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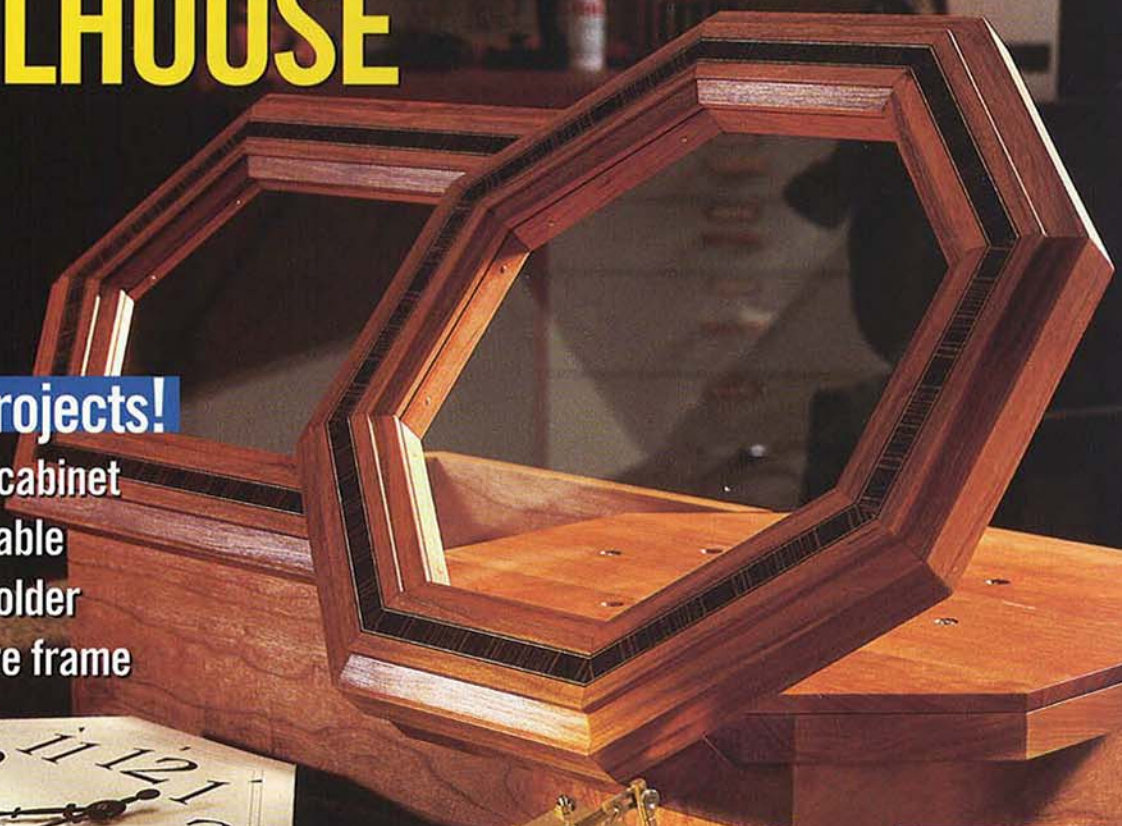
ISSUE 117 OCTOBER 1999

Build this heirloom **SCHOOLHOUSE CLOCK**

Page 45

More **COOL** Projects!

- Oak ironing-board cabinet
- Tablesaw outfeed table
- Scrollsawn letter holder
- Woodburned picture frame



BISCUIT JOINERS See which ones make the cut *Page 56*

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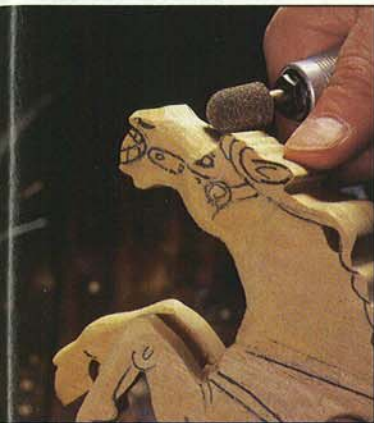
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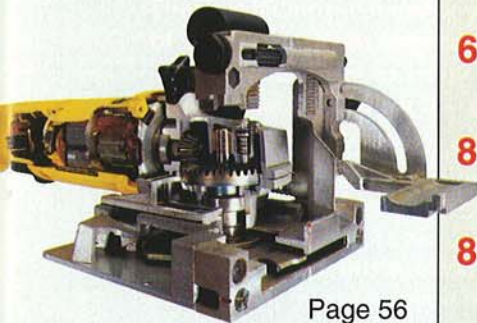
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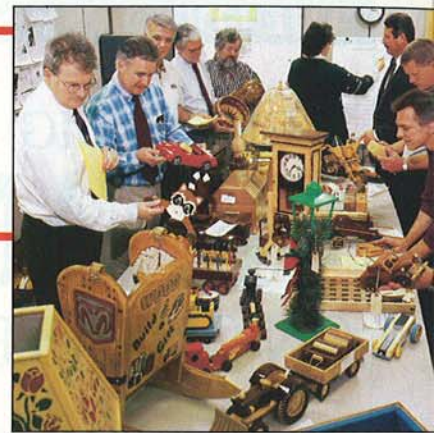
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A GREAT BIG "THANK YOU" ON OUR 15TH ANNIVERSARY

Time does indeed fly when you're having fun. And that's exactly what we've been experiencing since the fall of 1984 when we began making *WOOD*® magazine for you. During these past 15 years, we have attempted to inform, entertain, and inspire you, and increase your enjoyment of what we feel is one of the absolute best leisure-time activities going. Here's hoping you think that we have, at least in part, succeeded in our quest.

We appreciate all of the help, support, and kind words you have given us during the years. And we promise you that we'll do our level best to serve you well in the future, too.

Before I move on to another subject, I'd like to single out two groups that have been instrumental in the success of your magazine. First, there are the 15,728 charter subscribers who have been with us since 1984. That's three of them in the photo *above*.



Believe it or not, this happy group of Ohio woodworkers—Everett "Max" Marshall, F.W. "Bill" Thompson, Jr., and Jack Monroe—has been with *WOOD* magazine from the beginning. Thanks guys!

And let's not forget our long-time advertisers who have brought you information on the latest products available. Hopefully, their exposure in the magazine has helped their businesses prosper.

Thanks to one and all!

New bonus section: Woodworker's Home Improvement Guide

We know that you like putting your woodworking skills to work around your home. We do, too. That's why we've decided to begin coverage of some woodworking projects that will improve the looks and value of your home. In this issue, beginning on *page H1*, we focus on interior trimwork. We start by telling you what's involved in planning an interior trim project, show you several ways to go designwise, and cover some important installation pointers.

If you've ever wanted to give your home's trim a more impressive look, you'll like this piece. Drop me a line and let me know what other subjects you would like us to treat in future issues.

Please note: These 16-page sections are over and above the regular material we present in *WOOD* magazine.♣

Larry Clayton

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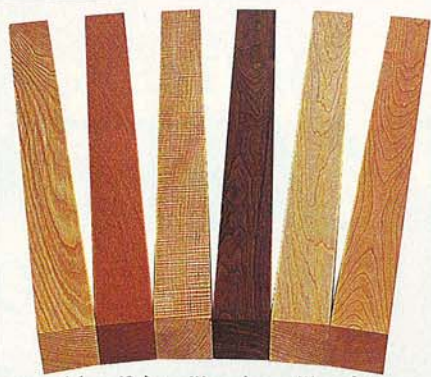
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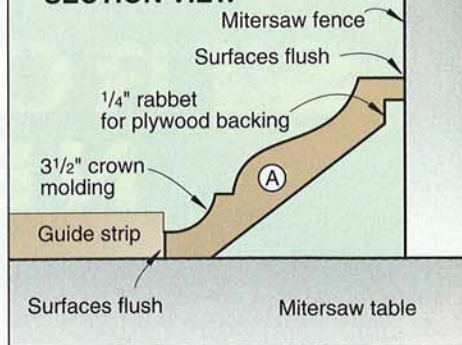


TALKING BACK

Flip the molding for the eight-sided clock

The article "A Crown Jewel" in issue #115 has a mistake in the Miter Saw Table Section View drawing on page 43. The frame pieces (A) should be positioned with the rabbet against the miter saw fence as shown at *right*, not against the guide strip as previously shown. We apologize for any inconvenience this may have caused.

MITERSAW TABLE SECTION VIEW



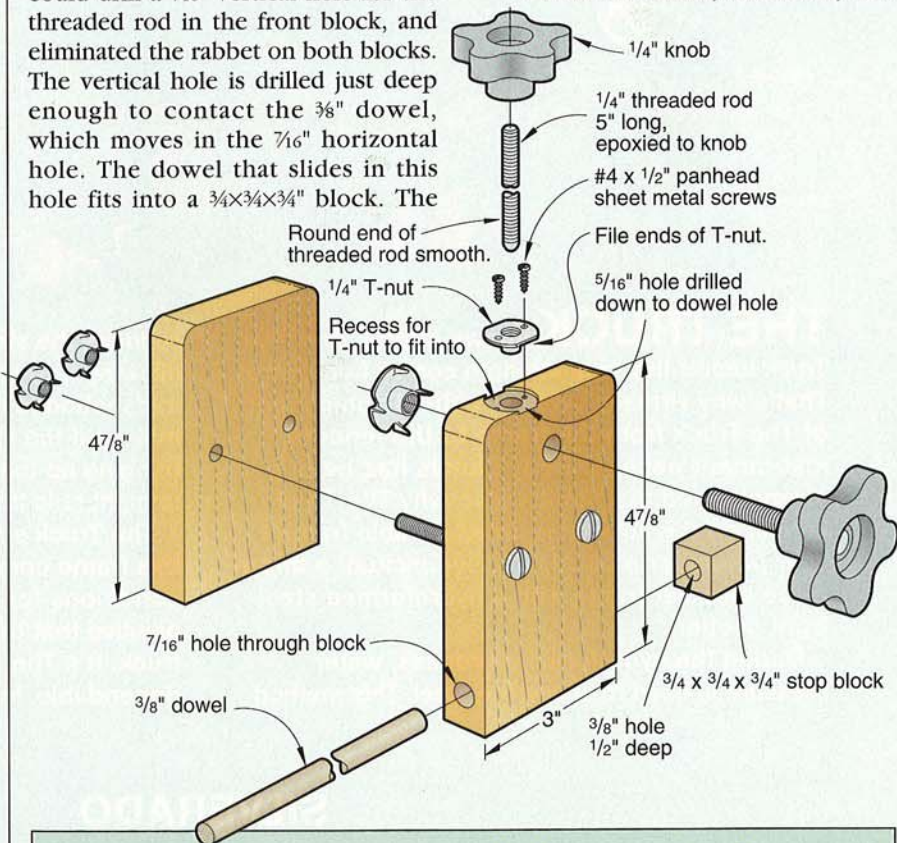
Fence stop modification makes it more versatile

Your "Fail-Safe Fence Stop" in issue #104 beats all and is what I've wanted for my Craftsman radial-arm saw. However, to use it on both sides of the blade and have the tightening knob in front at all times, I modified the plan as shown.

I increased the width to 3" so that I could drill a 5/16" vertical hole for the threaded rod in the front block, and eliminated the rabbet on both blocks. The vertical hole is drilled just deep enough to contact the 3/8" dowel, which moves in the 7/16" horizontal hole. The dowel that slides in this hole fits into a 3/4 x 3/4 x 3/4" block. The

upper part of the vertical hole should be enlarged just enough to hold a 1/4" T-nut. Due to the 3/4" thickness of the stopblock, I nipped off two sides of the T-nut. I used a motorized rotary tool to make a shallow recess for this altered T-nut, and fastened it with two #4 x 1/2" panhead screws.

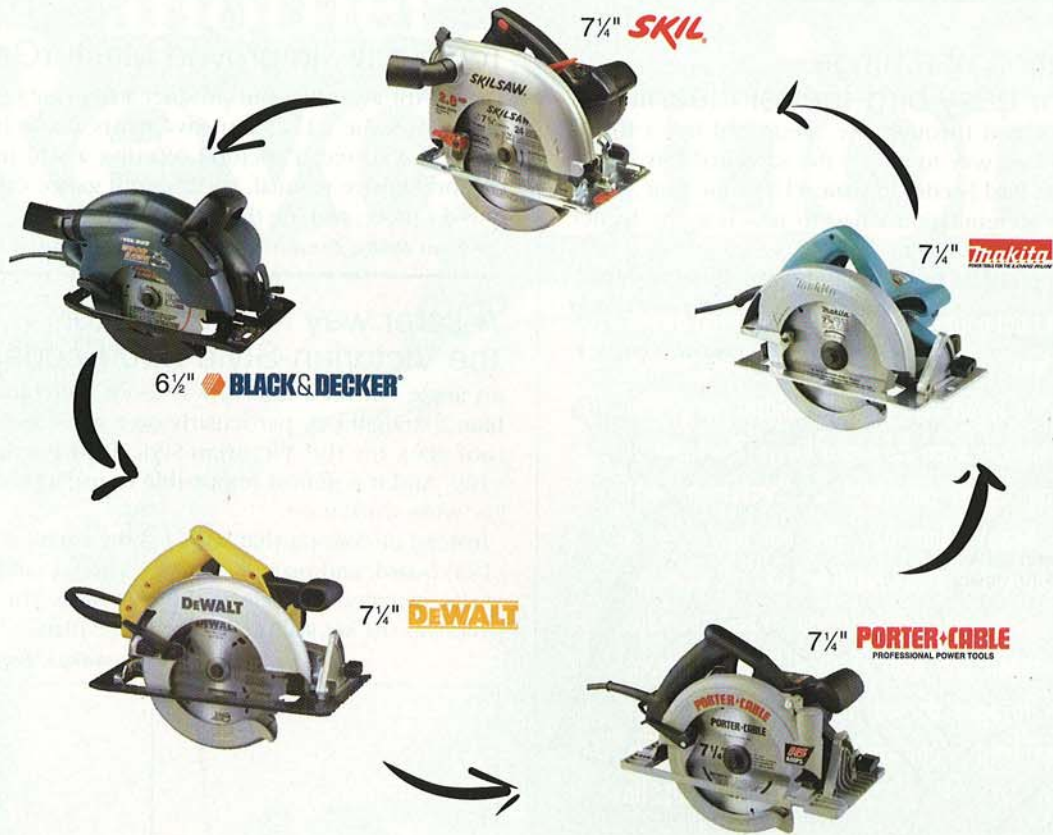
—Clarence Gerbitz, Milwaukee, Wis.



We would like to hear from you

We welcome your comments, criticisms, suggestions, and yes, even compliments. We'll publish letters of the greatest benefit to our readers. Write to: Talking Back, *WOOD Magazine*, 1716 Locust St., GA310, Des Moines, IA 50309-3023

Continued on page 6



Circular Logic



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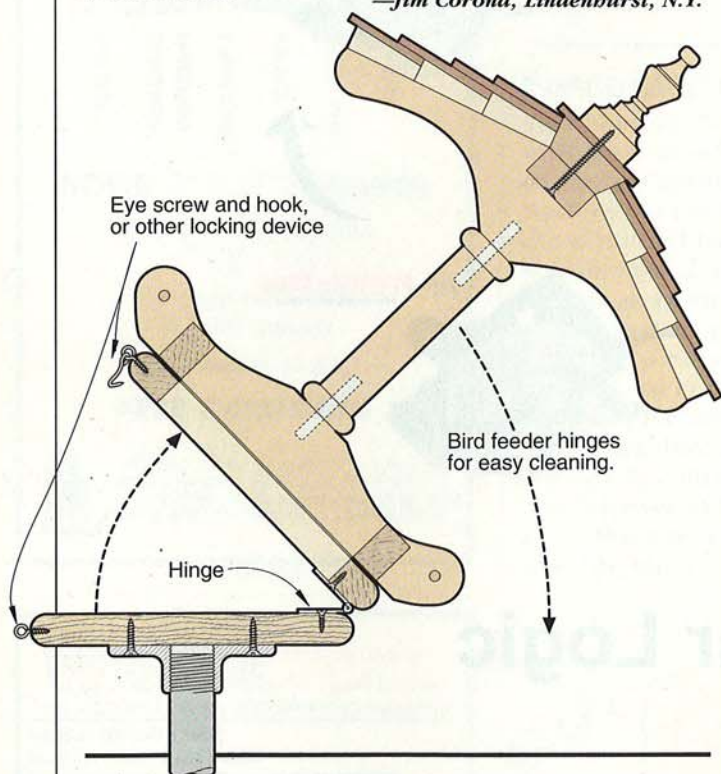
Continued from page 4

The addition of a hinge makes for easy bird-feeder cleaning

After birds picked through the seeds and left a lot of shells, I found no way to empty the screened tray of the Victorian-Style Bird Feeder in issue #109. One time, there was such an accumulation I had to unscrew the feeder from its post to clean it out.

I solved the problem by hinging the pole base and feeder base so I can turn the feeder upside down to dump out the debris.

—Jim Corona, Lindenburst, N.Y.

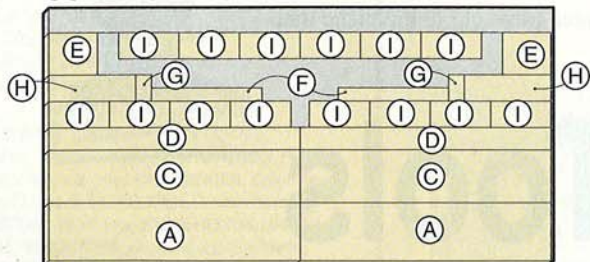


Altered layout nets two copies of box-joint jig

I liked the box-joint jig in issue #108 so well that I plan to build a second one for a router table. I thought your readers would like to know that by shortening the length of pieces A, C, and D from 26" to 23 7/8", and rearranging the cutting diagram, it is possible to get two complete sets of pieces with indexing blocks from a 24x48" piece of plywood.

—Gordon P. Patnude, Sumner, Wash.

CUTTING DIAGRAM



3/4 x 24 x 48" Baltic birch plywood

Touts new, improved MasterGage

Thanks for awarding our product a five-star performance rating in issue #112. Improvements made in the unit since you tested it include offering a dial indicator, a comprehensive manual, and a depth gauge capability for only \$4 more, making the price \$229.

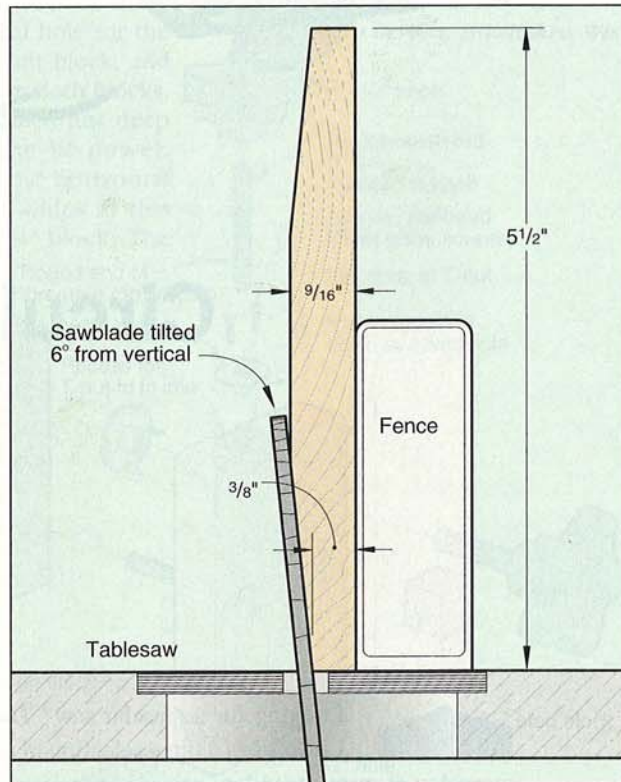
—Paul Reilly, Production Solutions, Thousand Oaks, Calif.

A safer way to cut slats for the Victorian-Style Bird Feeder

An angle cut on a tablesaw is more difficult and riskier than a straight cut, particularly on a piece as small as the roof slats for the Victorian-Style Bird Feeder in issue #109. And it is almost impossible to use a pushstick on a 1/16"-wide workpiece.

Instead of doing it that way, I started with a 3/4x5 1/2x39" (1x6) board, and planed it to 1/16". Then, I cut both edges at the specified 6° angle as shown below. The 39" length produces the six slats called for in the plan.

—Jerry Amundson, Laporte, Minn.

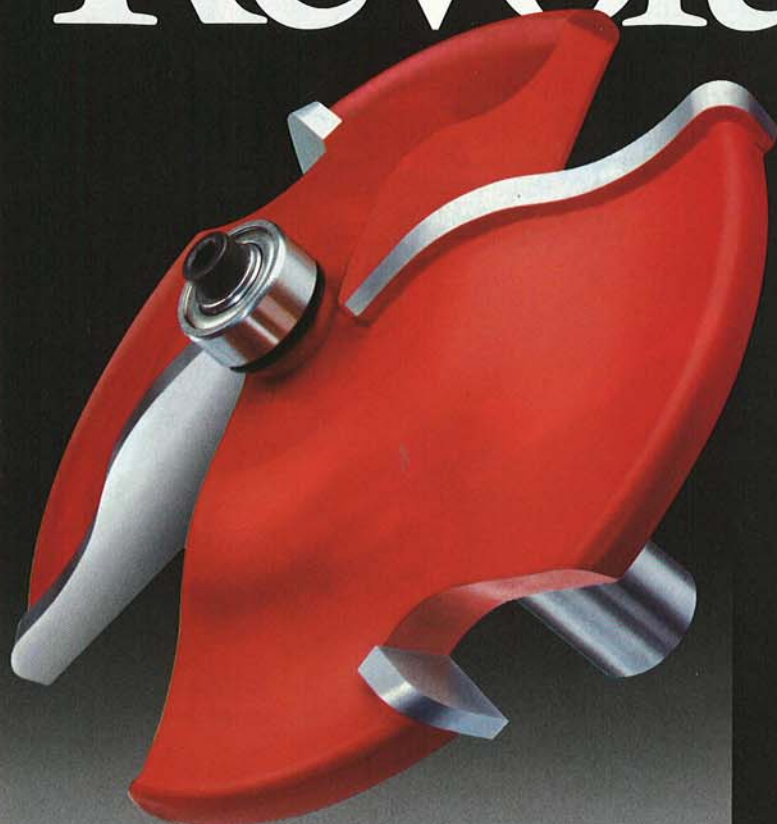


Wood turns up the heat economically

In your "Ask Wood" column in issue #113, you give a figure of 12 to 26 million BTU per cord of wood. It might be interesting for your readers to note that a kilowatt of electricity generates 3,400 BTU's, and costs around \$10, depending on your location. In other words, that cord of wood is giving you from \$350 to \$760 worth of heat.

—Ron V. Parsons, Sequim, Wash.

another Revolution...

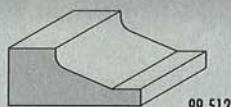


Freud has always been first in cutting tools technology. **First** with anti-kickback design. **First** with Teflon[®] coatings. **First** with Super micrograin carbide. Now, in their never ending quest for superior cutting tools, Freud engineers have designed another "first for the industry". A four-wing raised panel cutter that will revolutionize the way you make raised panel doors. Freud's patented 2+2 Raised Panel Router Bits produce glass-smooth cuts, even on cross grain! This new design has an ingenious configuration of both positive and negative shear angles that eliminates the fuzz on the top edge of the profile. Available individually and in sets. Once you've tried Freud's 2+2's, you'll see all others are second class.

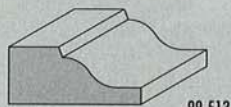
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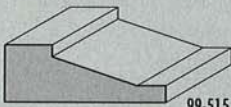
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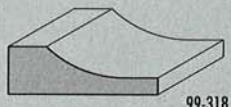
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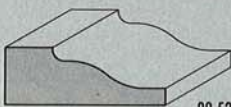
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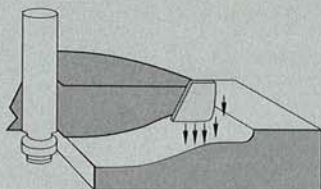


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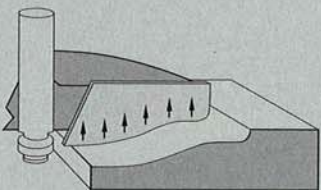


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Other profiles available.



The small wings cut downward on the wood fibers to shear the top edge off for a perfect splinter free edge.



The large wings shear upwards for a perfect finish on the raised panel profile.

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Telescope reflects both craftsmanship and stars

"I spend more time looking at a telescope than through it," **Drew Killius** realized after building a few of them. That in mind, he built his latest, this pair of Newtonian reflectors, for looks as well as optical performance. He made the hexagonal tubes (8×29" and 4×12") of ¼" mahogany plywood with oak framing; the tripod and crossbeam, mainly of oak. Drew, a materials scientist in a testing laboratory who lives in Derry, New Hampshire, ground, polished, figured, and tested his own telescope mirrors, too.



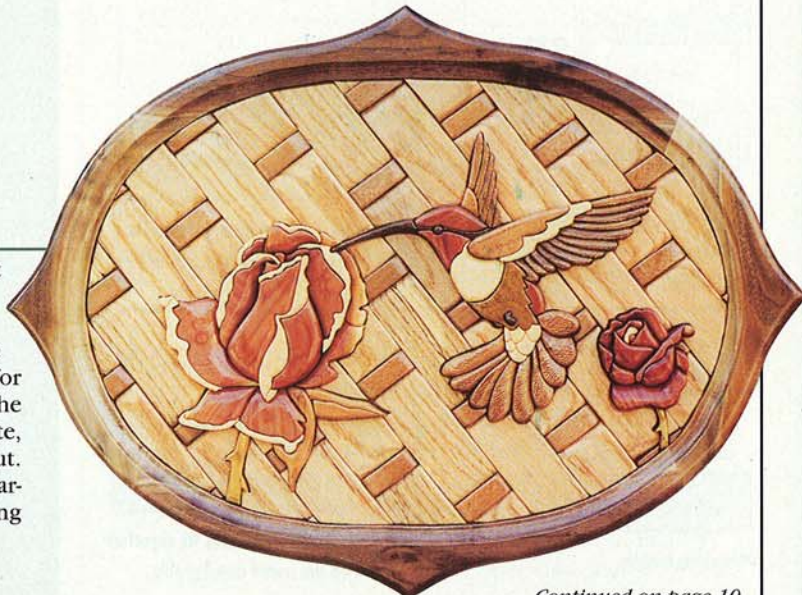
Pennsylvanian's hutch looks like an antique

Dave Dively spent nearly a month of evenings and weekends building this antique-style hutch. Designed by Dave and his wife, the two-section piece stands a bit over 7' tall. A woodworker for nearly 20 years, Dave used some plywood in the lower carcass, but otherwise the 6'-long hutch is solid pine. He made the hutch's back of tongue-and-groove boards. For an antique look, Dave distressed the cabinet and painted it New England red over black. Reproduction iron hardware completes the look. Dave, a maintenance technician, lives in Mechanicsburg, Pennsylvania.



Intarsia incorporates many woods

Rex and Patty Anderson create intarsia together at their farm home in San Jacinto County, Texas. Red oak and dogwood make up the background in this 22×16" piece, called *Monica's Rose*. For the roses, the Andersons chose red and white cedar, with apricot for the bud petals on the large one. Stems are sumac. The hummingbird includes cedar, bubinga, walnut, mesquite, agarita, and spalted cottonwood. The frame is walnut. Both offspring of woodworking fathers, Rex (a letter carrier in Cleveland, Texas) and Patty started out making bandsaw boxes and pen-and-pencil sets.



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Makita

20th CORDLESS Anniversary

1999 marks the 20th Anniversary of the introduction of Makita's first Cordless tool.

Special 20th Anniversary Kits

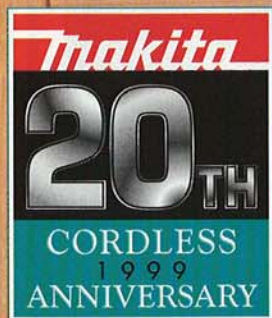
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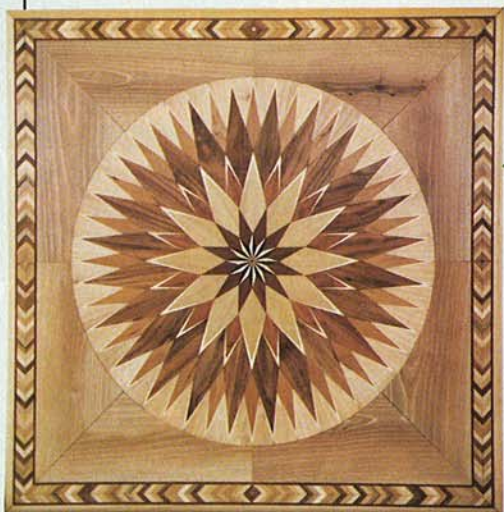
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Project Showcase

Continued from page 8

Creeping around the shop keeps this big job going

When his youngest daughter wanted an entertainment center, **Harold Crice** of Ft. Gibson, Oklahoma, went to work. The retired California police officer built the three-piece unit from oak plywood, with trim, doors, drawer fronts, and bases from red oak. "Moving the heavy things around the shop became a real chore," Harold says. He solved the problem by picking up a mechanic's creeper at a garage sale. With a $\frac{3}{4}$ " plywood platform attached, the creeper made moving the cabinets easier.



Marquetry sets off top of folding card table

"In the 24 years since I retired," **Verle McDougall** says, "woodworking has been my hobby and my pleasure." Verle, 84, of Goleta, California, tells us he had little time to devote to woodworking during the years he worked as a retail grocery manager. Now, he makes card boxes, game boards, cutting boards, and more, including a 30x30" card table with this impressive top. Some of the veneers Verle chose for the intricately inlaid tabletop include rosewood, purpleheart, cherry, holly, and English walnut.

Well-aged wood goes into Texan's blanket chest

To build this blanket chest, **Kenneth Smith** dragged out cypress lumber that had been in storage since it washed ashore during hurricane Carla in 1961. Kenneth, a retired accountant living in Baytown, Texas, built the chest for his wife. Standing 27" tall, the chest is 36" long by 17" deep. Kenneth gave the cypress a light stain, then applied several coats of lacquer. He tells us he has "dabbled in woodworking" since he was a teenager. 🌲



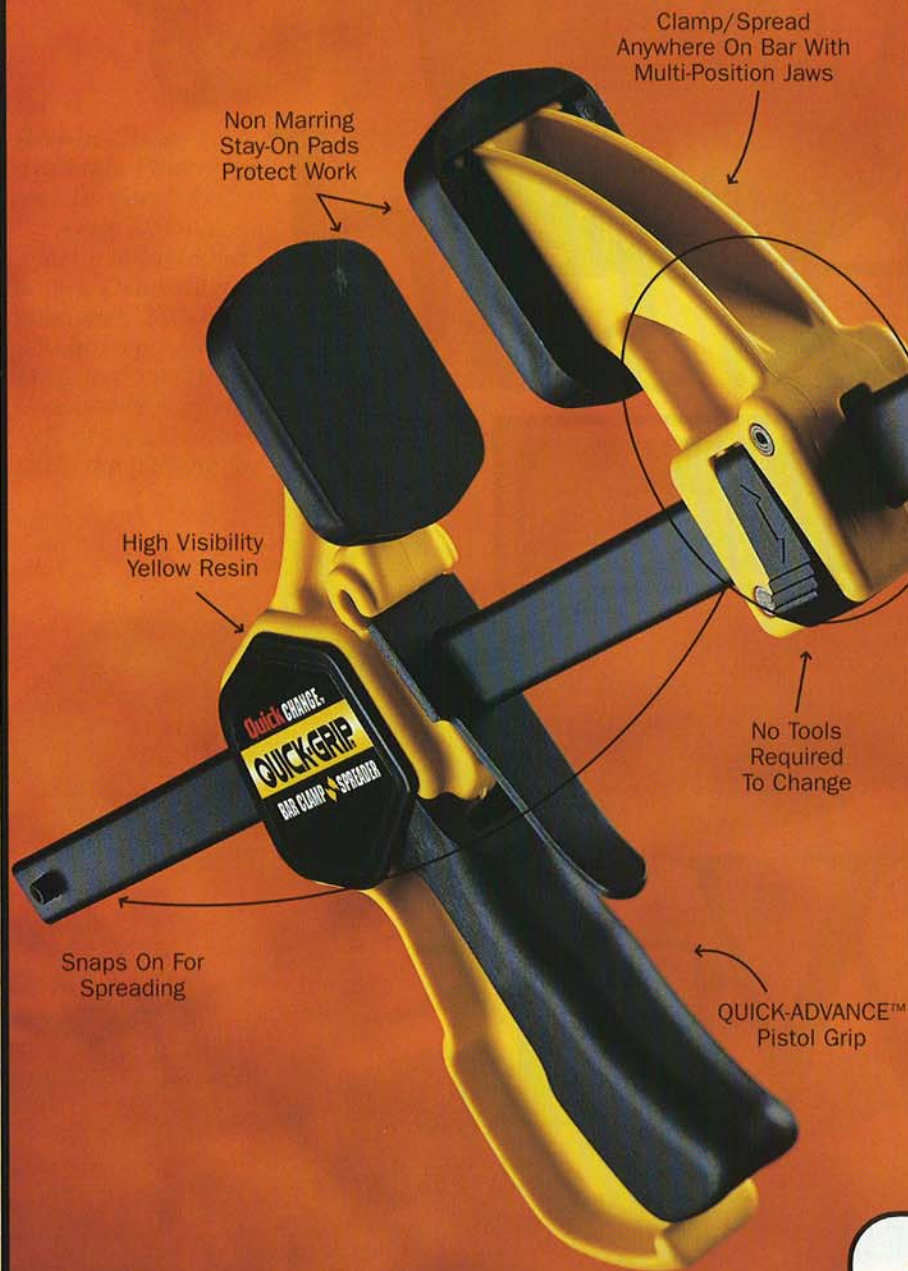
We'd love to share your best work with our fellow woodworkers. But, of course, there are a few rules.

- Items built from kits or directly from published plans are ineligible, as are carvings made from roughout blanks.
- Please don't submit carpentry projects, such as decks or remodeling.
- Send sharp color slides or glossy prints (we can't use Polaroid photos).
- Avoid cluttered or busy backgrounds.
- Photos cannot be returned.
- Explain what your project is or what it does—we don't want to call your lamp table a plant stand.
- Describe features, wood, finish, and overall dimensions.
- Tell us a little about yourself, too; how old you are, your occupation (or former one if you are retired), how long you've been woodworking, and so forth.
- Include a daytime phone number or e-mail address so we can contact you if we need additional information.

Send everything to:
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Project Showcase
1716 Locust St., GA 310
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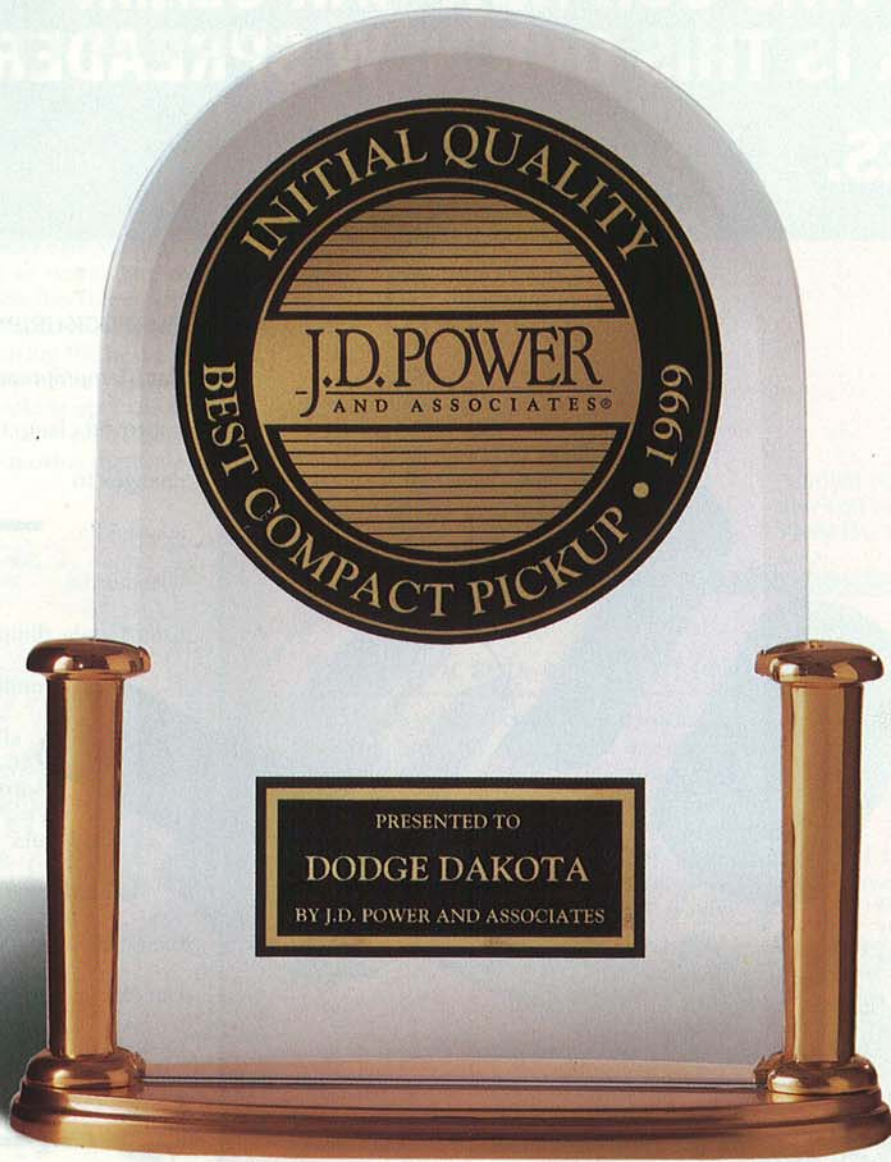
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Books and Magazines Offer Furniture Facts

Visiting shops, galleries, and museums, as suggested in the August edition of *WOOD*® magazine (issue 114), is a great way to study antique and collectible furniture. But you can learn a lot about it by reading, too.

Hit the books for basics

"When it comes to identifying styles of old furniture, you'll find many helpful books at public libraries and in bookstores," says antique-furniture appraiser and consultant Dennis R. Tesdell. "Start with general furniture books showing photos and drawings of styles from various countries and eras," Dennis suggests. "Then, to learn more about particular furniture that interests you—say, Victorian—refer to more specific books."

Some general references on American furniture that the *WOOD*® magazine staff turns to include

- *Furniture Treasury, Volumes I, II, and III* by Wallace Nutting
- *The New Fine Points of Furniture* by Albert Sack
- *The Bullfinch Anatomy of Antique Furniture* by Tim Forrest
- *Field Guide to American Antique Furniture* by Joseph T. Butler
- *The Encyclopedia of Furniture* by Joseph Aronson

Magazines offer added advice

"In addition to books, magazines about antiques can provide valuable information. They typically carry articles and ads with photos describing and showing many different kinds of furniture," Dennis says. A public library may carry the magazines, or you can buy copies at a newsstand.

Some of the popular periodicals are

- *Antiques*
- *Antique Trader Weekly*
- *Art and Antiques*
- *Maine Antique Digest*
- *Antiques and the Arts Weekly*

"For the most part you will see American, English, and French furni-

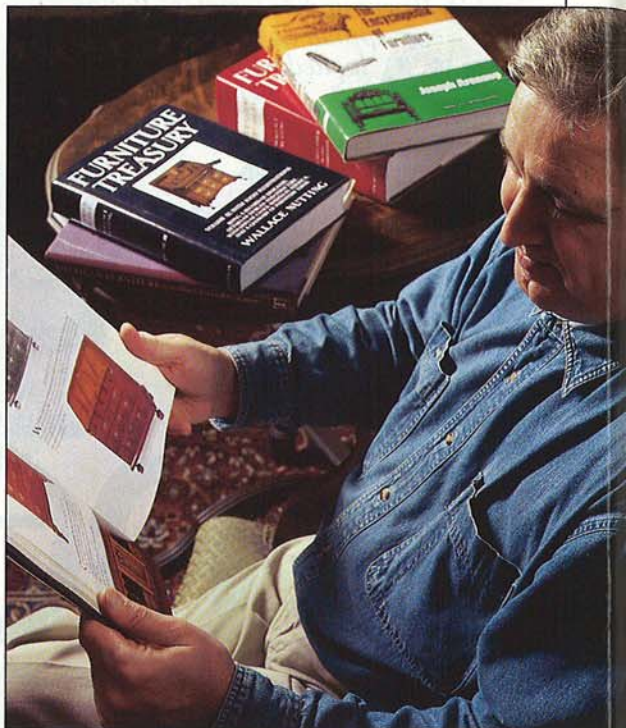
ture described and advertised in these magazines because those are the most popular and common countries of origin for antique furniture," Dennis comments. "It's well worth the money, if you intend to collect furniture seriously or for a long time, to subscribe to some of these magazines," he advises.

Price guides are prime resources

Price guides can help you identify furniture and will give you some idea as to its value. "Keep in mind that these are merely guides," Dennis emphasizes. "The price for each piece pictured or described is usually taken from only one source—a shop, a show, or an auction are the usual ones." Some popular guides, available at larger book stores and in many antique shops, include

- *Kovel's Antiques and Collectibles Price List*, issued annually for more than 30 years
- *Warman's Antiques and Collectibles Price Guide*, an annual listing of prices in 500 categories
- *Schroeder's Antiques Price Guide*, an annual guide published for more than 15 years

"Of course, just because your piece looks like the photo in the guide does not mean it is of the same vintage or has the same value," Dennis says. "It takes hands-on experience and some academic knowledge to tell the difference between a good 19th- or 20th-century copy and a piece that is 200 years old," he points out. "This is where visiting good shops and gal-



leries, museums, and antique shows will help you. The more authentic old pieces you see and study, the more easily you will be able to identify and date furniture you have or buy for yourself," he says.

Pros may help you identify and value your old furniture

"Finally, you can ask dealers or auction house experts to help you identify or value furniture," Dennis says. But taking this approach doesn't guarantee answers. "If you show them a good photo or take the piece to them," he says, "these people may be very helpful or they might just tell you they do not appraise pieces or will only help you for a fee. Be prepared to pay for a written expert appraisal if you ask a dealer or appraiser to come to your home and look at the pieces you want identified and priced," he adds. (In a future article we'll discuss how to locate and hire a furniture appraiser.)

Dennis R. Tesdell of West Des Moines, Iowa, an associate member of the International Society of Appraisers, has 25 years of experience in evaluating old furniture.

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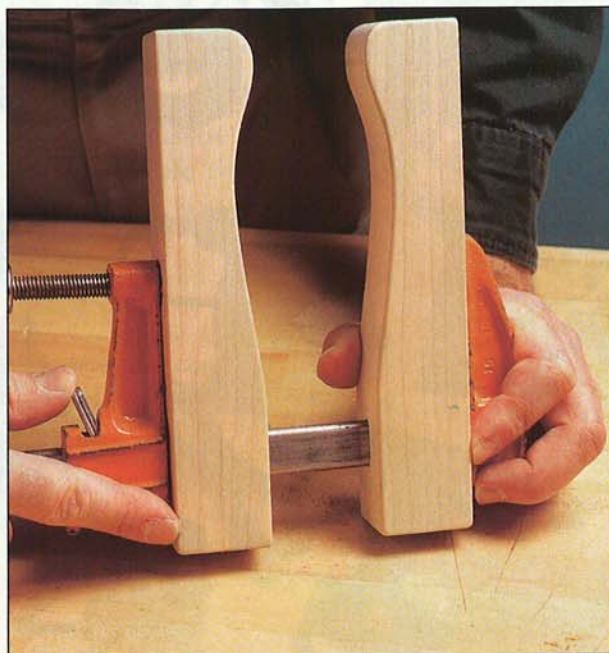
Long-reaching clamp extensions

For clamping jobs like that shown *below* that require clamping pressure farther in from the edge than sliding-head clamps have, add a pair of these hardworking extensions. (We've used them on Jorgensen sliding-head-type steel bar clamps and Bessey sliding-arm bar clamps.)

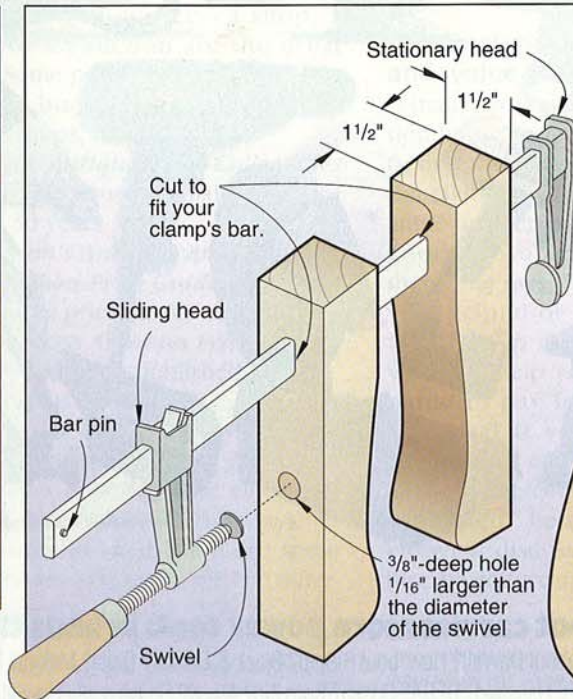
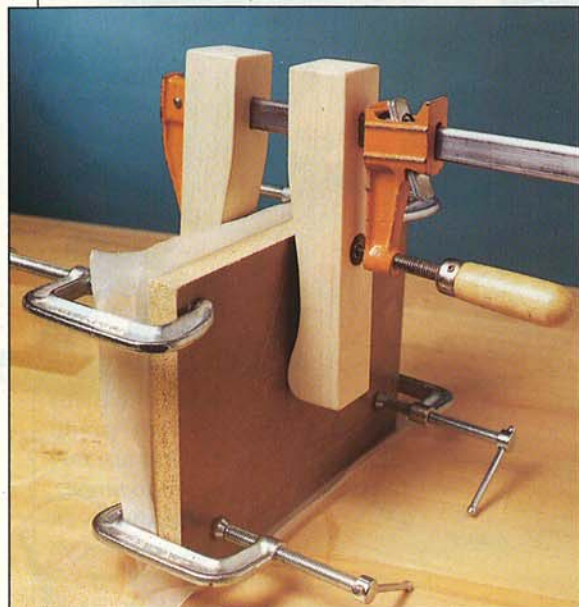
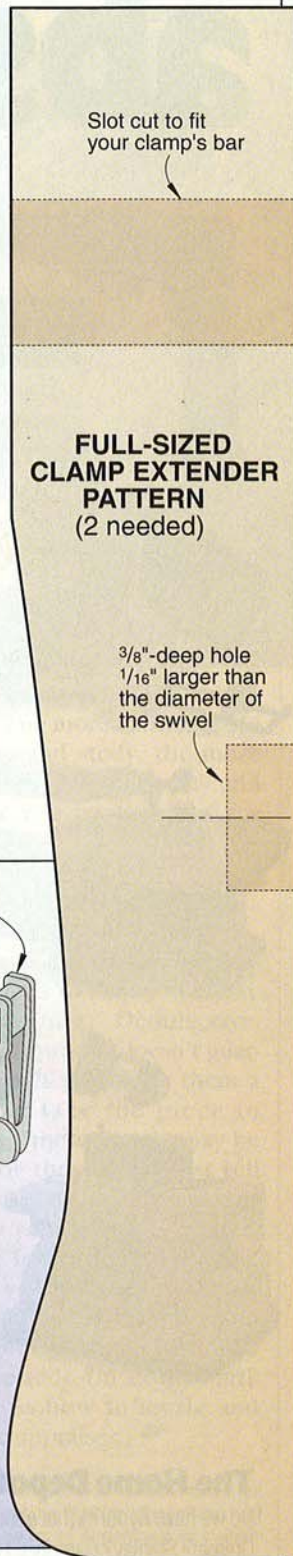
Simply cut a pair of the extensions to shape from 1½"-square stock (we laminated two pieces of ¾" maple), using our full-sized pattern. Pop the bar pin out of the end of your clamp's bar. Then, drill and cut a slot in each extension so it slides smoothly, but fits snugly on the bar.

Put the extensions on the bar in the configuration shown on the drawing *below right*. Mark the location of the swivel on its mating extension. Remove that extension from the bar, and drill a ⅜"-deep hole ⅛" larger than the diameter of the swivel-head clamp end where marked.

As shown in the photo *above*, position the sliding head next to the extension when moving the two back and forth on



the bar. If you leave a gap between them, they tend to bind and are harder to move in unison. Drilling the hole for the swivel in the extension allows you to slide the extension flush against the metal head.



Project Design: Mike Sarnes, Fairview, Michigan; Chuck Hedlund
 Illustrations: Roxanne LeMoine
 Photographs: Dan Tanner

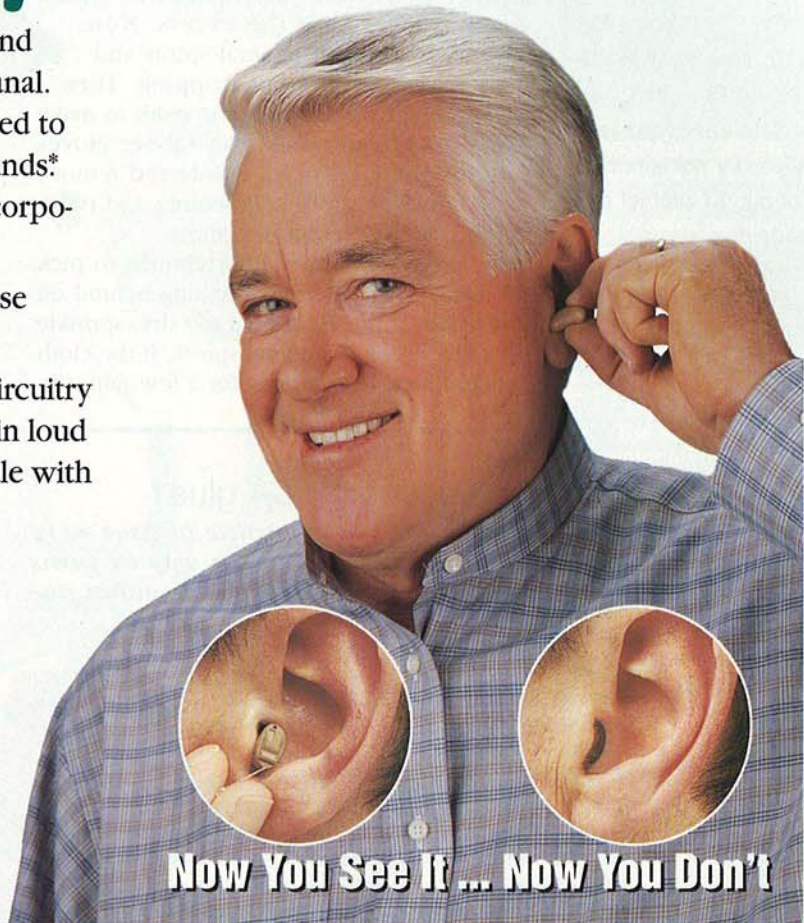
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Have a question?

If you're looking for an answer to a question that you think would interest lots of other readers, we would like to hear from you. Write to: Ask WOOD®, 1716 Locust St., GA310, Des Moines, IA 50309-3023. For an immediate answer to your question, try posting it on one of our 10 internet discussion groups at: www.woodmagazine.com

Make your own tack cloth

I know you can buy it, but I've heard there's a way to make a tack cloth for cleaning a surface before applying finishes. What's the procedure?

—Dick Bulot, San Pedro, Calif.

To make a tack cloth, Dick, start by soaking a piece of cotton cheesecloth in warm water. Squeeze out the excess. Now, soak the cloth with mineral spirits and hang it up until it stops dripping. Then pour enough varnish over the cloth to make it uniformly yellow. Put on rubber gloves and mix the ingredients evenly and remove extra liquid by repeatedly folding and twisting the rag in different directions.

The cloth should be sticky enough to pick up dust without leaving anything behind on the wood. If the cloth gets too dry, sprinkle on a few drops of mineral spirits. If the cloth gets too wet, let it air dry for a few minutes.



Store your tack rag in a sealed plastic bag as shown above to keep it in good condition.

The scoop on CA glue

I really enjoyed the article in issue #112 about Ray Allen and the way he turns bowls. I followed the explanation just fine

until the story mentioned CA glue. What is this, and why did he use it for just the one part? Who makes the stuff?

—Herman Roy, Bow, N.H.



“CA” is an abbreviation for cyanoacrylate glue. Commonly known as Super Glue, you can buy CA glue in thin formulations that soak into wood and reinforce it, and in thicker viscosities for filling gaps between joined pieces. Ray used CA glue when he needed a fast-curing glue to speed his work. He applied just a few drops so he could later break the bond. Some turners use double-faced tape to perform the same task.

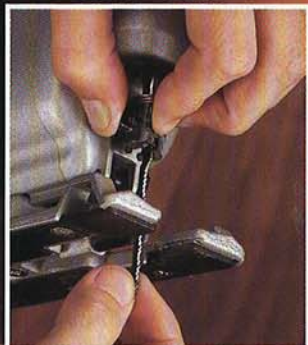
CA glue comes in especially handy for small or hard-to-clamp parts. Jim Adams of Loctite, an adhesive manufacturer, informed us that his company's CA gel, Prism 454, bonds wood parts well enough to machine after 15 seconds. Jim also warns not to use CA glue in projects that come in contact with moisture. For more information, call these numbers:

Loctite: 800/562-8483
Devcon: 800/375-2525
Elmer's: 800/848-9400

Continued on page 20

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Continued from page 18

My dado set is bigger than my arbor

Recently I decided to try my hand at using a set of dado blades. The new blades I bought make a 1"-thick stack when all of them are put on the arbor. When I went to position the set, I discovered the arbor of my tablesaw is only 3/4" long, making installation impossible. Can I fit my saw with a longer arbor to accommodate the dado blades?

—Joe Brody, Sun City, Ariz.

Joe, to answer your question, in a word, no. All saws have their limits, and the length of your arbor is your

saw manufacturer's way of letting you know how much it can handle. When you cut a dado, a saw has to work tremendously hard to turn the dado blades fast enough to cut and remove all of that waste. A full inch is a lot to dado at once even with powerful cabinet-style saws.

To achieve the most dado capacity with any saw, leave the arbor washer off the arbor. Then, put on as many blades as will fit, while still allowing the nut to fully engage the threads. If you can only get a couple of chipper blades on, then you'll simply have to make multiple passes to achieve the size of dado needed.

Show your brushes a little love for years of faithful service

Try as I may to clean my finishing brushes, with time they always fill up and harden. I've heard of people using the same brush for years. What's the secret?

—Nathan Fultz, Fosston, Minn.

Much of the time, Nathan, finishers wash their brushes too often. If you're planning to use the brush again within a day or so, simply store the brush in plastic-wrap or a resealable bag with all of the air pressed out. The lack of air will keep the finish from drying on the bristles.

Also, you can store brushes for a few hours in a solvent that's appropriate for the finish on the brush (water for water-based finishes, lacquer thinner for lacquer, alcohol

for shellac, and mineral spirits for polyurethane, varnish, and oil). Anytime you soak a brush, remember that the weight of the brush will bend the bristles and ruin the shape of your brush. So suspend the brush in the finish by running a small dowel through a hole drilled in the handle, or cut an X in the plastic lid of your container to suspend the brush, as shown *left*.

If cleaning is necessary, start with a wash in the appropriate solvent. You may have to use your fingers to loosen up the finish thoroughly, so wear rubber gloves. When the brush seems mostly clean, wash it in lacquer thinner. This should remove any remaining finish and the oil from the solvent wash. Between each wash, spin dry the brush. Do this by placing the handle between your palms and twirling the brush by moving your hands quickly back-and-forth.

Now, give the brush a third wash with dish-soap and water, rinsing until the water runs clear. Give the brush a final spin-dry, and if the bristles aren't straight, run through them with a wire-brush, comb, or even a fork. Finally, store them in their original sleeve or in a wrap of heavy paper (such as brown paper bags) to keep the bristles straight and clean as they dry. Hold the paper in place with a rubber band or masking tape as shown *left*.

Here are a few more tips to consider for brush care:

1. If you have a brush that has completely hardened, soak it in stripper for a few minutes; then work out the finish with a wire brush.
2. If a brush is quite worn, save it for less exacting tasks such as stripping.
3. Finish matter will settle to the bottom of your soak cans, so re-use your solvent over and over to clean brushes. Keep lids on your soak cans to control evaporation.
4. Use natural bristle brushes to apply oil-based finishes. You can use plastic (nylon/polyester) bristle brushes with water-based finishes.
5. If you use a brush for oil finishes only, add a few drops of mineral-oil to clean, dry brushes before storing them. This helps keep the bristles soft.
6. Always store your wrapped brushes flat in a drawer or hanging on a hook.



Continued on page 22

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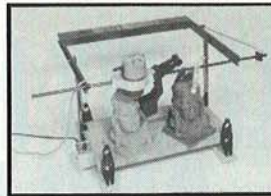
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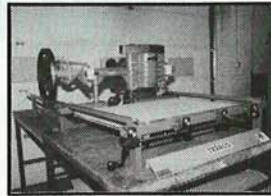
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ASK WOOD

Continued from page 20

How cold can you go and still finish projects outside?

I am working on some projects to which I would like to apply aerosol finishes. I usually spray these projects outdoors and then move them inside to cure. As the temperatures get colder, will I still be able to finish in this manner?

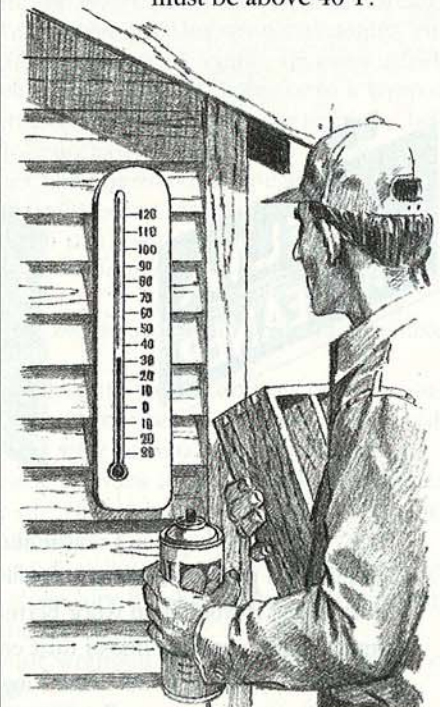
—Victor Luedke, Billings, Mont.

Good question, Victor! Although the labels on many aerosol finishes list a minimum application temperature, we turned to Lloyd Haanstra, a technician for Deft, Inc. (a finish manufacturer based in Irvine, Calif.) to find out more on this topic. Lloyd broke this issue down into three parts: lacquer, varnish, and water-based products.

Lacquer dries by solvent evaporation so you can apply it at any temperature. The colder or more humid the climate, the longer the drying time will be, though.

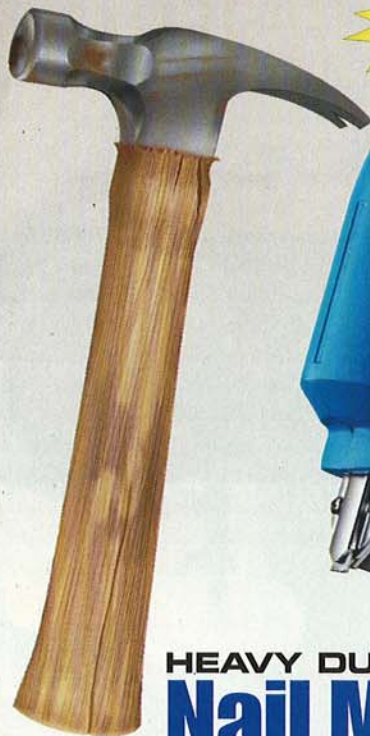
You also can apply varnish at any temperature. It cures by oxidation (a chemical reaction when exposed to the air). As with lacquer, cold temperatures will slow curing rates for varnish.

Water-based finishes rely on resin particles melting together for success. For this bond to happen, the temperature of both the air and work surface must be above 40°F.



Continued on page 26

Prototype



New!



Finished Product



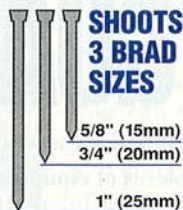
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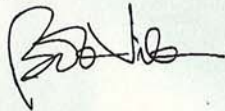
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SEARS

ASK WOOD

Continued from page 22

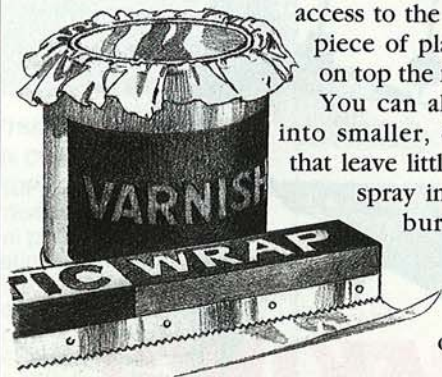
Protect your unused varnish with these tips

I buy varnish by the gallon. No matter what I do to make sure that the can is sealed, I always seem to get a layer of film that hardens on top of the liquid varnish. How do woodworkers keep their cans sealed tight enough to stop finish from curing inside of its container?

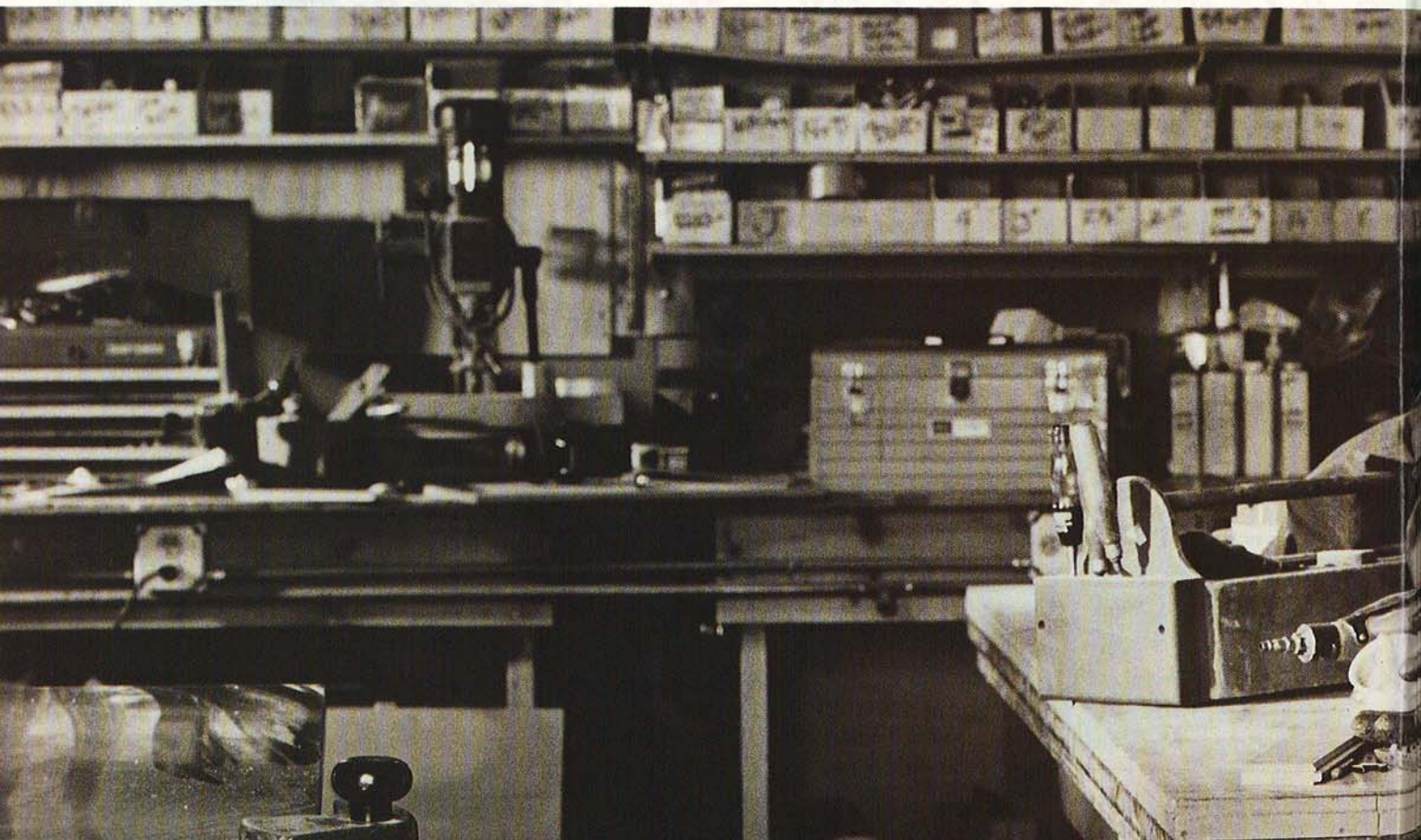
—Melvin VanderVeen, Round Lake, Minn.

It doesn't matter how tight you manage to get that lid on, Melvin. The more varnish or other finish missing from the can, the more room there will be for air. The oxygen in the air absorbs into the finish and begins the curing process. You can cut off the oxygen's access to the finish by placing a piece of plastic wrap directly on top of the finish.

You can also pour left-overs into smaller, clean, finish cans that leave little room for air. Or, spray into the can a short burst of Bloxygen, a heavier-than-air blend of inert gases that block oxygen. The jar on



the right side of the photo *below* was treated with Bloxygen in our shop, the jar on the left was not. For more information, call Bloxygen at 805/542-9219, visit www.bloxygen.com, or see our review of this product in issue #107, page 78, of WOOD® magazine.



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You won't be a "square" when using square nails

I like to reproduce 18th- and 19th-century woodwork, and have found that round nails look out of place. Is there a source that still makes square nails? If so, how are they made?

—Robert Stauffer, Cassopolis, Mich.

You're in luck, Bob. There's a company in Wareham, Massachusetts, that still makes cut nails (sometimes referred to as square nails because of their shape). In fact, the Tremont Nail Company still makes its cut nails in much the same way it has for 180 years—by hand, with historic machines. In this way the factory also serves as a true living history museum.

The folks at Tremont start with 2x9' sheets of hot-rolled, high-carbon steel, which they first cut into strips as wide as the nails will be long. As each nail is cut to width and tapered, a die presses on a head. Some nails, such as flooring and masonry nails, are made from hardened steel, which requires the extra steps of heat treating to 2000° Fahrenheit, quenching in water, and tempering at 500° F.

Tremont makes 20 styles of cut nails, each in many different sizes for about \$5 per pound. Cut nails push wood fibers downward to wedge against the nail, which great-

ly reduces the possibility of the nail loosening over time. The folks at Tremont will argue the durability of cut nails, and claim once you try them, you'll choose cut nails for all types of woodworking.

To place an order or attain a sample kit of nails and a catalog, contact:

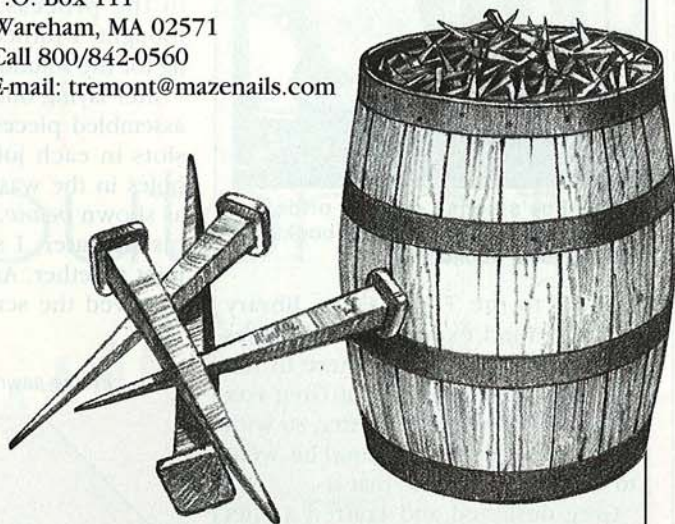
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Wareham, MA 02571

Call 800/842-0560

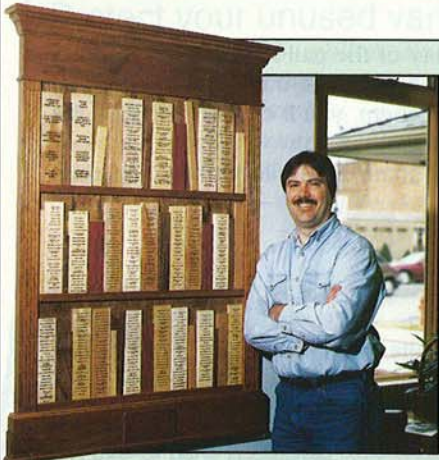
E-mail: tremont@mazenails.com

A black and white photograph of a man, Pike Noyes, in a workshop. He is smiling and holding a can of Cabot's Oil-Based Wood Stain. In the background, there is a wooden chair and various tools on a workbench.

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Greg Fox's sense of civic pride led him to fashion an imitation bookshelf for his local public library.

Donors to the Tiffin, Ohio, library building fund expected their names on a tiny plaque somewhere in the library's new addition. But Greg Fox thought they deserved better, so with the library board's blessing, he went to work—woodwork, that is.

Greg designed and crafted a faux bookshelf (shown above) with bindings made of purpleheart, cherry, yellow pine, and other colorful woods. Each volume on the stunning wall-hanging boasts the name of a contributor. Besides his book-smarts, Greg is pretty shop-savvy, earning this issue's Top Shop Tip honors for his method of gluing up polygons, at right.

Tell us how you solved a problem in your shop, and you'll pocket a check for \$75 if we publish it. And the person who submits the Top Shop Tip also wins a tool prize worth more than \$250. Just jot us a note, including a photo or drawing of your idea and your daytime telephone number, and send it to:

Tips From Your Shop (And Ours)
WOOD® Magazine
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Because we try to publish only original shop tips, please send them only to *WOOD* magazine. And remember, we can't return your submission. Thanks!

Due Campbell
 GENERAL-INTEREST EDITOR

Skip the clamps and pocket the time saved

When making a pair of oval mirror frames recently, I was faced with (and dreading) the complex task of clamping up all those 22½° miter cuts, and keeping them snug in the process. After much thought, I turned to my pocket-hole jig for the solution.



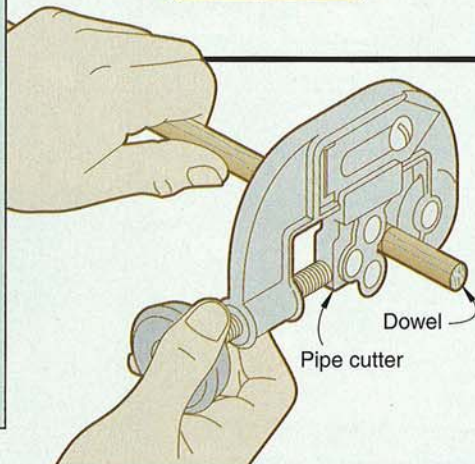
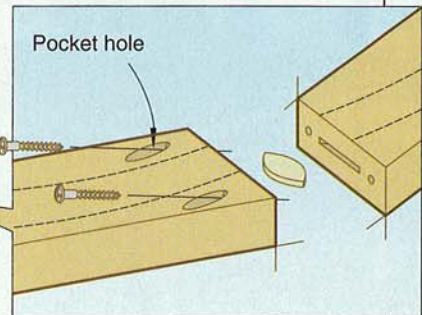
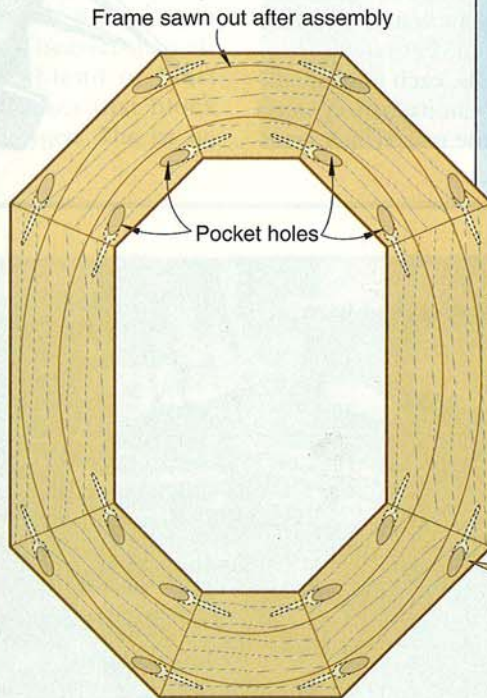
the frame. With this method, I got tight-fitting joints, and because I glued only one joint at a time, didn't have to rush through the assembly before the glue set.

—Greg Fox, Tiffin, Ohio

After laying out the oval on the dry-assembled pieces and cutting biscuit slots in each joint, I drilled pocket holes in the waste area of the joints, as shown below. A dab of glue and a biscuit later, I simply screwed the joint together. After the glue cured, I removed the screws and sawed out



Top Shop Tip winner Greg Fox receives a Porter-Cable model 7529 2-hp plunge router for his efforts. Way to go, Greg!



Tubing cutter on dowel scores big

To score hardwood dowel rod, whether for decorative purposes or to reduce splintering, use a tubing cutter. It produces a clean line with several light passes, and doesn't tear the surrounding wood fibers.

—Philip Daniels, Lunenburg, Nova Scotia

Continued on page 30

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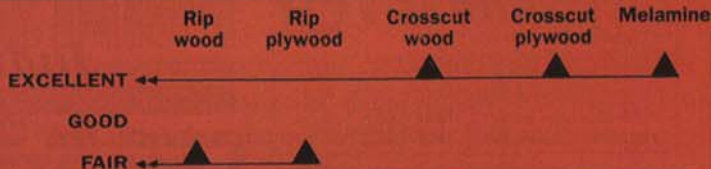
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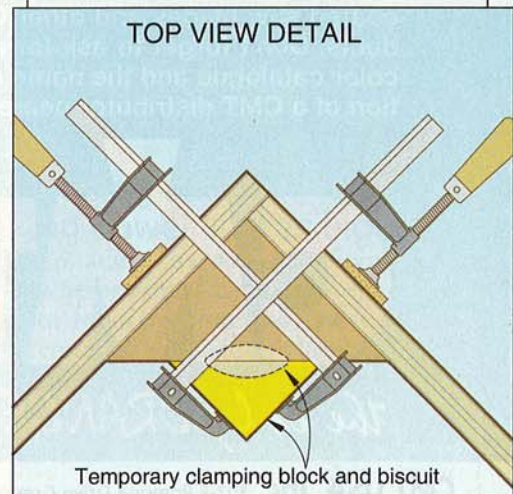
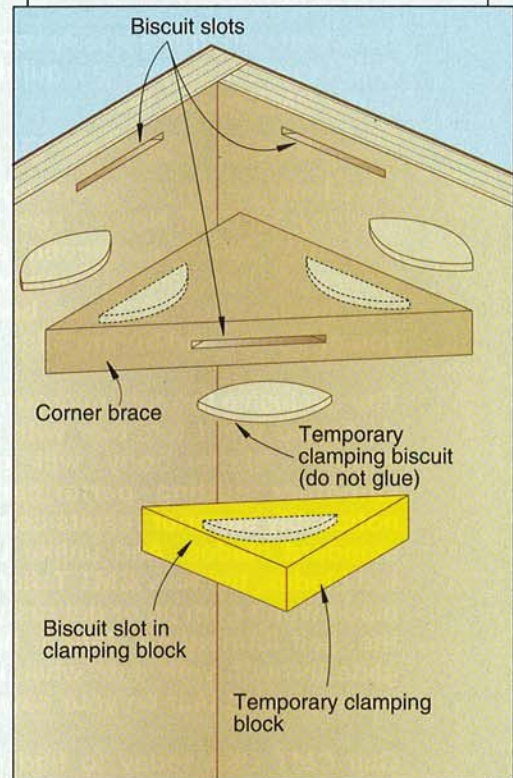
TIPS FROM YOUR SHOP (AND OURS)

Continued from page 28

Extra biscuit and slot ease corner-bracing woes

To clamp corner braces in cabinets, I cut biscuit slots in all three sides of the brace as shown *below*—two to glue the brace to the case, and a third to position a temporary clamping block. Then I glue the brace and corner biscuits as usual, and put another biscuit (with no glue) in the slot between the brace and block. A pair of short bar clamps, acting on the temporary block, keep everything snug until the glue sets.

—Frank Orthmeyer, Sioux Falls, S.D.



Continued on page 32

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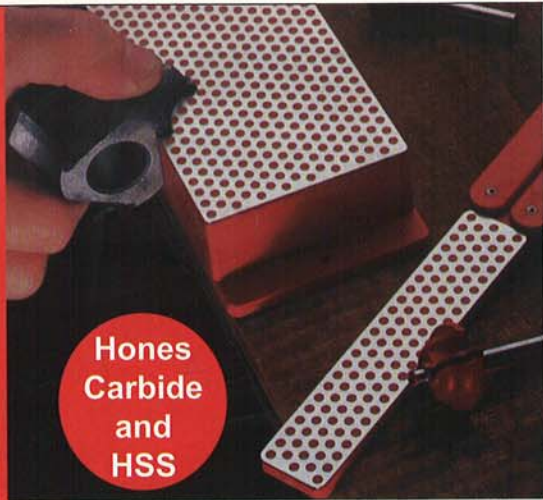


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Continued from page 30

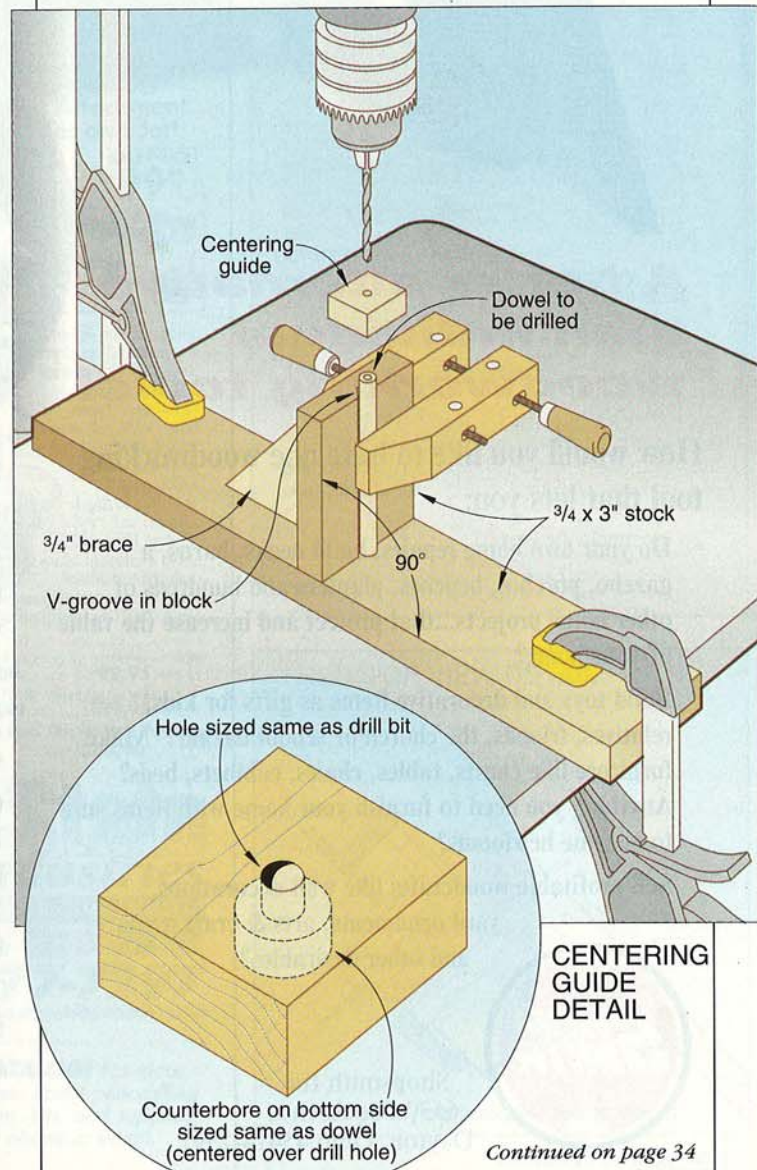
Centering guide may get you excited about boring dowel ends

I've seen lots of tricks for drilling centered holes into dowel ends, but I'd not seen one that allowed me to bore a 1/8" hole into a 3/16"-diameter dowel without blowing out the side. Here is the method I came up with that gives me that ability.

Make a centering guide by clamping a 2x3" scrap of 3/4" hardwood to your drill press table, and boring a hole the diameter of your dowel halfway into it. Without moving the workpiece, chuck a bit the size of the hole you want and drill the rest of the way through it. (For small holes, advance the bit slowly to keep it from flexing.)

Place this centering guide over the end of your dowel, and clamp the dowel into a holding device such as the V-groove jig shown below. Lower the drill press head, fitting the bit into the centering guide, and clamp the holding jig in place. Now drill the hole in the dowel, again going easy with small bits.

—Wayne Holder, Brooksville, Fla.



CENTERING GUIDE DETAIL

Continued on page 34

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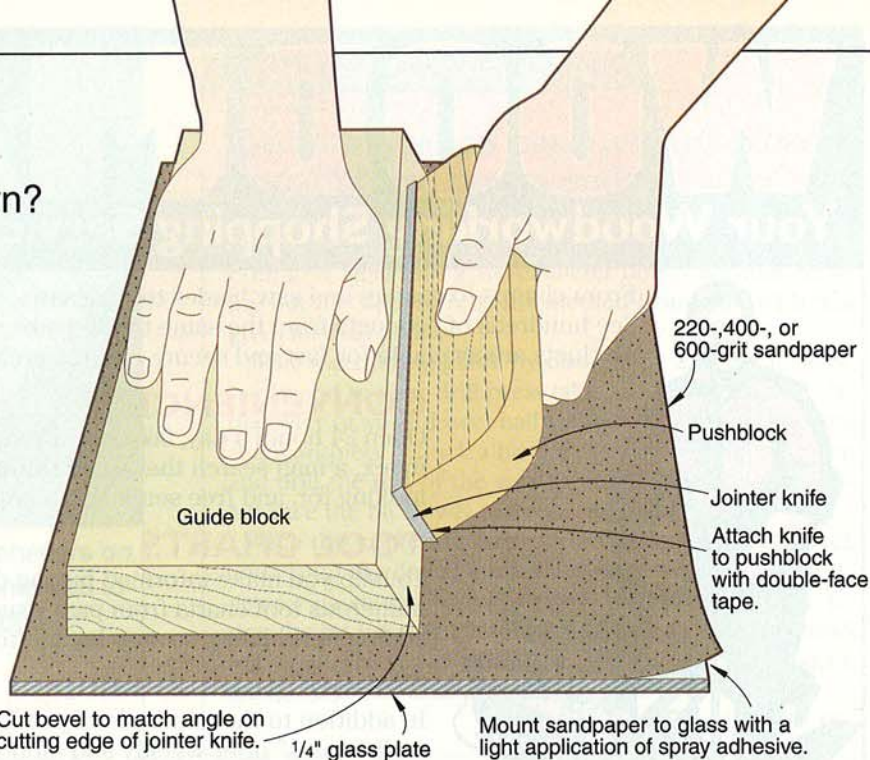
Why pay to sharpen knives when you can hone your own?

Instead of sending your jointer knives out to be sharpened, save money (and time) by sharpening them yourself. All you need is glass, sandpaper, and a couple of scraps of hardwood.

Fashion a guide block as shown in the drawing at right, about 4-6" longer than your knives, with one edge beveled to match the grind of your knives. Joint or sand that edge as smooth as possible (I sanded down to 320 grit, then waxed the bevel).

Next, make a pushblock the same length as, and 1/8" thinner than, the width of your knives. Joint one edge of the pushblock flat and attach a knife to it with cloth-backed double-faced tape.

Glue a sheet of 220-grit wet/dry sandpaper to a flat sheet of glass, and lay your guide block on the abrasive. Keeping the knife flat against the beveled edge of the guide block as shown, stroke the knife back and



forth to sharpen it. I work my way from 220-grit up to 600-grit paper for a superfine edge.

Finally, flatten the knife's back by switching the push block to the other

side of the knife. Remove the burr by sliding the knife back and forth across the 600-grit abrasive a few times without the beveled guide block.

—Eric Sutton, McDonough, N.Y.

Continued on page 36

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1276DVS 4x24 Variable Speed Belt Sander \$225.00
3315K 12V Cordless Drill Kit w/ Case & 2 Batteries \$157.90
3615K 14.4V Cordless Drill Kit w/ 2 batteries, case & charger \$173.90
3107DVS 5" H.D. R/O Sander-Polisher \$94.60
3725DVS 5" H.D. R/O Sander-Polisher \$138.90
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DA250A 15G 1 1/2" Finish \$209.90
FN 250A 16G 3/4" 2" Finish \$181.50
NS150 18G 1 1/2" Crown Stapler \$136.90
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#ACC 0	8"	4-1/2"	4"	\$11.65
#ACC 1	10"	6"	5"	\$13.35
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#ACC 7236	30"	7000 lbs.	\$21.95
#ACC 7248	48"	7000 lbs.	\$24.10
#ACC 7260	60"	7000 lbs.	\$25.70

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TIPS FROM YOUR SHOP (AND OURS)

Continued from page 34

Shop-built mini-channels fit his jigs to a "T"

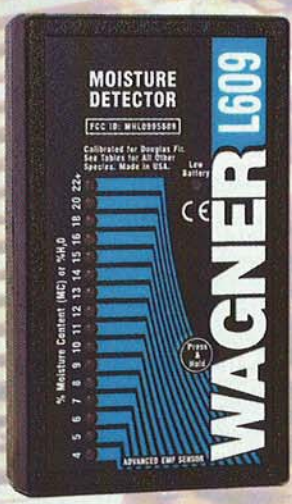
To save money when I built your Universal Tablesaw Jig (*WOOD* magazine, December 1996), I decided to fashion my own T-slots, rather than buy the hardware. My system, shown below, works so well I'll be using it in place of commercial mini-channel in future jigs and fixtures.

—Jeff Arnett, Ypsilanti, Mich.



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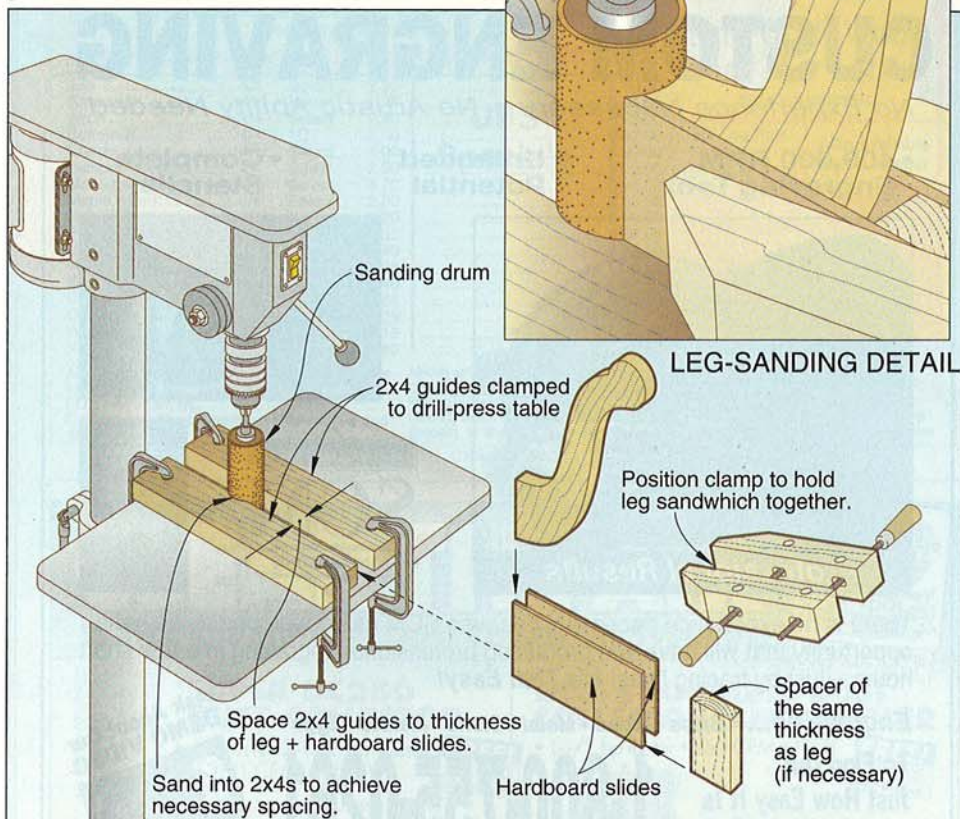
A noteworthy method of sanding curves on edges

When requests for my turned music stands started pouring in, I had to find an efficient way to shape the legs where they attach to the center spindle. Here's what I came up with.

First, I make a "leg sandwich" by clamping it between two pieces of hardboard, making sure the face to be shaped is perpendicular to the bottom edges of the hardboard. Using a sanding drum the same diameter as the music stand's spindle, I sand into a pair of 2x4 guides as shown at right, until the gap between them is the same thickness as my sandwich. I then clamp the guides to my drill-press table so that the leg and hardboard just slide between them.

To sand the radius, I push the sandwich between the guide blocks until it contacts the spinning abrasive. When the drum sands into the corners of the leg, I stop.

—Bob Weigel, Tucson, Ariz.



Continued on page 38

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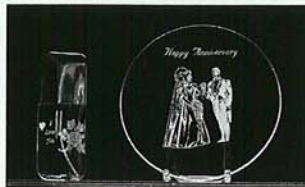
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TIPS FROM YOUR SHOP (AND OURS)

Continued from page 37

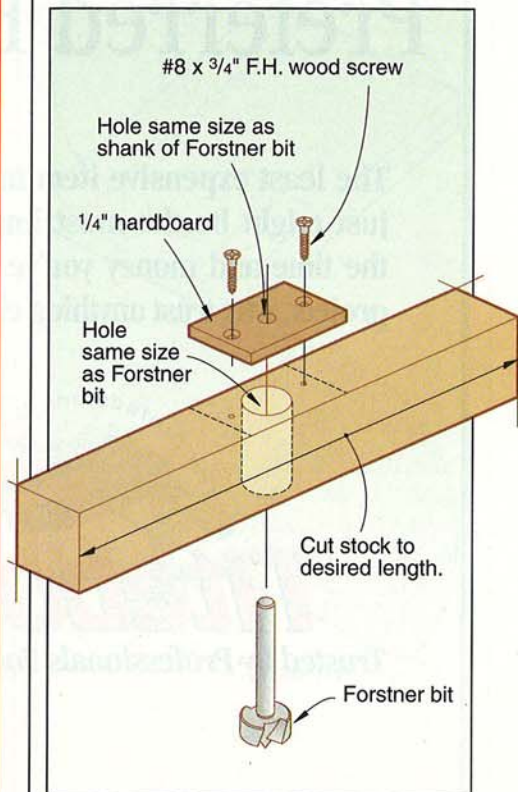
How to bore perpendicular holes without a drill press

Forstner bits work great in a drill press, but how can you ensure a perpendicular hole in the middle of a large workpiece or built-in cabinet? Here's how to make a jig that gives you flat-bottomed holes with a portable drill.

As shown below, attach a piece of 1/4" hardboard to one face of a block of wood that has been jointed perfectly square. Chuck the Forstner bit for the desired hole in your drill press. Bore into the face of the block opposite the hardboard piece until the bit just contacts the hardboard, leaving a centered dimple. Using that dimple as a starter, drill through the hardboard with a bit the same diameter as the Forstner bit's shank.

Next, remove the hardboard guide and clamp the jig where you want the hole in your workpiece. Place the Forstner bit into the hole in the block, slip the hardboard guide over the shank, and re-attach it to the block. Finally, chuck the bit into your portable drill and bore a perfectly perpendicular hole.

— Myron Backhaus, Pleasant Hill, Calif.



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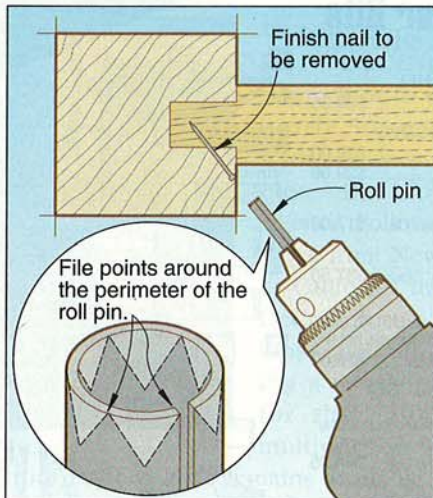
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J107

Remove finish nails with this shop-built plug cutter. Recently, when repairing a wobbly maple headboard, I found that the previous owner had tried to strengthen the loose joints by driving finish nails through the tenons. I needed a way to remove just enough wood from around the nails to be able to pull them with a needle-nose pliers.

Digging through a drawer in my shop, I found a roll pin—a cylindrical piece of spring steel. After making several “teeth” in one end of the pin with a flat file, I chucked the roll pin into my portable drill, positioned it over the nail, and slowly pulled the trigger. My crude “plug cutter” cleanly removed the wood around the nail, allowing me to pull the nail. I filled the hole with a tapered wooden plug.

—William Belz, Jr., Cheektowaga, N.Y.



A FEW MORE TIPS FROM OUR WOODWORKING PROS

- Even if you don't do any carving, check out the rotary-tool bits shown on page 54. You can apply many to woodworking chores, such as rounding over corners.
- If you need to repair a clear-finished piece, find out what kind of finish is on it by performing the simple three-step test you'll find on page 74.
- On page 84, see how we glued up scrollsawn pieces to form rabbits and grooves in small parts. It's in the letter holder project. 🐿️

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Cherry	4/4	Select	4.00	\$96.00
Hickory - Pecan	4/4	Select	2.00	\$69.00
Mahogany (Genuine) ..	4/4	Select	3.70	\$96.00
Maple (Hard)	4/4	Select	2.80	\$83.00
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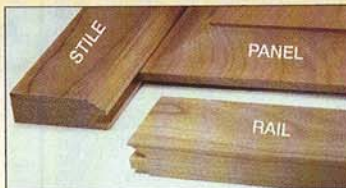
It's simple, inexpensive, and easy with professional production quality MLCS carbide tipped door sets! Sets include Combination Rail and Stile bit, Raised Panel bit plus instructions, professional tips and techniques.

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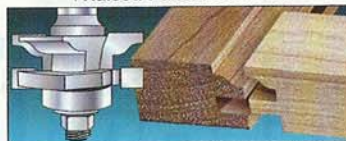
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*Raised Panel Router Bit



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WOOD Product Scorecard	
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Value	★★★★★

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Merle Clamp and 23 ft. of steel banding

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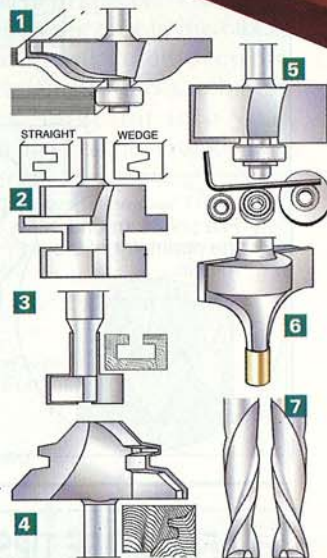
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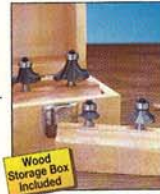
Sizes: 1/4", 3/8", 1/2", 5/8", 3/4", 7/8", 1", 1-1/8", 1-1/4", 1-3/8", 1-1/2", 1-5/8", 1-3/4", 1-7/8", 2", 2-1/8".



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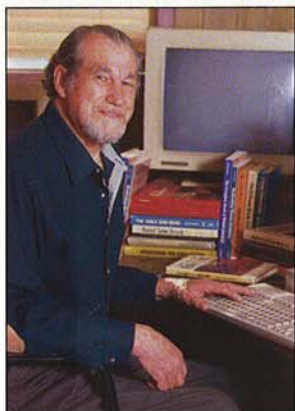
WOOD magazine's

Woodworking Hall of Fame

Presenting the 1999 Inductees

In the November 1997 issue of *WOOD* magazine we introduced the inaugural members in the Woodworking Hall of Fame. In 1998, we inducted two more who have made contributions to the field. Here are this year's honorees.

R.J. De Cristoforo (1926-present): For education in woodworking



Woodworking author R.J. DeCristoforo began how-to writing nearly 50 years ago with occasional articles in *Popular Science*. Following his move from New York to California in 1951, DeCristoforo's career blossomed after writing a user's manual for the Shopsmith multipurpose power

tool, a book that remains available. Since those early years, he has produced more than 40 books for a host of publishers and thousands of articles for national magazines. His words have inspired, instructed, and guided two generations of woodworkers.

In his woodworking books, he has covered jigs, stationary power tool techniques, portable power tools, the router, beginning woodworking, mistakes and solutions, joinery, and projects to build. For his thorough contributions, R.J. DeCristoforo has been aptly called by publishers the "Dean of Home Workshop Writers."

The inventive philosophy that guides his woodworking writing has always been, "Learn to do it the traditional way; then discover a better, safer, faster, more convenient method of accomplishing the chore." And when DeCristoforo looks at a new tool, that's just a beginning. "There must be

more to it than this" is his renowned approach which results in jigs and fixtures that expand a tool's usefulness beyond even its manufacturer's expectations.

In his books and magazine articles, R.J. DeCristoforo frequently included projects that he built for his readers to build as well, such as in the circa 1960s photo *below*. Today, he still presents sound advice, techniques, and tips to create them.

With his wife and friend, Mary, R.J. DeCristoforo lives and works in Los Altos Hills, California. Visitors often remark at his basic garage shop. "It's what you do with the tools that counts," he counters.

Continued



The field of woodworking represents the collective achievements of many people from a variety of pursuits and professions.

We dedicate the Woodworking Hall of Fame as an ongoing tribute to these outstanding individuals.

Past Inductees

Furniture design and craftsmanship:
Wharton Esherick, (1997)
Gustav Stickley (1997)
Samuel S. Maloof, (1998)

Forestry:
Gifford Pinchot (1997)

Turning:
Rude Osolnik, (1997)
Frank Knox (1997)

Carving:
Lemuel and Stephen Ward (1997)

Marquetry:
Silas Kopf (1997)

Intarsia:
Judy Gale Roberts (1997)

Tool design and development:
Alonzo Decker, Jr. (1997)

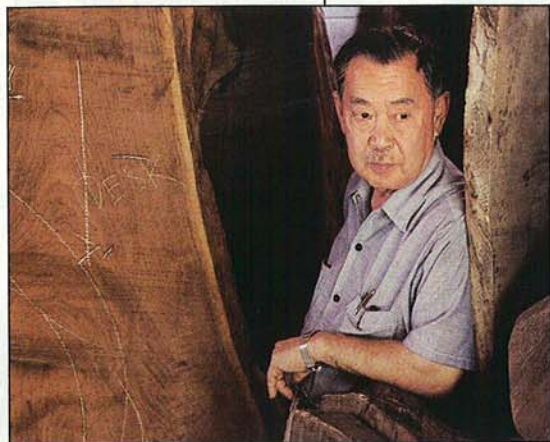
Woodworking promotion:
Norm Abram (1998)

Projects to build represent a great part of R.J. DeCristoforo's books and articles, as depicted in this photo from the 1960s.



Woodworking Hall of Fame

George Nakashima (1905-1990): For design and craftsmanship in furnituremaking



Born in Spokane, Washington, George Nakashima graduated from the University of Washington. He made his first trip to Japan in 1925. On his return, he again entered the university and earned an architecture degree. Later, he obtained an MA in the field from Massachusetts Institute of Technology. During the 1930s, he traveled

considered wood just another material, a belief summarized in his book *The Soul of a Tree*.

Nakashima's designs are unmistakable for their focal point on the wood itself. In his words, "We work this material to fulfill the yearning of nature to find destiny, to give this absolute inanimate object a second life, to release its richness, its beauty, to read its history and life." His philosophy has had its effect on woodworkers around the world.

Commissions by George Nakashima include furnishings for the late New York governor Nelson A. Rockefeller's home, interiors for Columbia University, Mt. Holyoke College, and the International Paper Corporation. His

How we choose our candidates

To be considered for induction into *WOOD*® magazine's Woodworking Hall of Fame™, candidates must:

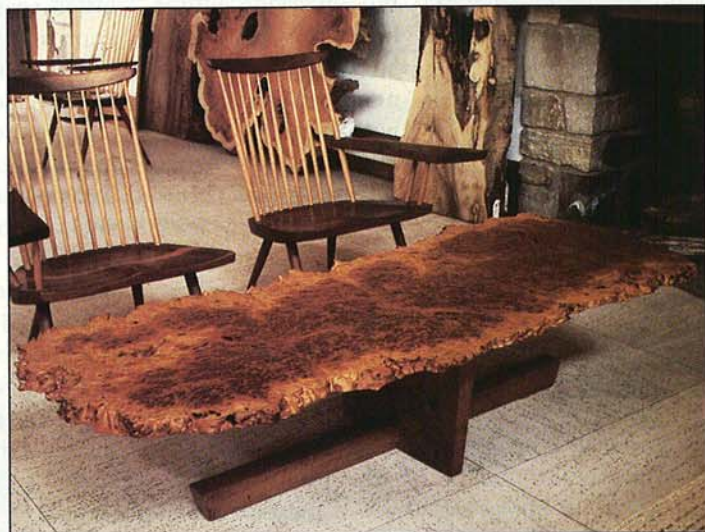
- Have made (need not be living) or be making a significant impact in the North American woodworking field through one (or more) of the following areas—design, craftsmanship, education, research, product development, and public service on a regional or national level.
- Have made or be making their contribution(s) in the current century.

A selection committee made up of *WOOD* magazine staff members annually gathers the nominees received from our staff and readers and votes in the year's inductees. Names are announced in the October issue. To submit a candidate for nomination, send a short biography of the person, along with a statement indicating his or her accomplishments to:

WOOD magazine's
Woodworking Hall of Fame,
1716 Locust St., GA310,
Des Moines, IA 50309-3023.

the world pursuing his career, but became disillusioned and turned to furniture design and woodworking in 1941. He was designing and building furniture in Seattle when his new career was interrupted by internment of all those of Japanese ancestry. In 1943 Nakashima resettled in New Hope, Pennsylvania, to set up a studio and woodworking shop, which today is still operated by his daughter, Mira Nakashima-Yarnell.

George Nakashima's world-famous work embodies the idea that wood is sublime, and that each piece has an ideal use if only one can find it. Late in his life he said that his objective was to create beauty, not art, and he had little use for those who con-



This 1968 coffee table of English oak burl is called "Minguren I."

George Nakashima created this "Milkhouse table" in 1945.



exhibitions have included the Museum of Modern Art, New York; the Renwick Gallery, Washington, D.C.; the Nelson Atkins Gallery, Kansas City; and Boston's Museum of Fine Art. Among his many honors, he was awarded the Gold Medal of Craftsmanship by the American Institute of Architects in 1952, was named a fellow of the American Craft Council in 1979, received the 1981 Hazlett Award for outstanding crafts achievement, and in 1989 was the first honoree in a major series of exhibitions called "America's Living National Treasures" at New York's American Craft Museum. ♣

Photographs:
R. J. DeCristoforo, Eddie Richardson/Sheldon's of Los Altos; Project, courtesy of R. J. DeCristoforo; George Nakashima and his work, courtesy Mira Nakashima-Yarnell

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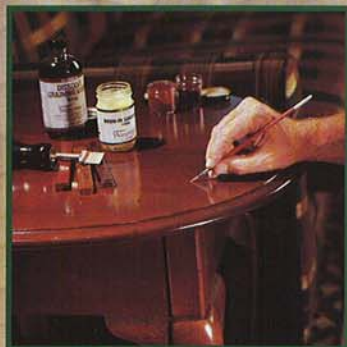
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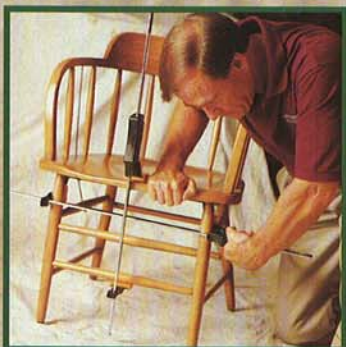
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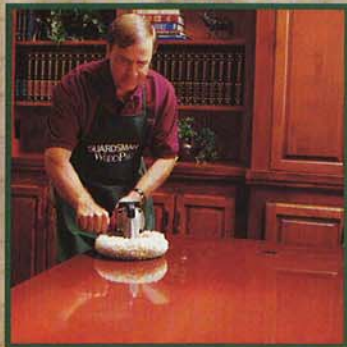
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Schoolhouse Pendulum Clock

There's
no better
time to
build this
beauty

If you've visited lots of antique shops, chances are you've seen a variation or two of this traditionally styled octagon clock. Here, both the clock surround and the lower long-drop case in which the pendulum swings feature attractive inlay banding. For the works, you can choose between a more expensive spring-wound movement or a less expensive quartz movement that employs a battery.

Start with the solid cherry clock case

- 1 Cut the top (A), sides (B), and bottoms (C) to the sizes listed in the Bill of Materials plus 1" in length.
- 2 Cut a $\frac{1}{4}$ " groove $\frac{1}{4}$ " deep along the back inside edge of each piece where shown on the Clock Case drawing.
- 3 Miter-cut the pieces (A, B, C) to the lengths listed in the Bill of Materials.
- 4 Carefully mark the location of the $\frac{5}{16}$ " notches on the front top edge of the case sides (B) where dimensioned on the Parts View drawing on the *WOOD PATTERNS*® insert in the magazine.

Continued



3/4 x 1" brass butt hinge
 *Note placement of hinges on Parts View drawing.

F.H. brass wood screws (come with hinges)

*Left-side hinges screw to (G) and (H).

#8 flat washer and 8-32 nut

*Right-side hinges screw to (G) and (H).

SEE THE WOOD PATTERNS® INSERT FOR THE PARTS VIEW AND FULL-SIZE PATTERN

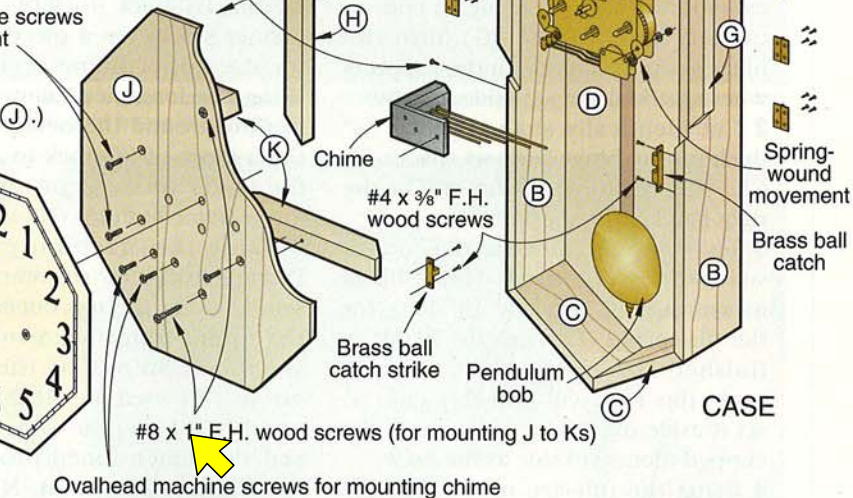
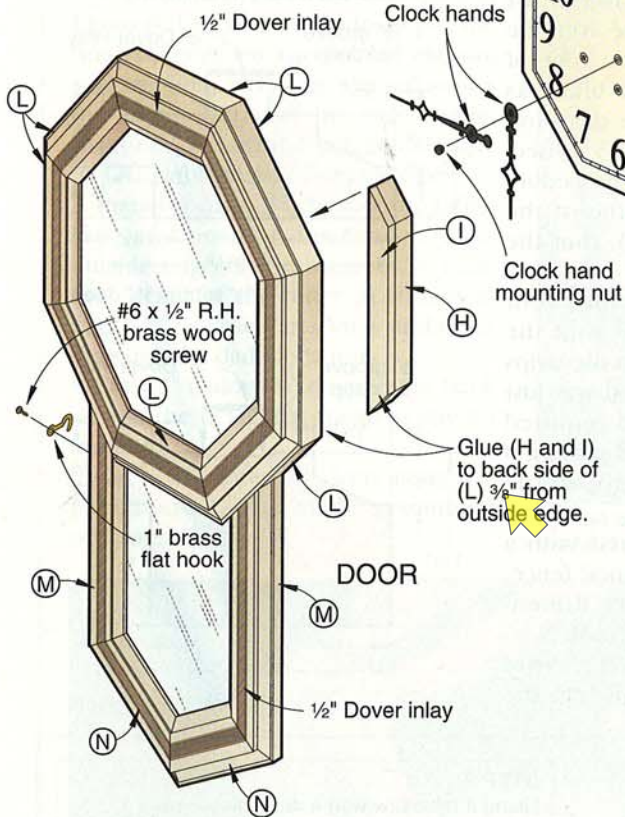
Glue (H) to back face of (J).

#6 x 1/2" R.H. brass wood screw (for brass flat hook on frame)

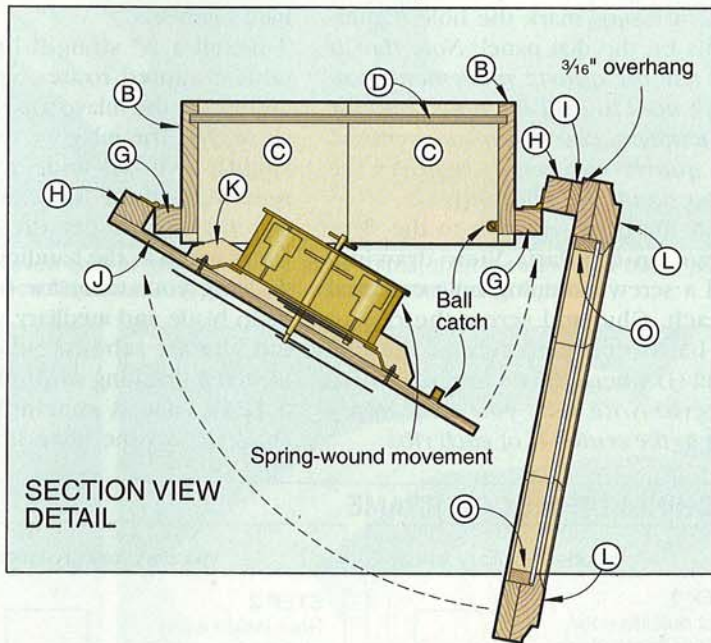
8-32 x 3/4" F.H. machine screws for mounting movement

Dial (Attach with double-faced tape to (J).)

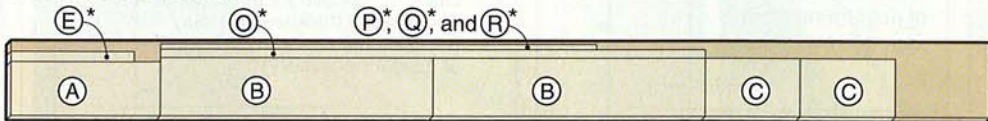
EXPLODED VIEW



Ovalhead machine screws for mounting chime



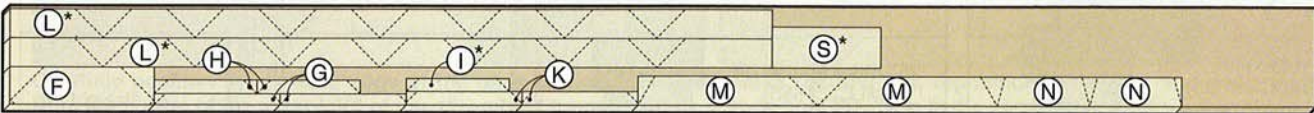
CUTTING DIAGRAM



1/2 x 5 1/2 x 72" Cherry

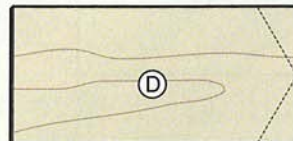


1/2 x 5 1/2 x 48" Cherry



3/4 x 7 1/4 x 96" Cherry

*Plane or resaw to the thicknesses listed in the Bill of Materials.



1/4 x 10 x 21" Cherry plywood

Schoolhouse Clock

Add the hinge supports and dial panel

1 Cut the hinge supports (H) to width and 8" long. Clamp (no glue) them to the side trim pieces (G) with $\frac{1}{16}$ " spacers between them. Use a ruler to extend the lines of the angled ends of the side trim pieces (G) onto the hinge supports. Miter-cut the supports where marked and set aside for now.

2 Cut identically shaped piece $\frac{5}{16}$ " thick for the hinge support spacer (I). Glue it to the front of what will be the right-hand hinge support (H).

3 Resaw, plane, and edge-join enough solid stock to form a $\frac{5}{16}$ "-thick blank measuring 13" wide by 14" long for the dial panel (J). Trim the blank to finished size ($12\frac{3}{4} \times 13\frac{3}{4}$ "). A solid panel this thin will probably cup, so set it aside overnight. Later, mark the cupped (concave) side as the *back*.

4 Using the full-size pattern on the pattern insert, mark the hole center-points on the dial panel. *Note that if you use the quartz movement, you won't need to drill the nine holes for the winders, chime, and movement. The quartz movement requires the center bandshaft hole only.*

5 Cut the panel ribs (K) to the sizes shown on the Parts View drawing. Drill a screw-mounting hole centered in each. Glue and screw the ribs to the back (concave) side of the dial panel (J) where shown on the full-size pattern. *Note that you only apply glue to the center 1" of each rib.*

6 Glue and clamp the left-hand hinge support to the back face of the dial panel (J).

Machining the door moulding comes next

1 From $1\frac{1}{4}$ "-thick stock (we laminated thinner stock) cut a piece to $2\frac{1}{8} \times 56$ " for the upper frame segments (L). Using one long piece allows the grain to flow around the octagonal frame. Cut a piece of $\frac{3}{4}$ " stock to $2\frac{1}{8} \times 40$ " for the lower frame segments (M) and lower frame bottoms (N).

2 Using the Machining the Door Frame drawing for reference, rout the profile along the top outside edge of the upper frame segment blank as shown in Step 1 of the drawing *below*. (We used the MLCS 25° raised-panel bit.) Using the same procedure and the dimensioned profile of the lower frame pieces (M, N), rout the long segments.

3 Install a $\frac{1}{2}$ " straight bit into your table-mounted router, and rout the groove for the inlay strips in the strips (L, M, N). The inlay we used was just slightly over $\frac{1}{2}$ " wide and required repositioning the fence and making a second pass to get the groove the exact width as the banding.

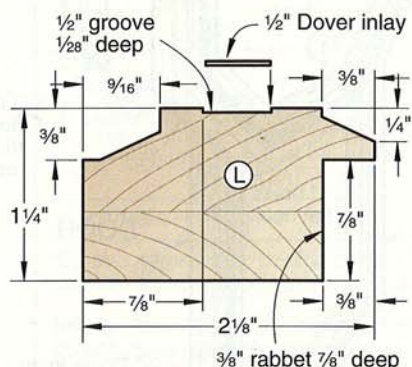
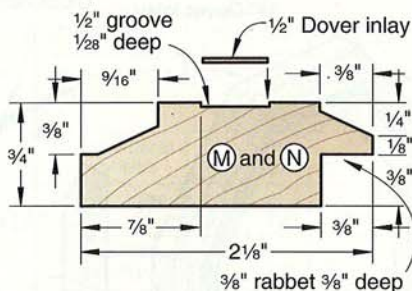
4 Using your tablesaw fitted with a dado blade and auxiliary wood fence, cut the $\frac{3}{8}$ " rabbets where dimensioned in the long strips for L, M, N.

5 Glue (use it sparingly to avoid squeeze-out) the inlay strips into the

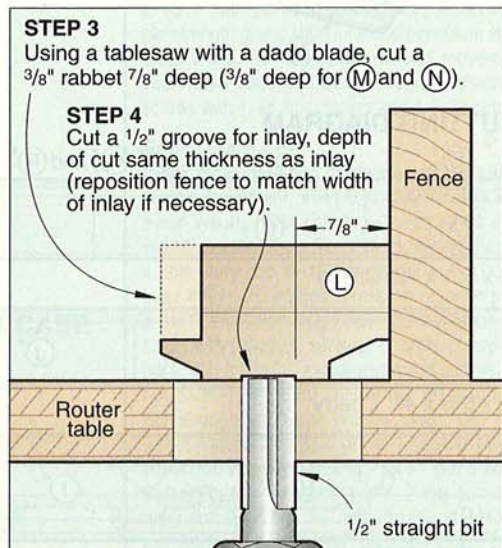
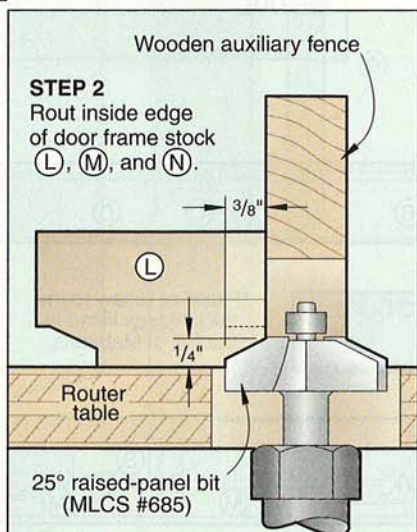
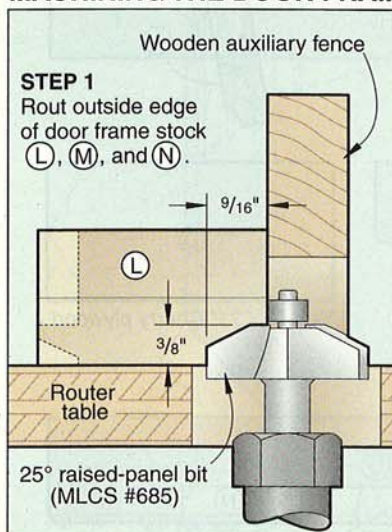
grooves, butting the factory ends together tightly where they meet. Apply masking tape to the edge of two $\frac{3}{4}$ "-thick boards to act as clamping cauls. (The tape will prevent the cauls from sticking to any glue squeeze-out.) Using the cauls to distribute the pressure evenly, clamp the inlay strips into the grooves in the moldings for L, M, N.

6 Later, remove the cauls, and sand the inlay strips flush with the top surface of the long molding strips.

MOLDING PROFILES



MACHINING THE DOOR FRAME



Cutting and assembling the door frame pieces

1 Miter-cut the upper frame segments (L) to length for the octagonal frame. (We miter-cut scrap stock first to verify our miter gauge setting.) Number the pieces in the order they were cut for ease in matching the grain in the next step.

2 Using strapping tape, tape the frame segments end-to-end as show in *Photo A*. Apply glue to the miters, roll the segments into an octagonal frame, and tape the final joint closed as shown in *Photo B*. Use a band clamp to put the final squeeze on the frame, making sure the inlay strips are aligned across the miters. Wipe off any excess glue. Clamp or weight the octagonal frame to a flat surface until the glue dries.

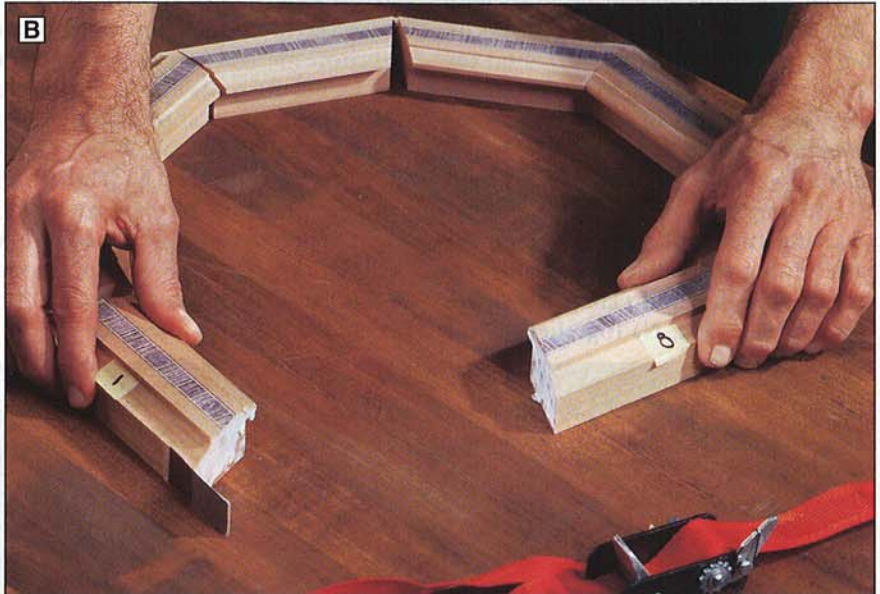
3 Install a dado blade in your table-saw, and position the fence so the outside edge of the blade is $\frac{3}{8}$ " from the corner of the miter as shown in *Photo C*. See the Parts View and Door drawings for dado locations.

4 Cut $1\frac{3}{4}$ " dados $\frac{3}{8}$ " deep in the back side of the octagonal frame as shown in *Photo D*.

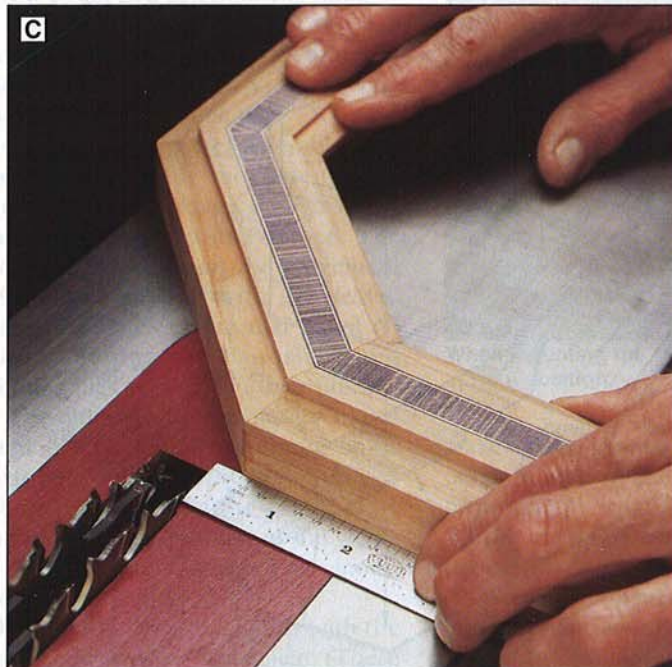
5 Cut a $\frac{3}{8}$ " rabbet $\frac{3}{8}$ " deep along the back bottom edge of the assembled octagonal frame.



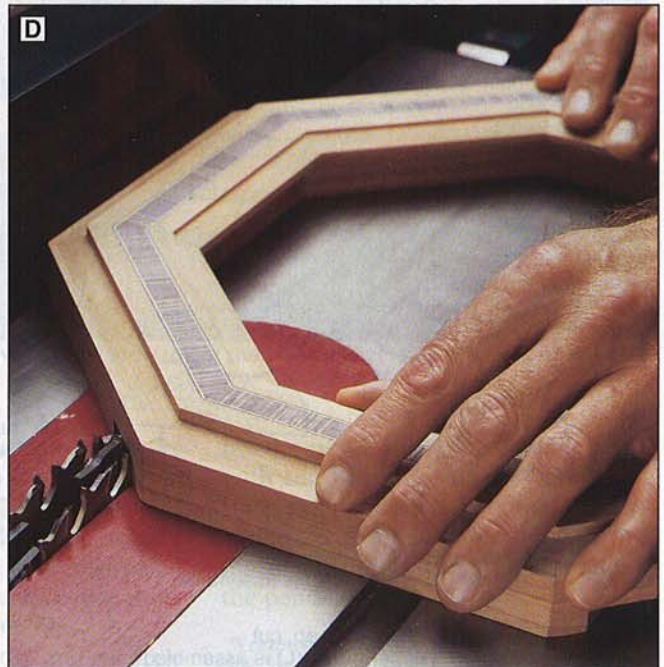
A Working on a flat surface and against a straightedge, tape the outside edges of the miter-cut octagonal frame pieces together.



B Spread an even coat of glue on all the miter joints; then tape the first frame piece to the final piece. Use a band clamp to pull the octagonal frame tight.



C Carefully position the outside edge of the dado blade $\frac{3}{8}$ " away from the corner of the miter joint of the assembled frame.



D Make the first cut, reposition the fence, and make additional cuts until the dado is the same width as the frame sides (M).

Schoolhouse Clock

Miter-cut and assemble the lower door frame

1 Crosscut the lower frame sides (M) to size plus 1" in length and miter-cut the top ends. Cut $1\frac{3}{4}$ " rabbets $\frac{3}{8}$ " deep across the front face of each M where dimensioned on the Frame Rabbet detail accompanying the Door Rabbet drawing. When inserted into the mating dadoes in the octagonal frame later, the mitered top ends of the lower frame sides (M) should be flush with the inside shoulder of the rabbet in the octagonal frame, as shown on the Parts View drawing. Now, miter-cut the bottom ends of the lower frame sides (M) to final length.

2 Miter-cut the lower frame bottoms (N) to length.

3 Using the same method of taping and gluing the octagonal frame segments (L), glue and clamp the lower frame pieces (M, N) together. While

the glue is still wet, glue and clamp the top ends of the M/N assembly into the mating grooves in the octagonal frame. Clamp or weight the assembly to a flat surface until the glue dries.

4 Position and clamp the door assembly (L, M, N) over the assembled case and dial panel. The octagonal frame should overlap the dial panel $\frac{1}{8}$ " all around. The lower frame assembly (M, N) should be flush with the sides (B) and bottoms (C) of the case. Without moving the pieces out of alignment, insert a $\frac{1}{16}$ " spacer between the previously assembled right-hand hinge support (H, I) and the right-hand trim (G).

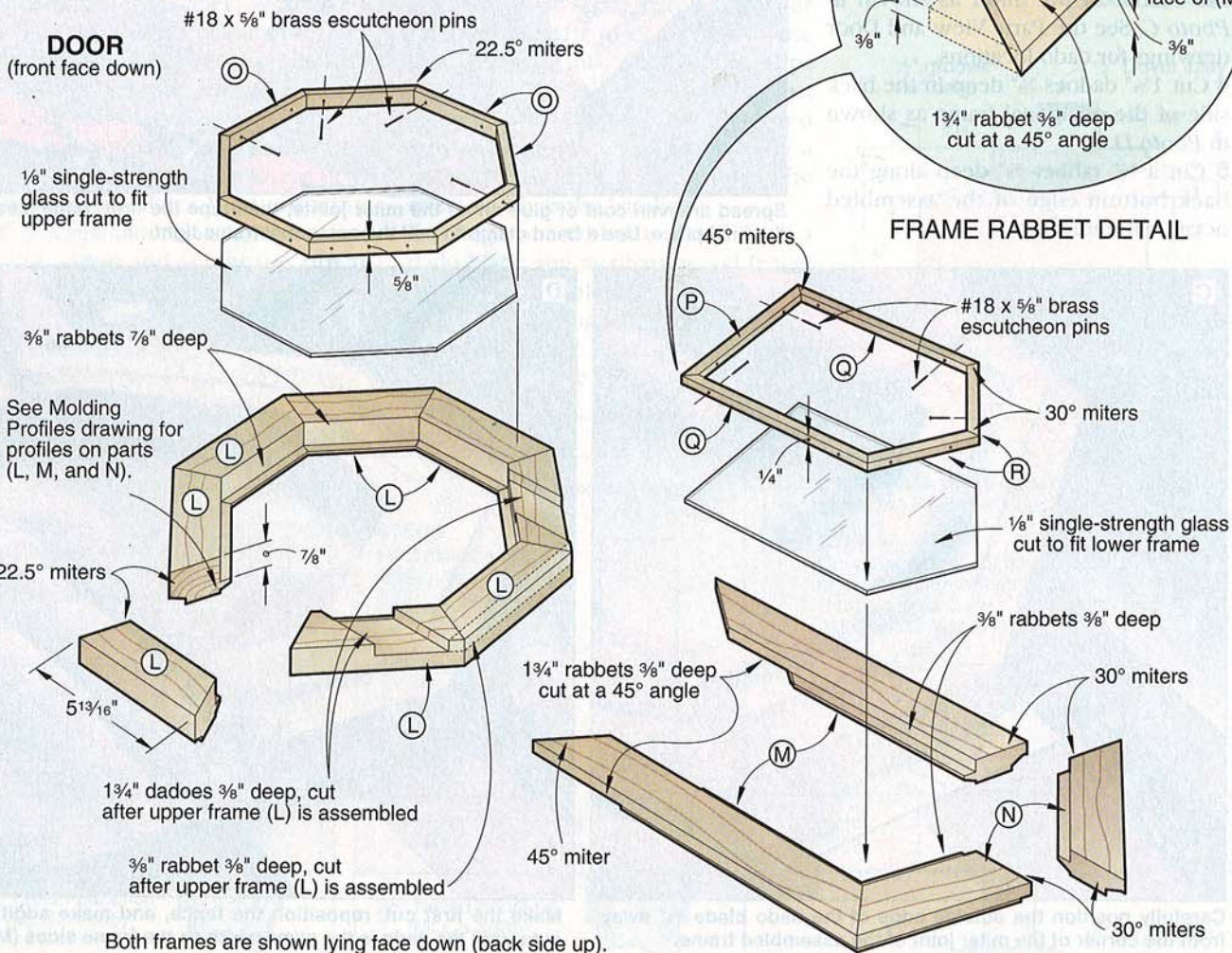
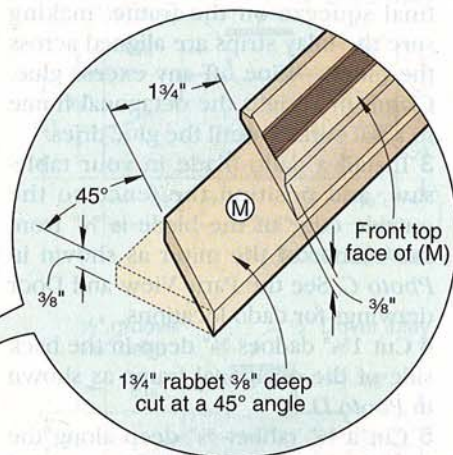
5 Glue and clamp the right-hand hinge support (H, I) to the back of the right-hand side of the octagonal part of the door assembly. See the Section View detail accompanying the Exploded View for reference.

Add the glass stops

1 Cut a piece of stock to $\frac{3}{8} \times \frac{5}{8} \times 40$ " for the upper stops (O). Miter-cut the stops (O) to length from the 40" strip.

2 Cut a piece of stock to $\frac{1}{4} \times \frac{3}{8} \times 32$ " for the lower top stops (P), lower side stops (Q), and lower bottom stops (R). Miter-cut the pieces to length from the long strip.

3 Drill holes through the stops (O-R) to fit the escutcheon pins. (To drill the pilot holes for the escutcheon pins, we clipped the head off a #18 wire nail, chucked the nail into our drill, and used it as a bit to drill the holes through the stops.)



Finishing and final assembly

1 Finish-sand all the parts.

2 Stain the wood pendulum stick to match the clock case.

3 Apply the finish. (We used two coats of Olympic Antique Oil Finish, rubbing between coats with an ultra-fine [gray] Scotch-Brite pad.)

4 Have two pieces of single-strength glass cut to fit the door. The panes should be sized to leave a $\frac{1}{16}$ " space between the glass and frame. See the Parts View drawing for dimensions for the glass panes.

5 Install the glass stops (O-R) by driving the escutcheon pins through the previously drilled holes in the stops.

6 Lay the door face down on your workbench with a spacer under the lower portion to keep the top surface level. Place the dial panel assembly and then the case assembly in place on top of it. When everything is aligned, clamp the three assemblies together. Center three hinges over the $\frac{1}{16}$ " gap between the hinge supports (both right and left) and the right and left side trim pieces (G). Drill the screw pilot holes, and screw the six hinges in place.

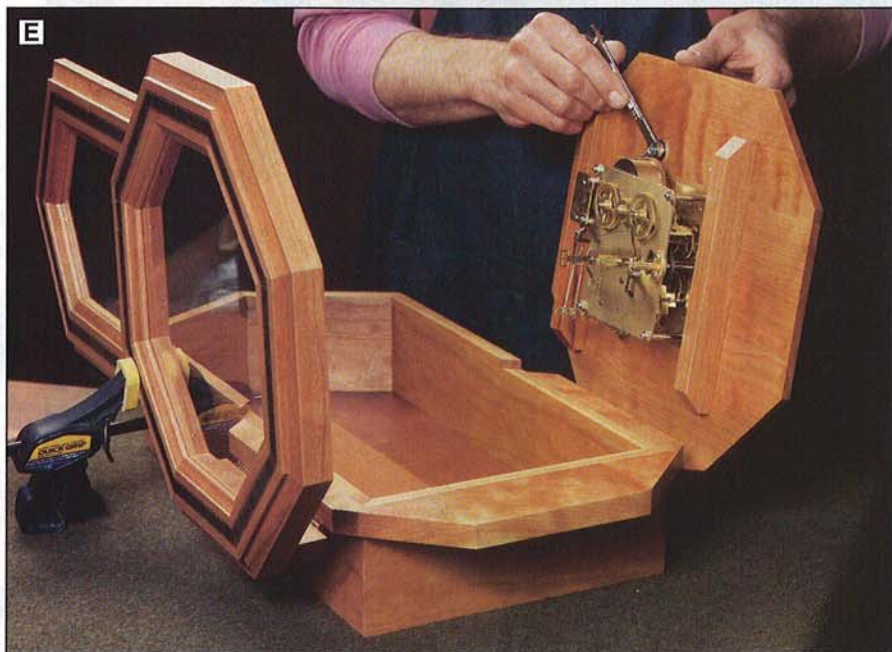
7 Turn the clock over and install the brass hook with one $\#6 \times \frac{1}{2}$ " round-head brass wood screw. Add a second screw to act as a catch for the hook.

8 Open the door and install the ball catch on the dial panel assembly, as shown on the Exploded View drawing and accompanying detail.

9 Open the dial panel assembly, and mount the Hermle movement with four machine screws, flat washers, and nuts as shown in *Photo E*. The mounting brackets on the movement will swivel to align with the drilled mounting holes in the dial panel (J) while keeping the handshaft and winding lugs centered in their holes.

The alternate quartz/battery movement is attached to the center handshaft hole only after the dial is mounted. A piece of double-faced tape applied to the movement in the vicinity of the chimes will keep the movement from rotating.

10 Mount the Hermle chimes with the two ovalhead screws supplied. (These are metric screws supplied by the manufacturer and not easily replaced.)



E When mounting the movement to the back of the dial panel, clamp the front door in an upright position.

Make certain that the countersinks are deep enough to keep the heads from protruding.

11 Use double-faced tape to adhere the dial to the front of the dial panel (J). Attach the hands and secure them with the hand mounting nut.

12 Cut the wall cleat (S), and securely mount (hit a stud if possible) the cleat to the wall. Hang the clock by engag-

ing the bevel of the hanging cleat (E) with the bevel of the wall cleat (S). Hang the pendulum. Follow the operating instructions that come with the movement to set the time and adjust the pendulum bob. ♣

Written by Marlen Kemmet
Project Design: Jan Hale Svec
Illustrations: Kim Downing; Lorna Johnson
Photographs: Hetherington Photography

Give Power-Carving a Go

Rotary tools make carving quick and easy—even in tough wood

As a method of shaping wood, power-carving boasts some advantages over traditional knife-and-gouge carving. You can remove lots of wood fast—even if it's extremely hard, knotty, or has difficult grain; you don't have to pay close attention to grain direction; and you're less likely to cut yourself.

But these advantages don't come without drawbacks. Traditional carvers object to power-carving's noisiness, lamenting that the process more closely resembles grinding than carving. Others argue that smooth, power-carved surfaces lack the tool marks that lend texture and character to carvings. (Some carvers effect a compromise on this point by roughing a carving with rotary tools, then completing it with handtools.) Then, of course, there's the dust. (See *below*.)

You can't let the dust get to you

Power-carving raises lots of dust. And the speed and rotation of the bit will throw much of it right at you. Carving for more than a few seconds turns the air hazy with fine dust, which is both hazardous to breathe and messy to clean up.

When power-carving, wear a dust mask or respirator and eye protection, at the very least. A cap and apron can help keep some dust out of your hair and off your clothes.

Ideally, you should isolate your carving area and equip it with air-cleaning and dust-collection devices. Working in front of a portable air cleaner, like the one at *left below*, can keep dust down. You also could work in front of an open hose from your shop's dust-collector.

Many carving-supply dealers sell a variety of devices designed to deal with dust.



TAKE ONE OF THESE TOOLS FOR A SPIN

Handheld rotary tools and flexible-shaft machines are the basic rotary power-carving tools. Power-carvers have been known to use die grinders, angle grinders, and all types of sanders. Some turn to micromotor machines or ultrahigh-speed air-turbine tools for detail work, but that's another story.

Start with an easy choice: the handy handheld tool

The versatile handheld rotary tool (*right*) offers easy entry into power-carving. Many a carver has turned out show-winning work with one of these and just a few bits.

For carving, a variable-speed corded tool offers the ideal combination of power and flexibility. Interchangeable collets allow these tools to take bits with either $\frac{3}{32}$ " or $\frac{1}{8}$ " shanks. Rechargeable rotary tools generally offer neither adequate power nor runtime.

A serious carver's tool: the flexible-shaft machine

For anyone who carves many hours at a time, the flexible-shaft machine (*below right*) offers several advantages, including light weight. "You don't think of a rotary tool as weighing much, but one starts to feel heavy after several hours of use," explains Sheila Hunter, a carver from the Kansas City area. "The smaller, lighter flex-shaft handpiece is easier to hang onto and less tiring to use," she says.

Flex-shaft carving machines generally boast more power than handheld tools, too, so they can handle larger cutters. Many handpieces will accept collets up to $\frac{1}{4}$ ", enabling use of the largest available carving bits.

Continued

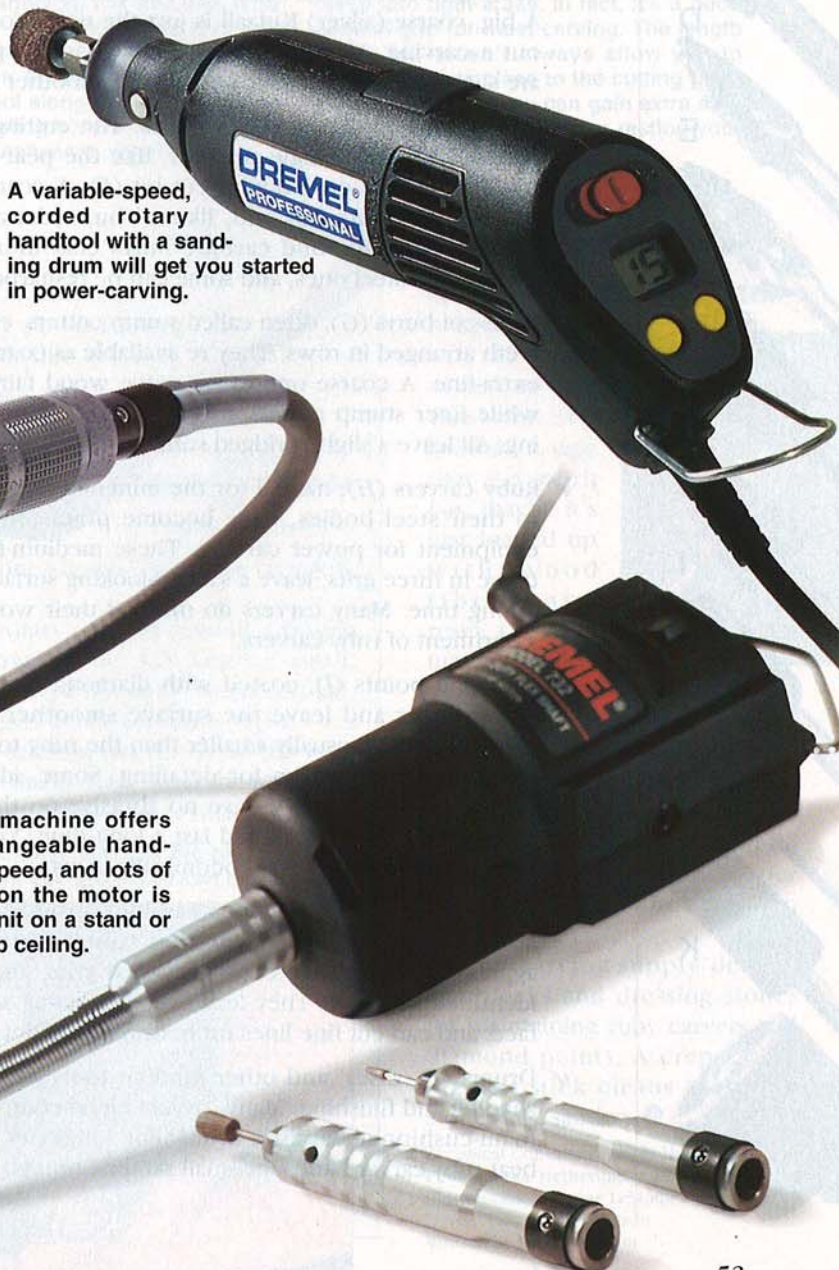
Try these tips for top results

- ✓ Move the tool so the bit rotates into the work: Cut from right to left if you're holding the tool with the bit pointing away from you, left to right if it's facing toward you.
- ✓ Don't force the cutter into the wood. Let the bit do the cutting; you just guide it.
- ✓ Keep the bit moving to avoid burning and gouging.
- ✓ Take care at corners. The rotation of the bit can kick the tool over an edge or end if you try to start a cut there. You'll do better to turn the workpiece around and carve off over an edge or end.
- ✓ Start with the tool running at a mid-range speed. If the bit chatters as it cuts, increase the speed.

A variable-speed, corded rotary handtool with a sanding drum will get you started in power-carving.



A flexible-shaft machine offers carvers interchangeable handpieces, variable speed, and lots of power. The bail on the motor is for hanging the unit on a stand or a hook in the shop ceiling.



Power-Carving

BITS: LET'S CUT THE CONFUSION

Deciding which bit to use from the bewildering array available might seem perplexing. Choosing one won't be so baffling if you start by answering these questions:

- ✓ How much wood do you need to remove?
- ✓ How fast or how precisely would you like to do it?
- ✓ How smooth do you want the carved surface to be?

Your answers, in conjunction with the capsule descriptions of bits *below*, will point you toward the type of bit to use. As for the size and shape, pick the largest practical size of a shape that fits the job. The illustrations *below right* show some of the many shapes available.

Comparing the cutters

- ✓ Tungsten carbide burrs, such as Kutzall (A and B, at left) and Typhoon bits (C), remove wood faster than any others. A big, coarse (silver) Kutzall is just the ticket for roughing out a carving. Medium (gold) Kutzalls and Typhoon bits are slightly less aggressive, but leave a smoother surface.
- ✓ Steel or carbide burrs cut like files. The cutting edges lie parallel around a single-cut burr, like the pear-shape one (D). They cross on a double-cut bit (E). A coarse double-cut burr (F) cuts fast and, like all burrs, leaves a fairly smooth surface. Solid carbide burrs cost more but last longer than steel ones, and some can be resharpened.
- ✓ Cross-cut burrs (G), often called stump cutters, carry milled teeth arranged in rows. They're available as coarse, fine, or extra-fine. A coarse one can remove wood fairly quickly, while finer stump cutters are well suited to precise shaping. All leave a slightly ridged surface.
- ✓ Ruby carvers (H), named for the mineral particles bonded to their steel bodies, have become practically standard equipment for power carving. These medium-fast cutters come in three grits, leave a sanded-looking surface, and last a long time. Many carvers do most of their work with an assortment of ruby carvers.
- ✓ Diamond points (I), coated with diamond chips, remove wood faster and leave the surface smoother than ruby carvers. They're usually smaller than the ruby tools, so lots of carvers prefer them for detailing. Some, identified as *safe-end diamonds* (J), have no abrasive on the end. On wood, a diamond bit should last a long time. You can buy these versatile bits most economically in sets.
- ✓ Texturing stones (K)—silicon carbide, corundum, or other abrasives similar to sharpening stones—are the least aggressive tools. They come in varied grits, and often are identified by color. They leave a soft-looking, smooth surface, and can cut fine lines for texturing and detailing.
- ✓ Drums (L), discs, and other sanding tools serve for both shaping and finishing. Many carvers blend contours using a foam-cushioned sanding drum. For longevity, you can't beat ruby-carver bands for small sanding drums.

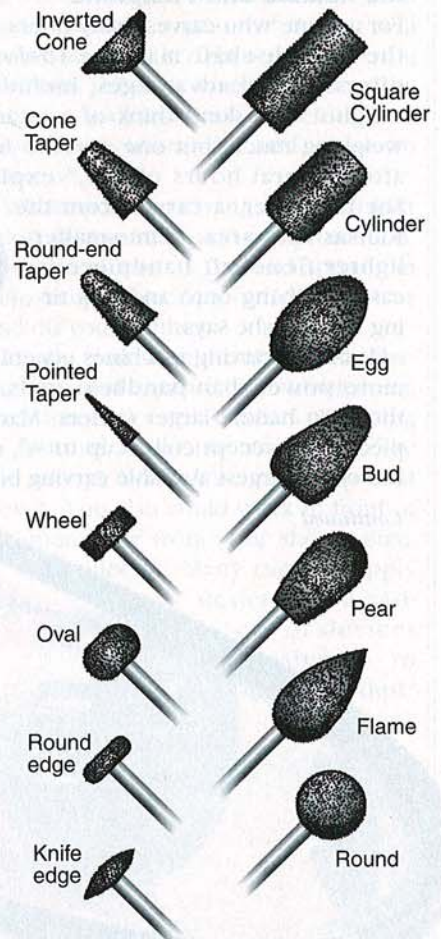
Sizing up the bits to buy

When you shop for carving bits in person, it's easy to pick out one that looks about the right size. But when ordering from catalogs, you'll have only dimensions to go by. (Some catalogs show bits at or near actual size for easier selection.)

Sometimes you'll encounter ISO sizing—a three-digit number (often part of the bit's catalog number), such as 025 or 130, that indicates the bit's diameter. To convert the ISO size to millimeters, place a decimal point between the second and third digits from the left. So the 025 bit measures 2.5mm in diameter and the 130, 13 mm. (25.4mm = 1")

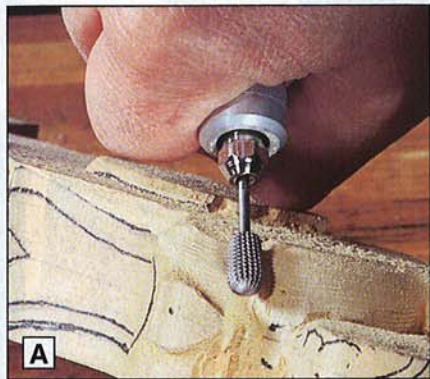
Shanks measure $\frac{3}{32}$ " in diameter for most bits, $\frac{1}{8}$ " for some. Large burrs designed for aggressive cutting often feature $\frac{1}{4}$ " shanks.

The shape of things



GET A GOOD GRIP ON THE TOOL

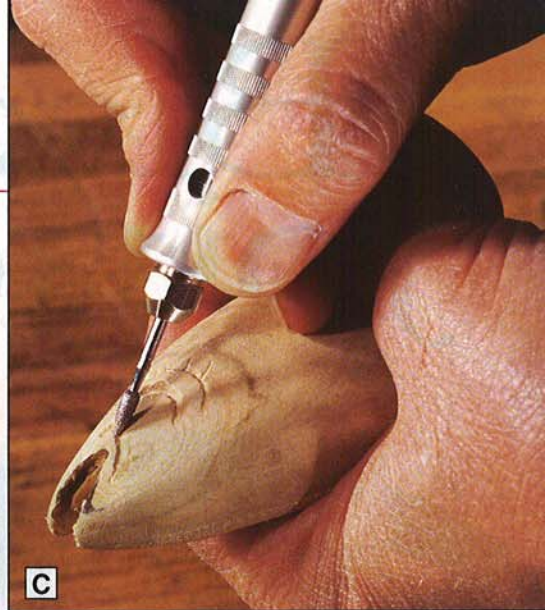
The secret to success in power-carving lies in keeping the bit under control. The first step is to get a firm, comfortable hold on the tool. Some popular ways to hold a rotary carving tool are the *grinder-style* (Photo A), *knife-style* (Photo B), and *pencil-style* (Photo C) grips.



The grinder-style grip is good for heavy wood removal, as in roughing, where precise control is less important. For stability, you can rest a knuckle or an extended finger against the workpiece.



The knife grip gives better control for more precise shaping. For this one, hold the tool as for the grinder-style grip, but extend your thumb away from the tool. Then, with your thumb at one end of the cut, pull the tool along the cut by closing your hand. Resting a knuckle or finger on the workpiece enhances control.



The pencil-style grip affords fine control for detail work, but also allows you to reach into tight areas. In fact, it's a good general grip for most carving. The length of the bit doesn't always allow you to hold the tool as close to the cutting point as you'd like, but you can gain extra support by extending a finger or resting your tool hand on a support.

SAND A STYLIZED BIRD

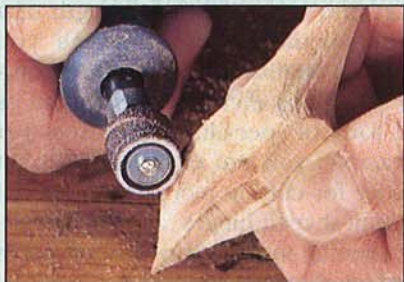
When we asked carver Sheila Hunter for a quick, easy power-carving project, she had the perfect answer: a stylized bird, like the one shown *right*. With no more than a sanding drum chucked in a handheld rotary tool, you can carve one in just a few minutes.

To carve the bird, transfer the top- and side-view patterns to a 2x2x6" block of suitable stock. (For power carving, that can be virtually any wood. We used a mahogany scrap for the one shown.) Bandsaw or scroll-saw the two views.

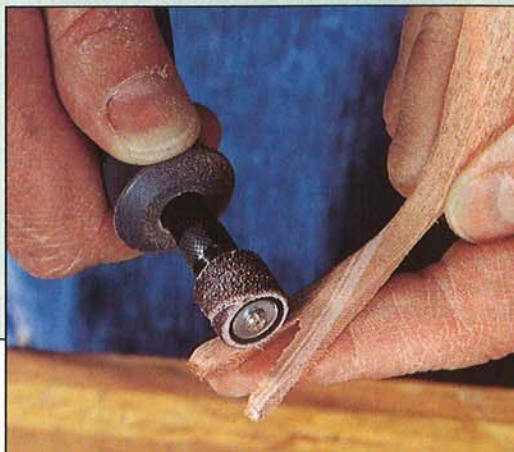
Then, chuck a 1/4, 3/8, or 1/2" sanding drum to your rotary tool, and install a 60-grit sleeve. Sand the corners of the blank round, as shown *below left*. Leave a small, rounded flat spot on the bottom for the bird to sit on. Shape the body, head, and tail. As you thin and shape the tail, support it with your finger, as shown *below right*.

Once you've shaped the bird, change to a 120-grit sanding sleeve. Blend the contours, and remove deeper scratches left by the coarser drum. Hand-sand the bird with 150- and 220-grit sandpaper, going with the grain. Finally, apply a clear finish.

You can hand-hold small carvings. Many power carvers sit down to work, holding the work close to the chest.



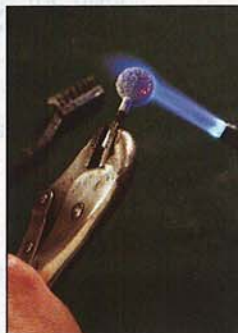
Support thin sections, such as the bird's tail, for a more consistent cut and to prevent breakage.



See the **WOOD PATTERNS®** Insert for full-size patterns

Clean bits carve better

A bit may not cut as well after some use. That's not necessarily a sign that it's worn out; maybe it's just loaded up with wood fibers and resin. Cleaning may revive it.

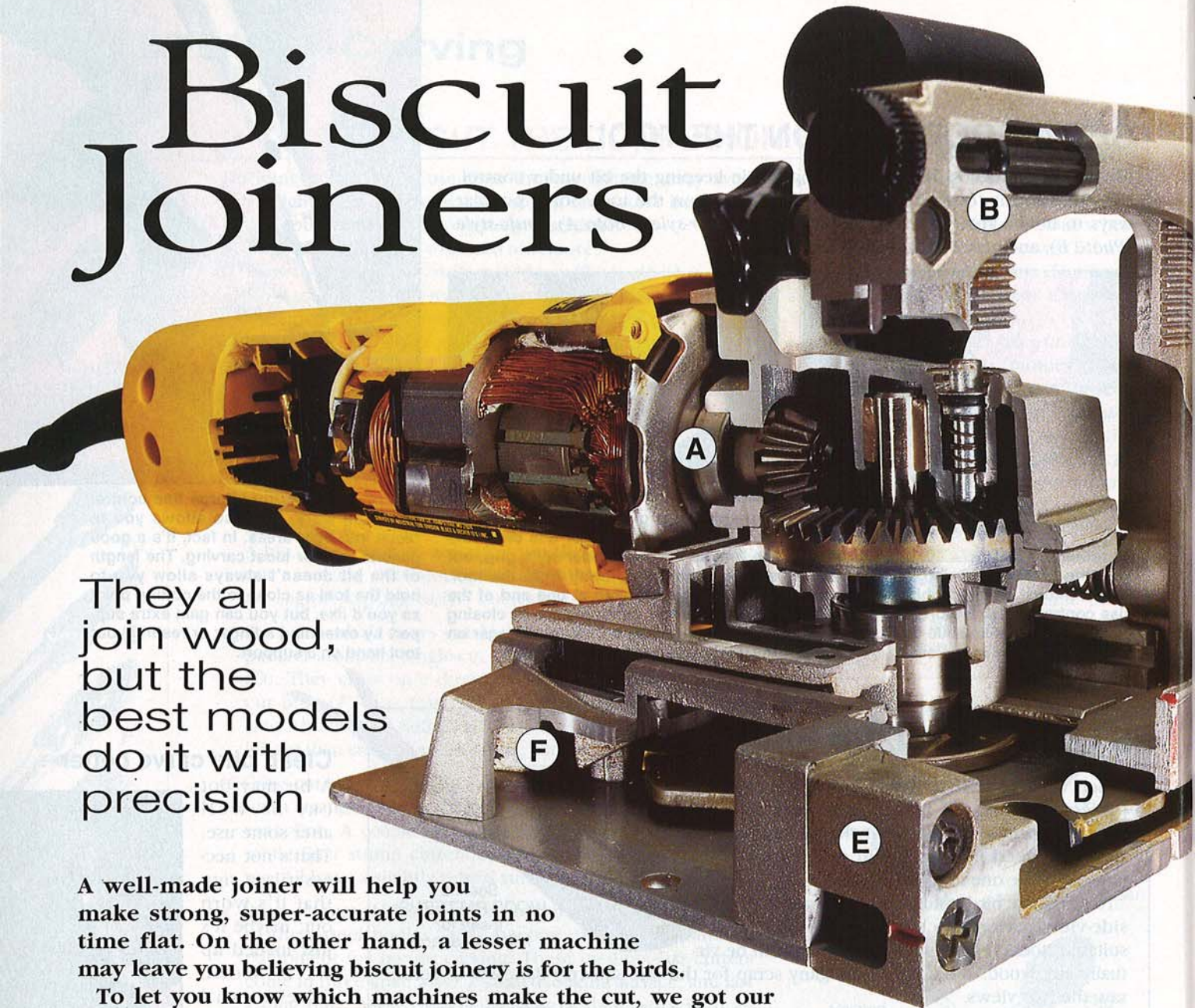


Clean light buildups from burrs, ruby carvers, and diamond points with a brass-bristle brush, about the size of a toothbrush. Go after heavier deposits with oven cleaner. Blast a clogged Kutzall with the flame from your propane torch (*above*), then brush it clean.

Many carving-supply dealers sell blocks and dressing stones for maintaining ruby carvers and diamond points. A crepe sanding-belt stick cleans texturing stones and sanders. ♣

Technical Consultant: Sheila Hunter
Photographs: Hetherington Photography
Illustrations: Roxanne LeMoine;
Lorna Johnson
Written by Larry Johnston

Biscuit Joiners



They all join wood, but the best models do it with precision

A well-made joiner will help you make strong, super-accurate joints in no time flat. On the other hand, a lesser machine may leave you believing biscuit joinery is for the birds.

To let you know which machines make the cut, we got our hands on 10 popular biscuit joiners (they're also known as plate joiners, by the way). Here's what we uncovered.

First, a few things to consider if you're new to biscuit joiners

At this point you may wonder if you even need one of these tools in your shop. Well, if you currently use dowels or splines in your joinery, you'll find that biscuits are just as strong, and much easier to install. We rank only pocket-hole joinery as being faster, but it leaves holes on the backside of your workpieces.

With a biscuit joiner you simply mark a line across the two workpieces where the biscuit will be. Then, you separate the workpieces, position the

fence of the joiner on one of the marks, and plunge the machine's small circular blade into the workpiece. Repeat this on the other marked workpiece. You now have mating half-oval slots less than $\frac{3}{4}$ " deep in each workpiece. Into these slots you insert a flat, football-shaped, compressed-wood biscuit. And, as you'll see later in this article, with a good biscuit joiner the two workpieces will align perfectly. Try doing that with dowels!

We especially like to use biscuits for aligning and joining edge-glued stock, and for rail-and-stile or mitered frames that don't require the strength of a mortise-and-tenon joint. As you become familiar with the ins and outs of a biscuit joiner, you'll come across all sorts of specialized uses, too. For example, you can even use a biscuit joiner for cutting mortises for special biscuit-shaped hinges, and for precisely aligning interior trim around doors and windows.

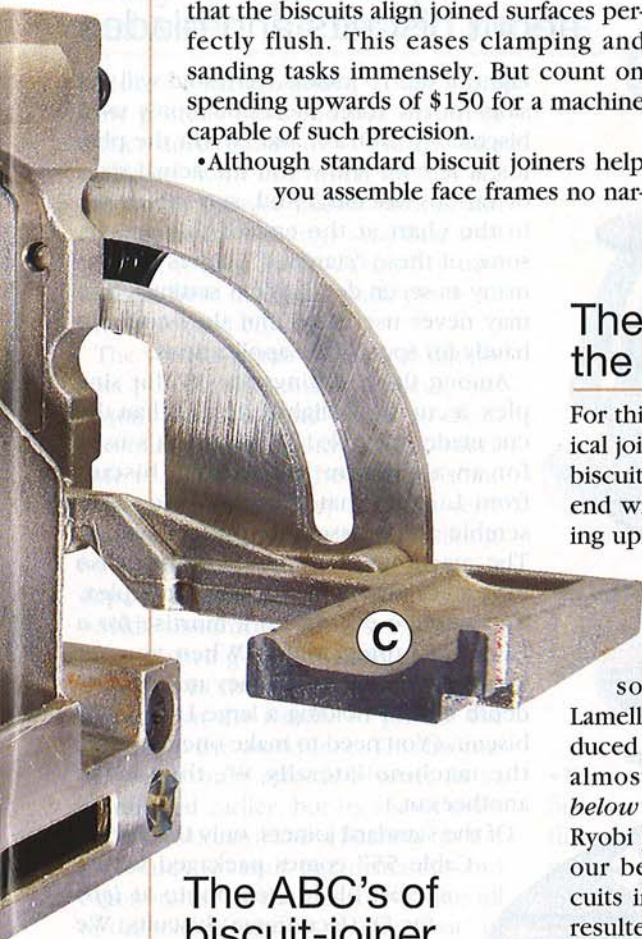
Fast Facts

•One of the beauties of a biscuit joiner is that the biscuits align joined surfaces perfectly flush. This eases clamping and sanding tasks immensely. But count on spending upwards of \$150 for a machine capable of such precision.

•Although standard biscuit joiners help you assemble face frames no nar-

rower than 2¼", one model (the Porter-Cable 557) comes with an accessory blade that enables you to join 1½"-wide face-frame pieces.

•Downsized "detail" biscuit joiners work with frames as narrow as 1", but these machines don't have the built-in accuracy necessary for flush-aligned surfaces.



The ABC's of biscuit-joiner anatomy

A

A grinder motor and transmission deliver ample power to the blade of a biscuit joiner.

B

Rack-and-pinion mechanism raises and lowers fence.

C

Fence ensures consistent biscuit positioning, and keeps blade square to workpiece.

D

A small blade cuts a semi-circular slot that holds a football-shaped biscuit.

E

Slide assembly goes back to expose turning blade when you plunge motor housing toward workpiece.

F

Debris exhaust port funnels sawdust to dust bag.

The alignment test separates the best from the rest

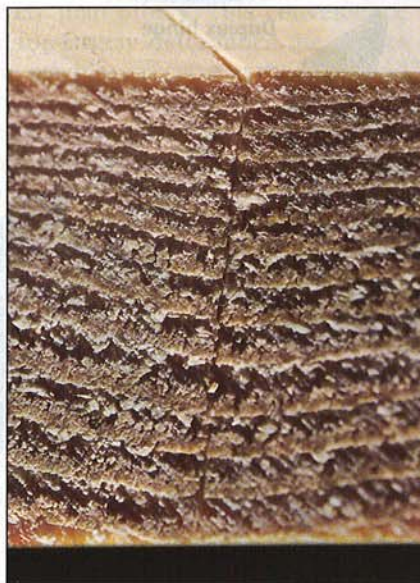
For this article we made the five typical joints you might assemble with a biscuit joiner: edge-to-edge, edge-to-end with pieces lying flat and standing upright, and mitered with pieces lying flat and upright. We carefully adjusted each machine for the best cut possible and found that some machines (DeWalt, Lamello, and Porter-Cable 557) produced joints with surfaces that were almost perfectly flush, as shown *below left*. With the Craftsman and Ryobi joiners we found that, despite our best efforts, the fit of the biscuits in their slots was sloppy. This resulted in joints that did not align themselves, as shown *below right*. The Makita, Skil, and Porter-Cable 556 joiners produced joints that, in

terms of sloppiness, were between the two photographed.

Although you can correct workpiece misalignment due to loose biscuits during clamping, life is a lot simpler when you don't have that hassle. And, with ill-fitting biscuits, you'll likely find that workpieces will creep out of alignment during clamp-up, leaving you to plane, scrape, or sand the surfaces flush.

Why does one machine cut precisely aligned slots, and another doesn't? The top-performing machines in this category have well-machined plunging mechanisms that slide the blade straight in and straight out without widening the slot beyond the thickness of the blade teeth. Some machines have blades with teeth too thick to cut a tight slot.

Continued



Our edge-joined ¾"-thick test pieces aligned precisely when we used the DeWalt, Lamello, and Porter-Cable 557 biscuit joiners as shown at left. The low-priced joiners in our test do not effectively align workpieces as shown in the test pieces at right. Edge-to-edge joints like these have about 1/32" of play in them.

Biscuit Joiners

What you need to know about biscuits and blades



Lamello S6



No. 20



No. 10



No. 0



Lamello H9



Porter-Cable FF



R1



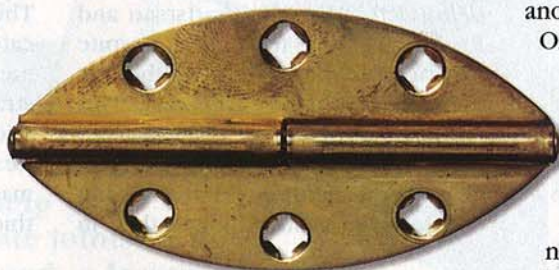
R2



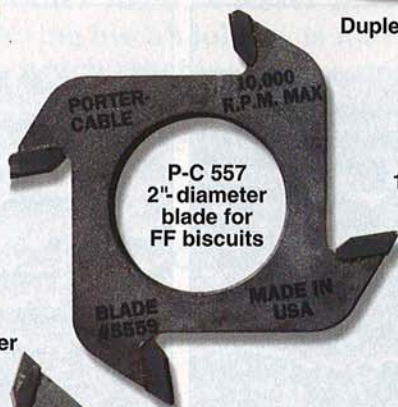
R3



R3-size hinge



Duplex hinge

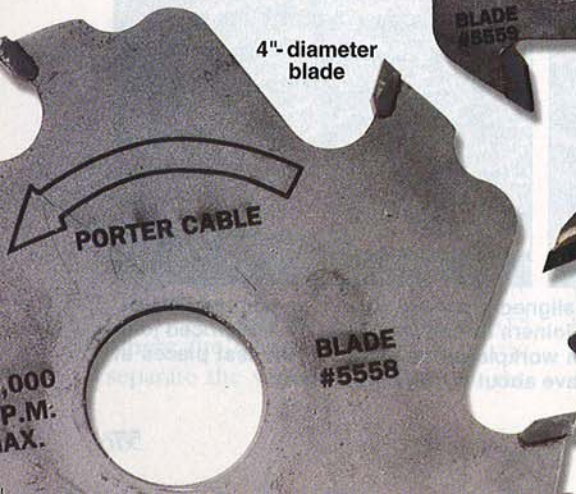


P-C 557
2"-diameter
blade for
FF biscuits

Steel
1½"-diameter
blade



Carbide
1½"-diameter
blade



4"-diameter
blade

Eight of the 10 joiners we tested will cut slots for the three most commonly used biscuits: Nos. 0, 10, and 20. (In the photos at left we show you the actual sizes of various biscuits.) And, as you can see in the chart at the end of this article, some of these "standard" joiners have as many as seven depth-of-cut settings. You may never use these, but they come in handy for specialized applications.

Among these settings are "S" for simplex, a cut that's slightly deeper than the cut made for a No. 20 biscuit. It's used for an aluminum knockdown biscuit from Lamello that allows you to disassemble and reassemble project pieces. The machines with an "S" setting also have a "D" setting that stands for duplex. This surface cut makes a mortise for a Lamello duplex hinge. When you set these joiners to "max," they make a full-depth cut for holding a large Lamello S6 biscuit. (You need to make one cut, slide the machine laterally $\frac{3}{8}$ ", then make another cut.)

Of the standard joiners, only the Porter-Cable 557 comes packaged with a special blade (see photo at left) for FF (face frame) biscuits. We found it a simple and quick operation to switch to this blade when joining face frames as narrow as 1½".

You also can switch to a smaller "H9" blade with the Lamello joiner, but this optional blade carries a suggested list price of \$99. And with H9 biscuits, the face frame pieces need to be at least 1¾" wide. Also, this biscuit is slightly narrower than the FF biscuit. All in all, for face frame work we consider the P-C system the best way to go.

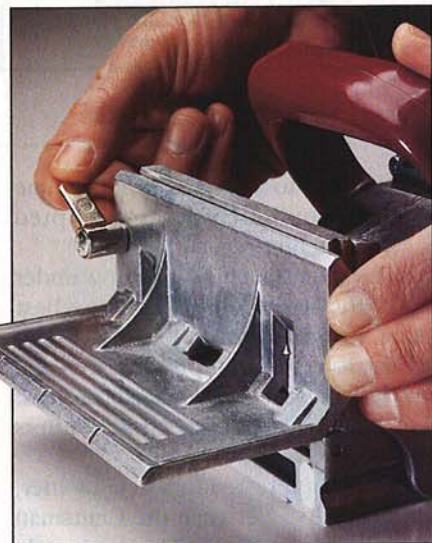
If you want to join really narrow stock, take a look at one of the two "detail" biscuit joiners from Craftsman and Ryobi. These nearly identical units work with the R1, R2, and R3 "mini" biscuits as well as the hinges that require an R3-size mortise. Unlike the standard joiners that come with carbide-tipped blades, both detail joiners come with a steel blade that dulls quickly. Our advice: Buy the optional carbide-tipped mini blade if you plan to use the machine frequently.

More key points of difference between the tested joiners

•**Motor configuration.** Today's biscuit joiners have motors oriented either horizontally or vertically. The machines with horizontal motors are essentially grinder bodies (motor and transmission housing) attached to a biscuit-joiner slide assembly and fence. These machines pack plenty of power for fast cutting.

The vertical-motor units have slightly less power; they make the cut, but require a split-second longer to do it. We found them slightly less comfortable to use at bench height, but some woodworkers say they find the vertical-motor design more to their liking. So a preference in this area may just depend on what you're used to.

•**Slide assembly.** All biscuit joiners have a spring-loaded slide assembly that houses the blade until you push forward on the handle to plunge the blade into the workpiece. This mechanism not only affects biscuit fit as mentioned earlier, but its smoothness (or lack of) can have a bearing on the machine's overall performance and ergonomics. In the chart, we rate all of the joiners "good" or "excellent" in "smoothness of slide," except the Craftsman 175010, which earns a "poor." That's because its excessively strong springs make the plunge action a real chore.



You need to apply pressure to one side of the Lamello fence as you lock it down with your other hand to ensure that it will be parallel with the blade.

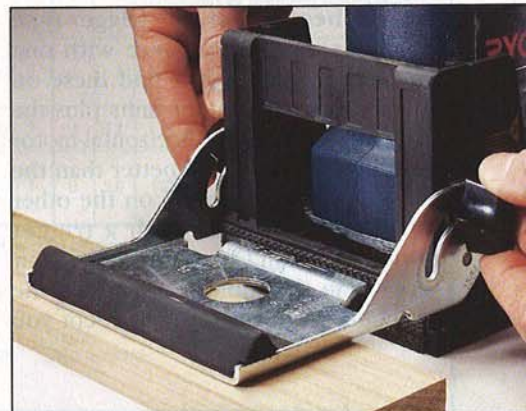


The P-C 557 (shown), DeWalt, and Makita biscuit joiners have fences that precisely elevate via hand-operated knobs.

•**Fence.** Attached to the slide assembly of every biscuit joiner is a fence that you hold firmly on the workpiece with one hand as you plunge the joiner with your other hand. The fence keeps the blade aligned with the workpiece so that the mating slots match up precisely.

As we discovered in our tests, some fences are much easier to set up accurately than others. This convenience factor largely determines the grades the machines receive in the "ease and speed of making various joints" column in the chart. As the photos on *this page and the next* show, differences in fence design result in widely varying performance levels.

The best fences in the test were those on the Porter-Cable 557 and DeWalt models. Both fences stay square to the blade as you change their height or angle them for miter cuts. There were other fences in the test that stayed square without our assistance, including those on the Makita, Porter-Cable 556, and the Craftsman/Ryobi detail joiners. But the DeWalt and P-C 557 joiners topped all of them in terms of convenience. That's because all adjustments are accomplished with easy-to-use knobs as shown *above*—no loose



The fences on the Ryobi JM80K (shown) as well as the Craftsman 175010 and Skil, do not lock square automatically. A block of wood helps you align them.

wrenches necessary. And you never have to disassemble the fence or add more parts to make certain miter cuts—more on that in just a bit.

The Lamello fence also aligns square with the blade, but you have to give it a little help. As shown at *left*, you must hold the machined end of the fence firmly against the slide assembly with one hand as you lock the fence in place with your other hand.

The fences on the Craftsman 175010, Ryobi JM80K, and Skil biscuit joiners do not self-square themselves. As shown *above*, with these we had

Continued

Biscuit Joiners

to use blocks of wood of various thicknesses to set the fence.

Although we found the fence on the Makita joiner to be self-squaring, accurate, and well-made, it and the Lamello fence proved somewhat inconvenient for mitered joints like the one at *right*. To cut slots into such a mitered end, you must remove the portion of the fence that slides up and down, then install a plastic spacer block. If you think you'll be doing miter joints like the one pictured, keep in mind that the fences on the DeWalt, P-C 557, and Ryobi JM80K joiners do not require any such disassembly and reassembly.

Only two of the tested joiners—the P-C 556 and Skil—require you to use a wrench to make fence adjustments as shown at *right*. Besides the obvious inconvenience this presents, it also creates the potential for misplacing the wrench.

•**Switches.** We prefer trigger-type switches that you squeeze with one or more fingers. You'll find these on all of the vertical-motor units plus the DeWalt and P-C 557 horizontal-motor joiners. Why are these better than the slide-type triggers found on the other machines? Because with a trigger switch you don't have to change your grip from the moment you turn the machine on through the moment you



The Makita (shown) and Lamello fences require disassembly and a spacer block for joining miters like this one.



The fences on the Porter-Cable 556 (shown) and Skil require you to use an allen wrench to lock them in place.

turn it off. With the slide-type switches, we found that we had to re-grip the motor housing after turning on the joiner.

•**Dust collection.** Biscuit joiners produce a fair amount of stringy shavings and some fine dust. All of them come with a dust bag except for the Lamello, P-C 556, and both detail joiners. (You can buy an optional Lamello dust-collection hose for \$53 list.)

The Makita performed best in this area with about 90 percent of the shavings going in its collection bag with no clogging. The otherwise top-notch DeWalt was a bit disappointing in this area because it had a tendency to clog at its debris exhaust port.

What about the Freud biscuit joiners?

The only widely available joiners that we did not test for this article were the units from Freud. That's because the company was in the midst of overhauling these units as we produced this article, and working production models were not available for testing. (The new versions should be on the market by the time you read this.) Company officials say the latest models will have improved fences with smoother and more-precise sliding parts. They do not expect prices (which would be on the low end of the models we tested) to increase.

Here are the best machines in a tight race

The Lamello was the best-made joiner in the test, with outstanding machining evident in the fit and finish of its parts. That said, it did not make better joints than the DeWalt or Porter-Cable 557 models, which carry significantly lower price tags and come with dust bags. We feel that the value-conscious woodworker will be happiest with the DeWalt or the P-C 557. The DeWalt was more compact and easier to handle than the 557, and gets our nod if you will be working only with standard No. 0, 10, and 20 biscuits. But, if you see yourself needing the

557's ability to cut slots for face-frame biscuits, you'll be happy you opted for this machine.

Among the machines costing under \$150, the Ryobi JM80K was the best value. Its fence was a bit of a hassle to set up, it has a lot of plastic parts, and its carrying case was nearly useless. Still, you can make acceptable joints with it.

If you're interested in a detail joiner, it's a coin toss between the Craftsman and Ryobi machines. They're nearly identical, so buy the one you find at the lowest price. 🍀

Written by Bill Krier Product testing: Bob McFarlin

BISCUIT JOINER RESULTS TO CHEW ON

BRAND	MODEL	MOTOR ORIENTATION (1)	BISCUIT SIZE SETTINGS (2)	BASE ASSEMBLY	FENCE	PERFORMANCE (4)														COMMENTS		
						EASE AND SPEED OF MAKING VARIOUS JOINTS																
						EDGE-TO-EDGE	FLAT EDGE-TO-END	UPRIGHT EDGE-TO-END	FLAT MITERS	UPRIGHT MITERS	BISCUIT FIT AND WORKPIECE ALIGNMENT	SLIDE-MECHANISM PLAY	SMOOTHNESS OF SLIDE	DUST-COLLECTION EFFECTIVENESS	ERGONOMICS	BLADE-CHANGING EASE	CORD LENGTH (FEET)	WARRANTY (YEARS)	COUNTRY OF ASSEMBLY (5)		WEIGHT (POUNDS)	SELLING PRICE (6)
CRAFTSMAN	175010	V	0, 10, 20	P	P	F	P	P	P	P	F	F	P	G	E	F	10	1	U	6.3	\$ 95	Produces sloppy-fitting joints. Fence is difficult to set up.
	175500	V	R1, R2, R3	A/P	P	G	G	G	G	G	F	G	G	P	E	G	10	1	U	3.7	68	Produces sloppy-fitting joints. Setting the fence square is easy. Same machine as Ryobi DBJ50.
DEWALT	DW682	H	0, 10, 20, MAX	A	A	E	E	E	E	E	E	G	E	G	E	G	8	1	U	6.7	190	Has an accurate and easy-to-use fence. Cuts slots that fit biscuits perfectly. We like its compact size and trigger switch. We would buy it.
LAMELLO	Classic C2	H	0, 10, 20, S, D, MAX	A	A	E	E	G	E	G	E	E	E*	G	E	9	1	S	7.6	350	Best fit and finish of the machines tested. Biscuit fit is excellent.	
MAKITA	3901	H	0, 10, 20, S, D, MAX	A	A	E	E	G	E	G	G	G	E	E	G	E	9	1	U	7	160	Fence is accurate, but requires you to interchange parts for certain joints. Biscuit fit is slightly sloppy because of too-thick blade.
PORTER-CABLE	556	V	0, 10, 20	A	A	G	G	P	G	F	G	F	G	P	G	P	6.5	1	U	6.7	130	Well built, but design is dated because fence requires an allen wrench for adjustment, and there's no dust collection.
	557	H	0, 10, 20, S, D, FF, MAX	A	A	E	E	E	E	E	E	G	E	G	E	G	7	1	U	7.5	200	Has an accurate fence, and cuts slots that fit biscuits perfectly. Ability to cut slots for face-frame biscuits sets it apart. We would buy it.
RYOBI	JM80K	V	0, 10, 20	P	S	G	G	G	G	G	F	G	G	G	E	F	10	2	U	6.7	110	Has numerous drawbacks, but gets the job done at a relatively low price. The carrying case was bothersome to use.
	DBJ50	V	R1, R2, R3	A/P	P	G	G	G	G	G	F	G	G	P	E	G	10	2	U	3.7	75	See comments for Craftsman 175500.
SKIL	HD1605	H	0, 10, 20	P	P	F	F	P	F	P	G	G	G	G	G	F	8	1	U	5.8	120	Fence requires tools for adjustment and is difficult to use. Biscuit fit is slightly better than other low-cost units.

NOTES:

- (H) Horizontal (V) Vertical
- (0, 10, 20) Standard biscuit sizes
(R1, R2, R3) Mini biscuit sizes
(FF) Porter-Cable face-frame biscuits
(S) Lamello Simplex knock-down fittings
(D) Lamello Duplex hinges
(MAX) Maximum depth of cut

- (A) Aluminum (P) Plastic
(A/P) Aluminum and plastic
(S) Stamped steel

- E** Excellent **G** Good
F Fair **P** Poor

* Dust hose is optional on Lamello

Where to call for more information:

- | | | | |
|--|---|------------------------------|----------------------|
| Craftsman
Visit your local
Sears Store | Lamello
Call Colonial Saw
at 800/252-6355 | Porter-Cable
800/487-8665 | Skil
877/754-5999 |
| DeWalt
800/433-9258 | Makita
800/462-5482 | Ryobi
800/525-2579 | |



Similar detail biscuit joiners: Craftsman 17550 (above) and Ryobi DBJ50.



WOOD MAGAZINE
EDITORS' CHOICE
GOOD VALUE
1999 TM
Ryobi JM80K



WOOD MAGAZINE
EDITORS' CHOICE
TOP TOOL
1999 TM
Porter-Cable 557



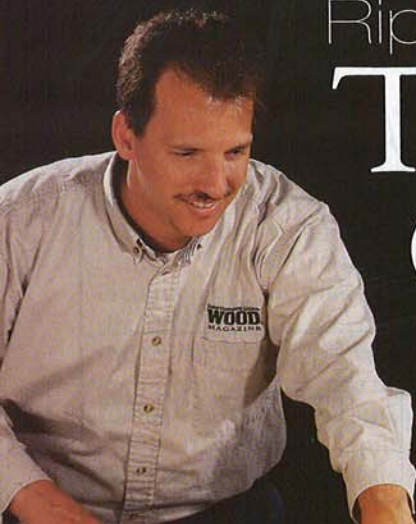
Lamello Classic C2



DeWalt DW682
WOOD MAGAZINE
EDITORS' CHOICE
TOP TOOL
1999 TM

Rip-and-flip

Tablesaw Outfeed Table



(Note: This fixture attaches to any stationary tablesaw, regardless of the style or material of your saw's extension wings. We built ours to fit a Ridgid TS2424 tablesaw with webbed, cast-iron extension wings, but we'll also show you how to mount the outfeed table to solid cast-iron, stamped-steel, and shop-built wooden tables.)

First, size the table to fit your saw

If your tablesaw fence clamps to the rear rail, as shown in the Fence Clearances drawing on the *opposite page*, you'll need to leave a gap between the outfeed and saw tables for the fence to travel in.

To calculate the width of that gap, measure

from the back of your saw table to the rearmost part of the fence, and add $\frac{1}{4}$ ".

You'll also need to size the fixed table, which should be just wide enough for the extension table to clear the motor when folded down. On belt-driven saws, crank the blade all the way down to find the maximum reach of the motor, then measure the horizontal distance between the back of the saw table and the back of the motor. If you

Our handy folding fixture adds only inches to your saw when stored, but provides you with more than 3' of stock support beyond the blade for safer and more convenient cutting.

have to leave a gap for the fence, subtract the width of the gap to find the fixed table's length.

Finally, measure from the front of your saw's cabinet to the back edge of its table. Add the motor clearance measurement you just took, then subtract 1" to find the length of the mounting bars.

Let's get to work and install the mounting bars

1 Size the mounting plates (A), if needed, to straddle three cells (as shown in the Web Mounting detail drawing on page 65), and cut them to length.

2 Cut the mounting bars (B) to length. To locate the mounting bars, crank the saw blade to full height and adjust the bevel to 45°. Using a level, mark a minimum clearance line on the back edge of the saw table, plumb above the farthest reach of the motor.

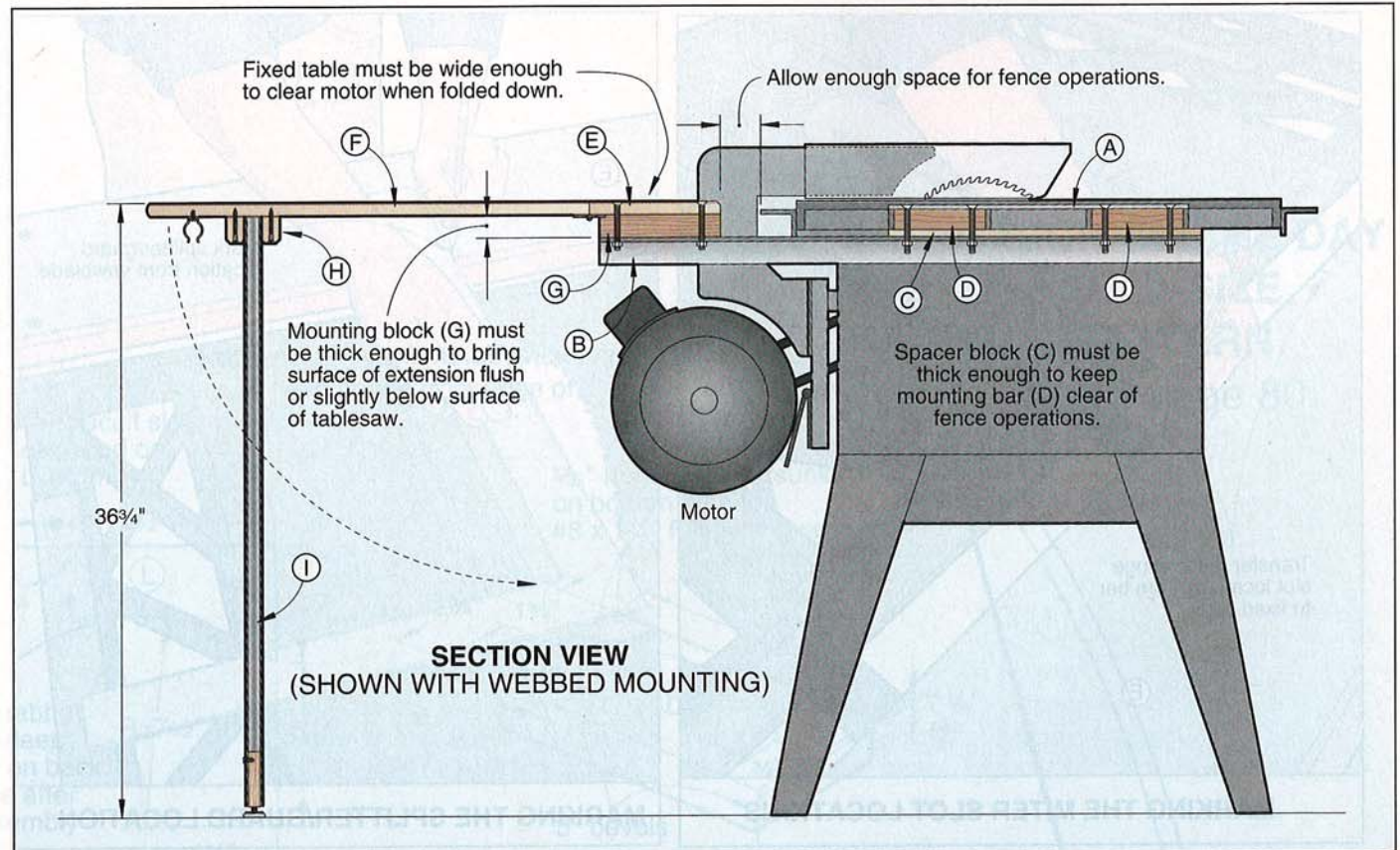
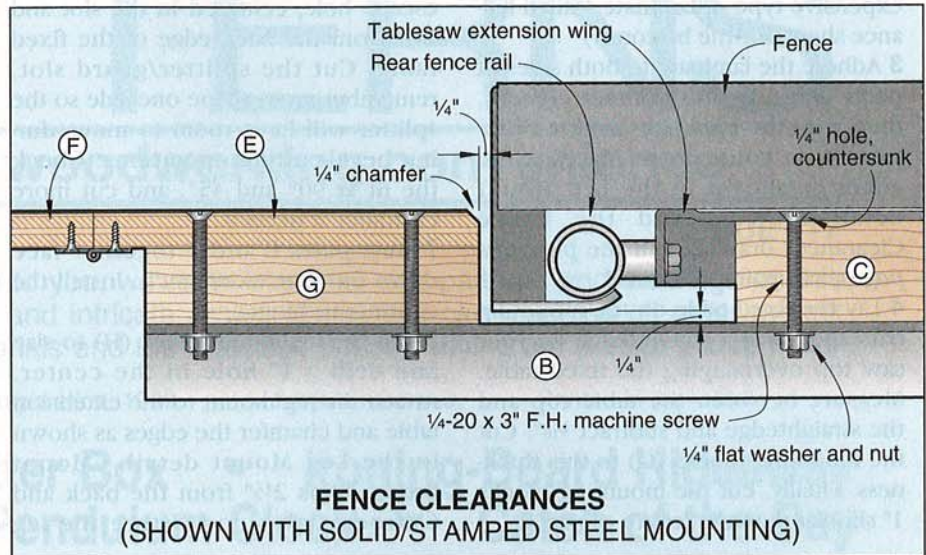
3 Using the Web Mounting detail and the Fence Clearances drawing (at right) as a guide, cut two spacer blocks (C) and filler blocks (D), if

needed, to size. For a rear-locking fence, the spacer blocks must be thick enough to allow 1/4" clearance between the mounting bar and the fence mechanism. (See the Fence Clearances drawing.)

4 Temporarily attach the spacer blocks to the filler blocks, steel bars, and mounting bars with cloth-backed

double-faced tape. Drill and countersink mounting holes through the taped stack. For non-webbed tables, clamp the spacer blocks and mounting bars in place on the saw and drill up from the bottom, then countersink the top. Remove the tape and bolt the assemblies in place.

Continued



Tablesaw Outfeed Table

Make and mount the fixed and extension tabletops

1 From $\frac{3}{4}$ " medium-density fiberboard (MDF) or plywood, cut the fixed table (E) and extension table (F) to size listed in the Bill of Materials. Shape the radius on two corners of part F.

2 Cut top and bottom pieces of plastic laminate 1" longer and wider than each table segment. (We used a less-expensive type of laminate, called balance sheet, for the bottoms.)

3 Adhere the laminate to both sides of parts E and F with contact cement, then trim the laminate using a flush-trim bit in your router. Machine the edges as shown in the Leg Mount detail drawing and the Fence Clearances drawing (on the *previous page*), and paint, if desired.

4 Lay the fixed table on the mounting bars and place a straightedge on your saw top overhanging the fixed table. Measure between the table top and the straightedge and subtract $\frac{1}{16}$ ". Cut the mounting blocks (G) to this thickness. Finally, cut the mounting blocks 1" shorter than the length of part E.

5 Clamp the fixed table and mounting blocks in position on the mounting bars. Drill and countersink screw holes, and bolt the assembly together.

6 Locate the miter-slot extensions and splitter/guard slot as shown *below*. Remove the fixed table and dado the miter slots a little wider and deeper than your saw's slots so the bar clears easily. In each slot, drill a $\frac{3}{4}$ " dust-escape hole, centered in the slot and $1\frac{1}{2}$ " from the back edge of the fixed table. Cut the splitter/guard slot, remembering to shape one side so the splitter will have room to move during bevel-cutting operations. Check the fit at 90° and 45° , and cut more clearance if needed.

7 Butt parts E and F together face down on your workbench. Install the continuous hinge.

8 Cut the leg mount block (H) to size and drill a 1" hole in the center. Attach the leg mount to the extension table and chamfer the edges as shown in the Leg Mount detail. Mount broom clips $2\frac{1}{2}$ " from the back and 6" from each side to store the leg

when not in use. Bolt the outfeed table assembly to the mounting bars.

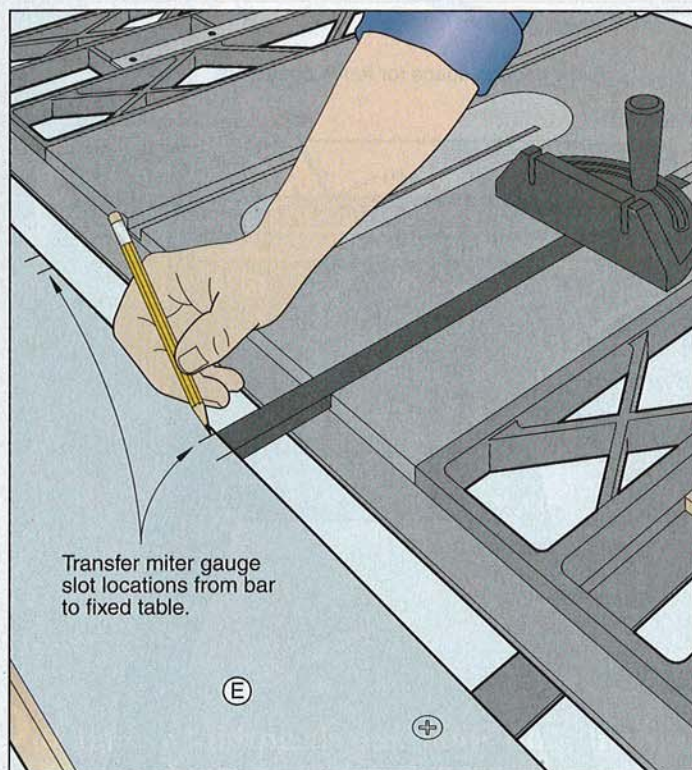
Finally, give it a leg to stand on

1 With the extension table at full height, measure from the bottom of the extension to the floor. Subtract 1" for the adjustable floor glide, and cut a piece of 1" aluminum tubing (I) to that length.

2 Cut a 3" length of $\frac{7}{8}$ " dowel (you may need to sand down a 1" dowel) to fit inside the aluminum tubing, and drill a hole to accept the floor glide insert in the center of one end. Slip the dowel in one end of part H and drill a $\frac{5}{32}$ " hole where shown. Secure the dowel with a #8 panhead sheet-metal screw, then press the insert and floor glide in place.

3 Now slip the leg into its mount on the extension table and double check its length. Trim to fit or adjust the glide as necessary. 🌲

Written by Dave Campbell
Project Design: James R. Downing
Illustrations: Kim Downing; Lorna Johnson
Photograph: Baldwin Photography



MARKING THE MITER SLOT LOCATIONS



MARKING THE SPLITTER/GUARD LOCATION

Bill of Materials

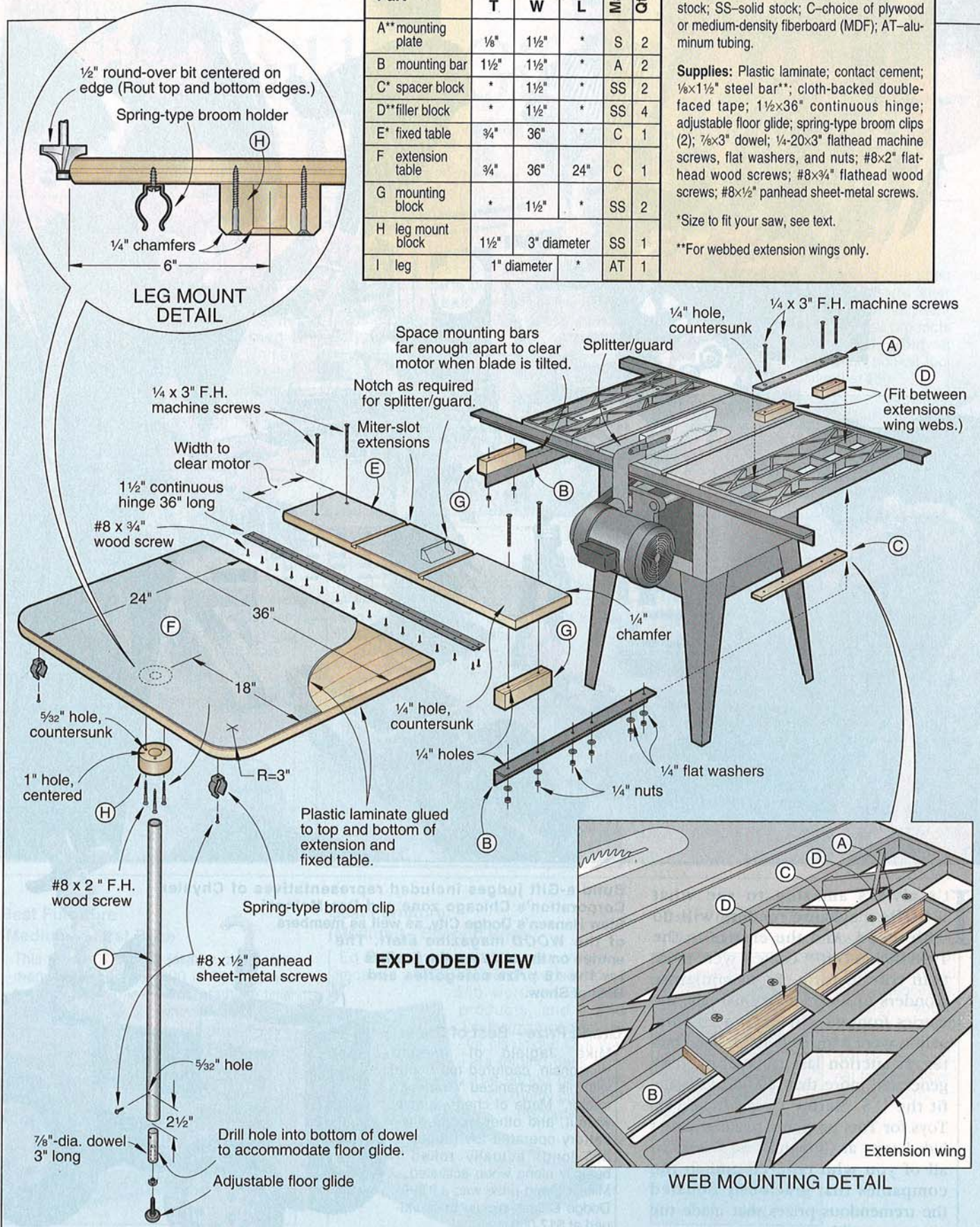
Part	Finished Size			Mater.	Qty.
	T	W	L		
A** mounting plate	1/8"	1 1/2"	*	S	2
B mounting bar	1 1/2"	1 1/2"	*	A	2
C* spacer block	*	1 1/2"	*	SS	2
D** filler block	*	1 1/2"	*	SS	4
E* fixed table	3/4"	36"	*	C	1
F extension table	3/4"	36"	24"	C	1
G mounting block	*	1 1/2"	*	SS	2
H leg mount block	1 1/2"	3" diameter		SS	1
I leg	1" diameter	*		AT	1

Materials Key: A—1/8" angle iron; S—steel bar stock; SS—solid stock; C—choice of plywood or medium-density fiberboard (MDF); AT—aluminum tubing.

Supplies: Plastic laminate; contact cement; 1/8x1 1/2" steel bar**; cloth-backed double-faced tape; 1 1/2x36" continuous hinge; adjustable floor glide; spring-type broom clips (2); 7/8x3" dowel; 1/4-20x3" flathead machine screws, flat washers, and nuts; #8x2" flathead wood screws; #8x3/4" flathead wood screws; #8x1 1/2" panhead sheet-metal screws.

*Size to fit your saw, see text.

**For webbed extension wings only.





It's always amazing to see what *WOOD*® magazine readers will do with wood. And the entries in the 1998 Build-a-Gift™ contest were more than true to form. From miniature wonders to mechanized marvels, the entries from woodworkers across the nation were a joy to behold. Even better, at auction last December, they generated more than \$7,000 to benefit the U.S. Marine Corps Reserves' Toys for Tots program, making lots of kids happy at Christmas. So thanks to all of you who entered and to the companies that graciously donated the tremendous prizes that made the contest possible.

Build-a-Gift judges included representatives of Chrysler Corporation's Chicago zone and Des Moines' Stew Hansen's Dodge City, as well as members of the *WOOD* magazine staff. The entries on the table are the finalists for the 18 prize categories and Best of Show.

Grand Prize—Best of Show

Mike Jagielo of Almond, Wisconsin, captured top honors with his mechanized "Grandpa's tractor." Made of cherry, maple, walnut, and other woods, the battery operated toy (about 30" long) actually rolled bumpy along when activated. Mike's grand prize was a 1999 Dodge Dakota pickup truck valued at \$17,000.



Here they are!

The 1998 **Build-A-Gift**™ **Winners**



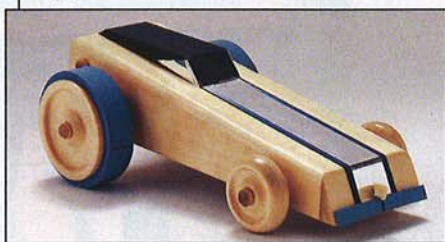
Best Originality

This wonderfully designed and crafted walnut jewelry case measuring 24" tall was created by Stanhope, New Jersey's, Roberta Grafe. She earned a Delta Unisaw and 14" band-saw valued at \$2,500, and \$120 in Flecto Varathane Clear Wood Finish.



Best Toy—First Prize

Simple as it looks, this maple rubber-band racer was a joy to play with. For his great toy, Rod Hildahl of Brooklyn Park, Minnesota, won \$2,500 in Grizzly stationary power tools.



Best Toy—Second Prize

A child's pedal-powered helicopter earned Jackson, South Carolina, woodworker Jack Dalton \$165 in Storehorse merchandise, Bondex products worth \$50, and a Leatherman pocket tool valued at \$50.



Best Craftsmanship

South Carolina's Jack Dalton won another prize with his 18"-long, 1960-era La France fire truck. It was made of bloodwood, ash, and maple, and trimmed in hand-turned brass. It won him \$2,000 in DeWalt tools.



Best Use of Wood

Fond Du Lac, Wisconsin, woodworker Wayne Wollersheim took special honors with his detailed maple and walnut Harley Davidson motorcycle that stood about 8" high. His prize was \$2,000 in DeWalt tools.



Best Transportation Vehicle Replica

Wayne Holder's realistic stagecoach had working brakes and was sprung like the real thing. The Brooksville, Florida, craftsman won a \$1,000 Milwaukee compound miter saw and \$120 in Flecto Varathane Clear Wood Finish for his tabletop replica.



Best Furniture (Medium)—First Prize

This 20x8x10" walnut jewelry chest drew many raves, and \$1,000 in Ryobi power tools, plus \$120 in Flecto Varathane finish for James Wilcox of Cainsville, Missouri.



Best Furniture (Medium)—Second Prize

Ed Barnett, from Winchester, Virginia, received a \$169 Pro-Tech Power scrollsaw, \$50 worth of Bondex products, and a \$50 Leatherman pocket tool for his unique Civil War era folding desk box. The laptop gem was expertly crafted of mahogany.



Best Furniture (Small)

Dee Cook's 1/4-scale antique baker's cabinet, made of cherry, earned the Lawrenceville, Illinois, woodworker a \$480 Makita cordless drill kit. The cabinet featured operable flour bins.





Winners

Best Scrollsaw Project

An intricately scrollsawn Victorian basket by Shirley Worthington caught the judges' eye. The Grantsville, Utah, scrollsawyer won a \$350 MLCS gift certificate.



Best Turning Project

Robert Matlack, of Ladysmith, Wisconsin, turned a black ash burl into a lamp. For his effort, he earned a \$250 gift certificate from Meisel Hardware specialties, \$50 in Bondex products, \$30 worth of Klingspor sandpaper, and a Leatherman pocket tool worth \$50.



Best Carving Project

The carved, child-size, rocking chair by Tyler, Texas', Robert Benson won a \$250 Klock-It gift certificate, Bondex products worth \$50, and Leatherman pocket tool valued at \$50.



Best Holiday Home Accessory

A \$129 Jesada router bit set, \$50 in Bondex products, and a \$50 Leatherman tool went to Charles City, Iowa's, John Shoemaker for a maple and walnut tray.



Best Educational Toy

Bridgid Infante, a woodworker from Trumansburg, New York, got a \$50 Leatherman tool, \$30 in Klingspor sandpaper, and \$50 in Bondex products for her modular building toy set.



Best Holiday Ornament

A tiny tree ornament of a vintage auto expertly crafted in maple and black walnut earned Knox, Pennsylvania's, Howard Clements a \$50 Leatherman tool, \$30 in Klingspor sandpaper, and \$50 in Bondex products.



Best Clear Finish

Bruce Freye's sugar maple and walnut biplane (12" wingspan) had an unsurpassed clear finish that earned the West Olive, Michigan, craftsman a \$500 cash award from Zinsser, plus \$50 in Zinsser finishing products.



Best Dyed or Painted Finish

Arthur Laurent, a Metairie, Louisiana, woodworker, snared a Wagner HVLP Spraytech sprayer valued at \$189, \$50 in Bondex products, and a \$50 Leatherman pocket tool for his vividly painted animal clothes hangers.



Best Home Decorative Accessory

A 16"-long model of a circa 1700 European signal cannon of brass with a rosewood caisson brought Jackson, South Carolina's, Jack Dalton a \$50 Leatherman tool, \$30 in Klingspor sandpaper, and \$50 in Bondex products.



Photographs: Hetherington Photography

Ironing-Board Hideaway

Give an ironing board a new home

Ironing boards were never intended to be works of art. But a project as attractive as this shouldn't be relegated to the laundry room. Now, you can store your board quickly and easily, and best of all, out of sight.

Start with the sides, top, and bottom

1 Cut the cabinet sides (A) to size. (We used oak to match the existing cabinetry and trim in our house.) If you don't have oak this wide, edge-join narrower stock.

2 Using the Parts View on the *WOOD PATTERNS*® insert in the center of the magazine for reference, cut a $\frac{3}{8}$ " rabbet $\frac{3}{8}$ " deep along the top and bottom ends on the *outside* face of each panel. Then, cut a $\frac{1}{2}$ " rabbet $\frac{1}{4}$ " deep along the back *inside* edge of each panel.

3 Working from the bottom end up, mark the shelf-hole center-points where located on the Parts View drawing. Drill a $\frac{1}{4}$ " hole $\frac{1}{2}$ " deep at each marked centerpoint. (We used a 6×33" piece of perforated hardboard cut and clamped in place so two rows of holes in the hardboard aligned with where we wanted the holes on the side panels. Using the holes as a guides and a stop on our drill bit to prevent drilling through the sides, we drilled the holes in each side panel.)

4 For the top and bottom panels (B), cut two pieces of solid stock to $12\frac{1}{4}$ × $16\frac{1}{2}$ ". Trim the front off each panel, leaving a piece $10\frac{1}{2}$ " wide. Set the narrower strips aside; you'll reattach them to the pieces they were cut from later.



Continued

Ironing-Board Hideaway

5 Cut a $\frac{3}{8}$ " dado $\frac{3}{8}$ " deep $1\frac{1}{8}$ " from each end on the *inside* face of each large panel section where shown on the Top and Bottom Panels drawing. Next, rout a $\frac{1}{2}$ " rabbet $\frac{1}{4}$ " deep along the back inside face of each large panel section, stopping the rabbet 1" from each end.

6 Glue the front strips back in place to the pieces from which they were cut, keeping the ends and surfaces flush. Next, trim the front edge of the top and bottom panel (B) to a finished width of 12".

7 Rout a $\frac{3}{8}$ " cove on the *inside* face along the front edge and ends of the top and bottom panels.

Cut and add the other carcass pieces

1 Cut the fixed shelf (C) and adjustable shelves (D) to size. Cut the shelf cleats (E) to size.

2 Cut the top and bottom rear rails (F) to size.

3 Using biscuit or dowel joints, machine the ends of the rails (F) and the mating locations on the inside face of the side panels (A). See the Parts View drawing of part A for the rail locations.

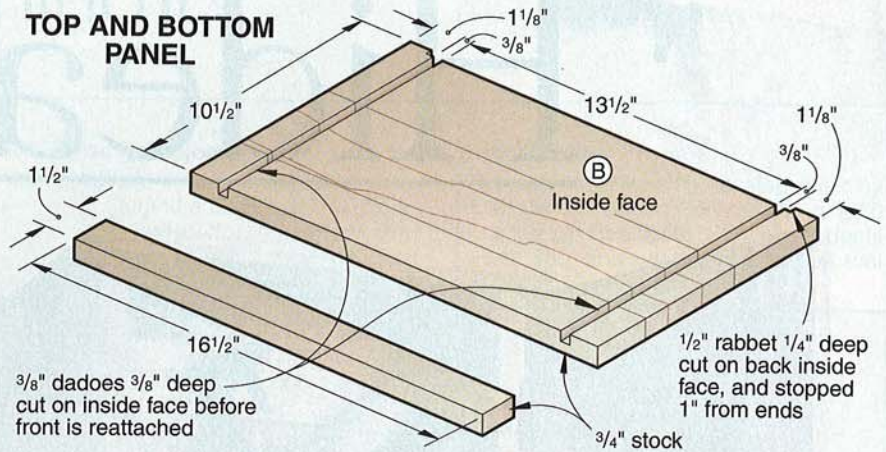
4 Cut the ironing board support (G) and cleats (H) to size.

5 Drill the countersunk mounting holes in cleats (E, H).

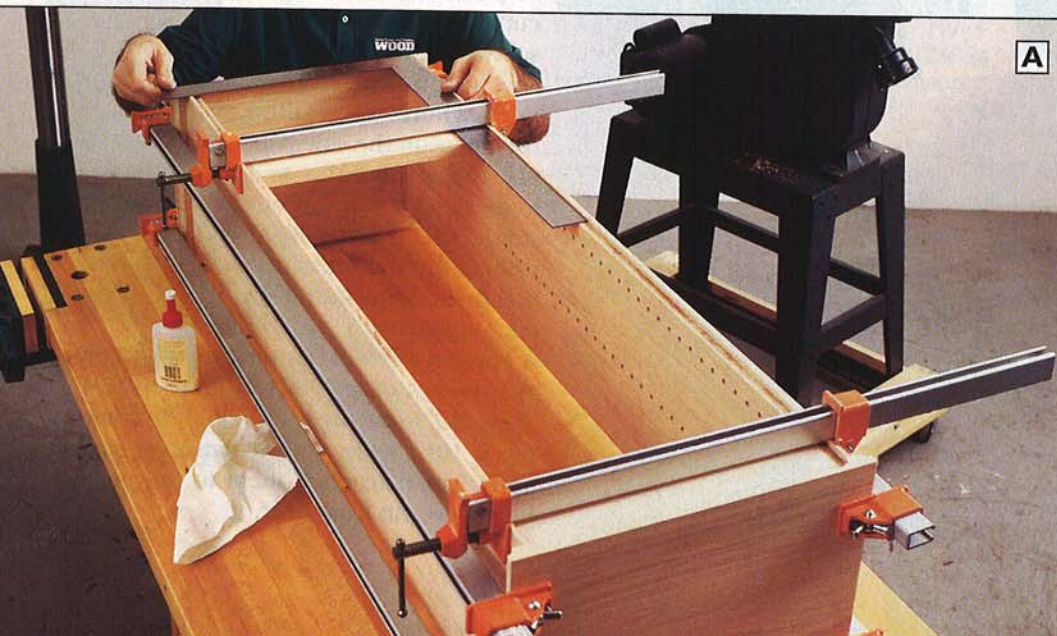
6 Glue and clamp the cabinet together as shown in *Photo A*.

Continued

Glue and clamp the cabinet together, checking for square.

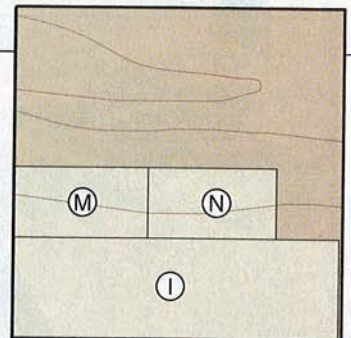


Bill of Materials											
Part	Finished Size			Mati.	Qty.	Part	Finished Size			Mati.	Qty.
	T	W	L				T	W	L		
CABINET						IRONING BOARD					
A sides	3/4"	10 1/2"	47 1/4"	EO	2	O board	3/4"	11 1/2"	37 1/4"	EO	1
B* top & bottom	3/4"	12"	16 1/2"	EO	2	P* supports	1 1/2"	1 1/2"	36"	LO	2
C fixed shelf	3/4"	6 1/2"	13 1/2"	O	1	Q spreaders	3/4"	1 1/2"	5 5/8"	O	2
D adjustable shelves	3/4"	6 1/2"	13 5/16"	O	3	R stabilizer	3/4"	2 3/4"	5 5/8"	O	1
E cleats	3/4"	1"	6 1/2"	O	2	* Cut parts marked with an * oversized. Trim to finished size according to the how-to instructions.					
F rails	3/4"	3 1/2"	13 1/2"	O	2	Materials Key: EO—edge-joined oak, O—oak, OP—oak plywood, EP—edge-joined pine					
G support	3/4"	6 1/2"	13 1/2"	O	1	Supplies: Supplies: #6x3/4" flathead wood screws, #8x1 1/4" flathead wood screws, #8x1 1/2" flathead wood screws, #8x2 1/2" flathead wood screws, stain, finish.					
H cleats	3/4"	1"	6 1/2"	O	2	Buying Guide					
I back panel	1/4"	14 1/2"	47 1/2"	OP	1	Hardware: Three pair of 1 3/16" non-mortise hinges, #27G13; ironing board cover, #130350; 1/4" brass shelf supports, #27114; 1 1/4" brass knob, #130160; adjustable ball catch, #27H39; single magnetic catch, #27H03. For current prices, contact Woodcraft, 210 Wood County Industrial Park, P.O. Box 1686, Parkersburg, WV 26102-1686 or call 800/225-1153 to order.					
DOOR											
J stiles	3/4"	2 3/4"	46 3/8"	O	2						
K bottom and center rails	3/4"	3 1/2"	9 1/2"	O	2						
L top rail	3/4"	4 1/4"	9 1/2"	O	1						
M top panel	1/4"	10 1/4"	19 1/2"	OP	1						
N bottom panel	1/4"	10 1/4"	18 3/4"	OP	1						



A

See the **WOOD PATTERNS®** insert for Parts View Drawings.



1/4 x 48 x 48" Oak plywood

Ironing-Board Hideaway

7 With the cabinet assembly still clamped together, use the cleats to screw the fixed shelf (C) and support (G) in place.

8 Measure the rabbeted opening, and cut the back (I) to size from 1/4" oak plywood. Set it aside for now.

Add a door with an arched-top panel for style

1 Cut the door stiles (J), bottom and center rails (K), and top rail (L) to the sizes listed in the Bill of Materials. Mark and bandsaw an arc on the bottom edge of the top rail (L) where shown on the Parts View drawing. Sand the arc smooth.

2 Using biscuits or dowels, glue and clamp the rails (K, L) between the stiles (J) where shown on the Door drawing. (As shown in *Photo B*, we used masking tape for marking the biscuit and rail location on the door rails and stiles.)

3 Rout a 3/8" rabbet 1/4" deep along the *inside* of the door openings along the *back* face of the door. See the Bead and Rabbet detail accompanying the Door drawing for reference.

4 Switch to a 1/4" round-over bit, and set the bit depth to cut a 1/4" bead on the openings on the *front* face of the door frame where shown in the detail. Rout the bead.

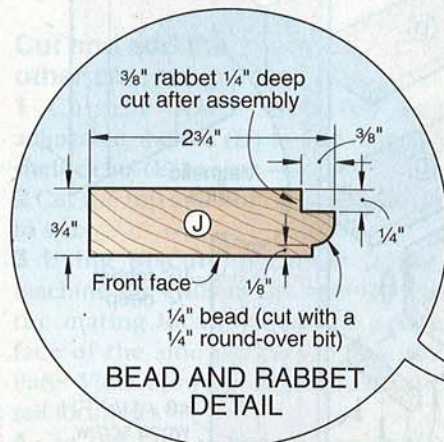
5 Cut the door panels (M, N) to fit the rabbeted openings.

6 Mark the location on the door, and drill the hole for adding the brass knob later.

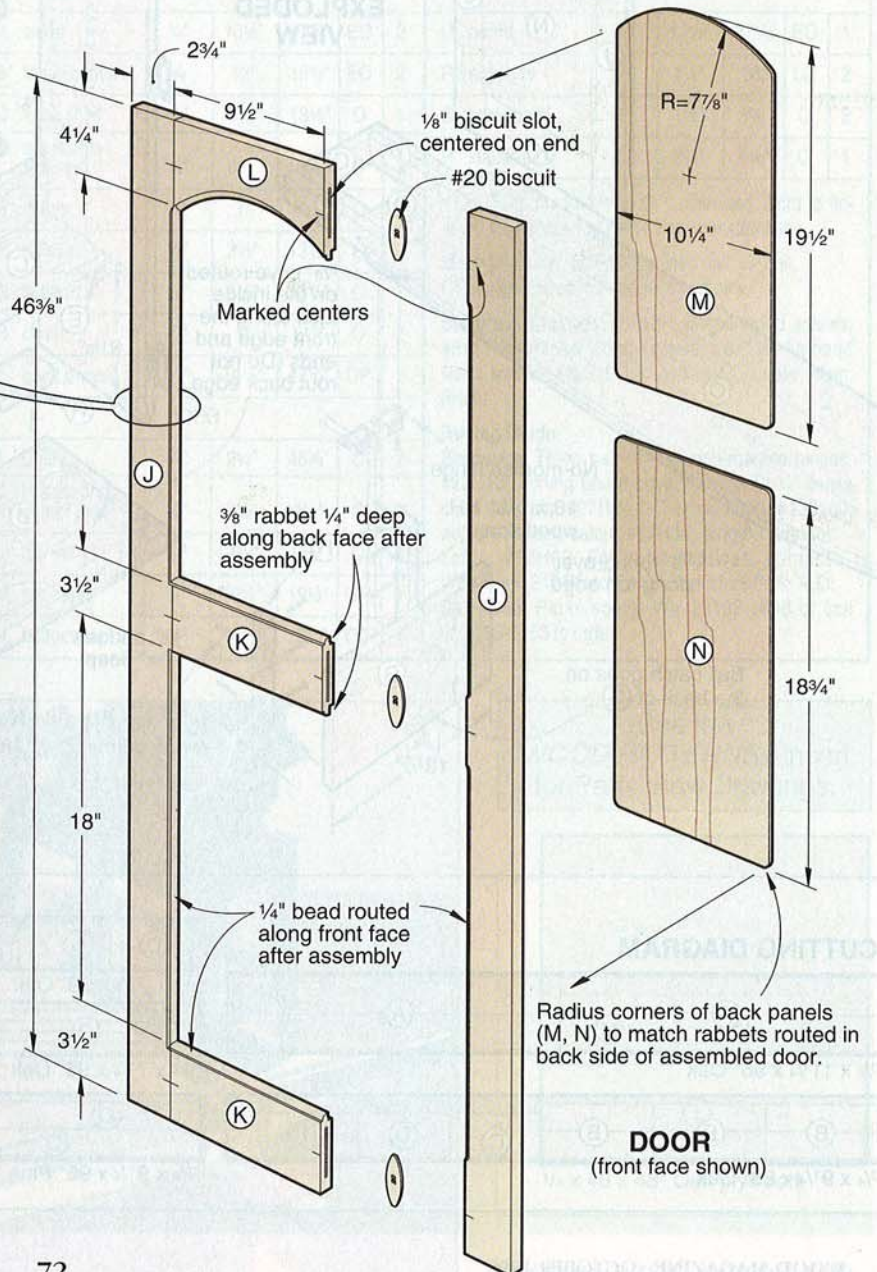
Finally, the ironing board and support assembly

1 Edge-join enough pine to form a 3/4x11 1/2x37 1/4" blank for the ironing board (O). Using the Parts View drawing for reference, mark the board's outline onto the blank. Then cut the board to shape.

2 Mark the centerpoints, and drill and countersink eight mounting holes through the board (O).



To minimize sanding later, we marked our biscuit centerlines on masking tape, and then removed the tape after cutting the biscuit slots.



3 Rout a $\frac{3}{8}$ " round-over along the *top* face of the board.

4 Laminate $\frac{3}{4}$ " stock to form blanks for the long supports (P). Trim the supports to finished size. Cut a chamfer on one end, and then cut a $\frac{1}{4}$ " rabbet and dado on the *inside* face of the opposite end where dimensioned on the Ironing Board drawing.

5 Cut the spreaders (Q) to size. Watching for flatness and square, glue and clamp the spreaders between the long supports (P).

6 Using the Ironing Board on the Parts View for reference, clamp the ironing board (P) to the support frame (P, Q). Using the previously drilled holes in the board as guides, drill pilot holes into the support frame (Q) and screw the assemblies together.

7 Cut the stabilizer (R) to fit snugly between the supports (P). The stabilizer prevents the ironing board assembly from moving when the ironing board is in the down position and in use.

Add the hardware, assemble, and apply the finish

1 Lay out the hinge locations on the cabinet where shown on the Exploded View drawing. Drill the pilot holes, and attach the small flap of each hinge to the cabinet.

2 Place the cabinet on its side with the hinge side next to the worktop. Raise the door with shims to make contact with the hinges attached to the cabinet. Then, drill pilot holes, and attach the hinges to the door.

3 Raise the cabinet to its upright position, and clamp it to your workbench.

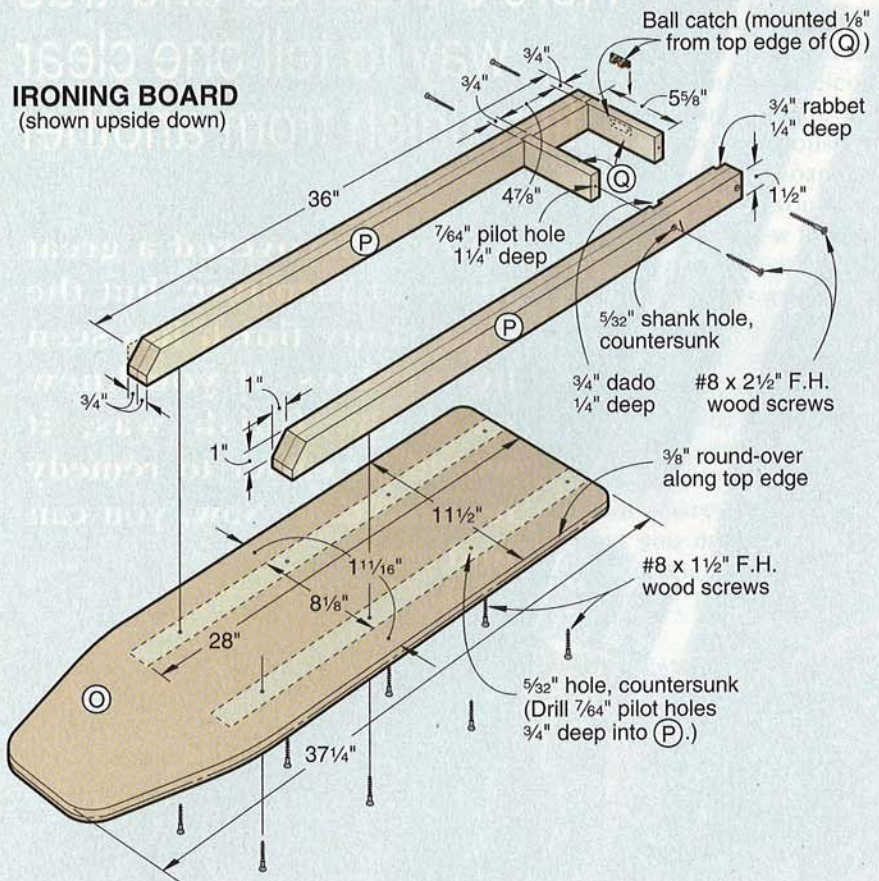
4 Attach the large flap of two hinges to the inner spreader (Q). Attach the female portion of the ball catch to the rear spreader (Q). See the Catch and Hinge detail on the *WOOD PATTERNS* insert for reference.

5 Fit the ironing board assembly into position and centered on the stabilizer (R). Screw the small hinge flaps to the back side of the support (G) where shown in *Photo C*.

6 Raise the ironing board, and attach the male portion of the ball catch to the support (G) so it mates with the female portion on spreader (Q). Adjust the tension on the ball catch.



With the cabinet clamped to your workbench and working from the back of the cabinet, hinge the ironing board assembly to the inside spreader support (G).

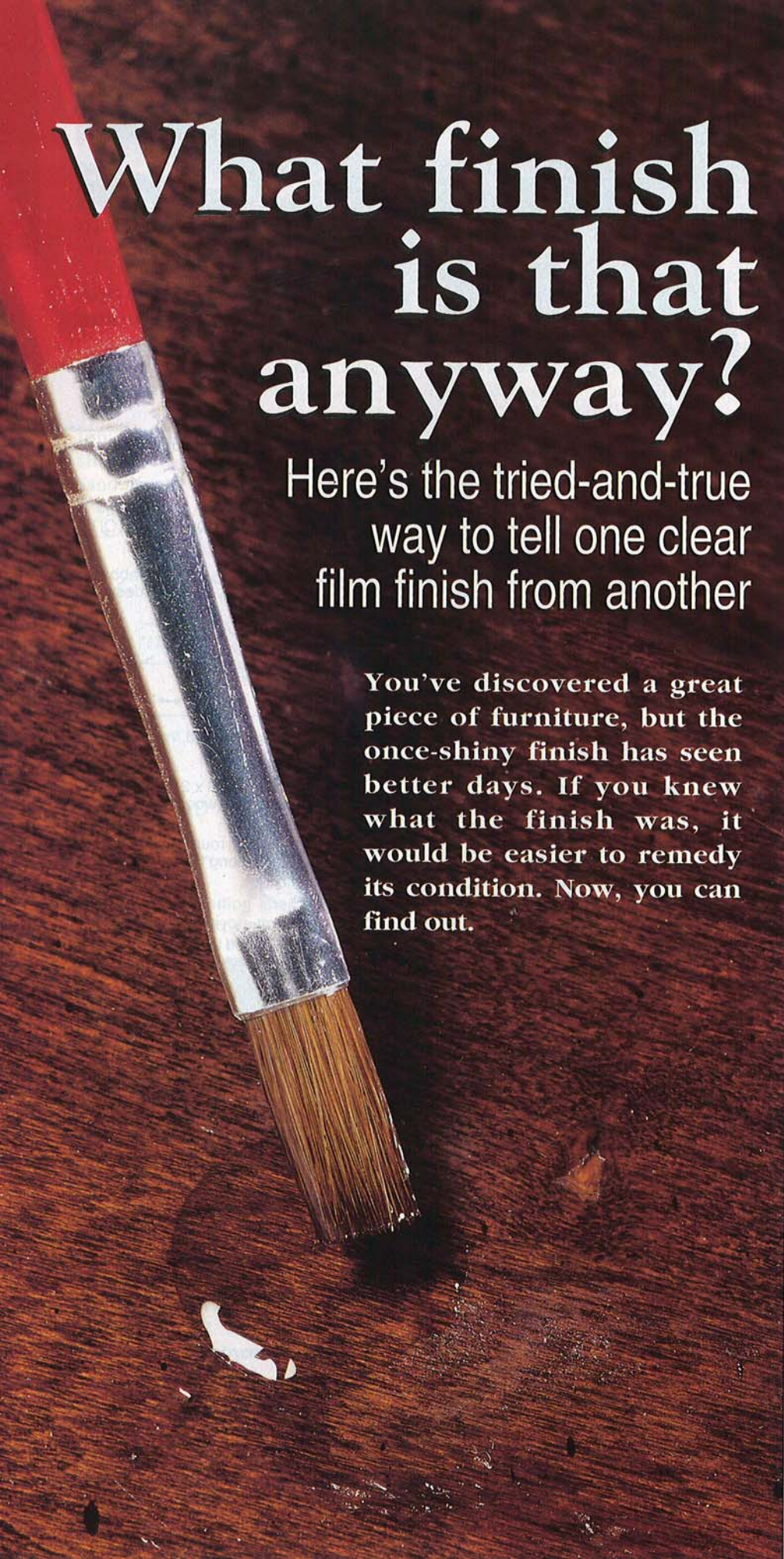


7 Attach the magnetic catch on the inside face on the right-hand side panel (A) and the strike plate on the back of the door.

8 Remove the hardware from the cabinet. Finish-sand, stain, and finish the cabinet and door as desired. Leave the ironing board unfinished. (We used ZAR #137 White Oak stain and sealed the pieces with the same finish as used on the woodwork in our house.)

9 Attach the cabinet back (I) to the cabinet. Secure the cabinet to the wall, making sure to screw it into a stud. Reattach the hardware, door, and ironing board. Install the shelf supports and shelves. Pull the cover over the ironing board. 🌲

Written by Marlen Kemmet
Project Design: James R. Downing
Illustrations: Kim Downing
Photographs: Hetherington Photography



What finish is that anyway?

Here's the tried-and-true way to tell one clear film finish from another

You've discovered a great piece of furniture, but the once-shiny finish has seen better days. If you knew what the finish was, it would be easier to remedy its condition. Now, you can find out.

The furniture piece could be relatively new or very old. Either way, there's a good chance you can repair the dull and dingy look of superficial wear by renewing the existing finish. By doing that, you'll save yourself the time and trouble of stripping, then refinishing. The trick is knowing what finish was put on in the first place. To identify the type of clear film finish on a piece of furniture, you test it with solvents. (See the chart, *opposite page*.) To find out, just do the following.

(Note: Furniture on which there are oil finishes repairs easily. Simply apply more oil finish after removing wax or furniture polish with mineral spirits or soap and water.)

1 Start with alcohol

Apply a few drops of denatured alcohol to the furniture, as shown in the photo *left*. Wait a few seconds; then touch the spot with a soft-bristle brush or a cloth. Shellac—a popular finish before about 1920—will soften and turn a bit sticky. If it doesn't, it's not shellac. Move on to Step 2.

2 Try lacquer thinner

Change your solvent to lacquer thinner, and repeat the first step by applying a few drops of it to a new spot on the surface. If after a couple of seconds the finish softens enough to almost flow, you have lacquer. (You already know it's not shellac.) But if the finish only becomes tacky—and you know that it was built in the last decade—the finish could be water-based. To be sure, test further.

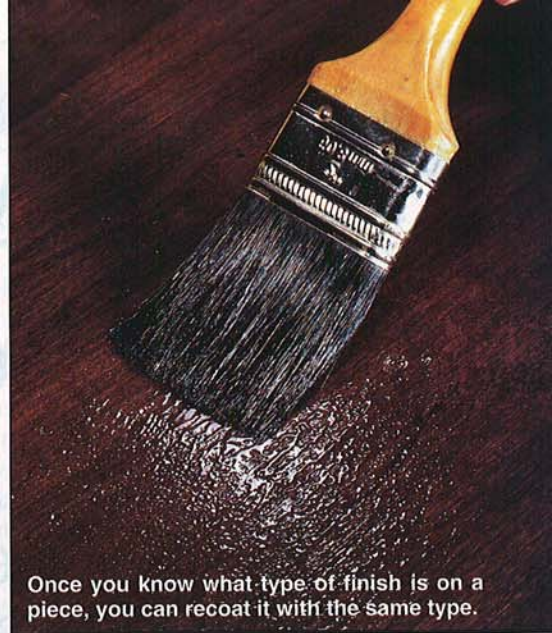
3 Maybe you need a stronger solvent

Try touching a bit of xylene (at hardware and paint stores) to a different part of the finish. If the test area gets gummy, you're definitely looking at a water-based finish.

◀ Testing with tiny drops of different solvents helps you identify certain types of clear film finishes.



If the original finish is thick enough, you can repair superficial damage by rubbing it down.



Once you know what type of finish is on a piece, you can recoat it with the same type.

What to do when nothing works

If none of these solvents dissolves the old finish, it has to be one of the *reactive* finishes—one that cures through a chemical reaction—such as varnish or polyurethane. You must thoroughly sand (scuff up) these film finishes before you can apply another coat of the same finish. Or, in cases of severe damage, you have to strip them completely off with a paint-and-varnish remover, then sand and refinish.

Finish-restoration strategies

Once you know what finish you're facing, you can restore it in one of several ways. Which one of the following you choose depends on the result you want to achieve.

• *For nicks, scratches, and small areas of damage, try reflowing the finish.* A cloth dampened with dena-

tured alcohol will reflow shellac. You'll be able to dissolve the original finish and move it around to cover minor damage, brightening the surface as you go. This also works on lacquer finishes when you use lacquer thinner as the solvent. In either case, don't be over-zealous. You could go completely through the finish.

• *Cut back the damaged surface film to a more presentable layer.* Do this with 0000 steel wool (or gray Scotch-Brite) or 1,000-grit or finer sandpaper, and lubricant (linseed oil), as shown *above*. It's much like sanding between coats when you want to build up a finish. The trouble with this method: You don't really know how thick the finish layer is, so you could cut through it to bare wood. If your option to cutting back the finish is refinishing, you might as well try it.

• *Apply more of the finish type atop the old.* Classify this as a thorough finish repair—and the most time-consuming of all. You want a clean, dull finish, so first remove any polish or wax with mineral spirits or soap and water. Then, proceed as if you were adding a second coat of a new finish.

Sand the existing finish with extra-fine sandpaper (400-grit or greater) or 0000 steel wool (unless you're putting on water-based, then use gray Scotch-Brite rather than steel wool so you won't end up with tiny rust spots). Then, remove all dust with a tack cloth and apply another coat of finish, as in the photo *above right*. It's not necessary that you match the commercial brand of original finish, only the type—shellac, lacquer, water-based, etc. 🌲

Photographs: Marty Baldwin

THESE SOLVENTS BREAK DOWN CLEAR FINISHES

Solvents dissolve cured finishes, while thinners dilute finishing solutions. Some will do both. Listed below are common solvents used in finishing.

SOLVENT	WHAT IT DISSOLVES
Denatured alcohol	shellac
Xylene	water-based
Lacquer thinner	lacquer, shellac, water-based
Paint thinner, naphtha, turpentine	wax





Accent On Woodburning

Basic tools and skills net impressive results



This woodburned cigar box from New York, circa 1920, has a leather-like look.

In the early 1800s, artisans did woodburning with the tips of iron pokers that they heated to red hot in an open fire. The problem was that they could only burn small sections of a design before the poker cooled. It wasn't until the latter part of that century that someone adapted a medical cauterizing tool for woodburning. But the tiny fire that heated the tip had to be fueled constantly by benzene fed by a squeeze bulb. In those Victorian times, woodburners slowly and painstakingly decorated everything from furniture to boat oars and fireplace mantels with intricate designs. It wasn't until electricity came along that woodburning (often called pyrography) became easier and more popular.



She puts the burn to wood

Vicki Schreiner discovered woodburning 15 years ago. "The minute I touched the hot tip to the wood and smelled that wonderful, campfire-like scent, I was hooked," wistfully recalls the Springfield, Missouri, craftswoman (shown at left). "And I'm still going strong at it. Although I've learned to complement it with color at times, there's just something about the rustic, natural look of a wood-burned piece that keeps me fascinated."

In fact, we were plain lucky that Vicki could fit us in to pass along some basic techniques to *WOOD*® magazine readers. She's usually busy demonstrating woodburning at national craft events, designing and making new projects to sell, or writing how-to books.

On page 80 you'll find the country-style photo frame that she designed and crafted. It's fun to make with the techniques shown and explained in this article. But don't limit your newly acquired woodburning skills to this project. Use the techniques to decorate and accent other items from your workshop, such as boxes, turnings, trays, and even wooden kitchen spoons. You'll find endless applications for this timeless art.

Heat up points in a pen

Woodburning pens come in various styles. And price tags range from the inexpensive craft type used in this article to the variable-heat detail burners decoy and bird carvers employ, expensive at up to \$500. Vicki prefers using a basic pen called the Creative Woodburner, shown at right (see the Buying Guide on page 81). "It develops a 900-degree tip temperature, which causes the wood to burn quickly," she points out. The pen also features a comfortably balanced handle with flow-through ventilation that keeps the fingers cool and relaxed. To burn the wood, the pen has a number of different, interchangeable points available. (For the techniques described in this article, we only used the first three points listed in the following descriptions.)

Here are the more popular woodburning tips you can buy, along with Vicki's suggestions for using them:

1. **Cone point**—Used to burn fine lines, tiny dots, curves, small details, and outlines.
2. **Shading point**—For creating even shading with a light touch or to fill large areas darkly.
3. **Universal point**—Employed for all-purpose woodburning; a good tip for short, straight lines.
4. **Flow point**—Makes large dots and curves, also for outlining.

5. **Mini universal point**—A smaller version of the flow point that makes the wood burn faster and darker.

6. **Mini flow point**—Does dots and curves on a smaller scale than the larger ones; and makes outlines.

7. **Texture 'n Tone point**—Creates many fine woodburned lines with one stroke.

8. **Calligraphy point**—For basic calligraphic styles.

All tips have threads that allow you to screw them into the pen. Note: Always change tips with the woodburner unplugged and cool. Tighten tips with a needle-nose pliers.

Choose your wood

Woodburning craftspeople like Vicki understand that softer wood burns more easily than harder wood. "That's why the favorite canvas for woodburning is American basswood," she says. "Yet white pine works well, too, if you're selective. The piece should be kiln-dried, even-grained, and without knots." (See the Buying Guide for the basswood used in this article and the project.)

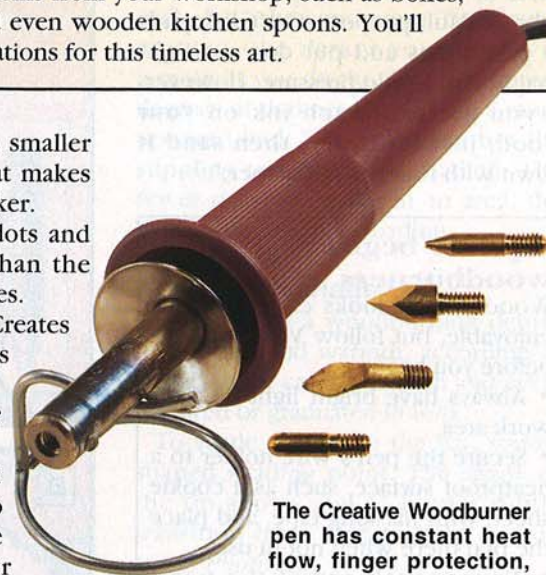
With that advice in mind, you might choose for woodburning some of the same species that carvers favor. Those would include cottonwood, jelutong, tupelo, sugar pine, and butternut. According to Vicki, you can

burn harder wood, like cherry or walnut; it just takes longer for the surface to heat up.

And be sure to prepare your wood well before burning it. You want to sand it extremely smooth so the points will move evenly.

Transfer your pattern

To get good pattern transfers to wood, Vicki prefers graphite transfer paper (available at art-supply stores) over carbon paper. "It's better for photos and illustrations out of magazines, or off old greeting cards. It's also the best for transferring actual printed patterns. In woodburning, the carbon from carbon paper tends to



The Creative Woodburner pen has constant heat flow, finger protection, and interchangeable, special-purpose points.

Continued

Accent On Woodburning

bubble under the extreme heat of the woodburning pen and run onto the wood," she cautions. "With graphite paper, I use a ballpoint pen to trace all of the design lines, but with not enough pressure to dent the wood. All you really need is a light image."

Vicki also has found two other ways to get designs onto wood. One is plastic stencils, available at craft stores. "Simply trace around the stencil pattern with a #2 pencil," she says. The other is the rubber stamps sold by craft stores. "They come in a wide variety of sizes and designs. But for woodburning, you can't use just any ink pad with them because some kinds of ink run into the wood. I use Fabrico Multipurpose Craft Ink pads in pale tones and put down a light image with gentle pressure. However, if you get too much ink on your wood, just let it dry, then sand it down with fine-grit sandpaper."

Tips for beginning woodburners

Woodburning looks easy, and it is enjoyable, but follow Vicki's advice before you begin.

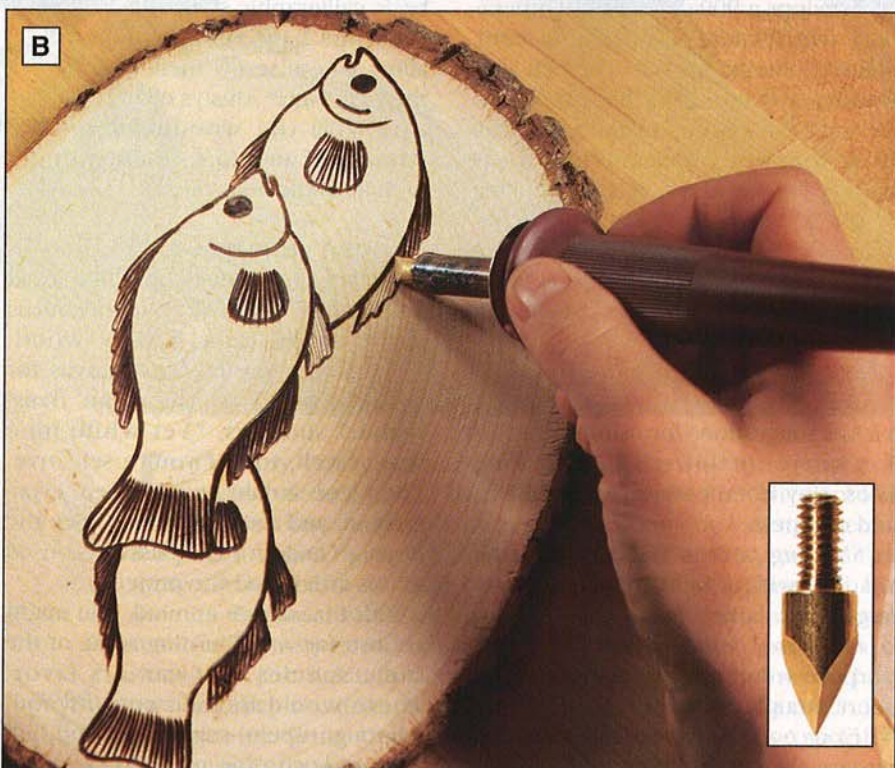
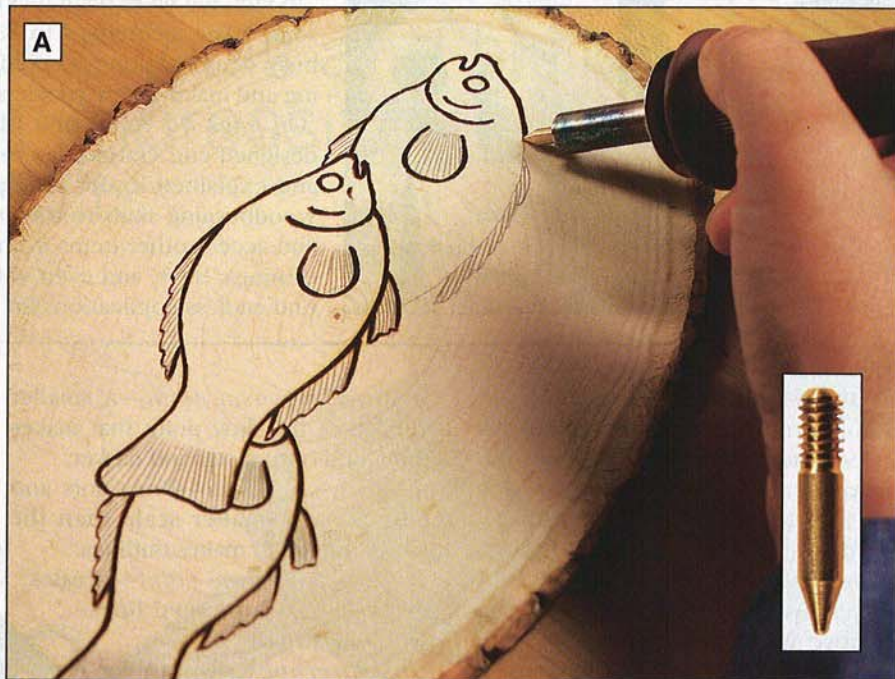
- Always have bright light on your work area.
- Secure the pen's wire holder to a heatproof surface, such as a cookie sheet, with masking tape, and place the pen there when not in use.
- Never touch any of the pen's metal parts when it's plugged in.
- Woodburn in strokes toward you or to your left or right. Never push the tip away from you. This causes the tip to unevenly bump across the wood for incomplete lines.
- Use slow, short strokes rather than long continuous ones. The slower you go, the darker your strokes will be.
- Don't use heavy pressure; let the heat do the work.
- Practice on scrapwood or the back of your project.
- Turn your wood as needed to achieve the best burning angle.
- Occasionally clean accumulated residue from the points by dragging them across 320-grit sandpaper. This maintains even heat flow.

Outlining, the first burns

After you have transferred your pattern to the wood with graphite paper, you begin woodburning with a stroke technique called outlining. This defines your design and makes it stand out on the wood. After outlining the design, you go back and apply the details that give the image texture.

"Outlining is a great technique to start with because you can get comfortable with the burning tool," explains Vicki. "For this, I use the cone point, but the flow point or mini flow would work as well."

Hold the pen in the position that allows you the best control. Turn the wood and angle the pen so the point's



tip makes even contact with the wood, as shown in *Photo A*. Then, proceed to trace the point along the outside of the entire pattern. Work with short, slow, sketching strokes that give the point time to darken the pattern line. Try to avoid going over and over the same area because you want an even burn.

Add lines for accent

To “line” with a woodburning point means to fill in or accent small areas with closely spaced, fine lines parallel to each other, as shown in *Photo B*. “Because other tips produce wider lines than needed, I do all my lining with the blade edge of the universal tip,” notes Vicki.



The cleanest lines come from holding the pen at a 45° angle to the work and letting only the tip and about half the blade touch the wood, as you can see in the photo. “Do not press down as you draw the blade toward you,” she says.

Stippling gives texture

“Stippling is the addition of a series of spaced dots to a design to provide texture (as in *Photo C*). Depending on the size of dot you want, you use either the cone point (for the largest dot), flow point, or mini flow point,” Vicki explains.

“To stipple, hold the pen upright and use a tapping motion to burn each dot,” she continues. “The slower you tap, the darker your dots will appear. If you do the dots in different degrees of darkness, you’ll get a more textured look.” You also can use the stippling technique for shading. The fewer dots you make in an area, the lighter the resulting shading.

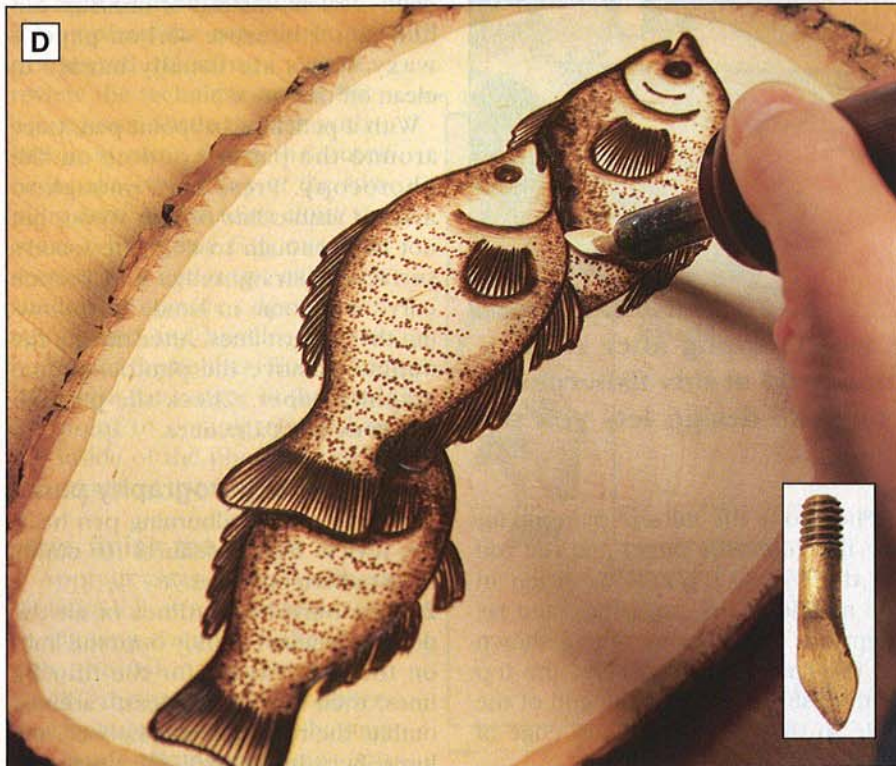
Now, make shade

Shading gives a woodburning depth, dimension, and warmth, according to Vicki. And it can be smooth and even-textured or graduated in tone.

To shade, switch to the flat, spoon-shaped shading point. The shape of the tip allows you to burn a subtle transition from dark to light, as you see in *Photo D*.

“You’ll get the best results by using small lifting strokes with the forward half of the tip,” Vicki notes. “Release pressure on the point at the end of each stroke to feather or lighten the woodburning. To make the shading the desired darkness, overlap the strokes. And remember, the longer you leave the tip on the wood, the darker it will burn.

“You can use the shading point for textured shading, too” she adds. “Just touch the front half of the tip to the wood in a tiny circular motion at irregular speeds. Combine slow movements of the tip with faster movements to produce different degrees of darkness for a textured effect.”



Written by Peter J. Stephano with Vicki Schreiner
Photographs: Vicki Shriener, PhotoWorld by Emric;
Hetherington Photography

Catch of the Day



The width of a natural-edge blank may vary from the measurement shown in the Frame drawing. If your blank is wider or narrower than $11\frac{1}{4}$ ", do not follow the pattern-placement dimensions shown. Instead, simply center the straight portion of the fishing pole between the frame opening and the right edge of the blank. Center the stringer of fish between the opening and the left edge of the blank. If the blank is so narrow that the fish pattern crowds the space between the opening and the edge, you can reduce the width of the opening to improve spacing.

3 When you're satisfied with the pattern placement, cut out the frame opening. To do this, drill a blade start hole inside the outline, and cut the opening with a scrollsaw or handheld jigsaw. Sand the blank's face smooth.

4 Transfer the patterns to the frame face. To transfer a pattern, position the photocopy on the blank. Tape one edge to the wood, and slide a piece of graphite transfer paper under the pattern, coated face toward the wood. (We prefer graphite transfer paper, available from art-supply or crafts dealers, instead of ordinary carbon paper because carbon paper's waxy marks are usually harder to clean off the wood.)

With a pencil or ballpoint pen, trace around the pattern outline on the photocopy. Press hard enough to make a visible line on the wood, but not hard enough to dent the wood's surface. A straightedge and French curve will come in handy for following the pattern lines. After tracing the outline, remove the photocopy and graphite paper. Check the pattern, and erase any extra lines.

If you're hooked on doing some woodburning after reading the article on *pages 76-79*, try your hand at this fisherman's photo frame. It's easy to make, and the design lets you try several pyrographic techniques.

Prepare the blank for burning

1 Referring to the Frame drawing on the *opposite page*, lay out the picture opening, a centered $4\frac{1}{4}\times 5\frac{3}{8}$ " rectangle (or one to fit your particular photo), on a $\frac{3}{4}\times 11\frac{1}{4}\times 13$ " piece of basswood. (For the frame shown, we used a natural-edge blank. See the Buying Guide for our source.)

2 Photocopy the full-size patterns for the fish (*opposite page*) and the rod (in the *WOOD PATTERNS®* insert in the middle of the magazine), and lay them out on the blank where shown on the Frame drawing. Place the top of the fish stringer and the end of the pole so they run off the top edge of the blank.

Pick up your pyrography pen

1 While your woodburning pen heats up, review the procedures for outlining a pattern on *pages 78-79*.

2 Woodburn the outlines of all the design elements. Darkly burn the lines on the fish, except for the thin fin lines; then the chain. Next, carefully outline the rod, reel, line, bobber, and lures. Burn in the small lines that give

Woodburn a frame for your favorite fishing photo

dimension to the rod handle and reel. Strive for uniform line darkness.

Now, unplug the woodburner and let it cool. Change to the flow point, and solidly fill in the eyes on each fish. Also fill in the dark parts of the fishing reel, including the hole for the line. Fill in the rod.

3 Next, add the detail lines, employing the universal-tip lining technique described in the woodburning article. Burn all of the small lines on the fishes' fins, starting at the leading edge of each fin and working outward from the body. Refer to the pattern for detail lines on the pole, reel, bobber, and lure.

4 Stippling comes next. Review this technique in the woodburning article, and install the cone point. To stipple the fish scales, work across each fish, burning the dots in a stripe pattern. Then, go back and burn stippling dots along the fishes' backs and bellies.

Turn your burning tool to the rest of the design, and add a few dots along the bobber's edges. Stipple a large area beneath the lures and around the rod and reel. Take the texture around the butt of the pole and the lures to the right edge of the frame.

5 Complete the woodburning with graduated shading. Again, review the technique article for procedures. Shade the fish with lifting strokes along the outer edges, directly on top of the stippling dots. Add shading along the areas where one fish overlaps another and under the gills. Also shade the outside edges of the fishing reel and handle, and the bottom of the bobber. Finally, use the entire flat surface of the shading point to completely darken the inside of the photo cutout in the middle of the frame.

Now, finish the frame

1 Apply a clear sealer, such as Walnut Hollow's Flair Finish (see the Buying Guide), to the three fish, the fishing reel, the pole handle, the lures, and the bobber. Brush on the sealer carefully, staying inside the burned lines. Do

not apply sealer to the fishing rod, the stringer chain or clips, the fishing line, or the stippled area around the lures on the bottom.

2 After the sealer dries, stain the frame. (For the frame shown, we applied Minwax Wood Finish, no. 210B golden oak, with a sponge brush, and immediately wiped it off.) The stain will not stick to the sealed areas, highlighting the woodburned pattern. Stain the edges and back.

3 Spray on two coats of clear finish.

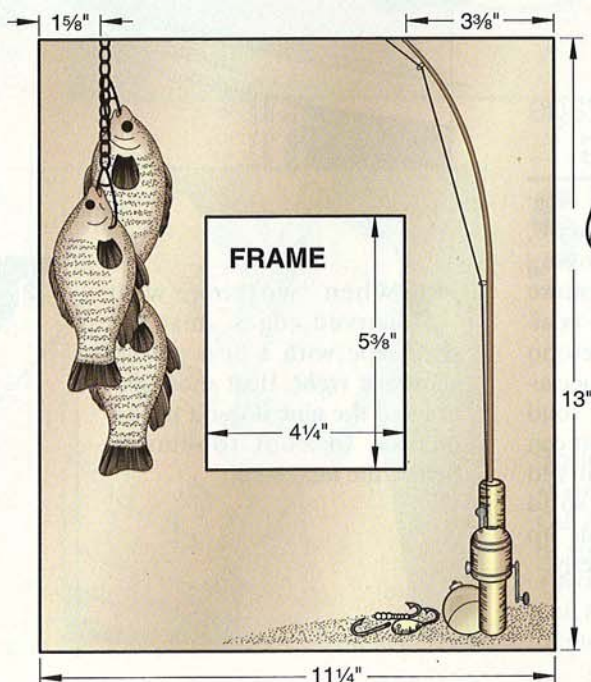
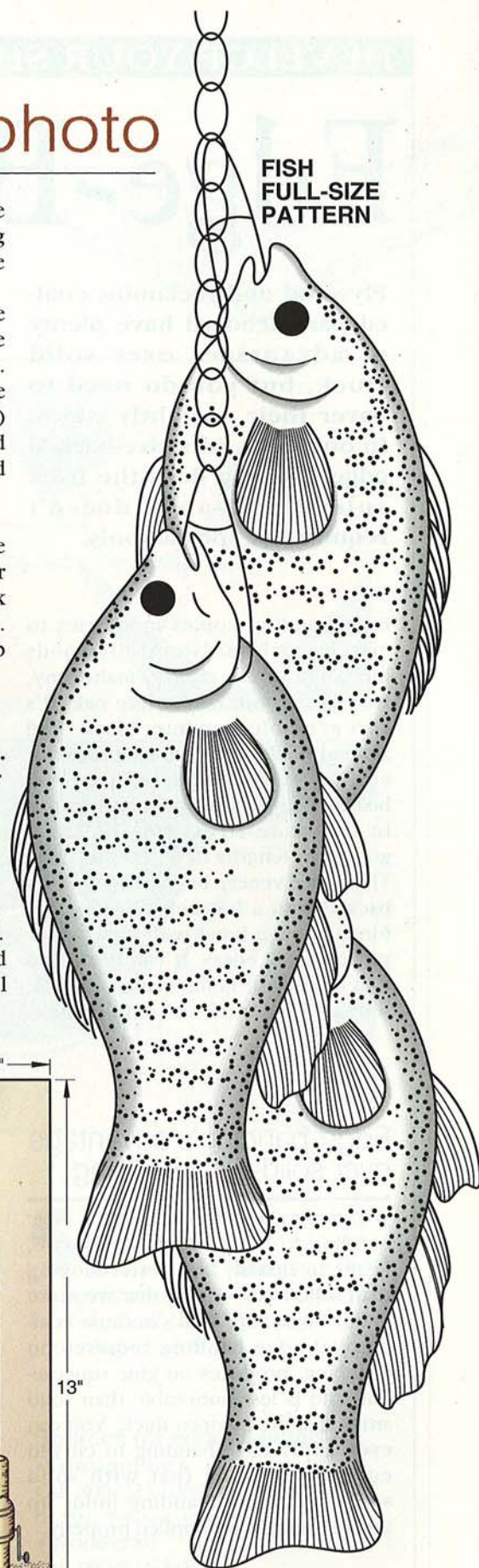
4 Tape the photo to the back of the frame. Cut a piece of kraft paper or construction paper to cover the back of the frame, and staple it in place. Install a sawtooth hanger at the top center of the back.

Buying Guide

Natural-edge blank, supplies.

Creative Woodburner pen and four points, catalog no. 5580, \$25.46; basswood country plank, 11×13", catalog no. 3510, \$9.84; graphite transfer paper, 12×24", catalog no. 1095, \$1.78; Flair Finish, 8 oz., \$5.86. Shipping, \$5 for orders up to \$50. From Walnut Hollow, 1409 State Road 23, Dodgeville, WI 53533. Call 800/950-5101; fax, 608/935-7511. ♣

FISH
FULL-SIZE
PATTERN



Project Design: Vicki Schreiner
Illustrations: Roxanne LeMoine; Lorna Johnson
Photograph: Steve Struse

Edge-Banding Basics

Plywood and melamine-coated particleboard have plenty of advantages over solid stock, but you do need to cover their unsightly edges. In our shop, adhesive-backed edge banding does the trick splendidly—and doesn't require any special tools.

Edge banding comes in species to match most hardwood plywoods including birch, cherry, mahogany, red oak, walnut, and white oak. It's also available in white, black, and almond shades of polyester plastic for edging melamine-coated particleboard. You'll most commonly find it in $\frac{1}{16}$ "-wide strips (for $\frac{3}{4}$ " sheet goods) in lengths of 8', 50', or 250'. This wood-veneer or plastic "tape" is backed with a hot-melt adhesive that forms a tough bond with plywood or particleboard edges. If you don't find it at your local home center, call the sources listed at the end of this article.

Edge-banding's advantage over solid-wood edging

We've found commercially made edge banding to be easier to work with, faster to install, and better-looking than solid-wood edging that we make in our own shop. That's because commercial edge banding requires no clamping, produces no glue squeeze-out, and is less noticeable than solid strips that are $\frac{1}{4}$ "-or-so thick. You can even apply edge banding to curved edges—try doing that with solid strips! And edge banding holds up great so long as it's applied properly.

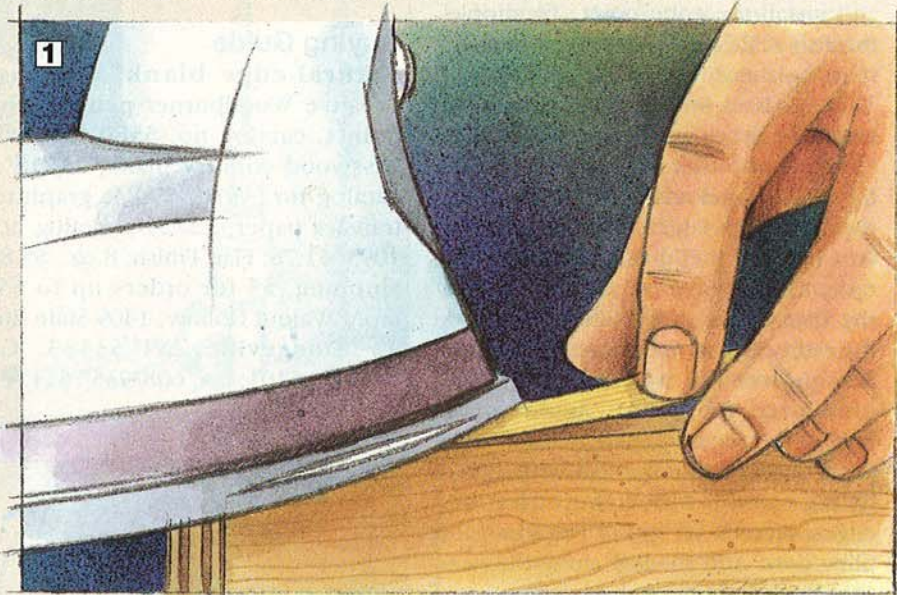
How to give your projects the edge

1 Ensure the sawn edge is smooth and flat; deep saw marks and large voids will cause problems. Then, set a common clothes iron on a high heat setting (you can buy commercial edge-banding irons if you fear getting glue on your clothes iron, but they're not necessary for good results on flat edges).

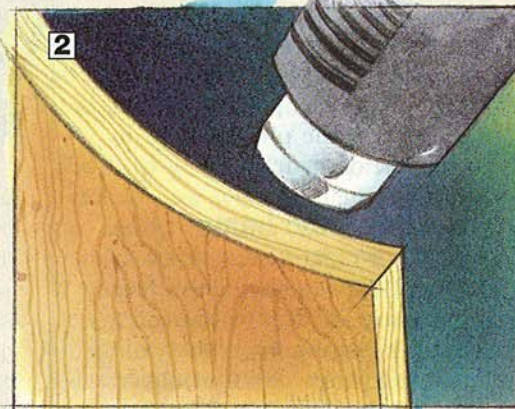
Starting with any edge on the sheet-good, cut a piece of edge banding about $\frac{1}{2}$ " longer than the edge. (Large

rolls of edge banding will have finger-jointed splices about every 8'. Work around these splices if they are noticeable.)

Center the edge banding on the edge, and with the iron apply heat to one end. Be careful to keep the banding centered with one hand as you advance the iron down the length of the banding as shown *below*. Move the iron steadily so you don't burn the wood or melt the plastic.



2 When working with curved edges, heat the tape with a heat gun as shown at *right*. Heat short sections so the glue doesn't have a chance to cool too much before the next step.



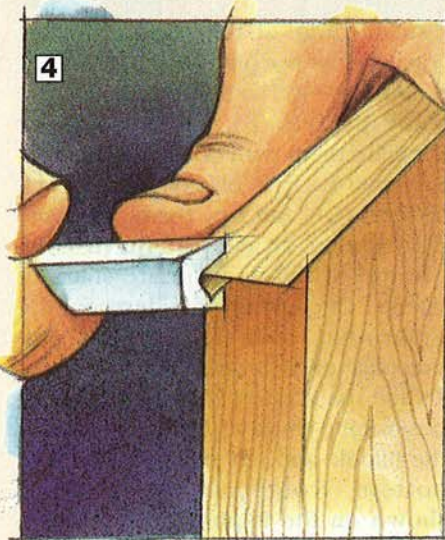
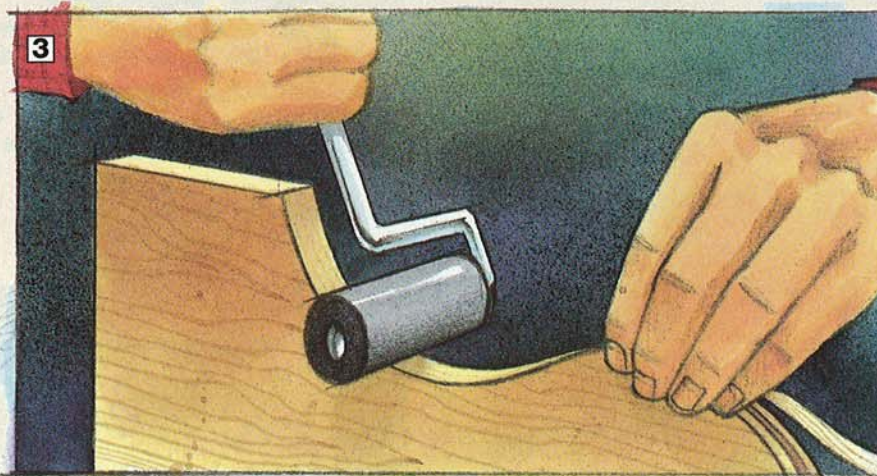
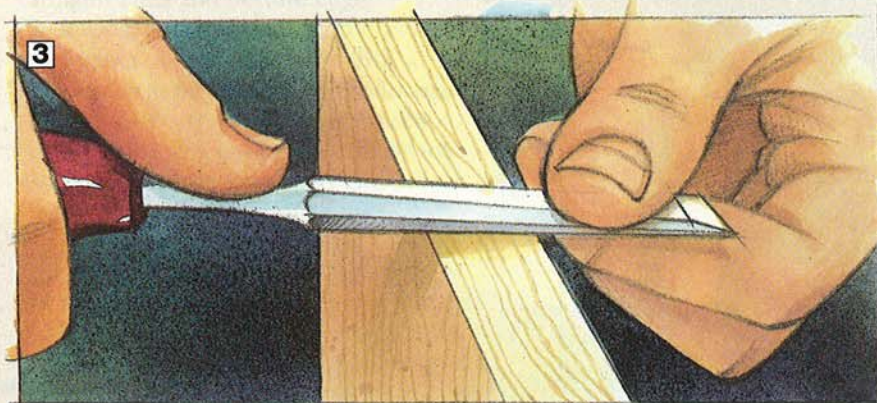
The easy way to dress up the edges of sheet goods

3 Immediately after heating the adhesive with the iron or heat gun, press it down firmly for good adhesion. The iron normally presses the tape down adequately, but it's a good idea to go back over the banding with the back side of a chisel as shown at *right, top*. On curved edges, use a hard roller as shown at *right, middle*.

Allow the hot-melt adhesive to cool for a minute; then run your fingers along the edges of the banding to check for good adhesion. Reheat and rub down any areas that lift up.

4 Trim away the excess banding with a *sharp* chisel. Start with the banding ends as shown *below*. Push the chisel in short strokes for good control, and don't be concerned about getting every last bit of the excess banding; you'll take care of the remainder in the next step.

If your chisels aren't sharp enough to handle this task, buy a hand-held commercial trimmer from one of the sources listed at the end of this article.



5 Outfit a hardwood sanding block with 100- or 120-grit abrasive, and sand away the remaining excess as shown at *left*. Repeat all of these steps for the remaining edges. ♣

Sources for edge banding

- Constantine's
Call 800/223-8087,
or visit www.constantines.com
- Woodcraft
Call 800/535-4482,
or visit www.woodcraft.com

First-Class Letter Box

Make misplaced missives a thing of the past



Stick the day's mail in this two-compartment bin (which you can hang on a wall, if you like), and you won't lose any of those important cards and letters. A scrollsawn floral motif highlights the front.

Glue up the end panels first

1 Photocopy the full-size patterns for the end panels (A) and dividers (B, C), on the *opposite page*, and the front panel (D) and back panel (E), in the *WOOD PATTERNS® insert* in the magazine. (Make two copies of the pattern that shows parts D and E, the front and back panels.)

2 Cut two $\frac{3}{8} \times 3 \times 4\frac{1}{2}$ " blanks for the end panels (A). Temporarily laminate them with double-faced tape, the good faces to the outside. Adhere the pattern to the top of the stack, using rubber cement or spray adhesive.

3 Bandsaw or scrollsaw the outline. Sand or plane the straight edges and bottom true, then separate the parts.

4 Rout a $\frac{3}{8}$ " half round-over along both faces on the top (curved) and front (sloped) edge of each part. To do that, install a $\frac{3}{8}$ " round-over bit in your table-mounted router. Adjust the cutting depth to center the top of the bit's cutting edge (not the pilot) on the edge of the stock, as shown in the Half Round-Over detail. Clamp a fence to the table, aligning its face with the

cutting edge at the top of the bit (right below the pilot bearing).

5 Cut two $\frac{1}{8} \times 1\frac{1}{4} \times 3\frac{1}{2}$ " blanks for the front dividers (B), and temporarily laminate them with double-faced tape. Saw two $\frac{1}{8} \times 1 \times 4$ " blanks for the back dividers (C), and tape them together.

6 Adhere the divider patterns (B, C) to the top of the appropriate stack of blanks. Cut out the dividers. Sand a slight round-over along the top outside edge of each divider.

7 Glue the dividers to the end panels, positioning them to form a groove in the middle and rabbets along the top, bottom, front, and back, where shown on the Exploded View drawing. Be sure to assemble the two ends (A, B, C) as a mirror-image pair.



Scrapwood spacers (the dark pieces) help position the front and back dividers when gluing the end assemblies.

To glue the dividers in place accurately, tack $\frac{1}{4}$ "-wide spacers to the inside face of each end panel (A), as shown above. Align the outside edge of one spacer flush with the bottom of part A, the outside edge of the other flush with the back edge of A. Cut a $\frac{1}{8}$ " spacer for the groove, then glue and clamp the parts as shown. (We used another piece of scrapwood as a clamping caul for the back divider because the face of the part was lower than the spacer behind it.) Remove the spacer from the groove as soon as the glue begins to tack.

Scrollsaw a decorative design

1 Cut a $\frac{1}{4} \times 4 \times 10$ " blank for the front panel (D). Adhere the full-size pattern to the blank, aligning it along the straight ends and bottom edge.

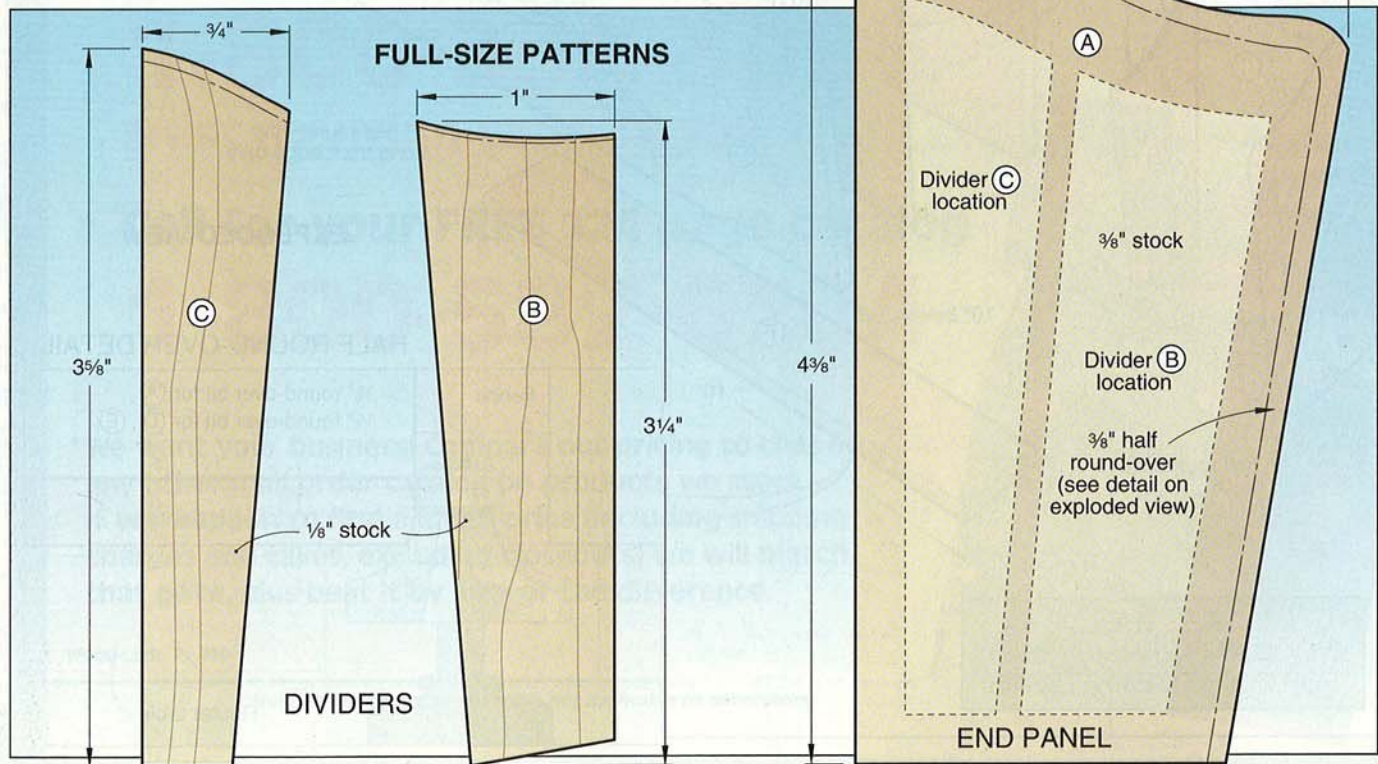
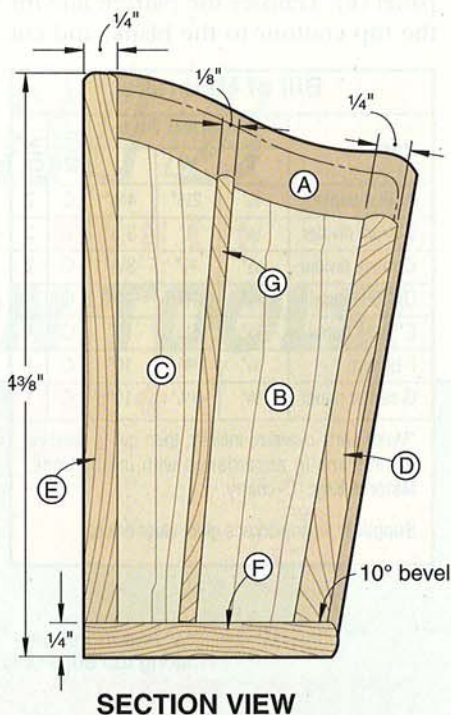
2 Scrollsaw the design in the face of the panel. To do that, first drill a $\frac{3}{32}$ " blade-start hole for each of the interior cuts. Notice that you don't need to drill entry holes in most of the narrow stems; you can saw into the stems from the leaves.

Thread the scrollsaw blade through the start hole in the left leaf (where the callout arrow on the pattern points), and cut out the leaf and stem. (We sawed the design using a #4 blade, .035 \times .015" with 15 teeth per inch.) Continue around the pattern to make all the cutouts.

3 Scrollsaw or bandsaw the front panel's curved top. If you cut it with a bandsaw, stay slightly outside the pattern line, and sand to the line for a smoother edge.

4 Form a half round-over along the top of the front panel.

Continued



First-Class Letter Box

Make a few more parts, and assemble the letter holder

1 Cut a $\frac{1}{4} \times 4\frac{1}{2} \times 10$ " blank for the back panel (E). Transfer the pattern line for the top contour to the blank, and cut

it out. Form a half round-over along the top edge of the panel. If you plan to hang the letter holder on a wall, drill $\frac{5}{32}$ " screw holes where shown.

2 Cut the bottom (F) and center panel (G) to the dimensions shown on the Bill of Materials. Rout a half round-over along the front edge of the bottom and sand one on the top edge of the center panel. Sand all parts with grits from 120 to 220.

3 Dry-assemble the parts to check for fit. For easiest assembly, join the ends (A, B, C) and bottom (F). Then add the back (E), front (D), and center panel (G).

Disassemble the parts, then glue and clamp the letter holder together. Clean off any glue squeeze-out.

4 Finish-sand the assembled letter holder. Apply three coats of semigloss lacquer, sanding between coats with 320-grit sandpaper.

To hang the letter holder, drive #6 brass flathead wood screws with finish washers into the wall or appropriate anchors. 📌

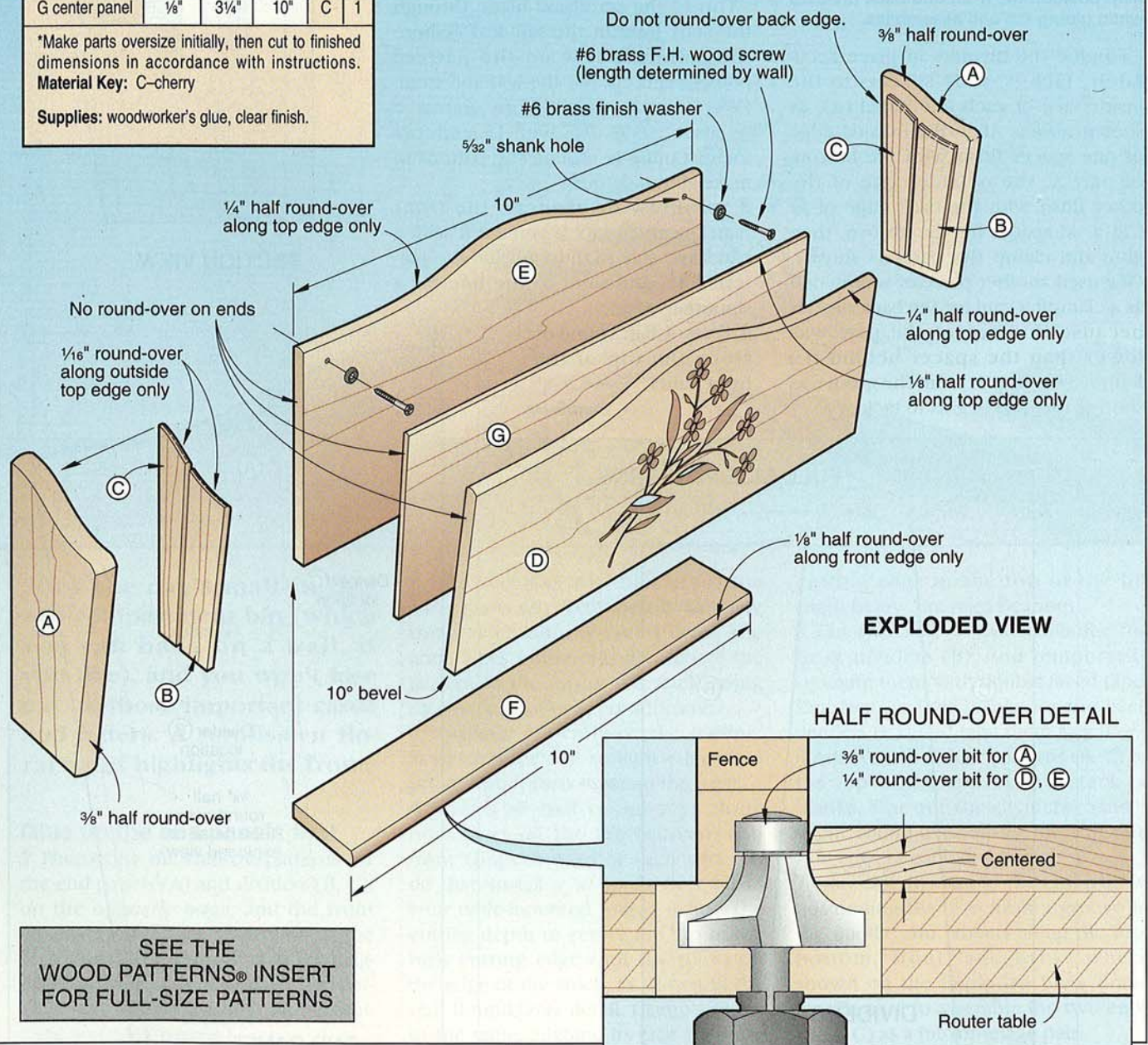
Project Design: James R. Downing
 Illustrations: Kim Downing; Lorna Johnson
 Photographs: Steve Struse;
 Hetherington Photography

Bill of Materials					
Part	Finished Size			Mati.	Qty.
	T	W	L		
A* end panel	$\frac{3}{8}$ "	$2\frac{1}{2}$ "	$4\frac{3}{8}$ "	C	2
B* front divider	$\frac{1}{8}$ "	1"	$3\frac{1}{4}$ "	C	2
C* back divider	$\frac{1}{8}$ "	$\frac{3}{4}$ "	$3\frac{5}{8}$ "	C	2
D* front panel	$\frac{1}{4}$ "	$3\frac{1}{16}$ "	10"	C	1
E* back panel	$\frac{1}{4}$ "	$4\frac{1}{8}$ "	10"	C	1
F bottom	$\frac{1}{4}$ "	$11\frac{5}{16}$ "	10"	C	1
G center panel	$\frac{1}{8}$ "	$3\frac{1}{4}$ "	10"	C	1

*Make parts oversize initially, then cut to finished dimensions in accordance with instructions.

Material Key: C—cherry

Supplies: woodworker's glue, clear finish.



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HI 2 interior trim 101

HI 7 simply country

HI 10 craft an arts-and-crafts look

HI 6 build on what's already there

HI 8 truly traditional

HI 12 19th-century nostalgia

HI 14 how to get the job done right

interior trim 101

Taking the guesswork out of millwork

Is the interior trim in your home all that you would like it to be? If the answer is no—or if a remodeling project calls for replicating existing moldings—help is at hand. The pages that follow show the magic you can perform with millwork. But first let's walk you through the steps you need to follow in planning your particular project.

Moldings serve two basic functions: 1) They cover gaps around windows and doors, at floor level, and other places where different surfaces meet; 2) They protect against accidental nicks and bumps from everyday wear and tear.

But moldings also serve a larger, more aesthetic function: They go a long way toward defining a home's architectural style.

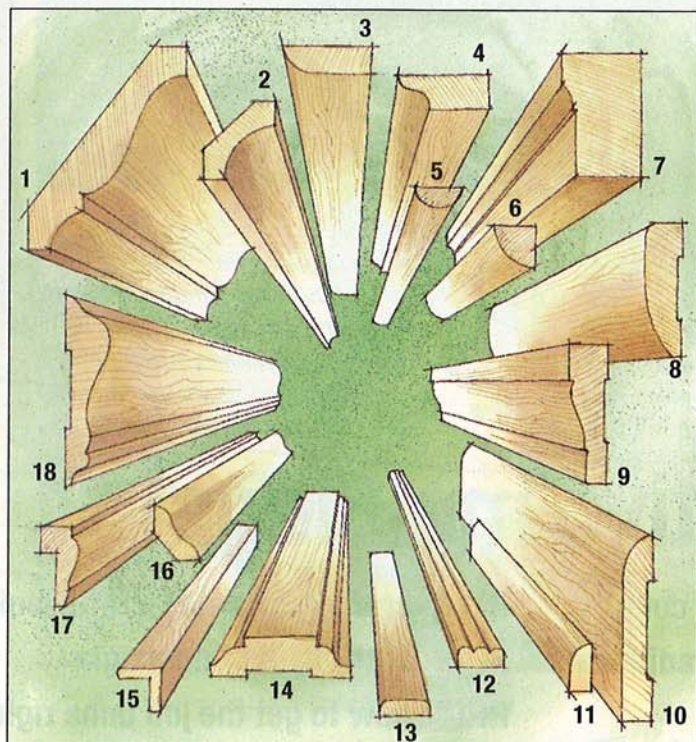
How to build architectural character

Too many homes built in the last 30 years or so have bland, semi-rounded, almost-no-style trimwork that's often called "clam shell." Our first upgrade (see page HI 6) shows how you can add distinction to this common theme by simply enhancing the existing trim.

continued

trim choices

Producers mill more than 350 standard wood moldings in the United States. Here's a sampling of the most common types.



COMMON TYPES	TYPICAL USES
1, 2 Crown, Cove	Trim and conceal the joint between walls and ceilings.
3, 4 Stop	Attaches to faces of door jambs to limit door swing. Holds inside sash of double-hung windows in place.
5 Half-round	Serves as screen bead, shelf edging, and battens.
6 Quarter-round	Serves as base shoe and inside corner guard.
7, 8, 9 Brick mold, casing	Trim around openings for interior (casing) and exterior (brick mold) windows and doors.
10, 11 Baseboard, Base shoe	Trim and protect walls along wall-floor line.
12, 13 Screen Bead	Covers seams where screen material fastens to frames. Finishes edges of shelves.
14 Batten	Conceals vertical or horizontal panel seams.
15, 16 Outside, Inside corner guard	Conceal seams and protect areas where walls or different wall finishes meet at corners.
17 Plycap	Conceals plywood edges. Caps top of wainscoting.
18 Chair rail	Protects walls from damage from chair backs. Hides seams where different wall materials meet.

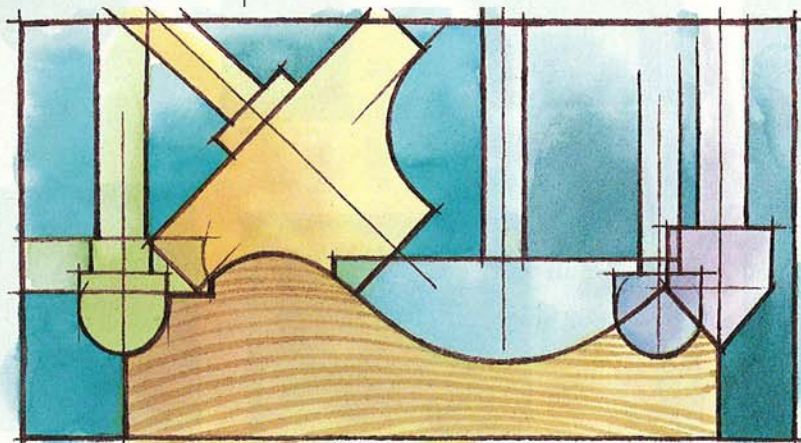


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interior trim 101



Armed with a router, router table, and a few bits, you can turn plain stock—of any species—into custom moldings for a fraction of the cost of factory-milled trim.

If you're a bit more ambitious, consider prying off your home's original trim and creating an entirely new/old look. This special section depicts the elements that make up country (page HI 7), traditional (pages HI 8-9), Arts and Crafts (pages HI 10-11), and Victorian (pages HI 12-13) styling.

Keep in mind that these five interior trim improvements are just idea-starters that can point the way to your own special style.

What are moldings made of?

More stuff than you might think. Here's a survey of the choices available at most home centers and millwork suppliers.

■ **Softwoods.** Made primarily of pine, softwood moldings are affordable and can be stained to look like just about any species.

■ **Hardwoods.** Oak, poplar, and mahogany are the most common. Again, you can experiment with stains to make them look like more exotic wood species.

■ **Prefinished.** Manufacturers of prefinished paneling and flooring make moldings that exactly match their products.

■ **Plastic and urethane.** These wood look-alikes have come a long way in recent years, and have lots to recommend themselves. They won't warp or splinter, work with standard woodworking tools, don't require sanding, and fasten with adhesive and/or nails. You can paint them, of course, or treat urethane foam moldings with non-penetrating stain for a natural look.

Milling your own trim

If you have a molder/planer at your disposal, you can save a bundle by making your own moldings—from any species, in exactly the pro-

file you want. We've also found that if you work carefully, you can get good results by making multiple passes with a router equipped with a variety of standard bits, plus a few specialized cutters. (To learn how to mill your own trim, see *Make 'Em Yourself Moldings*, in *WOOD* magazine, February 1988, pages 44-49).

How much molding will you need?

First, determine where the molding will be used, then estimate the quantity of each type you'll need. Make a list of the specific lengths, rounding each up to the next largest foot to allow for cutting and trimming.

Bear in mind that short lengths of wood trim cost less per running foot than long ones, sometimes a lot less. That's because all woods have defects, which manufacturers cut out of the wood as it comes off the molder.

What's long and what's short? Generally, lengths of 3 to 8 feet are considered shorts, excepting 7-foot casing and stop moldings, which are called long lengths. Molding manufacturers estimate that more half of a home's interior trim consists of lengths under 8 feet.

If you plan to paint, consider finger-jointed molding, which is made of short pieces joined end to end and sometimes preprimed. It costs less than regular molding, but you may need to sand the joints smooth.

Tools for trim work

You probably have most, if not all, of the equipment you'll need, but here's a list.

- Metal miter box fitted with a quality backsaw (Don't even consider trying to make accurate cuts with a cheap wood or plastic miter box.)
 - Pry bar
 - Two wallboard taping knives
 - Utility knife
 - Stud finder
 - Tape measure
 - Hammer
 - Nail set
 - Sandpaper
 - Woodworker's glue
 - Putty
- or*
- A power miter saw
 - Coping saw (Stock up on extra blades; they break easily.)
 - Clamps (To hold moldings while you cut them)

Home improvement and craft projects? Get AccuSet!



A200BN Brad Nailer for general woodworking, drives 18-gauge brads from 5/8" to 2"



A250SM Finish Nailer for finish and trim projects, drives 16-gauge finish nails from 1 1/4" to 2 1/2"



A150LS Finish Stapler for crafts, drives 18-gauge finish staples from 1/2" to 1 1/2"

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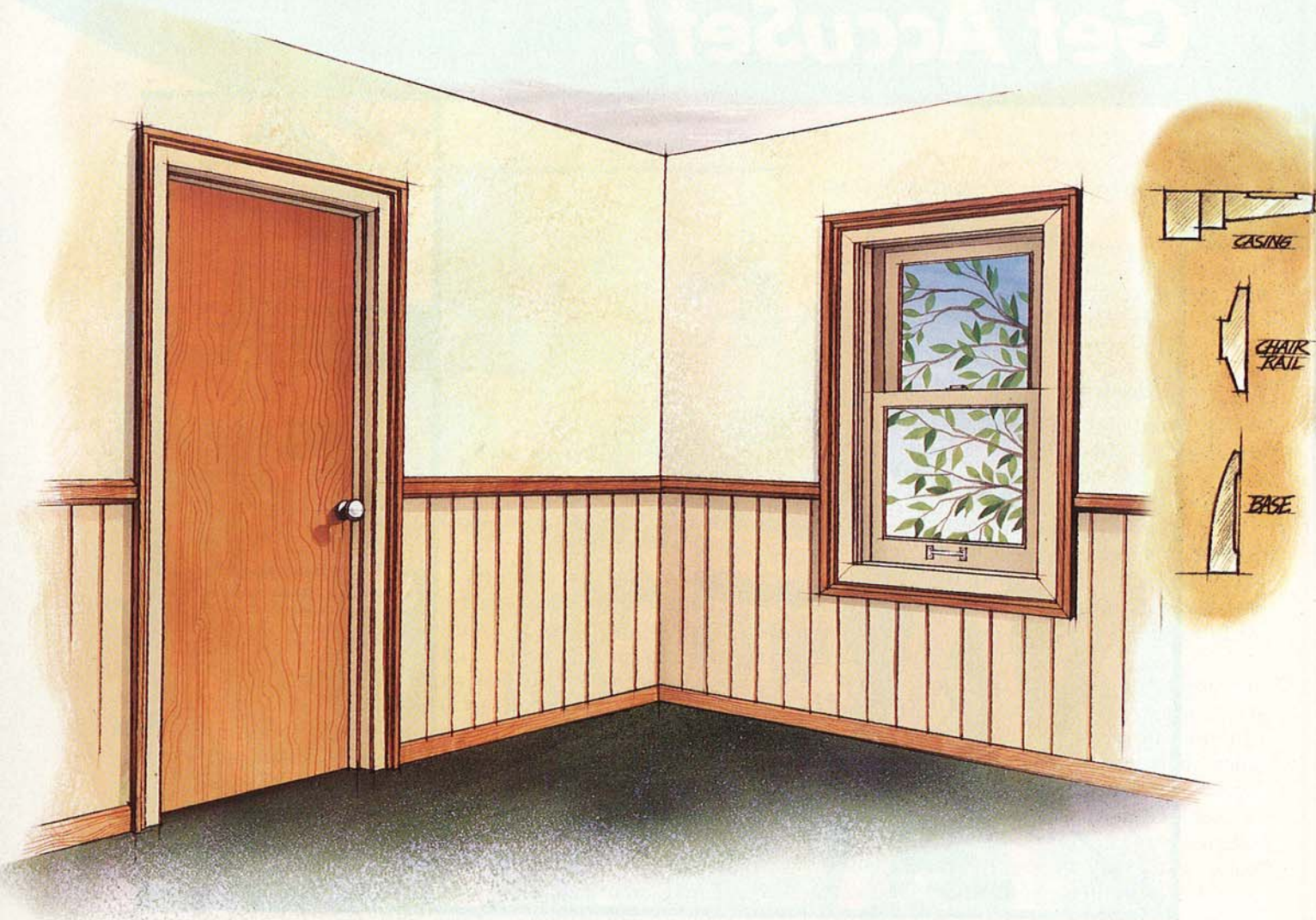
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build on what's already there

One nice thing about a trim project is that it needn't be an all-or-nothing proposition. You can remove all the trim in a room and replace it with something else, or you can just butt new trim against the old, as we did here.

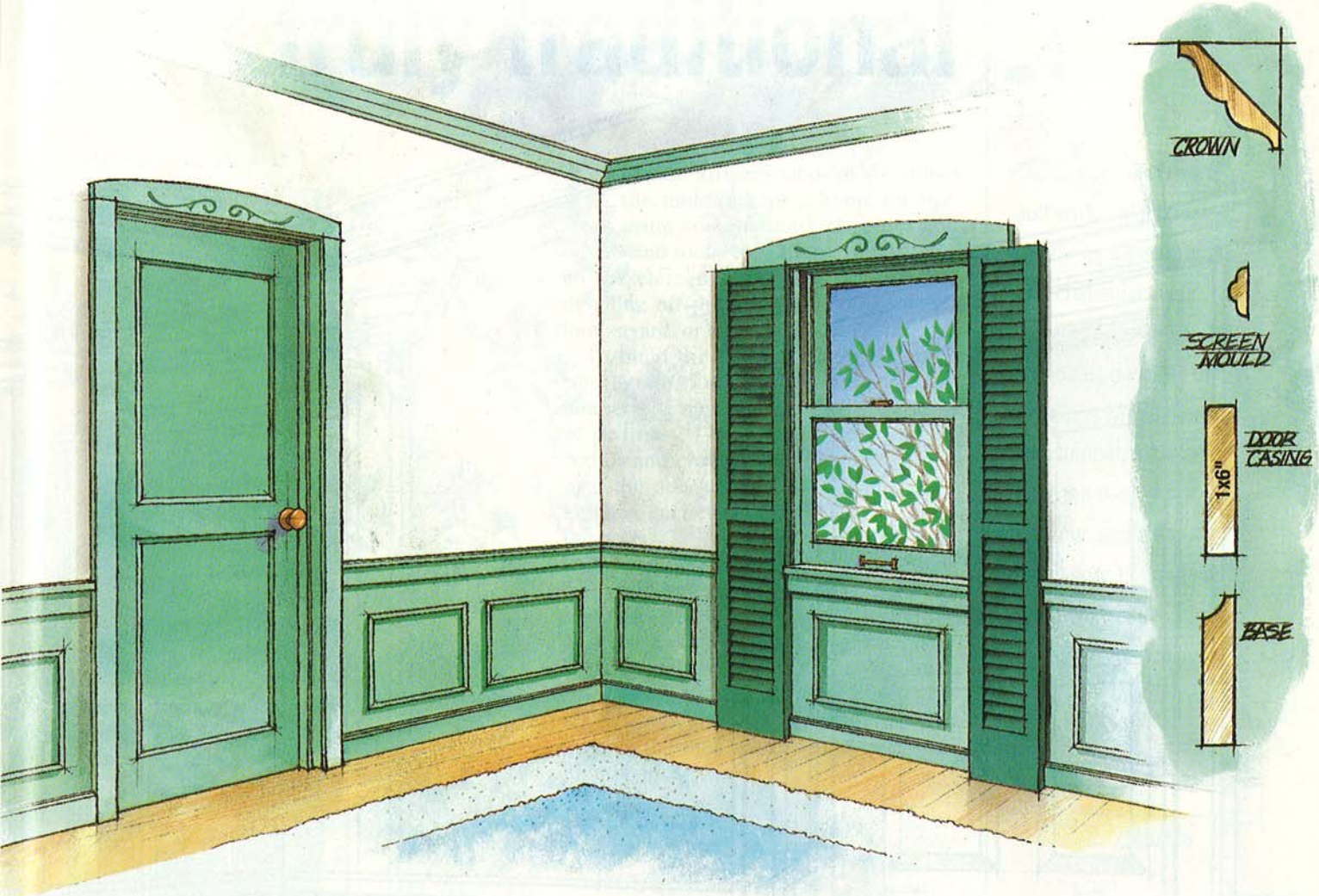
To perk up this once-dull room, we used a combination of old and new moldings, enhanced with wood wainscoting and a chair rail 3 feet above the stock baseboard.

To build out the clamshell door and window casings, we ripped dimension lumber into $\frac{1}{2} \times 1$ - and $\frac{3}{4} \times \frac{1}{2}$ -inch strips and butted them against the existing moldings. Rather than attempt to match the original moldings' light oak finish, we stained the new ones dark for a two-tone effect.

The chair rail and wainscoting continue the two-tone look. Ordinarily, this type of wainscoting consists of beadboard paneling. But beadboard is too thick for this application, so we substituted golden-oak, prefinished $\frac{1}{4}$ -inch sheet paneling glued directly to the wall. The chair rail is a classic pattern available at home centers and other millwork outlets.

Time-Saving Tip

To make a build-on restyling like this one even easier, select prefinished moldings, offered as accessories by paneling and flooring manufacturers. Nail them in place, countersink the nails, and fill the countersinks with matching wood filler (also available from manufacturers). Or, easier yet, glue the moldings in place with paneling adhesive.



simply country

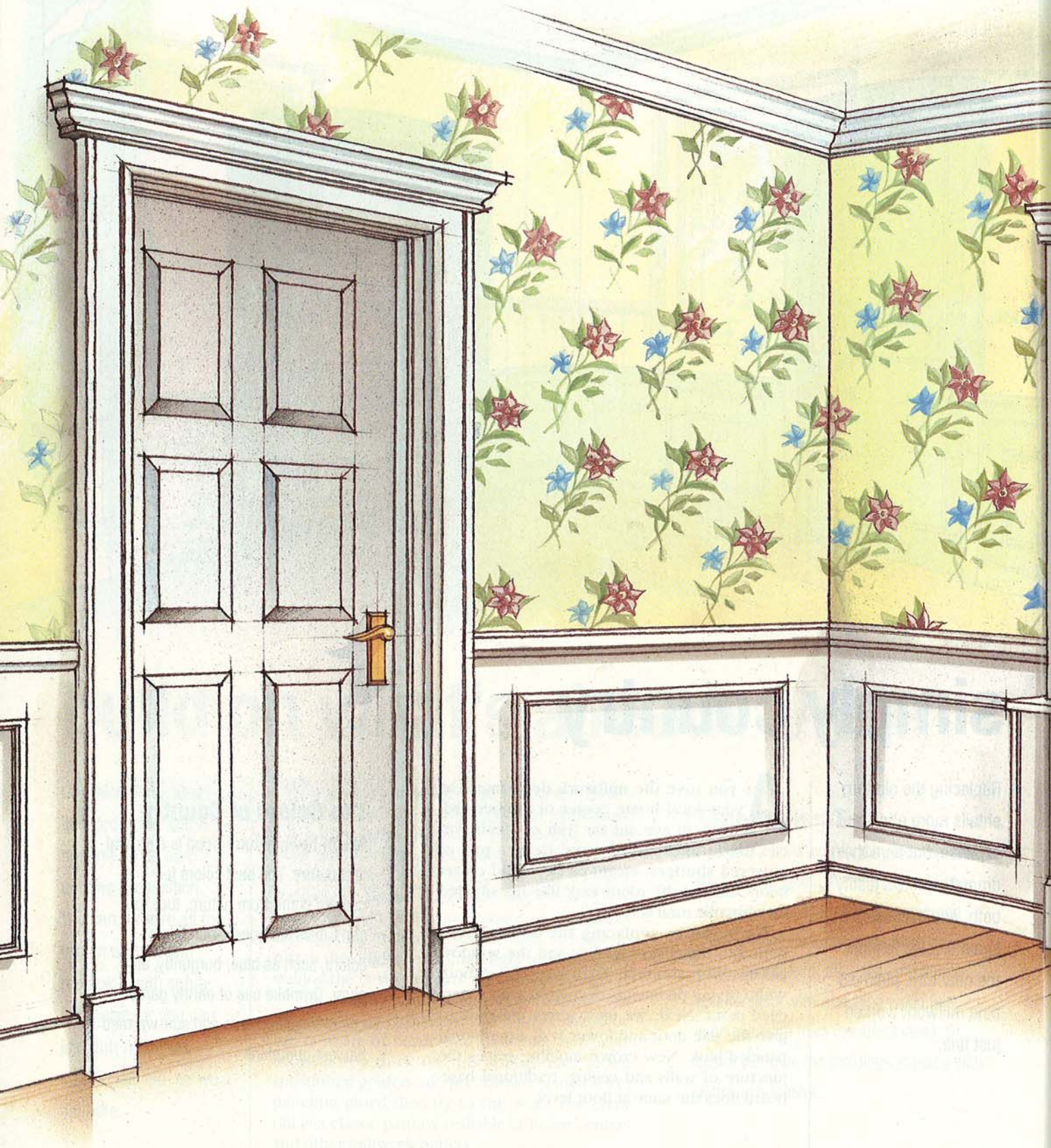
Replacing the old trim entails more effort and expense, but here the dramatic results justify both. And because we again elected to paint the new trim, plain old pine millwork worked just fine.

As you rove the millwork department at your local home center or lumberyard, keep an eye out for trim elements you can use in unexpected ways. Here, a pair of louvered shutters, meant to be bifold closet doors, helped the room look like it's situated on a bucolic rural acreage.

We began by replacing the door casings with 1x6 dimension lumber and the window casings with shutters. Then we topped both with curving pediments decorated with a stenciled motif. Next, we used screen molding to give the slab door and lower wall a traditional paneled look. New crown molding graces the juncture of walls and ceiling; traditional baseboard does the same at floor level.

The Colors of Country

Rough-hewn natural wood is a natural for country. The best colors for country come from nature, too. You can't miss with deep, rich berry colors, such as blue, burgundy, and plum. Or make use of earthy garden colors of golden corn and sun-warmed harvest pumpkins.



truly traditional



Colonial artisans laboriously milled the moldings for a home on site, using combinations of planes and other hand tools. Nowadays, you can buy all the elements you need for Colonial detailing off the rack at a home center, lumberyard, or other millwork outlet.

To build the casings, we started with plinths at floor level and installed 1×6 lumber side members adorned with strips of ordinary 1-inch lath. One-by-eight boards and crown moldings create lintels over the door and window. More crown molding encircles the room at the top of the walls.

The chair rail consists of 1×2s with base cap moldings top and bottom. Base cap moldings glued to the walls below the chair rail hark back to the wainscot paneling used in many period homes.

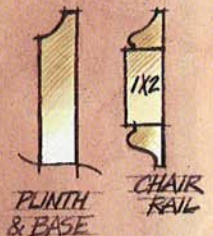
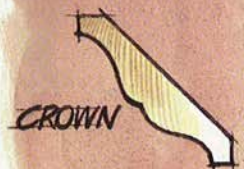
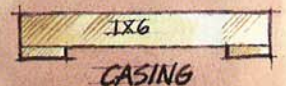
If the windows in your home aren't the traditional six-on-six style, you can achieve the look with snap-in or glue-on muntin grids.

The Spirit of '76

In the days before that famous tea party, builders trimmed their homes with maple, cherry, and other close-grained wood. If they had to mix wood species, they painted over the differences, usually with white.

For wall colors, you can't go wrong with the Williamsburg palette's muted tones. Average colonists didn't have access to the fine printed wallpapers used by the aristocracy, so walls were usually decorated with stenciled patterns similar to the paper shown here.

This trim project—an authentic Colonial motif—ups the ante and challenges your woodworking skills. It combines a variety of moldings with dimension lumber, a six-on-six pane double-hung window, and a six-panel door to create a room with 18th-century elegance.



craft an



arts-and-crafts look



A room full of mission-oak furniture cries out for Arts-and-Crafts woodwork. In fact, Arts and Crafts is often called mission style.

If you can crosscut and butt-join ordinary boards, you can achieve this intriguing trim style. It goes together with standard 1×4, 1×6, and 1×8 lumber, plus 2-inch-wide mull casing moldings.

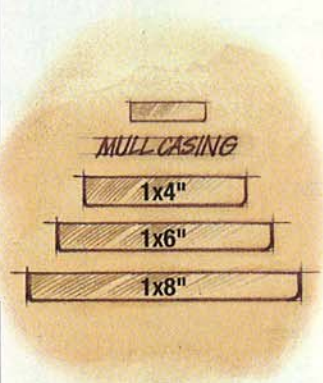
We framed the door and window with 1×6s, which also serve as banding around the top of the room. Pairs of 1×4s, flat and on edge, create a ledge that aligns with the top edge of the lower window sash. Another 1×4, with a 1×6 beneath it, serves as the windowsill. Vertical mull casings, spaced 1 foot on-center, visually support the ledge and windowsill. At floor level, 1×8 lumber serves as a baseboard.

Color is an important element in Arts-and-Crafts design. Our three-tone scheme uses a light yellow above the banding, orangish yellow between the banding and ledge, and light orange between the mull casing strips.

On a Mission

The Arts-and-Crafts Movement began in England, where it was championed by William Morris. (Yes, he's the same guy who gave us the Morris chair, shown on the first page of this section.) Morris's contemporary, Charles Eastlake, introduced Arts and Crafts to America with his book *Hints on Household Taste*. American influences on this style also borrowed from the architecture and furnishings of Spanish missions in Florida, the Southwest, and California—hence the term “mission.”

The Arts-and-Crafts Movement, popular from the late 1880s into the 1920s, promoted simple hand-craftsmanship over the machine-made millwork used extensively in Victorian-era architecture. Our interpretation is true to that tradition. In fact, it uses only one stock molding. Everything else is dimension lumber.





19th-century nostalgia



You can find most of the moldings shown here in a well-stocked millwork department, but a few may be available only on special order or through specialty catalogs. Or, you can create your own with a router and scrollsaw.

To make the vertical casing pieces, we routed grooves and coves in 1×6s and edged them with corner moldings. The scrollsaw comes in handy for cutting filets on the ends of the windowsill apron.

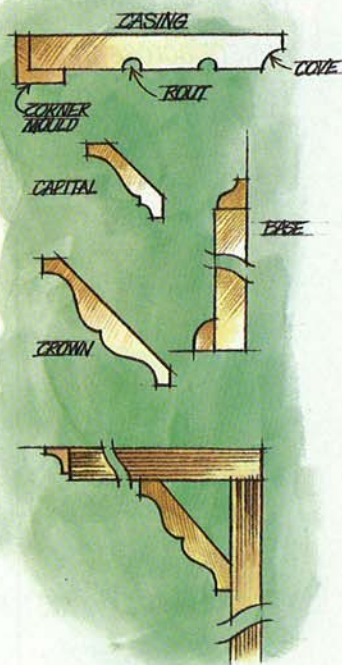
Build up the ceiling treatment with 15-inch-wide strips of plywood fastened to the ceiling and 7-inch-wide strips attached to the wall. Nail crown molding to the plywood, then finish its edges with cove moldings on the ceiling and quarter-round on the walls.

Strips of half-round molding frame the bottom edge of the border paper. We used 1×8s for the baseboard, topped with base cap molding and edged with shoe molding at the floor line.

Recycled Moldings

For a really authentic period look, especially in a vintage house that's missing some of its original trim, consider installing salvaged moldings. Salvaged trim generally costs more than new millwork because it involves more labor to remove it, pull nails, and sometimes strip off the old finish. But it can be worth the price if you want the patina of old wood. To save money, try to deal directly with a demolition firm rather than buying from an architectural salvage retailer. Retailers often charge high prices to cover overhead.

No portfolio of interior trim styles would be complete without a look at the exuberance of Victorian-era woodwork. Mass-produced moldings came into vogue during this period, and homebuilders used them with abandon, piling one on top of another, then adding to the clutter with fussy wallpaper patterns. We did likewise.



how to get the job done right

Tips for trimwork

Removing and installing moldings—a job builders call “finish carpentry”—isn’t especially difficult, but there are a few tricks to the trade. Here’s how to get your interior trim project across the finish line.

Off with the old: How to remove trim

Pry off old moldings with care, lest you damage the wall behind the millwork (and the trim itself, if you plan to reuse it). If the trim has been painted, first cut along its edges with a utility knife to break the seal between the molding and wall. The easiest way to save a base shoe without breaking it is to drive its finish nails all the way through with a nail set, as shown in *Figure 1*.

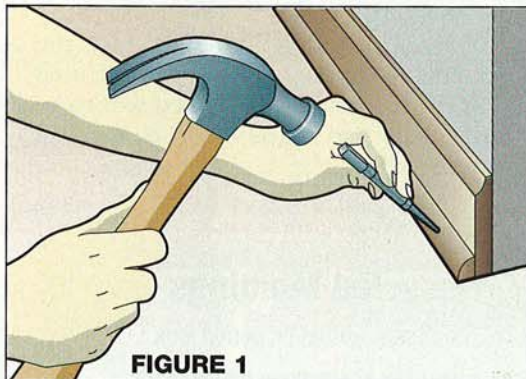


FIGURE 1

With wider elements, such as baseboards, crown moldings, and the like, first drive a pair of tapping knives behind the molding, then work a pry bar between the knives and molding, as shown in *Figure 2*. The knives ensure that the pry bar won't gouge the wall. After you've loosened a few inches, wedge the molding away from the wall with a shim, then move along, prying and wedging as you go.

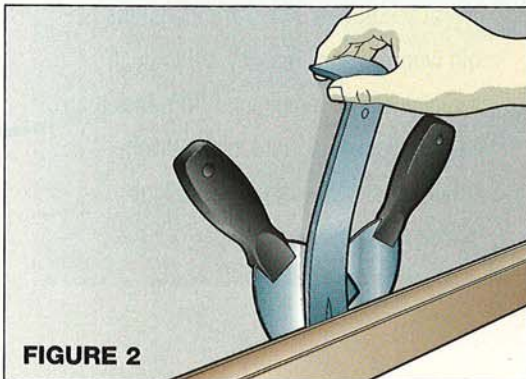


FIGURE 2

The best way to mark outside corners

Whenever possible, hold a piece of molding in place and mark it, as shown in *Figure 3*. This method provides greater accuracy than you'll get with a tape measure, and also lets you indicate the direction of the miter you need to cut.

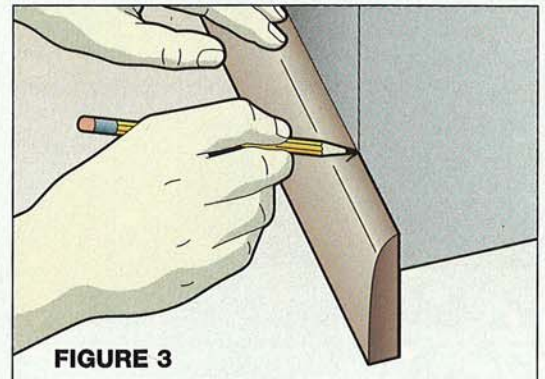


FIGURE 3

How to ensure a tight fit

Install door and window casings and other vertical trim before you fit horizontal elements, such as baseboards and chair rails. Mark and cut these pieces about $\frac{1}{16}$ inch longer than the space. If you're butting against a piece of casing, make sure it's well-secured so it won't move when you press against it. Install the horizontal piece by bowing it into position, as shown in *Figure 4*. This will give you a tight fit at each end.

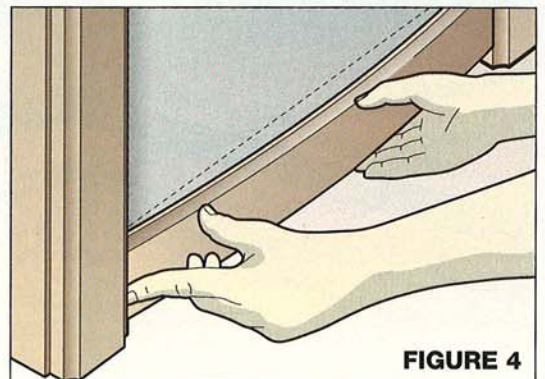
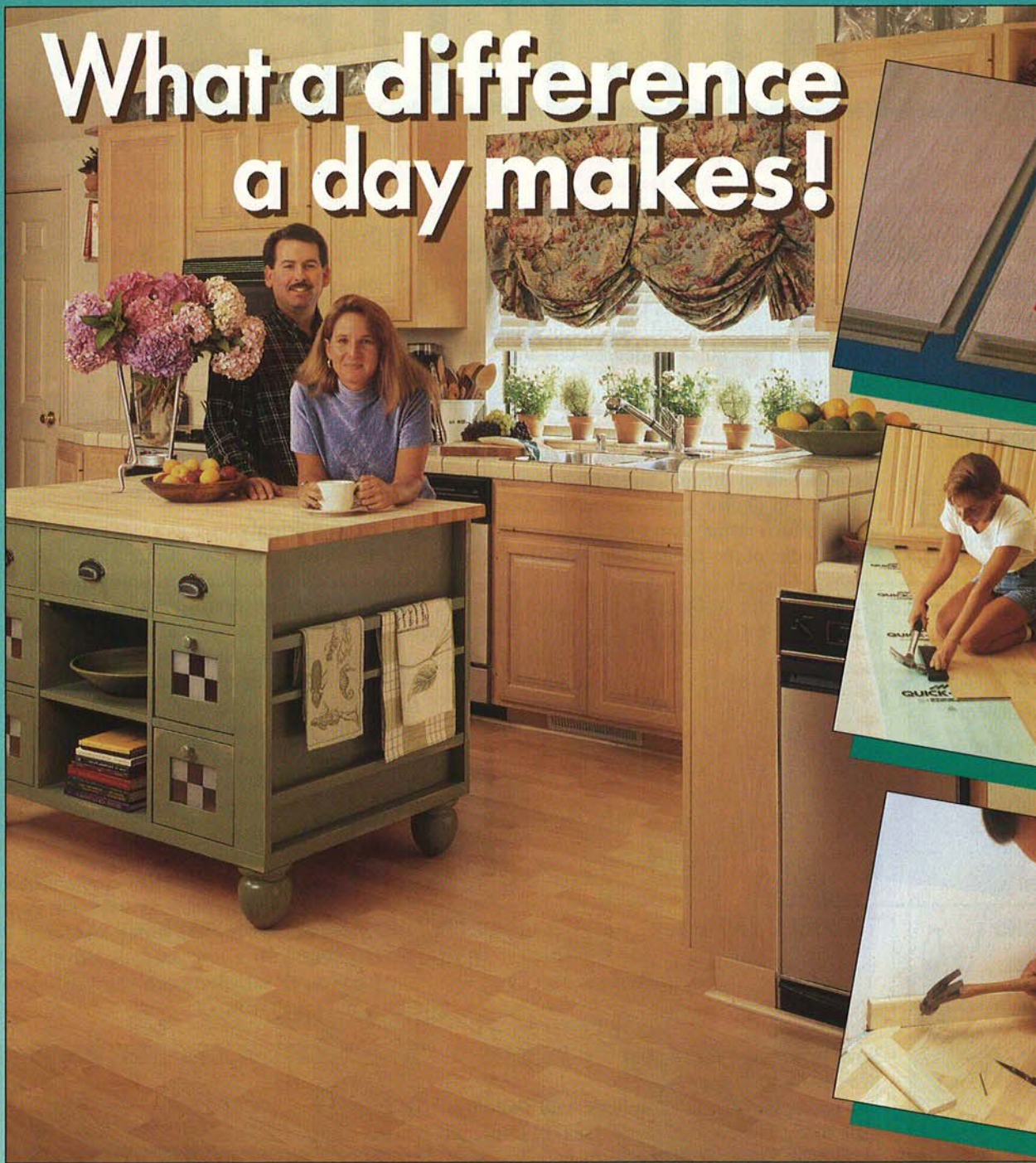


FIGURE 4

What a difference a day makes!



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how to get the job done right

When's the best time to finish moldings?

Stain beforehand, paint afterward. If your plans call for stain or clear finish, lay the moldings out on a bench and finish them before installation. After the moldings are in place, fill the countersunk nail holes with putty, and touch up any blemishes. If you will be painting, prime, install the moldings, then paint.

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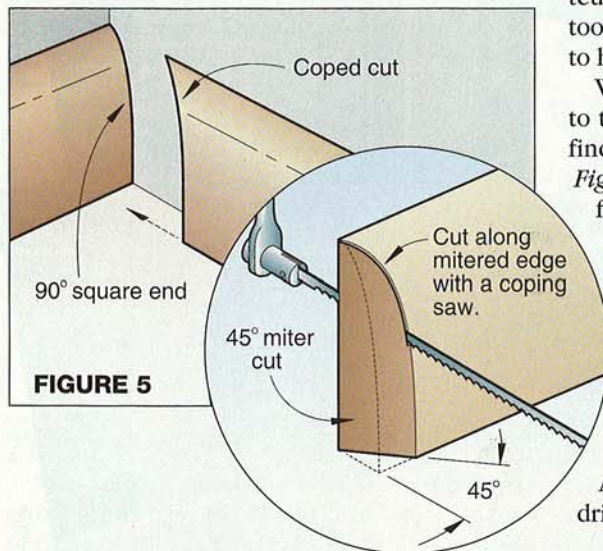
The Hardwood Council
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Style-Mark, Inc.
Wood Moulding & Millwork Association

Written by James Hufnagel
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Graphic Design: Mary Bendgen

Inside corners call for coped cuts

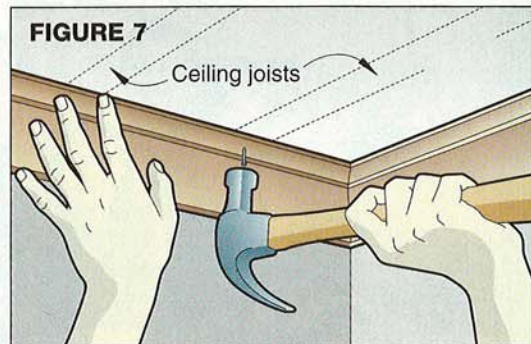
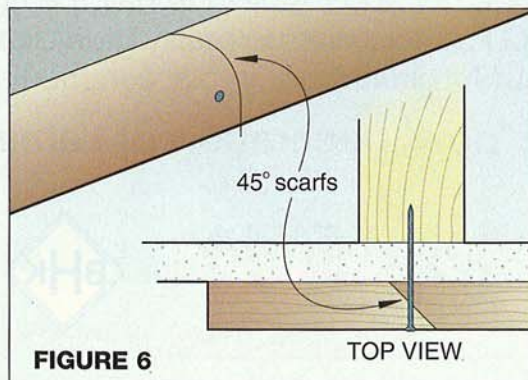
Don't bother trying to miter inside corners. This usually leads to unsightly gaps and misaligned joints because the corners are almost never true 90-degree angles. Instead, cut the first piece to length with a regular 90-degree cut and cope-cut the second piece.

To make a coped cut, first miter the end of the second piece, this lets you see the profile of the molding. Cut away the excess wood along the back side of the molding with a coping saw, as shown in *Figure 5*. Err on the side of removing too much rather than too little; only the outermost edge of the coped molding will be seen.



How to make splices that are nearly invisible

For professional-looking splices, join moldings end to end with a mitered "scarf" joint, as shown in *Figure 6*. If the joint falls at a wall stud, drive a nail through the joint into the stud. If not, glue the pieces together.

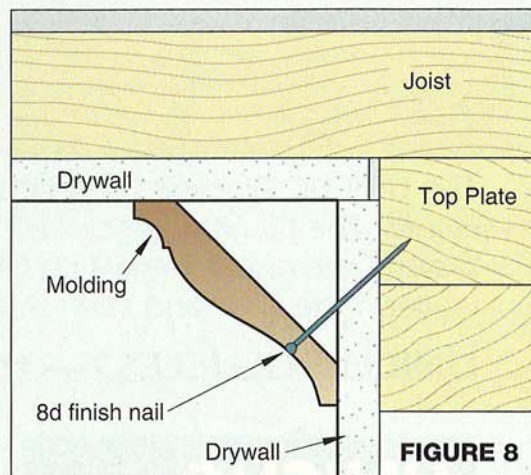


Use nails sparingly

Don't over-nail. The most common mistake amateurs make when installing moldings is to use too many nails. Drive only as many as you need to hold the piece firmly flush against the wall.

With crown moldings that run perpendicular to the ceiling joists, locate the joists with a stud finder, and drive nails into them as shown in *Figure 7*. Drill pilot holes to keep the molding from splitting. As you attach the molding, tack it in place with a few nails. Take a good look at the positioning before completing the nailing.

On the sides of a room that run parallel with the ceiling joists, nail crown molding to the wall's top plate, as shown in *Figure 8*. Again, drill pilot holes and tack the molding with a few partially driven nails. After you're satisfied with the positioning, drive and set all nails. □





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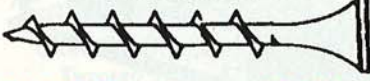
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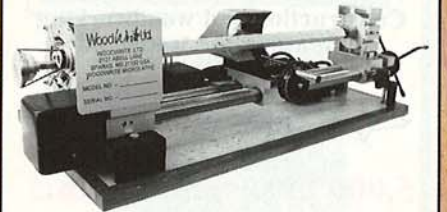
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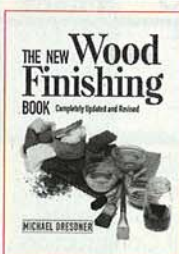
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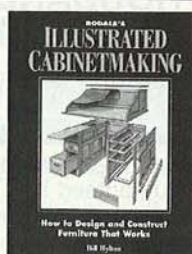
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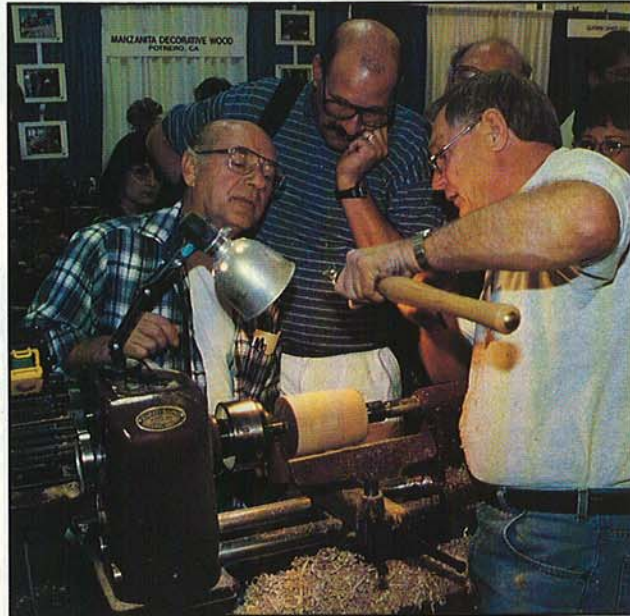
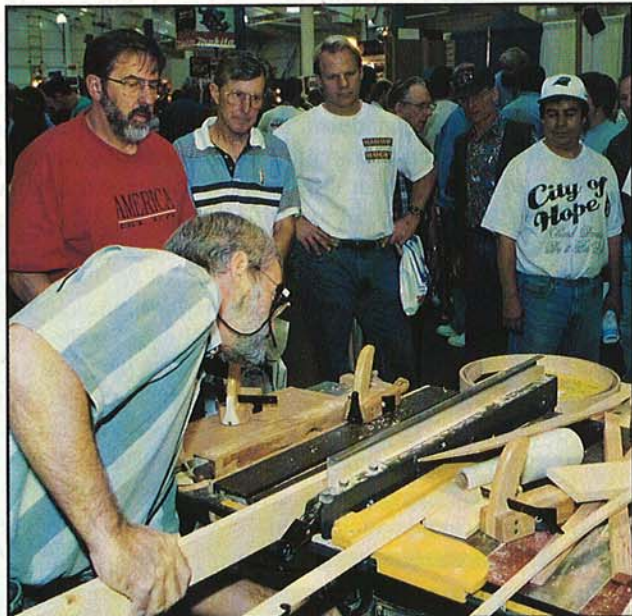


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TOOL BUYER'S UPDATE

Here's one clever Shop Fox

When we reviewed mobile bases in the December 1998 issue, we preferred those models that could change in size to adapt to different machines, had four points of support for stability, featured rigid construction for holding heavy machines with good stability, could maneuver in tight shops, and required no tools for leveling. That's quite a list of demands, and none of the mobile bases filled the whole bill—until now.

After testing two sizes of the new Shop Fox mobile bases from Woodstock International, we give them high grades in all of the above-mentioned areas. These fully adjustable bases feature heavy-gauge steel construction that holds up to extreme loads. Sixteen bolts hold the threaded stretchers to the heavy-duty corners with a rigidity that rivals welded joints.

The smaller model D2057 adjusts from 18½×20" to 29×29", and retails for about \$70. It's rated for 600 pounds, and it handled all of that with ease in our tests.

The model D2058 adjusts from 18×20¼" to 28½×33½", and retails for about \$90. It's rated for 1,200 pounds, but we found it increasingly difficult to push the base once we loaded it beyond 800 pounds.

If you have a lathe, table saw with extension table, or other machine that doesn't fit the current capacities of these bases, don't despair. The manufacturer has plans for shorter and longer stretchers to increase the capacity ranges (call for current availability and pricing). A "mini" version selling for \$65 is also in the works.

PRODUCT SCORECARD

Shop Fox mobile bases

Model D2057, \$70; Model D2058, \$90

Performance ★ ★ ★ ★ ★

Value ★ ★ ★ ★ ★

For more information, or the name of a dealer, call 800/840-8420. Or, visit www.woodstockinternational.com

All in all, we were quite pleased with these bases. It's not every day that we test a product with this combination of high performance and reasonable price. 🌱

—Tested by
Bob McFarlin



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3X18	.86 ea	4X36	1.35 ea
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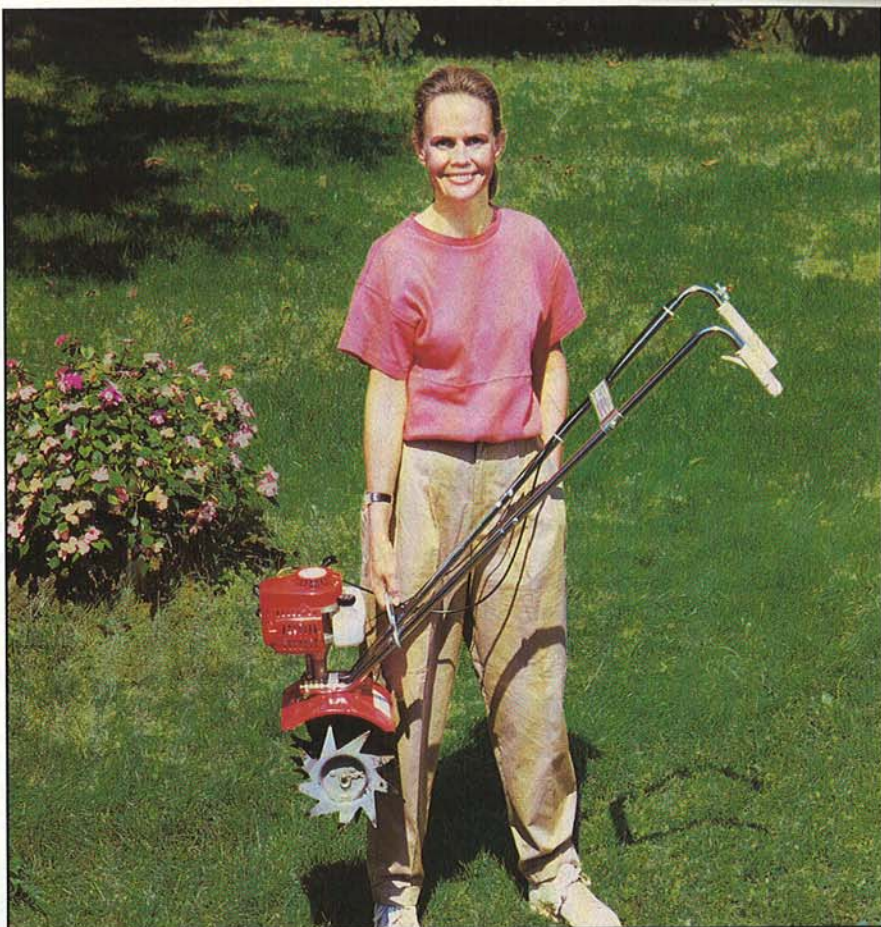
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Don't Buy a Big Tiller

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Big tillers weigh almost 300 lbs. The

Mantis tiller weighs just 20 lbs.! Simply turning a 300 lb. tiller in a backyard garden without running over crops (or yourself) is a challenge.

Costs Hundreds Less!

Most big tillers were designed to just till (but many now offer clumsy "add-on" attachments to try to justify their high cost). The Mantis Tiller/Cultivator was designed from the beginning to precisely match a small, powerful engine to a variety of useful attachments for your yard and garden. Tiller. Cultivator. Furrower. Edger. Lawn Aerator. Lawn Dethatcher. Hedge Trimmer.

Most big tillers cost an arm and a leg. Despite the fact that the Mantis is a tough, durable, precision instrument...it costs a *fraction* of what you'll pay for a big tiller.

Look at the warranty.

Most machines are *partially* covered for 90 days to a year. The Mantis Tiller/Cultivator's patented tines are guaranteed *forever against breakage*. If they ever break, return the broken one to

us for a replacement. The *tiller is guaranteed for two years, from the date of purchase, against defects in materials or workmanship.*

If we didn't make such a fine machine we couldn't make such a fine offer.

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- **Does so many jobs...**from lawn care to weeding...and more!
- **Women and senior gardeners love the Mantis Tiller/Cultivator.**
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- **Patented tines guaranteed forever against breakage.**



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Nylon work clothes send cotton duck south for the winter

Between my job in the cabinet shop, hunting, and chopping wood, I put a lot of hard miles on my work clothing. Although I was quite satisfied with the line of 100 percent cotton-duck clothing I'd been wearing, a recent experience gave me reason to try something new: After just one weekend of hard use, a brand-new pair of cotton-duck pants showed holes in several wear areas.

So, when the folks at Master Made promised that the material in their workwear lasts 10 times longer than duck, I wanted to test their claim. Like all Master Made clothes, the bib overalls I tried are made of DuPont

Cordura Plus nylon—a highly abrasion- and scuff-resistant fabric that repels water and wind. I sentenced the overalls to six months of hard labor: hunting rabbits, working on my knees installing cabinets, making firewood, you name it.

Right from the start, I liked the soft feel of the garment and how quickly I was able to break it in. The overalls were comfortable and easy to get on and off. And most importantly, they showed no holes. Occasionally when bending over, I'd stand up to find a shoulder strap dangling in the breeze, but the brass zippers and riveted stress points held up well and still look like they have many days of hard use left in them.

The Master Made line also includes pants, hooded jackets, coats, and coveralls. The full range of products is available in both insulated and non-insulated styles.

—Tested by Grant Soerens, Cedar Grove, Wis.



Continued on page 116

PRODUCT SCORECARD

Master Made work clothes

Performance	★ ★ ★ ★ ☆
Price	\$55 for non-insulated bibs
Value	★ ★ ★ ★ ☆

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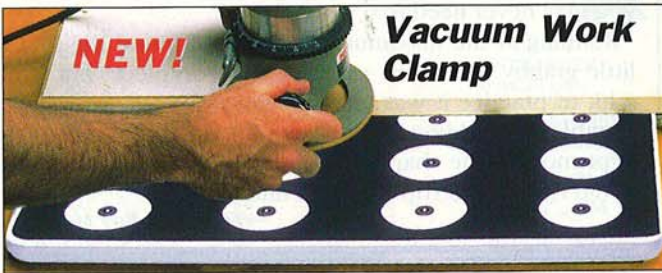
Kitchen Master Set
Includes every bit you'll need to build arched-style panel doors: a Raised Panel bit and Rail & Stile Set, a Back Cutter Bit (that enables you to fit 3/4"-thick panels) and a Super Duty Flush Trim bit for routing curved rails and panels. You'll also get Glue Joint and Drawer Lock bits and our Arched Door Pattern Set, a group of heavy paper patterns that let you make templates for routing 4 different styles of arched panel doors.

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VWC-001 Vacuum Work Clamp List: \$129.40 **SALE: \$99.90**

Doormaker's Sets



600-509 Ogee Set
600-510 Standard Set
600-511 Bevel & Radius
600-514 Cove Set

Slot Cutter Set

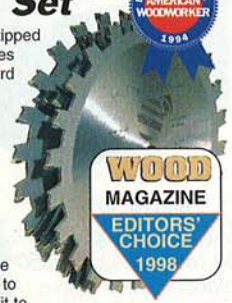
Vary the spacing and combinations of cutters to dado, rabbet, tongue-and-groove, even slot for biscuits. Our Slot Cutter Set cuts grooves from 1/8" to 1 1/16". Includes 1/8", 5/32", 3/16" & 1/4" carbide-tipped cutters, 1/2" shank arbor, bearing for 1/2" depth-of-cut & shims.



600-506 Slot Cutter Set List: \$83.40 **SALE: \$69.90**

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Our carbide tipped dado set slices dados in hard or soft wood, plywood or composites without tear-out or chipping. The 3/32" Ply-Groove Chipper lets you adjust the cutting width to give a snug fit to undersized plywood. The set also includes four 1/8" chippers and one 1/16" chipper. Set up any cut between 1/4" and 29/32". 8" diameter, 5/8" arbor.



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600-717 1/2" Shank Six-Bit Straight Bit Set
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This popular set includes 3 straight and 10 dovetail bits that cut every Leigh joint. Four bits are 1/2" shank, 9 are 1/4" shank.
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PRODUCTS THAT PERFORM



Continued from page 114

Stand back sanding drums, rotary shaper coming through

I've been a big fan of the Microplane line of rasps, but, when I first saw the Rotary Shaper, I thought, "This thing can grate a lot of parmesan on pizza night, but if it holds up in hardwood I'll eat my hat!" I'll take my hat, well done please.

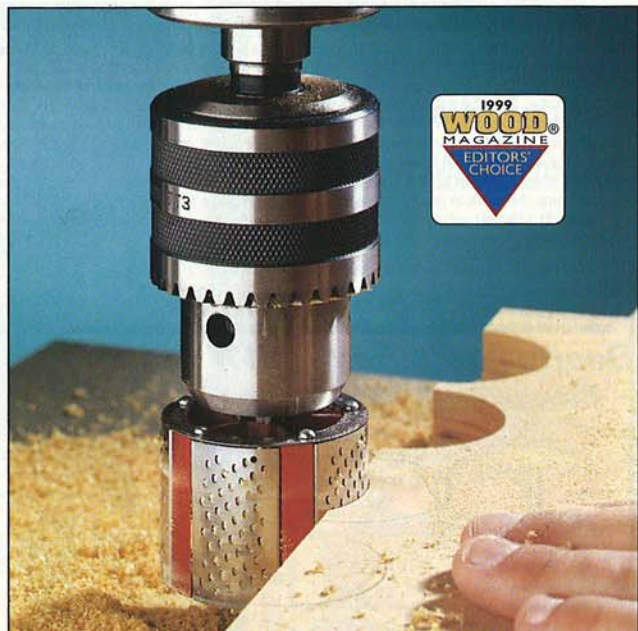
Like Microplane's handheld rasps, the Rotary Shaper uses a stainless-steel cutting screen to hog away tiny chips of wood. Only this time, the screen is mounted on an arbor that chucks into any drill for super-aggressive curve-cutting.

How aggressive? I cut the scallops shown in the photo below in about 10 seconds each. And though the finished edge isn't satin-smooth, a little hand-sanding cleaned things up quickly.

To see how durable the cutting edges are, I grated a 3x3x24" piece of red oak down to a twig, then tore through a few pine 2x4s about the same length with no apparent dulling. You can't buy replacement screens, but you may never need to.

Running at the maximum 1200 rpm, I found the tool a little grabby when first entering my workpiece, but after a bit of practice it was no problem. I also felt more comfortable after adding a subbase to my drill press table that kept most of the shaper captured in the wood—one slip could turn a fingertip it into so much cheese.

—Tested by Bob McFarlin



PRODUCT SCORECARD

Microplane Rotary Shaper

Performance ★ ★ ★ ★ ★

Price 1", \$19; 1½", \$21; 2", \$23

Value ★ ★ ★ ★ ★

For more information, call Grace Manufacturing at 800/555-2767, or visit www.microplane.com.

Continued on page 118

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12" x 30T x 1"	\$119	\$107	\$95
10" x 40T x 1/8" or 3/32"	\$119	\$107	\$95
10" x 30T x 1/8" or 3/32"	\$99	\$89	\$79
9" x 40T	\$109	\$98	\$87
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* 8 1/4" x 40T x 3/32"	\$99	\$89	\$79
8" x 40T x 3/32"	\$99	\$89	\$79
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		\$349	\$314	\$297



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Continued from page 116

Bosch's kinder, gentler mitersaw cuts finely

A 10" mitersaw is my go-to tool for angle-cutting stock, but it's a messy nuisance to haul it into the house when I need to cut molding. And, I have to admit, I get the willies when I crank up that big blade for cutting miters in small stock for picture frames and the like—especially in short pieces that put my fingers close to the blade. The answer to both problems comes in the form of Bosch's new Fine Cut Saw.

Think of it as a Japanese trim saw with a power cord, and you'll start to get an idea of what it's all about. The reciprocating blade mounts to one side of the tool, which lets it make flush cuts quickly. I used it to cut off 3/8" dowel plugs and found it sliced the plugs cleanly, but required a lot of attention to keep the blade from scarring the surface surrounding the plug, even with the variable speed dialed down to its slowest speed.



The Fine Cut Saw really shines when used with its optional miter-box base. Snappy detents positively position the saw at 0°, 15°, 22½°, 30°, and 45°, both left and right, while a threaded knob lets you lock in any angle in between. Cuts are clean and accurate with virtually no tear-out—I sliced off 1/16" slabs of poplar molding with a smooth edge every time. With the base's 1" dust-collection port connected to a shop vacuum, you could cut molding on the kitchen table if you want. The Fine Cut Saw, when mount-

PRODUCT SCORECARD

Bosch 1640VS Fine Cut Saw					
Performance	★	★	★	★	☆
Price	\$120; with base \$220.				
Value	★	★	★	★	☆

Available at home centers. For more information call toll-free 877/267-2499, or visit www.boschtools.com.

ed in its miter-box base, can cut stock up to 2 1/4" square.

The saw comes with three blades: a fine-tooth flush blade, a coarse-cut miter blade, and a fine-cut miter blade. It's also available in a package with case, base, and clamps.

—Tested by Bob McFarlin
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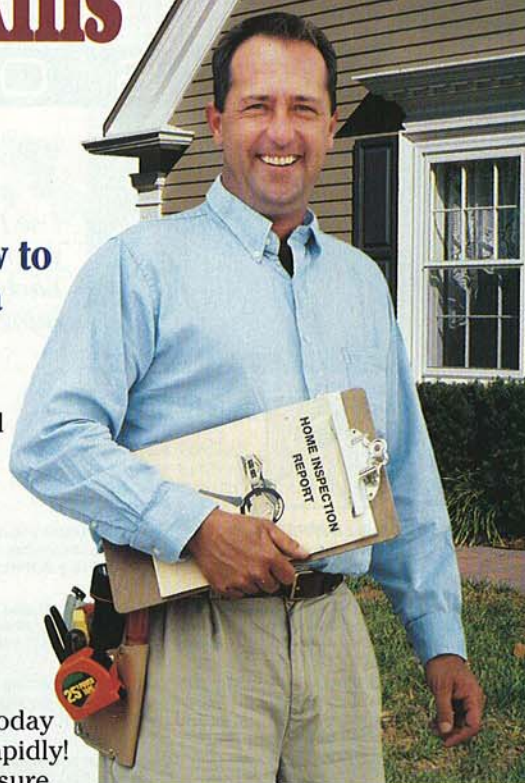


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PRODUCTS THAT PERFORM



Continued from page 118

The only way to set planer knives: "Just Plane Perfect"

While monkeying around with factory-supplied knife-setting gauges during a recent test of stationary planers, I wished I had an extra hand to hold the gauge while I set and bolted down the knives. At about the same time, I stumbled upon a nifty gauge called Just Plane Perfect, and I must say it's darned near that. To place it consistently over the knives, each jig has a locating nib that puts the stem of the dial indicator directly over the knife.

Here's how it works: Before loosening the knives, I put the machined aluminum Just Plane Perfect on the cutterhead (it stays put hands-free thanks to a pair of powerful magnets) and zeroed the dial indicator on one of the knives. I then replaced the knives, leaving them a few thousandths of an inch high, and tightened the gib bolts gently. With the jig back in position, I tapped the knife until the gauge again read "zero." By repeating the process, I quickly set it to within .0005" of parallel to the cutterhead.

For stationery planers, you'll need a Black series gauge (shown below); the Bronze and Gold versions are for portable planers. Although the Gold series uses a Starret gauge for durability and slightly better repeatability of settings, for the average hobbyist woodworker I don't feel it's worth the extra expense. ♣

—Tested by Dave Henderson



PRODUCT SCORECARD

Just Plane Perfect

Performance	★★★★★
Price	Bronze Series, \$50, Black Series, \$55, Gold Series, \$112
Value	★★★★★
Bronze & Black	★★★★☆
Gold	★★★★☆

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Ohio Buckeye The tree with a deadly reputation

The state of Ohio claims the Ohio buckeye as its official tree. And Ohio State sports teams enthusiastically call themselves "Buckeyes." But few Buckeye fans acknowledge that their tree happens to be the only one of the seven native species of the buckeye tree in the United States with an offensive, even deadly, reputation.

Buckeye refers to the resemblance of the tree's fruit—a nut—to the eye of a deer. But unlike the fruit of the yellow (sweet) buckeye, which is eaten by wild animals and livestock, Ohio buckeye nuts contain a poison that numbs all that venture to eat it.

Late spring brings forth greenish yellow flowers amidst the leaves of the shapely buckeye tree. Yet while the beholder admires the blooms, he may hold his nose because of their foul odor. In fact, this trait has led many

who live where it grows to call the tree "stinking" buckeye.

When its blooms and their odor have long gone, the Ohio buckeye in its greenery makes an attractive addition to the country landscape. But because even the tree's twigs and bark give off an offensive odor when bruised and, along with the leaves, tend to be toxic, rural landowners have at times waged war to eliminate it from their property.

Despite Ohio buckeye's drawbacks, its wood was favored by pioneers. It's light, works easily, and doesn't readily split. One use was for coffins, earning it the name "dead man's wood." On a livelier note, buckeye was also popular for dough bowls because it lacks odor or taste. And even the nut—carried in a pocket—was believed to ward off rheumatism. ♣

The wood of the Ohio buckeye was called "dead man's wood" because of its use for coffins.

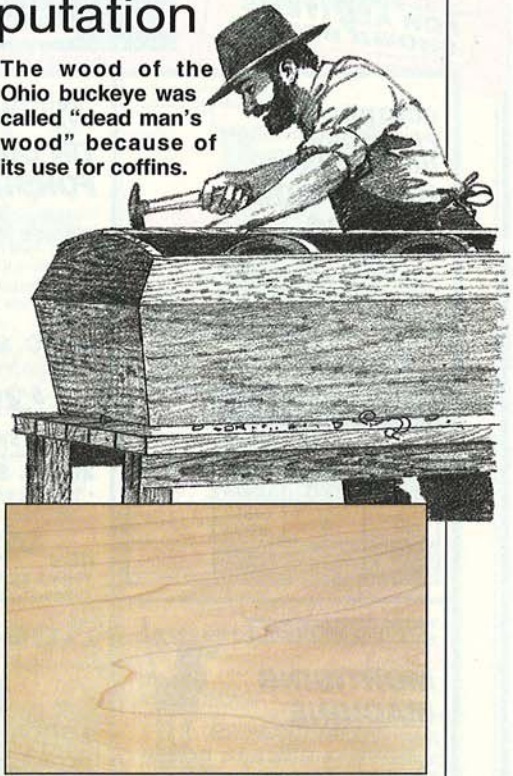


Illustration: Jim Stevenson

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For the Shaper WL-1580 was \$470. Now only \$89.

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1/2" shank WL-1430-2 only \$24.
for up to 1-1/4" material
1/2" shank WL-1430 only \$35.

NEW "V" FACE T & G router bit for up to 1-1/8" material. WL-1488 only \$33.

2 PC. SET "V" FACE T & G now in 2 sizes for the shaper
3/8" to 5/8" WL-1571 \$119. **\$99** NEW LOW PRICE
3/4" to 1" WL-1572 \$139. **\$119** NEW LOW PRICE

T & G FLOORING CUTTERS
For the Router WL-1488-1 only \$43.
For the Shaper WL-1584 only \$65.

T&G Router bit For 1/4" to 1/2" material WL-1488-2 only \$30.

Router bit CORNER LOCK MITRES in 3 sizes
WL-1420-2 (1/4" shank-up to 5/8" material) only \$25.
WL-1420-1 (1/2" shank-1/2" to 3/4" material) only \$30.
WL-1420 (for material to 3/4" to 1-1/4") only \$40.

SUPER-BUY!!

These great sets are packaged in an attractive wooden box!
Available in 1/4" and 1/2" shank

- 8-pc. Joint Making Set 2 Straight Bits, 6 Dovetails **\$52.**
- 6-pc. Roundover Set 1/8" 3/16" 1/4" 5/16" 3/8" 1/2" radius **\$55.**
- 5-pc. Cove Set-3/16", 1/4" 5/16", 3/8", 1/2" radius **\$49.**

NEW 24-pc. SUPER Set only \$129.

SUPER SALE!!

CUTTERS and BEARING SETS (to change depth of cut) Two-Flute Cutters available in 1/4" or 1/2" shank. Allen wrench incl.

Priced at only \$15. ea. Buy any 3 only \$42.

- 5/32" kerf w/ 3 bearings, cuts slot to fit all biscuit sizes. Sample bag of biscuits incl.
- Rabbeting Bit with 4 bearings for rabbets of 1/4", 7/16", 3/8" & 1/2" depth
- 1/4" kerf Slot Cutter with 4 bearings for cutting slots of 1/4", 7/16", 3/8" & 1/2" depth

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CONTROLLED PRESSURE, NON-MARRING HARDWOOD CLAMPS

These hand screws will clamp without scratching or marring your workpiece. Hardwood jaws distribute pressure evenly, and can easily be adjusted for non-parallel surfaces and odd shapes.

SAVE UP TO 50%

JAW LENGTH	JAW CAPACITY	ITEM	PRICE
6"	3"	06986-4SWA	\$199
7"	4-1/2"	06987-2SWA	\$279
8"	4-3/4"	04852-3SWA	\$399
10"	6"	04853-4SWA	\$499
12"	8-1/2"	04854-5SWA	\$599



TIN COATED FORSTNER BIT SETS

Titanium nitride runs cooler, cuts easier, and lasts longer than standard steel! Very smooth cutting - will not burn wood. Hardened and precision machined edges. Features 3/8" reinforced shanks, individually organized wooden case and bits over 1" have saw tooth design.

16 PC. SET

• 16 sizes from 1/4" to 2-1/8" by 8ths

~~\$399~~ **\$299**
 ITEM 39812-1SWA

20 PC. SET

• 20 sizes from 1/4" to 3/4" by 16ths, 7/8", 15/16", 1" to 2" by 8ths

~~\$429~~ **\$329**
 ITEM 39813-1SWA



4 SPEED ROTARY TOOL KIT

Versatile tool is ideal for shaping, sanding, deburring, grinding and polishing. Includes 30 pc. accessories packed neatly in a blow mold case.

Motor: 120V, 60 Hz, direct drive; 4 step speeds: 6,500, 10,700, 14,000 and 22,000 RPM; Collet sizes: 1/8" and 3/32" diameter

~~\$349~~ **\$299**
 ITEM 40457-1SWA

99 PC. ROTARY TOOL ACCESSORY KIT RYOBI

~~\$129~~ **\$99**
 ITEM 36197-5SWA



INCLUDES BATTERY AND CHARGER

18 VOLT CORDLESS, 5-3/8" CIRCULAR SAW KIT

Cut up to 85 ft. of plywood on a single charge. Kit includes: 1 hour quick charger, 18 volt battery, saw and hex key.

2400 RPM; 1.3 amps; 10mm arbor; 50° bevel capacity; maximum depth of cut @ 90°: 1-1/2" and @ 45°: 1-1/4"; weighs 7-1/2 lbs. Blade and rip fence sold separately

~~\$699~~ **\$699**
 ITEM 37412-7SWA

18 VOLT REPLACEMENT BATTERY

~~\$379~~ **\$379**
 ITEM 37145-4SWA

5-3/8" TUNGSTEN CARBIDE TIP BLADE

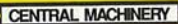
Teeth: 24, C2 carbide steel, 10mm arbor, max. RPM: 7000
\$799
 ITEM 37413-0SWA

RIP FENCE

~~\$399~~ **\$399**
 ITEM 37449-1SWA

5-3/8" TUNGSTEN CARBIDE TIP BLADE

Teeth: 24, 10mm arbor, 7,000 RPM max.
\$799
 ITEM 41290-0SWA



MORTISING MACHINE

Make a square hole in the fraction of the time it takes by hand! Easier layout for professional mortise and tenon joints in furniture, cabinets, and restoration projects. Fence will hold down clamp keeps workpieces from lifting off the table. Large capacity - up to 5" maximum height. Includes fence, workpiece clamp, and 1/4", 3/8", and 1/2" mortising chisels and bits.

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

~~\$1699~~ **\$1499**
 ITEM 35570-5SWA



Delta 36-075R

10" POWER MITER SAW

- 13 amps, 120V, 5200 RPM
- Extra wide one-piece fence for extra support
- 5-3/4" x 2-1/4" maximum crosscut capacity
- 4-1/8" x 2-1/4" maximum 45° miter capacity
- Electric blade brake • Cast iron head
- Includes dust bag and blade
- Easy-to-read scale for accurate miter settings
- Weights only 28 lbs.
- Rear support bracket for more stability
- Factory reconditioned, factory perfect

~~\$1599~~ **\$1399**
 ITEM 51841-4SWA



14.4 VOLT CORDLESS DRILL KIT

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

- Includes 6 pc. drill bit set, 6 pc. screw-driver bit set, magnetic extension bit, charger, battery, keyless Jacobs® chuck, and carrying case
- 0 to 600 RPM variable speed, reversible, 6 torque settings: 13-100 in. lbs.

~~\$699~~ **\$399**
 ITEM 34793-2SWA

~~\$299~~ **\$299**
 ITEM 34794-0SWA

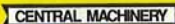


10 PC. SPRING CLAMP SET

Ideal for gluing, assembling, welding, and 1001 other uses in home or shop. Made of nickel-plated, heavy gauge steel, with heavy duty tempered springs and comfortable vinyl coated handles.

- Contains four 1" capacity clamps, four 2" capacity clamps, and two 3" capacity clamps

~~\$99~~ **\$599**
 ITEM 37451-4SWA



14" x 40" LATHE WITH 7" SANDER

Create beautifully turned pieces of furniture with this four speed lathe. Mount on your workbench. Includes 7" sanding disc, chuck plate, table, and miter gauge.

Motor: 1/2 HP, 110V, 60 Hz, 3.4 amps
 Speeds (RPM): 1125, 1640, 2360, and 3450
 Swing over bed: 14"
 Distance between center: 40"
 Bed: 2 lengths 1-3/4" steel tubing
 Tool rest: 12" x 3/4"
 Drive: V-belt
 Overall size: 57-1/2" x 8-1/2" x 14"
 Tool weight: 88 lbs.

~~\$1499~~ **\$999**
 ITEM 36066-3SWA



1/2" 5 SPEED DRILL PRESS

Get the quality and accuracy you need at a price you can afford. Powerful enough for small production shops, small enough for the home craftsman.

- 1/2" chuck capacity
- Table tilts 45° left or right
- Depth adjustment gauge

Motor: 1/3 HP, 120V, 60 Hz, 1720 RPM; Five speeds: 620, 1100, 1720, 2340, 3100; Spindle stroke: 2"; maximum swing: 9-1/2"; column diameter 1.89"; throat depth 4"
 Table size: 6-5/16" x 6-1/2"; Base dimensions: 11-1/8" x 7"; Overall dimensions: 17"W x 23"H x 7"D; Weight: 51 lbs.

~~\$899~~ **\$599**
 ITEM 38119-4SWA



Delta 17-960

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OSCILLATING SPINDLE SANDER ATTACHMENT

This spindle attachment turns almost any drill press into an oscillating spindle sander. Accepts up to 3" sanding drums. Includes table with dust outlet, 1" and 2" steel inserts, 2 drive belts, gear box, belt guard, mounting bracket and hardware.

- 40 Strokes per minute on 2" diameter drill chuck running at 2000 RPM
- 3/4" stroke
- 8-1/2" x 8-1/2" table
- 2-1/4" diameter dust outlet

~~\$1499~~ **\$3999**
 ITEM 53508-4SWA

~~\$199~~ **\$999**
 ITEM 53509-3SWA

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 ITEM 53510-3SWA

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Height: 63"; Base size: 20" x 13-3/4"; Spindle stroke: 3-1/8"; Table size: 14" diameter; Column diameter: 3-3/16"; 16-1/2" swing; No. 2 Morse taper spindle; 170 to 3800 RPM; Shipping weight: 148 lbs.

~~\$284⁹⁹~~

\$239⁹⁹

ITEM 00583-7SWA

29 PC. DRILL BIT SET

• M2 High speed steel
• Includes metal index

ITEM 00986-2SWA

\$9⁹⁹

TUNGSTEN CARBIDE TIPPED ROUTER BIT SETS

• 1/4" shanks
• Individually organized storage cases

15 PC. ASSORTED BITS

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

~~\$39⁹⁹~~ **\$27⁹⁹**

ITEM 31164-6SWA

4 PC. ROUNDING OVER BITS

• 1-5/32" long shanks • 2 flutes each
Sizes: 1/8", 1/4", 3/8" and 1/2" with pilot bearing tips

~~\$22⁹⁹~~ **\$15⁹⁹**

ITEM 33078-7SWA

CHICAGO
Electric Power Tools

3 HP PLUNGE ROUTER

Super duty unit provides the ultimate in router performance. Use to cut precision moldings, rabbets, dadoes, dovetails, recesses for inlays, and much more. 19 amp all ball bearing motor develops 23,000 RPM for unbelievably clean finishes. 2-1/2" plunge depth capacity allows easy penetration into or through work surfaces.

• Includes 1/4", 1/2", and 3/8" collets
• 115V, 19 amps, 8 foot cord
• 3 adjustable plunge settings
• Electric brake

~~\$139⁹⁹~~ **\$99⁹⁹**

ITEM 37793-2SWA

CENTRAL MACHINERY



INDUSTRIAL 16" x 8" PLANER WITH STAND

Quickly convert low-cost lumber into valuable finished stock. Knives are driven by a powerful 2 HP motor at 11 ft./min. feed rate. Electric brake. A fine unit for giving your projects a professional finish.

Motor: 2 HP, 3580 RPM, 220 volt, No load amps: 1.5, under load: 3.8; FPM: 11; Dual wheel depth adjustment: 3/16" to 7-5/8"; Max. width of stop: 16"; Max. depth of cut: 3/16"; Table: 23-3/4" x 17-1/16"

~~\$599⁹⁹~~ **\$559⁹⁹**

ITEM 39775-2SWA

3 PC. REPLACEMENT WOOD PLANER KNIVES

Heat-treated carbon steel. Size: 16".

~~\$32⁹⁹~~ **\$32⁹⁹**

ITEM 38266-0SWA

CHICAGO
Electric Power Tools

HEAVY DUTY 4" DISC GRINDER

• 115V, 5.18 amps, 10,000 RPM
• 5-5/8 lbs. shipping weight
• 5/8"-11 spindle with 7/8" arbor adapter
• Spindle lock
• Compact and powerful • 11" long
• 4-1/2 lbs. tool weight

ITEM 01711-4SWA

4" INDUSTRIAL GRINDING WHEELS

• 24 grit, 7/8" arbor hole, 3/16" thick

TYPE	ITEM	PACK OF 10
FOR METAL	35551-0SWA	\$7⁹⁹
FOR MASONRY	35552-1SWA	\$6⁹⁹

CHICAGO
Electric Power Tools

VARIABLE SPEED RECIPROCATING SAW

Gear driven, variable speed durable saw. All ball bearing for longer life.

• 300 SPM to 2400 SPM • 1-1/4" stroke
• 110V, 3.6 amps, 60 Hz, single phase
• 600 Watts • Overall length: 17"
• Tool weight: 7-1/4 lbs.

ITEM 36595-6SWA

RECIPROCATING SAW BLADES (15 PC.)

• 5 metal cutting 24 TPI, 5 wood cutting 7 TPI, 5 wood cutting 10 TPI
• Universal 1/2" shank

ITEM 40986-0SWA

\$5⁹⁹

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 metal workers. 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

~~\$59⁹⁹~~ **\$39⁹⁹**

ITEM 01611-2SWA

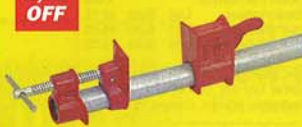
115 PC. M2 HIGH SPEED STEEL DRILL BIT SET W/INDEX

Same sizes as above; M2 high speed steel

~~\$34⁹⁹~~ **\$29⁹⁹**

ITEM 00528-1SWA

1/2 OFF



PIPE CLAMPS

Easily make any size clamp your project requires. Simply screw a 1/2" or 3/4" threaded pipe into the adjustable clamp, and slide the smaller foot clamp to the proper position where it locks tight when pressure is applied. Fast easy adjustments for all workshop needs. Pipe not included.

1/2" CLAMP

1-3/8" throat depth **\$7⁹⁹**

ITEM 03813-4SWA

3/4" CLAMP

1-5/8" throat depth **\$2⁴⁹**

ITEM 03814-5SWA

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CENTRAL MACHINERY

14" WOODWORKING BANDSAWS

Use for cutting plastics or wood; or anywhere the cutting of curves and compound curves is required. Precision cast iron tables tilt at 45° for bevel cuts and are grooved for use with a miter gauge.

1 HP, single phase, 115/230 volts, 16/8 amps; Blade to frame distance: 13-1/2"; Dimensions: 24-1/2" x 19-1/2" x 65-1/2"; Cutting capacity: 6"

SAVE \$30

SPEED	Single	Four
CUTTING SPEEDS (FPM)	3000	600, 1140, 1670, 2670
TABLE SIZE	13-3/4" x 13-1/2"	14" x 14"
SHIPPING WEIGHT	170 lbs.	191 lbs.
ITEM	32206-4SWA	32208-3SWA
PRICE	\$269⁹⁹	\$289⁹⁹

REPLACEMENT BANDSAW BLADES

• Fits bandsaws above, made of heavy duty carbon steel • Skip razer tooth design

TPI	SIZE	ITEM	PRICE
14	93-1/2" x 3/8" x .025"	03099-6SWA	\$9⁹⁹
4	93-1/2" x 1/2" x .025"	00524-6SWA	\$9⁹⁹

BI-METAL REPLACEMENT BANDSAW BLADE

ITEM 38754-0SWA **\$18⁹⁹**

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DELTA TOOLS			
Model	Description	List	Sale
31-750	NEW Bench Random Orbit Sander	199	
28-150	NEW 9" Bench Band Saw	155	
50-860	850 CFM Air Cleaner	239	
31-695	6" Belt/9" Disc Sander	441	299
23-710	Sharpening Center	217	149
31-460	4" Belt/Disc Sander	198	119
40-560	16" 2 speed Scroll Saw	230	129
40-540	16" var/spd Scroll Saw	249	159
11-990	12" Bench Drill Press	255	184
11-090	32" Radial Bench Drill Press	405	279
43-505	1/2" Bench Router/Shaper	398	299
22-540	12" Bench Top Planer	358	259
22-560	12" 1/2" Planer w/ extra knives	329	
36-865	Versa Feeder Stock Feeder	249	
36-220	10" Compound Miter Saw	294	199
37-070	6" v/spd Bench Jointer	351	265
14-650	Hollow Chisel Mortiser	380	249
17-900	16" 1/2" Floor Drill Press	490	329
17-924	Mortise Chisel Kit	358	265
36-285	8-1/4" Builders Saw w/ stand/Sale	275	
34-555	Sliding Table	487	315
36-250	10" Slide Compound Saw	825	455
31-780	Oscillating Spindle Sander	253	194
46-700	12" Wood Lathe	575	479
40-650	Q3 18" Scroll Saw	348	259
36-905	30" Unifence	344	259
36-906	50" Unifence	444	319
36-444	10" Contractors Table Saw	589	389
33-830	10" Radial Arm Saw	851	729
37-285	NEW 6" Jointer w/ stand	424	345

Single Stage Dust Collectors

50-850	1-1/2 HP, 1200 CFM	285
50-851	2 HP, 1500 CFM	489

The following tools have a \$50.00 rebate!
Price shown is before rebate.

36-445	10" Contractors Table Saw w/ 30" unifence	849
22-675	DC380 15" Planer	1175
28-275	14" Band Saw 3/4 HP	595
28-280	14" Band Saw 1 HP motor with enclosed stand	739
28-270	14" Band Saw 1 HP w/ 50-274 mobile base, 28-855 rip fence, & 28-266 cool blocks	849
31-280	Sanding Center w/ stand	789
37-190	6" Deluxe Jointer	603
37-195	6" Professional Jointer	625

MILWAUKEE TOOLS

6527-6	Sawzall with case	343	169
6537-226527	w/quick lok blade change	224	175
4070-2212V	Drill w/kyls chuck&2 batt	380	175
0224-1	3/8" Drill 4.5 amp magnum	236	136
0234-6	1/2" Drill 4.5A mag 0-850 rpm	255	134
0235-6	1/2" Drill w/keyless chuck	255	139
0244-1	1/2" Drill 4.5A mag 0-600 rpm	255	139
0222-1	3/8" Drill 3.5 amp 0-1000 rpm	213	128
0228-6	3/8" Drill 3.5 amp 0-1000 rpm	207	124
0375-6	3/8" close quarter Drill	255	148
0379-1	1/2" close quarter Drill	288	168
6546-6	ScREWDRIVER 200 & 400 RPM	150	89
6547-6	6546-6 w/bits, 1/4" chuck & c/s185	112	
5399	1/2" D-hdl Hammer Drill Kit	356	225
5397-6	3.8" v/spd Hammer Drill Kit	275	145
5371-6	1/2" v/spd Hammer Drill Kit	360	194
3107-6	1/2" v/spd right angle Drill Kit	1411	244
6142	4-1/2" Grinder w/cse & acc.	224	132
6490-6	10" Miter Saw	496	269
6491	6490 w/ carbide blade & bag	594	345
6494-6	10" Compound Miter Saw	585	319
6266-6	Top Handle Jig Saw	315	159
6496-6	10" Slide Compound Saw	1050	569

FREUD CARBIDE TIPPED SAW BLADES
5/8" Bore - Industrial Grade

Item	Description	Teeth	List	Sale
LUT72M10	Gen Pur. A.T.B. 10"	40	69	42
LUR2M10	Cut-off 10"	60	93	32
LUR4M11	Comb 10"	50	78	45
LUR8M10	Super Cut-off 10"	80	115	68
LM72M10	Ripping 10"	24	69	39
LUR3M10	Cut off 10"	60	84	49
LUR8R10	Thin Kerf 10"	24	72	48
LUR8R10	Thin Kerf 10"	60	88	49
LUR9R10	Ultimate 10"	80	128	75
LUR1M10	Compound Miter 10"	60	88	54
F410	Quiet Blade 10"	40	95	54
SD308	8" Dado - Carbide	230	119	
SD508	8" carbide w/case & shims	344	172	
FB100	16 piece Forstner Bit Set	338	194	
94-100	5 pc. Router Bit Drum System	320	169	
FT2000E	Plunge Router		185	

HITACHI TOOLS

C8FB2	8-1/2" Slide Compound Saw	1169	449
C10FS	10" Slide Compound Saw	1627	579
C15FB	15" Miter Saw	1336	645
C10CFD	NEW 10" dual bevel Compound Miter Saw	550	265
NV45AB	Coil Roofing Nailer	935	379
NT50AE	NEW Pinner 3/4" - 2"	119	

MAKITA TOOLS

Model	Description	List	Sale
5090DW	3-3/8" Saw Kit 9.6 volt	280	139
DA391D	3/8" angle Drill 9.6V	166	95
DA391DW	3/8" angle Drill Kit 9.6V	341	139

NEW 18 VOLT MAKITA TOOLS

6343DWAE	1-1/2" Drill Kit	255
6323DWAE	6-1/2" Circular Saw Kit	255
DK1016	1/2" Drill & 6-1/2" Saw combo kit	389

CORDLESS DRILLS
WITH 2.0 AMP HIGH CAPACITY BATTERIES

6213DWAE	12V 3/8" Drill Kit	325	169
6233DWAE	14.4V 3/8" Drill Kit	358	205

9900B	3"x21" Belt Sander w/bag	347	165
9924DB	3"x24" Belt Sander w/bag	360	175
N1900B	3-1/4" Planer with case	263	142
N912B	4-3/8" Planer	352	205
N9514B	4" Disc Grinder 4.6 amp	118	65
DA300R3B	Angle Drill	355	185
2708W	8-1/4" Table Saw	637	295
6405	3/8" Drill Rev. 0-2100 rpm	115	65
6013BR	1-1/2" Drill Rev. 6 amp	270	149
9401	4" x 24" Belt Sander w/bag	458	219
5007NBK1-1/4"	Circ Saw w/case	250	125
LS1011	10" Slide Compound Saw	995	429
LS1211	12" Slide Compound Saw	1620	695
3901	Plate Joiner Kit	376	159
3612C	3 HP Plunge Router	492	265
LS1040	10" Compound Miter Saw	460	259
LS1013	10" Dual Compound Slide Miter Saw	1088	599
BO5010	5" Random Orbit Sander	142	69
LS1220	12" Compound Miter Saw	379	
9227C	7/8" Polisher	350	195
L1401	16" Bench Scroll Saw	300	175
2702	8-1/4" Table Saw	348	209
2703	10" Table Saw	309	

SENCO AIR NAILERS

SNF1	Finishing Nailer 1" - 2" w/ cs448	299	
SNS45	Stapler 7/16" crown, 1" - 2"		
SLP20	Pinner w/cs 5/8 - 1-5/8"	540	365
SXS	Stapler 5/8 - 1-1/2"	390	269
SN70	Framing - Clip Hd 2 - 3-1/2"	725	449
SN65	Framing - Full Hd 2 - 3-1/2"	709	369
SN60	NEW Framing 2 - 3-1/2"	699	369
SNF40	Finish Nailer 1-1/4 - 2-1/2"	569	349

NEW Accuset Nailers by SENCO

A100LS	Finish Stapler 1/2" - 1"	180	109
A150LS	Finish Stapler 1/2" - 1-1/2"	220	139
A125BN	Brad Nailer 5/8" - 1-1/4"	160	99
A200BN	Brad Nailer 5/8" - 2"	215	139

BOSTITCH AIR NAILERS

Model	Description	List	Sale
N80S-1	Stick Nailer	358	325
RN45	Coil Roof Nailer 3/4 - 1-3/4"	345	269
N60FN-2K	Finishing Nailer w/ case	557	349
BT35-2K	Brad Tacker 5/8" - 1-3/8" with case, oil, & brads	279	125
MIIFS	Flooring Stapler 15 gauge	902	539
S32SX-1K	Finish Stapler 1/2" - 1-3/8" with case & oil	269	135

JORGENSEN ADJUSTABLE HANDSCREWS

Item#	Jaw Length	Opening Capacity	List	Sale	Box of 25
#0	8"	4-1/2"	20.35	12.50	69.95
#1	10"	6"	23.30	13.50	73.95
#2	12"	8-1/2"	26.75	15.75	88.95
#3	14"	10"	33.85	19.35	109.95

PONY CLAMP FIXTURES

Model	Description	List	Sale	Lots of 12
50	3/4" Black Pipe	15.45	8.50	94.00
52	1/2" Black Pipe	12.65	6.95	79.00

PANASONIC CORDLESS

EY6100FKW	12V 3/8" Drill kit w/ 2 Ironman batteries, 15 min. charger, & case	379	179
EY6230FKW	15.6V Drill Kit with 2 Ironman batteries, 30 minute charger & case	425	205
EY3503FKW	5-3/8" 12V Wood Cutting Circular Saw	500	259
EYCC01	EY6100FKW drill, EY3503FKW saw, 2 batteries, 15 minute charger, and case	299	

BIESEMEYER FENCES

B-50	50" Commer. Saw	443	325
T-SQUARE 52	52" Homeshop	360	275
T-SQUARE 40	40" Homeshop	335	255
T-SQUARE 28	28" Homeshop	325	245

AIRY AIR NAILERS

Model	Description	List	Sale
0241SK	Brad Nailer 3/8" - 1-1/4"	180	98
0626SK	1/4" Crown Stapler 3/8" - 1-1/4"	194	89

0241/0626
0241 Brad Nailer, 0626 Stapler, case, fasteners, oil, & wrenches
Super Sale 129.95

STABILA LEVELS

25010	10" die cast Torpedo Level	19.95
24640	24" Level w/ hand holes	62.20
24670	48" Level w/ hand holes	79.70

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DEWALT TOOLS

Model	Description	List	Sale
DW124K	1/2" right angle Drill	590	329
DW321K	Top Handle Jigsaw Kit	300	164
DW364	7-1/4" Circ. Saw w/brake	294	155
DW610	1-1/2 HP 2 handle Router	266	149
DW411K1/4	sheet Palm Sander w/ cse&h	58	
DW682K	Biscuit Joiner with case	448	169
DW705	12" Compound Miter Saw	734	359
DW621	2 HP Plunge Router	400	199
DW675K	3-1/8" Planer with case	292	164
DW431	3 x 21 v/spd Belt Sander	338	188
DW421	5" Palm Ran. Orb Sander	144	74
DW423	Palmgrip Random Orbit Sander - variable speed	170	89
DW421 & DW423	come with Free DW4317 case		
DW272	Drywall Gun, 0-4000, 6.3 amp/160 95		
DW276	Drywall Gun, 0-2500, 6.5 amp/160 95		

DEWALT CORDLESS DRILLS

DW972K-2	3-3/8" variable speed w/ two 12V XR batteries	362	184
DW991K-2	3-3/8" variable speed w/ two 14.4V XR batteries	415	209

Above drill kits come w/ charger & steel case!

DW991KS-2	DW991K drill, DW935 trim saw, 2 XR batteries & case	Sale	345
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DEWALT 18 VOLT CORDLESS TOOLS

DW933K	Jigsaw Kit	468	269
DW938K	Router Saw Kit	520	269
DW995K-2	1/2" Drill Kit w/ 2 batt.	Sale	259
DW997K	1/2" Drill/Hammer Drill Kit	454	249
DW936K	5-3/8" Saw Kit	458	249
DW995K-2	DW995K Drill, DW936 Saw and case	Sale	385
DW995K-2	DW995K 18V drill kit, DW938 18V reciprocating saw, & case	395	

DEWALT BENCH TOP TOOLS

DW708	12" Slide Miter Saw	Sale	649
DW788	20" Scroll Saw	Sale	469
DW733	12" Planer w/ w/ blades/Sale	499	
DW744	10" Portable Table Saw	Sale	499
DW756	6" Bench Grinder	164	75
DW758	8" Bench Grinder	184	115

DAVID WHITE INSTRUMENTS

Model	Description	List	Sale
LP6-20A	Sight Level package-20x...	329	239
LP6-20XLA	LP6-20A with 9056 tripod and 7620 rod	409	269
LT8-300P	Level Transjt - 26x	739	539
LT8-300P	above Level with optical plum	869	629
LT6-900	Level Transjt - 20x	419	299
LP76-900	Above level with tripod and rod	615	395
AL76-900	Automatic Level - Transit - 18x	666	479
AL76-90			

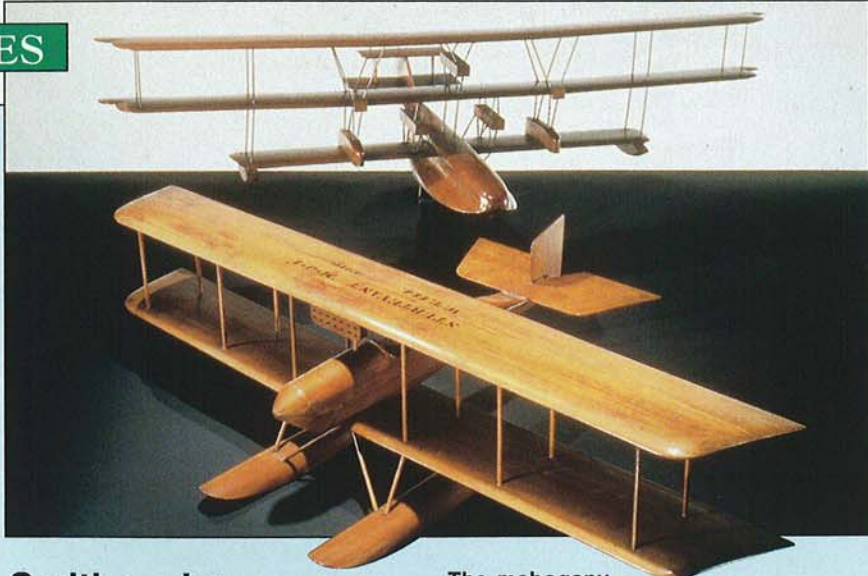
Marquetry in Minneapolis

If "shop 'til you drop" at the Mall of America in Bloomington, Minnesota, isn't for you, cross the river. From October 2-9 at the Minnesota River School of Fine Art (at the intersection of I-35W and Highway 13, Burnsville), you'll find an exhibit of marquetry unlike any ever assembled in the Midwest. This national marquetry exposition brings together the work of 30 or more artisans from around the United States.

The Marquetry Arts National Exposition is sponsored by the Lakeland Chapter of the American Marquetry Society, Inc., and admission is free. Besides the viewing of venerated art, there'll be several workshops and demonstrations during show hours. For more information, call 612/890-2454.



Wes Hanson of Minnetonka, Minnesota, created this seaside marquetry scene from wood veneer of a dozen species.



Smithsonian miniatures take wing for national tour

Beginning this October 25, model airplanes from the Smithsonian Institution's National Air and Space Museum collection of 3,000 scale aircraft will embark on a two-year, 12-city tour. Called "On Miniature Wings," the exhibit includes models in wood, metal, and plastic that represent everything from early attempts at flight to supersonic jets.

The models were created for differing reasons—to test new designs, to demonstrate aeronautical principles, to illustrate details, and to promote new aircraft. Whatever the reason for their existence, each evidences artistry and craftsmanship.

The Smithsonian Institution Traveling Exhibition Service (SITES) will collaborate with the Academy

The mahogany Sturtevant S-4 is one of the U.S. Navy's earliest wind-tunnel models. The actual float-plane trainer was built in 1919. In the background you see a 1:16 scale model U.S. Navy triplane flying boat that was tested, but never went into production.

of Model Aeronautics at each city on the tour to tie in educational programs for students in grades four through eight. There'll be workshops, films, and presentations on aeronautics and model building, as well as lesson plans for teachers that integrate aeromodeling and aviation with math and science curricula. Cities on the tour at press time include Morristown, N.J.; Saginaw, Mich.; Pittsfield, Mass.; Muncie, Ind.; Patterson, La.; Ashland, Neb., Hampton, Va., and Logan, Kan. For more information about the exhibit and a definite city schedule, call 202/357-2700, or visit their web site at www.si.edu/sites.

"Useful and Beautiful" Arts and Crafts conference

When Gustav Stickley designed his line of furniture that became known as "mission," he based it on the English Arts and Crafts style that he saw in Great Britain. In October, you can learn all about the Arts and Crafts movement and how it shaped design not only in furniture, but art and architecture as well.

"Uniting the Useful with the Beautiful: Ideas that formed the Arts and Crafts movement" is planned as a major conference in Perry, Iowa, October 28-31. The several noted guest lecturers

include Dr. Robert Judson Clark, curator of a 1972 Arts and Crafts exhibition at Princeton University that reawakened American interest in the style; Paul Atterbury, an art historian; and Peter Cormack, director of the William Morris Gallery in London. The restored Hotel Pattee, elegantly built in 1913 following the Arts and Crafts style, will be the setting. Perry is about 40 miles northwest of Des Moines, Iowa. For conference information, call 877/797-6886.



Same company, new name

For more than 20 years, the Minneapolis-based Rockler Companies, Inc. has served woodworkers with supplies and tools by mail-order and through its chain of retail outlets known as The Woodworker's Store. But to better reflect its expanded do-it-yourself hardware business, the company last fall decided to change its handle. Now, the company's catalog and stores go by the name Rockler Woodworking and Hardware. 🌲

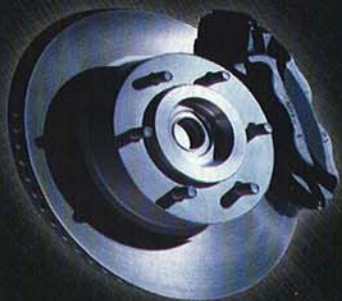




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The new full-size Tundra stops a whopping 19 feet shorter than our closest competitor.* And when you're trying to stay out of trouble, 19 feet makes a damn good cushion. To learn even more about the Tundra, call 1-800-GO-TOYOTA for your complimentary video.

Or have others not gone far enough?

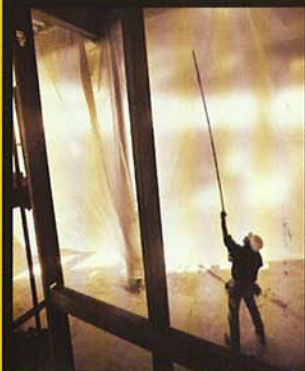
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*Based on AMCI-certified performance tests conducted using a model-year 2000 Toyota Tundra 4x4 V8 Access Cab Limited against comparably equipped 1999 5.4-liter Ford F-150, 5.3-liter Chevrolet Silverado and 5.9-liter Dodge Ram half-ton full-size 4x4 V8 pickup trucks with 1,200 lbs. of payload.

**GRANTED, BUILDING A HOUSE ALONE CAN BE TOUGH.
BUT WHAT IF YOU WERE 9 FT. TALLER?**

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With its 9 ft. standout, the 25' Stanley® MaxSteel™ tape rule does far more than measure feet and inches. The moment it springs into action you feel 9 ft. taller. Suddenly you can look up, way up, and get a dead-accurate read on the second floor even though you are down on the first floor, working alone. The MaxSteel™ 9 ft. standout is a Stanley® exclusive, a result of the 25% extra thickness we build into every blade. No wonder the world does more measuring with Stanley® than any other brand.



Corrosion-resistant three-rivet construction gives every MaxSteel™ tape rule extra durability.



- HARDWARE
- FASTENING SYSTEMS
- MECHANICS TOOLS
- HAND TOOLS
- DOORS
- AIR TOOLS
- HYDRAULIC TOOLS
- AUTOMATIC DOORS



33-402



33-625



34-790

Stanley measuring tools feature an exclusive cushion grip, heavy-duty Mylar® coating and impact-resistant casing. Lengths run from 3 ft. to 200 ft.



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OCTOBER 1999

ISSUE 117

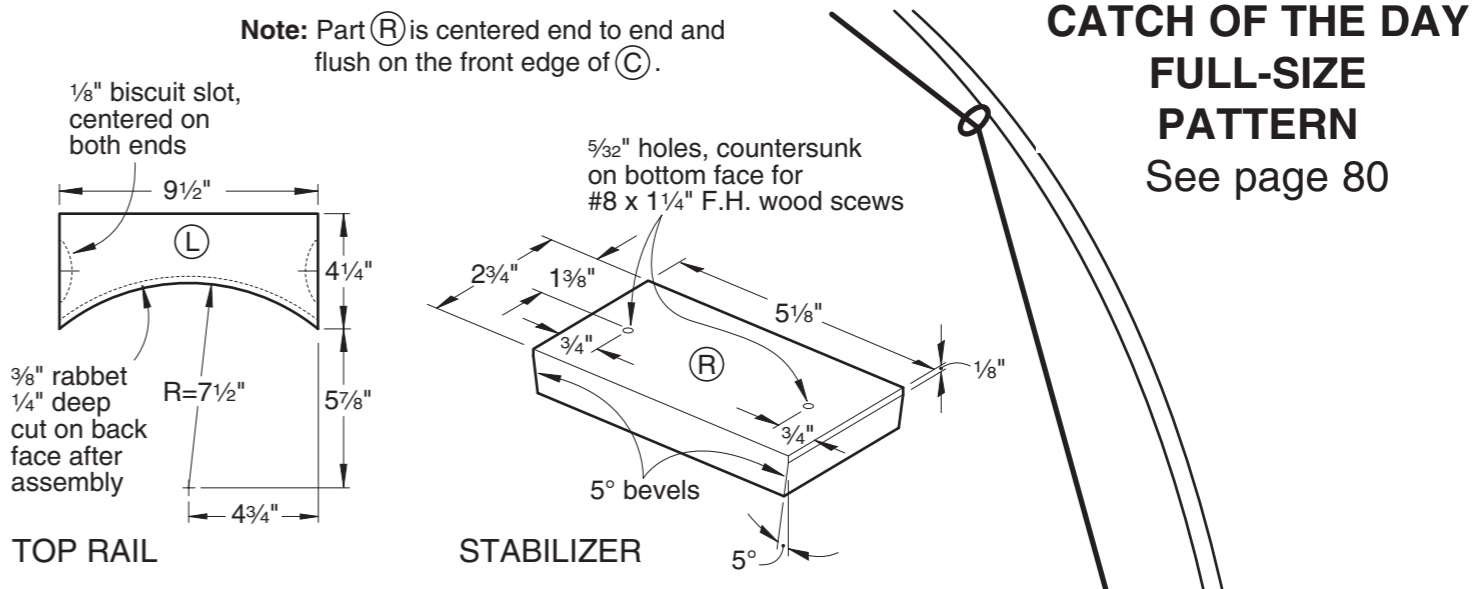
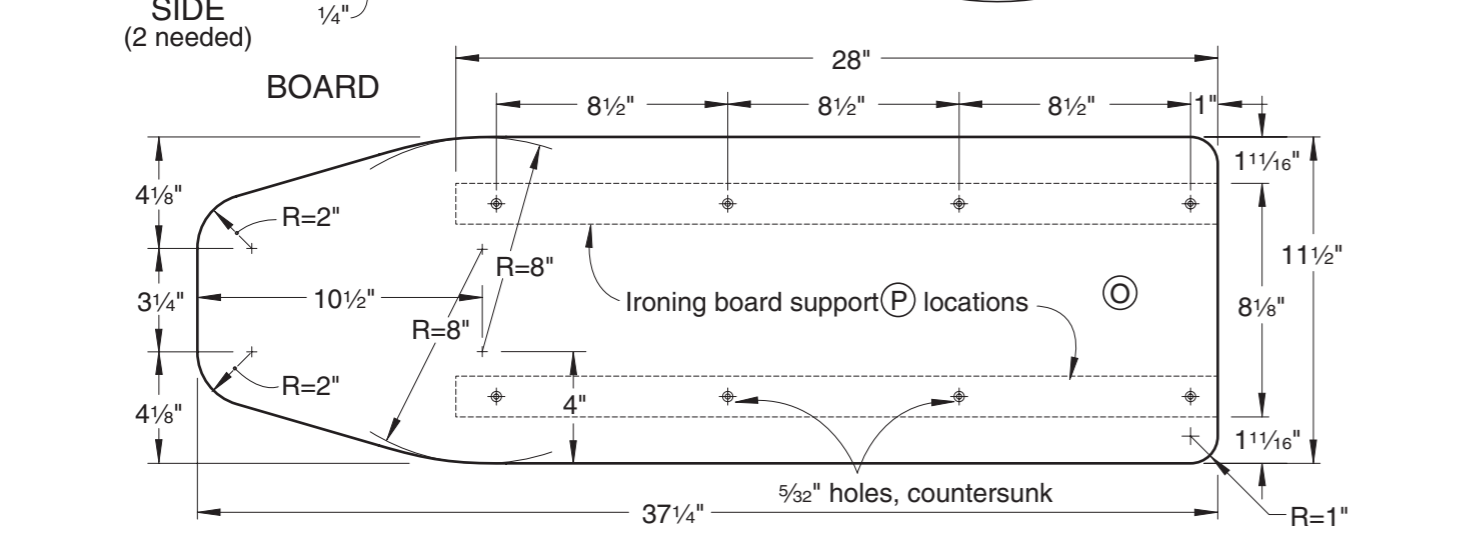
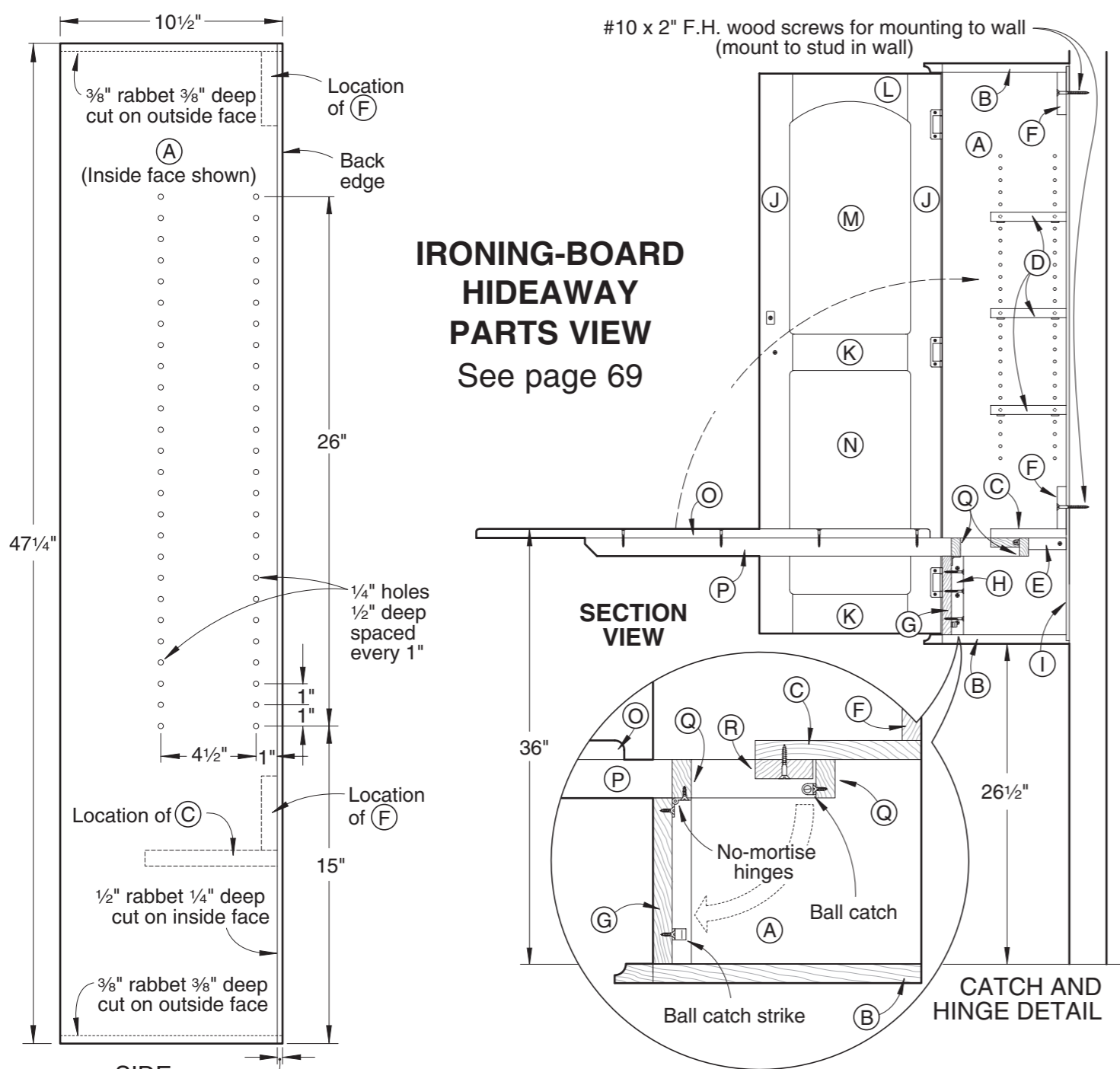
Dear Reader: As a service to you, we've included full-size patterns and drawings on this insert for irregular-shaped and intricate project parts. You can machine all other project parts using the Bill of Materials and the drawings accompanying the project you're building.

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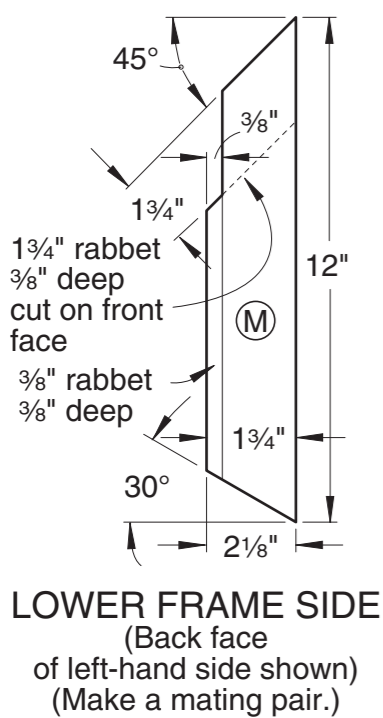
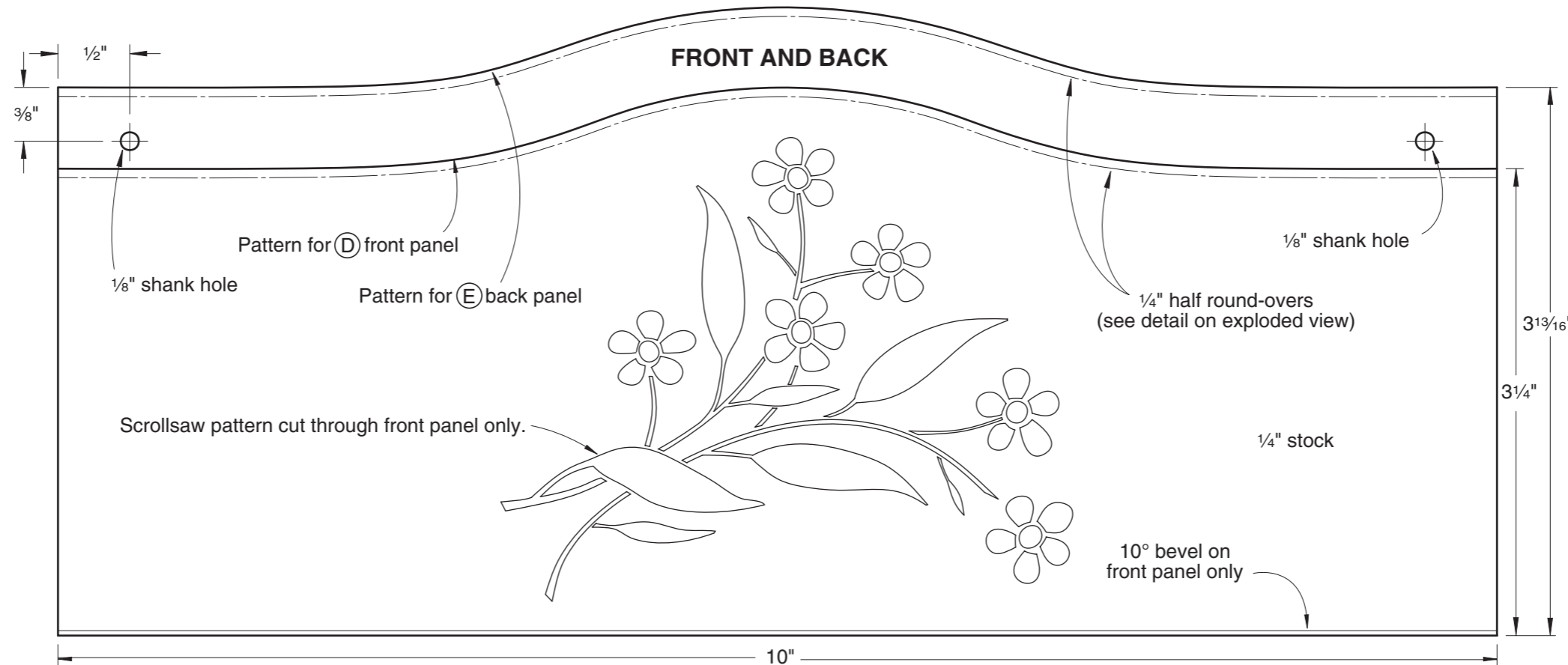
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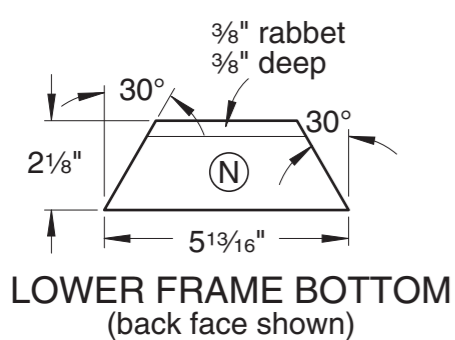
**First-Class Letter Box • Ironing-Board Hideaway
Schoolhouse Pendulum Clock • Catch of the Day**



**FIRST-CLASS
LETTER BOX
FULL-SIZE
PATTERNS**
See page 84

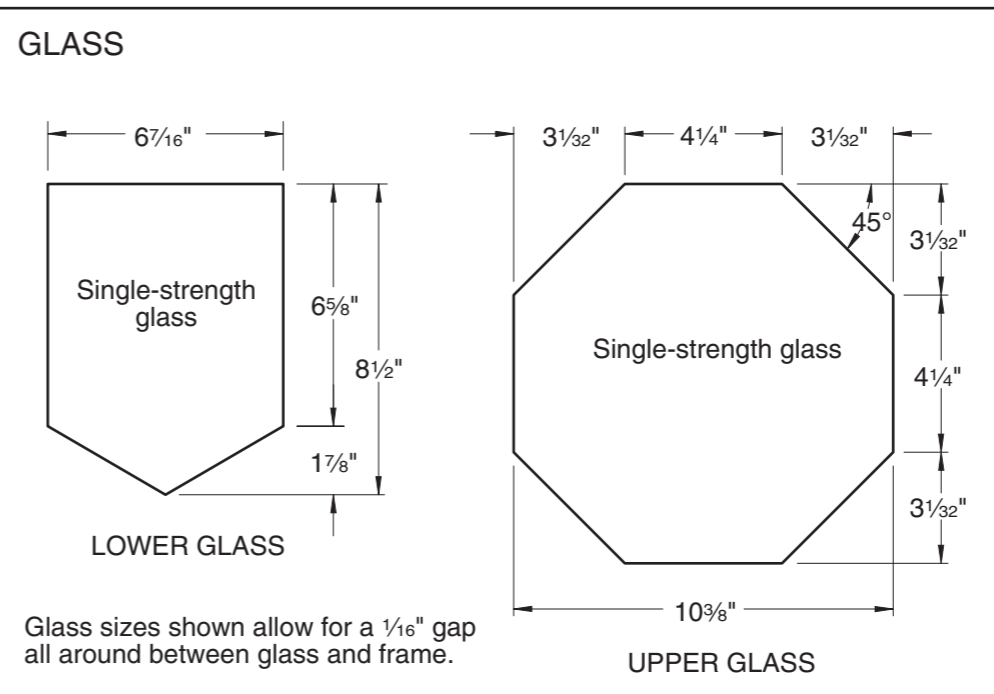
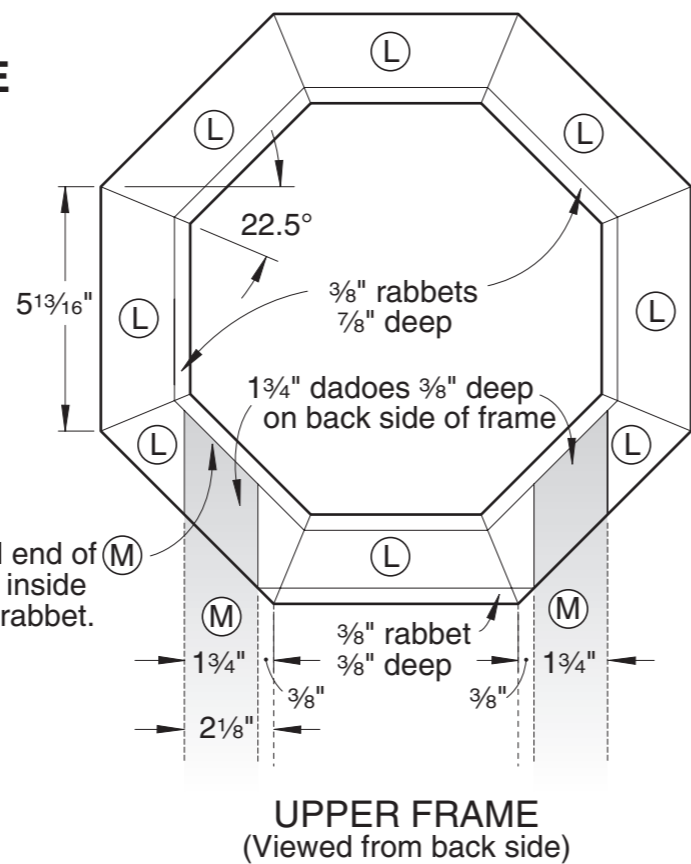


LOWER FRAME SIDE
(Back face
of left-hand side shown)
(Make a mating pair.)

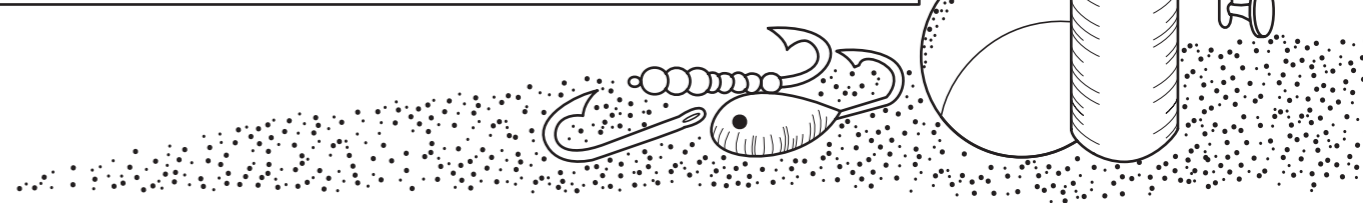


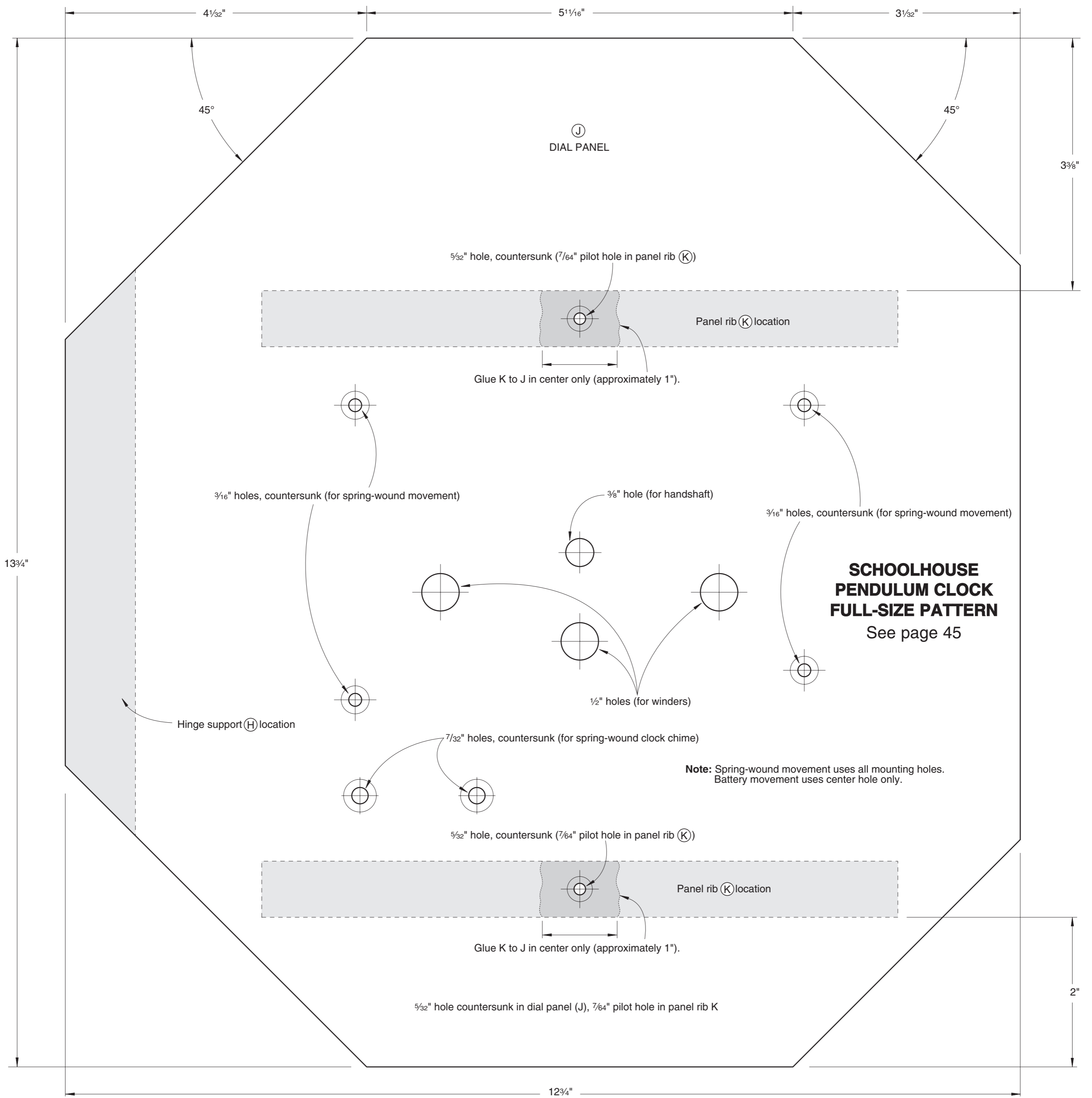
LOWER FRAME BOTTOM
(back face shown)

**SCHOOLHOUSE
PENDULUM
CLOCK
PARTS VIEW**
See page 45
See additional
patterns on
other side



Glass sizes shown allow for a 1/16 inch gap
all around between glass and frame.





**SCHOOLHOUSE
PENDULUM CLOCK
FULL-SIZE PATTERN**
See page 45

**SCHOOLHOUSE
PENDULUM CLOCK
PARTS VIEW**

See page 45
See additional
patterns on
other side

