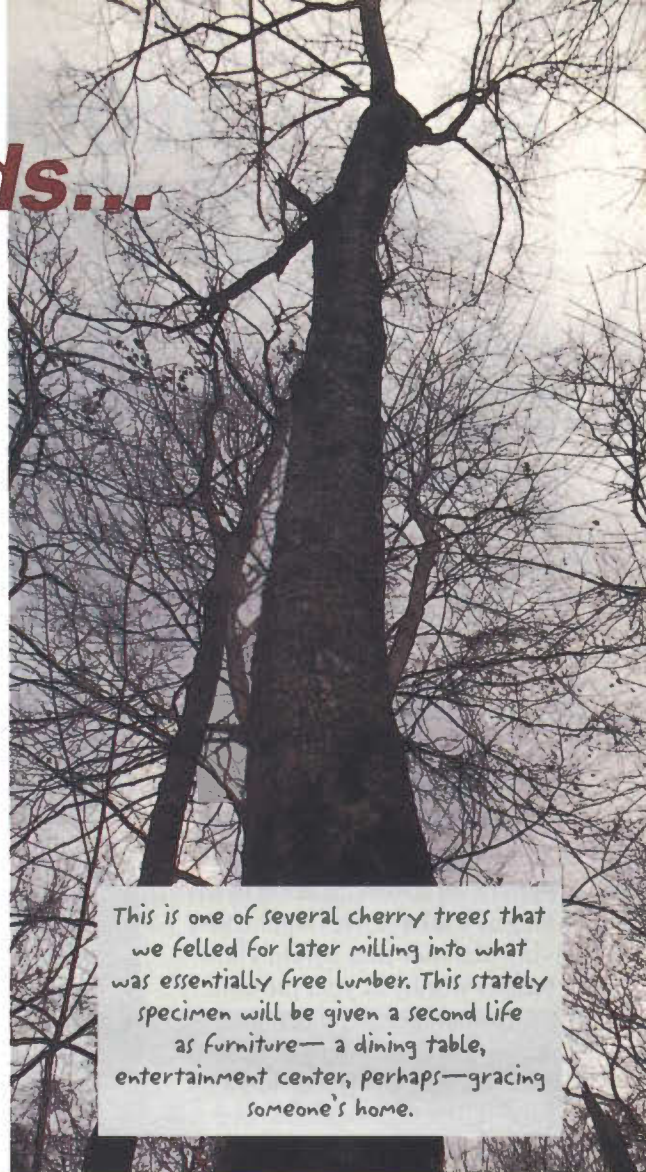
# A Day in the Woods...

ON THE Sunday after Thanksgiving I headed out early on a cold, steely gray morning to an older suburban area of Cincinnati known, ironically, as Cherry Grove. This day's agenda was not only perfect for working off the aftermath of "turkeyfest" but was, more importantly, the first step in the fulfillment of what had long been an unrealized dream. It was my chance to harvest trees that would become high quality hardwood lumber for future projects I'd build.

The fact that this lumber was, for all practical purposes, free wasn't nearly as significant as the harvesting process I was about to take part in. On this day in the woods, I was joining other woodworkers to select several mature black cherry trees, fell them and cut the trunks to length to later saw into material for future projects.

Getting close to the source of the material I had so often worked with was special for me and, in its own way, seemed spiritual. I'll admit that I felt bad when the whirring chain saw bit into these stately trees, that in an instant so many summers and winters of life came to a crashing end. Still, I reminded myself these trees were doomed anyway and would otherwise have found an ignoble end in a landfill or as smoke billowing out of a chimney. In fact, these trees would live again in another form, shaped by the hands of woodworkers, put to use for a practical purpose in a form to be admired by future generations.

In a matter of hours, I learned to appreciate the material I had often taken for granted. That appreciation grew even more on the day we returned to mill these logs into lumber. What a thrill to discuss with an experienced sawyer the best cuts, the optimum yields, the ways to get the best material out of the gift nature had provided us. As each log was sliced, it was 10 times more exciting than opening a gift to see what beautiful grain lay hidden below the bark. **PW** —Steve Shanesy



This is one of several cherry trees that we felled for later milling into what was essentially free lumber. This stately specimen will be given a second life as furniture—a dining table, entertainment center, perhaps—gracing someone's home.

## The Nuts and Bolts of Turning Waste Trees into Good Wood

By Sam Sherrill, Carey Sherrill  
and Michael Romanos

### Introduction

Whether a tree ultimately becomes a piece of furniture, refuse or smoke depends on where it grows. Forest trees felled by loggers and nature become lumber, paper and other pulp products. Most city trees become part of the municipal solid waste stream, ending up in landfills as debris (almost 15 million tons in the United States in 1994). Those that don't become solid waste are buried at construction sites, cut into firewood, used as fuel or are ground into mulch.

In a small way, here in Cincinnati, Ohio, we are trying to rescue fallen trees from landfills, burning, burying or being ground up. Our interest as woodworkers is moving trees from the site to the sawmill and then to the shop. For the past two years, we have been getting hardwood

logs from homeowners and the local parks department. We have the logs cut into lumber which we then air dry in our garages and basements. Once the lumber has dried, we design and build furniture with it in our shops. What follows is the story of how we did this, with the hope woodworkers elsewhere can learn from our experience and rescue trees for their own use.

### Finding Trees

Finding fallen trees or trees scheduled for cutting is easy. There are several local sources.

We started by asking the supervisor of the Cincinnati Park Board's maintenance crew to call us when street or park trees are scheduled for cutting. In addition, we call every month or so, or right after a severe storm, to stay current on cutting schedules. In our case, the Park Board crew would cut the logs into the sizes we needed — if we were on-site to make the request — and haul them back to a storage yard for subsequent pickup. They would even load the logs into trucks for us. Because the Board also sells logs for firewood, they charge a small fee (about \$25) for each load of logs we take.

Real estate developers, general contractors and exca-





Arborist and expert sawyer Richard Cross completes the notch near the base of the tree that will largely dictate the direction the tree will fall. This 70 to 80 year old cherry measured some 32" in diameter and produced four good saw logs, one being 12 feet long.



**1947 PRICES**

There are many considerations to take into account when the sawing of the log starts (above). For best yield, you need the straightest sections of log that yield optimum lengths. Even short sections of logs can produce great material (right). This piece will be cut into extra thick stock for turning blanks. A really great benefit of harvesting your own materials is your ability to custom cut it suit your own woodworking needs.



vating contractors are also knowledgeable sources because they know about land that will be cleared. Either the developer or the general contractor will provide permission to take logs, but it is the heavy equipment operator that the woodworker needs to know when clearing starts. How the tree is knocked over and moved by the operator determines how much usable wood will be available from the logs.

Once informed, the general public is a major source of logs, though careful screening by phone is important to separate workable from unworkable offers. In May of last year, an article appeared in the local newspaper on our efforts to convert street trees to lumber, along with our telephone numbers. We were flooded with calls from people who wanted to donate trees from their property (five months later we are still getting calls). Some of the trees were on the ground, some were standing and a few were actually on houses. Some callers wanted free tree removal, a few wanted to sell the trees and one was prepared to provide standing trees in exchange for free furniture made from the lumber. We quickly learned to ask every caller whether the tree was being given away, whether it was up or down and, if down, whether it was near a driveway or street. We visited callers who were giving away trees (or

wanted furniture) on the ground and accessible.

### The Logistics

While finding trees is relatively easy, converting them to lumber for furniture and crafts is more — sometimes much more — difficult. The most challenging part of this process is getting logs sawn, which means either getting the logs to the sawyer or the sawyer to the logs. (See the accompanying article on setting up a "Trees to Furniture" operation and to learn about Wood-Mizer operators in your area — even if you are overseas).

In the best of circumstances, the logs are accessible to sawyers with portable saw mills like the towable Wood-Mizer. For an hourly or daily fee or by the board foot, sawyers cut logs into lumber that can be either stored on-site or hauled in a pickup truck or small trailer. Once cut into lumber, transporting the wood is usually not a problem.

In less-than-ideal circumstances, the logs must be transported to the sawyer. Without heavy lifting equipment and trucks, moving large logs is not feasible and is risky for both those doing the lifting and for vehicles not designed for heavy loads. For light haul vehicles (we use a Ford Ranger



## 1947 PRICES

It takes several people to move a log of this size, which probably weighs over a ton. Cant hooks bite into the log and give you the leverage needed to roll the log. That's me in the orange jacket and Associate Editor Jim Stuard in the grey sweater and ball cap. Wood-Mizer's Jerry Myers in the dark jacket and red safety glasses oversees this inexperienced crew's log-moving efforts.



One of Wood-Mizer's hydraulically equipped portable saw mills effortlessly lifts a huge log from the ground onto the bed of the mill.

Once in place, other hydraulic equipment not only holds the log in place but also aids in leveling it to produce optimum yield. These devices also turn the log to square. This mill is equipped with a 40-horsepower diesel engine that powers a huge band saw blade.

pickup truck with reinforced rear springs), a load of 1,200 to 1,500 pounds is about maximum. A freshly cut 6-foot-long red oak or black walnut log two feet in diameter can weigh almost 1,200 pounds. Lifting just one end can be more than several people of average strength can safely handle.

In the most challenging situations, getting the logs on the truck is easier than getting the logs to the truck. Trees are not always, or even usually, near a street or driveway. Cincinnati is a city of hills, which means that we often have to retrieve trees from sloped yards and wooded areas. Here, we have to cut the tree into manageable sections and, depending on the situation, use various means to move the log uphill (they never seem to be at the top of a hill).

### The Costs

While retrieving and hauling logs might seem like fun, and thus worthwhile for its entertainment value, an important question is whether all this effort yields furniture-grade lumber at prices lower than those at local lumber yards. For us, the answer is "yes," depending on how the costs are calculated.

In this area, red or white oak costs \$3 to \$4 per

board foot, cherry runs \$4 to \$5, and walnut is \$5. The board foot cost for lumber from retrieved logs consists of one or two out-of-pocket expenses. We have to pay a sawyer to cut the logs into lumber: Currently we pay 35 cents per board foot for flat sawn lumber and 40 cents for quarter sawn. We may have to pay transportation for large logs as well. Fortunately for us, our sawyer has access to flatbed trucks, tractor trailers and forklifts. However, this hauling costs an extra \$75 to \$100, depending on the load and travel distance. We buy a sealer to coat the ends of the logs and lumber to inhibit splitting, and we buy furring strips to use as stickers for stacked lumber.

Generally speaking, our out-of-pocket expenses run 50 to 75 cents per board foot for all of our hardwoods. So we save significant money, get amazing wood and the trees that become furniture live on in a way that is more satisfying and permanent than those that go up in smoke or disappear into the ground.

Another advantage is that tree donors can become furniture customers. Many are sentimental about their trees and want furniture made from it. Because it will take six months for the lumber to dry, the woodworker





The mill is about to square the last wein edge of the kant. Note the uniform thickness of the log edges that have been milled already.



This beautiful material was from the crotch of a tree. Crotches yield beautiful grain patterns unique to that part of the log.



What do you want? How about some  $12/4$ , or is it  $8/4$  you need? At the end of the day, when you mill your own lumber, you get what you need. And it's a great experience, too. What could be better than spending a day in the woods with friends? And if you have some sore muscles tomorrow, think about that free wood you have, not to mention the materials you're keeping from becoming so much landfill tonnage. The "Trees to Furniture" project is a win-win project for everyone.

has time to work on design with the client.

### How Safe Is This?

This is risky business. There are several ways to be injured, seriously or fatally, and there are many ways to damage property. Tree cutting is not for amateurs. To bring down a tall tree in a city usually means doing so near a building, high-voltage wire, garden, or public street. This is best left to professionals who have the skill and insurance coverage.

Once the tree is down, cutting is the main hazard. Chain saws can inflict very nasty wounds and can (heaven forbid) even brutally amputate limbs. And they are noisy. We wear ear plugs, safety glasses and back supports and use a log jack (peavy or log cant) to lift logs for cutting. The one doing most of the cutting also wears steel-toed work shoes. Another major source of injuries is attempts to lift logs and lumber. The human lower back is not particularly well-designed for ordinary use, and it is very poorly suited to lift logs weighing hundreds of pounds. Also, groin and shoulder injuries can easily occur. Do not kid yourself about safety: you can be badly hurt if care and common sense are not followed. Injuries take all the fun out of this activity. So, above all, be careful! PW

## Why cut urban trees?

Honestly, sending a tree from your yard to the landfill makes absolutely no economic sense. When people have an old tree in their yard that needs to come down, this is how they look at the situation: I've got this beautiful old oak in my yard that must be removed, so which is cheaper? A) Cutting down the oak and sending it to the landfill, or B) Cutting down the oak, sending it to the sawmill, waiting for it to dry and paying to store the wood somewhere before you make something with it?

When you look at it this way, the landfill always wins.

Salvaging urban trees has benefits to the community most people just don't think about. Here are a few:

• **Benefits to the Tree Owner** A landowner can spend more than \$1,000 to have a tree cut down and removed from his or her property. And what does that leave them? Exactly \$1,000 poorer and one stump hole richer. If the tree's owner opted to salvage the tree instead, the woodworkers involved in the salvage could make something nice out of the wood for the tree's owner, who might be sentimentally attached to the tree.

• **Benefits to the Woodworker Who Salvages the Tree** Woodworkers who participate in salvage operations wind up with high quality wood they might not be able to find or afford in local lumber stores. Quarter-sawn white oak, black walnut, cherry and even rarer woods like osage orange and elm can be cut for pennies per board foot.

The real cost to you is your sweat-equity, and even that brings a sense of satisfaction because you saved a tree from the landfill and your next project will be built with amazing lumber you cut yourself.

• **Benefits to the Woodworking Community** You're not going to be able to salvage trees yourself. That means you need to work with other woodworkers, and that means you'll get to work with others in your community who share your interests. And your good deeds enhance the image of woodworkers in your community because you're helping the environment at the same time you're salvaging some great wood for your own use.

• **Benefits to the Whole Community** Keeping a tree from the dump saves valuable space in your local municipal landfill and prevents the tree from being burned in a fireplace — which also helps air quality.

• **Benefits to Environment** Not only do you help the air, you help other trees as well. By salvaging lumber, you reduce the need for commercial lumber, which is sometimes harvested at great price to the land and animals. PW



# Start Trees to Furniture in Your Town

Some good old American initiative is what's needed to get a "Trees to Furniture" program started in your community. And, of course, it really requires someone to take that first step and lead the project. Will you rally fellow woodworkers in your area, send for the literature, call the first meeting? I hope you will. The project will be easier to initiate if an area woodworking club takes up the program, but even if there isn't a club around we can help you find other interested woodworkers nearby.

Here are the Trees to Furniture "seedling" services you can obtain through *Popular Woodworking*, Wood-Mizer Products and the Cincinnati-based "Trees To Furniture" pilot project.

1 For more information about the project, including a detailed description of how to set up the program in your community, send a self-addressed, stamped envelope (with two first-class stamps) to *Popular Woodworking*, Trees to Furniture project, 1507 Dana Ave., Cincinnati, OH 45207. Or e-mail us at [popwood@earthlink.net](mailto:popwood@earthlink.net).

2 If you want to register yourself as a group or individual who is interested in finding others to work on a Trees to Furniture project in your community, write to us at the above address or

## HELP!

We need help. The Trees to Furniture program is in everyone's interest, not just woodworkers'. But a fledgling program, whether it's one woodworker in a community, or the larger program being initiated here, can use all the help it can get to ensure it's a success. While we are fortunate to have the generous helping hand of Wood-Mizer Products, we can't do it alone. Anyone with time, money or influ-

ence who recognizes the merits of this effort is enthusiastically welcomed to join hands in the Trees to Furniture project.

If you are a for-profit, not-for-profit corporation, an individual or group who would like to explore areas of involvement in the project, contact me, Steve Shanesy, editor and publisher of *Popular Woodworking*, at 513-531-2690 ext. 238 during East Coast business hours.

visit Wood-Mizer's site on the World Wide Web ([www.woodmizer.com](http://www.woodmizer.com)).

3 If you wish to find a Wood-Mizer portable saw mill owner in your area to learn the details of buying his or her cutting services, contact Wood-Mizer at **800-553-0182**.

## A Club Approach

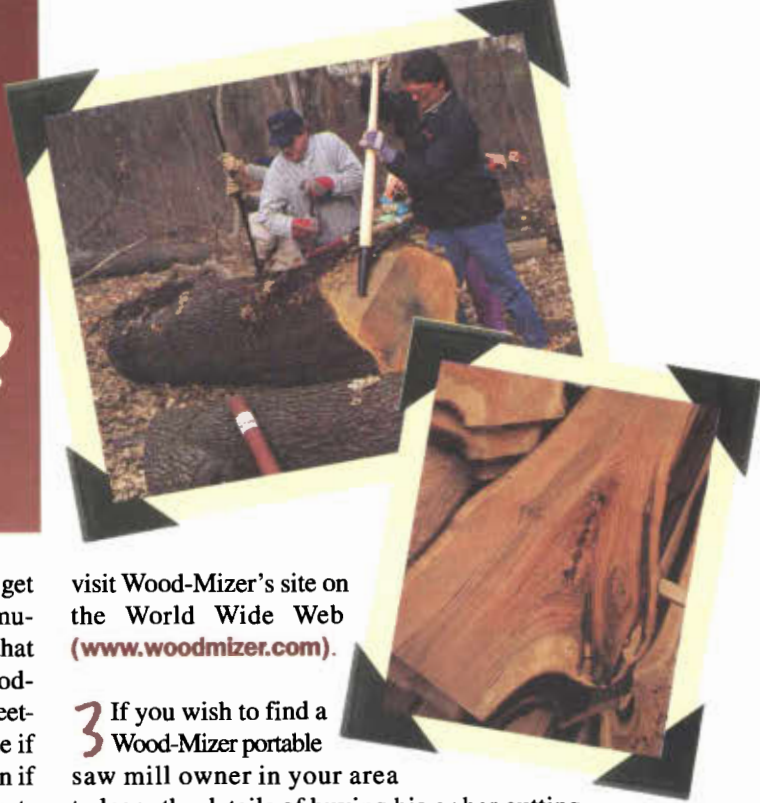
If you are a member of an established woodworking club, setting up a Trees to Furniture program for club members could be quite easy. It will likely attract more members, help publicize the club and could produce modest income to further the group's work. Here are some thoughts on how it could work.

You need four to six people to fell the trees, move the logs and assist in the cutting, stacking and storing of lumber. Obviously, these people would be entitled to the lumber, especially if they stood the expense of hiring the sawyer and mill operator. However, surplus material, and it's likely there will be plenty from even a moderately active project, could be sold to members of the club.

Project coordinators for the club might also consider providing "credits" for those who work in the project that entitle members to lumber; say, each credit, or hour worked, is worth 10 board feet of lumber. A large club might want to temporarily sell excess lumber for a bigger profit with the goal of buying a saw mill for their own program, thus forever eliminating one of the biggest (although still modest) expenses of the program.

## The Individual Approach

Remember, even solitary woodworkers can establish an effective program by simply seeking out like-minded woodworkers (just remember to register your interest with us). This method can be just as effective as the club approach. After all, the original pilot project in Cincinnati started thanks to the will and determination of two weekend woodworkers. In just a couple years, they obtained several thousand board feet of prime hardwood lumber — air dried and ready for building. You can do it, too. **PW**





# NEW! <sup>Popular</sup> Woodworking<sup>TM</sup>

## Full-Sized Plans

### Foolproof Your Projects

Now *Popular Woodworking* projects can be even easier to build. After hearing from many readers, we're now offering plans with more detail than we can pack into the magazine, including the full-sized patterns for some of our best projects. No more transferring complex measurements from a small drawing. These are big, easy-to-read construction drawings that make your project work the first time, every time. They're drawn on oversized sheets up to 24" x 36" and include a detailed cutting list and a reprint of the original article about the project. And the price is right.

Here are just four of the classic projects you can build with *Popular Woodworking's* plans:



#### Ultimate Workbench

Sure, everybody says they'll show you how to build the end-all workbench. After years of research, we really do it. Full-size patterns make the joinery easy work. (Issue #97)

#### Rockin' Harley Hog

It's the traditional rocking horse with a 1990s twist. These full-sized plans give you all the patterns to make the motorcycle rocker — the perfect holiday or birthday gift. (Issue #99)



#### JFK's Humidor

Build this replica of President Kennedy's cigar humidor, which sold recently at auction for \$574,000. Our detailed plans make this challenging project easy for most woodworkers. (Issue #97)



#### Tall Pine Clock

The readers of *Popular Woodworking* love this clock. One industrious fellow made four of them to give away as gifts. Now you can make as many as you like with our full-sized plans, which will help you finish in no time. (Issue #92)



**YES!** Please send me the complete plans for the following projects.

Name: \_\_\_\_\_

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City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

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| ___ Tall Pine Clock (\$9.95)                         |                                  |
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**To order by phone, call 800-365-0963;**  
**have your Visa/Mastercard ready.**

**PAA2**



# Doll Armoire

My daughter, Brooke, joined me in *Popular Woodworking's* project shop on national "Take Your Child To Work Day" to create a custom-sized armoire to "suit" the clothes of her favorite doll, Molly, one of the popular "historic" American Girls dolls produced by Pleasant Company.

The armoire is a simplified version of a full-sized one and accommodates clothes up to 12" long. I used  $\frac{1}{4}$ " Baltic birch plywood for all the case parts.

**STEP ONE:** Review the diagrams and materials list, then cut out the parts. I cut my doors and drawer opening from the front piece with a scroll saw.

**STEP TWO:** The back is housed in a  $\frac{1}{4}$ " x  $\frac{3}{16}$ " rabbet cut using the table saw. Set the blade to  $\frac{3}{16}$ " high (leaving  $\frac{1}{16}$ " material) and make two passes for the  $\frac{1}{4}$ " depth.

**STEP THREE:** Cut the bracket feet from the front and sides. Also cut the scrolled top and heart pattern at the front's top.

**STEP FOUR:** Assemble the case and drawer parts using glue and  $\frac{3}{4}$ " brads. Drill clearance holes for the nails to make the process easier and carefully align the parts while nailing.

**STEP FIVE:** To guide the drawer, glue filler strips to the sides running front to back behind the stile.



Chamfer the overlay drawer front edges, then attach it to the drawer box sub-front using a few dabs of construction adhesive.

**STEP SIX:** Take the piece you cut out for the door openings and use it for the doors. Check their fit in the opening and add small blocks to the back of the doors where the hinges go for support. Then screw the hinges to the edges. Next position each door and mark the hinge location on the stiles. Mortise for the hinges using a chisel. When done, hang the doors.

**STEP SEVEN:** The moulding near the top and on the left door is a half-round profile cut from scrap picture frames. Glue the mouldings in place.

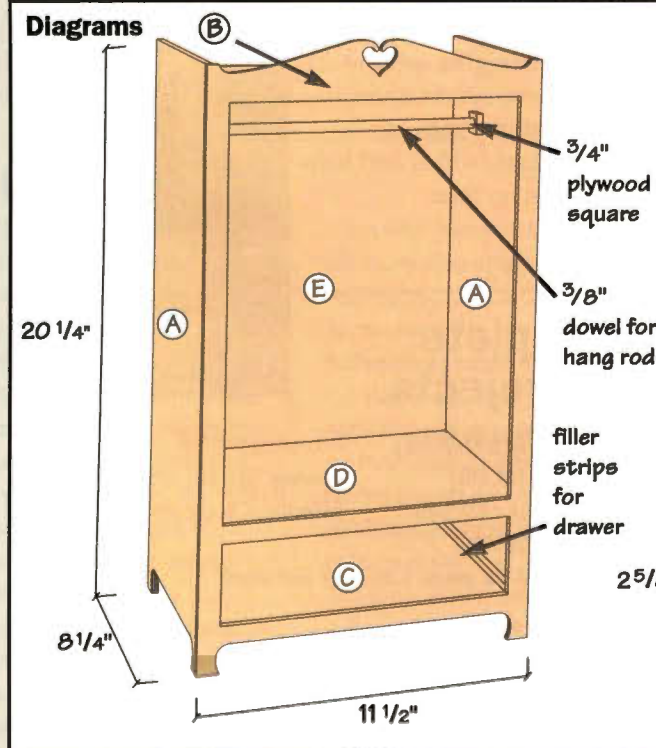
**STEP EIGHT:** The hang rod inside the closet is supported by two pieces of  $\frac{1}{4}$ " plywood ( $\frac{3}{4}$ "

square). Drill  $\frac{3}{8}$ " holes for the dowel rod and glue them with the dowel in place.

**STEP NINE:** Give the armoire a good sanding and generously ease all edges to avoid splinters. I used a walnut brown gel stain, then three coats of shellac, lightly sanding between coats. Lastly, I installed the door and drawer pulls, which I bought in a craft store, along with the hinges.

It was a fun day in the shop, but I think Brooke had more fun showing off her creation to her friends who also have American Girls dolls. Pity their poor parents when they'll be shown an armoire from the company's catalog with its \$150 price tag! **PW**

—Steve Shanesy, PW staff

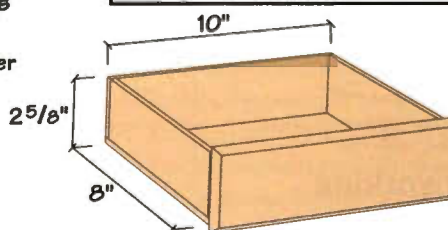


**Schedule of Materials: Doll Armoire**

No.	Let.	Item	Dimensions T W L	Material
2	A	Sides	$\frac{1}{4}$ " x 8" x 20 $\frac{1}{4}$ "	Birch Ply
1	B	Front	$\frac{1}{4}$ " x 11 $\frac{1}{2}$ " x 21"	Birch Ply
2	C	Top & Bot	$\frac{1}{4}$ " x 8" x 11"	Birch Ply
1	D	Shelf	$\frac{1}{4}$ " x 7 $\frac{3}{4}$ " x 11"	Birch Ply
1	E	Back	$\frac{1}{4}$ " x 11 $\frac{3}{8}$ " x 14 $\frac{1}{2}$ "	Birch Ply
2		Doors	$\frac{1}{4}$ " x 4 $\frac{7}{8}$ " x 13 $\frac{7}{8}$ "	Birch Ply
1		Drw Fmt	$\frac{1}{4}$ " x 3 $\frac{1}{8}$ " x 10 $\frac{1}{4}$ "	Birch Ply
2		Drw Sides	$\frac{1}{4}$ " x 2 $\frac{3}{8}$ " x 7 $\frac{1}{2}$ "	Birch Ply
2		Frnt & Bk	$\frac{1}{4}$ " x 2 $\frac{3}{8}$ " x 10"	Birch Ply
1		Drw Bot	$\frac{1}{4}$ " x 10" x 8"	Birch Ply

1 Length half-round moulding  $\frac{1}{4}$ " x 14" long for door

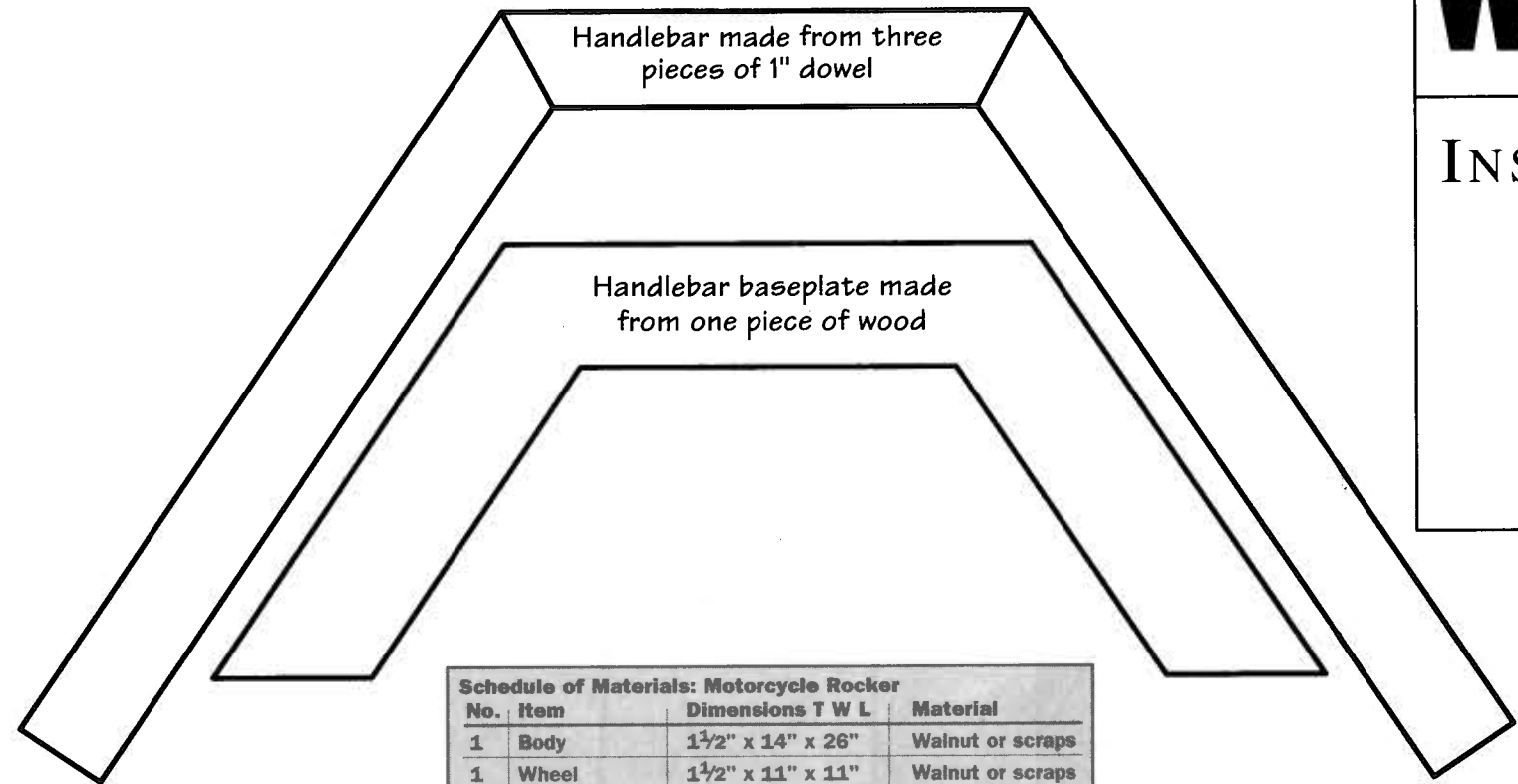
1 Length half-round moulding  $\frac{1}{8}$ " x 27" long for case



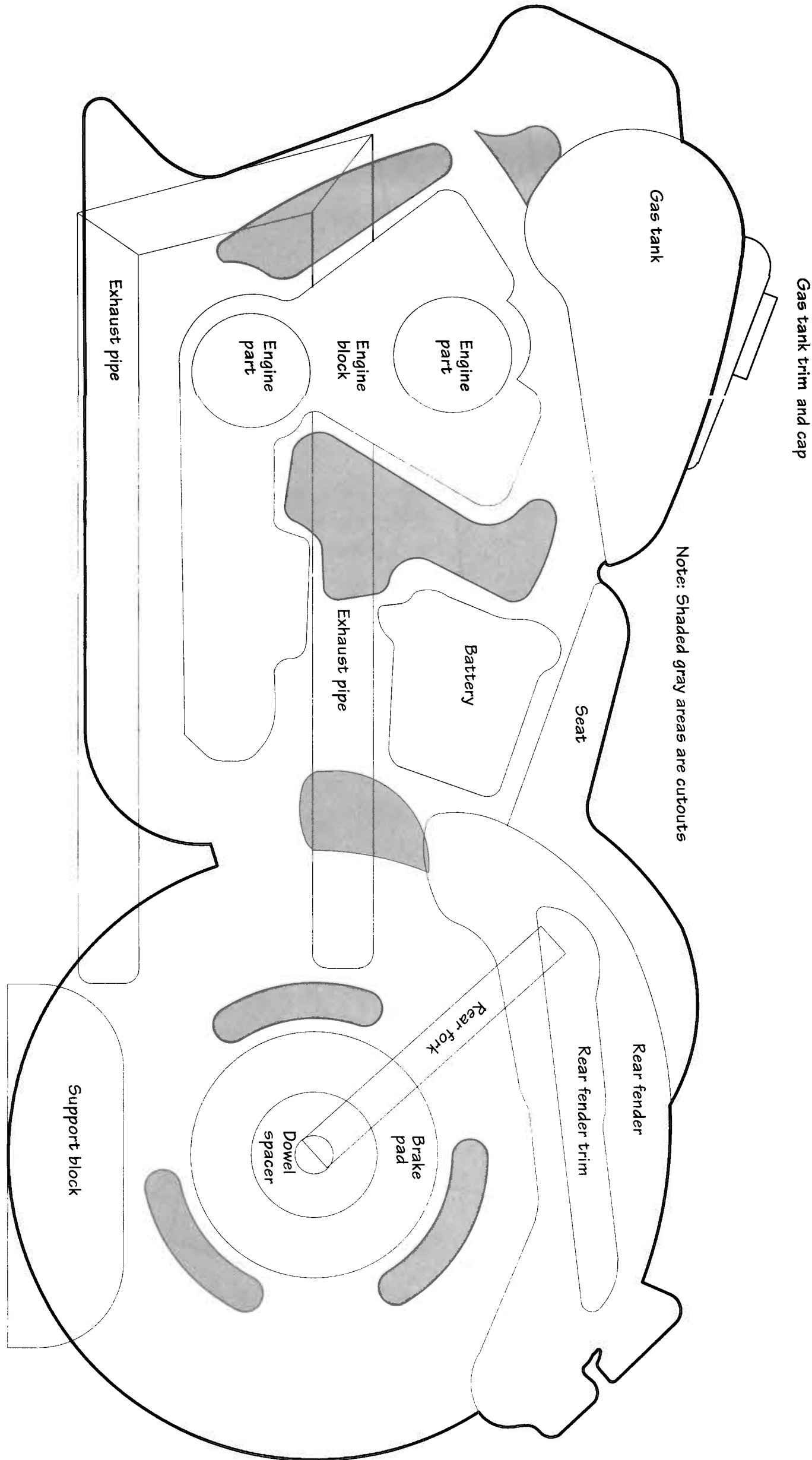


# The Rockin' Harley Hog

The center part of the main body and front wheel are shown as a bold outline. Interior pieces are drawn with the thinner line. All pieces are printed at 50 percent. Set your copier to 200 percent to enlarge to actual size.



Schedule of Materials: Motorcycle Rocker			
No.	Item	Dimensions T W L	Material
1	Body	1½" x 14" x 26"	Walnut or scraps
1	Wheel	1½" x 11" x 11"	Walnut or scraps
2	Front forks	14½" x 1½"	Dowels
	Handlebars	25" x 1"	Dowels
	Engine pieces		Scraps
2	Rockers	¾" x 4½" x 37"	Hardwood
7	Rocker slats	¾" x 3¾" x 18"	Hardwood



**PullOut™ Plans**

**#99**

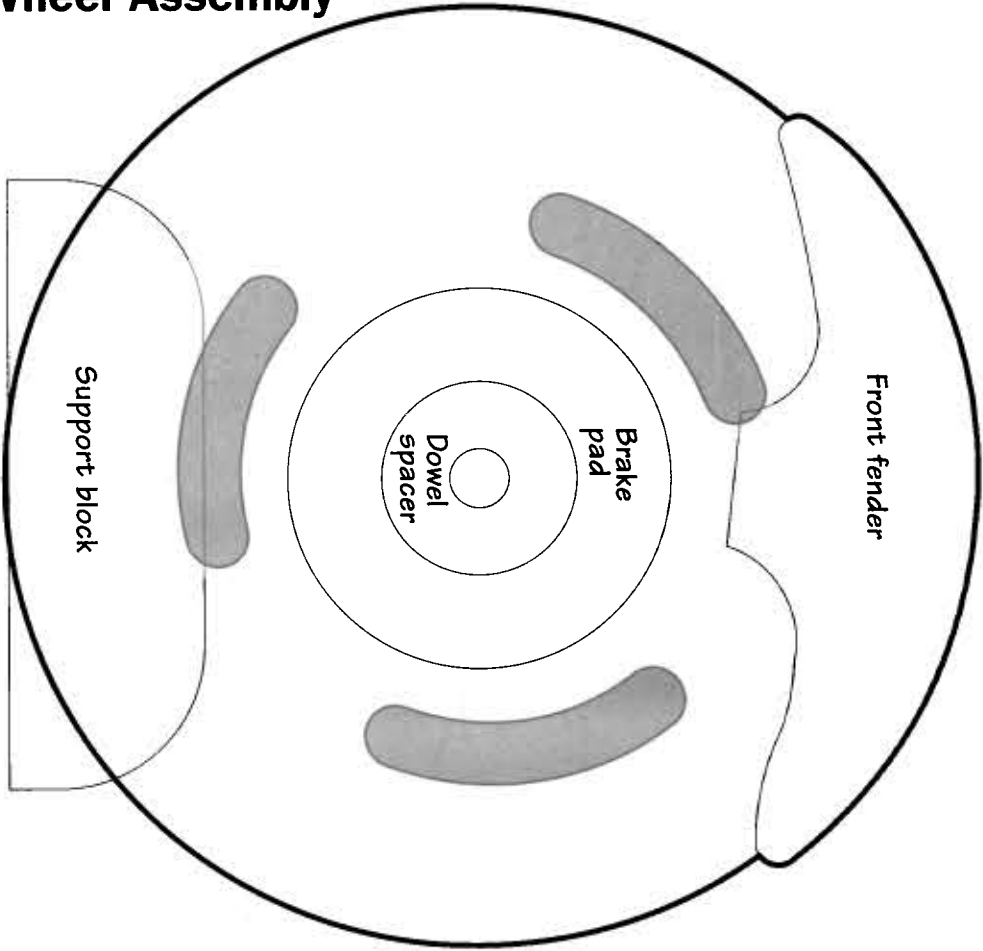
**Popular Woodworking**

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

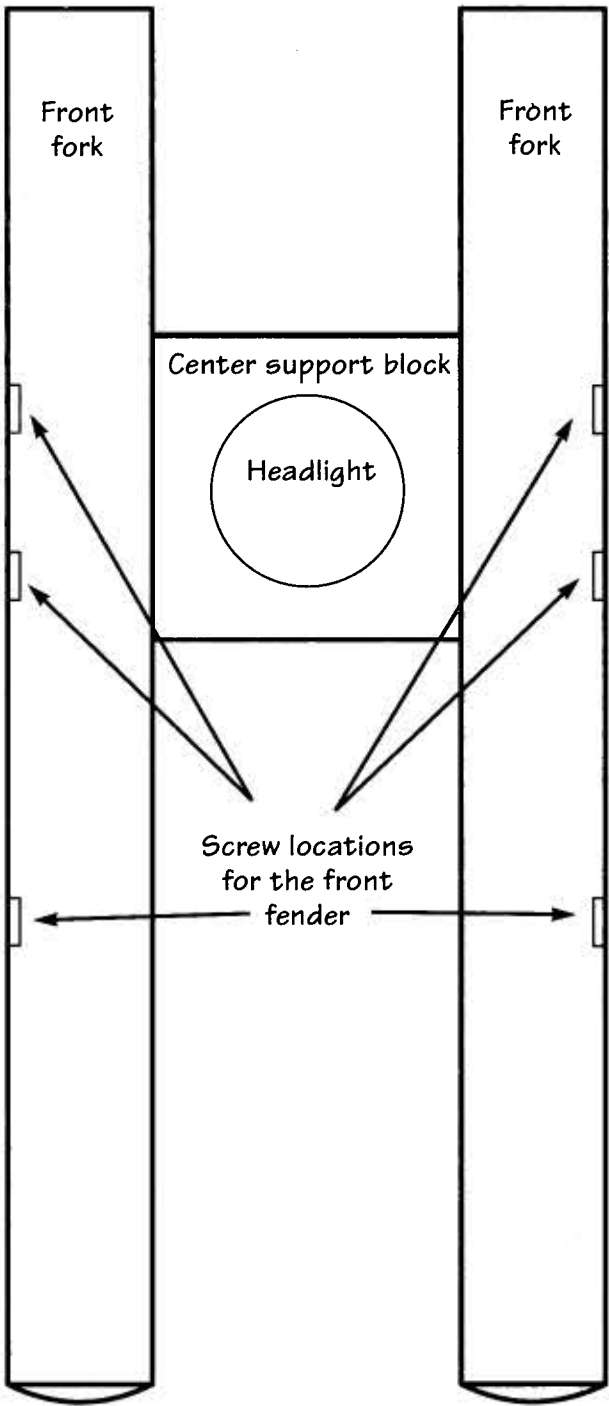
INSIDE

project	page
<b>Earring Rack</b>	<b>45</b>
<b>Chip Carved Box</b>	<b>49</b>
<b>Motorcycle Rocker</b>	<b>51</b>
<b>Chippendale Futon</b>	<b>58</b>
<b>Toy Train</b>	<b>66</b>

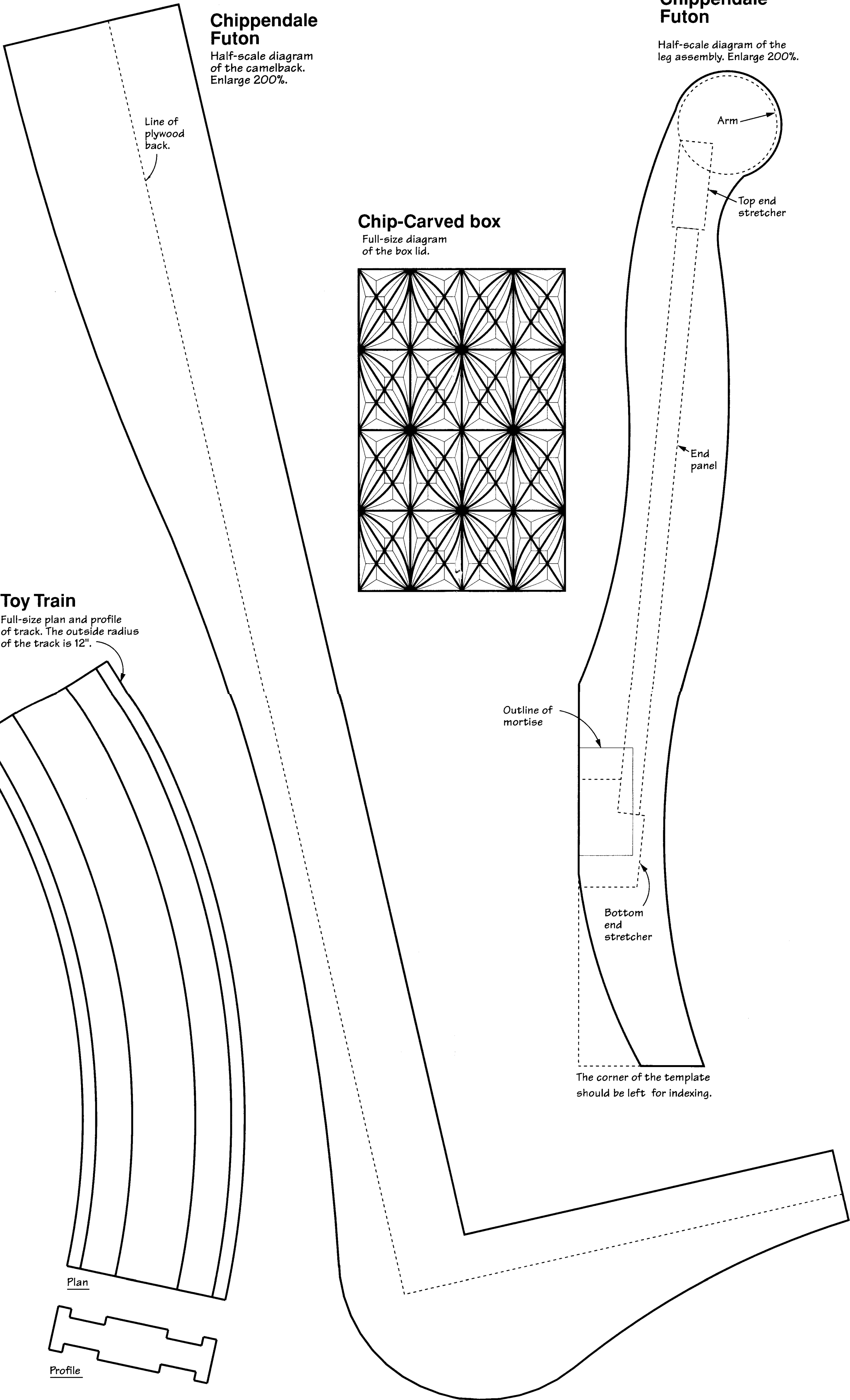
## Wheel Assembly



## Front Forks







### Chippendale Futon

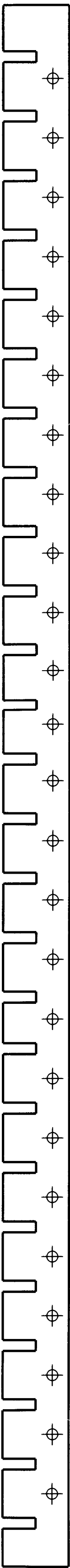
Half-scale diagram of the camelback. Enlarge 200%.

### Chippendale Futon

Half-scale diagram of the leg assembly. Enlarge 200%.

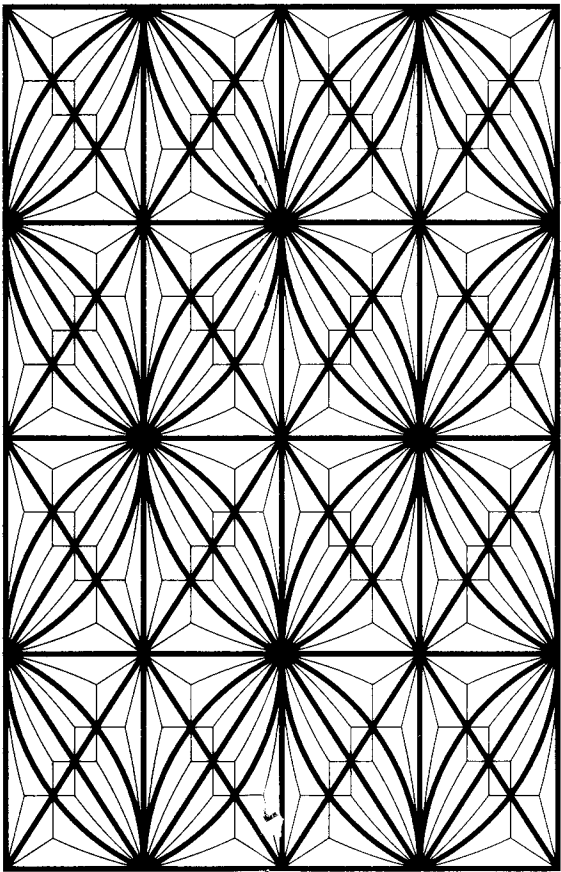
### Earring Rack

Full-size diagram of the main rail. Drilling centers for 1/8" holes are shown.



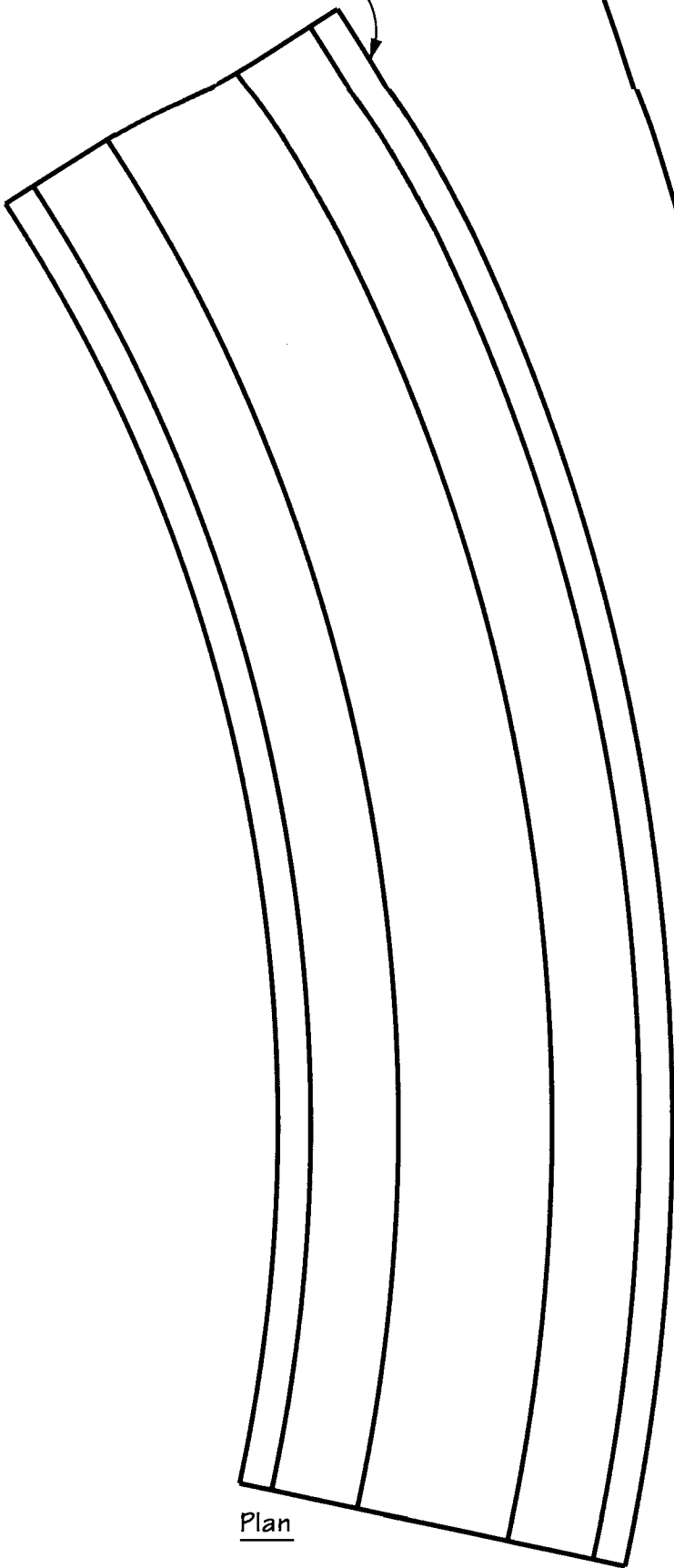
### Chip-Carved box

Full-size diagram of the box lid.



### Toy Train

Full-size plan and profile of track. The outside radius of the track is 12".

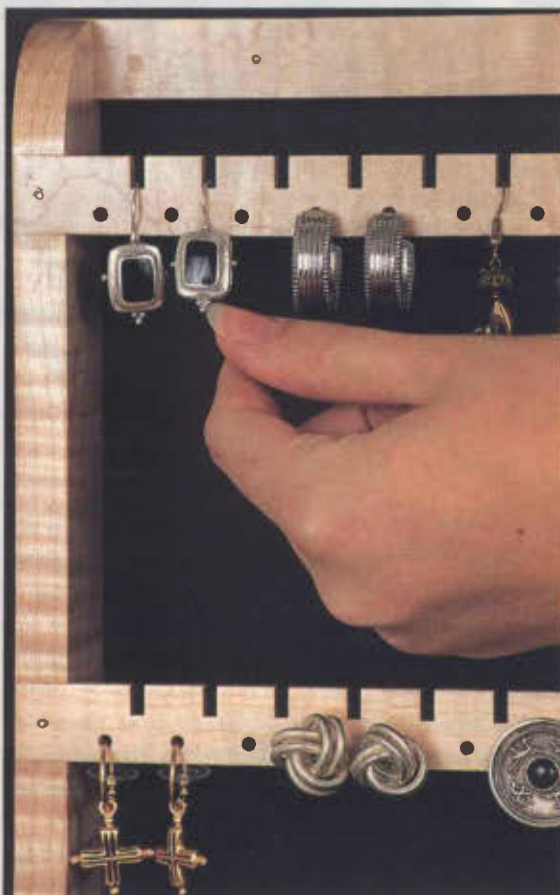


Plan

Profile



# Earring Rack



This easy project attaches nicely to the back of a closet door and holds more than 50 pairs of earrings.

I made a couple of these out of curly maple and one out of quartersawn oak, though any hardwood will do. This one's a gift for my wife, so I hope she doesn't see this issue of the magazine before Christmas.

**STEP ONE:** I made the four earring rails out of two strips of  $\frac{1}{2}$ " x  $\frac{3}{4}$ " x 18" material. First cut the wood to length, then lay out and drill  $\frac{1}{8}$ " holes in the locations shown in the PullOut™ Plans.

**STEP TWO:** Resaw the two strips to make four  $\frac{1}{8}$ " strips. I did this on the band saw and then planed them down to their finished size. The strips also could be cut on a table saw. To make the notches between the holes, first tape all four strips together. Then lay out the locations of the notches given in the PullOut Plans

on the taped block. Set your table saw's blade to  $\frac{5}{16}$ " high and make kerf cuts on these marks. Make sure to use a backing board to avoid tearout. Remove the tape, sand the pieces and set aside.

**STEP THREE:** Cut the top and bottom pieces and set them aside.

**STEP FOUR:** To cut the notches in the sides, set up a  $\frac{3}{4}$ " dado on your table saw. Cut  $\frac{1}{2}$ " x  $\frac{3}{4}$ " notches on the ends for the hanging rails. Then lay out four  $\frac{3}{4}$ " notches on the other side of the sides using the locations in the diagram. Cut these  $\frac{3}{4}$ " x  $\frac{1}{8}$ " notches on the table saw. Put your earring rails in these notches to make sure they fit. Cut the  $1\frac{1}{4}$ " radii on the ends of the sides. Sand the insides of the sides.

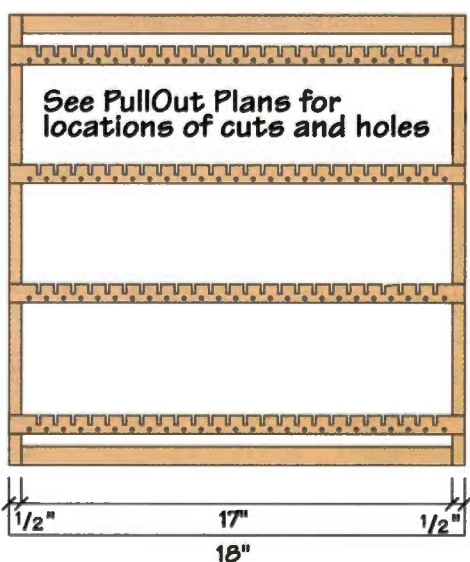
**STEP FIVE:** Begin assembly by putting the two sides on your bench with the fronts facing up. Put a drop of glue in each notch. Lay the end of the earring rail into the notch. Drill a  $\frac{1}{16}$ " pilot hole in the joint and tap in a #18 x  $\frac{5}{8}$ " es-cutcheon pin. Attach the top and bottom in the same way.

**STEP SIX:** Sand the earring rack and brush on two coats of clear finish. **PW**  
—Jim Stuard

## Diagrams



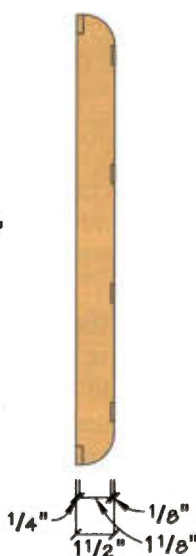
## Plan



## Elevation

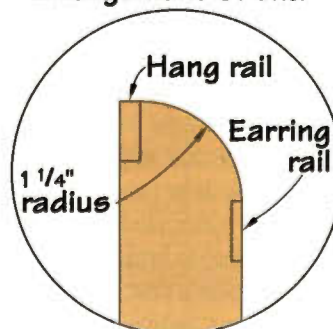
## Schedule of Materials: Earring Rack

No.	Item	Dimensions T W L	Material
2	Sides	$\frac{1}{2}$ " x $1\frac{1}{2}$ " x 18"	Maple
2	Hang Rails	$\frac{1}{4}$ " x $\frac{3}{4}$ " x 18"	Maple
4	Earring Rails	$\frac{1}{8}$ " x $\frac{3}{4}$ " x 18"	Maple



## Profile

## Enlargement of end





# CHRISTMAS In the Woods

John A. Nelson has been making scroll saw patterns for years, so when we went searching for ideas for Christmas decorations, we decided to take advantage of his experience.

The four projects shown here are variations on designs from his book "Holiday Woodworking Projects" (Stackpole Books, Mechanicsburg, Penn.). Though these projects were originally designed for painting, we decided to play with some of his designs and use different woods to add the color to the projects. All the diagrams for the projects are shown at a smaller scale and should be increased on a copier by the percentage indicated on the diagrams.



## Angel On High

We chose woods for this piece that contrasted nicely. As it's a little difficult to find a bright yellow wood, we used undiluted yellow aniline dye on the angel's wing and star. The maple body is a solid piece of wood running beneath the hair and arm veneers.

**STEP ONE:** Cut the body, wing and star to size and shape, fitting the wing to the body. Dye the wing and star, then glue the wing to the body, but wait to glue on the star.

**STEP TWO:** After cutting the hair and sash veneer pieces to shape, glue them to the angel's body, fitting them against one another.

**STEP THREE:** Cut, fit and glue the face and arm veneer pieces to the body. Sand all the veneer sections flush to the maple body, then glue the star in place. To make the hair look more natural (that is, we didn't want the angel to look like she is suffering from male pattern baldness) we used a dark walnut stain pen to color the maple between the walnut veneer pieces.

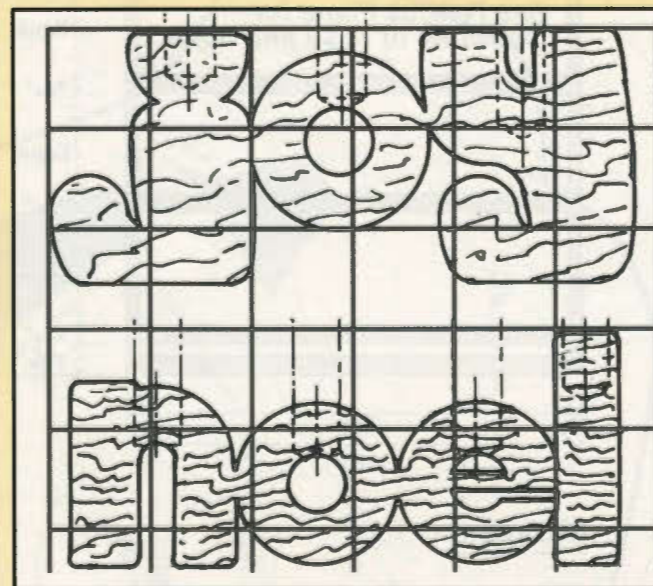
To top it off, add a coat of lacquer to bring out the beauty of the natural wood. Add a dowel and a base like we did, and your angel becomes a table centerpiece. Attach a piece of string to the top and you have an ornament. Glue some stiff wire to the bottom and you've got a tree topper.

## 3-D Tree

We combined two of John Nelson's Christmas tree trivets with a half-lap joint to create this table centerpiece. The project is made from  $\frac{1}{4}$ " Baltic birch plywood and can be whatever size fits your tastes. Our tree ended up 10" wide by 12" high.

**STEP ONE:** Construction can't get much simpler. Photocopy the diagram to the size you want, transfer the pattern to your wood with an adhesive and head to the drill press. Make holes in the areas you are going to cut out. Then head for the scroll saw. The two pieces are notched — one from the top of the star and the other from the base of the tree — to form the half-lap to make the tree three-dimensional.

**STEP TWO:** Sand and paint. Mount to a base, if desired.



1 square = 1" • Increase by 200%





1 square = 1"  
increase by 155%

## Illuminating Words

These simple candle holders are even more interesting when you use a different wood for each letter. It also makes the construction interesting because the letters need to be cut out individually and then fit together.

**STEP ONE:** Determine the woods you're going to use and cut the pieces into 2 1/4" strips, which will accommodate any of the letters. Then either cut or plane them to the same thickness (1 1/8" in our case).

**STEP TWO:** Transfer the patterns to the wood and cut each letter on a scroll saw.

**STEP THREE:** If you have access to a disk, stationary belt or spindle sander, you can cut a little outside the lines and power sand the pieces. This will save time and elbow grease. Regardless, sand the letters before gluing.

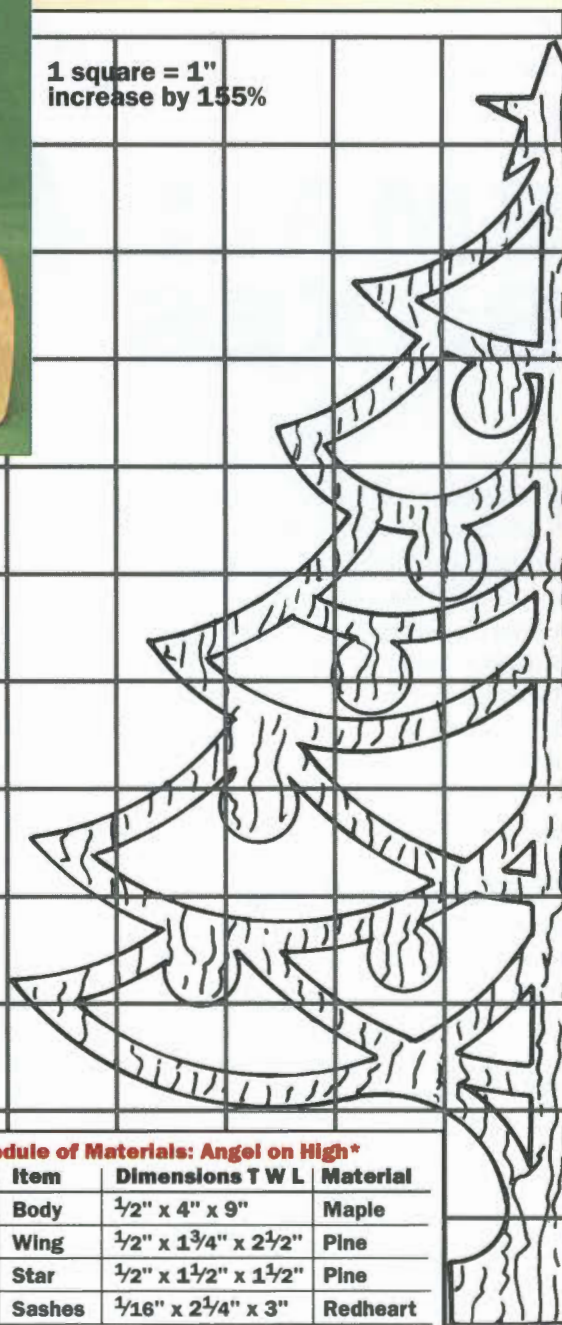
**STEP FOUR:** Glue up the words using a straight edge to align the letters.

**STEP FIVE:** Sand the faces of the letters flush to each other.

**STEP SIX:** After determining the candles you will use, chuck the appropriate diameter Forstner bit into your drill press and bore the holes for the candles.

**STEP SEVEN:** Finish with a clear finish to allow the colors of the woods to show to their best advantage. **PW**

—Designs by John A. Nelson; construction and story by Jamie Doan and David Thiel.

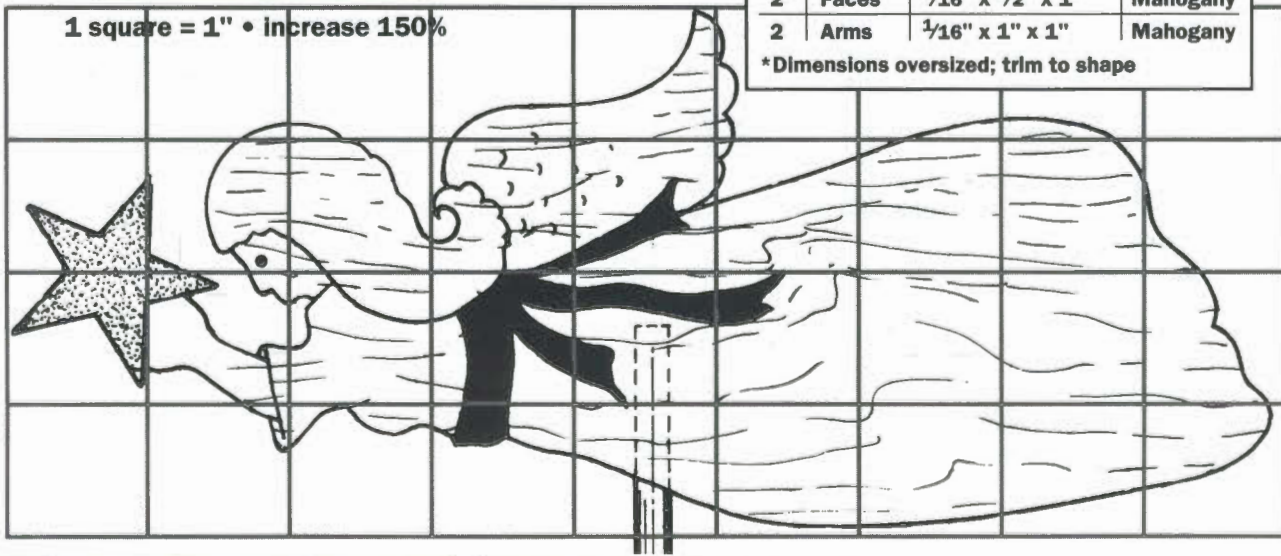


**Schedule of Materials: Angel on High\***

No.	Item	Dimensions T W L	Material
1	Body	1/2" x 4" x 9"	Maple
1	Wing	1/2" x 1 3/4" x 2 1/2"	Pine
1	Star	1/2" x 1 1/2" x 1 1/2"	Pine
2	Sashes	1/16" x 2 1/4" x 3"	Redheart
2	Hair	1/8" x 1 3/4" x 2 1/2"	Walnut
2	Faces	1/16" x 1/2" x 1"	Mahogany
2	Arms	1/16" x 1" x 1"	Mahogany

\*Dimensions oversized; trim to shape

1 square = 1" • increase 150%





# Good Things Come as SMALL BOXES



Christmas presents don't always come in boxes — sometimes they *are* the boxes. These two designs make great presents, and though they're designed to hold playing cards and file cards (as in a recipe box) they can hold anything that fits your needs. The chip carving on the lid of the file box is a great introduction to this decorative art.

As the playing card box is the simpler of the two, we'll start there.

## Playing Card Box

**STEP ONE:** Cut a 24" strip of walnut  $\frac{1}{4}$ " x  $1\frac{3}{8}$ " for the sides and ends. Cut a  $\frac{3}{16}$ " x  $\frac{3}{16}$ " rabbet on the top edge and a  $\frac{3}{16}$ " x  $\frac{1}{4}$ " rabbet on the bottom edge. Cut the pieces to length using miter cuts.

**STEP TWO:** Cut the bird's eye maple top. The top was resawn on the band saw and book matched to show off the

grain. Once to size, a  $\frac{3}{16}$ " x  $\frac{3}{16}$ " rabbet is cut around the upper surface of the top to accept the top trim.

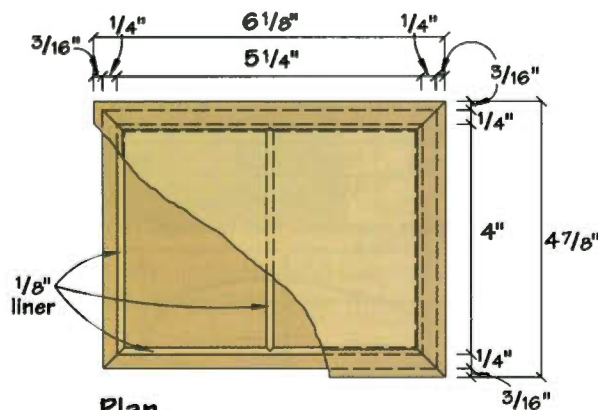
**STEP THREE:** Using the plywood bottom (cut to size) and the maple top to check for squareness, apply glue to the side miters and glue the box frame. This can be easily accomplished without clamps by laying the four sides in order face up and placing masking tape over the three meeting joints prior to gluing. Once the glue is applied, the sides are rolled into place and a final piece of tape is applied to the fourth joint.

**STEP FOUR:** When the box frame is dry, the box can be cut apart on the table saw. One way to make this step easier is

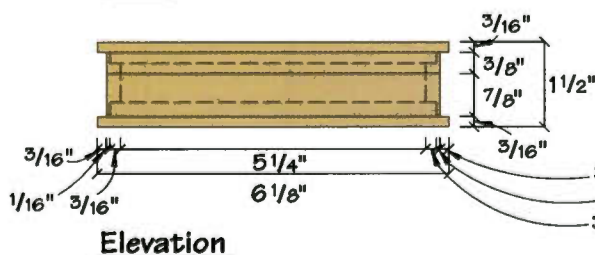
to use hot melt glue to apply  $\frac{1}{4}$ " x  $\frac{1}{4}$ " x  $\frac{3}{4}$ " strips to the inside surface of the box across where the cut will be made. Then, when the box is cut apart, the blade can be set to a height to cut only through the side and leave the strips supporting the box. Then knock the strips loose and your lid comes loose.

**STEP FIVE:** Set the top and bottom in place (don't use glue on the top piece to allow for wood movement). Then fit, glue and hand-taper the walnut trim after assembly.

**STEP SIX:** The maple lining is then miter cut to fit the interior with a center piece evenly dividing the space. Finish the piece with a coat of Danish oil and wax.



Plan

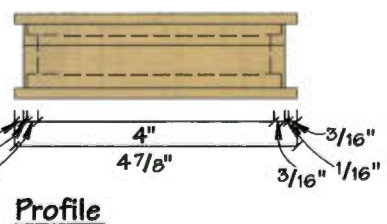


Elevation

Schedule of Materials: Playing Card Box

No.	Item	Dimensions T W L	Material
2	Sides	$\frac{1}{4}$ " x $1\frac{3}{8}$ " x $5\frac{3}{4}$ "	Walnut
2	Ends	$\frac{1}{4}$ " x $1\frac{3}{8}$ " x $4\frac{1}{2}$ "	Walnut
1	Top	$\frac{3}{8}$ " x $4\frac{1}{4}$ " x $5\frac{5}{8}$ "	Maple
1	Bottom	$\frac{1}{4}$ " x $4\frac{3}{8}$ " x $5\frac{5}{8}$ "	Plywood
4	Trim	$\frac{3}{16}$ " x $\frac{1}{2}$ " x $6\frac{1}{8}$ "	Walnut
4	Trim	$\frac{3}{16}$ " x $\frac{1}{2}$ " x $4\frac{7}{8}$ "	Walnut
	Liner*	$\frac{1}{8}$ " x $1\frac{1}{16}$ "	Maple

\*Cut to fit



Profile



## Chip Carved File Box

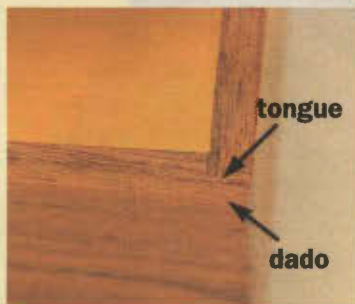
**STEP ONE:** Cut the sides and ends according to the Schedule of Materials.

**STEP TWO:** Unlike the playing card box, this box uses joinery where tongues (made by cutting rabbets) slide into dados (see inset photo). Use an  $\frac{1}{8}$ " saw blade kerf to form the  $\frac{1}{8}$ " deep dados in the sides. The  $\frac{1}{8}$ " x  $\frac{1}{8}$ " tongues are also formed on the table saw.

**STEP THREE:** The same  $\frac{1}{8}$ " x  $\frac{1}{8}$ " saw setting is used to form the grooves at the top and bottom of the sides and ends to accept the top and bottom pieces. These cuts need to be stopped cuts on the sides so the groove isn't visible from the outside. Use a chisel to finish the ends of the stopped grooves. You also could use an  $\frac{1}{8}$ " straight router bit.

**STEP FOUR:** The design for the top's carving is provided in the PullOut™ Plans. The black lines indicate the defined upper surface of the design, while the lighter lines show the recessed section of the pattern. A simple chip carving cutting knife can be used for all the cuts. If this is your first time chip carving, you may want to start on a scrap piece to get the feel of the knife.

**STEP FIVE:** After the top design is carved, the top and bottom are rabbet cut on the table saw. The rabbets are  $\frac{1}{8}$ " deep and  $\frac{3}{16}$ " wide, forming a tongue that will fit



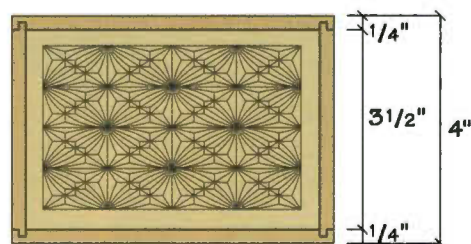
into the grooves in the sides and the ends.

**STEP SIX:** The box is now ready to glue together. Use the same procedure in step four on the previous box's instructions to make the box separation step easier. The box shown was then finished using a grain filler and lacquer.

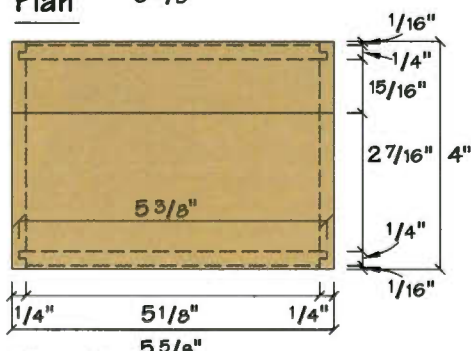
**STEP SEVEN:** To complete the box, screw two decorative hinges to the back

and add a delicate chain on the interior to serve as a lid support. **PW**

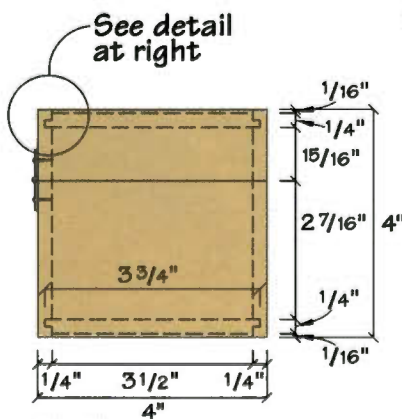
*The Playing Card Box was built by Keith Mealy of Cincinnati, Ohio, and the Chip Carved File Box was built by Maurice C. Anders of Oklahoma City, Oklahoma. Both boxes will appear in the forthcoming "The Best of Wood Boxes" ISBN 1-55870-476-0 from Betterway Books in spring 1998.*



Plan



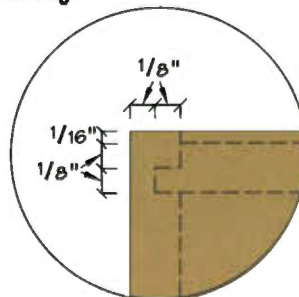
Elevation



Profile

Schedule of Materials: Carved File Card Box			
No.	Item	Dimensions T W L	Material
2	Sides	1/4" x 4 1/8" x 5 5/8"	Walnut
2	Ends	1/4" x 4 1/8" x 3 3/4"	Walnut
1	Top	1/4" x 3 3/4" x 5 3/8"	Basswood
1	Bottom	1/4" x 3 3/4" x 5 3/8"	Basswood

Full-size detail of box joinery



The lid and bottom are recessed  $\frac{1}{16}$ "



# Stumpy the Reindeer MAILBOX

You've seen them in all the flea markets, now you can own your own folk reindeer card holder. It doesn't take much more than finding a couple of appropriately shaped logs, purchasing some dowels and adding a couple of twigs.

The dimensions of the "lumber" we used are in the Schedule of Materials, but feel free to vary them based on the size of the logs in your woodpile.

**STEP ONE:** The one critical size is the trenched-out area on the reindeer's back to hold greeting cards. My space is 2" wide, 8" long and 3" deep and will accommodate all but the largest cards.

I first determined which part of the log should be the reindeer's back, then marked the location for the card slot on the back with a utility knife.

**STEP TWO:** Use the largest spade bit you have on hand to make a series of holes (about 1" deep at a time) along the center of the card slot. Then use a 1" chisel to clear away the waste material.

**STEP THREE:** Repeat the drilling and cleaning step twice more and the card slot will reach its 3" depth.

**STEP FOUR:** Flip the body over and clamp it to a platform, using the edges of the card slot to orient the top. Then use the appropriate spade bit in a drill and make four holes for the legs about 1½" deep. The legs should be splayed to the front, back and sides for more stable support.

**STEP FIVE:** Flip the reindeer back over and drill the holes for the tail and neck.

**STEP SIX:** Make another hole in the smaller log for the neck dowel.

**STEP SEVEN:** The last step is to find a couple of branches that make attractive antlers and drill a couple of holes

**Schedule of Materials: Stumpy Reindeer**

No.	Item	Dimensions D L	Material
1	Body log	5" x 16"	Whatever
1	Head log	3" x 8"	Whatever
4	Leg dowels	5/8" x 12"	
1	Neck dowel	1" x 10"	
1	Tail dowel	5/8" x 3"	
2	Antlers		Twigs

in the head for them.

I glued the leg, tail and neck dowels into the body but left the neck-to-head joint loose to allow the head to turn for posing. **PW**

—David Thiel, PW staff





# Rockin' Harley Hog

*Give the traditional rocking horse this modern twist.*

**Y**OU CAN FIND PLANS for rocking horses in almost every woodworking magazine, from those with a simple band-sawn head and broom tail to others that look like they were carved by Fredric Remington himself.

I always thought I'd like to build a rocking horse, but I changed my mind when I saw a rocking motorcycle in a store in Gatlinburg, Tenn. When I returned home, I decided to improve the design I saw in Tennessee and came up with what you see here.

This motorcycle was built primarily from scraps in my basement shop. The body and gas tank are walnut, the fenders are alder, the engine is oak and the dowels are beech. I've also built this motorcycle with the body made of pine, which can save you a bundle at the cash register.

The beauty of this project is that it's like a rocking horse.



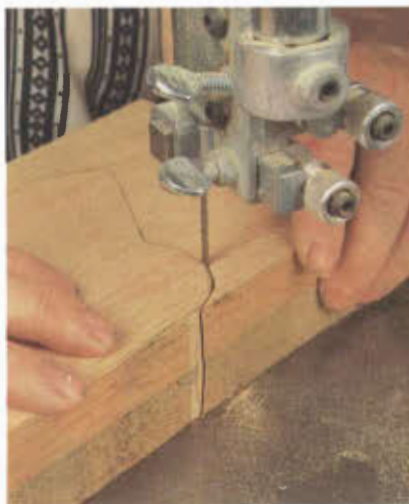
You can make it as simple or fancy as you like. Some of the parts can be carved or inlaid. Or you can even make an "economy model" using only a few of the essential pieces, such as the seat, fender and gas tank.



## MOTORCYCLE



**1 BODY WORK** • After you cut out the shape of the body on your band saw, use a jigsaw to cut out the interior holes in the body, such as the spokes. Cut out the wheel on a band saw and again use a jigsaw to cut out the spokes. Then use a  $\frac{1}{2}$ " roundover bit on most of the edges of both pieces. Don't round over the edges that will become part of the seat, fenders and gas tank.



**2 PRECISION WORK** • The best way to cut out the components for the interior is to draw the part on one piece of  $\frac{3}{4}$ " wood, then attach an identical board to that piece with two-sided tape. Cut out the shape on your band saw and presto, you have the pieces for both sides. Make sure you cut the seat, gas tank and fenders a little oversized so you can sand them to fit the body section.



**3 FLATTEN YOUR DOWELS** • This is easier than it looks. To give your dowels a flat edge, set your planer to cut off about  $\frac{1}{8}$ " and then run the dowel through. The cutterhead and feed bed should keep the dowel from rolling. You also could hand plane the dowels or flatten them with a belt sander.

**STEP 1 Build the Body** • For the body, you need to rummage through your scrap pile and find a piece of wood that is roughly 2" x 26" x 12". Don't be afraid to edge glue two smaller boards together for this project. The result will look just fine. Take the outline of the body and the front wheel in the PullOut™ Plans to your local photocopy store and have them blow up this and the other pieces in the PullOut Plans to 200 percent of their original size or you can purchase the full-size plans from us (The complete Schedule of Materials for the other parts is in the PullOut Plans. You can purchase

full-size plans from us by turning to the Project File section of this issue). Trace the outline of the body on your wood and cut out the shape on your band saw and round over most of the edges with your router.

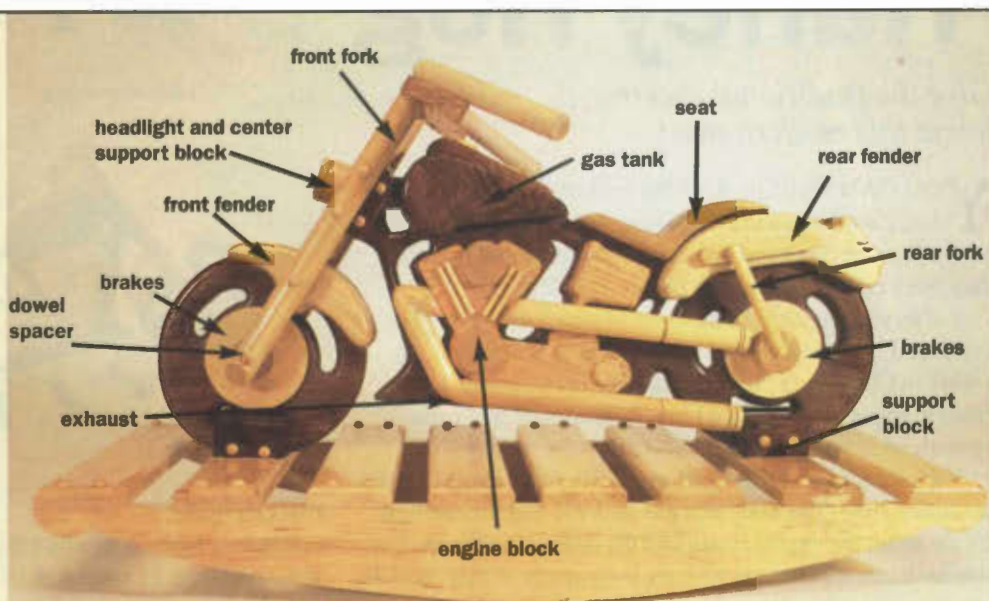
Use your drill press to make the two holes for the axles.

**STEP 2 Engine Fabrication** • Next cut out the rest of the pieces that make the motor, gas tank and other components. Cut the round brakes freehand on the band saw and drill a hole in the center for the axle. Use the same roundover

### Anatomy of a Rockin' Hog

You can find the Schedule of Materials and the drawings for the Rockin' Harley Hog in the PullOut™ Plans in the center of the magazine.

Use this illustration to familiarize yourself with where each of these parts is located on the motorcycle's body. You can make both sides of the motorcycle identical, or you can do what I did and put fewer pipes on one side.



A full diagram and parts list is located in the PullOut Plans.



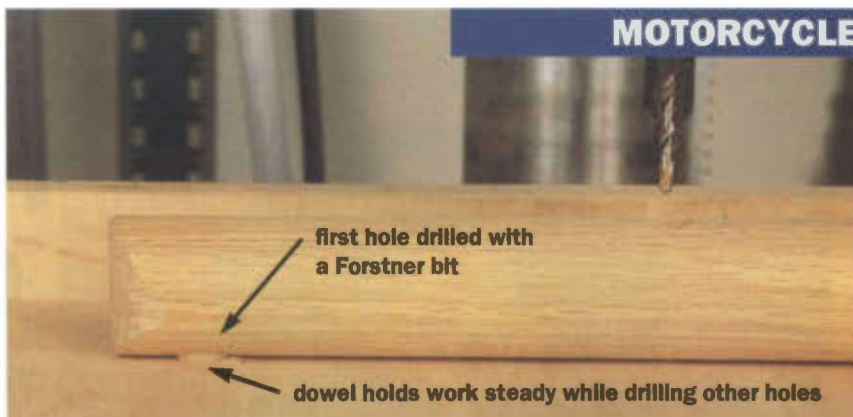


**4 CUTTING CIRCLES** • If you don't have a v-shaped jig for cutting round stock on your band saw, hold the dowel steady against a miter gauge and push the miter gauge forward to cut off your dowel piece.

detail on one edge of all these pieces. Then cut the support blocks (which hold the motorcycle to the rocking base) and cut the slats that attach to the rockers. Round over the outside edges of all these pieces.

**STEP 3 Some Plumbing** • The exhaust pipes are made from dowels that have had an edge flattened with a planer (see photo for details on this process). This flat edge makes gluing them to the body an easy — instead of a really messy — process.

**STEP 4 Disk Brakes** • The 1/4" thick disks on the engine and wheels are cut from 2" dowel stock on a band saw. The headlight is cut at a 55-degree angle on the band saw. The grooves on the exhaust pipes are also made on a band saw. If you're a turner, you can try something even fancier on your lathe. When you're cutting out the round supports that go between the brakes and the rear forks, make sure you pay attention to their thicknesses. The rear forks sit on top of the rear fender and another support rod, so the dowel needs to be extra thick. After you cut the four spacer dow-



**5 PRETTY HOLES ALL IN A ROW** • First use a Forstner bit to drill the hole in one end of the dowel that will attach to the dowel in the wheel. Then drill that same sized hole in a piece of scrap. Put a dowel in the hole in that piece of scrap, then put the fork on top of that. This holds the fork steady on your drill press table as you drill the other holes and countersinks.

els, drill a hole through them for the axle. Glue the disks and spacers.

**STEP 5 Front Forks and Handlebars** • Drilling holes in dowels can be tricky. The trick in the photo can save you from wasting several feet of dowel stock. The holes in the bottom of the front forks attach to the dowel that goes through the wheel and brakes. The other holes and countersinks are for screws that attach to the square support block, which also holds the headlight.

The handlebar pieces can be nailed together with an air gun, or you can dowel the handlebars together. Though this is an end-grain-to-end-grain joint, the single-piece support plate below the handlebars will give you enough strength.

**STEP 6 Assembly** • Glue the seat, gas tank, brakes and other engine pieces to the body. Clamp and let dry. Then start the assembly with the front wheel. Put the front forks over the dowel that is your front axle. Screw the forks to the front fender. (You can use screw caps to hide the screws, or you can glue in a scrap piece of dowel and sand it flat. Be very careful here. Screw caps can



**6 ADD THE HANDLEBARS** • Use several screws to attach the support plate to the handlebars. This area is likely to get a lot of abuse.

come loose and be swallowed by children, so be sure these are securely glued in place.)

Then screw the handlebar support plate to the top of the forks. Screw the front wheel assembly to the handlebars. Screw the assembly to the body through the support block and then glue the headlight on front of that block.

Assemble the rocking base with screws. Make sure you space your slats properly so that each of the two wheels sits firmly on a slat. Screw the bike to the rocker up through the bottom of the slat. Then, with a #12 screw, screw the blocks to the wheel and screw the blocks to the rocker. Then screw the support blocks to the base and the bike. Sand the whole rocker and cover with two or three coats of clear finish. **PW**

—Edward Coombs



# SHAKER

## Hanging Cabinet

*This classic cupboard is a nice accent piece for that empty corner.*

I DESIGNED this cabinet after seeing a similar hanging cupboard in a book about the Pennsylvania Dutch. That cupboard had a drawer in the bottom and a glass door. After building a copy of that original design, I discovered it was too heavy for my taste, so I redesigned the piece in a Shaker style to what you see here.

The entire piece is made from about 26 board feet of curly maple, a wood that I work with as much as possible. Finding wood with this much figure takes a lot of effort and money — curly maple can cost as much as \$15 a board foot. However, you can buy very respectable curly maple for only about \$6 a board foot. In fact, you don't even have to use maple. The Shakers used whatever wood was around them for their furniture, so cherry, walnut and pine are all appropriate for this cupboard.

**STEP 1 Make the Basic Frame** • Begin by cutting the shelves to shape as shown in the diagram. I cut the shelves using a pre-made pattern and a router, though you might be more comfortable using your band saw here.

Next make the two face stiles. The mortises in these pieces hold the tenons on the curved and straight rails which form the face of the cabinet. Mark the locations of the  $\frac{1}{4}$ " wide x 1" deep mortises as shown in the diagram, then chain drill the mortises on your drill press and chisel out the waste.

Next, make the  $22\frac{1}{2}$ -degree cuts on one edge of each of the face and end stiles. Then make two 45-degree cuts on the back stile. While you're making angled cuts on the table saw, make the spline cuts. The photo shows the set-up for these cuts in the face and end stiles.

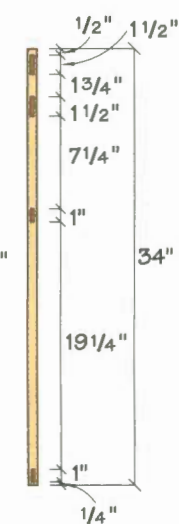
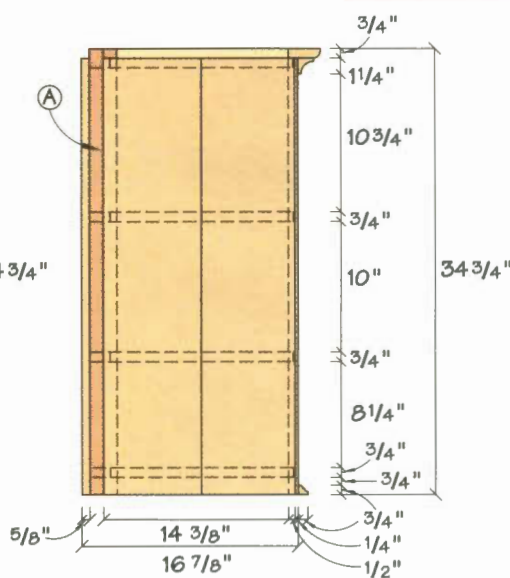
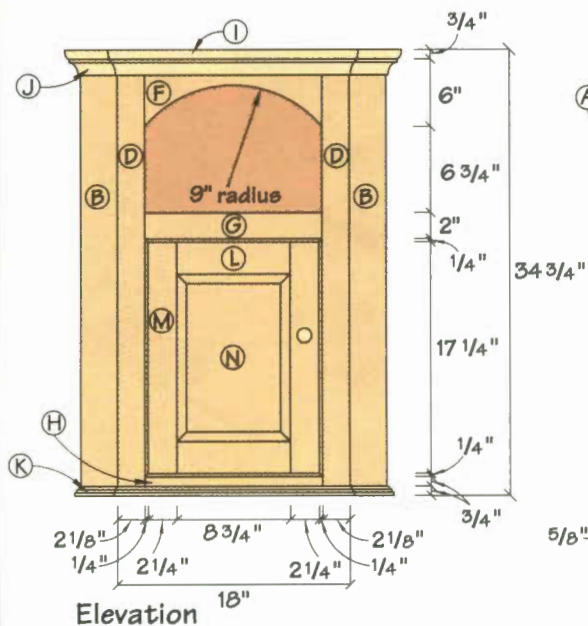
To hold the back pieces in place, make a  $\frac{3}{8}$ " by  $\frac{5}{8}$ " rabbet on each end stile. The rabbet goes to the inside of the long edge, opposite the angle cut.

Finally, mark the locations for the dados that hold the shelves on the back and end stiles. Measuring from the bottom of the stiles, the dados' top edges occur at  $2\frac{1}{4}$ ",  $11\frac{1}{4}$ ",  $22\frac{1}{8}$ " and  $33\frac{5}{8}$ ". Then use a dado set to make the four  $\frac{1}{4}$ " x  $\frac{3}{4}$ " dados in the stiles.

**1 SPLINE CUTS**  
• Set your table saw to  $22\frac{1}{2}$ " degrees to cut the bevel on one edge of the the front piece. To make the  $\frac{3}{16}$ " deep kerf cut for the spline, keep your blade set to the same angle, but move the table saw's fence in, as shown in the photo.

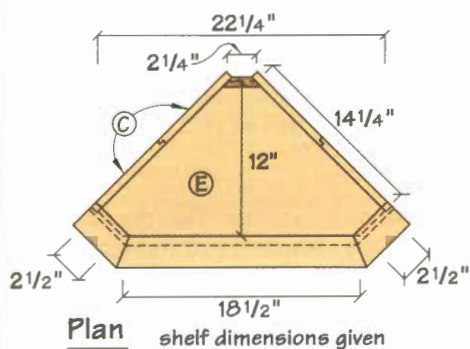






Mortise layout

All mortises are 1/4" wide and centered on the stile.



## Schedule of Materials: Shaker Hanging Cabinet

No.	Letter	Item	Dimensions T W L	Material
1	A	Back stile	3/4" x 2 3/4" x 34"	Maple
2	B	End stiles	3/4" x 4" x 34"	Maple
4	C	Back pieces	5/8" x 7 5/8" x 32"	Maple
2	D	Face stiles	3/4" x 2 1/8" x 34"	Maple
4	E	Shelves	3/4" x 12" x 22 1/4"	Maple
1	F	Curved face rail	3/4" x 6" x 15 3/4"*	Maple
1	G	Middle face rail	3/4" x 2" x 15 3/4"*	Maple
1	H	Bottom face rail	3/4" x 1 1/2" x 15 3/4"*	Maple
1	I	Top crown	3/4" x 2 1/2" x 31 1/2"	Maple
1	J	Crown moulding	3/4" x 2" x 31 1/2"	Maple
1	K	Bottom moulding	3/4" x 5/8" x 27 1/2"	Maple
<b>Door</b>				
2	L	Rails	3/4" x 2 1/4" x 10 1/2"*	Maple
2	M	Stiles	3/4" x 2 1/4" x 17 1/4"	Maple
1	N	Panel	11/16" x 9 3/8" x 13 3/8"	Maple
		Cockbeading	1/4" x 15/16"	Maple

\*This measurement includes tenon lengths on both sides.



**STEP 2 Assemble the Frame** • Next dry-assemble the shelves into the dadoes in the back and end stiles to check for fit. If everything fits, screw the back stile to the shelves. Then screw the end stiles to the shelves, making sure the bevels face the front. The type of screw here isn't important because you'll later replace these with square pegs. The photo shows this step.

**2 TRIAL RUN** • When dry-assembling the frame, I use small pieces of scrap with a clearance hole and slip them over the screw to keep the screw or screwdriver from accidentally marring the sides.

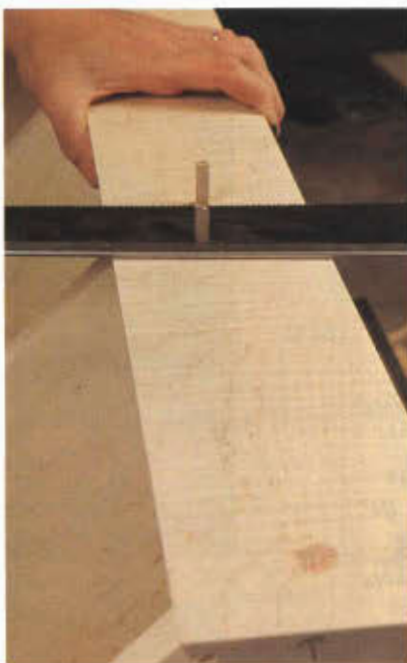
**STEP 3 Build the Face Frame** • With the carcass of the cabinet dry-assembled, cut the face rails to size. I do most of the tenoning work on the table saw, though I use the band saw to cut out some of the waste between the double tenons on the curved stile. Use the assembled carcass and face stiles to mark the shoulder locations on the face rails, then cut the tenons to size. Clean up your tenons with a chisel and test



## HANGING CABINET



**3 FIT THE FRONT** • The double tenons on the curved top rail are  $\frac{1}{4}$ " x 1" x  $1\frac{1}{2}$ ". Make sure the lower tenons are flush with the curve to avoid breaking off the tip of the curve. The tenons on the two other rails measure  $\frac{1}{4}$ " x 1" x 1".



**4 GLUE THE FRAME** • Here's how I pegged the joints in the cabinet: First drill a  $\frac{3}{16}$ " hole into the cabinet about  $1\frac{1}{2}$ " deep. Then rip walnut scraps to  $\frac{1}{4}$ " square. Whittle one end, paint with glue and hammer into the hole. Cut the peg flush (left). After pegging one side, fit the face frame into the front, glue the other side in place and clamp (right). As you can see, I don't have too many fancy clamps in my shop. Just use whatever you've got.



fit your mortises in the front stiles. The graceful arch on the top rail is cut on a band saw; when everything fits, you're ready to glue the face frame.

**STEP 4 Glue-up** • First glue one of the face stiles to the shelves, pegging the dado as shown in the photo. Remove the other end stile and glue the face frame to the front and first end stile using a  $\frac{1}{8}$ " x  $\frac{3}{8}$ " x 34" spline. Then glue and peg the other face stile to the shelves. I also use screws here for extra strength. After the glue cures, remove the screws and replace them with square pegs.

To pull the splined joint together during gluing, I use the homemade clamping cauls shown in the photo. Make the cauls by screwing a piece of  $\frac{1}{4}$ " plywood to a piece of scrap

cut at a  $22\frac{1}{2}$ -degree bevel on one side. Take my advice, I've tried clamping these cabinets a dozen different ways. This is the best.

After the glue is dry, remove the screws and peg the remainder of the cabinet, including the tenons and shelves on the front face. This will give your joints even more strength.

**STEP 5 Add the Detail Moulding** • Though you can buy moulding from a dealer, I prefer to make my own. There are three pieces of moulding on this cabinet. The top crown is simply a piece of  $\frac{1}{4}$ " maple that has been rounded over on one edge. The piece below it is made by following the steps in the accompanying story on cove-cutting. The detail moulding at the bottom of the cabinet is made by

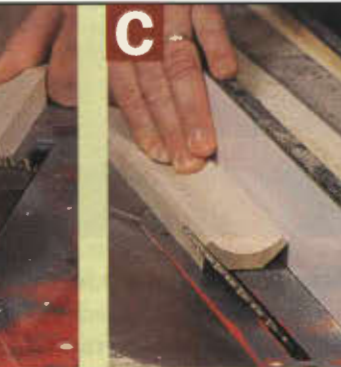
### Cove Cutting

To cove-cut the moulding for the cabinet, first raise your table saw's blade to the depth you want to cove. Then clamp a straight piece of scrap to your table saw to the right outfeed side of your blade to use as a fence.

Set the angle of the fence by aligning your cove location from the board's edges with the infeed and outfeed tips of the saw blade. You should make the cove cut using several passes, increasing the blade height until finished (photo A). Then set your blade angle to



45 degrees and use the standard rip fence to cut the front detail (photo B). Finally, put your fence on the left side



of the blade and cut the details on the back using the same 45-degree setting (photo C).





**5 HANDMADE DETAIL** • The top crown is made with  $\frac{1}{4}$ " maple; the coved piece below it is made from  $\frac{3}{4}$ " stock.

## Gun Blue Trick

To make your steel screws and hinges look authentic, soak them in gun blue for a few seconds, or until they turn black, and remove them.



**6 TRIAL RUN** • Here's what the door looks like before assembly. Note how the mortises for the rails are deeper than the grooves for the panel.

## HANGING CABINET



**7 ANTIQUE LATCH** • This door knob and turn allows the cabinet to be latched by twisting.

## WOOD WORDS (wood 'wurds) n.

**Stile:** The vertical framework pieces in frame-and-panel construction.

**Rail:** The horizontal framework pieces in frame-and-panel construction.

**Carcase:** The skeleton framework of a piece of furniture before the doors, drawers and other parts are added.

**Peen:** To drive a pin through two materials to reinforce the joint.

**Shiplap:** A joint where one board is rabbeted on its face, and the other board is rabbeted on its back and the boards are joined at the rabbet.

routing a classic ogee profile on a strip of  $\frac{3}{4}$ " x  $\frac{5}{8}$ " maple using a Freud bit (38-502).

First cut the 22 $\frac{1}{2}$ -degree miters for all the top moulding pieces. Attach them to the carcass with glue and screws, then glue and nail the coved piece below it as shown in the photo.

**STEP 6 Make the Back and Door** • The back pieces are shiplapped using a  $\frac{1}{4}$ " x  $\frac{3}{8}$ " rabbet cut on one edge of each of the four pieces. Before attaching the back, I like to paint the inside of the back's rabbets black. That way if there's any wood movement, only the black will show, instead of raw wood. I nail the back pieces to the carcass using cut nails for an authentic effect.

The door is made with traditional frame-and-panel construction. Cut  $\frac{1}{4}$ " x  $\frac{7}{8}$ " x  $\frac{1}{16}$ " tenons on the ends of each of the rails. Then cut the  $\frac{1}{4}$ " x  $\frac{3}{8}$ " deep grooves on the rails and stiles to house the panel. The grooves in the stiles should be stopped  $\frac{1}{4}$ " from each end to hide the groove. Next make the grooves in the door stiles a little deeper to form the mortises for the rail tenons.

After test fitting the door frame, make the panel. First cut a  $\frac{3}{16}$ " x  $\frac{1}{2}$ " rabbet on all four sides of the back of the panel. The bevel on the front starts 1 $\frac{5}{8}$ " in from the edge and ends in a  $\frac{1}{8}$ " flat on the edge. To assemble the door, apply glue only to the mortise and tenon joints, allowing the panel to "float" without glue in the frame. Clamp the door and let dry, then peg the mortises using the same technique you used for the frame. The cockbeading around the door is made from  $\frac{1}{4}$ " x  $\frac{15}{16}$ " scrap. Use a router to put a full roundover on one

edge and then glue it on the frame around the door.

**STEP 7 The Antique Touch** • You could buy reproduction hinges and screws and spend a lot of money. Or you could try to make the hardware look old using highly diluted nitric acid, like many reproduction companies do. This can be dangerous to you and the environment. Or, even easier, you can do what I do and age your hardware with gun blue, which is available at most hardware stores. Gun blue is usually used on gun barrels to give the metal a blue look, but it works great on steel screws and hinges.

The door handle is made from a simple store-bought pull, a  $\frac{1}{2}$ " dowel and a piece of scrap maple cut to the shape shown in the photo. Peen the dowel after gluing it into the scrap piece.

The antiqued 2" butt hinges were let into the door and frame about  $\frac{1}{16}$ " on each side using a jig and router, though they could be hand cut with a chisel to carry the authentic technique even further. To finish, I sand the entire piece to either 180 or 220 grit. Then I brush on a water-based aniline dye, wipe off the excess and then sand with 400-grit sandpaper. Next I spray on a sealer and sand again with 320-grit sandpaper. Then I finish the entire piece with three or four coats of spray lacquer. Finally, I screw brass hangers to the back of the cabinet. **PW**

*Glen D. Huey is a professional woodworker for Malcolm L. Huey & Sons and Benchmark Wood Products. He lives in Middletown, Ohio, and specializes in reproduction 18th and 19th century furniture.*



# CHIPPENDALE

## futon

*Introducing the  
first futon that looks  
like real furniture.*



**E**VERY FUTON I've ever seen looked like crates that were put together in haste. So I decided it was time to make a futon that would complement any room of the house. With its sleigh-style arms and camelback, this futon is sure to become a "classic."

I used cherry for this futon, although any hardwood would work. One note before you begin this project: Buy the futon mattress first and take measurements from it. For mine, I used a full-size futon mattress that was about 6" high; yours might be different, and you will need to adjust some measurements of the project accordingly.

**STEP 1 Dowel-Making Time** • The arms are 2<sup>3</sup>/<sub>4</sub>"-thick dowels. Your hardware store is unlikely to have this part, and I didn't find it at my specialty dowel store either, so I glued together several pieces of cherry to make my own dowels. Square and cut the turnings to 2<sup>7</sup>/<sub>8</sub>", which leaves you about 1/8" extra on the width. Next, mark the centers and turn them into 2<sup>3</sup>/<sub>4</sub>" dowels. Sand the dowels on the lathe; set them aside.

Next, lay out the leg/panel assembly on a piece of paper. You can design your own or enlarge the one in the PullOut™ Plans. Then take the full-sized drawing on paper and glue it



**1 ARMS AND LEGS** • To make the arm dowel, find the center of the dowel and use a compass to draw the radius you will need for turning. Figure out how much you can rip off the dowel in order to make it easier to turn, and set your table saw at a 45-degree angle for the four cuts (left). After you turn the arm dowels, decide what design you are going to use for the legs. Make a full-size drawing of it and glue it to some scrap plywood. This is the template that I used to make the legs, and I later adjusted it (right). Refer to the PullOut™ Plans for the final diagram.

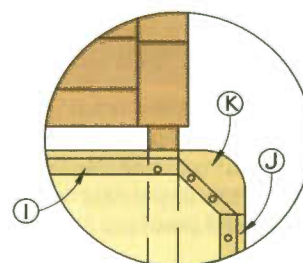
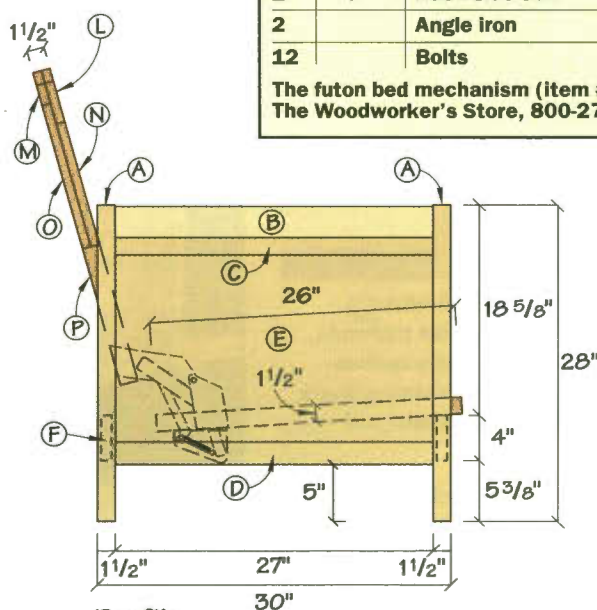




## Schedule of Materials: Chippendale Futon

No.	Letter	Item	Dimensions T W L	Material
4	A	Legs	1 1/2" x 6" x 28"	Cherry
2	B	Arms	2 3/4" x 27"	Cherry
2	C	Top end stretchers	3/4" x 1 1/2" x 27"	Cherry
2	D	Bottom end stretchers	1 3/4" x 3" x 27"	Cherry
2	E	End panels	1 1/2" x 27" x 16 3/8"	Cherry Ply
2	F	Frame stretchers	1" x 4" x 76 1/2"	Cherry
1	G	Seat	3/4" x 25 3/4" x 74 1/2"	Plywood
1	H	Back	3/4" x 25" x 74 1/2"	Plywood
2	I	Seat side trim	3/4" x 1 1/2" x 24"	Cherry
1	J	Seat front trim	3/4" x 1 1/2" x 71"	Cherry
2	K	Seat corner blocks	1 1/2" x 2" x 2"	Cherry
1	L	Back top/face trim	3/4" x 5" x 80 1/2"	Cherry
1	M	Back top/rear trim	3/4" x 3" x 80 1/2"	Cherry
2	N	Back side/face trim	3/4" x 5" x 10 1/2"	Cherry
2	O	Back side/rear trim	3/4" x 3" x 12 1/2"	Cherry
2	P	Back side trim	3/4" x 1 1/2" x 12 1/2"	Cherry
2		Angle iron	1 1/4" x 1 1/4" x 74"	Steel
12		Bolts	1/4" - 20 x 1 1/4"	

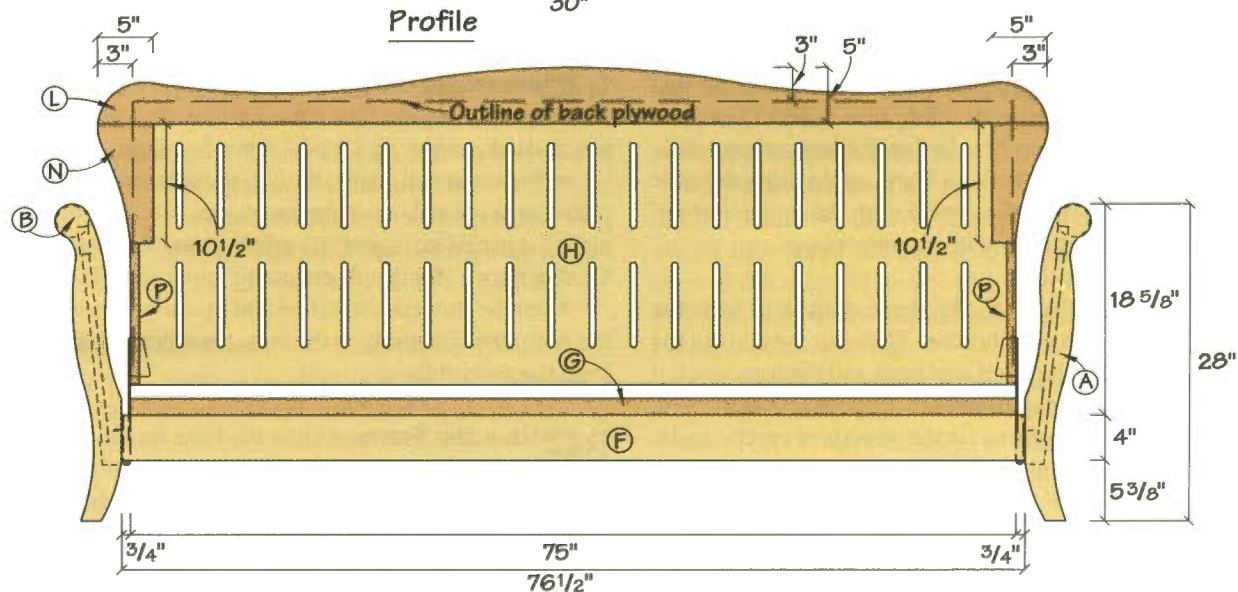
The futon bed mechanism (item #89096) is available from The Woodworker's Store, 800-279-4441 for \$35.99 a pair.



Plan view of seat corner

Diagrams

Profile



Elevation





**2 DOWEL JIG** • When you notch the dowel, make a T-shaped jig that you can clamp the dowel into and lay out the 90-degree cut. The first cut is made, and for the second cut you will have to remove the dowel and turn it from end to end. Check for square.



**3 CUT MORTISES** • Using the leg template, mark up the outline of the leg to locate the mortise location. Then cut a  $\frac{1}{2}$ " x 3" x  $1\frac{1}{2}$ " mortise for the front and back rails.



**4 CLAMP THE ENDS** • After gluing the upper and lower stretchers to the panel, make clamping cauls for the ends. Using a caul that outlines the inside part of the end panel assembly, clamp the arm dowel to the end panel. The clamp angle shown gives good pressure on top of and into the joint.



**5 ADD THE LEGS** • When you glue the legs to the end panel assembly, make sure you apply even clamping pressure on both sides and clean off the glue.

to a piece of  $\frac{1}{8}$ " plywood scrap. Cut it out on the band saw, but be sure to leave the bottom square. This will help you when you cut the legs out.

**STEP 2 Notch the Dowel** • After you lay out the legs, locate where you need to groove the dowel. Make a jig that will hold the dowel square to the table saw. I used a T-shaped jig for this. Next, glue up blanks for the bottom end rails and rabbet as shown in the PullOut Plans, again using the table saw. Then check the fit of the dowel with the upper end rail and do any necessary fitting with a rabbet plane.

**STEP 3 Cut the Legs** • Transfer the shape of the legs from the PullOut Plans to your lumber. Then lay out and cut the  $\frac{1}{2}$ " x 3" mortises for the front and back rails before you cut the legs out on the band saw. Band saw the legs and sand them. Then cut the  $1\frac{1}{2}$ " tenons to fit the mortises on the rails. (For my mattress, the finished distance between the vertical parts of the legs was 75".)

**STEP 4 Make the End Panels** • Cut the dowels, upper and lower end stretchers and panels to length. Next, biscuit join and glue the upper stretcher to the end panel, and

screw and glue the lower stretcher to the end panel. This creates the end panel assembly. Be sure everything is flush across the assemblies. Clamping the ends can be tricky, so see the tip in the photo above for details on how I clamped mine.

**STEP 5 Assemble the Ends** • To attach the legs to the end assembly, lay out four holes for dowels (I used dowel centers and a doweling jig for this). One dowel goes at the bottom where the tenon will go into the leg, and three are at the top—one in the upper rail and two in the arm dowel. Use three biscuit joints in the flat panel (see issue #96's article on the "Greene and Greene Garden Bench" for details on biscuit joining non-flush panels).

After the dowels are drilled and biscuit joints are cut, glue the end panel assembly to the legs, then clean up the glue and sand the assemblies.

**STEP 6 Glue the Frame** • Glue the base frame assembly together using the front and back rails and the two ends. I used a band clamp around the bottom to hold the four pieces together while the glue cured.

**STEP 7 Make the Seat and Back** • Cut out the seat and back according to the Schedule of Materials. You need to





## 6 CLAMP THE FRAME •

After you sand the end panel assembly and the front and back rails, glue them together into the base frame assembly with a band clamp.



**8 ATTACH THE BACK •** After making your camelback wood assembly, attach it with glue to the seat back, then screw the camelback to the trim. Note the way the seat and camelback overlap to provide extra strength.



**7 AIR OUT THE BACK •** To rout the slots in the seat and back, use a plunge router and straight edge. Start the slots 4" in on both sides and leave a 3" solid strip down the middle. The slots are 1/2" wide and 3" apart.



**9 ADD THE HARDWARE •** When the hardware is ready to be attached to the seat and back, lay the seat and back face-down and follow the instructions provided with the hardware. Bolt the 1 1/2" angle iron to the rear part of the seat and the bottom part of the back for support.

cut ventilation holes in these pieces to allow your futon to breathe — you don't want a rotting bed. Lay out and cut 1/2" slots on 3" centers across the length of the seat and back according to the diagram. I used a plunge router with a straight bit to make the ventilation holes. Clamp a straight piece of scrap to your work to guide your router.

Next, clip the corners of the seat at a 45-degree angle, 1 1/2" in from the corner, in order to attach the corner blocks as shown in the diagram. After clipping the corners, cut the seat's edge trim parts to size according to the Schedule of Materials. Make a 1/2" x 3/4" rabbet cut into the edge trim and attach the trim to the seat as shown in the diagram. Lay out the cuts for the corner blocks of the seat and cut them using a 2" radius.

**STEP 8 Make the Camelback •** To make the camelback, glue the wood for the camelback front to the 3/4"-thick build-up strip that goes behind it. Finish sand and break all edges on the seat, back and bench frame assembly. Then attach the camelback to the top of the back. Make a full-size pattern to lay on the top edge of the back. Next cut the profile on the camelback.

Now attach the side pieces of cherry for the back. Glue together the two 3/4" pieces for the sides and after the glue is dry, cut the pattern for the sides using a band saw. Glue and clamp the sides and the 3/4" x 1/2" rabbeted trim to the back.

**STEP 9 Assemble the Frame •** To attach the hardware, lay the seat and the back face-down on a flat surface edge to edge. Attach the futon hardware to the seat and back according to the instructions provided. Also at this time, bolt the 1 1/2" angle iron to the seat and back for needed support.

Lay the flat seat assembly into the frame making sure the seat faces toward the front. Make sure the seat and back overhang beyond the rails is equal. Then check for fit and temporarily attach the futon hardware to the base frame.

Lay your mattress into the seat and make sure it works in both the sitting and reclined positions (my seat and back were a little large so I ended up cutting an inch off the butt-edge of the seat and back). If everything is OK, remove the mattress, take out the seat assembly and remove the hardware. Finish sand everything.

For the stain, I used a combination of two stains to get a nice warm cherry stain — Olympic Interior oil-based wood stains in Red Oak (#41567) and Early American (#41552), with the Red Oak stain going on first. Then apply three coats of clear finish.

Re-assemble the seat and back to the hardware and then to the bed frame. Next — it's nap time! **PW**

—Jim Stuard, PW staff



# WOODWORKING BY MAIL

## *Ten steps to becoming a mail-order maven.*

**M**Y NAME IS DAVID THIEL, and I have a problem. I can't walk into a hardware store and buy just one item. It's physically impossible. I have to walk up and down each aisle to see what's new, or wait for some item to jump off the shelf into my hands. After all, if I'm writing a check for \$5, it might as well be for \$25. I'm addicted. However, there is one solution that satisfies my need without running up the total: catalogs!

I get lots of catalogs, and I spend hours going through every page, comparing prices and discovering clever new tools or accessories — and it's free as long as I don't pick up the phone.

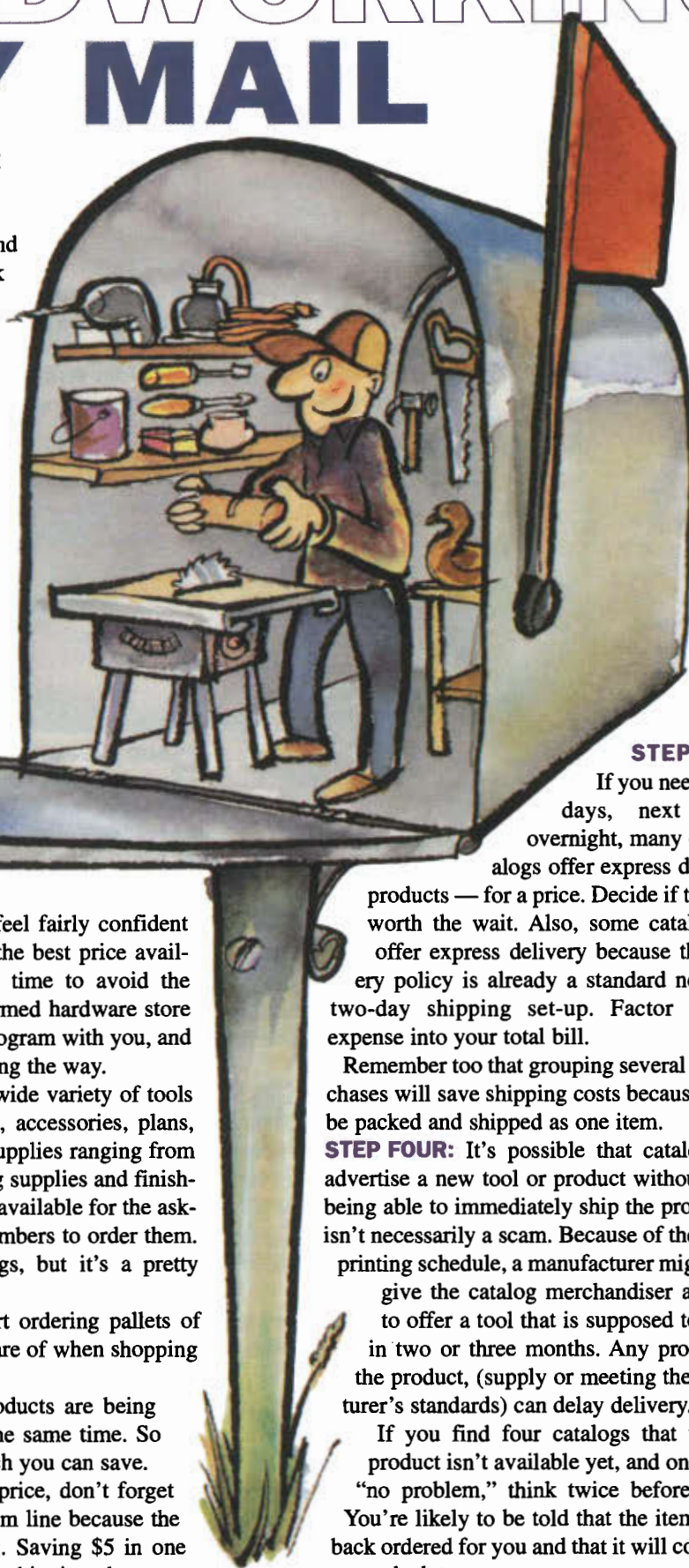
When I do pick up the phone, I feel fairly confident that I've shopped around and found the best price available for my tool fix. I've also had time to avoid the impulse shopping urge. So, as a reformed hardware store junkie, I'd like to share my 10-step program with you, and maybe save a couple of marriages along the way.

I've listed 57 catalogs offering a wide variety of tools (from stationary tools to hand tools), accessories, plans, books and lots of shop and projects supplies ranging from wood and veneer to hardware, sanding supplies and finishing supplies. Most of the catalogs are available for the asking, and I've supplied the toll-free numbers to order them. This isn't a complete list of catalogs, but it's a pretty exhaustive selection.

Now before you go nuts and start ordering pallets of tools, here are my 10 things to be aware of when shopping by mail.

**STEP ONE:** Frequently the same products are being offered by a number of catalogs at the same time. So shop the price around to see how much you can save.

**STEP TWO:** While you're shopping price, don't forget to add shipping charges to your bottom line because the charges vary from catalog to catalog. Saving \$5 in one catalog can quickly be offset by a \$10 shipping charge.



### **STEP THREE:**

If you need it in two days, next day or overnight, many of the catalogs offer express delivery on products — for a price. Decide if the price is worth the wait. Also, some catalogs don't offer express delivery because their delivery policy is already a standard next-day or two-day shipping set-up. Factor that non-expense into your total bill.

Remember too that grouping several small purchases will save shipping costs because they can be packed and shipped as one item.

**STEP FOUR:** It's possible that catalogs might advertise a new tool or product without actually being able to immediately ship the product. This isn't necessarily a scam. Because of the catalog's printing schedule, a manufacturer might have to give the catalog merchandiser a go-ahead to offer a tool that is supposed to be ready in two or three months. Any problem with the product, (supply or meeting the manufacturer's standards) can delay delivery.

If you find four catalogs that tell you a product isn't available yet, and one that says "no problem," think twice before ordering. You're likely to be told that the item has been back ordered for you and that it will come weeks or months later.



**STEP FIVE:** Check the return policy. They're all over the place. Many include a limited amount of time to return merchandise; some include an immediate restocking fee or one that kicks in after a certain amount of time.

**STEP SIX:** If you're purchasing large items (such as a table saw) there are delivery concerns beyond shipping charges. The delivery carrier (usually a trucking line) has to have someone to accept delivery. Someone needs to be home. Also, that truck driver may or may not have a lift gate on the back of his truck. If you don't have a loading dock and he doesn't have a gate, there's some heavy lifting to do. And that's not all. The driver might help you get the machinery off his truck, but if it's going in the basement, or in any other awkward space, you're likely on your own. Ask questions when you order to avoid surprises so that you understand your responsibilities for receiving a shipment.

**STEP SEVEN:** If you have a question, ask. Most of the catalog companies' phone representatives are informed about the products in their catalogs. They might not be able to offer recommendations, but it's not a stupid question until it's unasked.

**STEP EIGHT:** Catalogs accept a wide variety of payment plans, and credit card confidentiality is respected. Many companies will provide an order acknowledgement number, and while there's unlikely to be a problem, it's best to note the number just in case.

**STEP NINE:** If you're ordering by phone, take the time to write your order down, including the item order numbers, prices, the catalog issue it appears in and page number. If there are any ID numbers on the catalog, write them down as well. This will make everyone's life easier.

**STEP TEN:** Don't think that impulse buying is a thing of the past. Total your order before you make the phone call. If the total scares you, take off that last item that you added because it looked fun. Catalog shopping can be great fun and can save you time and money. Enjoy! **PW**

— David Thiel, PW staff

## Key



Wooden components



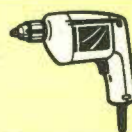
Hardware



Wood & veneer



Hand tools



Power or bench tools



Finishing supplies



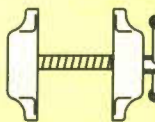
Bits & blades



Stationary tools



Books & plans



Jigs & fixtures



Abrasive products



Turning accessories



Fasteners



Measuring tools

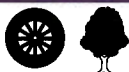


Gear, clothing & accessories

C = Check  
MO = Money order  
MC = Mastercard  
D = Discover

COD = Cash on delivery  
AX = American Express  
V = Visa  
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full refund)

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10913 E St., Omaha, NE 68137  
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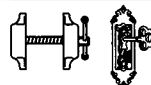
### BALL & BALL HARDWARE



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C, MO, MC, V, D, AX (\$4.75 to \$23.25\*,  
return for full credit within three weeks, 21-  
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**800-541-5537 West of Mississippi**  
P.O. Box 2069, Bellingham, WA 98227  
MC, V, D, C.O.D. (\$4.95 to \$10.95\*, 30-day money-back guarantee, 60-day for exchange, one-year warranty on all products)

**HARBOR FREIGHT TOOLS****800-423-2567**

3491 Mission Oaks Blvd., Camarillo, CA 93010  
C, MO, MC, V, D, AX (\$3.45 to 6.75\*, free over \$50, 30-day money-back guarantee)

**HARRIS TOOLS****800-449-7747**

145 Sherman Ave., #1R, Jersey City, NJ 07307  
C, MO, MC, V, D (\$3 to \$9\*, 90-day money-back guarantee)

**HARTVILLE TOOL****800-345-2396**

13163 Market Ave. North, Hartville, OH 44632  
C, MC, V, D, AX (\$4.95 to 9.95\*, free over \$500, exchange or full credit at any time, for any reason)

**HIGHLAND HARDWARE****800-241-6748**

1045 N. Highland Ave., Atlanta, GA 30306  
C, MO, MC, V, D, AX (\$3.95 to \$8.50, 30-day money-back guarantee)

**HORTON BRASSES INC.****860-635-4400**

Nooks Hill Road, Cromwell, CT 06416  
C, MO, C.O.D., MC, V (\$4.50 to \$8, 30-day money-back guarantee)  
*Horton carries reproduction hardware*

**INTERNATIONAL TOOL CORP.****800-338-3384**

2590 Dovie Road, Dovie, FL 33317  
C, MO, MC, V, D, AX. (Free on most shipments, 30-day money-back guarantee, with restocking fee)

**THE JAPAN WOODWORKER****800-537-7820**

1731 Clement Ave., Alameda, CA 94501  
C, MO, MC, V, D (\$3.75\*, free over \$150, open return)

**JESADA (FORMERLY CMT TOOLS)****800-531-5559**

310 Mears Blvd., Oldsmar, FL 34677  
C, MO, MC, V, D (\$5 for orders under \$200, free if over \$200, lifetime guarantee prior to resharpening, return for replacement or credit)

**KLINGSPOR'S SANDING CATALOG****800-228-0000**

P.O. Box 3737, Hickory, NC 28603  
C, MO, MC, V, D, AX (\$4.50\*, 100% guarantee)

**KLOCKIT****800-556-2548**

P.O. Box 636, Lake Geneva, WI 53147  
C, MO, MC, V, D, C.O.D. (\$3.55 to \$39.95, full refund or exchange within 90 days, after 90 days a 20% restocking fee will be charged)  
*Klockit specializes in clock parts and kits.*

**LEE VALLEY TOOLS****800-871-8158**

P. O. Box 1780, Ogdensburg, NY 13669-0490  
C, MO, MC, V (\$4 to \$9\*, full refund or exchange within 90 days)

**LEICHTUNG****800-321-6840**

1125 Jay Lane, Graham, NC 27253  
C, MO, MC, V, D (\$4.95 to \$7.95\*, full refund or exchange at any time)

**LIE-NIELSON****800-327-2520**

P.O. Box 9, Warren, ME 04864  
C, MO, MC, V, AX (\$6 per tool, 30-day money-back guarantee)

**MLCS****800-533-9298**

P.O. Box 4053, Rydal, PA 19046  
C, MO, MC, V, D, AX, C.O.D. (Free within contiguous US on most items\*, 90-day warranty)

**MANNY'S****800-243-0713**

555 S. Broadway, Lexington, KY 40508  
C, MO, MC, V, D, AX (\$4 to \$8)



**MCFEELEY'S****800-443-7937**

1620 Wythe Road., Lynchburg, VA 24506  
C, MO, MC, V, D, C.O.D. (\$4.50 to \$8.50,  
full refund or exchange at any time)

**MIDWEST DOWEL WORKS****800-555-0133**

4631 Hutchinson Road, Cincinnati, OH 45248  
C, MO, MC, V, C.O.D. (\$3 for orders under \$25,  
COD add \$4.75, 30-day money-back guarantee)

**PACKARD WOODWORKS****800-683-8876**

101 Miller Road, Tryon, NC 28782  
C, MO, MC, V, D (\$4.50 to \$7.50\*, 30-day  
money-back guarantee)

**PAXTON HARDWARE****800-241-9741**

P. O. Box 256, Upper Falls, MD 21156  
C, MO, C.O.D., V, MC (\$4.50-\$6.50, 30-day  
money-back guarantee)

**PENN STATE****800-377-7297**

2850 Comly Road, Philadelphia, PA 19154  
C, MC, V, D, AX, C.O.D. (\$4.95 minimum  
charge\*, replace or refund within 30 days)

**RED HILL CORP.****800-822-4003**

P.O. Box 4234, Gettysburg, PA 17325  
C, MO, MC, V (\$4.75)

**STONE MOUNTAIN****(888) 356-2700**

1016 Windward Ridge Pkwy, Alpharetta, GA 30202  
C, MO, MC, V (\$4.95 to \$8.95, free over  
\$200, replace or refund within 30 days)

**TOOL CRIB OF THE NORTH****800-358-3096**

P.O. Box 14040, Grand Forks, ND 58208-4040  
C, MO, MC, V, D (\$5 to \$8\*, return item  
unused, restocking charge)

**TRADESMAN****800-243-5114**

3 Craftsman Road, East Windsor, CT 06088  
C, MO, C.O.D., MC, V (call for shipping rates,  
30-day money-back guarantee, five-year warranty  
on machines, two-year warranty on motors)

**TRENDLINES****800-767-9999**

135 American Legion Highway, Revere, MA 02151  
C, MO, MC, V, D, WU (\$6.50 to \$9.95\*, 30-  
day money-back guarantee)

**TOOLS ON SALE****800-328-0457**

216 West 7th St., St. Paul, MN 55102  
C, MO, MC, V, D (Free within continental  
U.S.\*, returns accepted with pre-paid freight)

**VAN DYKE'S RESTORER****800-843-3320**

P.O. Box 278, Woonsocket, SD 57385  
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money-back guarantee, 10% restocking fee)

**WALNUT CREEK WOODWORKING****800-942-0553**

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C, MO, MC, V, C.O.D. (\$3.50\*, full refund,  
replacement or exchange for any reason)

**WILDWOOD DESIGN INC.****800-470-9090**

P.O. Box 676, Richland Center, WI 53581  
C, MO, MC, V, D (\$3.25 to \$4.50\*, 30-day  
money-back guarantee for unused merchandise)

**WILKE MACHINERY****800-235-2100**

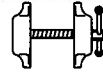
3230 Susquehanna Trail, York, PA 17402  
C, MO, MC, V, D, C.O.D. (Contact for prices,  
30-day money-back guarantee, 90-day warranty)

**WOOD CARVERS SUPPLY INC.****800-284-6229**

P.O. Box 7500, Englewood, FL 34295-7500  
C, MO, MC, V, D, AX (\$4.50\*, 30-day  
money-back guarantee)

**WOODCRAFT SUPPLY****800-225-1153**

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Parkersburg, WV 26102-1686  
C, MO, MC, V, D, O, AX, C.O.D. & Woodcraft  
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**WOODHAVEN****800-344-6657**

501 W. 1st Ave., Durant, IA 52747  
C, MO, MC, V, D (\$6 - \$10\*, 30-day money-back  
guarantee, material defects covered for one year)

**WOODSMITH SHOP****800-444-7002**

P.O. Box 842, Des Moines, IA 50304-9661  
C, MO, MC, V, D (\$4.95 to \$8.55\*, 100%  
refund, no questions asked)

**THE WOODTURNER'S CATALOG****(801) 373-0917**

1287 E. 1120 South, Provo, UT 84606  
C, MO, MC, V, D (\$4 to \$7\*, 30-day money-  
back guarantee)

**WOODWORKER'S BOOK CLUB****800-937-0963**

1507 Dana Ave., Cincinnati, OH 45207  
C, MO, MC, V (free with pre-paid order, 15-  
day full refund)

**WOODWORKER'S HARDWARE****800-383-0130**

P.O. Box 180, Sank Rapids, MN 56379  
C, MO, MC, V, D (\$4.75 to \$8.90\*)

**THE WOODWORKER'S STORE****800-279-4441**

4365 Willow Drive, Medina, MN 55340  
C, MO, MC, V, D, AX (\$4.99 to \$9.99\*, 45-  
day full refund)

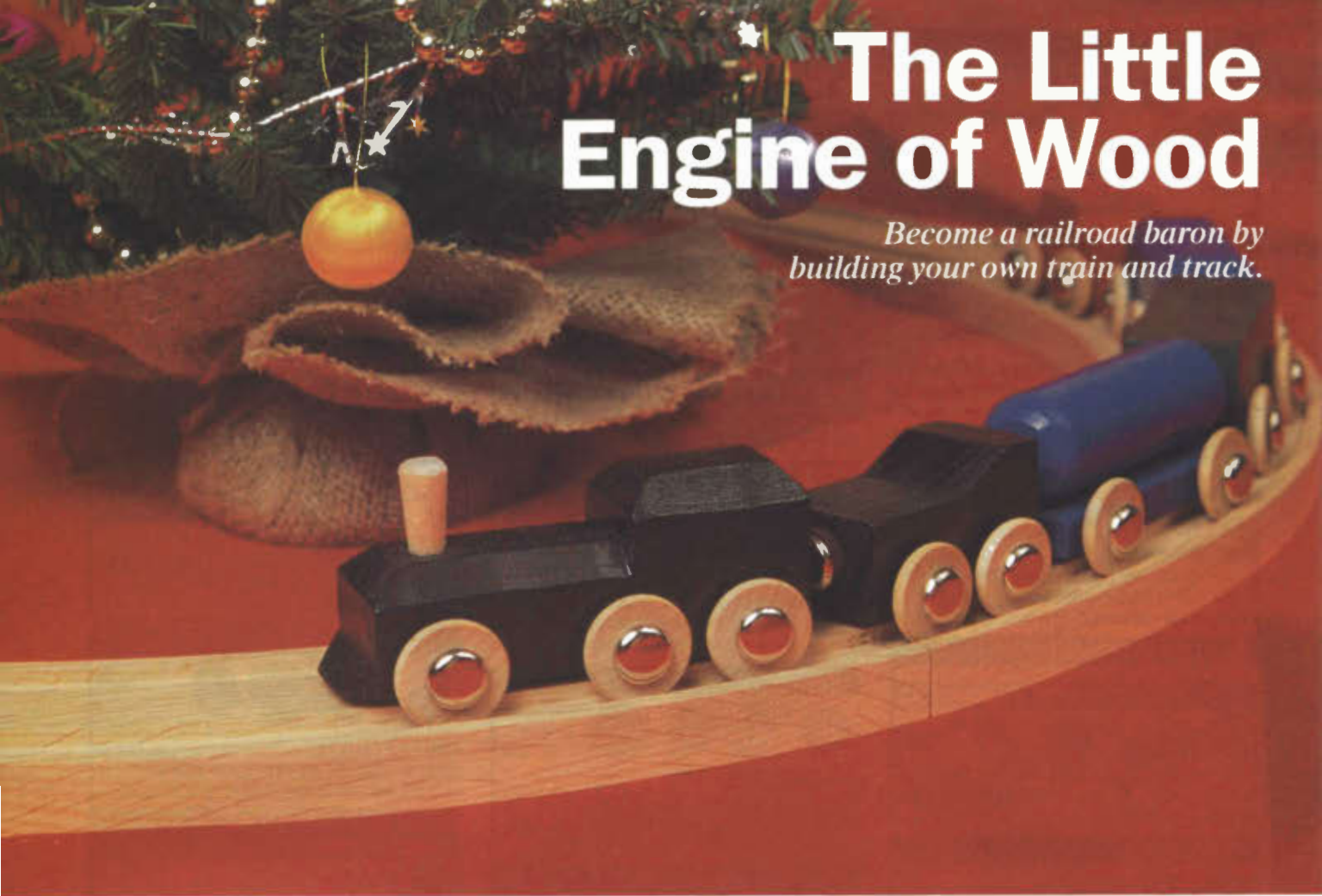
**WOODWORKER'S SUPPLY****800-645-9292**

1125 Jay Lane, Graham, NC 27253  
(Plus other retail outlets)  
C, MO, MC, V, D (\$1 to \$10.50, free over \$500,  
full refunds for everything except machinery,  
which is covered by manufacturer) **PW**



# The Little Engine of Wood

*Become a railroad baron by building your own train and track.*



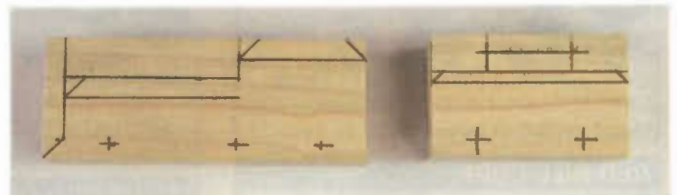
**W**HEN IT comes to Christmas presents, it doesn't get more traditional than the toy train. They come in all sizes and styles, but the one I remember best was the one that made me use my imagination — the basic wooden train.

I happened to be in a toy store the other day (I'm just a big kid at heart) and saw some of the popular Swedish wooden trains. After some smelling salts and a couple hard thumps on the chest I fled the store. The train engines and cars cost between \$10 and \$40 dollars! Each! The track isn't far behind at about \$12 for four pieces.

Nothing a woodworker likes more than building something for a lot less than you can buy it for. I accepted the challenge, and I'm quite pleased with the results.

**STEP 1 Design Your Train** • I came up with designs for six train cars, most of which are painfully simple. The coal car has a simple curve cut on the top edge and the passenger car has a chamfered roof detail. The tank car is a dowel with the ends rounded and nailed to a base. The details on the engine and the caboose are given in the diagrams. Transfer those details to the roughed-out blocks for each car and then head for the scroll saw.

**STEP 2 Cut the Sides** • Start by cutting the side details first. Again, the detailing is pretty simple in this design, so you may want to jazz it up a little.



**1 FOLLOW THE LINES** • Each car's shape is first marked on the side. This includes locations for the wheels as well. Don't bother marking the end view yet as your lines would just be cut away.



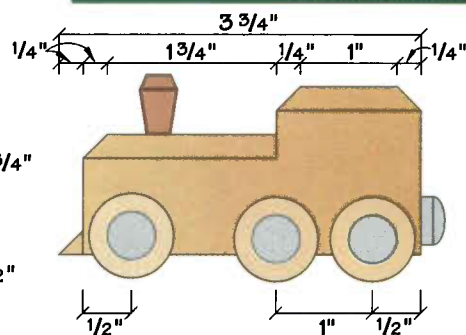
**2 CUT YOUR CARS** • The scroll saw works well for cutting these small pieces. While a band saw or hand saw would work, the band saw is riskier and cutting small pieces by hand is awkward.



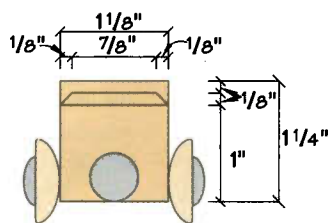
**Toy safety is not child's play. Many paints and finishes are toxic, and while that's usually only a concern during application on most projects, children's toys end up in mouths. So read the label carefully, and if you're still unsure, call the manufacturer.**

Another safety factor concerns small pieces on toys. The ring-shank, or threaded, nails listed in the source list are designed to not pull out, or work their way out of a toy. If you choose a different type of wheel and fastener, it is your responsibility to make sure small hands won't pull the pieces off and put them in small mouths. Also, the magnets in the track and the smoke stack on the engine should be attached with an epoxy to help ensure a no-fall bond.

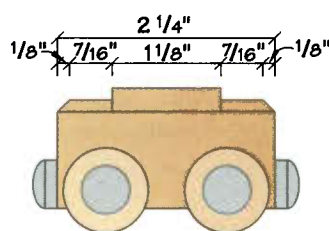
## Diagrams



## Profile



### Elevation of caboose



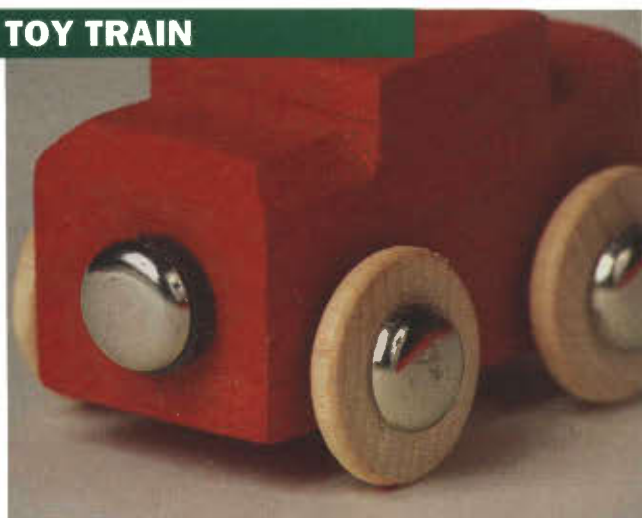
## Profile

### Schedule of Materials: Toy Train

No.	Item	Dimensions T W L	Material
1	Engine	1 $\frac{1}{8}$ " x 1 $\frac{3}{4}$ " x 3 $\frac{3}{4}$ "	Poplar
1	Coal car	1 $\frac{1}{8}$ " x 1 $\frac{1}{4}$ " x 2"	Poplar
1	Tank car base	1 $\frac{1}{8}$ " x $\frac{3}{8}$ " x 3"	Poplar
1	Tank	1" x 3" Dowel	Poplar
2	Passenger/freight car	1 $\frac{1}{8}$ " x 1 $\frac{1}{4}$ " x 3"	Poplar
1	Caboose	1 $\frac{1}{8}$ " x 1 $\frac{1}{4}$ " x 2 $\frac{1}{4}$ "	Poplar

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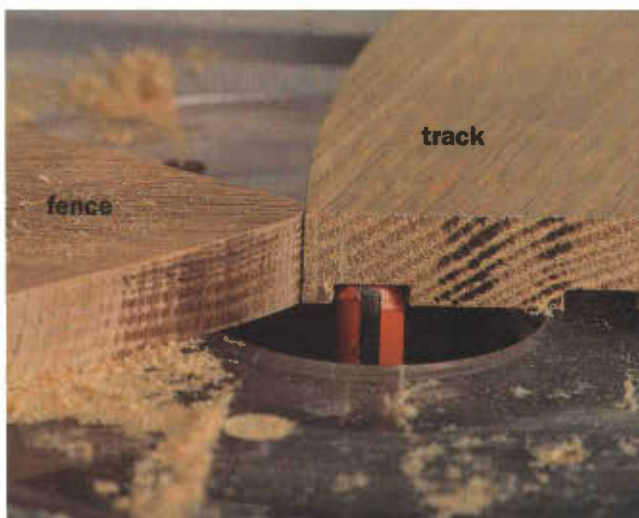
**4 PERMANENT WHEELS** • The wheels and magnets are purchased from catalogs and attached using threaded nails. The threading (or ring shank) makes it nearly impossible to remove the nail without tearing up the wood. Definitely kid-proof.

**STEP 4 Wheels and Paint** • Go ahead and pilot drill the locations of the wheels and magnet nails at this time. Then paint the cars. If small mouths might come in contact with the cars, use a child-safe paint. This is another great opportunity to customize your train. You might want to go as far as painting on windows and car numbers. After the paint is dry, drive the nails into the cars using a soft-faced mallet or a hammer covered with a piece of cloth.

**STEP 5 Make Tracks** • The track shown is a huge simplification over the store-bought version. To begin with, use the pattern in the PullOut™ Plans for the radius pieces and mill the basic shapes. Then set up your router table with a 1/2" straight router bit set for a 1/8" deep cut. Next cut a guide from a piece of scrap, rounding a point on one end. Clamp it to the router table leaving a 3/16" space between the guide and the router bit. Both the radius and straight tracks can be run on both sides, inside and out, without moving the guide. It's a variation on a pin router—without spending the money on an extra machine.

**STEP 6 Sticky Track** • The last step is making the track stay together. Rare earth magnets are amazingly small and strong and can be ordered from the catalog at right. I found the holding power to be equal to the task of holding the track together. Make sure the recessed hole is drilled dead center on each track because the magnets align with one another very accurately and if the holes aren't centered the tracks won't align exactly. Also, make sure you orient the magnetic fields accurately before gluing the magnets in place with epoxy! Put north-aligned magnets on one end of the track and south-aligned magnets on the other. You'll quickly find out why this is critical. Try to pair two north-sided magnets together and you'll see something that looks like the train wreck from the movie "The Fugitive." **PW**

—David Thiel, PW staff



**5 ROUT THE TRACK** • The 1/2" track slots are cut on a router table using a indexing fence rounded to a point for pivoting the work. This keeps the distance to the bit accurate without having to make a fence to match the shape of the track.



**6 EARTHLY SOLUTION** • Rare earth magnets serve to join the tracks together. The holding strength is amazing. A 1/2" Forstner bit is used to recess the magnet into the end of the track and then it is glued in place.

## Sources of Supply

While you can find magnets and wheels at many craft stores, these are the wheels we used for these trains and definitely work with this track.

### The Cherry Tree catalog

(800) 848-4363

- Wheels (#403, \$.15 each)
- Magnets (#430, \$.20 each)
- Nails (#410, \$.15 each)

### Lee Valley Tools catalog

(800) 871-8158

- Rare earth magnets (#99K31.01, \$.48 for 10 or more)





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# The **TEN** COMMANDMENTS

*Ever wonder how to improve your finishes short of selling your soul to the devil? Read on. A little faith and knowledge will have your projects feeling like a baby's back side.*

**A**DMIT IT. There's a bogeyman in your shop, and he lives in the cupboard where your stains, finishes and brushes are stored. And near the end of every project when you open that cupboard door, that d\*\*n bogeyman gets out, the dread sets in and you feel that all your good work up to this point is suddenly in jeopardy. At this last stage, your project seems out of control and vulnerable now that there's the most at stake. Hey, it can spook ya!

Some of you might not find finishing quite so loathsome. Good for you. (Unless you are one of those "oil" finishers who hides behind the little lie of, "Oil really brings out the natural beauty of the grain," which really means, "Oil is easy, and unlike most other finishes is hard to screw up, so I stick with oil, even though it offers little protection and requires a lifetime of maintenance.") Some of you might fear the bogeyman more than finishing itself. I've heard from more than one reader who was so flummoxed by finishing that good projects stayed under a blanket for over a year while the builder searched for the courage to venture into the great unknown of finishing.

Why is finishing such a big problem for so many woodworkers? There are several reasons. First, I will risk offending you and say you haven't tried very hard. Oh, you've spent hours, months, even years learning to work wood, perfect a putt, tune an engine. Yet you expect to open a can of stain, rag it on, pop open a can of clear finish, slap on a couple quick coats then wonder why it looks a little screwed up. I hope it's obvious there's more to it than that.

But it's not necessarily your fault that you believe this. After all, how many manufacturers of finish products (and how many magazine articles) have promised you "flawless finishes first time, every time?" There's a big gap between the promise and the re-

**I** Thou shalt not finish wood before it's time; for improper or inadequate sanding and preparation cheat only oneself. There are no shortcuts to the Kingdom of Heavenly Finishes.

**II** Thou shalt master at least one finishing method and find happiness at the end of every project; for those who remain in a state of ignorance shall not enter the Kingdom of Heavenly Finishes.

**III** Thou shalt buy one good brush for finishing and care and nurture it like a son; for if you do, it will serve you well even as you grow long in the beard and tooth.

**IV** Thou shalt only use polyurethane when appropriate; for it is not the beginning and the end of all finishes. Know its strengths and likewise weaknesses; then go forth and be judicious in its use.

**V** Thou shalt overcome thy fear of finishing by using a little knowledge as thy sword, and a sample board as thy shield; for with these weapons in hand you possess the password to the Kingdom of Heavenly Finishes.

ality. Unfortunately, the size of the gap often exceeds the gap in finishing know-how by the person making the claim. Remember too, that the "advice" you're getting from the sales clerk at your hardware store is probably just an opinion. He may have no more experience than you — possibly less. Heck, he probably knows more about open heart surgery because he spends an hour or two every week watching a TV medical drama.

Now, let's get the bad news out of the way. You're going to have to work at finishing. You'll have to devote some time to learn the basics. A no-brainer it isn't. But trust me, it won't be that bad, either. Like many endeavors, there are some tricks that will give you immediate, significant results. And when you're done, your family, friends and neighbors will respond to your projects with a "WOW!" instead of, "Oh, isn't that nice."

Remember, every successful project has three elements



# of Finishing

**VI** Thou shalt learn the proper technique for brushing on a finish and know that it is different from sealing a driveway or painting the bathroom.

**VII** Thou shalt always make a sample board when finishing with colors; for those who do not are the lemmings about to hurtle themselves from the mountainside.

**VIII** Thou shalt learn to sand finishes, both wet and dry; for those who do this stand before the gates of the Kingdom of Heavenly Finishes with a first class ticket in hand.

**IX** Thou shalt learn the ways of the woods one finishes; for like a good spouse, each needs special care and attention and has likes and dislikes. So go forth and learn the woods that splotch and treat them with special care; and know that those that don't splotch are the most forgiving.

**X** Thou shalt faithfully read each of the articles in this series on finishing and will renew your subscription because the series appears in more than six issues. And for you Phillistine newsstand buyer, get a two-year subscription; for with the money you save, you'll be on your way to fulfilling the Third Commandment.

of equal importance — design, construction and finish. Your project will only be as good as the weakest part of the triad. By the way, I consider the most difficult part to be design. Construction is a part we all get sooner or later and is difficult, too; while finish is actually the easiest of the three. You can improve your finishes immensely after learning a few fundamentals.

Because this series will run in more than six installments, you deserve to know something about the approach to finishing I'll take. Generally speaking, it will be a very practical approach, the same practical approach we take to building projects here at *Popular Woodworking*. Read it tonight, use it tomorrow. Get the job done. Bingo.

More specifically, there will be no long lectures on chemistry. While it's important, we'll only get involved with finish chemistry on a need-to-know basis. I don't want your eyes rolling up in your head while talking about polymers and the like. Besides, I'll admit that I haven't bothered to learn all that scientific stuff. If you are interested in a deeper understanding of the "whys" behind successful finishes, or if you want to do some independent reading and get ahead of the class, pick up Bob Flexner's "Understanding Wood Finishes" (Rodale Press). Bob has a firm grip on the subject and tells it like it is. In fact, Bob is acting as a bit of a sounding board for this series, and I'm using his book as a reference for some of that "need-to-know" stuff.

What are my finishing credentials? It should be a relief to you to know that I've spent a lot more time finishing than I have writing about it. Although I started out nearly 20 years ago as an oil finisher, I quickly put the Watco on the shelf when I entered the world of big-time custom commercial cabinet and furniture making. There I learned from Paul Antonides, who I'm sure has forgotten more about finishing than I know. Paul's first job was in the finish department at the Steinway Piano Company. He spent a lifetime in finishing and could do it all, literally.

The shops I managed required finishes of all varieties. Finishes that were equal to the fine furniture we produced. Furniture and casegoods going to the top executive offices and homes of some of this country's biggest corporations. Although of first quality, let me emphasize even these finishes were practical in approach.

The finishing techniques we'll use in future articles use the same fundamentals you need to use at home. We're not going to get into the exotics of finishing, we're just going to get the footers and foundation poured. Armed with this, you'll enjoy finishing, you'll get predictable results, you'll keep yourself out of trouble by not getting yourself into it, and ultimately, you'll take your woodworking to the next level.

The following two pages contain the syllabus for the series and will give you a peek at where we're going and even give you a handful of essential tips you can use in the shop tomorrow.

*Continued on page 74*

## Abrasives

### ECON-ABRASIVES.

Econ-Abrasives custom makes abrasive belts up to 52" wide in any size and grit. Sandpaper is our specialty; we can help you answer any questions you may have on product applications. Call now for your free catalog; it contains hundreds of abrasives and woodworking accessories, including: safety equipment, velcro®-backed discs, wood clamps, wood glue, drawer slides, hinges and much, much more!  
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offers industrial quality sanding belts, discs, rolls and sheets at wholesale prices directly to the small consumer. An extensive range of hook & loop backed abrasives are available: vacuum and solid discs, triangles for detail sanders, shop rolls for drum sanders, conversion discs and rolls. Try Supergrit Blue Zirconia discs and belts, "The Best in the World." Free 28-page catalog and incredible close-out sheets.  
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## Catalogs

### CONSTANTINE'S CATALOG FOR WOODWORKERS

The oldest-established, most comprehensive woodworker's catalog in the USA. 104 pages, more than 5,000 items, including lumber, veneers, adhesives, tools, finishes, hardware, books, plans and more, all covered by a 60-day money-back guarantee. Free when you call (800) 223-8087 and mention Dept. 38610 or  
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### WOODWORKER'S

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### DELTA INTERNATIONAL MACHINERY CORP.

manufactures woodworking machinery and accessories for home workshops, building and construction trades, industry and schools. Quality line includes table saws, miter saws, band saws, jointers, scroll saws, wood lathes,

planers, belt/disc sanders, grinders and more. For the name of your nearest Delta distributor, or to order free Delta machinery catalogs, call toll-free (800) 438-2486.  
**Circle #135 & #101.**

**MAKITA U.S.A.** is the U.S. Distributor of Makita's line of high-performance corded and cordless power tools. The company, which has nine branch offices, 50 service centers, and over 300 authorized service centers, features an extensive line of tools for both woodworking and metalworking applications. They also offer a line-up of pneumatic nailers, including brads and finishing nailers. For additional information, call (714) 522-8088 or  
**Circle #102.**

### ARROW FASTENER

**COMPANY, Inc.** is one of the oldest American hand tool manufacturers. In addition to its world famous line of all-steel staple gun tackers and staples, Arrow also produces a full line of Brute steel rule measuring tapes, rivet tools, hot melt glue guns and supplies. Arrow...the standard of excellence by which all others are judged.  
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## Miscellaneous

### MOBILE

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**RB INDUSTRIES**, woodworking tools & accessories 100% made in the USA. The new precision hawk ultra scroll saws, "4-in-1" and "3-in-1" universal wood-sander systems, 26" variable speed drum sander, 38" drum sander, the all new panelmaster II raised panel door machine, router tables, books, accessories, patterns and much more. We stand behind every piece of equipment we manufacture with our exclusive 30-day money back guarantee and 5-year warranty. Send today for your free catalog. **Circle #121.**

## Shop Accessories

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## Woods

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

## COMMANDMENT I

### FINISH NO WOOD BEFORE IT'S TIME



Here I'm removing a glue stain from a piece of walnut using water and a razor blade.

The first, and one of the most important steps in finishing, is the proper preparation of the surface to be finished. Principally, this means removing "washboard" machine marks, generally sanding the wood and removing often unseen glue smudges, which prevent the wood from accepting stain evenly and appear as unsightly blemishes. I don't think I've ever met a soul who said sanding is his favorite part of woodworking. But it's important to learn the basics of sanding: What's the best type machine to use (random orbit), what grit papers to use (usually 180 is more than adequate), etc. Should you wet the surface to raise the grain? (Sometimes.) How do you find that hidden glue smudge and how do you remove it? (Find it with a damp cloth, remove it with a straight edge razor blade.)

## COMMANDMENT II

### LEARN THE WAYS OF FINISHING



The bold, the beautiful and the blotching. Here are some of the finishing products and thinners used routinely in the *Popular Woodworking* shop. It's important to know which are compatible.

There are many different types of finish and wood-coloring materials. Whether it's dyes or stains or glazes, varnish, polyurethane, shellac, oil or lacquer; it's fundamental to know at least the basics of each, its advantages and disadvantages. Next choose the one you are really going to learn, the one you will use 90 percent of the time. Once you get good at it, understand it, know what to expect, what to do when something goes wrong, you're home free.

## COMMANDMENT VI

### KNOW HOW TO BRUSH A FINISH



Handle your finishing brush like you would the *Magna Carta*. It takes a light touch to lay down a finish without making a lot of bubbles.

Have you seen the TV commercial where a finish is being brushed on by members of the family? Oh they're having such a good time, slapping that finish on, back and forth, forth and back. I'll bet there's more brushing bubbles on that table top than there is in the head of an overprimed keg of beer. Folks, you've got to lay that finish down with a caress, a gentle touch with as little brushing as possible. You've got to stretch that finish out, thinned if need be, so that those bubbles can burst before a film forms and those little crater makers can't escape. Develop a winning brushing technique.

## COMMANDMENT VII

### MAKE A SAMPLE BOARD



Some of the sample boards we've made in the last year in our shop at *Popular Woodworking*. Working without one of these is like taking pictures with your eyes closed: You never know what you're gonna get.

It's your road map in uncharted territory. It tells you at the beginning and every step along the way the direction to the next step. Best of all, you don't have to foul all your good work on your project to find out something just went wrong with your finish.

Except for applying a clear finish, a sample board is a must when you are working with colors. OK, it might take an extra hour, but it's a small price to pay to avoid a bout of depression, and it's a heck of a lot easier than stripping finish.



**COMMANDMENT III****BUY A GOOD FINISH BRUSH**

Here's an old friend that's been with me for years. Sure, it cost a bit more, but this baby's finished more board feet of wood than I can remember.

If you are a brush finisher, you must have a good tool, period. But what constitutes an acceptable finish brush? (And it's not the price tag.) What sort of bristles do you need? (That depends on the finish you've decided to learn.) How do I care for my brush? Where do I buy one? Because I assume most of you brush on your finishes, we won't get involved with spraying. It really is the best application method, but it is impractical for most home woodworkers due to overspray problems. But if there's enough who want some tips (no pun intended) on spraying, let me know and we can put the topic on the syllabus.

**COMMANDMENT IV****THE USE AND ABUSE OF POLYURETHANE**

The successful marketing of polyurethane as a do-everything finish has imparted it with near-magical properties. It certainly has some advantages, but it also has disadvantages that make it more difficult to work with. Also, some products touted to be "poly" on the label are actually another finish with a minor amount of polyurethane added to it. You may buy it expecting the protection of polyurethane but not getting it.

Yes, it is a hard finish and provides good scratch and moisture protection. Remember though that these properties make it hard to sand and therefore difficult to make smooth. It doesn't bond well to other finishes or even itself, and it doesn't hold up well when exposed to direct sunlight.

**COMMANDMENT V****RELAX AND ENJOY**

Finishing doesn't have to be a dreaded chore. It can really be the step that brings great beauty and life to all your woodworking projects. You can do it, you just have to spend a little time and learn. Follow these tips and techniques, and you'll find it's simpler than you think. I promise you a reserved seat in the Kingdom of Heavenly Finishes if you just stay with this series. You might even learn to like it (except the sanding part).

**COMMANDMENT VIII****LEARN TO SAND YOUR FINISH**

Dry sand the first sealer coat with 360 grit lubed aluminum oxide sandpaper (left photo); then wet sand your final coat with 400 to 600 grit sandpaper (right photo). You'll be amazed at the results.

When you learn that you should sand your finishes, good things happen. How about this one: You never have to worry about finishing in a "dust free" environment again. Let all manner of goobers fall in your wet finish, and your blood pressure won't advance a notch. Dry sand between coats with 360 grit lubed paper, or wet sand your final coats with 400 to 600 grit wet/dry paper. Wet sand with mineral spirits or water with a tiny bit of dish detergent added. The liquid keeps the sandpaper from clogging up and allows it to work more efficiently. Learn these techniques, and you'll be off the porch and running with the big dogs. (You can retire your steel wool now, too! Hateful stuff that it is.)

**COMMANDMENT IX****KNOW THY WOODS**

If you know you want to stain or dye a project, choose a wood that will accept the color evenly. This alone will keep your finish frustration level in check. Of course pine blotches, as does cherry and poplar, also birch and maple, to name some of your popular, but blotching, friends. So if you use them anyway, what are your options? Gelstains can help, as can stain controllers, which are also called wood conditioners. When properly applied (no, not like the directions on the can) the stain will be accepted more evenly in the wood. Or, consider using a glaze color, which is so much more forgiving.

**COMMANDMENT X****STAY WITH THE WHOLE SERIES,  
SUBSCRIBE OR RENEW**

OK, it sounds like a big commitment, but every great journey begins with that first step. So now you know what those @#\*<^+@# cards that fall out of the magazine are for. So if you picked up this copy at the store or from a friend, send that card in today. For subscribers, when you get your renewal notice, do it right away. You don't want to miss one part of this series. After all, you can't sleep in on Sunday and expect to get into the Kingdom of Heavenly Finishes. **PW**

—Steve Shanesy, PW staff



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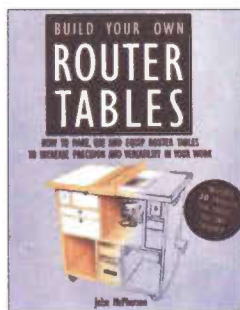
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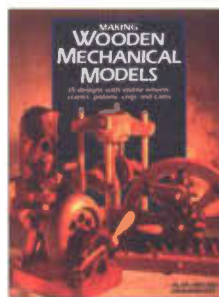
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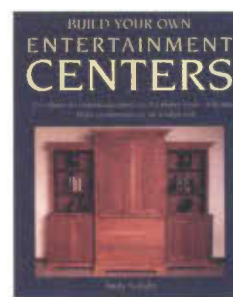
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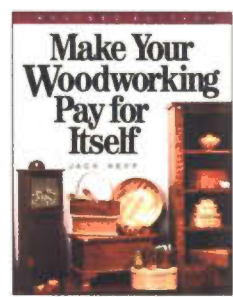
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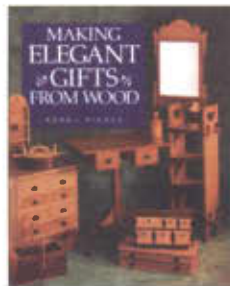
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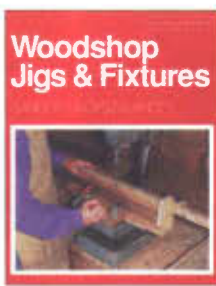
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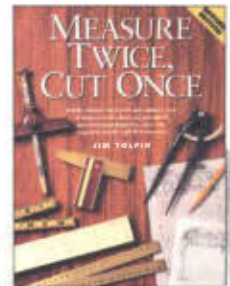
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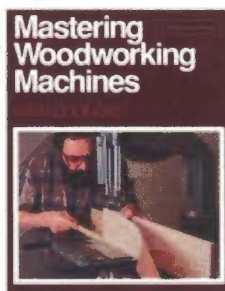
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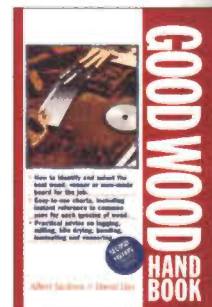


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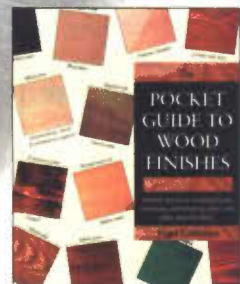


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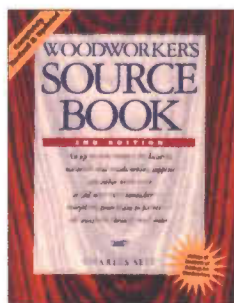
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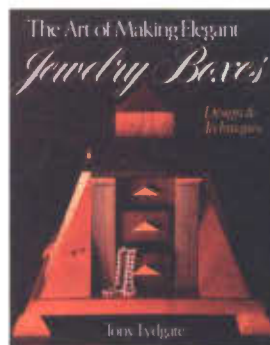
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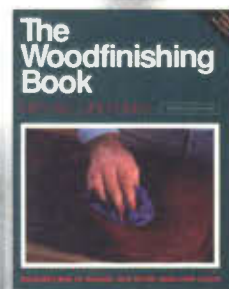
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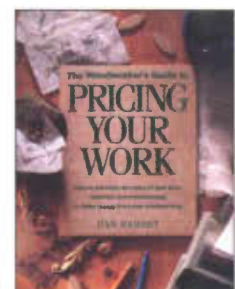
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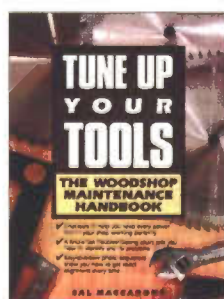
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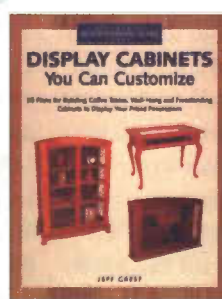
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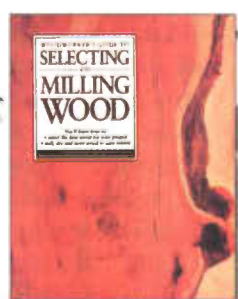
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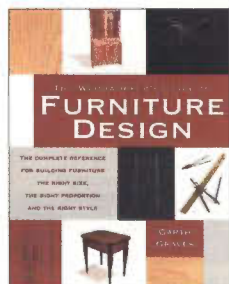
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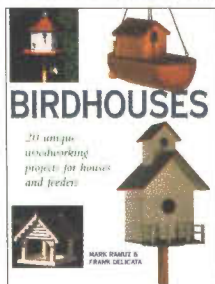
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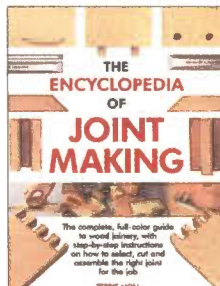
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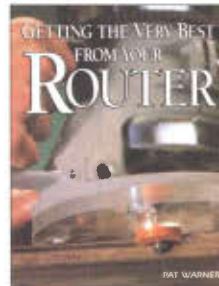
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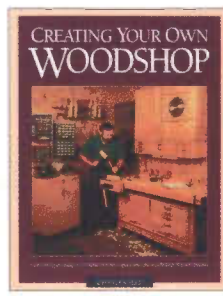
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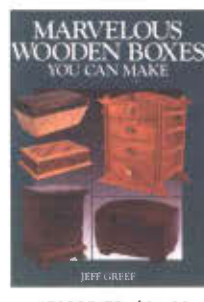
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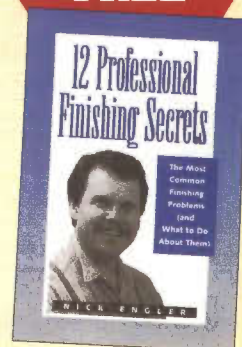


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# What Dad Left Behind

*How one man's love of wood profoundly changed his children's lives.*

**T**HE SMELL OF WOOD being cut stops me dead. If I determine it's a chain saw, I keep going. But if I hear the more refined buzz of a circular saw, or better yet a table or radial saw, I take a closer look.

My father was a cabinetmaker — at least that's what I consider him. He worked full time at a textile mill for 40 years, a child of the Depression who was reluctant to quit a steady job to pursue his real calling. But he built his own house in the early 1950s, and the radial arm saw that dominated our garage got plenty of work.

Eventually he started making furniture. In the mid-60s, when I was being toilet-trained, he made a 6"-high step stool for me to stand on so I could pee into the toilet. It was a simple piece, but a few years later it was the prototype for my very first woodworking project.

During my freshman year in high school, Dad helped my older brother start a business in our garage making butcher-block tables. I also was enlisted, using wood filler and a belt sander to transform the glue-encrusted, rough-ridged slabs into smooth surfaces. It was winter in upstate New York, and my father had installed an oil-burning furnace in the garage, which was toasty warm and mingled with the heady aroma of sawdust, glue and polyurethane.

My brother, who is still a cabinetmaker, opened a small store and sold the tables. He also carried bookcases and wall shelves, which included duplicates of the one I'd made in seventh-grade shop class. My shelves sold for \$10 apiece, and Dad showed me how to rig up a jig on the radial saw so I could cut the pieces to size and fit dados faster.

The store failed, though one handsome legacy of it lives on: a restaurant still has the butcher-block bar top and tables that came from our hands. (When I eat there, I caress the table top with my fingers and wonder, "Did I do this one?" The slight ridges in the top are still there, though imperceptible to the touch of most people, and they feel as satisfying as the fire crackling in the restaurant's fireplace.) Those "imperfections" are important to me. Once, when I was making a stereo cabinet, I found that I'd made the top shelf a hair too narrow for my turntable. I got mad. But Dad showed me how to fix it and told me this: Every imperfection in a piece of handmade work is your signature.

To this day, I think of that creed when I'm polishing my writing. That doesn't mean I don't edit my work. I just know the purpose of the endeavor and its limitations—I stop before the grains of emotional energy that come from a human heart and hand begin to get sanded away.



The butcher-block coffee table I built after my father died.

Photo: Karen Plude

Now my house is populated with handmade furniture. In my office are three pine bookcases I built. An open dictionary sits on top of my former stereo cabinet. In the bedroom is a nightstand my father helped me make for my girlfriend (now my wife). And there's a butcher-block cabinet in the kitchen my father built for me to take to college. It has a cherry cutting board that pulls out above a small drawer, and a door that opens underneath with a shelf inside. My favorite piece, however, sits in the living room: a butcher-block coffee table that I built right after my father died in 1983, when I was 21. (It was the ultimate test: Dad wouldn't be there to tell me how to start it or how to fix it if I screwed it up.)

Before he died he'd bought a pallet of small pentagon-shaped pieces of maple from a manufacturer of hand saw handles. I cut the pieces into one-inch strips, just like I'd seen my father do, and glued them end-to-end and side-to-side on the garage floor. Then I nailed two long wooden strips on each side of the assemblage and drove wedges between the strips and the glued-up pieces until the setup was snug but not too tight. A day later I hammered out the wedges, pulled up the strips and took the slab to a sawmill to be planed. I cut two identical pieces for the top, glued them together to make it 1½" thick, and sawed square notches out of each corner. I cut four legs from the remaining stock and doweled them into the notches. I stained the coffee table dark brown and brushed on several coats of polyurethane.

So my father and his love of wood are all around me — and around him, too. When I went with my mother to pick out his casket, I saw one that was different from all the rest: it was chestnut-colored and made of maple. It reminded me of his work and what he really was. He lies buried in it today. I only wish I would have made it. **PW**

*Jeff Plude, a writer in Clifton Park, N.Y., is planning to build a bookcase he hopes will some day hold the novel he's writing.*



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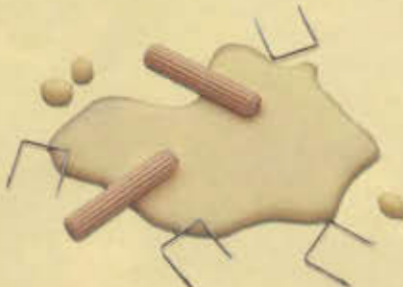
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