



WOODWORKER'S JOURNAL

August 2000
Volume 24, Number 4



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plane truth



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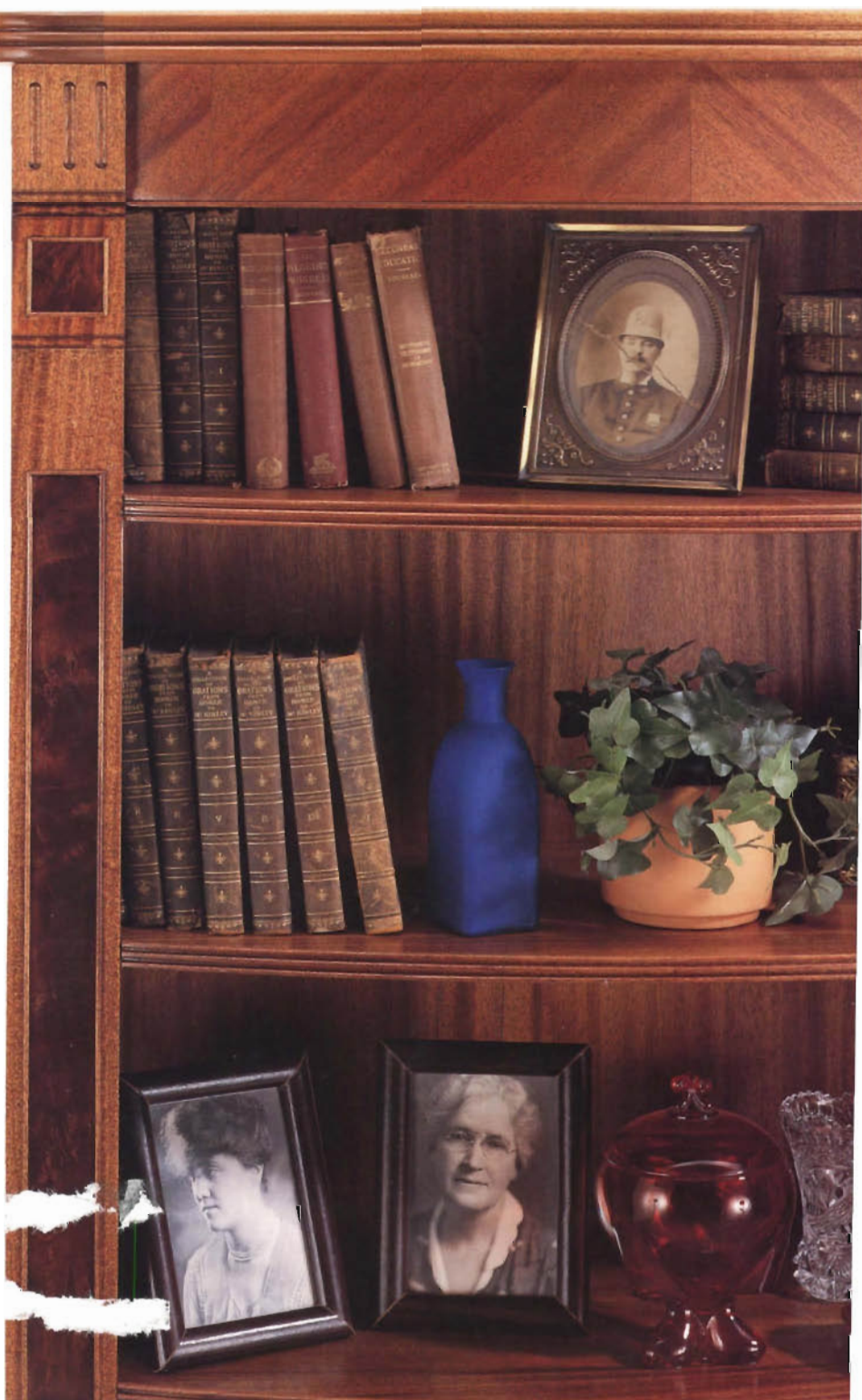
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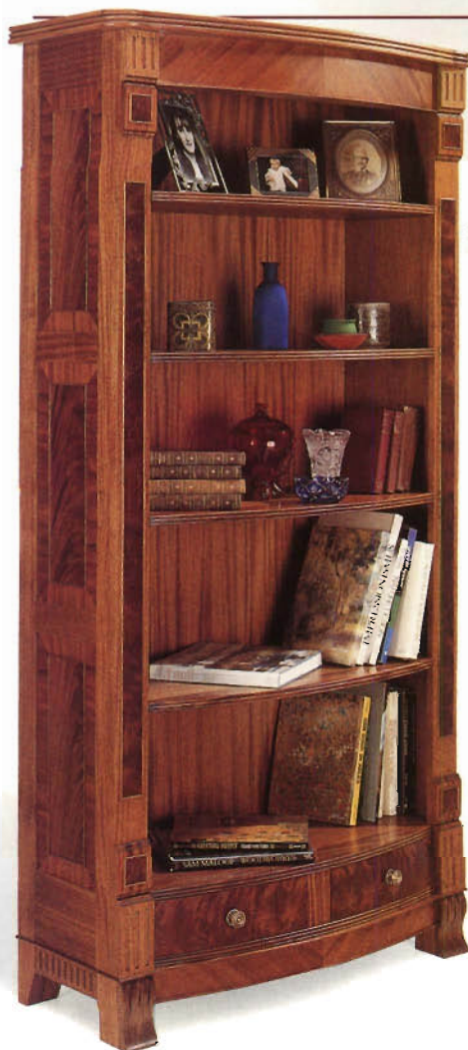
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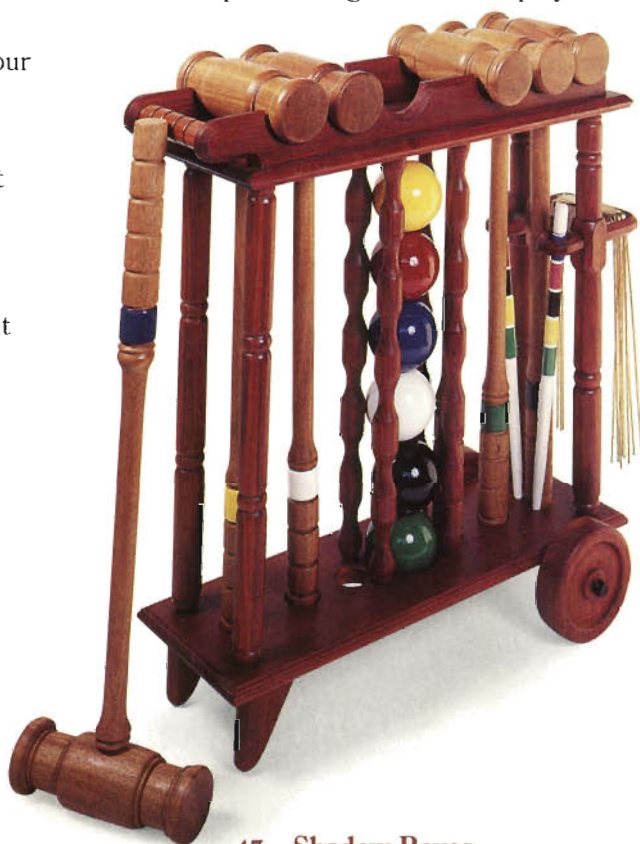


- 30 Heirloom Bookcase**
By Rick White
A real woodworking workout, presented by our own in-house master woodworker. The end result is a piece of furniture the grandchildren will still be bragging about in 50 years.

Projects

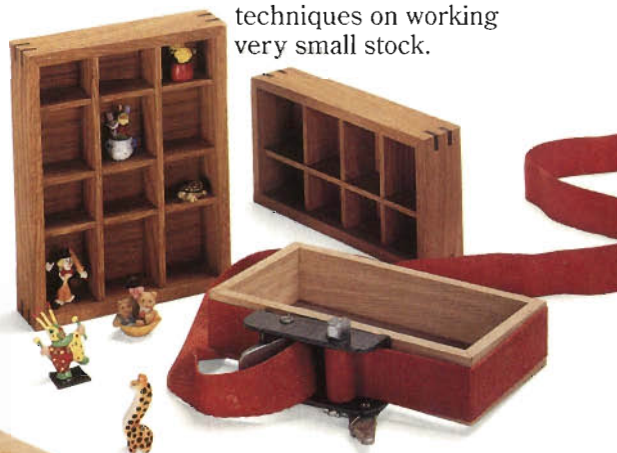
- 52 Croquet Set**
By Ron Hampton

Practice your technique — at the lathe and on the lawn — with this turned croquet set. A great summer project!



- 47 Shadow Boxes**
By John English

An easy project to bring order to tiny collectibles. Solid techniques on working very small stock.



- 24 Planecraft**
By Ian Kirby

Learn all about the hand plane: the original multi-tool.

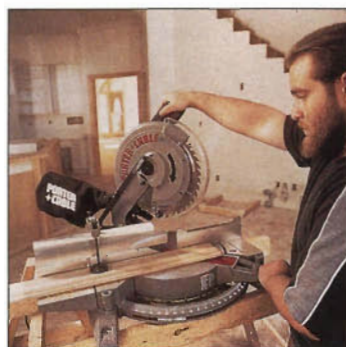


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Butt hinges, the perfect layout tool for getting around woodworking corners! (see page 13)



Dog Days of Woodworking

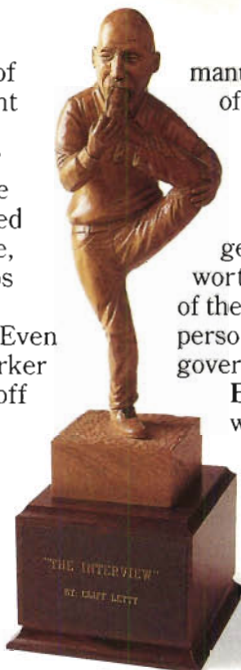
Ah, summer. The hum of the table saw in the night air wait, was that a swarm of mosquitoes? And the always welcome smell of freshly machined sawdust ... wait a minute, those are mesquite chips under the grill.

Ok, ok, I understand. Even the most jaded woodworker has to take a little time off during the summer months to recharge those batteries. Yes, it's summertime again, when nearly everyone goes on vacation and thoughts of the shop get left behind for short spans of time. But just because you're not in the shop doesn't mean woodworking can't go with you. Pack a few back issues of Woodworker's Journal in that suitcase or backpack — you're liable to learn a thing or two during your down time!

For our part, Editor Rob Johnstone and I will be spending part of our summer vacations this year on the woodworking show circuit: from Chicago to Atlanta, we'll be checking out the newest in tools to bring to you in future issues. Rob's also planning a road trip this summer to visit your favorite tool

manufacturers. We'll run a version of his excellent adventure, complete with pictures, in an upcoming issue.

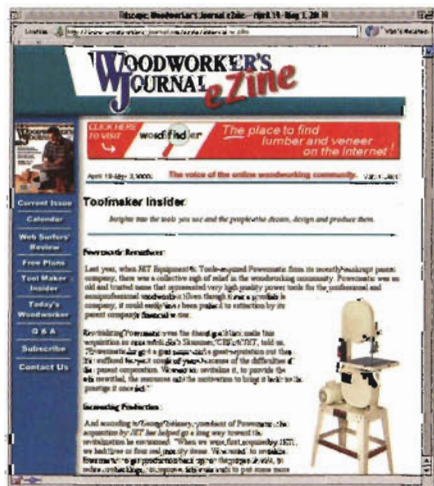
Speaking of excellent adventures, it's not often you get a chance to win \$1,000 worth of tools just for carving one of the country's most talked about personalities — Minnesota's governor, Jesse (formerly "The Body") Ventura. A contest for woodcarvers to create Jesse's likeness occurred this spring, sponsored by our friends at Minnesota-based Rockler Woodworking and Hardware. Everyone had fun, a big check went to Habitat for Humanity (all the entry fees), and our guy took it in good spirits. Check out the selection of entries in this issue's *Shop Talk* on page 16.



Of course, our projects this issue will help you enjoy your summer, too. Swing your mallets through a few croquet parties; store your summer reading on our stylish mahogany bookcase or let your kids — like mine — keep the trinkets they pick up on your travels in their own Miniature Shadow Boxes. Best-selling author and woodworker Patrick Spielman joins our woodworking community this issue with a review of a brand new scroll saw, and Ian Kirby (*Surfacing Wood with a Plane*) and Michael Dresdner (*Finishing with Dyes*) are both back with some great advice.

Larry N. Stojan

The **Woodworker's Journal eZine** launched this spring and was a huge success! It's the first fully electronic woodworking magazine on the web, and it's free, every two weeks! You can sign up at woodworkersjournal.com.



JULY/AUGUST 2000
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Taming the Dragon

I really like the design of the dragon toy (*Articulating the Dragon*) in your April 2000 issue, but using a scratch awl to cut a groove in the edge of a fast rotating wheel seems like an accident waiting to happen.

I solved this potential problem by running a screw through a piece of wood just a little bigger than a toothbrush at a 90° angle to the length. This item not only has a smaller metal part that prevents it from going too deep into the wood, but also is a lot lighter than my scratch awl.

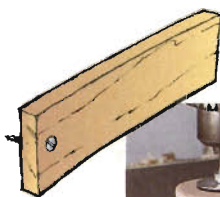
Donald Pelton

Colorado Springs, Colorado

Corrections

The dragon story in April 2000 included an incorrect dimension for the lacewood used for the wings. The 1/4" lacewood, as stated in the material list, is correct.

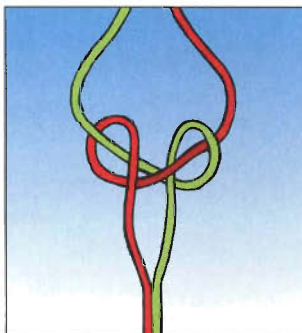
Donald Pelton thinks a simple board with a screw protruding is a much safer way to score the wheels on the animated dragon from April 2000.



Tie the Knot

In the April 2000 issue, you describe the assembly of electric lamp hardware (*Hardware Hints*). There is one improvement I would like to add for increased safety:

In order to prevent the electrical connections from being pulled off the screws by any strain on the cord, a knot called an "underwriter's knot" is traditionally used. The knot is tied between the socket base and the socket itself.



I will refer you to almost any packaged lamp kit or cord replacement kit for further detail; you can also find an online example at www.best.com/~mikesand/ShowHowItWorks3.html.

D.C. Price

Lakeridge, Virginia

According to my observation, even two-prong electrical cords have been polarized (hot and cold/ground) for years, and this could be critical in certain situations.

The broad plug blade is the cold one, which should be neutral and grounded in

a properly wired house.

The neutral wire is identified by multi-ribbing on the insulation. It should be connected to the silver screw on a socket — the threaded outer shell. The narrow plug blade is the hot one, which connects to the smooth wire and should be connected to the brass screw, which leads to the center contact or contacts.

In the case of changing a bulb in a situation where a person can be accidentally grounded, contact with a plugged-in shell could be dangerous or fatal. I know, we should unplug the fixtures before changing the bulb, but when was the last time you did that?

Charles Brewer

St. Clairsville, Ohio

RAM Keeps RPM Going

After reading the April 2000 *On the Level* entitled "RAM or RPMs?" let me first say that I share your amazement at the growth of the Internet and its penetration of our daily lives. But this is not all bad.

I live in a town where you have to travel 250 miles to touch a 3 HP router. If Home Depot doesn't have what I need, I have to order the item and hope that it really is what I need. Are you beginning to hear the violins in the background?

Although the Internet does not take me to a place where I can interact with

fellow woodworkers over a cup of coffee, or allow me to touch a Unisaw, it does bring these things closer to me. A virtual visit to a manufacturer's web site gives me a lot more information on a tool than anything else available to me. Most of all, I enjoy the information and camaraderie of the many newsgroups.

I can't speak for everyone, Larry, but I would have given up woodworking a long time ago if the Internet had not made it

much more fun. So, wipe that speck of sawdust from your eye and just think of your computer as one of your more valuable woodworking tools. Maybe not as valuable as a speedsquare, but certainly up there with a back saw or miter box.

*John Howard
Tallahassee, Florida*

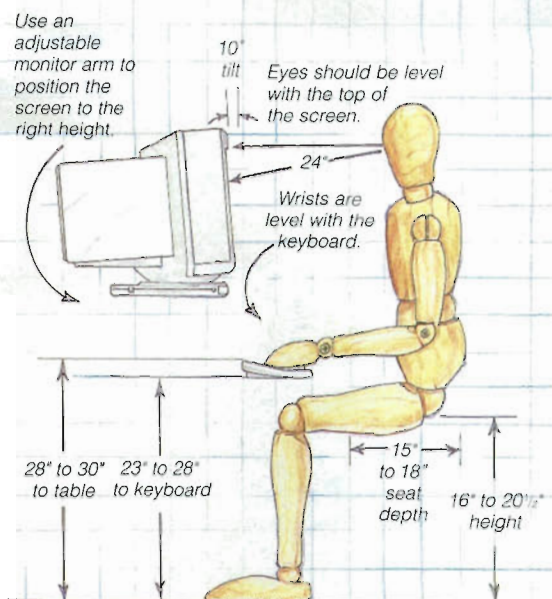
I took up the evil habit of woodworking about four years ago and have lots to learn. Many of the techniques I need to understand are on the Net,

and I have been able to glean a lot from these sources, but a hard copy in the hand, like the *Woodworker's*

Journal, is [still] a great comfort to those of us who grew up in real vs. virtual libraries.

*Ken Maurizi
Galesburg, Illinois*

I have been a computer user since 1984 and



Don't be a wooden head.
If you're spending a lot of time at your computer, make sure your workspace is ergonomically correct.

continues on page 10 ...



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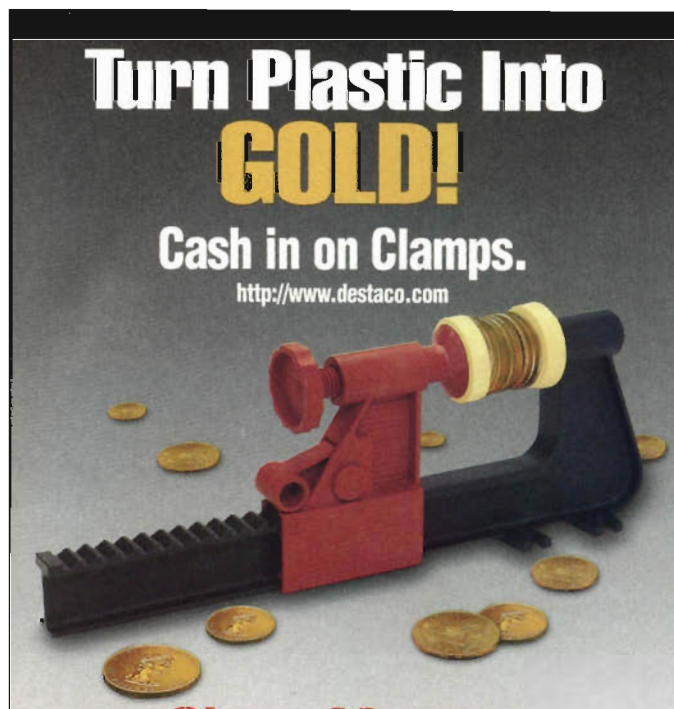
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a woodworker since childhood (the 1950s). In the last year, my wife and I bought a new computer, but more importantly, with her help, I have also purchased a set of Bessy clamps, a JET jointer to replace my old one, a hollow chisel mortiser, a spindle sander, a good battery-operated drill, a tenoning jig, a new compressor, an air nailer, and other odds and ends.

If I had to choose between spending time in the shop or in front of my computer, the shop would win. If I had to choose between getting rid of my computer or my table saw, the computer would be gone in a flash. The computer is a great tool, but my heart belongs to Delta, JET, Grizzly, Craftsman, Makita, Bosch, DeWalt, Skil, Leigh, Porter Cable ...

*Jerry Brightbill
Tonasket, Washington*

I am a model builder who likes to build and fly scale model aircraft. I also just installed a computer in the house.

I have four grandchildren who live out of state. When they come to Papa's house, they always want to build something. After building numerous airplanes, their mother said, "enough is enough." That was shortly after I found the web site in your magazine. I took time to look at it and found plans of birdhouses, napkin holders and other small projects that I can use with the grandchildren when they want to make a project.

Was that time wasted? I don't think so. With plans in hand, I can keep on teaching the woodworking skills that the kids need to keep advancing to more advanced projects. In this case, the RAM is going to keep the RPM going.

*Ron Hemphill
Butler, Pennsylvania*



Looking for a nice Web surfing spot? The Modular Computer Desk from the March/April 1994 Today's Woodworker will get you into the shop.

Sorry to say that, yes, indeed, I spend more time surfing about wood than surfacing it. I console myself, however, with the fact that I am new to woodworking, and therefore am justified in searching the Web for guidance. Also, my access to a shop is limited, as I don't have one! I use the Web to get my woodworking fix.

*Frank Krar
Washington, D.C*

Your [editorial] "RAM or RPMs?" is interesting. However, using the letters RPMs is wrong. There should not be an "s" after rpm. RPMs is used by many people mistakenly because rpm stands for revolutions per minute (not minutes). It would be more correct to say RsPM, but I wouldn't even try to convert anyone to that.

*Bill Walraven
Champlin, Minnesota*

Safety First: Learning how to operate power and hand tools is essential for developing safe woodworking practices. For purposes of clarity, necessary guards have been removed from equipment shown in our magazine. We in no way recommend using this equipment without safety guards and urge readers to strictly follow manufacturers' instructions and safety precautions.



Another project to cut your [saw]teeth on is the Computer Cabinet from Today's Woodworker Sept/Oct 1997.

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Shop Secrets

A Little "Pick-me-up"

I often need to "lift" a design or a letter from some of my woodworking jobs in order to repeat them on a new repair section, etc. I used to do this with tracing paper, but it was always getting torn. I solved this problem by using heavier opaque paper and alcohol. After placing the paper, simply rub it with alcohol and the paper becomes very transparent, allowing you to easily trace the work. After a few moments the alcohol evaporates, leaving the tracing dry and clean.

*Howard Moody
Upper Jay, New York*

Magnetic Attraction

When installing a screw into a tight spot, I found I could hold the screw to the screwdriver blade by attaching a small rare earth magnet on the screwdriver shank near the blade. The magnet does not get in the way, and it can be removed as soon as the job is done.

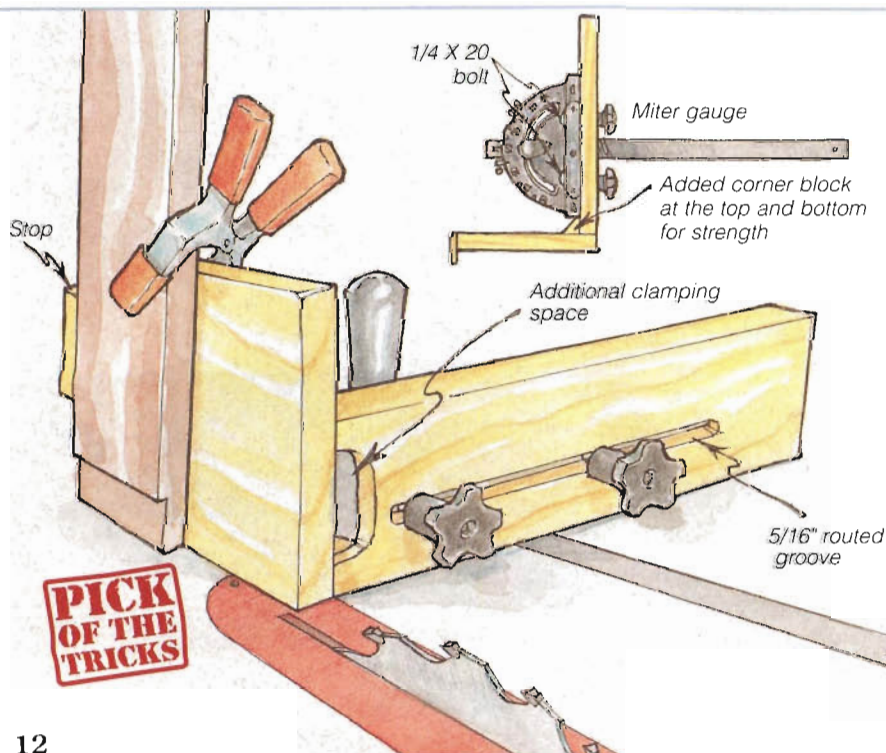
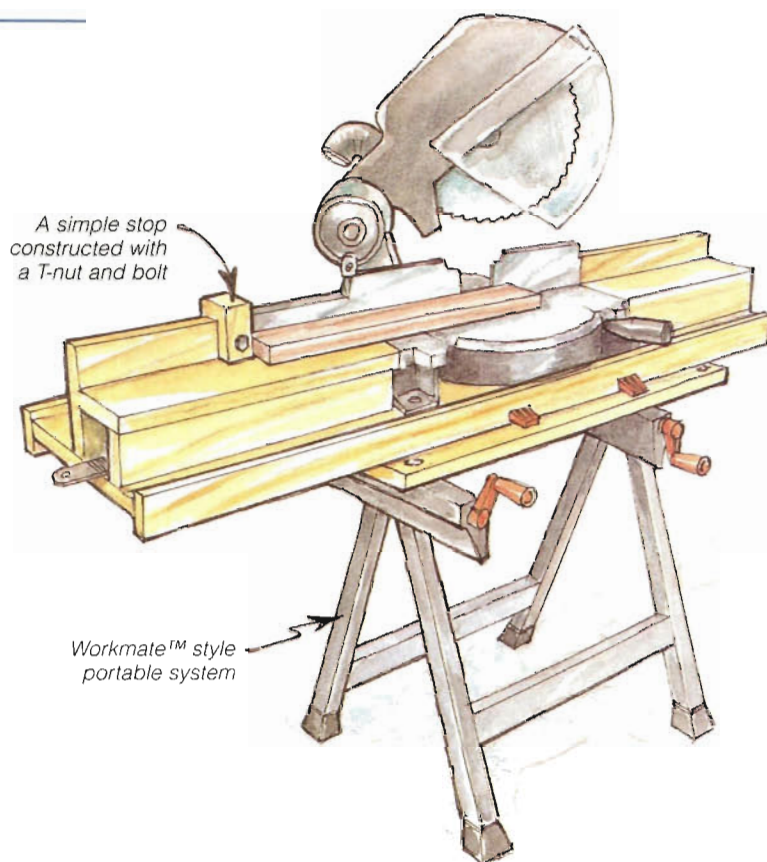
*Bob Kelland
St. John's, Newfoundland*

Expanding Space — Without Sacrificing Portability

I extended the working table of my power miter saw by adding permanent mounted extensions to each side. It maintains portability in the workshop, or mounted at a job site. The saw can also be easily removed. I added threaded inserts

in the plywood base to fasten the saw securely to the table with bolts through the saw's foot holes. To duplicate cuts, I added a stop block to attach to the fence.

*Walter L. France
Lithia Springs, Georgia*



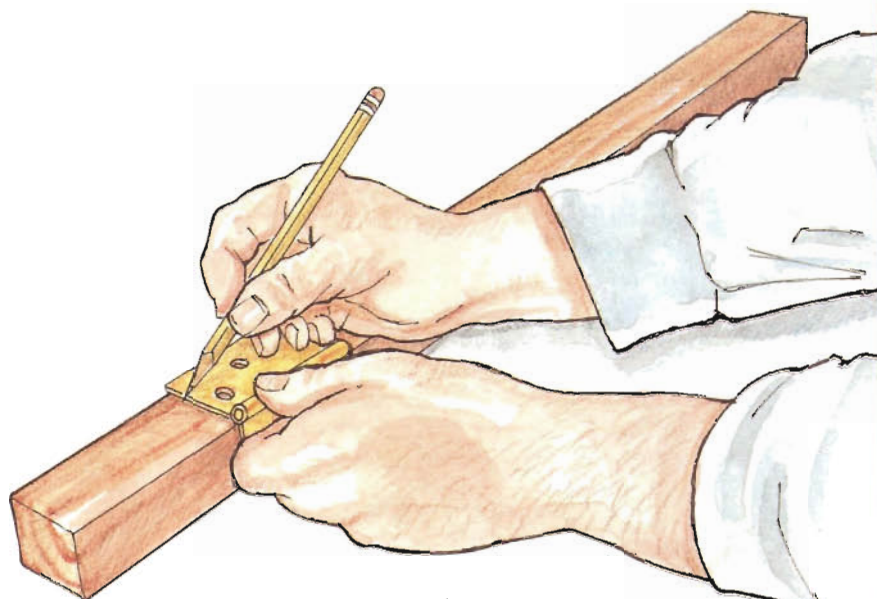
Jig Produces Terrific Tenons

Recently I needed to cut a lot of tenons for a project. Lacking a good dado blade, much less a tenoning attachment, I decided to build my own jig. Two factors determined size: fitting the miter gauge on my table saw and offering enough adjustability to cut stock up to 3" thick.

I clamp the stock to be cut in place with spring or C-clamps. The hole along the jig's front edge gives me another clamping opportunity. Then loosen the knobs and slide the jig back and forth until the stock is correctly positioned, tighten the knobs and make the cut.

*R.B. Himes
Vienna, Ohio*

**PICK
OF THE
TRICKS**



Butt Hinge Aids in Layout

Do you have need to draw a line around a corner? This might come up when you're laying out a table leg design — or when you're making mortise and tenon joints.

A heavy-duty hinge, such as you might use to hang a door, can help accomplish this task quickly and accurately. Simply turn the hinge

backward to provide a sharp angle, then lay it on the work and mark along the edge with your pencil as shown. It's an easy way to make your markings turn the corner!

*Ralph Wilkes
Penn Yan, New York*



Winner! R.B. Himes will receive Porter Cable's 9845 Saw Boss for submitting this month's Pick of the Tricks. *Woodworker's Journal* will pay from \$50 to \$150 for all Tricks of the Trade published. In addition, the reader whose trick is selected as our "Pick of the Tricks" will receive a free tool. To join in the fun, submit your original, unpublished trick to the editor. Include photos or drawings needed to explain your idea. Send all tricks to *Woodworker's Journal*, Dept. T/T, P.O. Box 261, Medina, Minnesota 55340. Or send us an e-mail: rjohnstone@woodworkersjournal.com.

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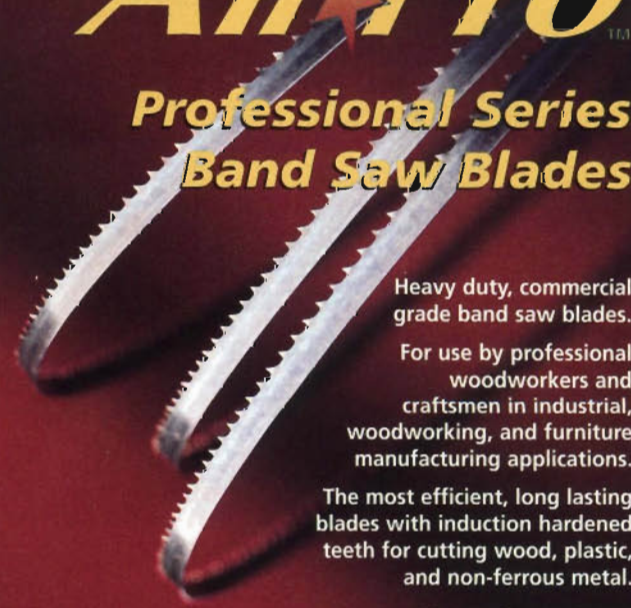


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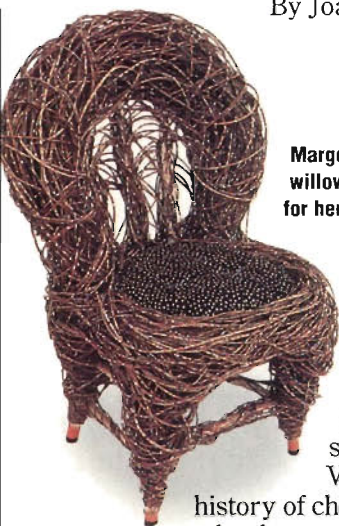
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Chairs: Practicality and Whimsy

By Joanna Werch Takes



Margo Proksa wrapped willow around a chair for her "tot throne."

A chair "can be as creative or as straightforward as you want," says Kerry Vesper. The

history of chairs reveals technology, practicality and imagination, adds Margo Proksa. "There's a whole range of possibilities in this one object," she said.

Kerry and Margo entered their chairs in the Southern Highland Craft Guild's "Chair Show 3." Why chairs? "A chair is very recognizable to every person in Western civilization but isn't limited to one type of craftsman," explained Katherine Caldwell of the Guild.

For woodworkers, chairs can be a real threat. "I think it's probably the most complicated furniture to deal with because of the interaction between the person and the chair itself," James Dietz, another show participant, said.

Kerry agrees: "There's more to consider in a chair because the human body is so intimate with it. A large part of your body is touching it, and your body is also at an angle."

Just as important to him, though, are the aesthetics. He chooses plywood for consistency and attractive-

ness, stacks the laminations and cuts away until the chair looks good.

James looks to his material in defining his chairs' structure. He mortises

other elements into logs found on walks in the woods. At the lumberyard, he explained, "I felt a little detached from the source." Interpretations of the chair from James, Kerry, Margo and others are on display in Arkansas until July 9th. You can find out more by calling the Southern Highland Craft Guild at 828-298-7928.



A drawer in James Dietz's log chair offers storage room.



"Test sitters" help Kerry Vesper assure comfort in his plywood chairs.

Restorers Rejuvenate the Past

For example, Daley said, some people think filling a crack in a piece of old furniture is all that's required to fix it. "They don't realize there's structural damage, and the crack will just reappear."

Providing that education is AOR's mission. A web site, newsletter and conventions provide information on restoration topics ranging from furniture to porcelain to glass. Founded in 1997, the association quickly grew to over 450 members: beginners, experts and those in between.

"The most common things people ask are, 'How do I clean my furniture?' or 'what is the effect of climate on wood?'" Daley said. Find out AOR's answers at 800-260-1829 or visit their web site: www.assoc-restorers.com.



After

A 1991 restoration revitalized this André Charles Boulle 18th century cabinet.



Before



Before

It took seven coats of stable polyester fill to restore this 19th century ebonized table.



After

Restoration is more than refinishing, Andrea Daley wants you to know. Daley, founder and president of the Association of Restorers (AOR), says preserving old pieces has become popular, but not all restorers know what they're doing.

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Carvers Wrestle With Portrayals of Gov. Jesse Ventura

"Wood" you like to take a whack at Minnesota's governor? Minnesota-based Rockler Woodworking and Hardware recently decided to take on the ex-wrestler with a national carving contest. Originality, craftsmanship, resemblance to Ventura and

capturing "the spirit of Jesse" were criteria for judging the portrayals of Jesse "The Guv" Ventura.



Not just Minnesotans: John Hoesman of Woodville, Ohio, also took a crack at our governor.

First place winner Cliff Letty of Sturgeon Lake, Minnesota, did his limewood carving of "The Interview" after hearing Ventura say that if there were anything he'd take back, it would be his *Playboy* interview. "Every once in a while, no matter who you are, you're going to stick your foot in your mouth," Cliff said.

Cliff wasn't concerned about upsetting Ventura. "He's an honest

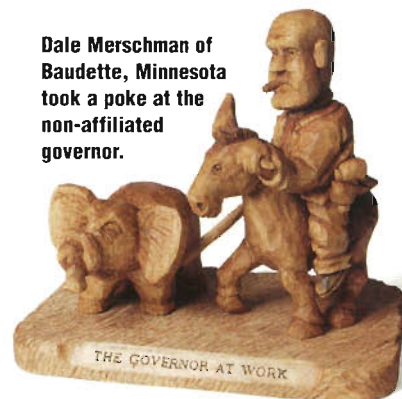
Cliff Letty's "Interview" with Governor Jesse Ventura took top honors in the contest.

politician; if he makes a mistake, he admits it." Cliff limited his own mistakes with a clay model, which helped him figure out which way to bend the foot, before taking on the sculpture in wood.

More information, and photos of many of the other entries, are available at www.rockler.com/ventura.



Dale Merschman of Baudette, Minnesota took a poke at the non-affiliated governor.



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very next year, though, merchants forced La-Z-Boy's inventors to upholster their chair so it would sell year-round.

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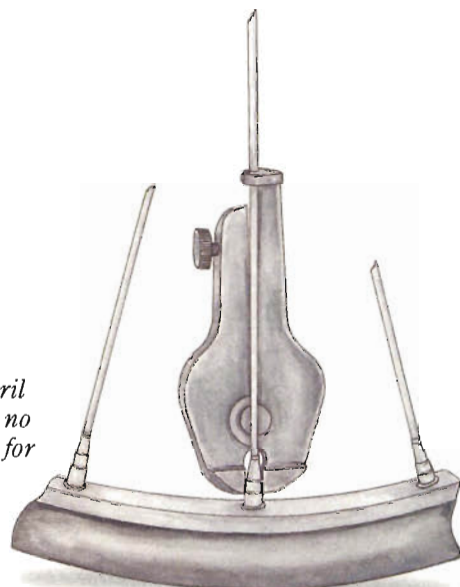
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Speaking of Spokes



Q Identifying Alan Ribbe's mystery tool from our April *Stumpers* was certainly no wrenching experience for our readers. We received over 100 responses to the *Dudly Tool Company* item.

*The Editors
Woodworker's Journal*



Q My uncle purchased the tool shown below at an antique auction. No one, not even the auctioneer, knew what it was. It is approximately 15" long with a cast iron spike on one end. From the underside of the one foot crosspiece, eight nails protrude at an angle toward the spike end. The cast iron handle has a rope attached and a pawl at its base to keep tension on the rope. The rope passes around a pulley and attaches to the crosspiece. A bolt passes through the cast iron handle and then through a gap in the wood of the long piece to attach the crosspiece. As the handle is turned, the rope wraps around its base, thereby pulling the cross piece toward the end with the spike and, presumably, stretching whatever it is attached to. Stenciled on the side is "The Star."

*David Moon
Glencoe, Alabama*

A Despite David's stellar description, it looks like we'll need your help identifying his tool. Send in those answers!



Looking for your own stardom?
Help us identify this tool.



Robert M. Barnes of Sacramento, California, says his grandfather used this tool to tune his 1905 ride — the bike, not the horse.

A "The tool is an adjustable spoke nipple wrench, used to tighten nipples on spoked wheels to make them straight and properly tensioned," **Richard Kallenberger** of Yakima, Washington, told us. How does it work? **Joe Bouwhuis** of Bountiful, Utah, explained that you slip the slot in the wrench's heel over the spoke wire. Tighten the front jaws around the spoke's head with the thumb screw, then rotate the tool to loosen or tighten the spoke.

It works on bicycles, motorcycles or, according to **Fred Bellman** of Islip Terrace, New York, on wheelchair spokes.

Alan's tool "fits all spokes, unlike most of the bicycle spoke tighteners made nowadays; however, it is a bit heavier to carry on your racing bike," noted **Gary Lewandowski** of Shawano, Wisconsin.

Schwinn/GT product technology director **Forrest Yelverton** confirmed that today's nipple wrenches are made to fit the four standard nipple sizes.

"In 'yesteryear,' there was no such standardization, and so the adjustable wrench made the most sense," he said.

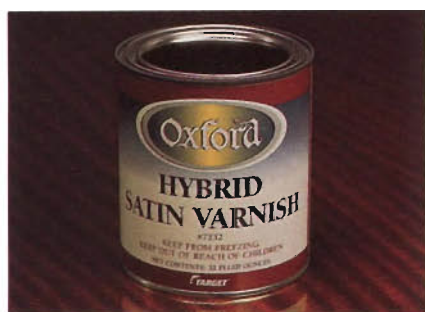
As for the "Dudly Tool Co., Pat. May 29, 94" markings, our readers had further insights. Science librarian **Donna Hanson** in Moscow, Idaho, sent us copies of the 1894 records granting Albert Dudly of Menominee, Michigan patent 520,562 for his nipple wrench. Back then, Pawtucket, Rhode Islander **Roger Gosselin's** grandfather, "who would be about 120 years old by now, purchased it for about 50 cents."



Winner! For taking the time to respond to *Stumpers*, **Bruce McCormick** of Ventura, California wins a collection of American Tool's Quick Grip clamps. We toss all the *Stumpers* letters into a hat to select a winner. If you have a question or answer, send it to the editor: *Stumpers* Dept., *Woodworker's Journal*, P.O. Box 261, Medina, Minnesota 55340. Or send us an e-mail: jtakes@woodworkersjournal.com

Q I recently read The New Wood Finishing Book by Michael Dresdner. In it, he mentions waterborne poly/lacquer with crosslinker. I'd love to try some of the stuff, but can't seem to find any products.

Bruce McCormick
Ventura, California



Jeff Weiss of Target Coatings (800-752-9922) says products like this one have replaced waterborne crosslinkers for furniture use.

A There are very few crosslinked waterborne coatings on the market, and some very good reasons why.

Flooring contractors have used them for years; some years back, several companies introduced versions designed for furniture. As of this writing, almost all of them have disappeared — Jeff Weiss of Target Coatings says new materials for furniture applications have made them unnecessary.

One of the problems is that the preferred crosslinking agent (an added catalyst) has a nasty safety profile. Many manufacturers are reluctant to sell such products to non-professionals. If you choose to use one, please handle the crosslinker very carefully — with gloves, goggles, and respirator. The final cured finish is no longer a hazard.

You'll find crosslinked waterbornes at most flooring outlets that sell to contractors.

Michael Dresdner

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Colors to Dye For

By Michael Dresdner



Most off-the-shelf wood stains contain a combination of two different types of coloring agents: pigments and dyes. Pigments work best on ring porous woods, like ash or oak, while dyes work best on dense, close pore woods, like maple. Wouldn't it be nice if you could use each one separately to gain more control over your coloring options? Well, you can.

Defining Terms

Before we go any further, let's stop and define some terms. A stain is anything that is used to color raw wood. That's not to say you can't

add color to wood that has a coat of finish already on it. You can.

But that is called glaze, or shading, or toner.

Chemical stains are compounds that react with wood to create color changes, like ammonia darkening oak. All other stains are liquids or gels that have some sort of coloring agent in them. As mentioned, there are two primary types of coloring agents used: pigments, which are ground up particles of colored "dirt" suspended in liquid; and dyes. I'll cover chemical stains and pigments in future columns, but today I want to talk about dye stains.

What is a Dye?

Dyes are organic colorants that dissolve in some solvent. That's not the same thing as pigments, which are ground up chunks of color that are suspended in liquid. Suspended particles, like pigments, settle to the bottom of a container, but dyes do not. Imagine adding a bit of sand to a glass of warm water, and a bit of salt to another. The sand mixture would disperse when you stirred it, but eventually, the sand would settle to the bottom. The salt would dissolve and never settle to the

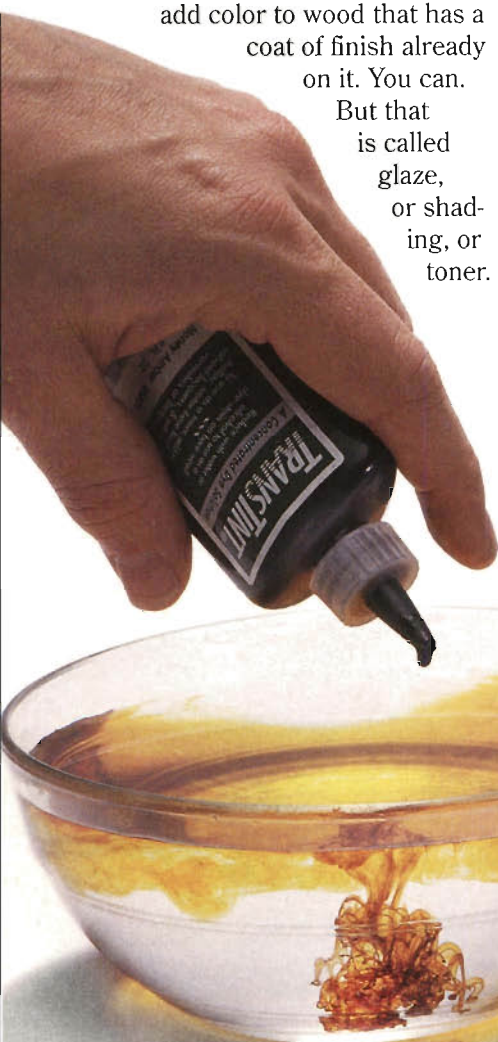
bottom. Dye acts like that saltwater solution. The color dissolves into a translucent solution and never settles out.

Natural dyes have been around for ages, but most dyes we use today are synthetic. The first synthetic dyes were derived from coal tar in 1856 by an Englishman named Perkins, so historically speaking, they are fairly new.

Size Matters

First and foremost, dyes look different than pigments, and the easiest way to see that is to look at samples. In the photo on page 22, I used the same color of dye stain and pigment stain on slabs of figured maple and oak. The pigment was able to lodge in the nooks and crannies of the large pores of the oak, but mostly wiped off the finer grained maple. However, the dye soaked deeply into all areas of both woods. This is because dyes go into the wood to color its fibers, while pigments sit on top of the wood. Why? Dye particles are vastly smaller than pigment particles. If a typical dye particle were the size of a field mouse, a typical pigment particle would be the size of a whale. Staining is one area where size does matter.

Mixing dye is as simple as adding powder or concentrate to the right liquid. Add more dye for a stronger solution and less for a weaker one.



If a typical dye particle were the size of a mouse, a typical pigment particle would be the size of a whale.

All commercial stains containing pigment also contain a binder that acts like a thin coat of finish, sealing the wood as you stain. Dyes can be simple colorant in solvent, leaving nothing but color in the wood once the solvent evaporates. Therefore, dyed wood acts like raw wood, and must be finished over. Dyes are compatible under any finish, and dyed wood can be restained with another dye or a pigment.

Finally, there is the issue of clarity. A very dark application of pigmented stain will start to look like a painted surface. But, due to the clarity of dyes, you can make wood very dark and still retain the look of wood. (See the maple boards pg. 22.) When you go dark on dense wood, dye is the ticket.

Making Stains from Dyes

Ready to give them a try? It's quite simple. Dyes are sold as powders meant to be dissolved in a particular solvent, as liquid concentrates that will go into several solvents, and as

ready-to-use stains. The powders come in water-, alcohol- or oil-soluble versions. Of the three, I find water-soluble dyes to be the most user friendly for staining raw wood. So, for your first try,

I suggest water-soluble dyes. Add up to an ounce of dye powder to a pint of warm water for a very intense dye. To make the dye weaker, use less powder or concentrate, or add more water. For custom colors, dissolve each dye in solvent first, then mix the liquids a bit at a time to get the color you want. Test the mixture on scrap wood, and keep track of your formula in case you want to repeat it later.

Water-soluble dyes dissolve in warm water almost immediately and completely. Alcohol-soluble dyes go into denatured alcohol, but may take several hours to dissolve completely. I let them sit overnight, then strain out any sediment through fine cheesecloth. Oil-soluble dyes will break down in most petroleum distillates — naphtha, lacquer thinner, toluene, etc. Let them sit overnight and strain them as above.



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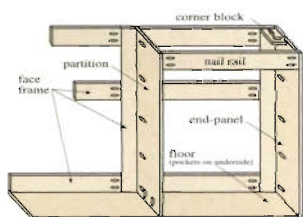
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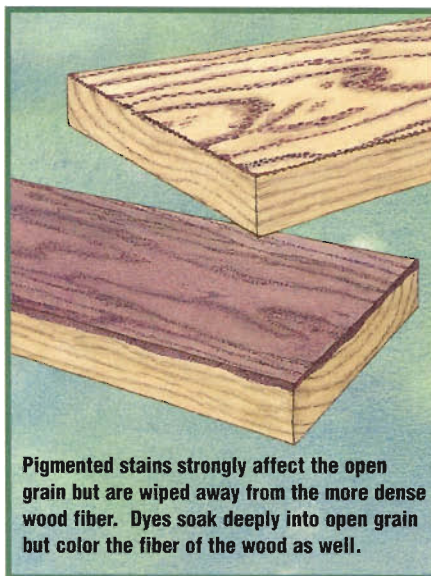
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FINISHING THOUGHTS

Once you've mixed liquid dye, try it on scrap wood to see the color. As the dye dries, the color will fade and start to look "chalky," but don't worry, it will come back to life once a coat of finish is added. The true color is how it looks when wet.



Pigmented stains strongly affect the open grain but are wiped away from the more dense wood fiber. Dyes soak deeply into open grain but color the fiber of the wood as well.

the dye solution and wipe it again to even it out.

Control the color not by how you apply it, but by how you mix it. If it is too strong, add more solvent. If it is too weak, add more dye. You can restrain as often as you like, changing the color as you go. You can even lighten the

Flooding

One simple method works best with dyes: flood it onto the raw wood and wipe it off while it is still wet. That lets the dye soak into the wood, but takes off anything sitting on top, resulting in uniform coloration. I like to use nylon abrasive pads, a foam pad or a sponge to apply the dye, because it stays wet longer than a cloth. Flood on plenty of dye and work quickly so it does not dry before you wipe it. If it does dry too fast and leaves lap marks or uneven areas, rewet the entire surface with

dye after it is on the wood by scrubbing with its solvent. For example, lighten a water-soluble dye by scrubbing the wood with clean water and wiping it off with paper towels. In fact, you can remove most, if not all, of the dye by washing the unsealed wood with full strength laundry bleach. You can use dye to tint a finish. Add a few drops of liquid dye concentrate or mixed alcohol-soluble dye to shellac or lacquer for a translucent tinted coating.

The pigmented stain on the bottom of each board lodged in the large pores of the oak, but mostly wiped off the denser maple and the denser areas of the oak. The dye stain on the top of each board penetrated deeper, coloring the wood and bringing out the figure in the maple.

Maple

Quilted Maple

Oak



Problems with Dyes

As easy to use as dye stains are, there are some problems to watch out for. The first is splotching, or uneven staining. Some hardwoods, such as cherry, and most softwoods, like pine, contain pockets of resin that can be dissolved by petroleum distillates. Oil-soluble dyes dissolved in such solvents are absorbed more readily into these resinous areas, causing large patches of dark stain where no grain or figure accounts for it. The easiest way to avoid this is to use a solvent that will not dissolve the resin. Water-soluble dyes will not cause splotching on these woods because the resin patches are not water-soluble.

Fading is another common problem with dyes. Most dyes fade in strong sunlight, so dyes are not a good choice for exterior staining.



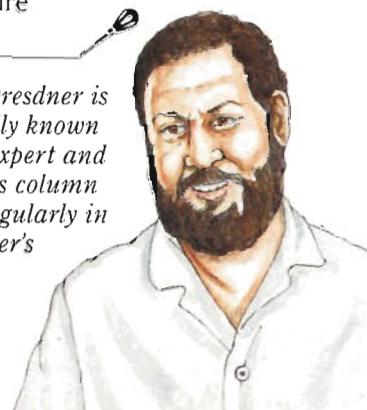
One of the chief advantages of coloring wood with dye is the virtually unlimited range of achievable colors. You can even restain dyed stock with different successive colors (above) until you reach the desired hue.

Dyes will also bleed into a finish that has the same solvent as the dye. For example, if you use a waterborne coating over a water-soluble dye, expect some of it to bleed up into the first coat of finish, or to come off on the brush

or pad you are using to apply the coating. This is not usually a big deal, but in extreme cases it can cause the stain to become uneven. If you use water-soluble dyes under waterborne coatings, seal the dye first with a thin wash coat of dewaxed shellac. It will seal in the dye and prevent bleeding.

So go ahead and give dyeing a try. A more colorful finishing future is sure to result.

Michael Dresdner is a nationally known finishing expert and author. His column appears regularly in Woodworker's Journal.



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Planecraft

A new look at one of our oldest tools

By Ian Kirby

What if I offered you a new woodworking tool that's capable of accuracy within a thousandth of an inch?

Not only that, while most tools have only one function, this amazing cordless device handles three important tasks:

- it can bring any piece of wood to precise dimensions,
- it can remove twists and other distortions, and
- it can prepare a surface for finishing.

Wouldn't you rush to pay \$200 to be the first kid on your block to own this remarkable new tool?

By now you probably realize that I've been describing an ordinary hand plane, which to me is still the key to woodworking success. Though machines have changed the way we use the plane, it remains the most precise and accurate tool woodworkers have.

Before machines, woodworkers relied on special-purpose planes for almost everything. Today we can turn to jointers, thickness planers, shapers, and routers for the hard work of flattening, dimensioning, and shaping. We still rely on the plane to remove machine marks and to bring parts into perfect alignment, in .001-inch steps. The plane remains the only tool we have that can reliably deliver this degree of accuracy. It's a bonus that it can flatten a surface of almost any size, such as your workbench, and in most situations it also will create the best surface for finishing.

Over the years many manufacturers have made planes, but the two mass-market survivors are Stanley Tools in the U.S. and Record in England. Stanley recently stopped

Brace your right index finger on the frog. Trap the front handle between your fingers. This grip gives you control and downward pressure.



production of planes, leaving Record to fill the breach. Along with the high volume manufacturers there have always been a number of high-end, Rolls-Royce type makers. In England it was Norris, and today in the United States it's Lie-Nielsen. Lie-Nielsen recently has reissued the Stanley Bedrock version of both the 07, which is 22 inches long, and the 9-inch 04-1/2, which are the only two sizes I use.

Driving the Plane

Planing wood is a whole-body exercise. Whether you are planing a face, an edge, or end grain, the grip, stance and body position are similar. Before you start, lubricate the operation by rubbing a little paraffin wax into the sole.

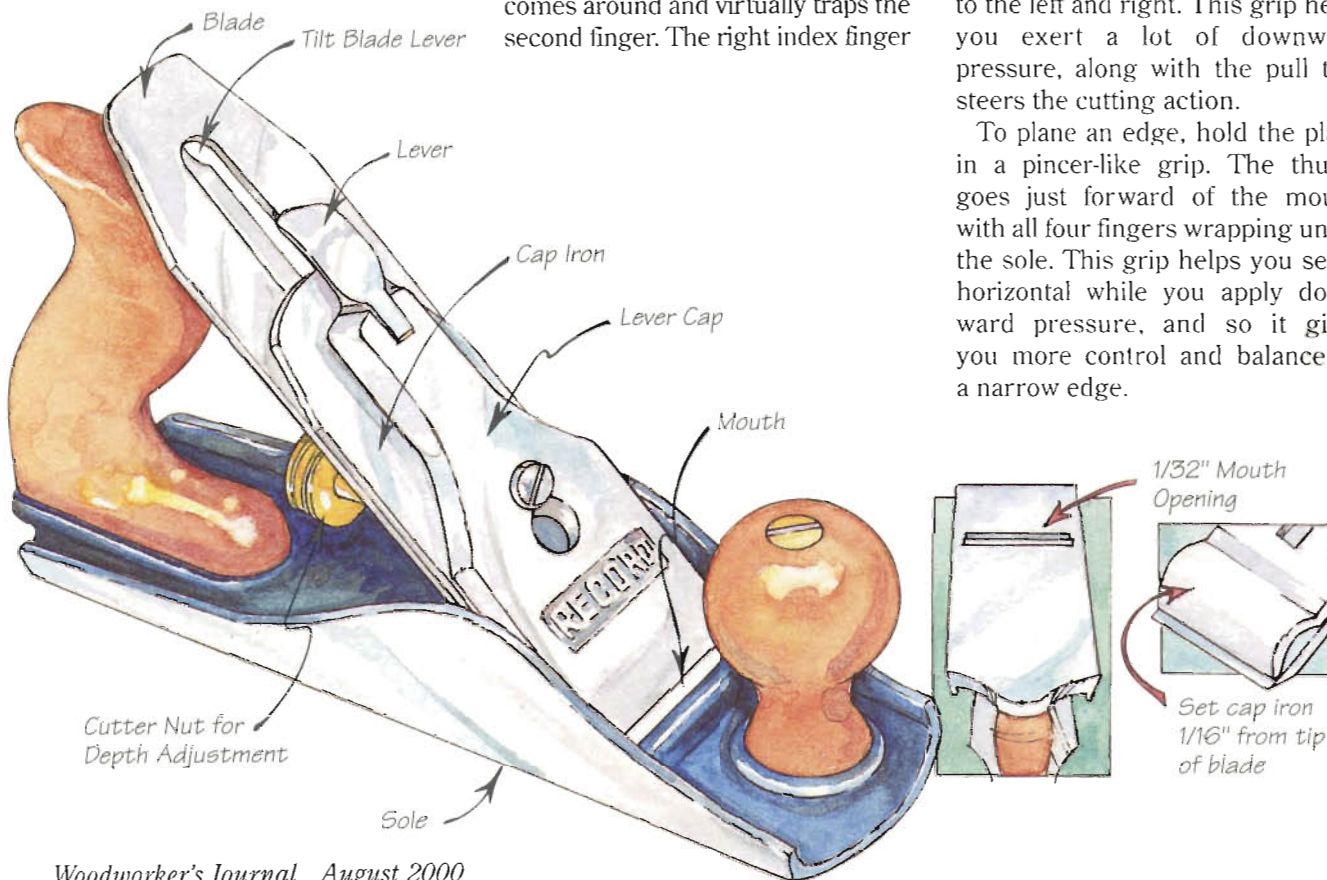
The Hand Grips

The right hand grips the rear handle. It applies downward pressure and transmits the push that comes from your legs and body. The right thumb comes around and virtually traps the second finger. The right index finger

doesn't wrap around the blade assembly; it tucks down into the casting of the frog. This grip creates a lot of control tension between the index and little fingers. If you wrap your index finger around the blade assembly, sooner or later you will move it.

The left hand grip varies according to whether you are planing a face or an edge. On a wide board, press down on the top of the front knob with the palm of the hand and curl two fingers under it to the left and right. This grip helps you exert a lot of downward pressure, along with the pull that steers the cutting action.

To plane an edge, hold the plane in a pincer-like grip. The thumb goes just forward of the mouth, with all four fingers wrapping under the sole. This grip helps you sense horizontal while you apply downward pressure, and so it gives you more control and balance on a narrow edge.



Stance and Motion

The plane gets its power from your feet, which should be placed a comfortable walking pace apart. Keep your wrist, lower arm and upper arm in one line, and direct the push from your shoulder. As the cut proceeds, shift your weight from your rear foot forward, and unwind until your body has rolled over your ankles. Your more powerful lower body thus will propel the plane about 42 inches. Continue the cut by unfolding your upper body and arms, to push onward another 18 inches, more or less. This 60 inches is about the limit you can cut without traveling or walking the plane. To plane a long board you have to travel in a smooth and unhurried way. Slide your rear foot up to the front foot, then slide your front foot forward. Don't try to cross your feet.

Planing a Face

To plane a piece of wood flat, you have to put it on a flat and solid surface and hold it against the push of the plane. Normally the solid surface is your bench, which, if you haven't done it yet, should be your first major planing project. If the

bench surface has a hollow, the force of planing will press the workpiece into the hollow. The deflection might be only a few thousandths of an inch, but it will deflect. If there's a hump, the workpiece will swivel on it, out of control. The bench acts as a jig – if it's not flat, the workpiece can't become flat either.

The link between bench, plane, workpiece, and workman is very important. That's why it's best to push the workpiece against a simple bench stop. The first virtue of its simplicity is that you can quickly pick up the workpiece and check it for flat or square, put it back, and carry on. The second virtue is the constant feedback this setup delivers. Poor planing technique will skid, slew or tip the workpiece, you'll know it right away, and you can correct your technique.

The two alternative holding methods, holding the workpiece in a vise or trapping it between an end-vise and a dog, are not as good, for three reasons:

- You lose the feedback.
- Clamping pressure can distort the wood.
- The work surface won't be flat.



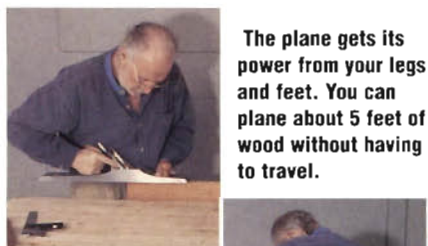
To plane a narrow edge, grip the toe of the plane between your thumb and fingers. By touching the workpiece, your fingers act as a fence. Look down into the plane to monitor the progress of the cut.

An end vise, even if flat and level when closed, will sag when opened. And wood trapped by its edges in the vise is not supported at all, so deflection is certain.

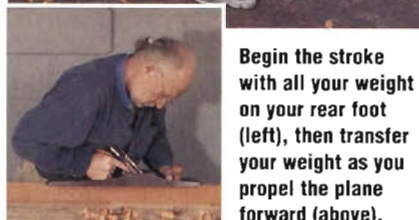
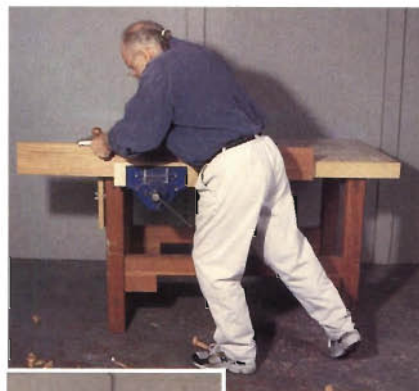
Narrow Workpieces

When the wood is narrower than the plane blade, each pass removes a full shaving. To plane evenly, be sure the edge is set parallel to the plane sole. Set it by sighting the blade against the sole and moving the adjusting lever. Check it by examining the shaving.

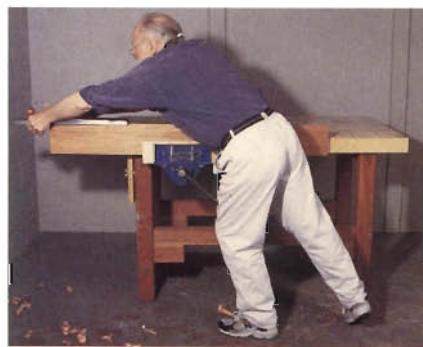
Planing is a whole body experience



The plane gets its power from your legs and feet. You can plane about 5 feet of wood without having to travel.



Begin the stroke with all your weight on your rear foot (left), then transfer your weight as you propel the plane forward (above).



To complete the stroke, unfold your arms to their maximum extension. Note that the feet remain a pace apart and do not move.

He's in fine fettle

Whether you buy old or new, it's almost certain that you will have some work on every plane – clean it up, modify it, tweak it or adjust it. The old term for these activities is “fettling,” and it's the source of the expression “he's in fine fettle,” for someone at the top of his game. The good news is that it's a rare old plane that can't be renovated to perform well. The bad news is that new planes need fettling as much as old ones.

General Cleanup

Disassemble, wash, remove the rust (I use Scotchbrite™), then go over edges and ends with a file to remove burrs, nicks and sharp corners. A burr on the edge of the sole will plow a groove in the work, so file a tiny chamfer on the long edges. To keep the toe and heel from gouging the work when cleaning up frames and subassemblies, file a more substantial chamfer there, one about 1/8-inch wide. Wipe all the metal with an oily rag, and put a drop of oil on the moving parts.

Blade Control

To operate the plane you need two controls: a blade-advancing mechanism for depth of cut and a left-right tilt for making the cutting edge parallel to the sole. The mechanisms in older planes offer more positive control than the folded metal parts in new ones. Old or new, make sure the controls work, and if they don't, find what's missing, bent, or clogged and put it right.

Frog and Mouth Adjustments

The frog is the mass of metal that supports the blade. The slot in the sole is called the mouth. There has to be enough of an opening for the shaving to pass through. Whether it ever needs any more adjusting (“opening” or “stopping down”) than that is debatable. The fact that the

frog in metal planes is an adjustable part is the outcome of manufacturing convenience, not a woodworking requirement. Making the frog removable solves a casting problem – otherwise, the body casting would distort as it cooled and shrank. It's also easier to machine the frog as a separate part. It's not, however, a necessity – Norris planes, among the best ever made, have fixed frogs.

These days, since we all prepare wood with machines, hogging off thick shavings isn't called for, so there's little need to adjust the mouth. Make sure the frog supports the blade, set the mouth for an opening of about 1/32 inch, and leave it there. The quality of the planed surface comes much more from the sharpness of the blade than from the width of the mouth opening.

Flattening the Sole

The sole of the plane has to be reasonably flat. However, flattening is a major operation, so don't do it just because you've been told you should. Clean up, sharpen and adjust the plane, then try it on wood. Most planes will work quite well, and if so, leave the sole alone.

If you decide you must flatten, there's no need to make an expensive fetish of it. Get a piece of 1/4-inch or thicker plate glass and wet two sheets of 220-grit wet-dry sandpaper onto it. Apply working tension by assembling the plane and mounting a blade, but retract the blade so it's not involved in the flattening. Then work the plane on the sandpaper in a circular motion, using plenty of water for lubrication. To check your progress, wipe the metal and look at it. Once you get contact at the mouth, toe, and heel of the sole, stop and polish up on a finer grade of paper. There's no need to achieve perfect flatness from one end to the other.



File a substantial chamfer on the toe and heel of the plane.



Old-style blade controls (left) are more robust than the stamped metal ones in recent planes.



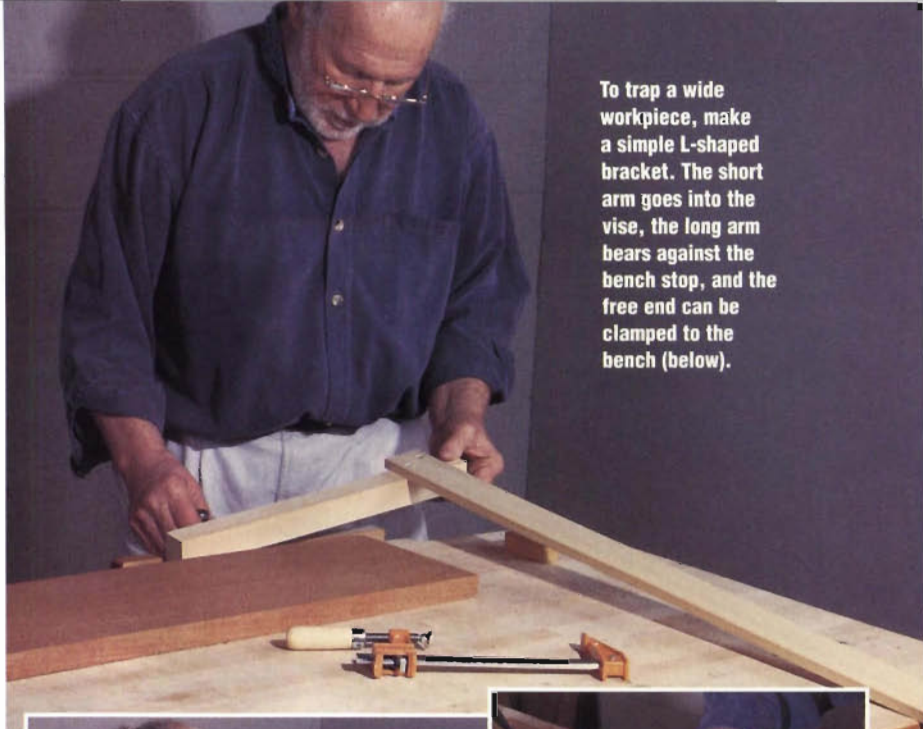
The bedrock style frog (above) firmly and ingeniously connects the blade assembly to the body. A regular frog is not as massive and does not seat as firmly.



Adjust the frog to support the blade securely. The mouth opening should be set to 1/32".

Wide Workpieces

When the wood is wider than the plane blade, the tool's geometry helps you work uniformly across the surface. If you were to plane in exactly the same line, you would get two shavings, maybe a thin third, then nothing. That's because the plane quickly bottoms and rides on the narrow web of metal alongside its mouth. To take advantage of this self-jigging property, begin at one edge of the board with the plane hanging over, so it takes a shaving three-quarters the width of the blade. For the next stroke, move the overhang just onto the wood. Go across the board systematically, moving about one-quarter of the plane's width for each stroke. If you were to attack the wood in a random pattern, half the time you wouldn't get a shaving, but more importantly, you would have no idea where wood had been removed or still needed to be removed.



To trap a wide workpiece, make a simple L-shaped bracket. The short arm goes into the vise, the long arm bears against the bench stop, and the free end can be clamped to the bench (below).



On wide work, overlap your strokes by about 1/4 of the plane's width. To practice, draw marker or chalk lines on the workpiece.

Planing an Edge

The edges of most furniture parts can be planed on the bench top, against a stop. A rail that is 3 inches wide and 3/4-inch thick, for example, is stable when stood on edge; if it falls over, you're not centered over it, or else you're pressing sideways instead of down and forward. You will quickly become adept at the technique and the ease of lifting the workpiece to check your progress. To square an

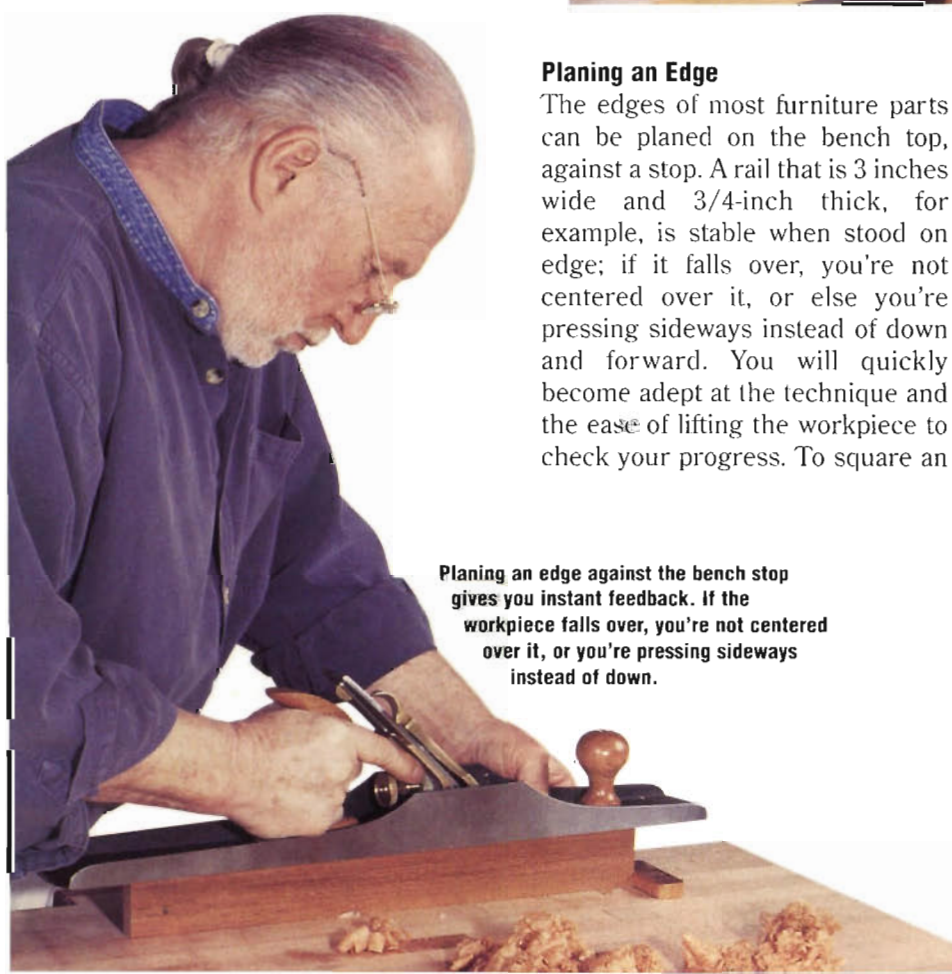
edge, center the plane over the material you need to remove and observe the shaving as it comes off the workpiece. You can trap a long or wide plank in the vise, but be sure to support the free end, or it will deflect.

Planing End Grain

Today the chop saw and carbide saw blade take care of most end grain cuts. The bench plane thus becomes an alternative for special situations. The size of the workpiece determines whether to hold it upright in the vise or lay it flat on a shooting board.

The shooting board allows you to use your heaviest plane to make a smooth and controlled cut. However, don't attempt to plane end grain until you have established a face side and edge. You need these reference surfaces to check your progress.

Planing an edge against the bench stop gives you instant feedback. If the workpiece falls over, you're not centered over it, or you're pressing sideways instead of down.



To plane end grain in the vise, you need a sharp and finely set blade, a plane with heft, and a deep knife line squared all around the workpiece. I prefer the 07 jointer because it is heavy enough to make a smooth cut. People commonly attack end grain with a block plane, but that tool is too small to grasp easily and too light to tackle anything but a very tiny area. The deep knife line will prevent splintering at the far end of the cut.

Planing Across the Grain

The technique for flattening wide surfaces and for taming difficult grain is the same: plane across the grain. Whether you want to flatten your workbench or smooth an ornery piece of sapele, you will need a straightedge and winding



Difficult figure, like this interesting walnut knot and feather, is easy to plane cross-grain.

sticks to check your progress and a bench brush to get rid of the debris. Begin with the blade set coarse and work straight across the grain, or at an angle of up to 40 degrees from straight across. Check the surface frequently, get it flat quickly, then begin to refine it. Keep a sharp blade in the plane, and remove ever-finer shavings until you get a down-like fuzz. Now a once-over with 220 or finer sandpaper will leave a great surface ready to finish.

Ian Kirby is a master woodworker, designer and wood scientist. Ian is one of the true masters of the British Arts & Crafts tradition. Look for his continuing series on woodworking design in upcoming issues of Woodworkers Journal.



An end grain shooting board has a stop to trap the work and a ledge where the plane rides. The secret is the plane's heft, allowing you to power across the hardest wood. Scribe a knife line all around the workpiece. It prevents splintering and shows you where to stop.



A shooting board gives you a clear view of the cut as you progress toward the knife line.

How many planes does a woodworker need?



Two planes do it all: Record's 04-1/2 smoother (left) and Lie-Nielsen's 07 bedrock jointer.

Name	Number	Length	Width
Smooth	03	varies	2"
Smooth	04	10"	2"
Smooth	04-1/2	10"	2 3/8"
Jack	05	14"	2"
Fore	06	18"	2"
Trying	07	22"	2 3/8"
Trying	08	24"	2 1/2"

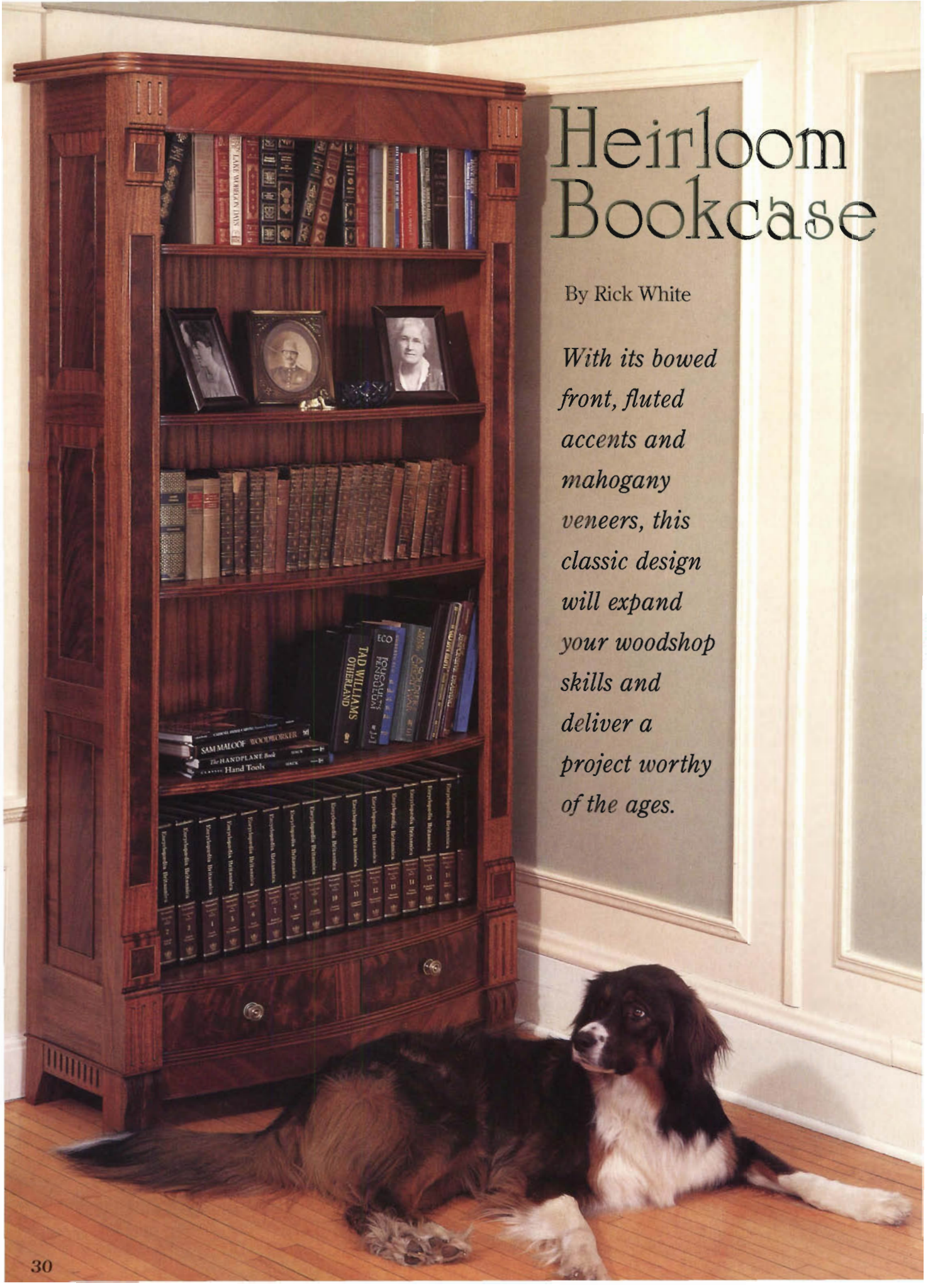
In my life as a furniture maker, I've only ever seen the need for two bench planes: an 04-1/2 and an 07. These lengths suit

all occasions and can solve almost any furniture-making problem.

Sharpening convenience is the reason for choosing the 04-1/2 smoother over the 04. Its wide blade matches the one in the 07, allowing me to keep about 20 identical blades that fit either tool. I can swap dull blades for sharp ones without interruption. Then I have one big sharpening session, using the grinder and stone setup

of a bench plane is indicated by a number cast into the body (see chart). Longer planes are heavier, but the underlying point is the length of wood that can be made flat. It's not an exact science, but you can flatten an edge that's about three times the length of your plane. Thus with an 07, which is 22 inches long, you can straighten a six foot edge. It's much more difficult to create flatness than to retain it once established.

described in my book, *Sharpening with Waterstones*. Although not a strict industry standard, the length and width



Heirloom Bookcase

By Rick White

With its bowed front, fluted accents and mahogany veneers, this classic design will expand your woodshop skills and deliver a project worthy of the ages.



With veneer,
all of these
great design
options
start to
appear.
Simple frame
and panel
projects
turn into
beautiful
works of art.

Rick White

I have a mental picture of one of my descendants telling a moving guy to be careful with this piece because "it was built by my great, great-grandfather over a century ago." By then, it will have been in the White family for four generations. That's the kind of notion that tends to keep you going when you tackle a project like this bookcase.

As different as the various sections of the bookcase look, all of the lumber used here is farm raised Honduras mahogany in various guises. Solid mahogany stock is attractive, stable and a joy to work. I built the shelves and back of the case from mahogany plywood, but the distinctive beauty of the piece is created by contrasting mahogany crotch and ribbon veneers.

Flattening the Veneer

You'll need to address the crotch veneers up front because it takes a little time for them to become workable. They're taken from the part of a tree where two large branches create a "Y", so it's their nature to have erratic grain, making them wavy and brittle. By clamping them in a press now, you can straighten them while

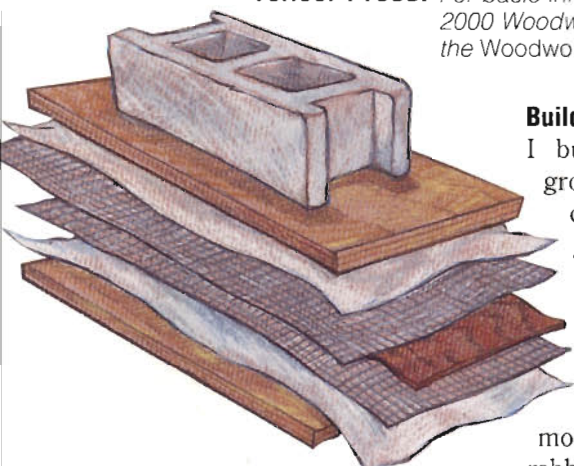
you build the bookcase base. That way, they'll be available when you get ready to make the sides.

A nice trick is to take a large piece of paper and cut a rectangular hole in it the same size

as the veneer you require. Use it as a moving window to view and select just the right areas of dramatic grain pattern from larger sheets of veneer. Trim these about an inch oversize before you flatten them.

Create the simple, shop-made veneer flattening press shown in the illustration on the next page. Soak the wavy veneer in a commercially available glycerine-based softener, following the manufacturer's instructions. Then lay it between two layers of window screen (to allow a little air movement). Place this assembly between several sheets of brown kraft paper —

Veneer Press: For basic information on veneering, look back to Ian Kirby's article in the April 2000 *Woodworker's Journal*. The article is also available in the current issue of the *Woodworker's Journal eZine*, available at www.woodworkersjournal.com.



the type used to make grocery bags — to soak up the excess moisture. Use a scrap of 3/4" plywood on the top and bottom to ensure flatness, then weigh the whole thing down with a concrete block or two. After the veneer has dried, quickly apply it to its plywood substrate and put it under pressure. Crotch veneer has a memory, and its wavy nature will reappear if it is not quickly glued and clamped in place. While the veneer is drying, start working on the base.

Building From the Bottom

I built the bookcase from the ground up. All four feet (pieces 1) can be made from a 24" long, glued-up block of mahogany measuring 2 1/2" x 3 1/4".

Crosscut the stock to length and chamfer the two back feet as shown in the drawing, below right. Chop a stopped mortise and a corresponding large rabbet into the back and inside faces of the legs. See the **Pinup Shop Drawings** on the center pull-out for dimensions and locations of the construction details.

Cut the base front, back and sides (pieces 2 and 3) to size. Use a cove bit and a straightedge to create the stopped flutes in the outside faces of the sides, following the dimensions shown on the **Pinup Shop Drawings**.

Make the foot plinth blocks (pieces 4) by following the guidelines in the sidebar at right. Next,

cut the two curved plywood supports (pieces 5) to size and shape. Screw and glue these supports to the base front, then rip the 1/4" plywood backer (piece 6) to size. Secure the backer to the curved supports with glue and brads, then refer to the sidebar below to apply ribbon veneer (pieces 7) to the backer. After the glue dries, trim the veneer flush with the edges all round using a sharp knife, sandpaper and a file.

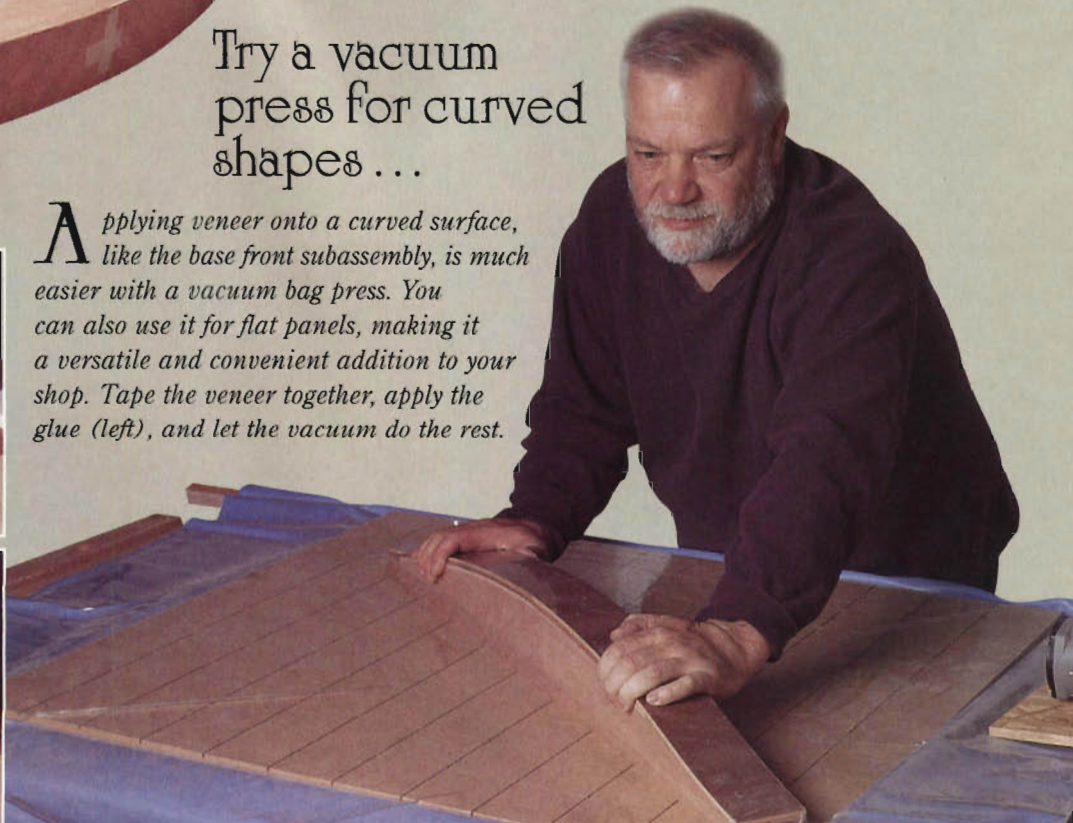
Finish off the base by adding 1/4" thick moldings (pieces 8 through 10) at the locations shown on the **Exploded View** at right. Shape both front edges (the bullnoses) of each of these pieces on the router table with a 1/8" roundover bit and a fence. Note that the bullnosed moldings are of various widths, and that the top pieces are mitered where they meet. After dry-fitting these pieces to the base assembly, secure them

Base Subassembly Cutaway



Try a vacuum press for curved shapes ...

Applying veneer onto a curved surface, like the base front subassembly, is much easier with a vacuum bag press. You can also use it for flat panels, making it a versatile and convenient addition to your shop. Tape the veneer together, apply the glue (left), and let the vacuum do the rest.



in place with glue and clamps. Cut, fit and attach the base cleats (pieces 11) to the inside faces of the base sides, front and back.

The Carcass Sides

The bookcase is built around two 3/4" plywood sides (pieces 12), to which the shelves and the stile and rail subassemblies are attached. Before ripping them to width, locate and plow five dados and a rabbet on the inside face (check the **Pinup Shop Drawings** for locations). By doing this before you separate the panels, you ensure that the dados and rabbet will line up perfectly.

The outside faces of these plywood sides are covered with stile and rail subassemblies. Each is comprised of two vertical hardwood stiles (pieces 13 and 14) and four horizontal rails (pieces 15, 16 and 17). After ripping them to size, use a 1/4" dado head to plow

Fluting on the router table

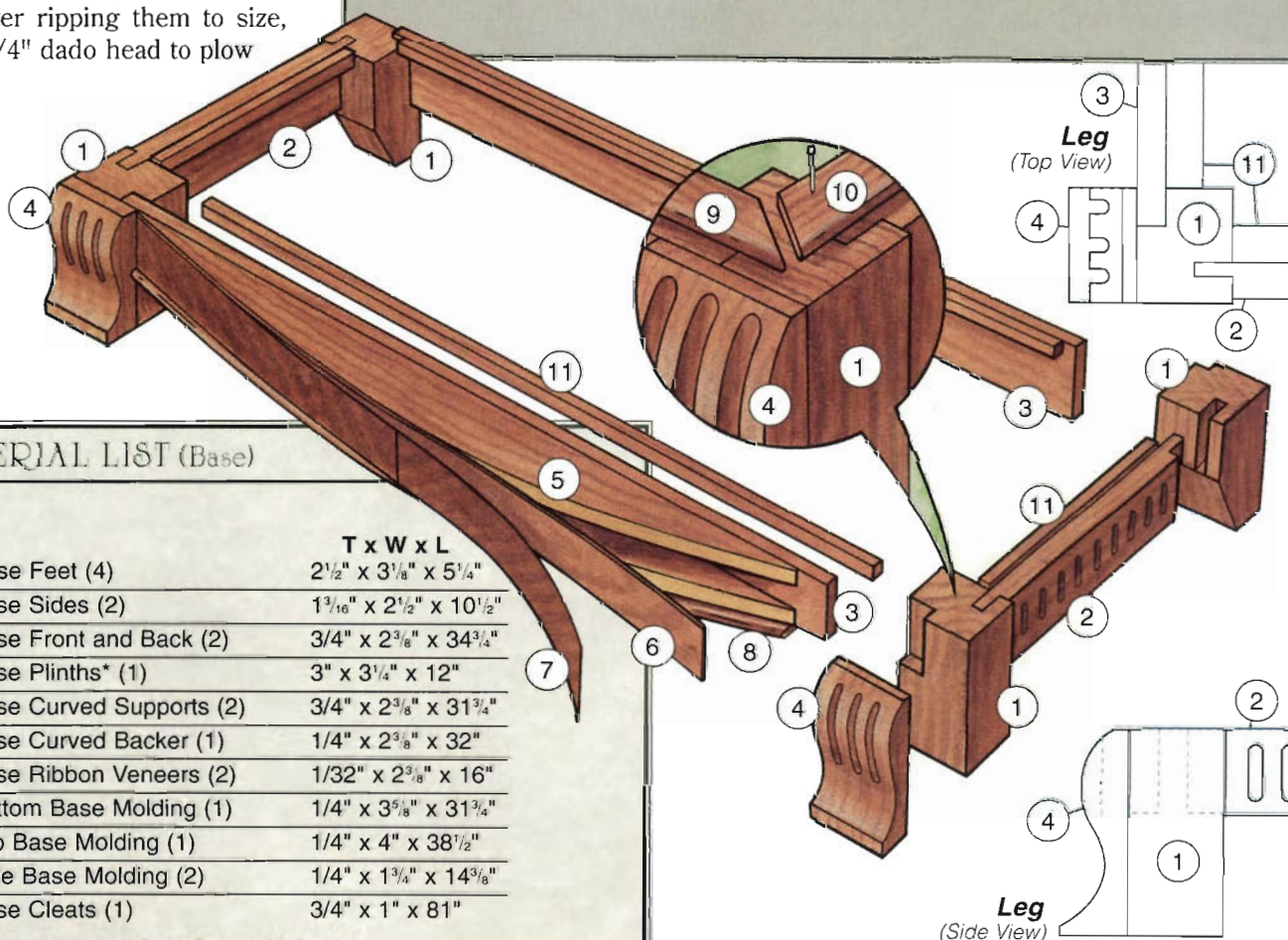
The front feet are adorned with curved and fluted plinth blocks, which are fluted before being cut apart. Band saw the curved shape (see the Full-size Pattern on the pullout), then use a 3/8" core box bit in your router table to create the three flutes in each block. Crosscut them into two blocks on the table saw, then sand them before attaching them to the front feet with glue and clamps.



Step 1: Start by band sawing the curved shape onto the front face of each plinth block while they are both still part of the same piece of raw stock.



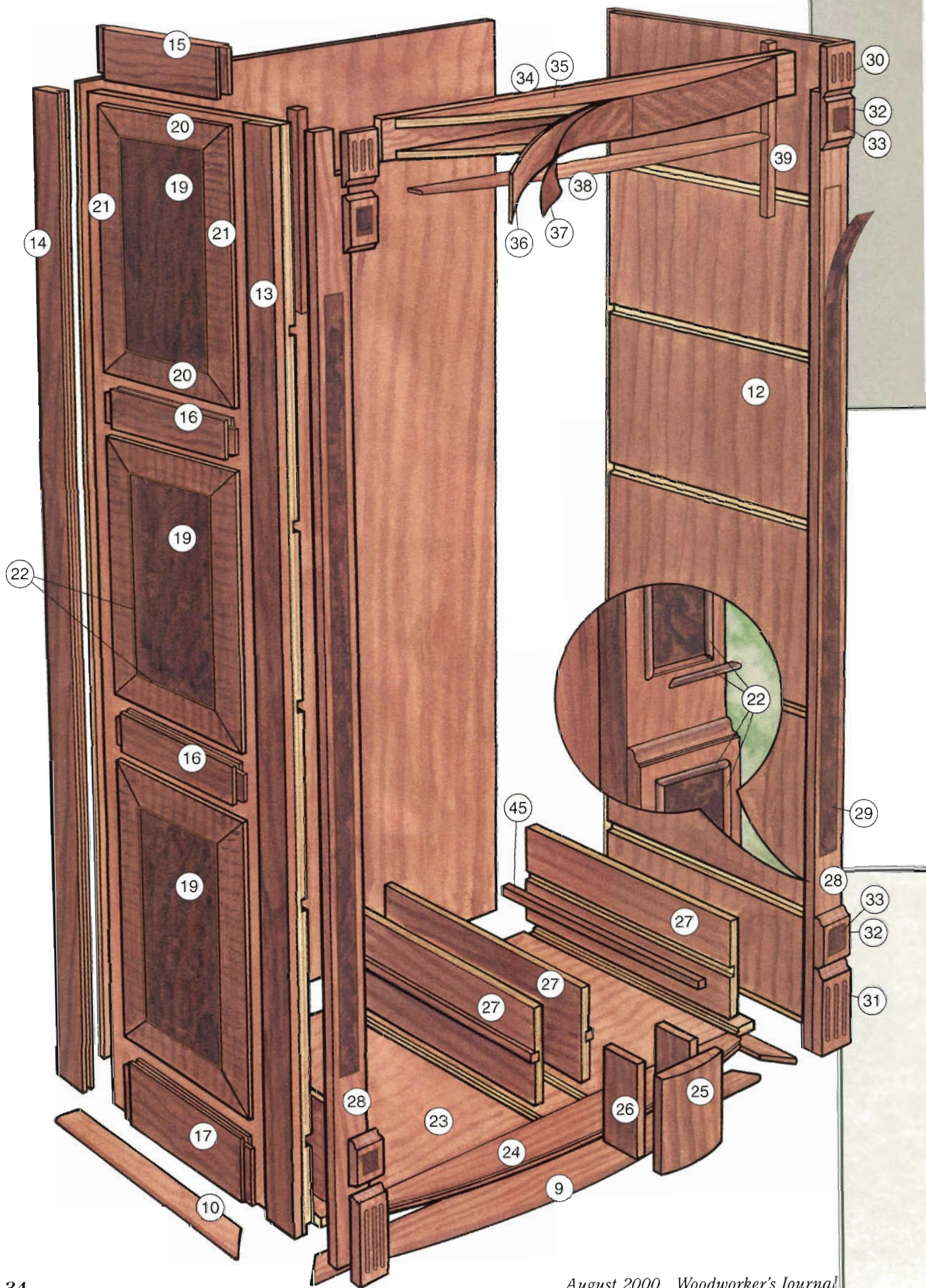
Step 2: Use a core box bit to plow three flutes in both pieces at the same time (see Full-Size Pattern for shape). As you can see, the flute cut will be deeper at the center of the curve.



MATERIAL LIST (Base)

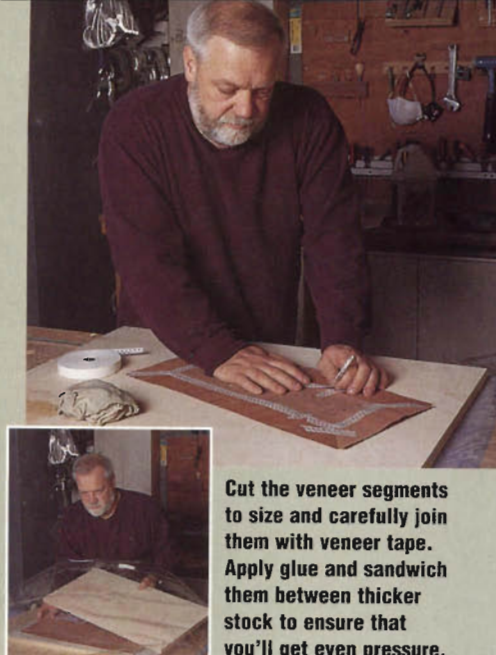
	T x W x L
1 Base Feet (4)	2 1/2" x 3 1/8" x 5 1/4"
2 Base Sides (2)	1 3/16" x 2 1/2" x 10 1/2"
3 Base Front and Back (2)	3/4" x 2 3/8" x 34 3/4"
4 Base Plinths* (1)	3" x 3 1/4" x 12"
5 Base Curved Supports (2)	3/4" x 2 3/8" x 31 3/4"
6 Base Curved Backer (1)	1/4" x 2 3/8" x 32"
7 Base Ribbon Veneers (2)	1/32" x 2 3/8" x 16"
8 Bottom Base Molding (1)	1/4" x 3 3/8" x 31 3/4"
9 Top Base Molding (1)	1/4" x 4" x 38 1/2"
10 Side Base Molding (2)	1/4" x 1 3/4" x 14 3/8"
11 Base Cleats (1)	3/4" x 1" x 81"

*Dimension shown allows for machining as demonstrated in the sidebar, above right.



Veneering the side panels

Each of the six veneered side panels is laid up on a 1/4" thick plywood base. The center of each panel is a piece of mahogany crotch veneer, and this is surrounded by a 2" wide mitered frame of ribbon veneer (shown at left). Trim the pieces to their proper shape with a sharp knife and steel straightedge, then use veneer tape (on the faces that will be exposed) to assemble the five pieces. The tape will be sanded off later. Spread the glue and apply even pressure with your veneer press.



Cut the veneer segments to size and carefully join them with veneer tape. Apply glue and sandwich them between thicker stock to ensure that you'll get even pressure.

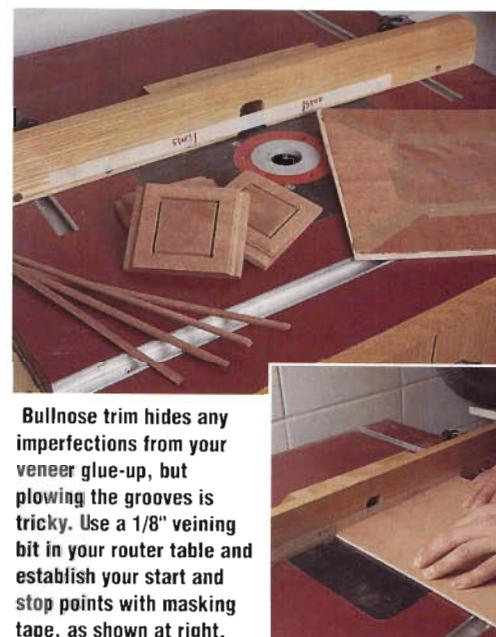
a groove down the center of one edge of each stile. Make a matching groove in one long edge of each top and bottom rail and in both long edges of the middle rails. Staying with the dado head, form two rabbets on each end of the rails (thus producing a tongue). Dry assemble the stiles and rails to check their fit, then disassemble before moving on to the six panels.

Creating the Veneered Panels

Each stile and rail framework houses three plywood panels (pieces 18), which are veneered on their outside faces (with pieces 19, 20 and 21). Follow the guidelines shown above to lay up the panels.

Remove the panels from the press and use a 1/8" veining bit to plow stopped grooves, as shown at right. These grooves straddle the joint between the ribbon and crotch veneers and house the bullnose molding strips (piece 22), which help create the 3D effect of a raised panel. Miter the molding to fit, then glue and clamp it in place.

Once the panels are well sanded, assemble the two frame and panels. Glue and clamp the frames together, checking for squareness and flatness as you go. Don't glue the panels in their grooves: they should be allowed to float freely. Sand the frames after the glue dries, then set them aside for a while.



Bullnose trim hides any imperfections from your veneer glue-up, but plowing the grooves is tricky. Use a 1/8" veining bit in your router table and establish your start and stop points with masking tape, as shown at right.

MATERIAL LIST (Carcass)

	T x W x L
12 Carcass Sides (2)	3/4" x 12 1/2" x 73 3/8"
13 Front Stiles (2)	3/4" x 1 3/4" x 73 3/8"
14 Back Stiles (2)	3/4" x 2 3/8" x 73 3/8"
15 Top Rails (2)	3/4" x 4" x 9"
16 Middle Rails (4)	3/4" x 2 1/2" x 9"
17 Bottom Rails (2)	3/4" x 5 3/4" x 9"
18 Side Panels (6)	1/4" x 8 15/16" x 19 15/16"
19 Crotch Veneers (6)	1/32" x 4 19/10" x 16 1/16"
20 Horizontal Ribbon Veneers (12)	1/32" x 2 1/2" x 9"
21 Vertical Ribbon Veneers (12)	1/32" x 2 1/2" x 20"
22 Bullnose Molding Strips (1)	1/8" x 1/4" x 525"
23 Shelves (6)	3/4" x 12 1/2" x 35 3/4"
24 Shelf Edging (6)	3/4" x 3 3/8" x 31 3/4"
25 Drawer Divider (1)	7/8" x 2 1/2" x 4 1/2"

	T x W x L
26 Drawer Returns (2)	3/4" x 2 3/8" x 4 1/2"
27 Drawer Walls (4)	3/4" x 5 1/4" x 12 1/2"
28 Decorative Front Stiles (2)	3/4" x 3 1/8" x 73 3/8"
29 Front Stile Burl Veneers (2)	1/32" x 2" x 48"
30 Top Fluted Plinths (2)	3/4" x 3 1/8" x 4"
31 Bottom Fluted Plinths (2)	3/4" x 3 1/8" x 6"
32 Veneered Plinths (4)	1/2" x 3 1/8" x 4 1/8"
33 Plinth Burl Veneers (4)	1/32" x 2 1/4" x 2 1/4"
34 Apron Backer (1)	3/4" x 3 7/8" x 33 3/4"
35 Apron Horizontal Supports (2)	3/4" x 2 3/8" x 31 3/4"
36 Apron Front (1)	3/4" x 3 7/8" x 32"
37 Apron Veneers (2)	1/32" x 4 1/2" x 17"
38 Apron Bottom Trim (1)	1/8" x 2 7/8" x 31 3/4"
39 Glue Blocks (2)	1" x 1" x 11 3/8"

Making the Shelves and Starting the Assembly Process

This bookcase is built around a carcass that takes shape when you attach the two dadoed sides you made earlier to a series of six fixed shelves. The lowest shelf is covered by a pair of drawers. All six shelves are mahogany plywood rectangles (pieces 23), faced with curved, solid wood edging (pieces 24).

After cutting the shelves to size, band saw the front faces of the edging to shape (see the **Pinup Shop Drawings**). This can be done in groups of threes by taping the stock together, as shown below. Keep the waste pieces and use them as clamping blocks when gluing the edging to the shelves.

Sand the curves, then mill a triple bead in them with a beading bit chucked in the table router, as shown in the photo below. To keep things lined up, cut biscuit slots in the shelves and edging before applying glue and biscuits. Make use of the curved waste pieces when clamping the edging in place, as shown below.

After the glue has dried, sand the shelves smooth. Cut the drawer divider (piece 25) to shape (see the **Pinup Shop Drawings**). Cut the drawer returns (pieces 26) from hardwood stock and the drawer walls (27) from plywood. Now machine the grooves in the drawer walls (for the drawer runners) and

the grooves on the lower and second shelves (for the walls). Screw and glue the shelves into the carcass dadoes. Apply glue to the grooves in the bottom two shelves and slide the four drawer walls in place. Moving fast, glue the divider and returns to the interior drawer walls and clamp these pieces in place between the two bottom shelves. Turn to the completed base subassembly and screw and glue it in place. Finally, glue and clamp the stile and rail assemblies to the outside of the assembled carcass. Now you're feeling like you've made some progress.

The Decorative Stiles

The front facade of the bookcase boasts two hardwood stiles (pieces 28) that are embellished with plinth blocks and veneered panels.

Note the notched cutout shape at the top of each, creating a right and left stile. Start on these



Bow front shelves

The plywood shelves are edged with hardwood after the front face of the edging has been beaded.

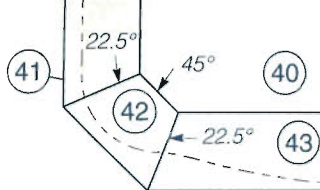
The author gang cuts three shelf edging strips to shape at the same time.



The distinctive front of the shelf edging is formed with a triple beading bit (see inset).



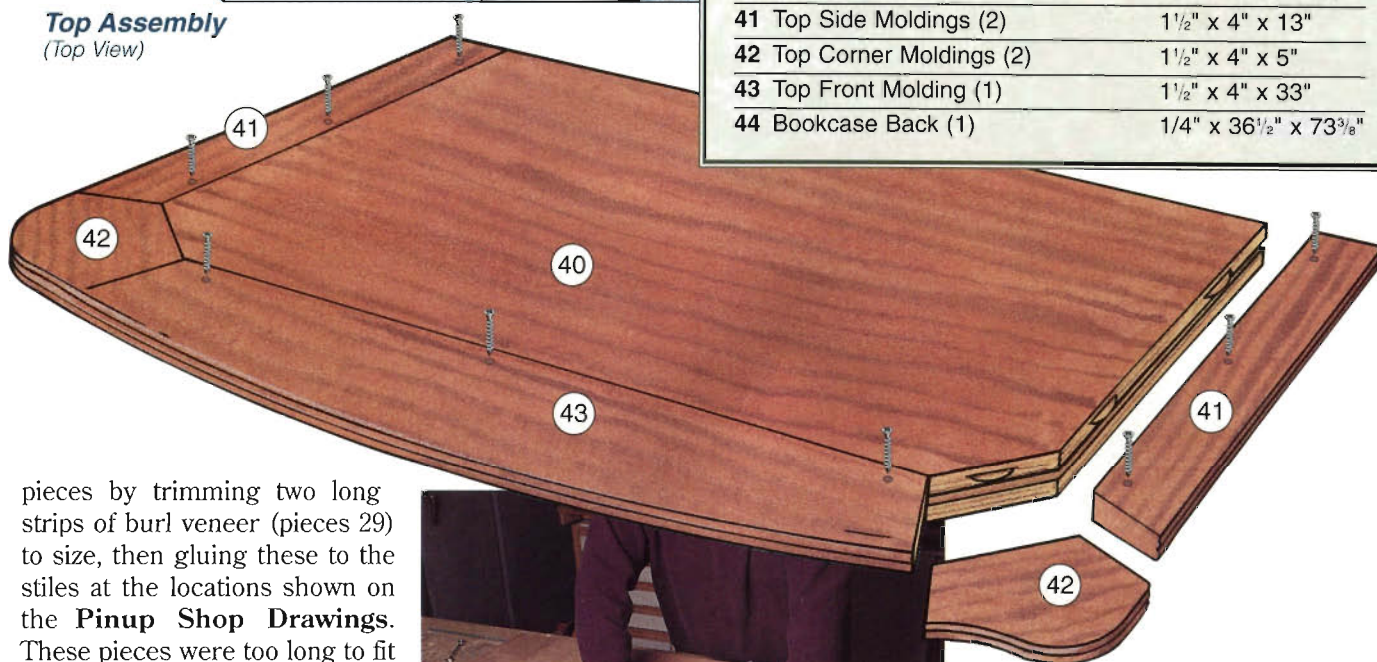
After cutting the biscuit slots and applying glue and biscuits, use the curved waste piece to help clamp the edging to the shelf.



Top Assembly
(Top View)

MATERIAL LIST (Top and Back)

	T x W x L
40 Top Panels (2)	3/4" x 13 1/2" x 35"
41 Top Side Moldings (2)	1 1/2" x 4" x 13"
42 Top Corner Moldings (2)	1 1/2" x 4" x 5"
43 Top Front Molding (1)	1 1/2" x 4" x 33"
44 Bookcase Back (1)	1/4" x 36 1/2" x 73 3/8"



After slotting for biscuits, apply glue and then secure the five pieces of beaded trim around the top using a band clamp.

pieces by trimming two long strips of burl veneer (pieces 29) to size, then gluing these to the stiles at the locations shown on the **Pinup Shop Drawings**. These pieces were too long to fit into my vacuum bag system, so I used yellow glue and a clamping caul (a strip of melamine covered MDF) to provide ample pressure for veneering. Use a veining bit to plow stopped dados around the edges of the veneer strips (like you did earlier on the side panels), then use up more of the 1/8" bullnose trim you made earlier. Miter this molding to fit into the dados and glue it in place.

Cut the top and bottom fluted plinth blocks (pieces 30 and 31) to size, then use a core box bit to plow flutes in their front faces. On such small pieces, make several router passes to reduce the tool's drag and preserve your grip (not to mention your fingers). After fluting, chuck an ogee bit in the table router to mill a classic profile on the top edge of the bottom plinth and the bottom edge of the top one. Sand them free of machining marks, then glue and clamp them to the decorative stiles.

The last two elements on each stile are smaller veneered plinths (pieces 32) with an ogee cut along their top and bottom edges. Glue a small rectangle of burl veneer (piece 33) to each block, as shown on the **Pinup Shop Drawings**.

Once again, use your table mounted router to plow shallow stopped dados around the veneer and miter more of the bullnose molding (piece 11) in the dados. After sanding, glue and clamp these blocks to the decorative stiles. Dry fit the stiles to the carcass to check their height, then temporarily secure them with clamps while you move on to the top apron.

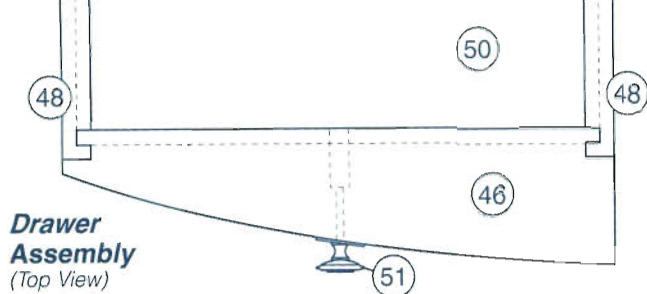
Building the Curved Top Apron

The curved apron that supports the top of the bookcase starts with a 3/4" plywood backer (piece 34). Two horizontal supports (pieces 35) are screwed and glued to this after their front edges have been band sawn to a curve. Bend a piece of 1/4" plywood (piece 36) along the curve and secure it with glue and small brads or pins.

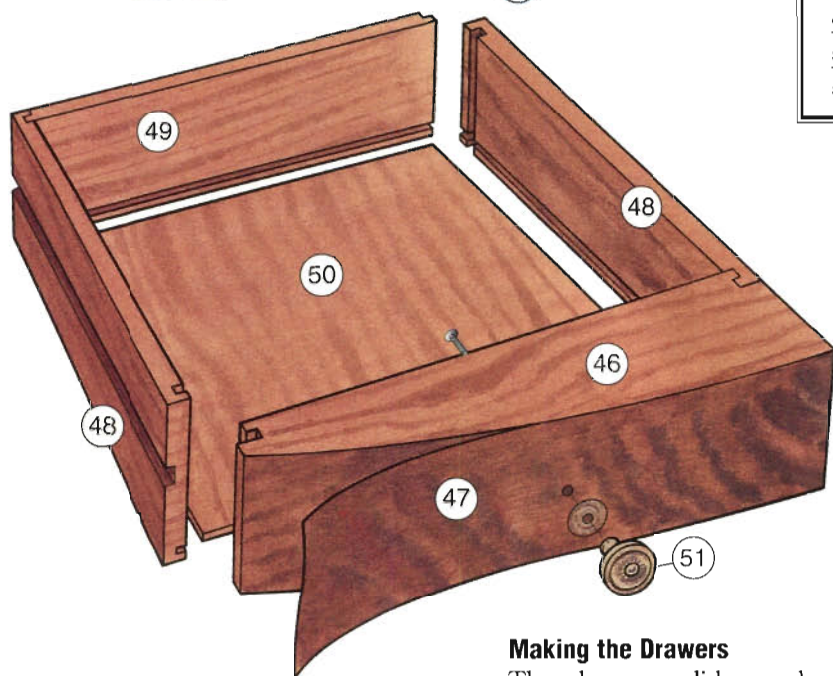
Select two pieces of book-matched ribbon veneer with grain at about a 45° angle (pieces 37), then glue these to the curved front of the apron as you did to the curved base subassembly. Dry fit the stiles and apron to the carcass, then cut the hardwood trim (piece 38) that will face the bottom of the apron. Make minor adjustments for a perfect fit, bullnose the front edge of the trim, then glue and clamp it in place. Now glue the decorative stile and apron assembly in place with the help of a couple of hidden glue blocks (pieces 39), as shown in the **Exploded View**.

Assembling the Top

To achieve the proper sense of proportion, the top of the bookcase is made from two sheets of 3/4" mahogany plywood (pieces 40) face-glued together. And to stay in keeping with the rest of the design, the top is edged on the front and sides with hardwood (pieces 41, 42 and 43). This molding is glued on in its sticked-up form. Band saw the gently curved shapes after the top has been glued up.



Drawer Assembly
(Top View)



MATERIAL LIST (Drawers)

	T x W x L
45 Drawer Runners (4)	1/2" x 3/4" x 12 1/2"
46 Drawer Fronts (2)	3 1/2" x 4 3/8" x 14 3/8"
47 Drawer Veneer (2)	1/32" x 4 5/8" x 15"
48 Drawer Sides (4)	3/4" x 4 3/8" x 13"
49 Drawer Backs (2)	3/4" x 4 3/8" x 13 1/2"
50 Drawer Bottoms (2)	1/4" x 13 1/2" x 12 3/8"
51 Drawer Pulls (2)	Antique Brass

Temporarily clamp each drawer together and test fit it in its opening. When everything appears right, assemble them permanently with glue and clamps. Sand the entire project to 220 grit sand paper. I used a light walnut General Finishes stain on the bookcase to good effect. It brought out the various grain patterns and veneer pieces very well. I followed with three coats of semi-gloss polyurethane to bring out the rich depths of the mahogany veneers and to protect the shelves from scratches.

Chop a few biscuit slots in the top and the moldings, then apply glue and assemble the parts. Exert equal pressure all the way around with a band clamp, as shown in the photo on the preceding page. After the glue dries, band saw the edging to shape and bead the fresh edges (see **Pinup Shop Drawing**).

Secure the top to the case with counterbored screws driven down through the top into pilot holes drilled in the top rails and apron. Cover the screws with mahogany plugs and sand them flush.

Installing the Back

With the top assembly in place, you can close up the bookcase by attaching the back (piece 44). Chuck a small rabbeting bit in your portable router to mill a 1/4" rabbet in the top and carcass sides, then square the corners with a chisel. Cut the back to fit with about 1/16" of play, then make sure the cabinet is perfectly square before you secure it with 1" panel pins. Pin the back to the shelves, too.

Making the Drawers

The drawers slide on hardwood runners (pieces 45) that are cut to size and installed into the grooves you plowed earlier.

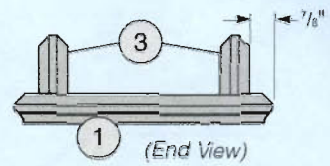
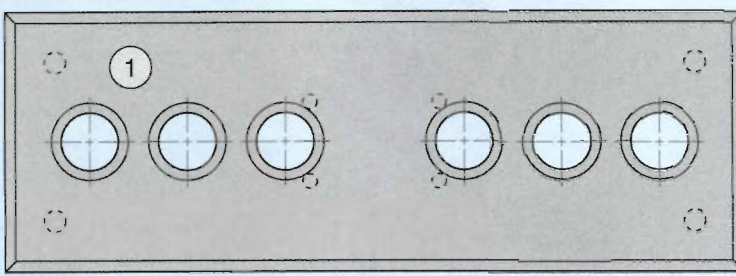
Band saw the drawer fronts (pieces 46) from a glued-up solid piece of mahogany and create the locking rabbets on either side with a dado head in the table saw. Sand the curved fronts. Again, select book-matched crotch veneer (pieces 47) and glue it to the drawer fronts, then trim it flush all around. Cut the sides (pieces 48) to size, then use the dado head to plow a groove in each of them for the drawer slides. Stay with the dado head to cut matching locking dadoes to secure them to the front and the drawer backs (pieces 49), then change the cutterhead to 1/4" thickness to mill grooves in the fronts, sides and backs for the drawer bottoms (pieces 50). Drill a hole in each front for a pull (piece 51): this will have to be counterbored from the back, as the screw won't be long enough.



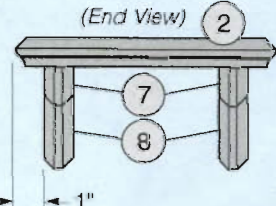
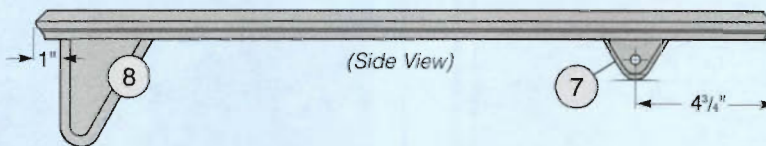
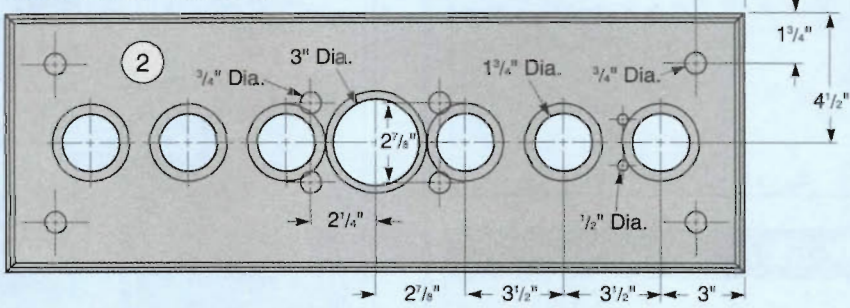
Wheel
(Full-size
Storyboard)

5

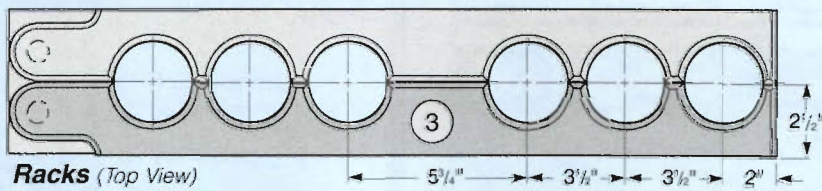
Cart Top (Top View)



Cart Bottom (Top View)

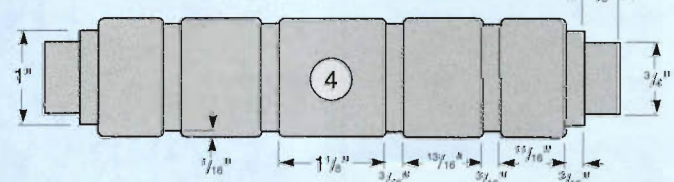


Note: Use the hole saw while piece 3 is square.
Rip the piece down the middle and form the
ends on the bandsaw, shown full-size at far right.



Racks (Top View)

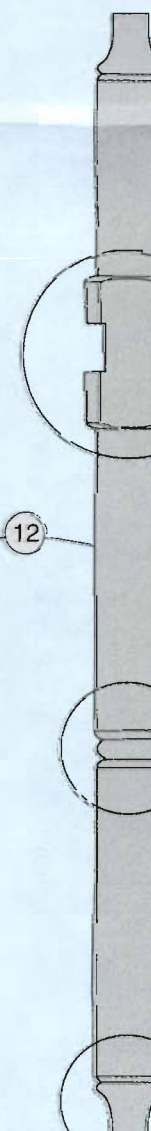
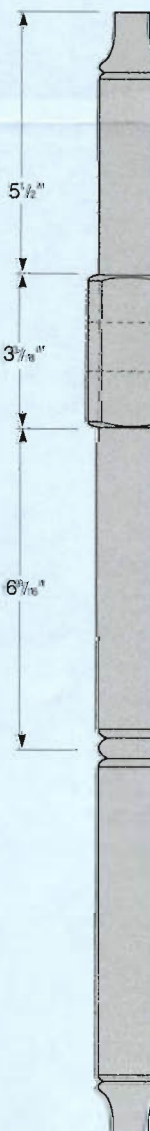
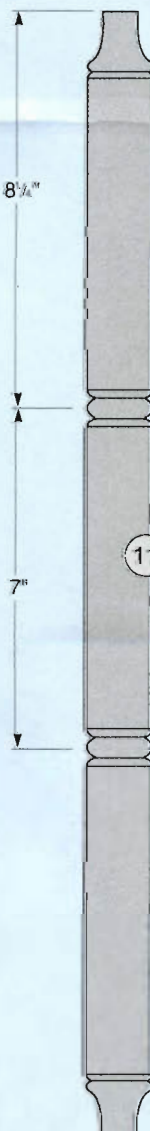
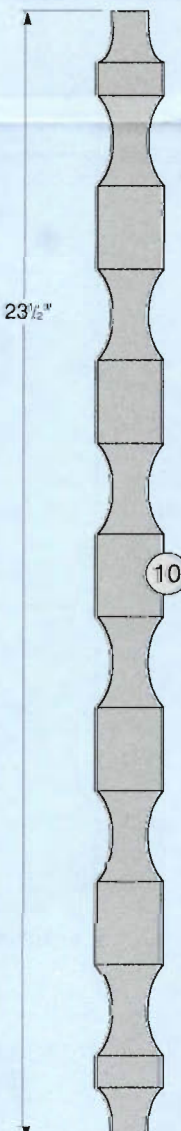
Handle (Section View)



**Center
Column**
(Section View)

Front Leg
(Section View)

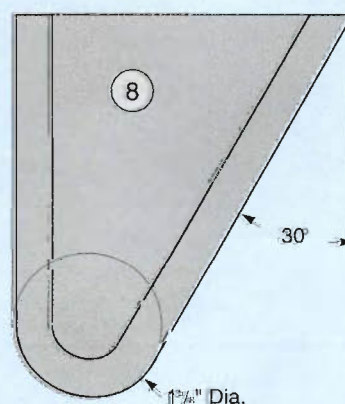
Back Leg
(Section Views)



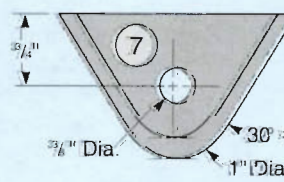
**Center
Column**
(Full-size
Storyboard)

10

Front Feet
(Side View)



Axle Support
(Side View)



16

Full-Size Patterns

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

Miniature Shadow Boxes

The article provides everything for box #5; here's the material lists for the other five boxes and a full-size pattern for the push stick.



Heirloom Bookcase

All the elevations for this large casework project, plus a full-size pattern for the base plinth.



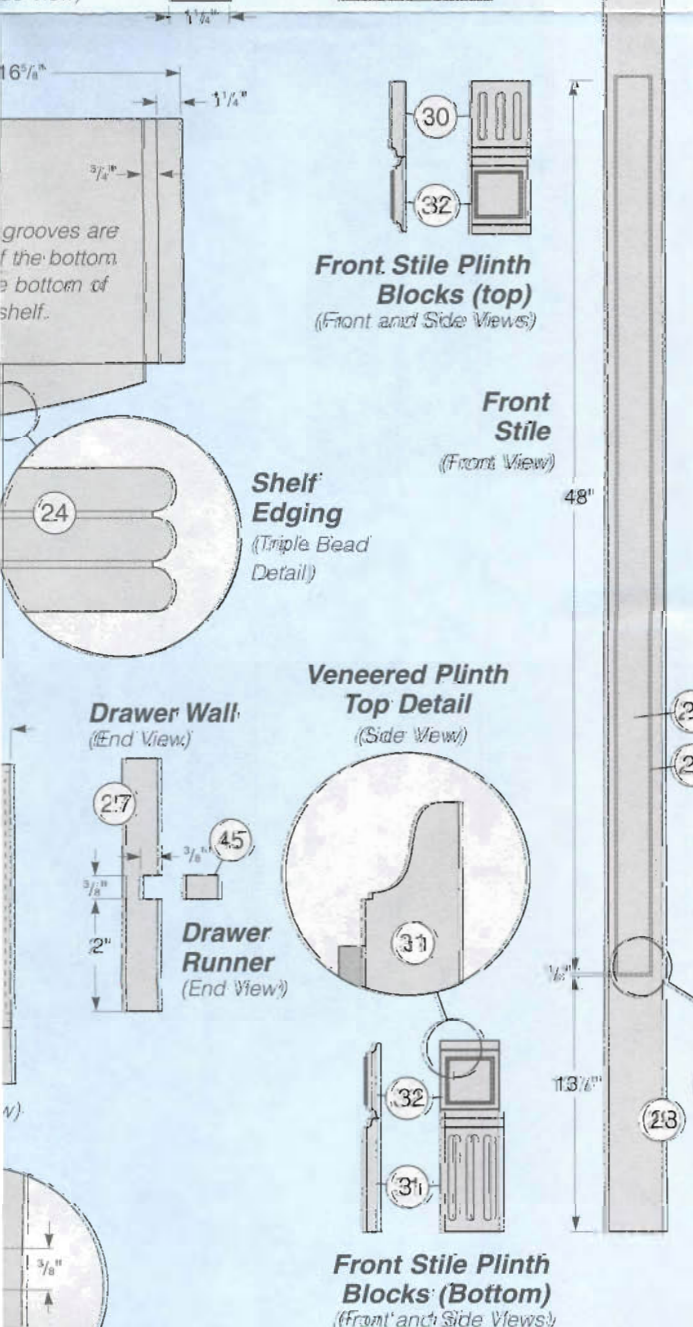
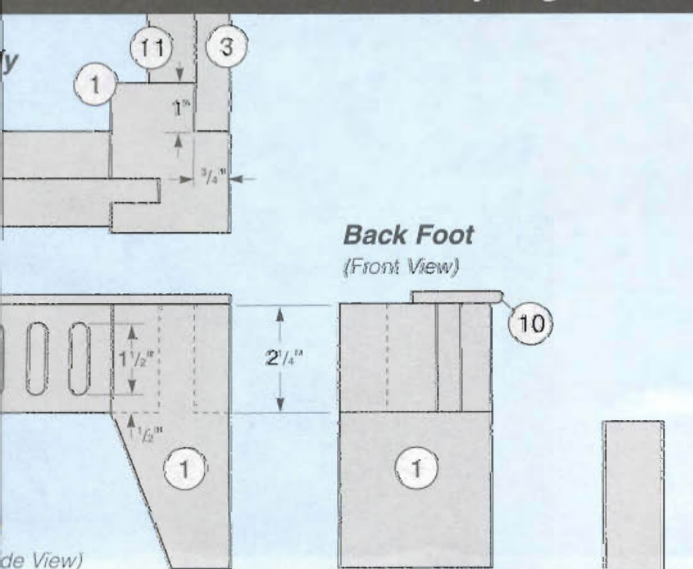
Croquet Set

Complete elevations, along with full-size patterns and storyboards for this delightful turning project.

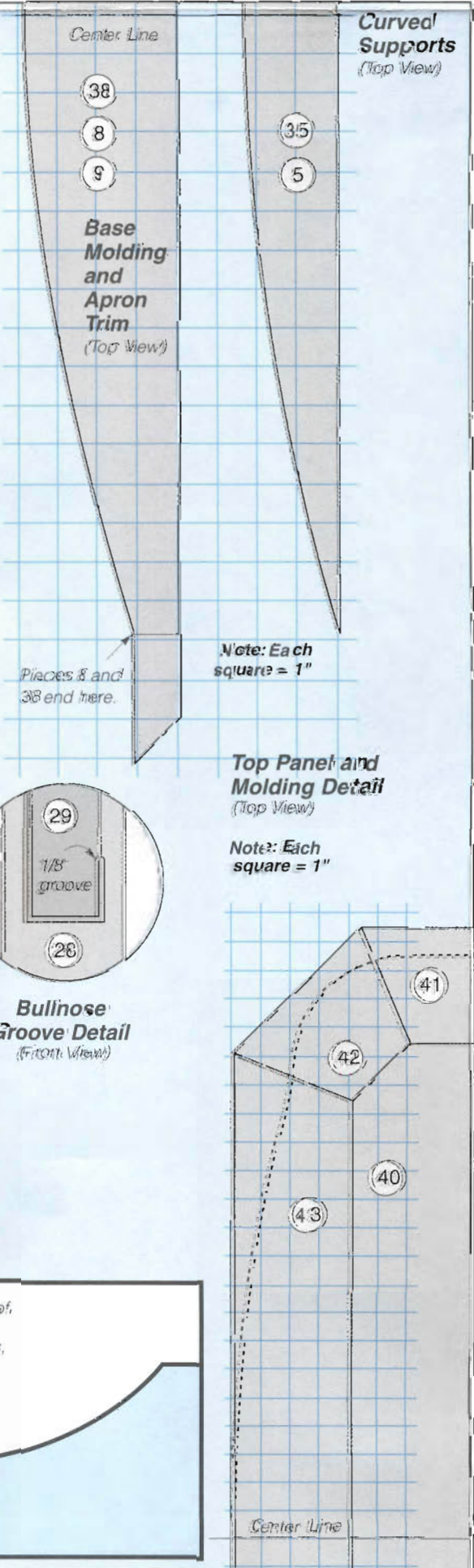


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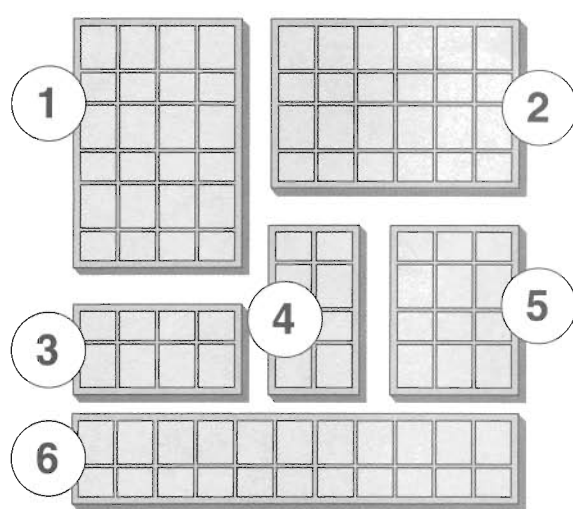
BOX 4	BOX 5*	BOX 6
T x W x L	T x W x L	T x W x L
1/4" x 5 7/8"	1/4" x 1 1/4" x 5 7/8"	1/4" x 1 1/4" x 3 3/8"
1/4" x 3 3/8"	1/4" x 1 1/4" x 4 1/2"	1/4" x 1 1/4" x 15 3/4"
1/8" x 5 5/8"	1/8" x 4 1/4" x 5 5/8"	1/8" x 15 1/2" x 3 1/8"
1/8" x 1"	1/8" x 1" x 1"	1/8" x 1" x 1"
1/8" x 2 5/8"	1/8" x 1" x 4"	1/8" x 1" x 15 1/4"
1/8" x 5 3/8"	1/8" x 1" x 5 3/8"	1/8" x 1" x 2 7/8"



Note: Both plinths are made out of the same piece of stock. They're separated after forming the flutes, as shown on page 33.



Six Shadow Boxes (Dimensions)



Push Stick

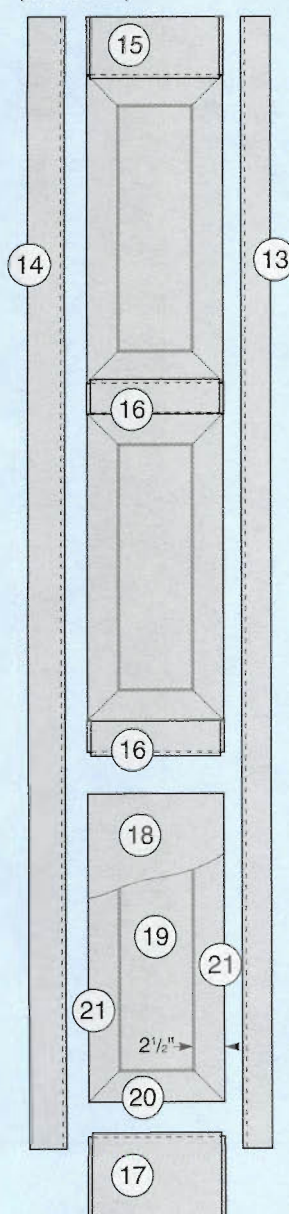
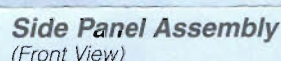
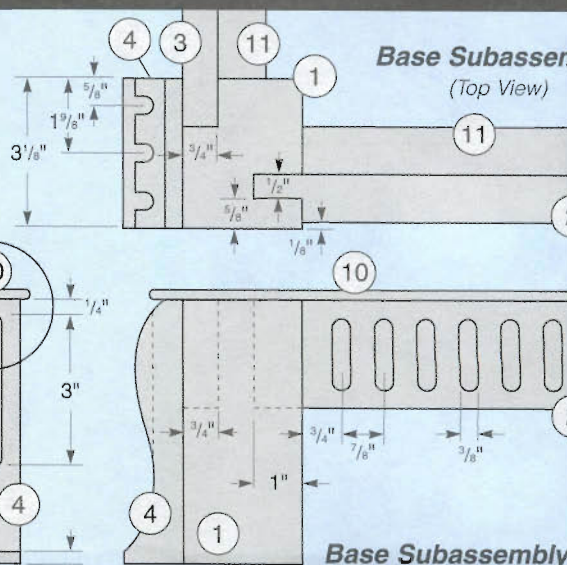
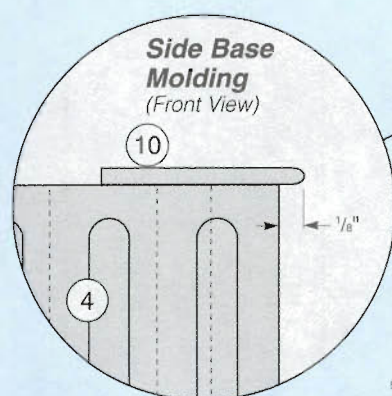
MATERIAL LIST	BOX 1	BOX 2	BOX 3	BOX 4
	T x W x L	T x W x L	T x W x L	T x W x L
1 Frame Sides (2)	1/4" x 1 1/4" x 8 3/8"	1/4" x 1 1/4" x 6 1/8"	1/4" x 1 1/4" x 3 1/8"	1/4" x 1 1/4" x 3 1/8"
2 Frame Top and Bottom (2)	1/4" x 1 1/4" x 6 1/8"	1/4" x 1 1/4" x 8 5/8"	1/4" x 1 1/4" x 6 1/8"	1/4" x 1 1/4" x 6 1/8"
3 Frame Back* (1)	1/8" x 5 7/8" x 8 3/8"	1/8" x 8 3/8" x 5 7/8"	1/8" x 5 7/8" x 2 7/8"	1/8" x 5 7/8" x 2 7/8"
4 Frame Splines (8)	1/8" x 1" x 1"	1/8" x 1" x 1"	1/8" x 1" x 1"	1/8" x 1" x 1"
5 Horizontal Dividers (3)	1/8" x 1" x 5 5/8"	1/8" x 1" x 8 1/8"	1/8" x 1" x 5 5/8"	1/8" x 1" x 5 5/8"
6 Vertical Dividers (2)	1/8" x 1" x 8 1/8"	1/8" x 1" x 5 5/8"	1/8" x 1" x 2 5/8"	1/8" x 1" x 2 5/8"

* Grain direction is with the width.

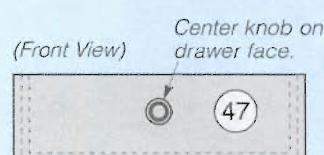
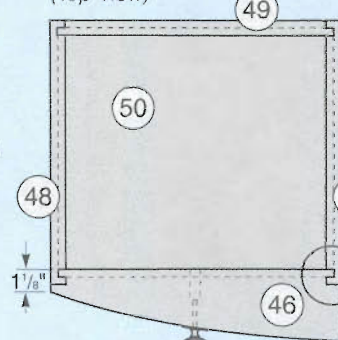
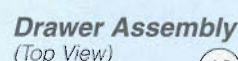
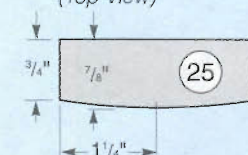
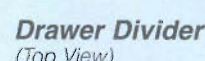
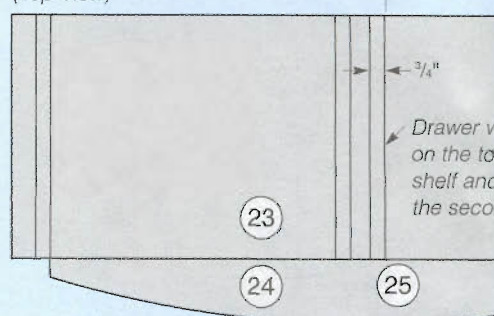
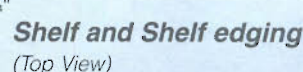
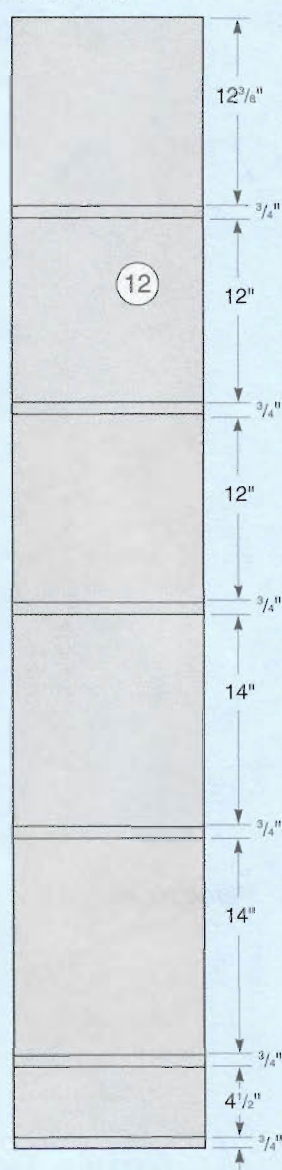
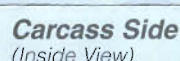
* Box 5 is the box shown in the article at right.

Pinup Shop Drawings

Heirloom Bookcase

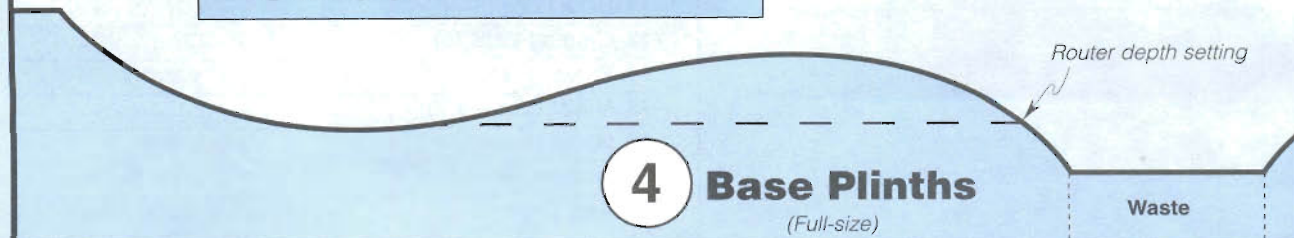


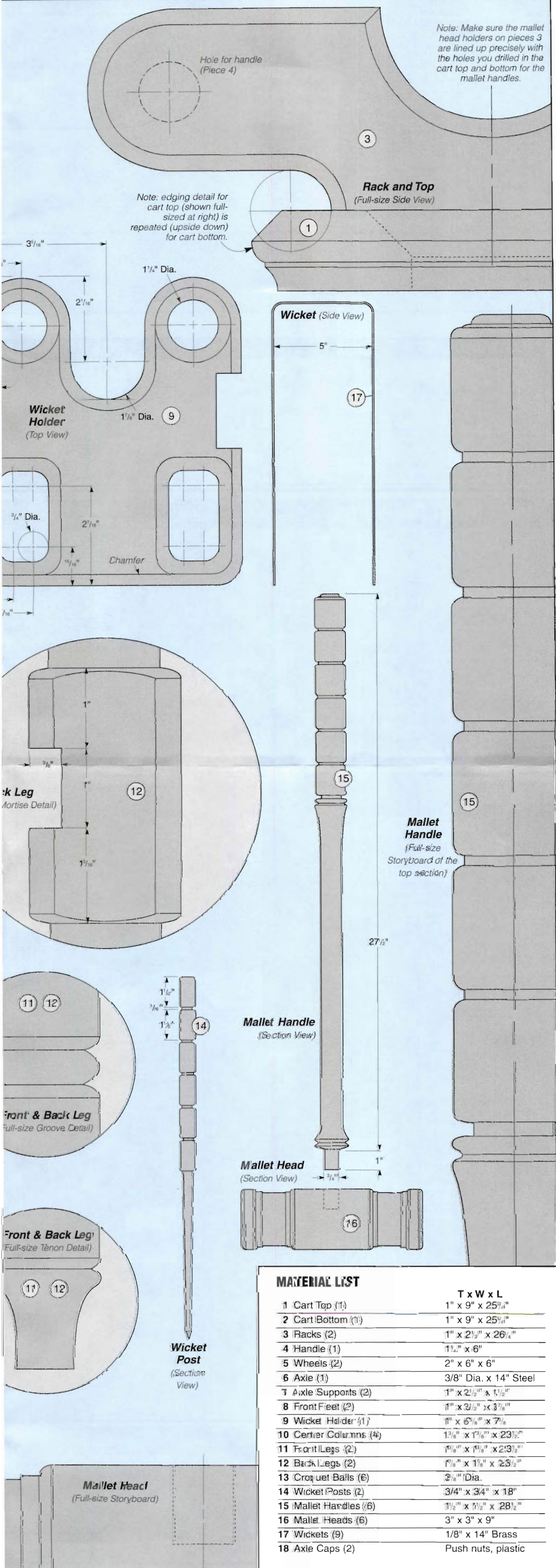
NOTE: Grooves for the side panels (in the stiles and rails) are 1/4" wide by 1/4" deep.



Center knob on
drawer face

Heirloom Bookcase





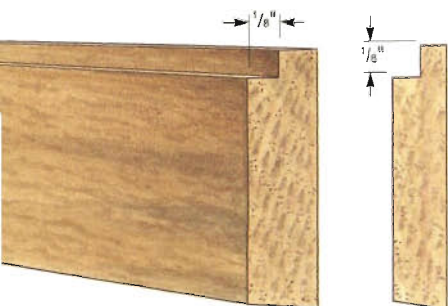


By John English

knew where she wanted to go, but didn't quite know how to get there. Something seemed vaguely familiar about her initial design: it took me a few minutes, but I remembered where I had seen it before. Her drawing resembled a wall-hung box that had graced my

grandmother's kitchen some 40 years ago. Building on that memory, we designed a series of complementary shadow boxes that offered Elizabeth a total of 98 compartments.

Rabbet for Back



Be sure to form the 1/8" rabbet for the back before cutting your sides to length.

Each oak box is an interlocking grid surrounded by a mitered frame. To add a little pizzazz, we dressed up the miters with walnut splines, then added an oak plywood back. Get started by seeing what hardwoods your supplier offers in 1/4" and 1/8" thicknesses, or refer to the sidebar below for guidelines on milling small parts.

The Mitered Frames

Each box has only six different parts. I'll describe how to build one box, and you can follow our **Material Lists** for the other five boxes, (shown on the center pull-out), or adapt them to your own sizes.

Rip some longer stock for your frame members (pieces 1 and 2) and form their rabbet, as shown at left. Make sure you guide these tiny workpieces with a push stick (see sidebar below): you can find a pattern for this critical tool in the **Full-size Pattern** at the center of this issue. With the rabbet in place, crosscut your pieces one inch longer than the dimensions shown in the **Materials List** on page 51.

You might be tempted to use the table saw's miter gauge to trim the frame members to length, but a sled is a much safer option with such small parts. This jig (see **Figure 1**)

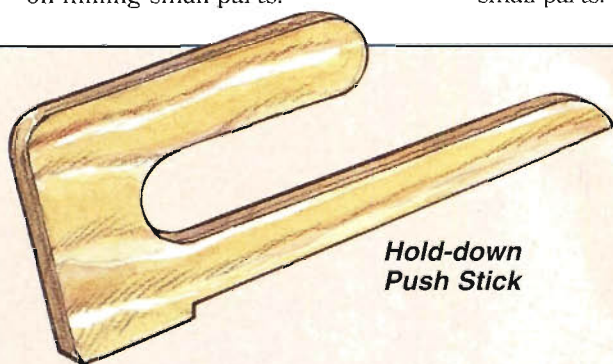


Figure 1: Create a sled to form the miters on the ends of these small pieces. It's safer, more stable and more accurate.



supports the work below and behind, making it much more stable and accurate. It also allows you to cut the first miter on several pieces simultaneously by clamping them to the sled (you'll have to miter them to final length one at a time).

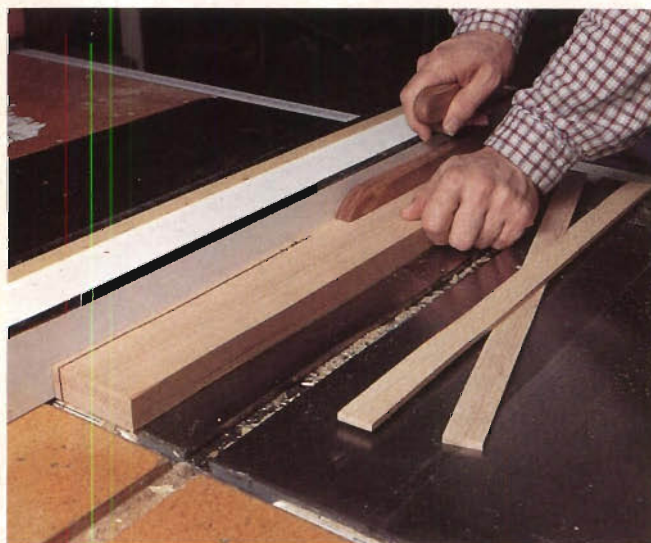
The sled itself is just a piece of plywood with a runner attached to the bottom. The runner must be sized so that it slides freely in the saw's miter gauge groove, without any play. Attach it with screws and glue, then lubricate it with a little paraffin wax.



Hold-down Push Stick

Ripping thin stock

Even the most grizzled woodshop veterans get a little nervous slicing thin stock. That's because it brings your fingers close to the saw blade and it's too thin to allow a decent grip. Begin making thin stock by ripping it off the edge of a wider board, using your hold-down push stick. The forward portion holds the stock down and the blade can actually cut right through the heel of this stick without causing damage to the workpiece ... or to you!



When the board gets too narrow for comfort, don't push your luck: switch to a new board. Using the push stick shown above helps control thin stock as you rip.

Temporarily screw a 45° fence to the top of your sled, then make a couple of test cuts on scrap stock, clamping the work to the fence to avoid creeping. When you are satisfied that the cut is precisely 45°, screw and glue the fence in place. Then miter the frame members to length.

Assemble the Frames

If you are building more than a couple of shadow boxes, ask your lumberyard about a hardwood door skin. This is perhaps the most economical way to make the 1/8" thick plywood back (piece 3). The smallest door skins (measuring 12" or 18" wide by 80" long) are surprisingly affordable.

With the backs cut to size, dry fit all the frame parts to check their dimensions and fit. Assemble three of the four frame corners with masking tape applied to their outside faces (the tape just keeps things lined up while you get ready to clamp). Apply glue to the miters, then close the fourth corner and apply tape here, too. Be aware that

the open time with yellow glue is only a couple of minutes, so work quickly. Secure the assembly with a band clamp, as shown at right, applying enough pressure to tighten the joints: do not over-tighten or you will squeeze out all the glue (squeezing out some is actually recommended). Use the back to check the frame for squareness (glue and clamp it in place later). Clean up any excess glue with a damp rag.

Machining the Spline Kerfs

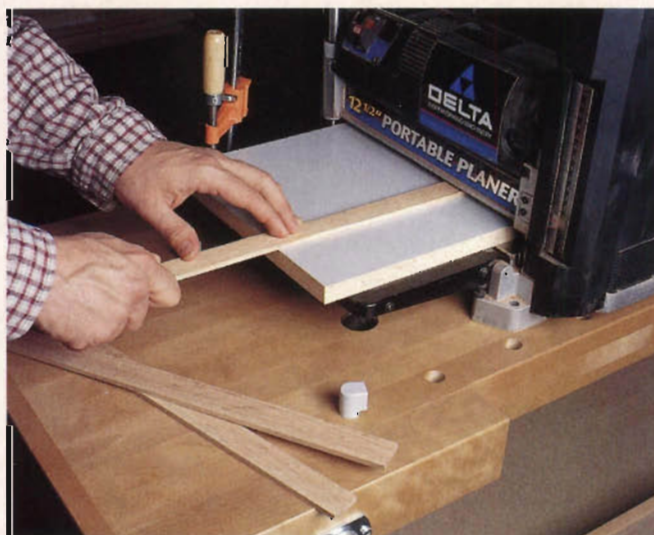
After the glue in the frame has dried, sand the assembly before you add the decorative walnut splines. Though small, these splines (pieces 4) add stability and strength to the frame. This is an ancient way of adding both gluing surface and visual appeal to a miter joint. That appeal is enhanced when the splines are made from a contrasting species — in our

Band clamps are perfect for small projects like this. Work quickly but don't over-tighten as you clamp.



case the walnut splines really jump out of the white oak background. These splines are relatively simple to install, but they add a huge visual impact to your project.

Two decorative splines adorn each mitered joint and installing them requires another simple jig. This is made from just three pieces of 3/4" thick scrap plywood. The two shorter pieces are trimmed at 45° and nailed or glued to the longer one, creating a 90° V-shape (see **Figure 2**). As the splines are only 1/8" thick, a regular blade should cut a perfect kerf for them.

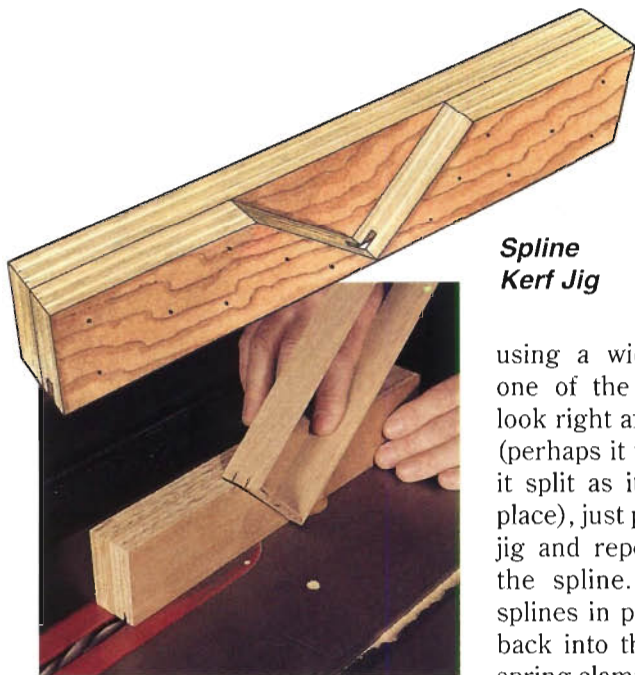


When planing to thicknesses of less than about 5/16", most bench top planers will require you to use a slave board. Not only will you be able to achieve more accurate cuts, but the operation is much safer.



Planing thin stock

Once you've got your stock ripped to rough size, you've got to get it to the exact thickness. Surfacing it down to the 1/8" or 1/4" thicknesses required for this project is a job for a planer, but in this case you must use a slave board for safety. The author used a piece of 3/4" melamine (because it is so smooth) and clamped it in place securely. In practical terms, 1/8" thick material is as thin as you can easily surface stock with most bench top planers.



**Spline
Kerf Jig**

Figure 2: A spline kerf jig is easy to make, as shown above. Just be sure to test the blade height setting with scraps before moving on to your workpiece.

With the blade height set at about $3/16$ ", place a piece of scrap in the jig and run it through the blade. Adjust the height up or down until you can fit the largest spline possible; keep in mind, however, that the frames are only $1/4$ " thick, and you don't want the spline penetrating to the inside. When you're satisfied with the setup, set the fence so the kerf is located $5/16$ " in from the edge of the frame sides and make your kerfs. The beauty of this jig is that all you have to do to create the second set of spline kerfs is reverse the workpiece and repeat the process.

Install the Splines

Keeping in mind the guidelines for ripping small stock, cut your splines from the edge of a wider board. If your blade is sharp, there should be no need to surface the stock: it will be smooth enough as is.

Apply glue to each of the eight kerfs in turn before gently tapping a short length of oversized spline stock in place. Once the glue has dried, trim and sand the splines flush with the box frame. Proceed slowly, as such thin stock can be brittle — especially when you're

using a wide-grained species. If one of the splines doesn't quite look right after it has been sanded (perhaps it was a little too thin, or it split as it was being tapped in place), just pop the box back in the jig and repeat the cut to remove the spline. Once you have the splines in place, glue the plywood back into the box using glue and spring-clamps.

Half-lapped Dividers

The essence of the shadow box is its array of small compartments, and the size of each of these is determined by the locations of the dividers. You can start milling your dividers once you've laid them out to accommodate your collectibles.

Cut all the horizontal and vertical dividers (pieces 5 and 6) from $1/8$ " thick stock, using your push stick to safely guide these small parts through the saw. Use the **Elevation Drawings** at right to locate and mark the half-lap notches on one horizontal and one vertical divider. Tape the same size dividers together (behind the marked up piece) and clamp them to an oversized fence screwed to your miter gauge. Now simply line up each notch with the blade and make the cuts (see **Figure 3**). In this fashion, you can cut all the notches at once, ensuring they all line up perfectly. It's a good idea to add one last scrap divider next to the fence to eliminate tearout. Repeat the process for the vertical dividers.

Dry fit the dividers together and see how well they fit the box. This should be a friction fit: just tight enough not to move around, but not so tight that they have to be forced into position. Trim if necessary, then sand the entire project.

Note: You can decide whether you want all the horizontal dividers to be solid lines and the vertical ones broken (or vice versa) by simply removing the grid, reversing it and then reinstalling it. If you have a series of shadow boxes, you can bring order or whimsy to the final look by either having them all match, or mixing them up a little.



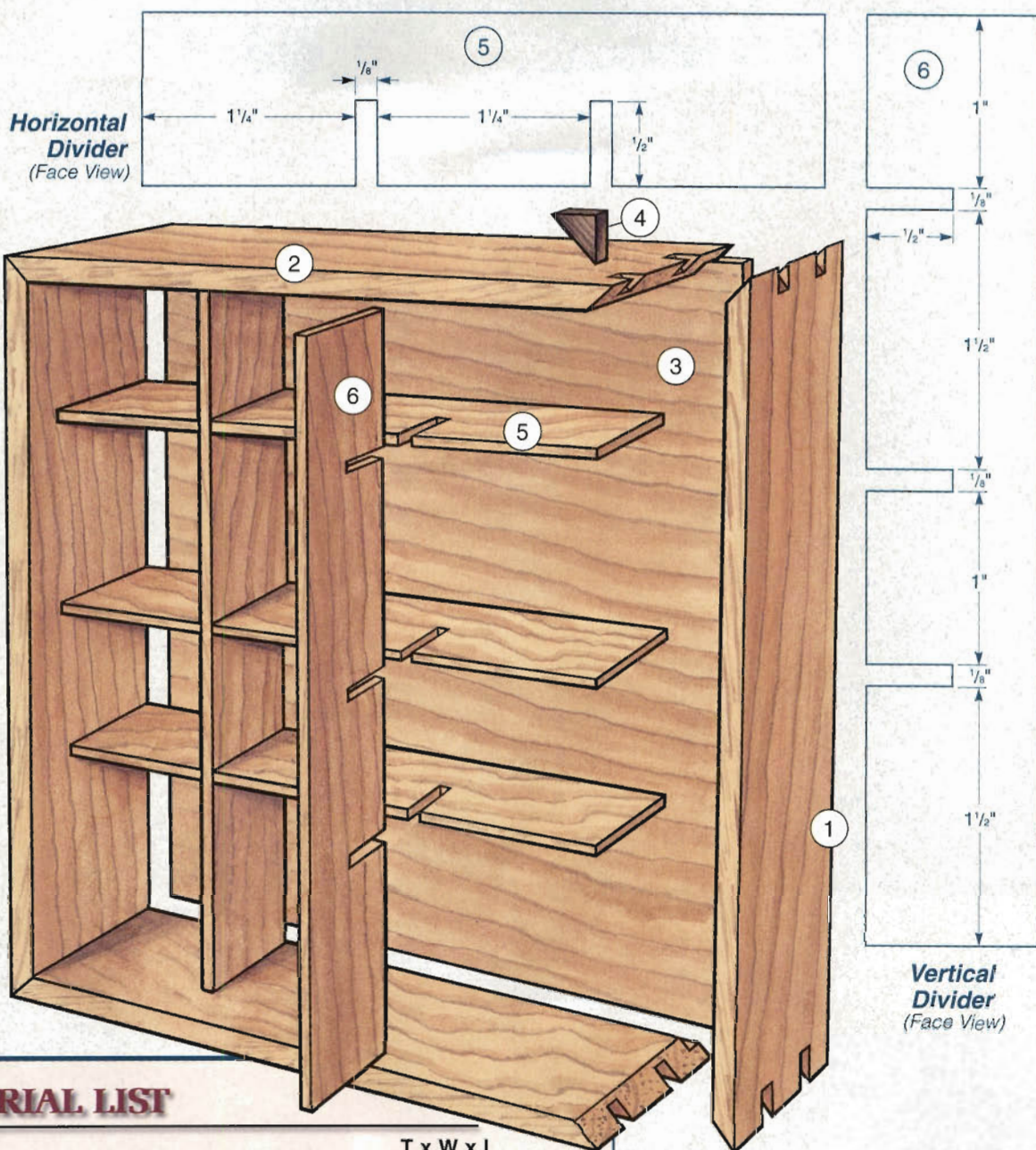
Figure 3: Tape the horizontal and vertical dividers together in groups with the notches plainly marked on the forward piece. Clamp the pieces to an auxiliary fence when cutting.

Apply the Finish

After sanding the project with 100, 180 and 220 grit papers, Elizabeth and I applied a natural oil finish to our shadow boxes. This matte finish brings out the rich colors and texture of the wood without visually overpowering her small collectibles in the compartments. You can apply the finish, wipe it off, let it dry and then reassemble the grids. Trying to finish them after they've been assembled will result in a drippy mess which will take forever to dry.

Mount the Shadow Boxes

How you arrange the shadow boxes on the wall has a lot to do with how many boxes you build. If you followed our guidelines and built six boxes, we recommend the



MATERIAL LIST

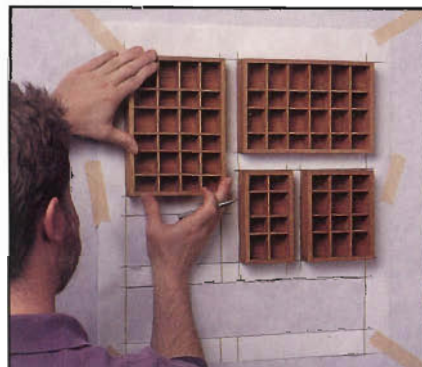
	T x W x L
1 Frame Sides (2)	1/4" x 1 1/4" x 5 7/8"
2 Frame Top and Bottom (2)	1/4" x 1 1/4" x 4 1/2"
3 Frame Back (1)	1/8" x 4 1/4" x 5 5/8"
4 Frame Splines (8)	1/8" x 1" x 1"
5 Horizontal Dividers (3)	1/8" x 1" x 4"
6 Vertical Dividers (2)	1/8" x 1" x 5 3/8"

Note: Material Lists for the other boxes shown on page 47 can be found on the pull-out pattern at the center of this issue.

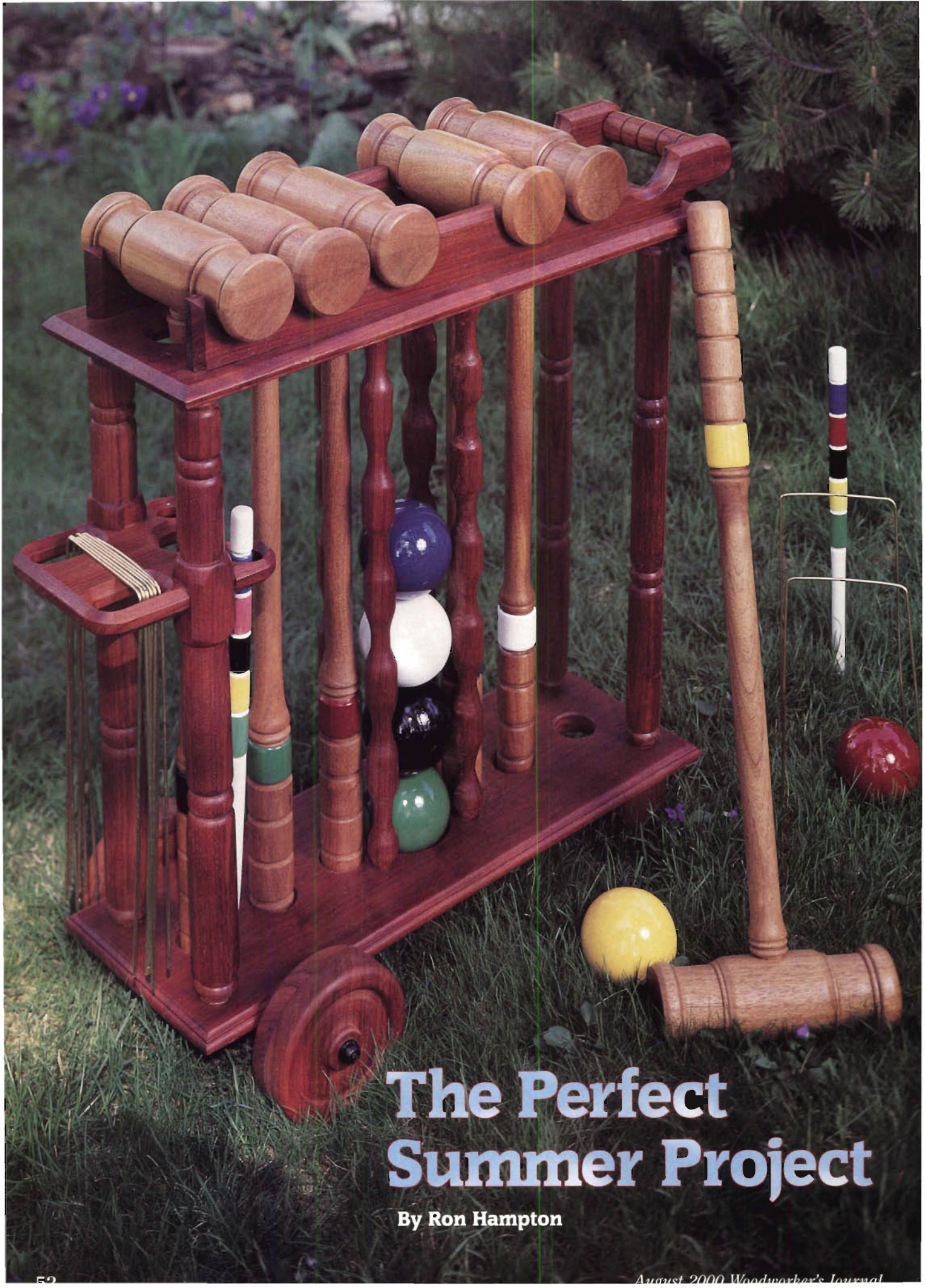
arrangement shown on the first page of this article.

Attaching the shadow boxes to the wall does not have to be difficult. The simplest method of mounting the boxes is to use a couple of small-headed screws in each unit, strategically placing the

screws in a compartment where one of the collectibles will obscure them from view. You may want to make sure the screws are long enough to reach a stud, but to tell you the truth, each assembly is so light that finding a wall stud is simply not necessary.

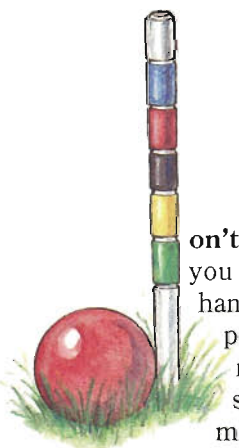


Hanging the shadow boxes and keeping them all square and even presented a challenge. Our solution: Lay them out on oversized paper to create a template. Tape the template to the wall (with the box positions cut out), perfectly level. Then you can install each box in turn.



The Perfect Summer Project

By Ron Hampton



on't you love the look you get when you hand a just finished project over to its new owner? That smile is worth a million dollars, so

you can imagine my joy when I presented this project to an entire family. Beyond the joy of giving, this croquet set is a lot of fun to build, too. Its construction will help you polish your joinery skills and introduce you to a couple of new turning techniques.

I chose African padauk for the cart, primarily because I fell in love with the color. I also like the way it machines: padauk has a fine, smooth texture, is very strong and hard, and is naturally resistant to decay. The only real disadvantage is that you must be very careful about dust collection: its residue is similar to hot chili pepper dust, and can aggravate some allergies.

For the mallets and stakes I chose Honduras mahogany. Again, this was based essentially on color: the mahogany provides such a rich contrast to the padauk. (Of course, the fact that my supplier had it in the right dimensions had some influence as well!)

Start with the Cart

The first step in creating the croquet set is to build the cart, since all the other parts must fit within its confines. Select two pieces of padauk for the cart top and bottom (pieces 1 and 2), then use the **Pinup Shop Drawing** (they're on the pullout at the center of the magazine) to establish the hole locations in each. Note that some of these go all the way through, while others are stopped. Use Forstner bits in the drill press and a scrap backer to bore the holes.

Follow the three-stage process shown at right to create a pair of perfectly matched racks (pieces 3) for the top of the cart. Then bore a stopped hole in each rack for the handle.

Turning the Handle

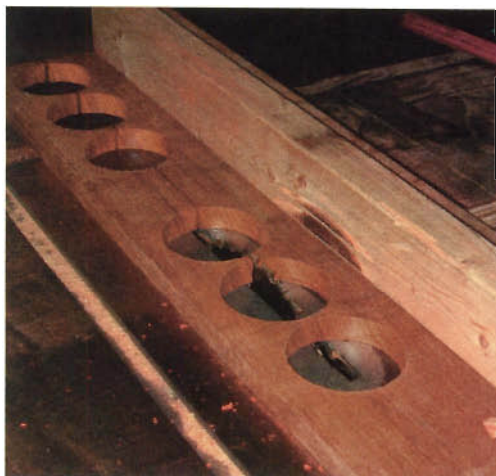
Get started on the handle (piece 4) by mounting a 2" x 2" x 8" padauk blank between centers on your lathe and bringing it to a 1 1/4" cylinder at slow speed with a bowl or a roughing gouge. Smooth the cylinder with a skew, checking dimensions with calipers. While the lathe is turning slowly, mark the handle's groove and end tenon locations with pencil lines: these are all shown on the **Pinup Shop Drawings**.

Remove most of the waste on the tenons with a skew or a thin parting tool, then bring it right to 3/4" with an open end wrench. (Yes, I ground a cutting bevel on the top edge of a regular old wrench, and this shop-made tool lets me quickly cut an exact thickness tenon). Clean up the corners with a thin parting tool. Use the same parting tool to define the four flat-bottom grooves, then lay your skew at 45° and bevel the top of each trough. Sand to 220 grit, then use a thin parting tool to cut most of the way through the end of both tenons.

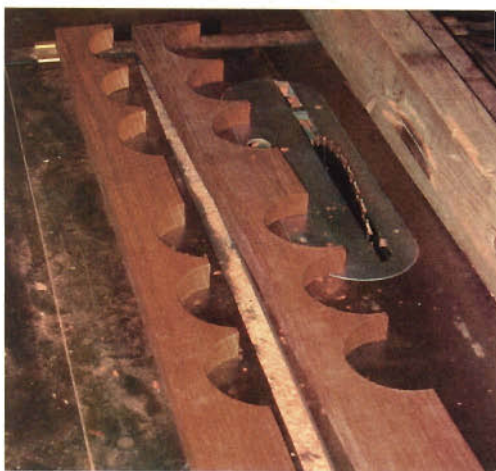
You can apply finish to all the turned parts while they are still on the lathe (except for the tenons). I use a mixture of Deft wood sealer diluted 50/50 with lacquer thinner. Wet the wood with the lathe turned off and let it soak for 15 seconds. Then turn the lathe on and dry the part with a paper towel (much safer than cloth). This produces a fast satin finish. After finishing, remove the handle from the lathe and trim the ends square on the band saw.



For perfectly matching scalloped rack pieces, chuck a hole saw in your drill press and bore holes down the center of a single piece of wood.



Once you've drilled the holes in the rack, move to the table saw to cut the piece exactly down the center, forming two pieces.



After separating your pieces, stack them for the next cut. Move to the band saw to form the handle portion of the rack.



The front legs and center columns are turned with a bowl gouge and then a skew. Chips will be flying, so it's important to wear a face shield and respirator for these cuts.



After getting the front legs round, mark off and cut the decorative grooves that divide each leg into visual thirds. With long, thin spindles always use sharp tools and light pressure to minimize flexing.



To form the tenons, make a marking cut with your thin skew or parting tool, then trim the tenon to size.



On the back legs, use a story board to locate the square portion for the wicket holder. A thin parting tool is used to make a slice straight in where the square edge meets the round.

Milling Profiles on the Edges

Take the completed parts of the cart to your router table and lock a bearing guided, 45° chamfer bit in the chuck (see **photo** at right). Bevel the top edges of the rack, the top edge of the cart top and the bottom edge of the cart bottom with this bit. Mill the same profile on the edges of all six large holes in the cart top (upper face only), then switch to an ogee bit to create a decorative profile along the bottom edge of the cart top and the top edge of the cart bottom. All of these are shown in detail on the **Pinup Shop Drawings**.

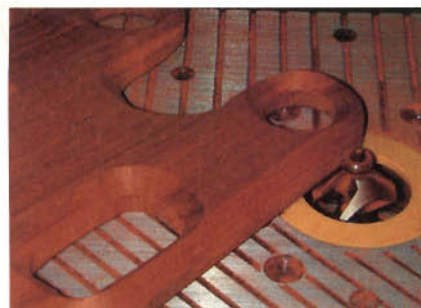
The Axle Supports and Feet

The cart can be moved around on a pair of wheels (pieces 5) that are attached by means of an axle (piece 6) and two supports (pieces 7). Cut strips of padauk for the supports, making sure their grain travels along the length, not the width. Band saw these pieces to shape (see the **Pinup Shop Drawings**) and sand their edges. Drill holes for the axle, then cut the two front feet (pieces 8) to shape.

Bevel all but the top edges of the axle supports and the feet using the same bearing guided chamfer bit you used earlier. With small parts like these, I like to hot-melt glue them to a large piece of scrap and take multiple passes. Keep your fingers away from the cutters.

The Wicket Holder

Cut the wicket holder (piece 9) to the shape shown on the **Pinup Shop Drawings**, then use a Forstner bit to drill its two round holes. Switch to a 1" bit to drill four corners of the rectangular holes, then complete these cutouts (and the notches for the legs) with a jigsaw. Sand, then relieve the exposed edges with the chamfering bit (except around the notches for the legs).



A bearing guided, 45° chamfering bit handles the edge milling for the top and bottom, the racks and the wicket holder (shown above).



Once the back legs are turned, cut the shallow mortises for the wicket holders on the table saw.

The wicket holders are notched where they meet the legs, so the mortise isn't as deep as it appears in the inset.



The Columns are Next

Turn the four center columns (pieces 10) next, using a bowl gouge and then a skew, as shown at top left. Follow the same sequence used earlier for the handle, only this time instead of grooves, you're creating curved arcs. Stick to the dimensions shown on the **Pinup Shop Drawings**, or the croquet balls won't be able to fit between the columns after the cart is assembled. To make this easier, cut a plywood circle the diameter of the balls and use it to test your arcs.

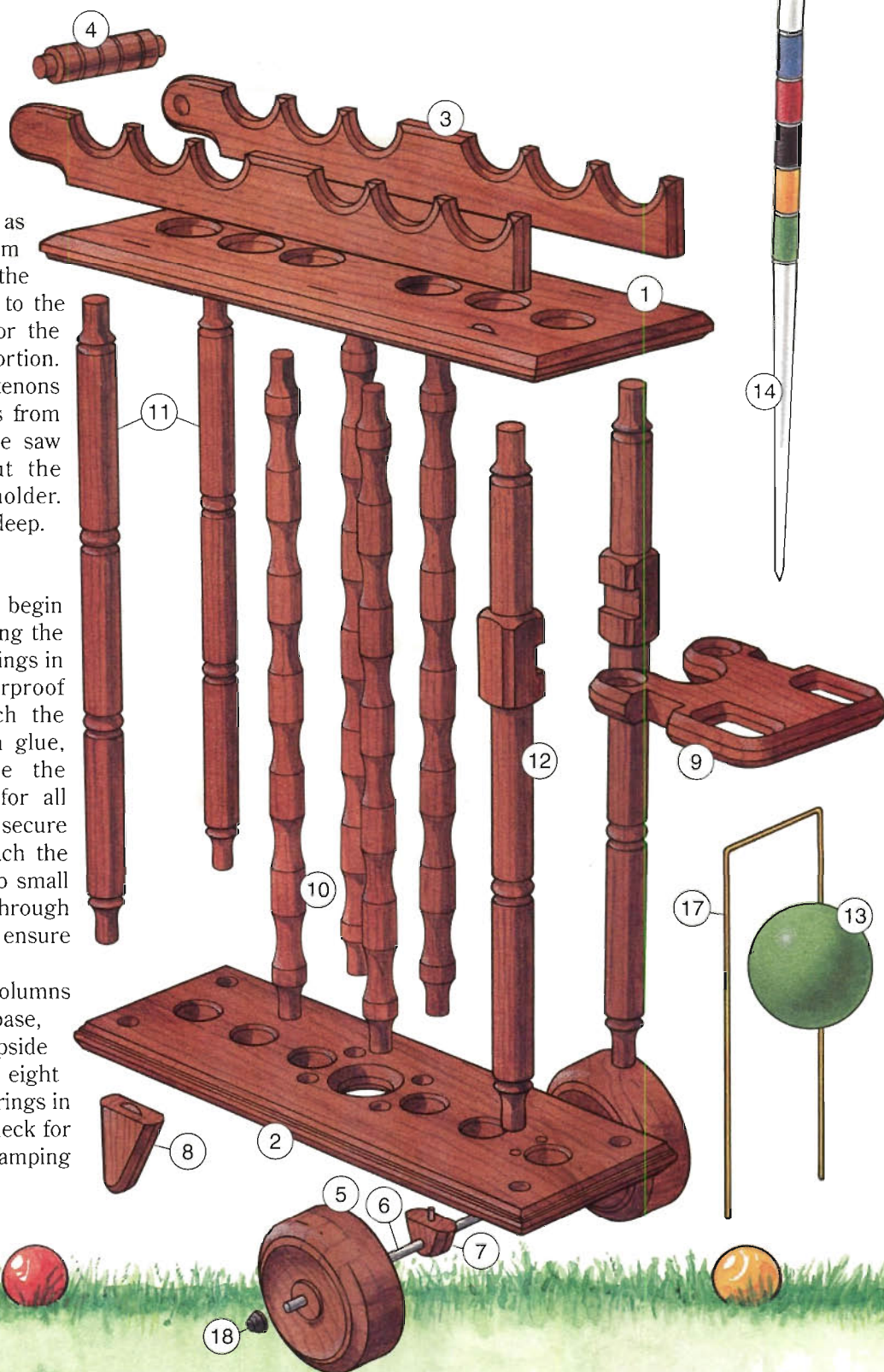
Making the two front legs (pieces 11) is a simple turning process. After getting them to round, mark off and cut the decorative grooves that divide each leg into visual thirds, then complete the tenons, as shown in the photo series at left. For the back legs (pieces 12), you'll have to use a storyboard since

a portion remains square, as shown in the photo (bottom left, previous page). Mill the round areas first, referring to the **Pinup Shop Drawings** for the dimensions of the square portion. Once you've formed the tenons and removed the back legs from the lathe, set up your table saw with a dado blade to cut the notches for the wicket holder. Each notch should be 1/2" deep.

Assembling the Cart

After completing a dry fit, begin assembling the cart by gluing the handle tenons into their borings in the racks. Use a weatherproof glue. Before it sets, attach the racks to the cart top with glue, biscuits and clamps. See the **Pinup Shop Drawings** for all locations. Use biscuits to secure the feet and dowels to attach the axle supports, as they're too small for biscuits. Push the axle through the supports as you work to ensure they will line up later.

Glue and clamp the four columns and the four legs into the base, then turn the assembly upside down to set and glue these eight pieces into their relevant borings in the underside of the top. Check for squareness as you apply clamping pressure.



MATERIAL LIST

	T x W x L		T x W x L
1 Cart Top (1)	1" x 9" x 25 3/4"	10 Center Columns (4)	1 3/8" x 1 3/8" x 23 1/2"
2 Cart Bottom (1)	1" x 9" x 25 3/4"	11 Front Legs (2)	1 3/8" x 1 3/8" x 23 1/2"
3 Racks (2)	1" x 2 1/2" x 26 3/4"	12 Back Legs (2)	1 7/8" x 1 7/8" x 23 1/2"
4 Handle (1)	1 1/4" x 6"	13 Croquet Balls (6)	3 5/8" Dia.
5 Wheels (2)	2" x 6" x 6"	14 Wicket Posts (2)	3/4" x 3/4" x 18"
6 Axle (1)	3/8" Dia. x 14" Steel	15 Mallet Handles (6)	1 1/2" x 1 1/2" x 28 1/2"
7 Axle Supports (2)	1" x 2 1/2" x 1 1/2"	16 Mallet Heads (6)	3" x 3" x 9"
8 Front Feet (2)	1" x 3 1/2" x 3 7/8"	17 Wickets (9)	1/8" x 14" Brass
9 Wicket Holder (1)	1" x 6 5/8" x 7 5/8"	18 Axle Caps (2)	Push nuts, plastic

Turning Wheels on the Lathe

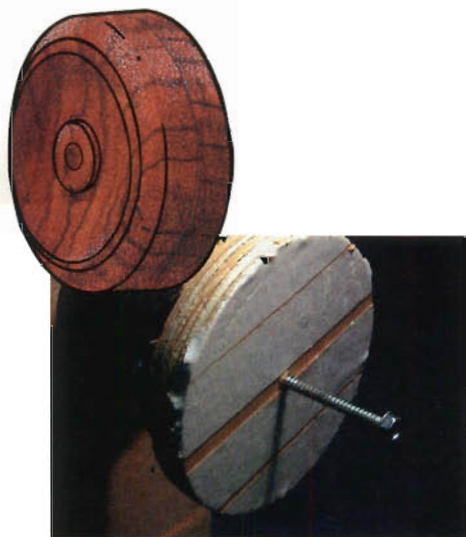
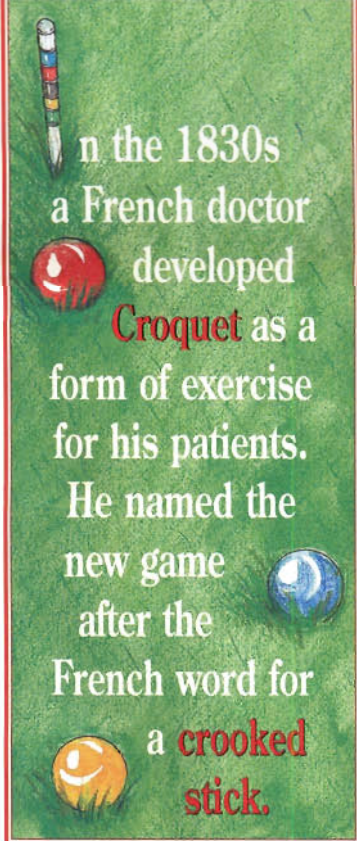
As you can see from the two photos at right, turning wheels on a lathe is a real natural. Get started by cutting four square blanks (two for each wheel) on the table saw and gluing them face to face. Then, band saw a round piece of plywood and attach it to a faceplate. Turn the plywood to round. This will become the holder for turning the wheels and, later, the balls. Drill a pilot hole at the center of the plywood and use a 3" wood screw and strips of two-sided tape to hold a wheel blank in place.

Turn the wheel true, then mark the points for its central depression. Use a sharp skew for this operation, making fine passes. When you're happy with the look, sand and apply finish, then unscrew the wheel and turn it around. You don't have to have the exact same look on the insides, but it should be close, since both sides are visible on the finished project.

Turning the Croquet Balls

First, put your ball blanks (pieces 13) between centers and turn the blank to a column. A small spindle gouge works well for this job.

After all six balls have been roughed to round, you'll have to remount the balls to continue. Begin by taking the two-sided tape off the face plate that you used to turn the wheels. Cut a small cup in



To hold the wheels (and the balls) in place, band saw a round piece of plywood and attach it to a faceplate. Turn it round and drill a pilot hole at the center for a 3" wood screw.



Turn the wheel true, then mark the points for its central depression. Use a sharp skew for this step, making fine cuts. When one side is right, reverse the wheel to turn the other side.

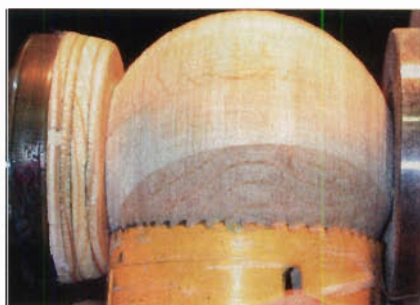
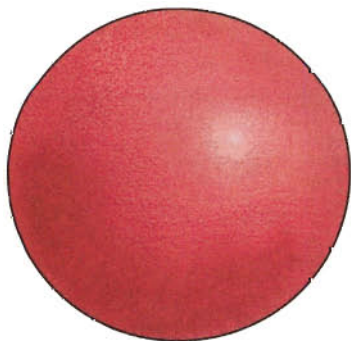
the center: the ball will rest in this cup on the headstock side. On the tailstock, mount a large sealed ball bearing to a plywood backer secured to a live center. Hold the ball between these two depressions. Now rough in the ball using a 3 1/4" to 3 1/2" bi-metal hole cutter, as shown in the photo below. This is a very quick and easy way to cut a ball round. Rotate the ball often, so you are cutting it round in all three axes. After you sand all six balls you can spray paint them. Set them on golf tees or egg cartons while you spray, and fine sand between coats.

Making the Wicket Post

I saved the wicket posts (pieces 14) until now so that your spindle

turning skills would have a chance to gain a little polish. A wicket post (also commonly called a stake) can be difficult to turn because it gets very thin and flexible. It's 18" long, so cut your turning blank no more than 20": the shorter the blank, the less flexible it will be.

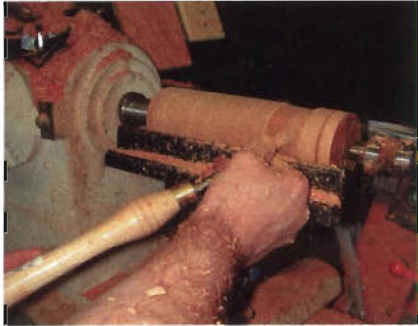
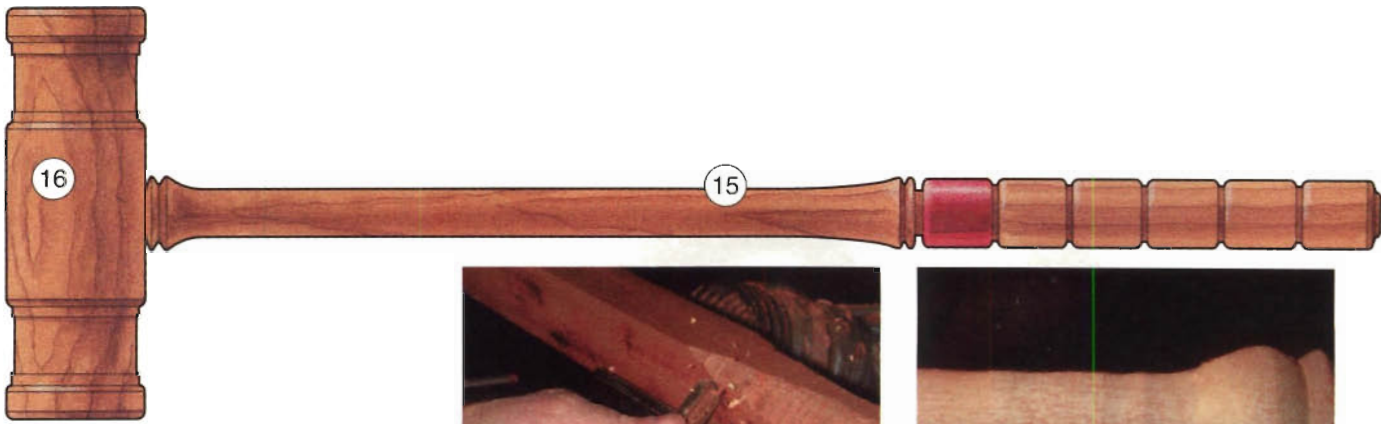
Use very little pressure in your tail stock as you lock the blank between centers, and make light cuts in the



After minor surgery on the wheel's faceplate, rough in the ball using a 3 1/4" - 3 1/2" bi-metal hole cutter — an easy way to cut a ball round.



Make sure you keep moving the hole cutter through all three axes during the roughing process, then work your way through the grits.



Turning the mallet heads is a welcome change from the spindles since you don't have to fight flexing. Turn them round with a bowl gouge and use a caliper to get the diameter right.



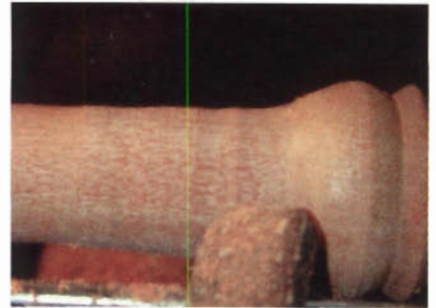
After applying finish to the head, go back to the ends and deepen the cut with your parting tool so only 1/4" remains. Finish up the ends on the band saw, followed by the belt sander.

wicket post as you turn it. Aggressive cuts should actually make the spindle stop turning. Lay out the wicket posts the way you have all other spindles in this project, according to the **Pinup Shop Drawings**. Reduce it to round and leave the pointed tip fat (that is, the full 3/4" diameter). Work on the wider head first.

Very carefully taper the point of the wicket post, starting from the middle and working toward the headstock where it will be thinnest. Use the tool that you can control the best. My preference is the skew, but



Rough out the flat part of the mallet handle with the bowl gouge and then the skew. Use your caliper to get the diameter perfect.



Make a story board to mark all the critical points at the top of the handle, then use the shallow gouge to shape the top end.

use whatever works best for you. An aggressive bowl gouge will dig in, flex the post and break it. After turning, sand this piece, but not too fine, since it will end up being painted later.

Turning the Mallets

The only difference between turning the mallet handles (pieces 15) and the legs is that a storyboard is essential here, as the profile is a little more complicated. It will also ensure that all six mallets are identical. Use calipers to make sure the mallet heads (pieces 16) are 3" diameter, then complete the rest of the turning in accordance with the **Pinup Shop Drawings**.

Make a simple scrap-wood V-shaped cradle to hold the mallet heads steady on the drill press while you bore them for the tenons on the ends of the handles. Once everything gets a good sanding, glue and clamp the handles to the heads.

Some folks think the challenge of the game is to progress through the wickets in the fewest strokes. For others, real joy is attained with a properly "sent" competitor's ball.

No Sticky Wickets Here

I went to a welding supply shop and got nine brass welding rods for the wire hoop wickets (pieces 17). They bend easily and I liked the brass color. Sand and finish those elements of the set that weren't finished on the lathe, then you're ready to present your completed set. Your family will have fun with this project for years to come.

Ron Hampton, a turner and dentist from Texas, last appeared in our June 1999 issue.



Reaching for Perfection

Compounding Your Miter Saw Choice



Lots of cutting power — and electric brakes to halt it — are some of the advantages Porter-Cable cites in its new compound miter saws. The 12" model 3802 and 10" slide model 3807 each saw has a 15 amp motor and a Riptide™ 40T carbide-tipped blade. Not only do the electric brakes decrease waiting between cuts,

Porter-Cable says, but a spindle lock minimizes down-time during blade changes, too. Each saw also has pre-set locking detents at 0°, 15°, 22.5°, 31.6° and 45° to the right and also to the left.

The 12" model 3802 has an extra tall sliding fence which allows you to cut 5 1/4" crown moldings with the workpiece standing vertically against the fence. An extension wing helps balance longer boards. The 10" model 3807 is a slide-compound miter saw which offers a one-piece fence and work clamp, as well as a dual rod linear-bearing



Porter-Cable has a new 12" compound miter saw and 10" slide-compound miter saw.

guide system for smooth, precise cuts. Both saws have a base which can mount on a bench or a 2 x 4 sawhorse.

Large, center-balanced carrying handles give these saws

portability. Each saw also comes with a dust bag. Approximate price for the 12" model 3802 is \$380; for the 10" model 3807, it's \$529. *For more information, call Porter-Cable at 800-487-8665 or visit them on the web: www.porter-cable.com.*

Still Thin, Still Strong

Matsushita, the company which manufactured the first thin kerf carbide blade over 38 years ago, is still making 'em — by hand, no less. They recently introduced the 7 1/4", 24-tooth Econo blade, and other combinations, rips and crosscuts ranging from 3 3/8" to 18" are distributed through Boone Supply. Prices range from \$26.59 to \$151.49. You can call 503-678-1200 for more info.



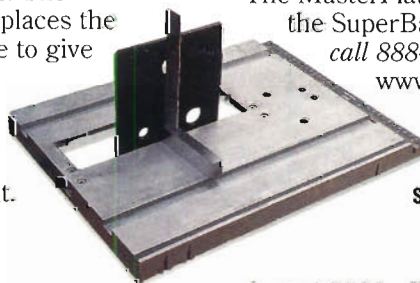
The Final Word in Accuracy

Want accurate cuts? Protruding teeth, resin deposits and sawdust gullets can interfere with getting them when you use your blade to align the table saw. To save you from this fate, MasterGage Corporation has sent two tools to the rescue. The MasterPlate is a 1/4" thick toolmaker's quality aluminum plate, ground flat and parallel with both 5/8" and 1" arbor mounting holes. The MasterPlate replaces the table saw blade to give you 10" of flat, unobstructed surface for calibration and alignment.



SuperBar's dials are accurate to .001".

It also works on radial arm saws and power miter boxes. A companion tool, the SuperBar, offers a precision dial indicator that checks alignment accuracy to .001". A spring-loaded adjustment mechanism lets it adjust to fit all standard 3/8" x 3/4" miter slots. The MasterPlate costs about \$49, the SuperBar, \$69. *For more info, call 888-893-8300 or visit www.mastergage.com.*



Align your tools with MasterPlate; confirm the accuracy with SuperBar.



Computer Applied Designs



Ever wanted to incorporate a cool image from your computer screen into your woodworking? That's just what Woodprint veneers were designed to do. "I can take a \$5 piece of veneer and have it look like a \$1,000 piece of rosewood in five minutes," says Dennis Brooker. He developed a special treatment which allows the paper-backed wood veneer to accept an accurate

image, instead of the smeary mess you'd get if you tried to run untreated veneer through your standard inkjet printer. Prices start at \$5 for 25 or fewer 8½ x 11" sheets of maple veneer. Red cedar, bird's-eye maple and other veneers are also available. *For more info, call 515-533-2103.*

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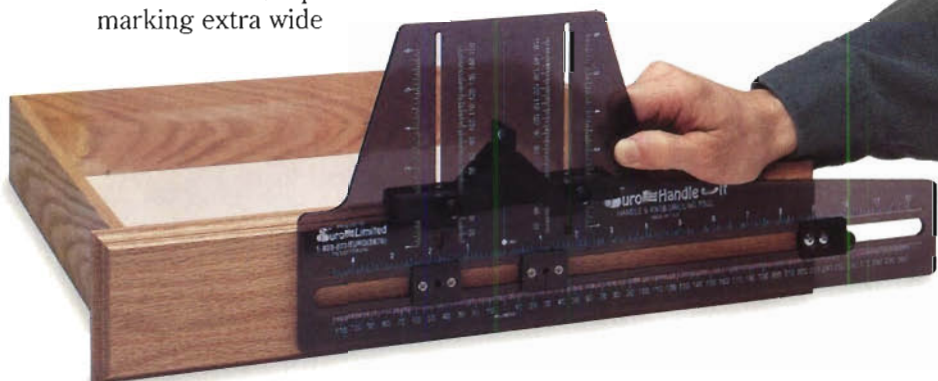
Shown with optional INFEED & OUTFEED TABLES

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Handles, With or Without an Accent

The benefit of Euro Handle-It, according to its makers at Euro Limited, is to get your handles and knobs in exactly the right spot — whether you're working from the English or the metric system of measurement. The tool itself is an 8" x 18.25" polycarbonate template with hardened steel bushings. All of its measurements are marked in English and metric. A center reference line helps in marking extra wide

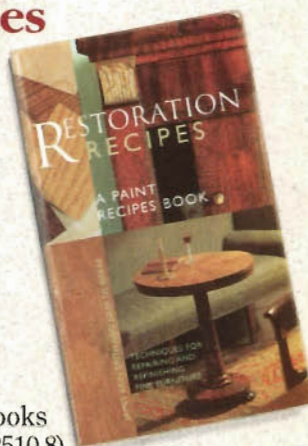
drawer fronts, while a movable positioning stop helps with drawer fronts of the same size. The Euro-Handle has a height adjustment to the center of (in English) a 12" high drawer front and can install handles as large as 24". Despite the name, it's made in the U.S. Retail price is approximately \$39.95. *For more information, call Euro Limited at 800-877-3876.*



Restoring Antiques

Whether you're identifying antique furniture or restoring it, you'll find guidance in *Restoration Recipes* from Chronicle Books (ISBN 0-811-2510-8).

Authors James Bain Smith and Julia de Bierre give instruction on repairing veneers, using nitro stains and replacing hinges and seats. Gilding, working with gesso and graining are just some of the other subjects. *Restoration Recipes* sells for \$19.95 and contains lots of helpful photos. *For more information, call 800-722-6657.*



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Three New Planer-molders

By Charles Self

Sooner or later, you're going to need a large molding that can't be milled with router bits. And every woodworker dreams of owning a planer. Well, now you can tackle both operations with a single machine! The author put a new generation of planer-molders through their paces, and here's what he found

Sure, you can mill a complicated molding with a router and a bunch of ingenious setups. Or maybe you depend on a shaper, or even a set of saw-mounted cutterheads. But deep down, you know there just has to be a way around problems like inaccurate reproduction and limitations on the size of stock you can mill. Plus, shapers are costly — especially if they won't see a lot of use. And even though a router table is handy, it can require a lot of passes to deliver an intricate compound molding.

With all that in mind, Craftsman, Grizzly and JET have each come up with an elegant option: the

integrated planer-molder. Here's a tool that can mill a large, complicated profile quickly (with relatively minor set-up) while handling a wide array of profiles ... all the way up to 5½" wide! After looking at a variety of machines, I settled on the three models shown here as being most suited to a home workshop.

All three of the models I tested carry a street price at or under \$800. Of the three, Craftsman's 12½" model #23383 is the least expensive. Perhaps that's because this is the only model that doesn't include a stand (although one is available as an optional extra).

Plus, another option not included with the Craftsman is a dust collection port.

Grizzly's 13" version of the planer-molder, the model G1037, comes with a 4" dust port and a stand, while JET's model JPM-13 includes a stand; their dust hood runs another \$40 plus shipping.



Craftsman 23383

Price: \$640 (plus S&H)

Phone: 800-377-7414

1½ HP

Cut Width: 12½"

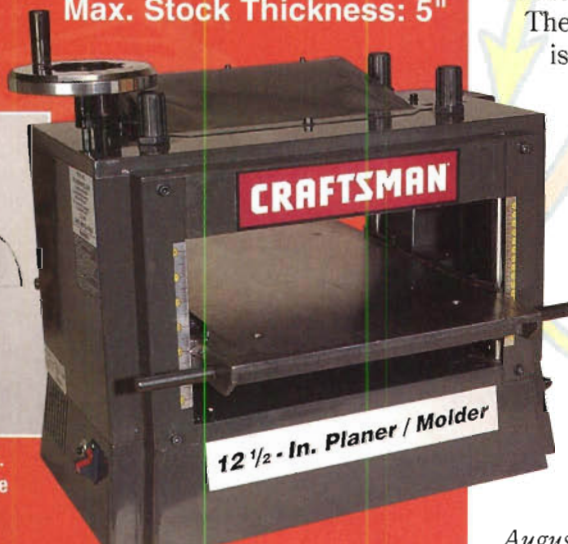
Max. Stock Thickness: 5"



Its 115 pound weight and its carrying handles make the Craftsman unit easy to move around.



Four columns support the Craftsman cutterhead. The gears, which control the stock feed rate, are easily accessible.



Size is Important

If your floor space is limited, the physical size of a new machine can be a big factor in your decision. The Craftsman unit is the smallest of the three at 115 pounds (minus a stand). Its motor is fully enclosed in the machine base.

The Grizzly, by comparison, is a bit of a monster. It boasts a huge 2 HP motor sitting right on top of the unit and a net weight of about 220 pounds. The JET's a little lighter, with a motor between the stand legs and a net weight of about 202 pounds.

Let's Start with the Craftsman

One of the nicest features of this machine is the set of

Grizzly G1037

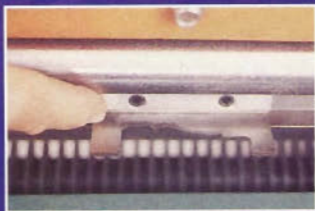
Price: \$795 (Plus \$40 S&H)

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2 HP

Cut Width: 13"

Max. Stock Thickness: 6"



The molding cutters that come with the Grizzly, like the others in the test, are a maximum of 4 1/2".



Grizzly's 2 HP motor switches from 110 to 220 volts. You can adjust the feed speed in about two minutes.

carrying handles that slide out of the tables on both sides of the machine. Balancing that is the fact you give up 1/2" on the planer cut width.

The recommended stand is no longer listed in the catalog, so a shop-built one is in order. This is not a benchtop machine in the true sense, as it needs air from underneath to prevent the 15 amp motor from overheating.

The Craftsman's 1 1/2 HP motor does a good job of removing wood, as long as you take less than 1/8" per pass in hardwoods. Four columns support the cutterhead. (All three units have movable tables). The unit's maximum planing thickness is 5", and feed speeds are adjustable from 13 feet per minute (FPM) for a smooth finish on moldings, to twice that for

Shop Test continues on page 64 ...

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SHOP TEST

planing. The machine delivers about 13,500 cuts per minute.

A very nice depth adjustment wheel lifts off for easy removal and installation of blades. The Craftsman's table size is 12½" x 19¼", and I thought the surface was nicely ground.

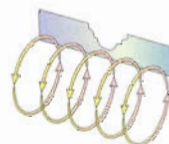
Cutter access, behind a screwed-on plate, is the same on all three machines, and each includes a gauge for setting molding cutters. They all came with their planer blades installed, too. The primary molding test on the Craftsman machine was made with their stock crown molding cutters, the most expensive set in the catalog (there are, however, two sets of cutters here, with one set doing the back of the crown and the other side doing the fancy front). Planer blades are left in place as the blades are set up. Cutters install easily with Allen screws, and they are very similar in all three tools.

For quality results, it's a good idea to use a shop-built bed board with these machines. Sizes vary, but the bed board should be close to the width of the table and at least a foot longer. This reduces snipe. In some tables, there are predrilled holes where the bed board can be attached.

You will need to install guide rails on each machine, to make sure the piece being fed for the molding operation doesn't wander off line. These are best made of hardwood. During my test, making the guide rails was the most finicky part of the setup.

The Grizzly B1037

This is the blue collar guy of the bunch, and as such doesn't have as fine a finish as either of the other two. It does have a more powerful motor, though, and it was the only one that came set up with a volt-switchable motor that draws nine



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there has to be
a solution to inaccurate
reproduction and
limitations on the size
of milling stock.
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amps at 220 volts, and 18 at 110. The cutterhead speed on the Grizzly is 5,000 rpm, for 15,000 cuts per minute. Planing maximum depth of cut is 3/32", with a recommended maximum depth of cut at 3/4" for molding. The 4" dust port really lets your dust collector haul chips, shavings and dust out in a hurry.

The table is cast iron, 14½" wide by 17¾" long, and cleanly ground. Feed speed is easily adjusted by changing a gear on the side of the machine. Overall time is probably two minutes, about the same as with the Craftsman.

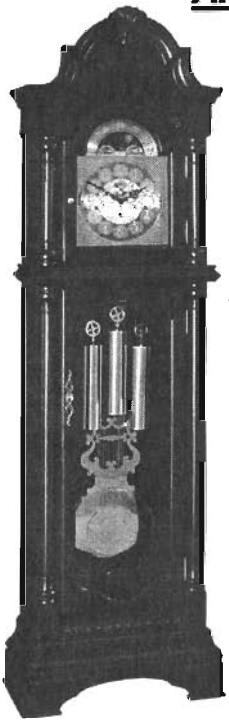
The stand on the Grizzly is sturdy, well braced and wide, so there is no problem with tipping. The depth adjustment wheel is large and removable for access to the dust collection plate. According to the literature, the planer-molder comes prewired for 110; however, the one that arrived for my test was

Shop Test continues on page 66 ...

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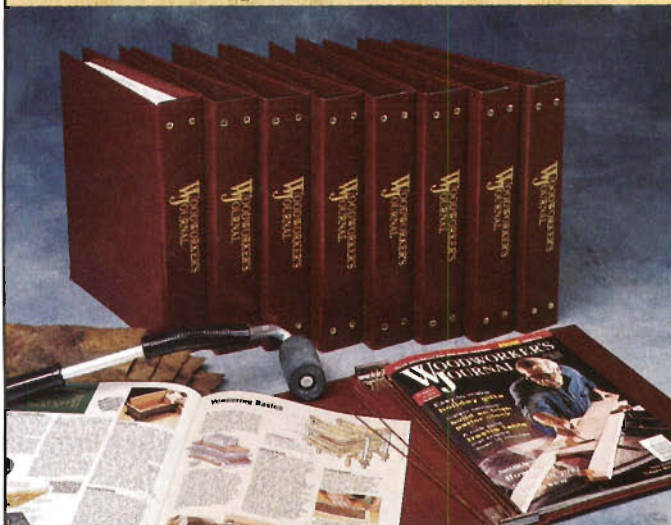
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**Their power seems
slightly better than on
portable planers, but
that may have more to
do with the adjustable
feed rates than the
power itself.**



prewired for 220. The motor is a TEFC (totally enclosed fan cooled) unit, as are those in the other two machines.

Stock thickness maximum on the Grizzly is 6", with a maximum width of 13". Planing speed is 24 FPM, and the molding speed is half that, 12 FPM. Grizzly lists a maximum width of molding cut at 13", but, like JET and Craftsman, keeps supplied molding cutters at 4 1/2" maximum. Shallow cuts of an extreme order would be essential for a full 13" wide molding cutter, as these machines might be taxed to handle that much resistance.

Grizzly lists the minimum length of stock as 8", but I'm just not comfortable using any planer with stock under 12" in length unless it is supported by a jig to prevent problems.

As with the Craftsman, the manufacturer gives directions in the manual for building a bed board and guide rail setup. The directions in the Grizzly manual are adequate, but could stand to be beefed up a little.

Cutting smoothness and speed were good in hard and softwoods. The knives appeared to have been made and sharpened nicely, and delivered a clean piece of molding. I found that cutter changes and alignment were identical to those on the Craftsman.

The JET JPM-13

The JPM-13, whether in the older blue version or new white version, definitely wins the fit and finish war. It is the most attractive of the

tools, and I found it to be the easiest to assemble. Several other nice touches were appealing. The switch is nicely located, and the stand comes with wheels that lock individually, making it easy to move around a small shop. Changing gears to adjust feed

rates was very simple: the gears are just removed and reversed. That is, the upper gear exchanges for the lower one. This gives a dual feed rate of 10 FPM for molding and 20 FPM for planing, which is a tad slower than either of the others.

The JET comes wired for 110 volts, with a TEFC 1 1/2 HP motor that ties into pulleys for a cutter-head speed of 4,500 RPM and 13,500 cuts per minute by the three

JET JPM-13

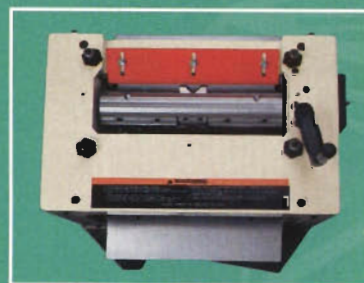
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1 1/2 HP

Cut Width: 13"

Max. Stock Thickness: 6 1/8"



You'll find the removable depth of cut handle (at right, above) in a convenient spot.

knives. The maximum planing width is 13", and stock height cannot exceed 6 1/8". Working with full width stock, the planer is limited to a 1/16" depth of cut, but, as with the others, narrower stock allows deeper cuts. JET recommends planing nothing shorter than 14". The polished cast iron table is 14 3/16" x 19 3/8".

The depth of cut adjustment handle is different than those on the Craftsman and Grizzly, since they are full circle units with a handle set at 90 degrees, while the Jet uses a shaft style with a vertical handle. The handle is removable (as are the others). Three socket head cap screws hold the dust cover in place.

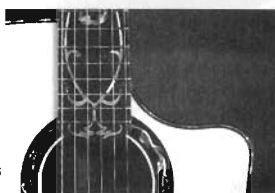
Blade changes, adjustments and other operations are similar to the



JET's cutters, like those of the other two machines in this test, install easily with an Allen wrench.

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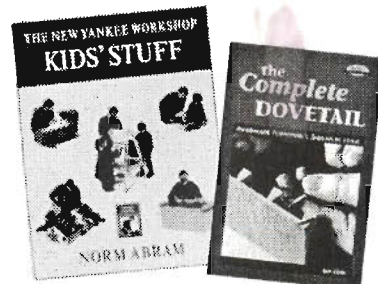
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other two units. Speed was plenty adequate to keep things moving well, but slow enough so that cuts were done cleanly.

Conclusions

These can be very worthwhile tools for the home workshop, assuming you do a fair amount of planing and molding for your projects. They'd be extremely handy for woodworkers who make lots of picture frames or similar projects. Custom knife profiles are also available from a number of sources.

I found these units planed as well or better than most 12" portable planers, though with an occasional tendency to snipe because of the moving tables. Their power seems slightly better than on the portable planers, but that may have more to do with the adjustable feed rates than with the actual power itself.

**I had no problem
milling clean softwood
moldings. Hardwoods
require experience.
The key is to keep
your knives sharp.**



Almost all these tools run at maximum capacity on a 20 amp circuit. Molding on all three machines was cleanly cut if enough care was taken to line up the knives properly. If you don't use

the setting gauge religiously, you're going to get bad profiles. Of course, that's true when you have a three knife setup for anything.

Using pine or similar softwoods (and poplar and other soft hardwoods), I had no problem milling clean moldings. With oak, walnut and hard maple, you have to gain a little experience and develop a technique. I found that it worked best to take a fairly modest cut on the face (to more or less hog out the extra material) and then come back with a shallower cut to get a really smooth finish. I even took a third cut on some wider hardwood materials. The key here is to keep your knives sharp. If you hone one knife in the set, make sure you also attend to the other two — and your planer-molder will deliver results that will make you proud.





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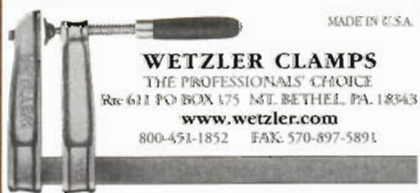
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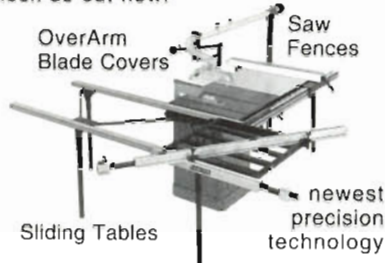
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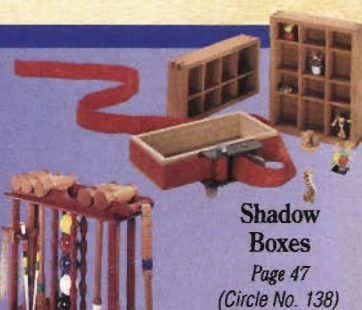


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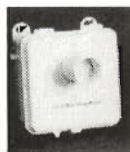
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Eclipse Scroll Saw Ready for Market

By Patrick Spielman

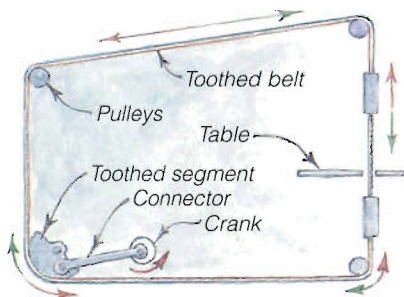
An unusual drive system, an abundance of exclusive, "scroller friendly" features and superbly built. That's a brief but accurate description of the new Eclipse scroll saw. The inventor and manufacturer of this revolutionary machine is Ernie Mellon of Quinton, Virginia, a machinist and serious scroller who wanted more performance than existing machines provided. Following are brief descriptions of the Eclipse's essential and exclusive features:

An "oscillating loop (belt) drive" system is radically different. It consists of a flat-toothed belt attached to one end of each of the two blade holders and, when fitted with a blade, forms a continuous loop. The loop is tensioned and moves back and forth over

a series of pulleys inside of a large, cast-aluminum C-shaped housing, as shown in the sketch and photos below. (As a side note, this general idea was tried 130 years ago on a foot-powered saw manufactured

by the W.F. and John Barnes Co. of Rockford, Illinois.)

The 1½" stroke length of the Eclipse is almost twice that of other saws. This means dust is carried out of the cut and wear is distributed,



Inventor Ernie Mellon's Eclipse design continues down a road first traveled 130 years ago on a foot-powered saw.



The toothed drive segment converts the rotary motion of the motor into the oscillating action of the drive belt.



The upper blade clamp, connected to the toothed belt. Note the large, multi-positionable clamp lever.



A precise table tilt scale (the table tilts 45° in either direction) is easily readable from above, through the inset opening.

Tools by the Numbers

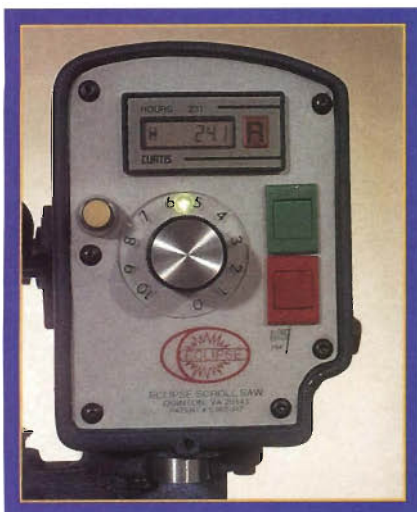
Motor	1/7 HP
Table	Cast iron
Table Tilt	45° (both ways)
Stroke Height	1½"
Throat Depth	20"
Speed Settings	200 - 1,350 spm
Price	\$1,495
Information	804-779-2478



Professional scroller John Polhemus replaced his major brand saw with the Eclipse because it allows him to make faster, more accurate cuts, with less blade breakage.

resulting in a cooler cut. In addition, the wood ends up being cut faster with a slower blade speed. A typical scroll saw, for example, with a 7/8" stroke operating at 1,750 spm (strokes per minute) results in 1,531" of blade travel per minute ($.875 \times 1,750 = 1,531$). The Eclipse, with a top speed of just 1,350 spm, but with its 1 1/2" stroke length, produces 2,025" of blade travel per minute.

There are two important safety features incorporated into this unit, both of which speak for themselves. First, if a blade does happen to break during operation, an automatic shut-off device is



The control panel includes a unique timer that starts and stops as the unit is turned on and off, allowing you to determine the exact amount of time you've spent on a project.

Tool Preview continues on page 74 ...

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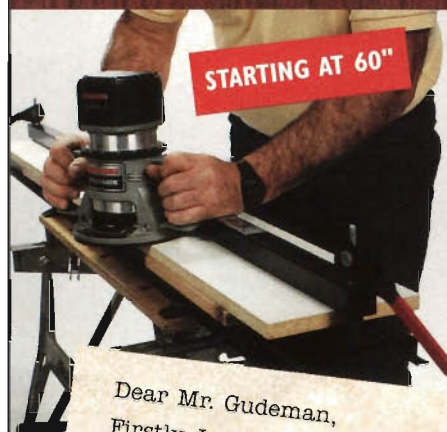
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Anyone who is a serious woodworker, or perhaps anyone who wants to plane an edge on a board, needs a JOINT A-billi-T.

Congratulations on this wonderful improvement to the woodworking process. Like any process, each step must produce the desired results each time. With your product, this is possible.

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TOOL PREVIEW



triggered. Second, there are simply no exposed moving parts, other than the reciprocating blade.

Painless, quick blade installation is accomplished with vertical and horizontal stops in the blade clamps. The upper blade clamp has a large, multi-positionable lever that is easy on fingers — especially nice when repeating numerous inside cuts. A three-slot table insert provides a choice of wide openings or a narrow slot to support small, delicate cutting.

Many other small features add up to big scrolling pleasure: a key lock prevents unauthorized operation, and an adjustable blower line

A large blade tensioning lever is easy to use. Note also the sizable hold-down and segmented air hose with 90° end piece.

delivers a good stream of air from a piston pump. An adjustable, self-leveling stand; a large, cast iron table; needle bearings on the drive system and ceramic bearings to guide the blade holders all play a role in ensuring trouble-free service.

About the only thing the Eclipse scroll saw doesn't do is vacuum up its own sawdust — other than that, this machine stands alone in all-around performance. After many minor design and engineering refinements, Ernie Mellon reports that his machine is now in limited production, with the first five units having shipped in mid-April.

Woodworker and author Patrick Spielman writes extensively on scroll saws and other tools. His best-selling "Router Handbook" is a shop staple.

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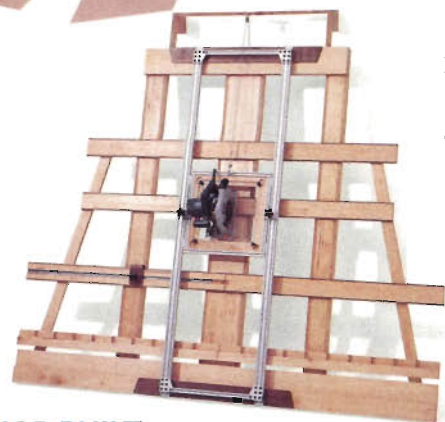
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PROJECT PLANNER



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22223 Extruded Aluminum Kit	\$299.99
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68064 Easy Grip Knob*	\$.89
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52423 Self-stick Measuring Tape	\$5.99

*Four required.



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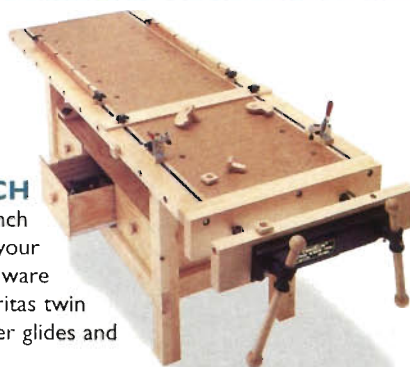
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ECONOMY WORKBENCH

A great workbench that won't bust your budget. The hardware kit includes a Veritas twin screw vise, leveler glides and T-bolt tracks.

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88379 Hardware Kit ...	\$164.99



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Built for kids of all ages, this sturdy workhorse will haul plants, tools and a couple of grandchildren ... all at the same time if necessary!

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Your feathered friends will have a classic bungalow in the country and a classy place to eat when you complete construction on this homey set.

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This plan, created from two Today's Woodworker projects, includes a house and feeder with classic Victorian lines.

65003 Plan.....	\$7.95
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ORIGINAL WHIRLIGIGS

Amuse your neighbors and yourself with the antics of these little fellows hard at work on their hobbies. The drive mechanisms, pivot nails and golf balls come in the kits; other supplies are easy to find at your local hardware store.

Golfer's:	17287 TW 44	\$2.47
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* Three required.



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This gorgeous garden bench will find a special place in your backyard. You can create this instant heirloom using our step-by-step plan, complete with full-size drawings and elevations. Finished size is 60" wide by 38 1/4" high.

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Choose from 3 arm styles. The roller hardware is inexpensive, durable and easy-to-use. Some routing required to install roller hardware. Plan includes full-size pattern for a jig to make the job easy.

Together, the two kits include all necessary parts.

37761 Plan \$12.99

38437 Futon Roller Kit \$12.99

80154 Futon Fastener Kit \$10.99



TV/VCR CABINET

Holds a 27" television, a VCR and all your favorite videos. Kit includes flipper door sets, pulls, drawer slides, hinges and more.

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10208 Hardware Kit \$149.99



COUNTRY KITCHEN TABLE

Combine a set of turned legs (your own or purchase the set below) with a butcher block top and in one quick weekend you'll have a traditional piece that will serve your family for years. Drawer pulls out both ways.

Full-size storyboard for legs included.

74010 Plan \$9.99

15869 Harvest Legs (set of 4) .. \$99.99



STEAMER TRUNK I

The kit includes trunk and center corners, a spring lock, hasps, leather handles, unpinned loops, stop hinges and lid supports.

52304 Plan \$9.99

94441 Hardware Kit \$44.99



GLIDER CHAIR PLAN

This chair and ottoman feature a bold, sturdy and practical look characteristic of the Mission style.

The chair measures 41" H x 25 1/2" W x 33" D.

Hardware kit includes floor guides, dowels, eight pivot hinges and chair webbing with metal ends.

52088 Plan \$14.99

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AUTHENTIC JELLY CUPBOARD

Optional tin panels add to this classic reproduction. Hardware kit includes a lock, the keyhole escutcheon, elbow catch and three pairs of hinges.

97271 TW 34 \$4.95

36707 Hardware Kit \$25.95

21709 10" x 14" Tin Panel* \$3.99

*Six required.





GRANDFATHER CLOCK

This classic clock design features book-matched side panels, faux tenons and a clock face designed by Today's Woodworker.

30286 Plan	\$14.99
43055 Movement	\$379.00
42990 Clock Face	\$17.99
26815 Stickley Pull*	\$17.99
27979 Stickley Hinges** (pair)	\$6.99

*Two required.

**Three pairs required.



MURPHY BED PLAN

A great convenience for living quarters where space is limited. Plan shows how to use side mounted hardware in either full or queen size.

90829 Plan	\$9.99
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Bed Mechanisms

Finely engineered hardware is counter-balanced for smooth operation with no binding or overextending. Purchase side mounted hardware in full or queen size if you are building the bed from the plan above.

Side mounted hardware

89583 Twin	\$229.00
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89616 Twin	\$229.00
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MODULAR KIDS' SET

This kids' bedroom set will change with their needs. Kit includes bed rail fasteners, safety catches and a pair of ladder hooks.

31859 Plan	\$14.99
35538 Hardware Kit	\$29.99
32482 Drawer Slides (set)*	\$13.49
36831 5" Solid Brass Pulls*	\$9.49

*Four required.



STEAMER TRUNK II

A simplified, smaller version of Steamer Trunk I. This one doubles as a coffee table.

17310 TW 47	\$2.47
23672 Hardware Kit	\$17.95



BARRISTER BOOKCASE

A classic bookcase that lends a prestigious feel to any office. Glass doors keep books dust-free while still showcasing your collection.

The hardware kit includes three barrister door slides and six crown top solid brass knobs.

52208 Plan	\$9.99
10195 Hardware Kit	\$59.99



OLD TIME ICEBOX

Nostalgia buffs and woodworkers alike will warm up to our reproduction of this classic. The hardware kit includes a nameplate, latches, hinges, glides, shelf standards and supports.

97263 TW 33	\$4.95 \$2.47
98625 Hardware Kit	\$59.99

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Wag-on-wall	#12460

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Electric Power Tools

3-1/4" PLANER

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

~~\$49.99~~ **\$39.99**
 ITEM 32222-3SHA

2 PC. REPLACEMENT BLADES
 ITEM 33262-0SHA **\$9.99**

ROTOZIP
Rotozip SCS01

SPIRAL SAW

Spiral cutting action provides clean cuts in tile, acrylic, aluminum and vinyl siding, drywall, fiberglass, and wood.

- 115V/120V, 4 amps, 30,000 RPM motor
- No-fail bump-off switch
- Bayonet style removable base and depth guide
- 2.7 lbs. tool weight

ITEM 41302-0SHA \$79.99

1/8" TILECUT CARBIDE BIT
 Cuts ceramic tile, marble, cement board and plaster. Rotozip 125 **\$4.99**

ITEM 41304-0SHA

CIRCLE CUTTER Rotozip CRCT1
 Cuts perfect circles from 3-1/2" to 14" in diameter.
ITEM 41307-0SHA \$16.99

CENTRAL MACHINERY

10" INDUSTRIAL TABLE SAW

Die cast aluminum table 26" x 16", has adjustable 17-7/8" x 2" rip fence and inch/metric scale for precise cutting.

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

~~\$119.99~~ **\$79.99**
ITEM 38533-1SHA

10" 40 TOOTH CARBIDE TIP SAW BLADE
 Molybdenum carbide M2 tips, 5/8" arbor **\$9.99**
ITEM 00529-4SHA

DREMEL

Dremel 3980



ROTARY TOOL KIT

Digital readout provides accurate and easy-to-set speeds in 1000 RPM increments. Electronic cruise control increases overall torque and performance by maintaining accuracy. All ball bearing construction for smooth and quiet operation.

- 120V, 1.15 amp soft start motor
- Unique cooling fan for maximum air flow
- Ergonomic design
- Separate on/off switch
- 5000-30,000 RPM
- Collet capacity: 1/32" - 1/8"

~~\$129.99~~ **\$99.99**
ITEM 41260-5SHA

LIMITED QUANTITIES

3/4 HP DUST COLLECTOR

Industrial quality motor and construction effectively handles the collection of wood chips and sawdust. Single stage design allows economical and quiet operation. Four castors stabilize the unit.

- Powerful continuous duty single phase motor • High air velocity design
- Includes 30 micron filter, 30 micron collector bag & single hose connection
- Motor: 3/4 HP, 115V, Sound rating at 3 ft.: 55-60 dB, Bag diameter: 10.5", Filter and collector bag length: 23" and 21", Collector bag capacity: 1.8 cubic feet, Air flow at 4": 610 CFM, Static pressure: 6.90, Velocity: 6987 FPM

ITEM 53651-0SHA \$179.99

CHICAGO
Electric Power Tools

A. 18 VOLT CORDLESS, VSR DRILL/DRIVER KIT WITH 3/8" KEYLESS CHUCK
 VSR: Speed range: 0-900 RPM; 3/8" Jacobs® keyless chuck; 6 pc. screwdriver & 6 pc. drill bit sets; Includes charger, battery and carrying case

ITEM 37144-4SHA \$59.99

B. 18 VOLT CORDLESS, 5-3/8" CIRCULAR SAW KIT
 Kit includes: 1 hour quick charger, 18V battery, saw & hex key. 2400 RPM, 1.3 amps, 10mm arbor, & 50° bevel capacity.

ITEM 37412-7SHA \$69.99

INCLUDES CHARGER & BATTERY



18 VOLT REPLACEMENT BATTERY
ITEM 37145-1SHA \$29.99

5-3/8" TUNGSTEN CARBIDE TIP BLADE
 Teeth: 24, C2 carbide steel, 10mm arbor, maximum RPM: 7000

ITEM 41290-0SHA \$7.99
RIP FENCE
ITEM 37449-1SHA \$3.99

DEWALT
LIMITED QUANTITIES

18 VOLT CORDLESS DRILL/DRIVER KIT WITH KEYLESS CHUCK

High-performance motor with fan cooling delivers maximum power and durability. Five steel-planet transmission and copper-plated switch withstands any job site application. Includes one hour charger, two XR2 PACK™ extended run-time batteries, screwdriver bit, & carrying case.

- 355 in. lbs. of torque • 1/2" chuck
- Variable speed, reversing
- 0 - 450/0 - 1450 RPM
- Factory reconditioned, factory perfect

ITEM 51965-0SHA \$199.99

LIMITED QUANTITIES

14", 5 SPEED FLOOR DRILL PRESS

- Hinged metal belt and pulley cover coupled with quick adjustment motor mount allows fast changing of spindle speeds
- Crank operated worktable with quick release clamp
- Table rotates and tilts 45°
- Built-in work light (bulb not included)
- Adjustable tension spindle return spring
- Motor: 1/2 HP, 115/230V; Spindle speeds: 5; Spindle speed range: 460-2500 RPM; Column diameter: 2-7/8"; Spindle taper: JT33; Spindle distance to table: 29-1/4" maximum; Spindle distance to base: 49" maximum; Spindle travel: 3-3/4"; Chuck size: 1/2"; Drilling capacity: 1/2"; Swing: 14"; Table size: 12.25"

ITEM 53650-0SHA \$269.99

CHICAGO
Electric Power Tools

VARIABLE SPEED RECIPROCATING SAW

- Gear driven, variable speed
- 0 to 2000 SPM • 1-1/8" stroke
- All ball bearing
- 110V, 4 amps, 60 Hz, single phase
- 600 watts • Overall length: 17"
- Includes 2 blades and 3mm hex wrench

ITEM 42596-0SHA \$49.99

RECIPROCATING SAW BLADES (PACK OF 10)
 • 5 metal cutting 18 TPI
 • 5 wood cutting 8 TPI
 • Universal 1/2" shank
ITEM 06467-0SHA \$5.99

MOBIL/FOLDING POWER TOOL STAND

Extend the capacity of your benchtop saw, shaper or sander. Extension wings with rollers make stabilizing large pieces easy. Large table and rugged construction support virtually all shop tools no matter what the size. Folds away for easy storage. Enamel finish.

~~\$69.99~~ **\$49.99**
ITEM 40612-2SHA

CENTRAL MACHINERY

8-1/4" COMPOUND MITER SAW

- 1 HP, 5000 RPM motor
- Cutting capacity: 3"H x 3-1/4"L @ 90°; 2"H x 3-1/4"L @ 45°
- Miter range 45° left and right
- Table: 15-1/4"W x 4-1/2"L
- Lightweight, die-cast aluminum construction
- Clear, retractable blade guard
- Includes carbide-tipped blade, dust bag, brushes, and two arbor wrenches

INCLUDES BLADE, DUST BAG AND EXTRA BRUSHES
~~\$89.99~~ **\$79.99**
ITEM 42654-1SHA

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The performance of a radial saw at a fraction of the cost. Award-winning patented design features easy setup with most 7-1/4" and 7-1/2" circular saws. Makes fast accurate bevels, rips, miters, and crosscuts. Ruggedly built and completely portable.

- Saw and table wood not included
- Maximum miter & bevel: 45°
- Crosscut: 12-3/4"; Length: 24"
- Rip capacity: 15-3/4"; Height: 22"
- Weight: 23 lbs.

~~\$599~~ **\$499**

ITEM 33576-1SHA

CENTRAL MACHINERY

5 SPEED BENCH DRILL PRESS WITH 1/2" KEYLESS CHUCK

1/3 HP MOTOR
Five speeds: 620, 1100, 1720, 2340 and 3100 RPM; 2" spindle stroke, 8-1/4" swing; Column diameter: 1-13/16"; Table dimensions: 6-1/2" x 6-5/8"; Tilts 45° left and right; Base dimensions: 11-1/2" L x 7-1/2" W x 1-5/8" H; Height: 22-1/2"

~~\$699~~ **\$499**

ITEM 34231-6SHA

5 SPEED BENCH DRILL PRESS WITH KEYED CHUCK

- 620 to 3100 RPM
- 1/2" chuck
- 1/3 HP, 2" spindle stroke, 8-1/4" swing
- 6-1/4" square table
- 22-1/2" height
- 8-1/4" max. distance spindle to table

~~\$599~~ **\$399**

ITEM 01844-6SHA

DEWALT

LIMITED
QUANTITIES



HEAVY DUTY JIGSAW

- 5.8 amp
- Variable speed
- Shoe bevels to 45° in both directions without tools
- Four position orbital action
- Anti-slip soft comfort grip
- Keyless blade change system
- Includes 3 assorted Cobalt steel blades and heavy duty carrying case
- Factory reconditioned, factory perfect

~~\$1299~~ **\$999**

ITEM 51869-1SHA

CHICAGO
Electric Power Tools



HEAVY DUTY 4-1/2" DISC GRINDER

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

~~\$399~~ **\$199**

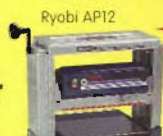
ITEM 42204-1SHA

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

- 24 grit, 7/8" arbor

FOR	ITEM	10 PACK
Metal	06674-0SHA	\$899
Masonry	07422-2SHA	\$899

RYOBI 12-5/16" PRECISION SURFACE PLANER



RapidSet™ blade system provides effort-free changeovers. Heavy duty 14 amp motor easily planes hard and soft woods to 12-5/16" x 6". Perfect for squaring up rough lumber, reducing board sizes and general smoothing. Features all ball bearing construction, large easy-to-read scale, and in-feed/out-feed rollers. Double edged knives are reversible to double their lifespan; lateral adjustability permit sliding over for continued smooth operation, even when you nick one.

115V, 14 amps, 8000 RPM, 16,000 cuts per minute, 1/8" maximum cutting depth, 26.2 FPM planing feed rate, 21-7/8" x 11-7/16" x 15-7/16" overall dimensions, 66-7/16 lbs. shipping weight

~~\$399~~ **\$329**

ITEM 01716-5SHA

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CENTRAL MACHINERY



PERFECT FOR
PRODUCTION
WORK

10" COMPOUND MITER SAW

LIMITED
QUANTITIES

A smooth-cutting saw that's perfect for production work. Make precise miter and compound cuts. Retractable blade guard. Includes arbor wrench, two side extension arms, electric brake, two U-brackets and an adjustable stop block. 110 Volts, 6.5 amps, No-load speed: 4600 RPM, Capacity: 4" @ 90°, 3" @ 45°, Blade: 10", Arbor: 5/8"

~~\$1799~~ **\$1459**

ITEM 39214-7SHA

DRILL
MASTER

115 PC. TITANIUM NITRIDE COATED DRILL BIT SET



These titanium nitride coated high speed steel bits last up to six times longer than standard bits. Cool turning titanium bits are a must for metalworkers. All bits can be sharpened. Includes: 29 fractional sizes 1/16" through 1/2", 26 letter sizes A through Z, 60 numbered sizes 1 through 60; Heavy duty metal drill index

~~\$599~~ **\$399**

ITEM 01611-2SHA

115 PC. M2 HIGH SPEED STEEL DRILL BIT SET W/INDEX

Same sizes as above; M2 high speed steel

~~\$349~~ **\$299**

ITEM 00528-1SHA

CHICAGO
Electric Power Tools

FLEXIBLE SHAFT GRINDER & CARVER



Tackle detail work in wood, metal, and plastics. Heavy duty tool grinds, deburrs, drills, polishes, buffs and sands. Motor hanger lets you mount it on any vertical surface. 1/4 HP, ball bearing motor. Includes 38" flexible shaft, handpiece, 4mm (5/32") key-type chuck, and variable speed foot control for hands-free operation. 1 phase, 60 Hz, 115V. Speed: 15,000 RPM. Shipping wt: 5-3/4 lbs.

~~\$649~~ **\$499**

ITEM 40432-1SHA

IRON HORSE

Iron Horse TAWS1

HEAVY DUTY STEEL BASE

ADJUSTABLE HEIGHT WORK SUPPORT



It's like having a third hand. Heavy duty steel base supports rugged plastic rollers. Use with table saws, miter saws, router tables, radial arm saws, and many other power tools. Height adjusts from 25" to 43" for maximum versatility. A must for any shop.

~~\$199~~ **\$159**

ITEM 02379-2SHA

DREMEL®

Dremel 1672.46

LIMITED
QUANTITIES

VARIABLE SPEED SCROLL SAW



Saws cut up to 2" thick in wood, metal or plastic. Tables tilt 0 to 45°. Use 5" long-pin or plain-end blades. Factory reconditioned, factory perfect. Includes dust port for vacuum hose.

Motor: 115V, 1/7 HP, 1.2 amps, 50-60 Hz. Speeds: 200-2000 SPM; Cutting capacity: 2" at 90° and 1" at 45°; Throat depth: 16"

~~\$1499~~ **\$1299**

ITEM 51961-1SHA

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Some Cherry Projects



The Curio Cabinet first appeared in the November/December 1987 issue of Woodworker's Journal.

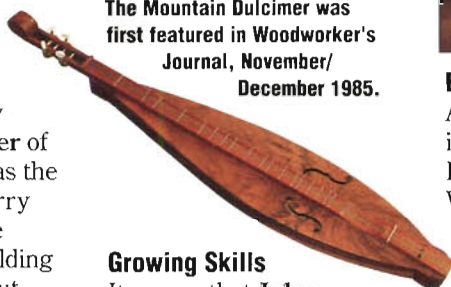
His First Time

Building our Curio Cabinet brought many "firsts" for Tom Winzer of Augusta, Kansas. It was the first time he used cherry wood, the first time he machined his own molding and the first time he cut coves on a table saw. "Your special techniques on making the continuous bracket foot and cutting coves worked out great!" he told us. Not only did Tom's project turn out well — it also gave him an excuse to get a router table.

Beautiful Music

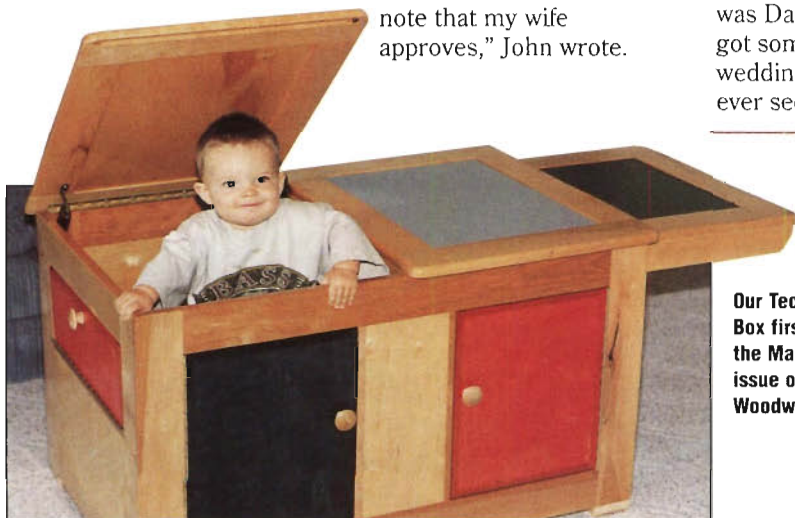
Making beautiful music — on a beautiful instrument — was the goal Fred Silverberg of Creve Coeur, Missouri achieved when he completed our Mountain Dulcimer. Fred built his dulcimer out of walnut and trimmed the sides of the fret board with padauk. (Our original was cherry, with walnut or maple as suggested options.)

The Mountain Dulcimer was first featured in Woodworker's Journal, November/December 1985.



Growing Skills

It seems that John Quinto of Graham, North Carolina, is planning for his woodworking skills to grow along with his son. John's first major woodworking project was a toy box for nine-month-old Kevin. "As you can see from the picture, Kevin loves it — and also take note that my wife approves," John wrote.



Bed (and the) Rest

Age produces beauty in cherry wood, as Dave Jezewski of Williamsville, New York, realizes. He substituted the fruitwood for padauk in the accents of our Maple Bed Frame.

Not content to rest on his laurels, Dave went on to design and build nightstands and an armoire to complete the bedroom set. He used the same combination of woods in this furniture. The lucky recipient of these pieces was Dave's daughter, who got some of the nicest wedding presents we've ever seen!



The Maple Bed Frame from the July/August 1991 issue of Today's Woodworker inspired an entire bedroom set for a reader.



Winner! Dave Jezewski wins a Bosch 1014 VSR drill for his contribution to End Grain. Send your letters and photos to: End Grain, Woodworker's Journal, P.O. Box 261, Medina, Minnesota 55340. If we publish yours, we'll throw your name in a hat for our free tool drawing. Photos of projects from Woodworker's Journal or Today's Woodworker are eligible.

Our Technicolor Toy Box first appeared in the March/April 1991 issue of Today's Woodworker.

"Compared to the other machines in the test, the Delta produced the cleanest surface and the least amount of snipe. The other planers in the test also gave us excellent surface finishing, but the Delta stood out as just a bit better."

Woodworker's Journal, January/February 1998

"...quick-change knives that we found easy and accurate to install. We found that with the quick-change systems we aligned the knives within .001!" And, we could install both knives in about five minutes." "Editors' Choice Top Tool™"

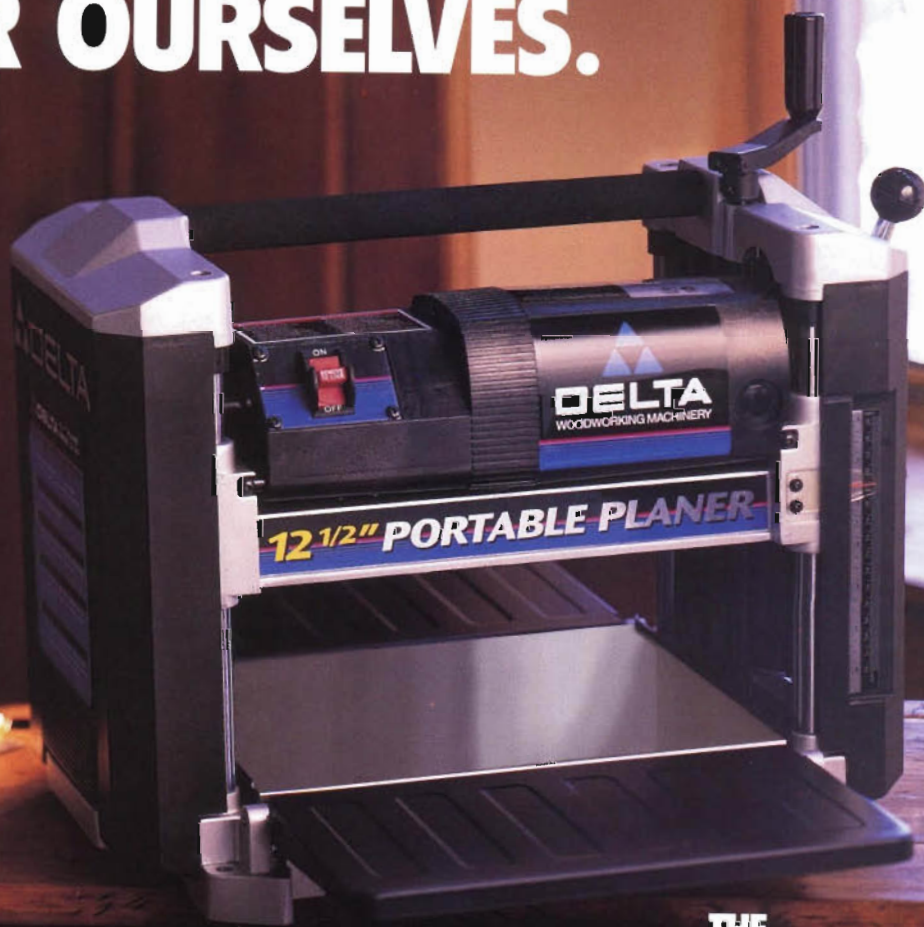
Better Homes & Gardens® Wood,® November 1996

"The Delta got great marks for quality of cut and portability, and for its innovative cutterhead assembly lock." "Editors' Choice"

American Woodworker,™ December 1996

WE COULDN'T HAVE SAID IT BETTER OURSELVES.

All of which leaves us with very little to say except this: If our planer fails to perform up to your expectations within 30 days of purchase, you can return it for a full refund. That's our Superior Performance Guarantee. And now, for a limited time, we'll even throw in an extra set of knives – a \$30 value. Call toll free for the name of your nearest Delta dealer. Delta International Machinery Corp., 800-438-2486. In Canada, 519-836-2840.



Model 22-560



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Strip away JET's rich white color and you still have the best 10-inch contractor-style table saw money can buy. Why the best? Because we have an eye for detail. We introduced the up-front switch on this saw—now an industry standard. Our precision T-style JETFENCE™ gives you the accuracy your projects demand and the ability to duplicate every cut you make. We also added quick-connect plugs to the 1½ horsepower motor so you have no wiring worries; just power up and get to work. The color? Well, that's another detail we thought you'd appreciate.



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