Dedicated to QUALITY, VALUE, and SERVICE!

Call now for your FREE 1995 Catalog!
WE'RE WORKING HARD TO SERVE YOU BETTER

Have you ever wondered how we decide what articles to include in WOOD® magazine? Actually, several things enter into the equation.

First and foremost, we pay close attention to what you have to say. When you stop by our offices for a visit, when you write, and when we run into each other at woodworking shows, we're always taking mental notes.

Consumer Woodworking Panel. Five hundred of you have been selected as a representative sample of the readership.

During the coming year, the panel members will tell us, among other things, how interested they are in various projects, techniques, tools, and other articles that we plan to include in upcoming issues. If we find out that something we plan to feature doesn't strike the fancy of the panel, we'll pull it from the lineup. By doing this, we will be able to give you more of what you want.

You say you're not a panel member, but you have something to say? Don't be shy. Write to:

The Editor
WOOD Magazine
1912 Grand Avenue
Des Moines, IA 50309-3379

Tell me what's on your mind. I'd like to hear from you.

We also do in-magazine and randomly mailed questionnaires. Through these, we learn about your habits as a woodworker and about your interest level in articles found in the magazine.

And lastly, we rely on our experience as woodworkers to guide what we include. We figure, for example, that if a project, technique, or tool category interests a majority of us, chances are good that you'll benefit from it, too.

This past summer, we began what we hope will be yet another way to measure your interests—this time in upcoming articles. It's called the WOOD magazine Consumer Woodworking Panel.

Could you use a brand-new pickup?

If you're like most woodworkers I know, you could easily find 101 reasons for owning a pickup truck. Good news—here's your chance to win one! Just fill out the entry form on page 92, and you may win a Dodge Ram 1500 SLT that's loaded with products from DeWalt, Ryobi, Delta, Franklin, and American Tool. Good luck to everyone who enters.

Larry Clayton
CONTENTS

37 The Maine course
See how a custom woodworker plies his trade.

42 Jointer safety
Use these tips for accident-free tool operation.

44 Jointers under $1,000
Choose the tool, features, and price that best suit your woodworking needs.

50 10 scrapwood jigs
Add convenience and accuracy to your woodworking with the handy ideas found here.

56 Wood veneer
Travel to a mill in Iowa and see the fascinating process for slicing wood veneers from logs.

Spectacular Gift Section

60 Wise men and camels
Scrollsaw a set of easy-to-assemble Nativity figures.

62 Arts and Crafts mantle clock
Fashion a stylish tabletop timepiece from oak.

68 Purse mirror
Turn this stocking stuffer for someone special.

70 Land-loving yacht
Please a child at Christmas with this pull toy.

72 Putting-on-airs potpourri box
Build a project that makes a lot of scents.

74 Tabletop Christmas trees
Celebrate the holiday with these candleholders.

76 Scrollsaw melody CD rack
Create shelftop storage for your favorite tunes.

78 Sprite on skis
Carve a legendary snow-loving gnome.

82 Craftsman-style shelf
Accent our wall shelf with square buttons.

SHORT-SUBJECT FEATURES

1 The Editor's Angle
4 Develop Your Shop Skills
8 What Woodworkers Need To Know
14 Tips From Your Shop (And Ours)
24 Great Ideas From Our Shop

28 Talking Back
32 Products That Perform
98 Yesterday's Tools
100 Sprite On Skis (Cont'd)
104 Finishing Touches
How To Leave A Subtle Hint.

To get a great gift you have to give a subtle hint. Nothing too conspicuous, mind you. Just a small reminder strategically placed on the refrigerator. Or the car dashboard. Or the bathroom sink. A little something to remind the ones you love about the gift you'd love to get.

After all, how are they supposed to know you want QUICK-GRIP® clamps if you don’t tell them? That’s exactly why we've included these handy clip-and-post coupons for your convenience. It’s the only way to make 100-percent certain you’ll get QUICK-GRIP clamps.

QUICK-GRIP clamps are great gifts for anyone who uses tools. Whether you’re into woodworking, hobbies, models, car repair or just general maintenance around the house, QUICK-GRIP clamps are the perfect companions for anyone who needs an extra hand.

In fact, there are QUICK-GRIP clamps for almost any job. So the next time someone asks what kind of present you’d like to receive, make it easy. Leave a note and tell 'em you want QUICK-GRIP clamps. Then when you get 'em — don’t forget to act surprised!

FREE GIFTS IDEA
QUICK-GRIP®
Bar Clamps
THE ONE HANDER™

The revolutionary bar clamp that redefined the concept of clamping.

FREE GIFTS IDEA
QUICK-GRIP®
Mini Bar Clamps

With the same great features as the QUICK-GRIP® Bar Clamp, but in a smaller, handier size.

FREE GIFTS IDEA
QUICK-GRIP®
Spring Clamps

The more you use these versatile clamps, the more uses you'll find for them.

FREE GIFTS IDEA
PowerPress™
Pipe Clamps

Adjusts for any size woodworking job and fits both threaded and unthreaded pipe. Reverses to a spreader.
Like most woodworkers, you probably enjoy building projects more than hanging them on a wall. But, the hanging chores usually go hand in hand with the creation of the project. The following are some surefire pointers that will make this task go smoothly for you.

Before you do anything, take note of the weight of the object that you're about to hang. In the case of shelves and cabinets, include in your total the weight of the objects that you will place on or in them.

Of course, it's always best to drive the hanging fastener into a wall stud, but the absence of a wall stud shouldn't prevent you from hanging most objects weighing less than 50 pounds. For example, with most objects up to three pounds, you can usually pound a nail into most any area of a wall and be done with it.

For objects up to 10 pounds, a picture hanger like the one in drawing A below works well. You can use versions of these designed for objects weighing over 10 pounds, but make sure the nail goes into a wall stud.

For objects weighing up to 30 pounds, you also can choose from a wide variety of hollow-wall anchors. For walls made of gypsum panels (drywall) at least 1/2" thick, we prefer the self-tapping, threaded, metal or plastic versions like the one shown in drawing B below. You simply drive these into the wall with a Phillips bit, then drive a screw into them.

If your house has lath-and-plaster walls, you'll need to drill a hole and insert an expanding-type bolt such as the one in drawing C below. Because of the strength of the lath boards, such a fastener should support up to 50 pounds.

When driving fasteners into a stud, remember that screws provide considerably more holding power than nails. And, screws with coarse threads have more "bite" than ones with fine threads.

Note: For more information on hardware for hanging projects, see pages 9 and 10 of the April 1993 issue of WOOD magazine.

Once you've determined the weight of the hanging object, also consider the direction that it exerts pressure on the wall fasteners. As shown below, "flat" projects such as mirrors and picture frames exert straight-downward pressure on a fastener. On the other hand, cabinets and shelves exert both downward and outward pressure on a wall fastener.

Picture hangers work fine on objects that exert downward pressure only. But, projects that protrude out from a wall are another matter. Since these objects tend to pull the fastener out of the wall, you should drive the fastener into the wall stud. If
TROPHY CASE

For more rewarding work, line the walls of your shop with Porter-Cable power tools. They are every serious woodworker's most prized possession. To learn more about the number one tools in woodworking, visit your nearest Porter-Cable distributor, hardware store or home center. Or call 1-800-487-8665 (In Canada: 519-836-2840).

PORTER-CABLE
The Woodworker's Choice™

©1995 Porter-Cable Corporation
POINTERS FOR HANGING YOUR PROJECTS

rather than mark the locations of the fasteners directly onto the wall, we mark the locations on "sticky notes" adhered to the wall. These notes keep your wall mark-free, and you can remove them without fear of lifting off paint.

Here's an example of how to use these with a picture frame requiring two fasteners. First, hold the frame in its approximate location and have a helper place a sticky note behind one of the top corners of the frame. The helper can then mark the exact location of the corner onto the sticky note.

Next, measure the back of the frame for the placement of the fasteners. Note the distance between the fastener location and the top of the frame, the distance between the fastener and the edge of the frame, and the distance between the two fastener locations.

Now, use the marked corner of the frame as a reference for marking the height of one fastener onto a sticky note. Mark the height of the other fastener onto another sticky note, using a level as shown left. Then, mark the exact location of the fasteners by drawing vertical lines through the lines already marked. Finally, drive the fastener through the sticky note as shown below, and tear away the sticky note.

More project-hanging tips

• When hanging a project with screws driven into wall studs, make sure that at least half of the total length of the screw goes into the stud. So, if you're mounting cabinets with ¾"-thick backs, to a wall with ¼"-thick drywall, use a screw that's at least 2½" long.
• Use screws with pan heads or round washer heads whenever possible. The flat bearing surfaces on these provide more support to projects than fasteners with flat, oval, or bugle heads.
• If you think there might be water pipes or electrical wires in a wall, take your time and gently drive the fastener. Strong driving force may send the fastener through the pipe or wire (and any metal plate protecting them) before you know it.
• Check the thickness of a wall before driving a fastener into it. Some non-bearing walls may be 2"-or-less thick, and you might drive a fastener through to the other side.
"CALLING ALL WOODWORKERS!"

JET rebates up to $100

when you buy our most popular woodworking tools, backed by JET's impressive 2-year warranty.

See your local JET dealer today!

Aging copper for the Arts and Crafts look

Copper almost seems to be a metal made for woodworkers. Its warm, rich color complements wood rather than fighting with it for our attention. And, copper, one of the first metals used by man, works easily.

These virtues gave copper widespread popularity during the Arts and Crafts movement early in this century. Arts and Crafts homes and furnishings, which stressed the beauty of natural materials and handwork, often combined copper and wood.

So, when we researched the clock project on page 62, we decided that the shiny, new copper on the face needed an aged look, as shown right. After some experimenting, we came up with a simple way to give copper that been-around-awhile look for projects in the Arts and Crafts style.

Working with copper

Many crafts-supply stores sell copper sheets for crafting, or you can buy it from a metals dealer. Copper comes in scores of alloys, though, so tell the dealer you want a soft, malleable one that you can work by hand.

Mark your cutting lines on copper with a scratch awl or other scriber. Pencil marks don’t show up well on metal, and markers usually make lines too wide for accurate work.

Use a straightedge with nonskid backing. (If you don’t have one, put a strip of double-faced tape on the back of a ruler. Press it against your shirt sleeve a couple of times to reduce the tape’s tack before starting the layout.) Scribe curved lines against a French curve or template, similarly skidproofed. For complex layouts, adhere the pattern directly to the metal with spray adhesive.

Copper cuts easily. Common tin snips will readily handle straight cuts and gentle curves in sheet copper about \( \frac{1}{8} \)" thick or less. As you cut, don’t close the snips all the way. Doing so crimps the metal’s edge every time the jaw tips come together. Instead, keep the snips moving forward so the cutting takes place mostly at the back of the jaws.

You also can cut this soft, nonferrous metal with a scrollsaw, bandsaw, or portable jigsaw (sabersaw). Back the metal with scrapwood at least \( \frac{3}{8} \)" thick for power sawing.

A no. 5 blade (.038×.015" with 16 teeth per inch) works fine for a few quick scrollsaw cuts. For serious copper sawing, go with a metal-piercing blade (24–48 teeth per inch), and lubricate it with beeswax. If you have a variable-speed saw, run it at a slow speed for metal cutting.

For the bandsaw or jigsaw, select a general-purpose or metal-cutting blade with 14 or more teeth per inch. If you’re using the jigsaw, clamp the workpiece securely to the workbench, the cutting line overhanging the edge. Cover the saw’s baseplate with masking tape to prevent scratching the copper.

Smooth and true cut edges by filing. For best results, clamp the metal between two pieces of scrapwood in a vise. Stand the metal’s edge about \( \frac{1}{4} \)" above the wood as shown above right, and draw a mill-cut bastard file along the edge.

Lay out and drill any required holes before finishing the metal. This way, you won’t risk marring the finished surface.

Continued on page 10
Limited Time Offer

For a limited time only, Freud is offering incredible rebates on their best selling power tools. $30 in Biscuit Joiners, or get a Free Edge Guide (list $29.90) and a $20 rebate on our professional router! This offer is valid through Freud participating dealers.

Freud machines are built though, for professional use. These are their features:

FT2000E Plunge Router
- 3 1/2 HP heavy duty motor.
- Constant RPM electronics.
- Soft start.
- Shaft lock.
- Plunge depth max 2 3/4".
- Variable speed control 8,000 to 22,000 RPM.
- 1 1/2" shank collet with 1/4" shank adaptor.
- Micro adjustment for depth.
- New plunge depth scale.
- 3 position depth turret (for multiple passes.)
- Depth lock lever.
- Limited time only: Edge Guide with Micro Adjustment.

$20 Rebate plus a Free Edge Guide!

JS100 Biscuit Joiner
- 5 Amp heavy duty motor.
- 6-wing carbide blade with safety shoulder design.
- Dust collection with bag, vacuum ready.
- Reinforced aluminum fence with 2 positions: 45° or 90°.
- New depth adjustment for 00, 10, 20, A, B size biscuits.
- Machined aluminum base.
- Non-marring rubber positioning pins.
- Fence scale with inches and metric.

JS102 Biscuit Joiner
Same as JS100 except:
- Aluminum adjustable fence for operation 0° to 90°.

Freud
Precisely What You Need.

For the name of your participating dealer or full details on the rebate call 800-472-7307.

Circle No. 1321
Aging copper for the Arts and Crafts look
Continued from page 8

Giving copper the old look
Over the years craftsmen have used various treatments to give new copper an old look. One old method, still employed by some artisans today, involves bathing the copper in a solution made by dissolving chunks of liver of sulfur (potassium sulfide) in water. But this process poses a hazard.

"Potassium sulfide hydrolyzes in water, releasing hydrogen sulfide (H2S), a gas as toxic as the hydrogen cyanide used in a gas chamber," warns Dr. Jim Lindberg, professor of chemistry at Drake University. "Without adequate ventilation, it will kill you," the chemist says.

The thought that aging copper this way might suddenly stop our own aging led us to try some other methods. In tests, we achieved best results with another chemical—rapid fixer, a common photographic material. Camera shops usually sell rapid fixer, or you can check the Yellow Pages for photographic-supply retailers. (We bought a 16-ounce bottle of Ilford Universal Rapid Fixer. Kodak and others market a similar product.)

Cleaning the copper is the first order of business. To remove oils and dirt, scrub both sides with kitchen cleanser. Rinse well.

Then, sand the exposed face to a satin sheen, using a fine (red) Scotchbrite pad followed by an ultrafine (gray) one. Don't make fingerprints on the copper—wear gloves or hold the piece with clean rags. (We wore latex medical gloves throughout the operation and handled the copper by the edges.) Wash off the sanding residue (we swabbed it off with denatured alcohol).

Dilute the rapid fixer 1:2 with water. To do this, pour a measure of fixer into a clean two-liter pop bottle (or similar suitable container), then add twice that amount of water. Stir or shake to mix.

Pour about 1" of dilute fixer into a suitable glass or plastic tray. (We bought a plastic photo-developing tray for $3.95 at the camera store where we bought the rapid fixer.) Slip the copper face-up into the chemical. Rock the tray gently to keep the solution moving across the copper's surface, as shown below.

Gently rock the tray from side to side and end to end while aging copper in photographic rapid fixer.

After a few minutes, the surface will begin to darken. Continue agitating until the copper takes on roughly the color of cinnamon. (Reaching this final shade can take 10 minutes or so.) Don't let the color get too dark—that hides the copper look.

Rinse both sides under running water, then stand the piece on edge to air dry. You can help it along with a hair dryer or heat gun, but don't rub the surface. After the copper dries, check the color. If you've hit one you like, spray on clear gloss lacquer or acrylic coating.

You can reimmerse the metal to darken it. To lighten it, though, you'll have to sand to bright metal and start over again.

Written by Larry Johnston
Photographs: John Hetherington

---

The Best Handmade Presents Start With CRAFTSMAN.

Craftsman 10" Benchtop Table Saw $179.99 Value!
- Motor develops maximum 2-1/2 HP.
- Self-aligning rip fence.
- Built-in sawdust collection port.

$159.99

Craftsman 16 Gallon Wet/Dry Vac Cleans Up Fast!
- Powerful 5.0 horsepower
- Three nozzles included.

$99.99

Craftsman Oscillating Spindle Sander, Perfect For Curves!
- Spindle turns 1,725 r.p.m. while moving up and down.
- Perfect companion tool for a scroll saw. Sands a variety of curves.

$149.99

CRAFTSMAN
Only at Sears and Sears Hardware Stores.
Prices may vary in Alaska, Hawaii, and Puerto Rico

© 1995 Sears Roebuck and Company
Rip Fence Technology at its Best
Craftsman's New EXACT-I-RIP Fence and 10" Table Saw

Think all table saws are pretty much alike?
Then you haven't checked out the Craftsman 10" Table Saw and Exact-I-Rip Fence Combo. Stock No. 29911. Together they cut the toughest jobs down to size— with an incredible new rip fence technology that gives you silky-smooth position changes, accurate cuts and a huge appetite for those large work pieces. In fact, the Exact-I-Rip fence is so terrific, we're offering it separately as a retro-fit option for other belt drive Craftsman table saws. Ask for accessory fence 29901.

CRAFTSMAN®
Only At Sears
SO POWERFUL TO PUT A L

(LIMITED TIME OFFER 00)

DEWALT is proud to introduce one powerful combination. For a limited time, we’re combining two cordless tools, two batteries and a charger, all in one heavy-duty kit box. DEWALT’s cordless drill/driver features a high performance fan-cooled motor with replaceable brushes to deliver long-lasting power for more professional applications than ever. And DEWALT’s 14.4 volt cordless saw is simply in a class by itself. With 3,000 rpm’s of power...
and a big 5 3/8" blade, it cuts everything from trim and molding to 1/2" plywood. And its 1 1/8" cutting depth allows it to go through 75 or more 2x4's on a single charge.

Get your hands on a 14.4 volt or 12 volt DeWALT Combination Pack while there's still time. It's part of the most powerful cordless system in the industry. For more information, call 1-800-4-DeWALT.
Rout raised panels with a straight bit

For a low-cost way to make raised panels, try using a straight bit and an elevation rail on your router table. Use a bit with a bottom-cleaning profile like you find on hinge-mortising bits. These will leave you with less sanding to do than with a regular straight bit.

Start by positioning the fence and elevation rail so that your panel tilts at a 15° angle, as shown in the drawing of the router table below. Secure a 3/4" straight bit into your router, and adjust the height to make the cut as shown in STEP 1. Make this cut on all four sides of the panel.

Now, remove the elevation rail, move the fence in, and make the flat cut shown in STEP 2, again on all four sides. Move the fence back out, and lower the bit to clean up the shoulders with the cut shown in STEP 3. Now, you’ve got a raised-panel profile that measures almost 1/2" wide.

—Richard Colman, Sr., Bowdoinham, N.H.

---

Tips From Your Shop (and Ours)
WOOD Magazine
1912 Grand Ave.
Des Moines, IA 50309-3379

We try to publish original shop tips, so please send your idea to only one magazine. Also note that we cannot return your submissions.

Tom Jackson
General-Interest Editor

For submitting the top tip, Richard will receive 20 Jorgensen E-Z Hold II Bar/Spreader Clamps from the Adjustable Clamp Co.

---

Print this article
ANY SANDER CAN FINISH. ONLY ONE CAN FINISH FIRST.

DeWALT's DW421 Random Orbit Sander took on all challengers and was chosen as the best all-around palm grip sander. The experts especially liked how smoothly it ran, its highly efficient dust collection system and its unique Controlled Finishing System™ that eliminates start-up scratching by keeping the sanding pad at a controlled speed on and off your work surface. Get your hands on a DeWALT Random Orbit Sander, and try the palm grip that left the competition in the dust. For more information, call 1-800-4-DeWALT.
The Dremel MultiPro.
At 30,000 rpm, nothing works faster.

Cut off rusty bolts
Fix a sticky door
Polish chrome trim
Sharpen an axe
Re-slot painted screws
Refinish an iron gate
Install a smoke alarm

The Dremel MultiPro is the fastest high-speed rotary tool. And it's extremely versatile. With up to 30,000 rpm it has the speed you need to effortlessly power through hundreds of jobs. You just guide the tool, the speed does all the work. 150 available accessories let you sand wood, polish brass, shape plastic, grind metal, and more. Look for our book with 175+ Uses in specially marked MultiPro packages at hardware, home center and hobby stores. Or for a free copy, write: Dremel, Dept. W, P.O. Box 1468, Racine, WI 53406-1468.

---

TIPS FROM YOUR SHOP (AND OURS)
Continued from page 14

For a durable scrollsaw pattern, try stencil material
The next time you need a reusable pattern for scrollsawing letters, head for the sewing supplies store and pick up a few sheets of plastic stencil material. Cut a piece of this material with scissors to the same size as your workpiece and glue it to your workpiece using a spray adhesive. Then, secure the paper pattern to the top of the stencil material, also with spray adhesive.

Now, cut out the pattern with your scrollsaw. Peel off the paper pattern and stencil material, and save the stencil material. The next time you need to reuse the pattern, simply place the stencil letter on your wood and trace around it. You can use the stencil pattern for years without it losing its shape.

—Kathy Fowler, Stockton, N.Y.
CRAFTSMAN MAKES A GOOD TABLESAW, BUT ONLY WE CAN TOP IT.

We know you've got choices when it comes to tablesaw accessories, but the proven fact is that Biesemeyer is better.

Over 15 years ago Biesemeyer introduced new saw fence technology that has won awards and legions of fans as it changed the way a tablesaw is used. The built-in tape and hairline pointer easily enable you to make precision setups quickly and consistently. And unlike other saw fence systems that count on a rear lock to crutch a weak front lock, the strength of the locking mechanism on the T-Square® saw fence allows precisely square cuts time after time.

Biesemeyer hasn't lost sight of your larger cutting needs. Don't settle for cutting capacity limited to only 30" when even our homeshop systems offer up to 52" to the right of the blade and 48" to the left, allowing even 4'x8' panels to be cut with ease.

And our system's all-steel construction will stand the test of time. Systems made of lightweight aluminum can flex and eventually fail to provide square cuts. The system pictured above bolts right onto most existing Craftsman saws with no drilling required.

So turn your Craftsman tablesaw into the precision cutting instrument it was meant to be. The full line of Biesemeyer products are available at over 530 professional woodworking machinery dealers throughout the U.S. and Canada. For the location of the dealer nearest you, call 1-800-782-1831.

BIESEMEYER
The Best Thing Next To Your Sawblade.
Rug pads grip workpieces under sanders and routers
For a low-cost, no-slip mat to use under workpieces that you sand or rout, check in the rug section of your local discount store. The anti-slip pads that go under most throw rugs cost a fraction of what you'll pay for router pads. You can buy these in rolls large enough to cover a benchtop, and the open-mesh designs help prevent sawdust build-up on the surface.

— Harry Baribault, Indialantic, Fla.

Modified jumper-wire clips put a big bite on small clamping jobs
The next time you need small clamps, try grinding the teeth off some jumper-wire clips used by electricians. You'll find these clips in the electrical-supply section at most hardware stores. The clips exert a lot of pressure, and their jaws open up to about 3/4".

— Harrold Keith, Cobble Hill, B.C.
Continued on page 20

RBIndustries Outperforms The Competition!
How can an American tool manufacturer outperform the competition? Simple. RBIndustries listens to the professional woodworker and manufactures all our woodworking tools to meet our customer's needs.

5 year Warranty / 30-Day Money Back Guarantee

rbindustries
The American Tool Manufacturer
Call 1-800-487-2623 for FREE Catalog
While the human hand is a powerful tool, carving by hand can be painfully slow. That's why we created our new Detail Carver. It gives you hand-carved results – with power tool speed and ease. And you control all the power. The Detail Carver's ergonomic body, two speeds, and five interchangeable chisels let you quickly rough in and precisely finish off every carving project. Relief carving, incised carving, sculpting, antique restoration. In every stock from apple to zebrawood. All with pinpoint finesse, in a fraction of the time hand carving takes. Yet the Detail Carver costs no more than the hand carving sets it'll leave in the dust. Ryobi carves out another advance in power tool design. We've brought the fine art of hand carving up to speed.
**TIPS FROM YOUR SHOP (AND OURS)**

Continued from page 18

**Steady plug cutter with guide holes in plywood**

Have you ever tried to use a plug cutter in a hand-held drill? The cutter usually dances all over the top of the workpiece. If you don’t have a drill press to keep the cutter steady, here’s a solution.

In a piece of ⅛” or thicker scrap plywood, drill a series of holes just big enough for the plug cutter to slip into without binding. Position the plywood template on top of the stock you want to take some plugs from, and securely clamp the plywood and the stock to a benchtop.

Now, insert your plug cutter into the guide holes and drill into the plug stock. The holes in the plywood will keep the plug cutter steady enough as you drill to give you good results.

—Jack Schmittel, Durango, Colo.

---

**FINALLY A CHRISTMAS OFFER WITH SOME TEETH TO IT**

Buy a Dremel 1671, 1672 or 1695 Scroll Saw in specially marked packages and get 50 bonus blades free!

Dremel Scroll Saws have features like a 16 inch throat, multiple speeds, a two inch cutting capacity, a built-in dust blower, a large cast aluminum table and a heavy cast iron base. And they accept pin and plain end blades.

From beginner to expert, Dremel has a reliable, easy to use scroll saw with the features you want. And with our 50 blade Christmas bonus offer, it’s a deal no wise man or woman could pass up.
WE MAKE IT A POINT TO HANDLE THE DETAILS

Now you can sand, buff, polish, strip, and scrape in nooks and crannies. Without scraped knuckles or a bruised budget.

Choose your favorite – Ryobi's original Detail Sander 1000 or our two-speed Detail Sander 2000 – and no detail will be too small for you to handle.

RYOBI
Exceed Your Expectations™

AT BETTER HOME CENTERS AND HARDWARE STORES • CALL 1-800-525-2579 FOR INFORMATION • TWO-YEAR WARRANTY • MADE IN USA

© 1995 Ryobi America Corp.
IPM JOINERY SYSTEMS
This multi-patented system has been recognized by the experts as the best and the easiest to use to make dovetails and box joints plus the best, all around-patented dovetail incremental fence system you will ever own. Because IPM's accuracy is based up on a fine-threaded chrome lead screw, fine joinery is made easy and accurate cuts assured every time. Micro-adjustability even allows you to move the fence in thousands of an inch increments.

CABINET MAKER'S SYSTEM
This one can do it all. All cabinet making operations can be accomplished with this ONE System. JOINTECH's CabinetMaker's Systems include all the Joinery System components plus our award-winning SmartFence. You don't have to be a master craftsman to build beautiful cabinetry furniture or even jewelry boxes. Our 48 templates enable you to easily make every type of dovetail and box joint. SmartFence accommodates any cutter in your shop allowing you to make raised panels, rails, & stiles, tongue & groove, face frame construction, drawer design, edgework and more. JOINTECH'S CabinetMaker's System is simply the best investment in quality and at a very affordable price.

Call, write or fax for a free brochure & special introductory offer details!
P.O. Box 790727 • San Antonio, Texas 78279
Toll Free: (800) 619-1288 • Tel: (210) 377-1288 • Fax: (210) 377-1282
Send, or charge by phone, $5.00 for a complete demonstraton 35 minute VHS video brochure

TIPS FROM YOUR SHOP (AND OURS)
Continued from page 20
Coffee-can lids make great spacers for saw blades
If you stack your tablesaw or circular-saw blades for storage or transport them to a sharpener, you need spacers between them to prevent the carbide teeth from chipping each other. Rather than go to the trouble and expense of cutting out hardboard or plywood spacers, just save a few of the plastic lids that come on three-pound coffee cans. Bore a hole the same size of your saw's arbor in the center of these, and place them between your blades.

—Ken Kraft, Boise, Idaho

For the dealer nearest you, call
1-800-282-2886

Hand Vacuum is Convenient and Versatile

New from EUREKA
Convenience is the watchword for Eureka's new cordless rechargeable hand vac, The Boss®, which is winning over consumers with its light weight, ease of use, and versatility. The Boss hand vacuum weighs only 2 pounds and 9 ounces. It is powered by a 3.6 volt nickel cadmium rechargeable battery which is removable for environmentally-safe disposal. The Boss comes with a wall-mounted recharging stand and a six-foot power cord. It has an easy grip handle with finger-control on-off switch. The top-filling dust container empties easily.
Suggested retail price $19.99

GREAT ENCOURAGEMENT FOR SHIPWRIGHTS!
All gentlemen shipwrights and able bodied modelists who have a mind to provide for themselves amusement and satisfaction through the traditional craft of ship modeling, an opportunity now offers to acquire, through the minimal cost of one Colonial Dollar ($1.00), a catalog of fine and unique ship model kits, plans, books and fittings from the renowned company of Model Expo located in Mt. Pocono in the state of Pennsylvania.

Send $1.00 for a catalog to:
MODEL EXPO INC.
Dept. WDCT, PO Box 1000, Mt. Pocono, PA 18344
Name ____________________________
Address ____________________________
City ____________________________ State ______ Zip __________

A FEW MORE TIPS FROM OUR WOODWORKING PROS
• Many pieces built during the Arts-and-Crafts era used ebony buttons for decoration and to hide screw heads. Highlight your own pieces with some easy-to-make buttons using our method on page 82.
• Tired of the same old commercially available clock faces? Check out the copper face we designed for the mantel clock on page 8.
• For a beautiful finish on your turnings, try Bonnie Klein's recipe on page 69. It's easy to apply right on the lathe, and it cures instantly.
ONLY A CORVETTE™ COULD TURN 175-MPH WITH 5 HORSEPOWER!

**Corvette™ Vac Wet/Dry**
- New Corvette™ Convertible Model 2829 packs 5 peak HP, produces 175-mph air velocity with its detachable, portable blower—easy yard cleanup!
- Sleek body design with capacities to 13 gallons.
- Five-wheel chasis for go-anywhere stability.
- For garage, home & auto.

**Corvette™ Vac Hand Vac**
- Powerful 19,000-rpm motor drives brush roll.
- Clear, easy-empty dust cup; no bags to buy.
- Convenient 25-ft. power cord.
- For home or auto.

**On-board tool storage** includes a 1/4" hose, two 1/4" wands, floor nozzle with squeegee. Also included: 2½" hose, 2½" wand, blower nozzle and diffuser.

Call 1-800-282-2886 for the dealer nearest you.

In Mexico City: Andromedas 16, C.P. 11520.
CORVETTE, Corvette appointments and Body Design are trademarks of Chevrolet Motor Division, General Motors Corporation, used under license to Eureka.
GREAT IDEAS FOR YOUR SHOP

AT-THE-READY
DRILL-BIT HOLDER

Fold-up metal drill-bit boxes save space, but they make it hard to see and retrieve bits. With our drill-bit holder you can find your bits in a jiffy without having to open a box.

To make the holder, remove and measure the metal cartridges that hold your drill bits. Dado the two sides of the holder as shown to match the width of the cartridges. After you glue the two halves together and attach the base, insert spacer blocks at the bottom of the dadoes as necessary. These raise the cartridges high enough so you can read the bit sizes stamped on the front.

Print this article

Give Yourself Some Breathing Room.

Recent medical studies show that breathing wood dust can be hazardous to your health. The JDS AIR-TECH 2000 will dramatically improve the quality of the air in your workshop.

Our model 350 delivers 350 CFM of filtered air. This will clean the air in a 20 x 20 x 8 foot shop six and a half times per hour. For larger areas, our dual speed model 8-12 will deliver 800 or 1,250 CFM of filtered air for only $495. Our model 10-16 will deliver 1,000 or 1,600 CFM of filtered air for $695.

The JDS AIR-TECH 2000 systems will remove 99% of dust particles as small as five micron and 80% of the particles as small as one micron.

Our unique design makes both ceiling installation and filter changing quick and easy.

For the removal of odors, fumes and smoke, our optional charcoal filter is available.

Another quality product from JDS COMPANY

$259.00

Model 350

JDS COMPANY
1-800-382-2637

Manufactured in the U.S.A.
You will run out of these

before you run out of power

Introducing the Super MAKPAK System that keeps you working 40% longer

Whether you're a professional or do-it-yourselfer, Makita's new family of Super MAKPAK power tools provides the power you need and the convenience you demand. With 40% more capacity per charge and an optional EZ read power display, the new Makita Super MAKPAK series has the power to keep you on the job.
SCROLL SAWING
EASY • EASY • EASY
with HEGNER...the better scroll saw

Try a HEGNER Scroll Saw and experience the pleasure of smooth, quiet operation, quick and easy blade changes, and perfect results everytime. With the world's top-rated scroll saw, scroll sawing will be easy for you! Call today for a FREE catalog!

800-322-2224
(toll free)

Advanced Machinery Dept. 691, P.O. Box 312 New Castle, DE 19720

Circle No. 3

Transform ordinary pieces of wood into beautiful works of art!

DECORATIVE WOODCRAFTS® Magazine is filled with everything you need to paint and decorate spectacular wood projects — projects you never dreamed you'd try!

• Over 12 all-new projects per issue
• Step-by-step instructions
• Painting and decorating techniques
• Removable full-size patterns
• Tips and tricks from the pros

MONEY-BACK GUARANTEE
If, for any reason, during your subscription you decide to cancel, we'll promptly send you a refund for all unmailed issues.

Send $19.97 for one year (6 issues) to:
Better Homes and Gardens® DECORATIVE WOODCRAFTS® Magazine, 8800 Spine Road, Dept. Z21006, P.O. Box 54969, Boulder, CO 80302-8969.

OR CALL TOLL-FREE: 1-800-477-4271
Add $8 for Canadian (plus GST) and other foreign subscriptions. Please allow 8-12 weeks for delivery of first issue.

Statement of Ownership, Management and Circulation (Required by 39 U.S.C. 3685) 1. Title of Publication: Better Homes and Gardens® WOODCRAFTS® Magazine. 2. Publication No.: 5720. 3. Date of Filing: September 1, 1995. 4. Issue Frequency: Nine times a year in January, February, April, June, August, September, October, November, and December. 5. No. of Issues Published Annually: 9. 6. Annual Subscription Price: $25. 7. Complete Mailing Address of the Known Office of Publication is 1716 Locust Street, Des Moines, Iowa 50309-3023. 8. Complete Mailing Address of the Headquarters of General Business Offices of the Publisher: 1716 Locust Street, Des Moines, Polk County, IA 50309-3023. 9. Full Names and Complete Mailing Addresses of Publisher, Editor, and Managing Editor: Publisher: William R. Reed, 1912 Grand Avenue, Des Moines, Iowa 50309-3379; Editor: Larry Clayton, 1912 Grand Avenue, Des Moines, Iowa 50309-3379; Managing Editor: James V. Hamrick, 1912 Grand Avenue, Des Moines, Iowa 50309-3379. 10. Owner: Meredith Corporation, 1716 Locust Street, Des Moines, IA 50309-3023. The Names and Addresses of Stockholders Owning or Holding 1 Percent or More of the Total Amount of Stock: The Bank of New York, 925 Patterson Place, Des Moines, IA 50309; Bankers Trust Co., Corporate Securities Services, 15 West Wall Street - Level D, New York, NY 10005; Boston Safe Deposit & Trust Co., c/o ADP Proxy Services, 1501 Broadway, New York, NY 10010; Chemical Bank, 330 Amsterdam Avenue, New York, NY 10023; Chase Manhattan Bank, 269 Madison Avenue, New York, NY 10016; Chemical Bank, 330 Amsterdam Avenue, New York, NY 10023; Chase Manhattan Bank, 269 Madison Avenue, New York, NY 10016.

Through some of the nominees listed above, the E. T. Meredith and Bohlen families and family foundations own directly or beneficially, approximately 29% of the issued and outstanding stock of the corporation. Each nominee listed above holds stock for one or more stockholders. 11. Known bondholders, mortgagees, and other security holders owning or holding 1 Percent or More of Total Amount of Bonds, Mortgages, or Other Securities: None. Item 12 of 7A Form 520 not applicable. 13. Publication Name: Better Homes and Gardens® WOODCRAFTS® Magazine. 14. Issue Date for Circulation: Fourth Quarter, 1995. 15. Extent and nature of circulation: A. Total No. Copies (Net Press Run): Average No. Copies Each Issue During Preceding 12 Months, 833,450; Actual No. Copies of Single Issue Published Nearest to the Filing Date, 833,274. B. Paid and/or Requested Circulation: I. Sales Through Dealers and Carriers, Street Vendors, and Counter Sales (Not Mailed): Average No. Copies Each Issue During Preceding 12 Months, 63,000; Actual No. Copies of Single Issue Published Nearest to the Filing Date, 63,000. C. Paid and/or Requested Circulation (Sum of 15b and 15c): Average No. Copies Each Issue During Preceding 12 Months, 697,044; Actual No. Copies of Single Issue Published Nearest to the Filing Date, 682,116. D. Free Distribution by Mail, (Samples, Complimentary, and Other Free): Average No. Copies Each Issue During Preceding 12 Months, 5,000; Actual No. Copies of Single Issue Published Nearest to the Filing Date, 5,000. E. Free Distribution Outside the Mail, (Carriers or Other Means): Average Number Copies Each Issue During Preceding 12 Months, 31,500; Actual No. Copies of Single Issue Published Nearest to the Filing Date, 31,500. F. Total Free Distribution (Sum of 15f and 15g): Average No. Copies Each Issue During Preceding 12 Months, 12,997; Actual No. Copies of Single Issue Published Nearest to the Filing Date, 11,648. G. Total Distribution (Sum of 15d and 15h): Average No. Copies Each Issue During Preceding 12 Months, 762,741; Actual No. Copies of Single Issue Published Nearest to the Filing Date, 757,781. H. Copies Not Distributed: (1) Office Use, 46 copies, 37 copies, (2) Return from News Agents: Average No. Copies Each Issue During Preceding 12 Months, 654; Actual No. Copies of Single Issue Published Nearest to the Filing Date, 654. I. Total (Sum of 15d, 15h(l), 15k(2)): Average No. Copies Each Issue During Preceding 12 Months, 762,794; Actual No. Copies of Single Issue Published Nearest to the Filing Date, 762,794. J. Percent Paid and/or Requested Circulation (15c/15d x 100): Average No. Copies Each Issue During Preceding 12 Months, 98.98%; Actual No. Copies of Single Issue Published Nearest to the Filing Date, 98.98%. K. Paid and/or Requested Circulation 15b +15c: 833,093. L. Ownership: The editorship and management of this publication is vested in Meredith Corporation. M. Signature and Title of Editor, Publisher, Business Manager, or Owner: Signed William R. Reed, Publisher. Date: September 29, 1995. I certify that all information furnished on this form is true and complete. I understand that anyone who furnishes false or misleading information on this form or who omits material or information requested on this form or omits material or information requested on this form may face criminal sanctions (including fines and imprisonment) and/or civil sanctions (including multiple damages and civil penalties).
Enlon is now in its 4th year of serving you with innovative new products and improvements. Enlon's quality far surpasses other brand names, products that look like Enlon's, such as the Enlon 10" Heavy-Duty Table Saw model #EN3202, Oscillating Vertical Spindle Sander model #EN3407, and more.

10" TILTING ARBOR SUPER HEAVY-DUTY TABLE SAW MODEL #EN3202

This industrial quality table saw features a heavy-duty cast-iron table top, 3 H.P., 220V, 15 AMPS, single phase motor, Enlon exclusive self-aligning 36" rip fence system, heavy-duty steel stand with dust collector port, magnetic safety switch and much more.

Reg. $795.00
$735.00

NEW!

24" DUAL DRUM SANDER MODEL #EN3409

This is the newest Enlon innovation with a full 24" sanding area, three rubber coated hold down rollers, and all sealed ball bearing construction. The quality of this machine is far beyond the introductory price that we're offering right now.

- 5 H.P., Single Phase, 220 Volt and 25 AMP Main Motor
- 1/4 H.P., 220 Volt and 3 AMP Belt Feed Motor
- Magnetic Starter and Reversing Switch
- Twin 6" Diameter Rubber Coated Drums
- 2 Stock Feeding Rates 11 and 17 F.P.M.
- 2 Built-In 4" Dust Collector Ports

Reg. $1,200.00
INTRODUCTORY PRICE $950.00

OSCILLATING VERTICAL SPINDLE SANDER MODEL #EN3407

This machine is one of Enlon's innovations, and won the American Woodworker Editors' Choice Award. Don't be fooled by look-alike and low quality of other brand names that copy Enlon's. Enlon was the first to offer this import fine quality machine in the market on April 1994.

- 1 H.P., 110/220V
- 75 Oscillations Per Minute
- Spindle Speed 1,725 R.P.M.
- Built-In 4" Dust Collector Port
- Includes Set of 10 Removable Spindles

Reg. $565.00
SALE $500.00

SHOWROOM/MAIN OFFICE:
17709 East Valley Boulevard,
City of Industry, CA 91744

CUSTOMER SERVICE:
TEL (818) 935-8888 FAX (818) 935-8889

HOURS (PST):
Monday-Friday 8:00 a.m.-5:00 p.m.
Saturday 9:00 a.m.-1:00 p.m.

GIFT CERTIFICATES AVAILABLE
Call Today for a Free Catalog
Pacific Time: Monday-Friday 7:00 a.m.-5:00 p.m.
Saturday 9:00 a.m.-1:00 p.m.

SHOWROOM/DISTRIBUTION CENTER:
12 Armory Road, Clarksburg, WV 26301

HOURS (EST):
Monday-Friday 8:00 a.m.-5:00 p.m.
Saturday 9:00 a.m.-1:00 p.m.

All machines above are F.O.B. City of Industry, CA or
Clarksburg, WV.

Prices and specifications are subject to change
without notice.

1 (800) 888-9697
How can I reduce the size of a plan?
I want to make a smaller version of the “Snow Stroller” shown in the November 1994 issue. How do I calculate the sizes of each piece?

—Lester Kocher, Rochester, Minn.

For a start, grab your calculator and multiply the measurements of each piece by a decimal based on the amount of reduction of the plan. For example, if you want to make a half-size copy of a part, divide 2 into 1, and the decimal you use is .5. For a ¼ scale piece, divide 4 into 3, for a decimal of .75. Here’s an example, based on the snow-stroller runner (part A) downsized to a ¼ scale:

<table>
<thead>
<tr>
<th>Fraction</th>
<th>Decimal Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/16&quot;</td>
<td>.0625</td>
</tr>
<tr>
<td>1/8&quot;</td>
<td>.125</td>
</tr>
<tr>
<td>3/16&quot;</td>
<td>.1875</td>
</tr>
<tr>
<td>1/4&quot;</td>
<td>.250</td>
</tr>
<tr>
<td>5/16&quot;</td>
<td>.3125</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>.375</td>
</tr>
<tr>
<td>7/16&quot;</td>
<td>.4375</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>.50</td>
</tr>
<tr>
<td>9/16&quot;</td>
<td>.5625</td>
</tr>
<tr>
<td>5/8&quot;</td>
<td>.625</td>
</tr>
<tr>
<td>11/16&quot;</td>
<td>.6875</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>.750</td>
</tr>
<tr>
<td>13/16&quot;</td>
<td>.8125</td>
</tr>
<tr>
<td>7/8&quot;</td>
<td>.875</td>
</tr>
<tr>
<td>15/16&quot;</td>
<td>.9375</td>
</tr>
</tbody>
</table>

Part A: T W L

Original size 3/4" 3 1/4" 25 1/2"
¼ scale (.25) 3/16" 1 1/16" 6 3/4"

To make these calculations, you will need to change each fraction into a decimal. For example, the 3/4" thickness dimension becomes .75. This measurement, when multiplied by .25 (the scale decimal) equals .1875. To make the fraction conversions easier, we have done them for you in the chart left.

Uses for left-over Corian
After building the “Plant Stand with Panache” from the February 1995 issue, I found myself with leftover pieces of Corian looking for a home. As I paged through my back issues of WOOD, searching for a project, the “Echoes of Antiquity” clock plan in the February 1993 issue seemed promising.

I had some questions about whether I could make the columns by gluing together two pieces of 1/2" Corian, if I could turn them on a lathe, and whether I could resaw the material to a 1/8" or 1/4" thickness. I found that the answer to all the above questions is “Yes!” I used epoxy for laminating the columns and assembling the clock. Here’s a snapshot of my finished project.

—Wesley Henderson, Lexington, Ky.

More on harvesting mahogany
I would like to respond to reader Julia Wuollet who questioned the use of Honduran mahogany on ecological grounds in the April 1995 Talking Back column. My qualifications are that I lived in Belize (Central America) for a number of years, and operated a sawmill on our farm for our own use.

There is no clear cutting done to harvest mahogany, nor any other tropical species other than Caribbean pine. The simple reason for this is that most tropical species can be found as mature trees at the rate of 1.5 trees per square mile or less. These trees are logged selectively because the expense of extracting them does not warrant the handling of smaller trees.

This is not to deny that clear-cutting occurs in tropical forests. However, clear-cutting is not a forest management strategy, but rather an agricultural or range-creation strategy. The wood harvested is sold as random hardwoods because of the variation in species, density, and color. This wood often goes for industrial uses such as making pallets.

The greatest threat to the tropical forest ecosystem lies in the clearing of agricultural land for the production of beef for your fast-food hamburger. Commercial logging by large corporations comes in second. Selective harvesting of mahogany or other expensive tropical hardwoods for use by the small woodshop has a minimal effect on the forest.

—Clifford W. Mossberg, Kasilof, Alaska

We stand corrected
In the comment entitled “Cardboard tube makes for a sound idea” in our April 1995 Talking Back, we inadvertently misspelled the name of the contributor of that letter. The credit should read Howard L. Coy of Monroe, La. Our apologies to Howard for this error.

Glues for biscuit joinery
I read the article “Today’s Advanced Woodworking Glues” in the June 1995 issue with interest. However, it didn’t mention which glue to use for biscuit joinery. Can you recommend one?

—Stephen A. Garvin, Walhamp, Mass.

We sure can, Steve. We prefer a yellow aliphatic resin glue like Titebond or Elmer’s Woodworker’s Glue for biscuit joinery. Because these glues are water-based, the moisture in the glue causes the compressed biscuit to swell, creating a tight fit.

Continued on page 30
Dear Friend,

If you don't want the finest cuts you can get at any price, then don't bother reading this letter. Why? Because I personally guarantee that CMT's Maxi-Combo™ and Ultra-Cut™ blades will deliver the finest cuts you've experienced, or I'll refund your money no questions asked!

We commissioned master sharpener Matt Ber Steep to develop these blades with one goal: produce the best possible combination and laminate blades. The secret to his success is in the unique grinding of the blades' teeth. As shown at right, the Maxi-Combo employs a Chamfered Raker tooth to eliminate chipping. The Ultra-Cut features a 40° top bevel (most competitors' blades use teeth that range from flat to 20°) to produce the best cuts in 2-sided material you'll find anywhere.

Although our prices are very attractive, you may find cheaper blades on the market. The special tooth design of the Maxi-Combo and Ultra-Cut takes about 3 times as long to grind as the simpler shapes of your average mass-produced blade. We also laser-cut a special pattern of sound suppression slots in our blades to dampen vibration and reduce noise. Those features add a little to the cost of our blades, but they also give me the confidence to tell you that a CMT blade is the best blade, guaranteed!

Sincerely,

Carlo Venditto, C.E.O.

P.S. If your saw is a little under-powered, be sure to try our thinner Maxi-Combo Line™.

---

**Carbide tipped Table Saw Blades**

<table>
<thead>
<tr>
<th>Item</th>
<th>Primary Function</th>
<th>No. of Teeth</th>
<th>List</th>
<th>Sale</th>
</tr>
</thead>
<tbody>
<tr>
<td>2&quot; diameter, 50° Arbor:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>110-240</td>
<td>Ultra-smooth Rippping</td>
<td>24</td>
<td>$60.00</td>
<td>$51.00</td>
</tr>
<tr>
<td>210-240</td>
<td>Thin-Kerf Rippling</td>
<td>24</td>
<td>$56.00</td>
<td>$48.00</td>
</tr>
<tr>
<td>110-600</td>
<td>Maxi-Combo™</td>
<td>50</td>
<td>$78.40</td>
<td>$66.60</td>
</tr>
<tr>
<td>210-600</td>
<td>Maxi-Combo Lite™</td>
<td>50</td>
<td>$79.00</td>
<td>$64.90</td>
</tr>
<tr>
<td>110-800</td>
<td>Ultra-Cut™</td>
<td>50</td>
<td>$100.50</td>
<td>$86.80</td>
</tr>
<tr>
<td>12&quot; diameter, 3&quot; Arbor:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>112-200</td>
<td>Combination Rippling</td>
<td>30</td>
<td>$54.00</td>
<td>$47.10</td>
</tr>
<tr>
<td>112-800</td>
<td>Ultra-Cut™</td>
<td>98</td>
<td>$1299.00</td>
<td>$118.15</td>
</tr>
</tbody>
</table>

**Two-blade Packages. SALE!**

<table>
<thead>
<tr>
<th>Item</th>
<th>List</th>
<th>Sale</th>
</tr>
</thead>
<tbody>
<tr>
<td>110-221</td>
<td>$134.00</td>
<td><strong>$100.50</strong></td>
</tr>
<tr>
<td>110-240 Rip &amp; 110-600 Maxi-Combo</td>
<td></td>
<td></td>
</tr>
<tr>
<td>110-223</td>
<td>$201.00</td>
<td><strong>$151.40</strong></td>
</tr>
<tr>
<td>110-800 Ultra-Cut &amp; 110-801 Miter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>110-224</td>
<td>$185.40</td>
<td><strong>$115.40</strong></td>
</tr>
<tr>
<td>210-600 Thru Kerf 247 Rip &amp; 210-600 Thru Kerf 60° Fine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>110-225</td>
<td>$185.40</td>
<td><strong>$138.90</strong></td>
</tr>
<tr>
<td>110-600 General Purpose &amp; 110-600 Ultra-Cut</td>
<td></td>
<td></td>
</tr>
<tr>
<td>110-228</td>
<td>$178.00</td>
<td><strong>$128.50</strong></td>
</tr>
<tr>
<td>110-800 80° Ultra-Cut &amp; 210-600 80° Maxi-Combo Lite</td>
<td></td>
<td></td>
</tr>
<tr>
<td>110-233</td>
<td>$179.30</td>
<td><strong>$119.00</strong></td>
</tr>
<tr>
<td>110-600 50° Maxi-Combo Light &amp; 110-800 80° Ultra-Cut</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CMT's Award-Winning Joint-Master 8" Dado Set**

Includes CMT's 3/32" Ply-Groove Chipper plus four 1/8" and one 1/4" chipper. The JointMaster delivers incredibly smooth cuts, even in splinter-prone veneer plywood.

<table>
<thead>
<tr>
<th>Item</th>
<th>List</th>
<th>Sale</th>
</tr>
</thead>
<tbody>
<tr>
<td>109-240S</td>
<td>$268.40</td>
<td><strong>$179.00</strong></td>
</tr>
</tbody>
</table>

**Blade Stiffening Collars:** Improve the performance of table or radial arm saws! A must with thin-kerf blades. Not for portable saws.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>List</th>
<th>Sale</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBS-005</td>
<td>5° Stabilizers (pair)</td>
<td>$25.20</td>
<td>$18.90</td>
</tr>
<tr>
<td>SBS-003</td>
<td>3° Stabilizers (pair)</td>
<td>$22.30</td>
<td>$17.90</td>
</tr>
</tbody>
</table>

**CMT TOOLS**

Create your next masterpiece with CMT's 3D Router Carve System! Our free catalog is packed with thousands of blades, bits, accessories and more! Call for your copy today!

Free shipping on orders over $200.00

$5.00 shipping & handling for orders under $200.00

To order, call toll-free 24 hours a day:

1-800-531-5559

Toll Free FAX: 1-800-870-7702

If you have questions or require assistance with your order, please call between 9 am & 6 pm ET

Dealer inquiries welcome!

For export orders please call:

(813) 891-6160  FAX: (813) 891-6259

CMT TOOLS,

310 Meers Boulevard, Oldsmar, FL 34677

in Canada, call: ToolTrend Ltd. 1-800-367-7005
Where does the dust go?
I loved the IDEA SHOP™ 2 "Do-It-All Mobile Tablesaw Base" but I have two questions about this project: (1) What is the need for router bit storage under the tablesaw? These would seem more appropriately stored near the router. (2) Where does the sawdust go from the tablesaw?

—Howard Nitzberg, Del Ray Beach, Fla.

Your questions are easy to answer, Howard. The Ryobi BT3000 tablesaw we use in IDEA SHOP 2 includes a router table in an extension wing. Consequently, the bits are stored near the router.

The Ryobi tablesaw has a dust-extraction port built into the saw base. We connect a 2½" shop-vacuum hose to this nozzle to collect sawdust.

What happens when stain meets wood?
Other than the color change, what happens when I apply a wood stain to my projects?

—Shanen Warren, Sacramento, Calif.

To help understand the process, Shanen, you should know something about the composition of wood stains. Basically, stains are similar to thinned paint, and are composed of two primary parts: 1) the pigment or coloring material, and 2) the vehicle or liquid the pigment is suspended in.

The small flakes of coloring material that make up the pigment of a stain cause a color change on the wood simply by settling onto the surface of the board. The amount of pigment that lands on a board controls the lightness or darkness of the stain. The open grain on the ends of a board tend to collect a lot of pigment, causing these areas to appear dark. Edge- and face-grained areas tend to retain less of the colored pigment, and appear lighter. And, as most of us woodworkers have found, much to our chagrin, dried glue spots retain little or no stain pigment.

The vehicle of the stain has two primary purposes: to allow an easier and more even spreading of the pigment on the wood surface, and to provide a binder that fastens the pigment flakes to the wood surface as the vehicle dries.

Many of the pigments used to make wood stains are opaque, with the result that a stain often will obscure some of the grain of the wood. If this presents a problem with the project you're building, we suggest you use aniline dyes, which use a transparent coloring agent.
GAS POWERED TRIMMER PLUS
With Ryobi's exclusive QUICK-LINK™ system you can turn this trimmer into a complete lawn and garden care system. Add snap-on accessories to as much as quadruple your trimmer's versatility:
- Factory reconditioned, factory perfect
- 3icc 2 cycle power
- 7000 RPM no load speed
- 15" cutting swath

ITEM 50275-OVKA
$49.99

OSCILLATING SPINDLE SANDER
Nothing beats this machine for contour and curve sanding. 1/2" to 3" spindles give you the control you need. Reduces stackItaly using the whole drum and prevents sanding burn marks:
- 120V, 3.5 amps
- 1800 RPM
- 45 oscillations per minute
- 29 lbs. tool weight
- 1/2" 6" drum diameters
- Dust collection port
- Factory reconditioned, factory perfect

LIMITED QUANTITIES
ITEM 33625-3VKA
$89.95

QUICK-GRIFF
BY THE MAKERS OF VISE-GRIFF TOOLS
MINI BAR CLAMPS
Compact size and one hand operation. Soft padded pads protect line finishes.
6" CLAMP QUICK-GRIFF 546
ITEM 07652-6VKA
$8.29

12" CLAMP QUICK-GRIFF 5412
ITEM 01948-2VKA
$11.99

Ryobi OS5450

2 PC. 3/4" HEAVY DUTY PIPE CLAMP SET
Pipe not included. 1/2" to 3/4" throat depth
- Handle screw operating range: 2-1/8"
- Weight: 2776 lbs.
ITEM 31255-5VKA
$2.93

CHICAGO TOOL COMPANY
28% MORE POWER!
13.2 VOLT, 3/8" KEYLESS CHUCK CORDLESS DRILL KIT
Variable speed, reversible 0-600 RPM 6 torque settings. Includes 6 pc. drill bit set, 6 pc. screwdriver bit set, charger, battery, keyless chuck, and carrying case
ITEM 33165-2VKA
$49.99

REPLACEMENT BATTERY
ITEM 33214-3VKA
$24.99

20 PC. HIGH SPEED STEEL DRILL BIT SET 1/16" to 1/2" by 64ths
ITEM 02642-5VKA

$9.99

CENTRAL MACHINERY
5 SPEED BENCH DRILL PRESS
2" stroke, 8-1/4" swing
1/2" chuck with key
1/3 HP MOTOR
ITEM 05901-6VKA
$49.99

25 PC. BRAD POINT WOOD BIT SET
- Sizes: 1/8" through 1/2" by 64ths
ITEM 03576-6VKA
$8.95

6" INDUSTRIAL RABBETING JOINTER
- Infeed table size: 22-1/2"
- Outfeed table size: 19-1/2"
- Motor: 1 HP, 110/220V, 4/8 amp, 4900 to 5900 RPM cutterhead speed
- Max. depth of cut: 3/8"
ITEM 07830-5VKA
LIMIT 1
$199.99

MORTISING MACHINE
Make mortises and tenon joints in furniture, cabinets, and restoration. Fence with hold down clamp keeps workpieces steady. Includes tenon, workpiece clamps and 1/4", 3/8", and 1/2" mortising chisels and bits.
ITEM 30036-5VKA
$179.99

RADIAL ARM SAW KIT
Award-winning patented design features easy setup with manual 7-1/4" and 3-1/2" circular saws. Makes fast accurate bevels, rip, miters, and crosscuts. Ruggedly built completely portable.
- Saw and table wood not included
- Maximum motor: 14-Amp, 2 HP#
- Crosscut: 12-3/4" Length: 24"
- Rip capacity: 15-3/4" Height: 22"
ITEM 33576-2VKA
$499.95

10", 2HP BENCH TABLE SAW
- Max. depth of cut 00": 90°, 00": 45°, 2-1/2"
- Motor: 2 HP, 115V, 60 Hz, 13 amp, 4500 RPM
- Blade sold separately
ITEM 32648-5VKA
$79.95

10" SAW BLADE
- 40 Tooth carbide tips
ITEM 00529-5VKA
$8.97

CENTRAL MACHINERY
1" x 10" LIMIT BELT Sander
Remove the belt back plate and sand all types of curves and odd shapes:
- Motor: 1/4 HP, 2 amp, 60 Hz, 120V, 3450 RPM
- Table: 5" x 5".
ITEM 07830-5VKA
$39.99

Call To Order or Ask for Free Catalog:
1-800-423-2567

FREE SHIPPING!
* For all items shown below!

LOW PRICE GUARANTEE
We'll beat any competitor's price on any identical item—even if it's an advertised special!
Workbench gives you three-way performance

Not many three-in-one tools actually perform three tasks well. But I found that the Dust Eliminator Workbench gave me outstanding results as a workbench, a downdraft sanding table, and an air-filtration unit.

As a workbench, the Dust Eliminator supports workpieces with a rock-solid 13\(\times\)30\(\times\)54" hardmaple top. The cabinet features rounded corners, invisible welds, and durable powder-coated paint. Heavy-duty casters allow you to easily move this 250-pound unit around the shop. Thanks to a 20' electrical cord you can position the bench almost anywhere in your shop. And you can plug two power tools into an electric outlet mounted on the cabinet's side.

When you want to sand, place the workpiece over the 16\(\times\)20" PVC-plastic grid centered in the top. Dual squirrel-cage blowers inside the cabinet pull 930 cubic feet per minute (cfm) of air through a three-stage filter system that traps dust particles down to 0.5 micron in size. The filter system includes a 2" polyester filter for removing large dust particles, a non-woven pleated secondary filter, and six fiberglass bag filters at the bottom.

Finally, the Dust Eliminator can be turned on at any time and used to filter room air. This eliminates the fine dust particles that remain suspended in your shop's air for long periods of time.

During my tests, I cleaned the primary and secondary filters by shaking and blowing the dust out. This takes only a few minutes, and in each case the filters returned to the same level of efficiency as when they were new. The first two filters did such a good job that the bag filters never needed cleaning.

The cabinet exhausts air out the sides. This draft can stir up a lot of dust and debris on the floor. To prevent this, I recommend that you order the optional diffuser (about $90) that turns this airflow into a gentle breeze. Another option, a $29 manometer, measures the static pressure inside the cabinet and tells you when the filters need to be cleaned. But I found I could tell when the filters need changing by simply inspecting them. Even though the Dust Eliminator Workbench costs nearly $800, a separate bench, air-filtration unit, and downdraft table of this quality and capacity would cost you over $2,000.

—Tested by Bob McFarlin

PRODUCT SCORECARD

<table>
<thead>
<tr>
<th>Dust Eliminator Workbench</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance</td>
</tr>
<tr>
<td>Price</td>
</tr>
<tr>
<td>Value</td>
</tr>
<tr>
<td>Wood Mark, P.O. Box 211834, Bedford, TX 76095. Call: 800/845-4400.</td>
</tr>
</tbody>
</table>

Combo blade delivers smooth results quietly

Most 10" combination blades can't cut as smooth as my 40-tooth ATB (alternating top bevel) blade. So I avoid them unless I'm doing rough work such as cutting lumber for carpentry.

But was I surprised by the CMT 110-500 Maxi-Combo Blade. Not only is it the quietest blade I've used, (silicone-impregnated slots help keep the noise low) but it gave me excellent crosscuts and ripcuts in any material—pine, curly maple, and melamine-coated particleboard to name a few.

Most combo blades offer a flat-topped raker tooth followed by four ATB teeth. On the Maxi-Combo, the corners of the rakers have the top points ground off which leaves behind just a whisker of material that the ATB teeth slice off cleanly.

This blade won't cut across the grain as smoothly as a crosscut blade or rip as fast as a ripping blade. But if you don't like to change blades, or can only afford one blade, this one outperforms any combination blade I've seen.

—Tested by Dave Henderson

PRODUCT SCORECARD

<table>
<thead>
<tr>
<th>CMT 110-500 Maxi-Combo blade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance</td>
</tr>
<tr>
<td>Price</td>
</tr>
<tr>
<td>Value</td>
</tr>
<tr>
<td>CMT Tools, 310 Mears Blvd., Oldsmar, FL 34677. Call 800/531-5559.</td>
</tr>
</tbody>
</table>

Continued on page 34
Like Having A Lumberyard Right In Your Shop!

Craftsmen everywhere are using the low-cost Woodmaster to bring in welcome extra cash and to save on all their lumber needs. You can, too!

With the big 18-inch Woodmaster or the standard 12-inch model, you can quickly convert low-cost, rough lumber into valuable finished stock. You can turn out perfect picture frame moldings, crown, bed and base moldings, tongue & groove, door and window trim...all popular patterns...any custom design.

You can do custom work for friends, neighbors, lumberyards, picture framers, home remodelers, hobby shops and businesses.

Because it takes just seconds to convert a $2 rough board into $10 worth of finished trim, you can see why so many Woodmaster owners enjoy substantial extra incomes!

Variable Speed Makes The Difference!

Just a twist of the dial gives you perfect control for planing, sanding or sawing...from 0 to 1,000 cuts per inch. Creates mirror-smooth molding with no sanding required!

Here’s what Woodmaster owner L. C. Griffin of Los Angeles writes: “The shop test article in Wood Magazine that said they loved your Variable Feed Rate is what sold me. They were right.”

Call or write today for free facts on how you can try this American-Made tool in your own shop for one full month. Easy terms.

CALL TOLL-FREE
1-800-821-6651 Ext. PW83
The A-Line-It checks tools for pinpoint accuracy

Most manuals show you how to use a framing square to set up and align tools. But framing squares were never designed for this. So I was eager to try the A-Line-It, a machine-setup device that measures runout, concentricity, and other dimensional differences as small as .001"—about one-third the thickness of a human hair.

The A-Line-It consists of a dial indicator, an 11" mounting bar, and a 6¼" miter-slot bar. Two springs in the miter-slot bar hold it firmly in any ½"-wide slot. With the dial indicator extended horizontally, you can check runout in a router bit, or tablesaw blade as shown in Photo A. Plus you can check the blade-to-miter-slot alignment and the alignment of the fence to the miter slot.

Other dial-indicator setup tools will do the same thing, but you can reconfigure the components of the A-Line-It to perform many different tasks. You can tilt it 90° from horizontal and extend the tip of the dial indicator below your saw's throat opening to check runout directly on the arbor. To check the height of your jointer knives, mount one end of the miter-gauge bar on the end of the mounting bar and secure the dial indicator pointing down in the middle of the miter-gauge bar as shown in Photo B. In this position, you also can check outfeed tables, extensions, and tablesaw or router inserts to ensure that they're flush.

For drill-press work, the A-Line-It comes with a ½×3½" steel pin that screws into any of the 12 holes in the mounting bar. Chuck the pin in your drill press, and rotate the chuck. The dial indicator will tell you whether or not the table is set 90° to the quill and help you square the fence to the table. The A-Line-It also includes a set of 22 different tips for the dial indicator, and a large spring-tensioned aluminum nut for checking saw-blades for variations in flatness that may cause runout.

In my tests, I found that all of the machine-ground components fit together perfectly. The finish on the two anodized-aluminum bars appears flawless.

The rough draft of the instructions gave me enough information to set up and use the tool in every configuration, and reconfiguring the A-Line-It never took more than a minute or two. I also checked the A-Line-It against a $160 dial-indicator-based fixture I built to test tools for WOODS magazine, and I got identical readings. In short, the A-Line-It is deadly accurate and gives you more ways to measure accuracy at less cost than any tool on the market.

—Tested by Bob McFarlin

PRODUCT SCORECARD

<table>
<thead>
<tr>
<th>Product</th>
<th>Performance</th>
<th>Price</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-Line-It</td>
<td>★★★★★</td>
<td>$99.95</td>
<td>★★★★★</td>
</tr>
</tbody>
</table>

In-Line Industries, 661 S. Main St., Webster, MA 01570. Call 800/555-6709.
Make Beautiful Raised Panel Doors with your 1/4" or 1/2" Router, or with your 1/2" or 3/4" Shaper.

Professional production quality router bits and make it quick and easy to produce matching rails and stiles. The panel raising bit with ball bearing guide makes the raised panel perfect every time!

**PROFESSIONAL PRODUCTION QUALITY GUARANTEED**

**ROUNDED OVER BITS**
- #1314: $11.00 (1/8" Radius)
- #1315: $11.00 (3/16" Radius)
- #1316: $14.00 (5/16" Radius)
- #1369: $15.00 (5/8" Radius)
- #1370: $17.00 (1" Radius)

**FLUSH TRIM BITS**
- #1337: $14.50 3/8" Diameter, 1" Cutting Length
- #1338: $18.50 1/2" Diameter, 1" Cutting Length

**BULL NOSE BITS**
- #1330: $16.00 3/8" Diameter, 1/2" Cutting Length
- #1331: $21.00 1/2" Diameter, 1/2" Cutting Length

**PATTERN/FLUSH TRIM**
- #1340: $15.00 1/2" Diameter, 1" Cutting Length
- #1341: $17.00 3/4" Diameter, 1" Cutting Length

**OGEE RAISED PANEL BIT**
- #1353: $29.95 2" Large Diameter

**TONGUE & GROOVE BITS**
- #1333: $29.00 Straight
- #1335: $29.00 Wedge

**45° CHAMFER BITS**
- #1404: $14.00 1" Ledge Diameter, 3/4" Cutting Length
- #1405: $16.00 1-1/2" Ledge Diameter, 5/8" Cutting Length
- #1406: $22.00 1-3/4" Ledge Diameter, 1" Cutting Length

**MERLE THE ADJUSTABLE CORNER CLAMP®**
- Almost NO capacity limitation
- Forces a Frame into a perfect square
- Even joining forces at ALL corners
- Adjustable, uniform clamping pressure
- Great for wide cabinet frames (for center or edges)
- Aluminum & Steel construction

Reg. $39.95 **SALE $24.95**
Item #1420

**RAISED PANEL ROUTER BIT**
- 1/2" Large Diameter (1/4" Shank)
- 3/4" Large Diameter (1/2" Shank)
- 4-5/8" Large Diameter (Shaper)

**CARBIDE TIPPED RAISED PANEL BIT**
- 1/4" Shank Router
- 1/2" Shank Router
- 1/2" Shaper

**QUANTITY DISCOUNT!**
When ordering three or more bits deduct $1.00 each!

**MERGE JOINING SET**
- 5/32" Slot Cotter
- 1/4" Shank & 250 #20 Biscuits

**BISCUIT JOINING SET**
- 5/32" Slot Cotter
- 1/4" Shank & 250 #20 Biscuits

**WOOD STORAGE BOX INCLUDED**

**25 PIECE BRAD POINT DRILL BIT SET**
Drill accurate holes in wood, plastics & composites.

Bit sizes from 1/8" to 1/2" by 1/64" increments. Bits are deep fluted to clear chips quickly.

Reg. $34.95 **SALE $18.95**
Item #1413

**22 PC TAPERED DRILL BIT SET**
For exceptional thread "bite".

Includes sizes 5, 6, 7, 8, 9, 10, 12, 14, 16, 18, and a bonus assortment of countersink heads with adjustable stop collars, & Allen key.

Reg. $34.95 **SALE $22.95**
Item #1414

**ONE YEAR FULL WARRANTY**
All MLCS products are guaranteed to be free of defects in material and workmanship. Durable gear head design will last a lifetime! All new products have a one year full warranty.

1-800-533-9298

To Order By MasterCard, VISA, Discover, or American Express
CALL TOLL-FREE, 7 DAY — 24 HOUR ORDER SERVICE
Or Send Check To: MLCS, Ltd., P.O. Box 4053 DA, Rydal, PA 19046

Circle No. 1251, 1350, 2250
New Englander Bob Newton serves up a full menu of advice and insights on running a successful custom-woodworking business.

Not everyone can claim success in two completely unrelated careers, but Yarmouth, Maine, resident Bob Newton can. A law graduate from Duke University, Bob first set up practice as a trial lawyer in Denver, Colorado, in 1971. There, his cases involved personal injury accidents and medical legal issues. And though his income at the time provided a comfortable living, he found that his work severely cut into his family life.

On top of that, Bob told us during our visit with him at his very own Yankee workshop, "I had a personal need for a creative outlet, and a need to work with my hands." During a particularly trying holiday season in 1981, Bob found himself asking if the proverbial Fast Lane was not without its share of potholes. With agreement from his wife, Carol, Bob moved his

Continued
family to Yarmouth in search of the good life. Bob and Carol found Maine attractive for several reasons. From previous visits, they had fallen in love with the woodsy countryside, rocky seacoasts, and charm of New England small-town life. The Yarmouth location seemed like the perfect place to raise a family. (Bob and Carol's children include Matthew, Anthony, Anne-Marie, Joseph, and Thomas, aged six to 20.) And it seemed like the ideal place to give woodworking a try. Indeed, that's when his hobby-level woodworking experience blossomed into a full-bodied new career, namely, owning and running a successful custom-woodworking business.

But the breakaway, in this case, was not overnight, nor without a serious sacrifice in income. You just don't open a woodworking shop and enjoy instant success, not when you lack professional experience. His years of lawyering allowed him to save enough to see him through the hard times. Bob solved his experience problem the old-fashioned way—by apprenticing under a master craftsman, one of the very best!

One of Bob's more interesting inventions, his glue-up table, left, folds up neatly and stands on a wall when not in use in a clamping operation.

Bob's shop contains over 1,500 square feet of work space. The machines use three-phase electricity to save on operation costs.

Enter Thomas Moser
During the time of the move, Bob wrote to renowned New England Shaker furnituremaker Thomas Moser, expressing his interest in working for him. Surprisingly, Moser wrote back. Over time, Bob convinced the reluctant furnituremaker to take him on board. "Since Gloucester, Maine [where Thomas Moser lives], is only 20 minutes away from Yarmouth, I more or less camped out on his porch until he came around."

Thus began Bob's five-year apprenticeship. "At the time, Tom was building a lot of custom stuff," Bob recalls. "He began advertising in the New Yorker magazine; just like that his woodworking went mainstream."

When Moser's woodworking business took off, so did the nature of the work done in the shop. "The work process of the shop became more production-like," says Bob, whose interest was in custom—not production—work. It was time to strike out on his own. But his master had taught him well. "From Tom, I learned a lot about Shaker, as well as other 18th- and 19th-century furniture designs. I learned mortise and handcut-dovetail joinery, too. And mostly, how to market."

The scary part: going it alone
January of 1986 saw Bob open his own shop, working out of the carriage house attached to his 1840s two-story home in Yarmouth. And though Tom Moser had kindly sent some custom work his way, it wasn't until Bob sold his first pieces of furniture—two desks—on speculation that he knew he had a shot at succeeding as a custom woodworker.

Later, in 1988, Bob experimented with speculation sales again by placing a clock (with the management's permission) in a Boston hotel lobby. When the clock sold,
he realized that this, too, may be a profitable avenue to pursue. After this aptly named “Crossroads” clock, Bob developed and began selling a complete line of tall, wall, and shelf clocks. According to Bob, “Everybody needs a bread-and-butter line to pull them through the tough times.”

Today, Bob’s business chugs along nicely, and has expanded to include two additional helpers, one full-timer and one part-timer. Due to a 1992 fire in the carriage house, Bob relocated to a 1,500 square foot shop just a few doors from his home.

**Getting the word out**
The demographics of Bob’s customers mostly include people living within a 25-mile radius of his shop; 30 percent of his business comes from the greater Boston area two hours away. “My timepieces, however, have sold nationwide, as far away as San Francisco,” says Bob. Generally, his clientele tends to be wealthy older couples and young couples with professional careers. “Only about 10 percent of my business is from commercial clients.”

This last group, Bob notes, makes for a hard sell; they seek out the rock-bottom price. “I once lost a job for ten small conference tables to a volume producer who came in with a lower bid and a simpler design. My courting efforts went for naught.”

To reach his customers, Bob’s marketing strategies take on many forms. “To lend an aura of seriousness and professionalism to my work, I’ve had brochures developed that include photographs of my pieces and a price list.” These Bob uses for blind mailings to interior design and architectural firms. He again uses them when following through on a second strategy—placing speculative pieces at such places as a furniture show, show home, or hotel lobby where the right people will see them. “I don’t place a piece where I have to pay, such as a gallery,” Bob says.

Occasionally, the craftsman places an ad in the local newspaper to help maintain a presence. But like many custom woodworkers, Bob gets much of his business through word of mouth.

**Cares and costs that won’t go away**
Along with filling customer orders with finished furniture pieces—the fun part—Bob must look after the burdensome costs that typify many small businesses. Included below are the items making up his operating costs:

- **Building rental**
- **Labor costs**
- **Electricity, heating, water, and sewage**
- **Taxes, specifically, in-state retail sales tax, personal taxes on equipment, assessed valuation on personal property, and employment tax.**

Bob has found a degree of help, though. “If you have payroll, withholding can foul you up. So I use a payroll service to take care of deductions and issue checks [for workers]. Right now, that service costs me $16 a week for two employees,” he explains.

*Commercial, general, and property liability insurance* (to protect the building and its contents from such things as fire loss.) “Here,” Bob says, “I include machinery, and something someone may not readily think about—work in progress, and the templates that might be used for future work.”

Bob also pays *premiums* on a one million dollar product liability policy should someone become injured while using a furniture piece he made and sold. He also carries *workman’s compensation* to cover worker injuries incurred in the course and scope of their employment with him.

Finally, he picks up the tab for *automobile insurance for the vehicles* that he owns and uses in the business. “All of these things must be taken into consideration when charging a customer for your products,” Bob advises.

**Quality design: job one**
Bob’s furniture designs have roots that run deep and wide. “I try to be up to speed on a design,” he says. “I own every furniture book there is.” Before taking pencil to
Bob's Calista table, left, draws its ribbed support system from a Norwegian antique design.

paper, though, he spends ample time researching work by the masters, people like Sam Maloof and George Nakashima, and by poring over many examples of period pieces.

In addition, he's careful not to impose his own tastes on furniture pieces his clients may want. "I have a real reverence for people's own aesthetic," he says.

What style does his furniture fit into? Something called "American style." The way Bob sees it, his work contains elements of the Arts and Crafts style, as well as the clean economy of design found in Shaker furniture. His signature accents include splines in contrasting woods, inlay work, mortise and tenon joinery, and hand-cut dovetails. Above all, each piece Bob produces must—by his own criteria—be a "sensible design, well executed, with beautiful materials."

Poised for the long haul
Besides his design concerns, Bob runs a smart shop. For popular designs of which he may make several, he keeps an inventory of patterns and jigs. Many of the latter see construction duty in a variety of furniture pieces.

Bob moves furniture orders through a well-organized set of stages (see right) while continually soliciting new business. Few days pass without interesting challenges. He enjoys tackling a new custom design, and getting lost in the project. "You lose a sense of time and space—it's a Zenlike experience that is personally transforming," says Bob.

His biggest kick? According to our craftsman, "taking something from raw material to a finished product that exceeds the expectations of your customer."

Bob's Grand Plan For Customer Satisfaction
Customer service stands at the top of Bob's priority list. We asked him to describe his working relationship with clients. His approach fits neatly into eight hardworking stages:

Stage 1: INITIAL CONTACT
Bob receives a phone call or letter from someone interested in having him make a furniture piece. He responds quickly and sets up the first meeting.

Stage 2: FIRST MEETING
Bob meets face-to-face with his customers and finds out what they want. "Many times, people don't know exactly," Bob says. He asks how the piece is to work, discusses the setting for the piece, reviews photos or pictures of sample pieces, and has the customers decide on the wood type.

Stage 3: DETERMINING PRICE
After the first meeting, Bob figures a "range of costs with options." He does this by taking into account the design, meeting time, building labor, overhead, and profit. "I typically want 25 percent profit out of a piece that I make for someone," Bob says. He calls or writes his customers with
the product costs, in part to develop “a clarity of understanding,” Bob claims, “More times than not, the customers scale back.”

**Stage 4: SECOND MEETING**
With a rough price decided on, Bob meets with his customers to flesh out the design details. He refines the costs and requests a 50 percent deposit that initiates the custom furniture order.

**Stage 5: DESIGN WORK**
Turning to his drafting table, Bob draws the working shop plans for the commission. Included are details, patterns, section views, and elevations. He numbers the drawings and refers to them as the “official documents” in the product invoice.

**Stage 6: FINAL MEETING**
During this get-together, Bob will “button down” any lingering questions the customers may have. They look at stain samples, select hardware, decide on door-panel profiles and other construction and design details.

**Stage 7: CONSTRUCTION**
At last, Bob and his crew turn on the tools and begin building the commission. “I keep an open-shop policy,” comments Bob. “Customers can drop in unannounced and see how their piece is coming. If they change their mind and want a curved profile, I do that for them.”

**Stage 8: DELIVERY TIME**
Sometimes, Bob delivers a furniture piece; other times, his customers will choose to pick it up. “To hand off a project is delightful. People are often shocked that it’s better than they imagined.”

After customers have had a commission for awhile, Bob writes or calls them and asks how the piece is performing. “People appreciate this,” he says. Bob offers a lifetime warranty for all of his furniture pieces and deals with defects right away. “You don’t want to let a little problem become a big one. Customer service is also a way of marketing,” he advises.

*Written by Jim Harrold
Photographs: Bob Hawks, Matt Spaulding*

---

**Bob’s Best Tips for Aspiring Woodworkers**
- Don’t enter the custom-design business without extensive woodworking experience.
- Expect to take several years to be fully up and running.
- Don’t underestimate a job, and always be candid with people about costs of the finished product.
- Be sure you have the personal support of your family.
- Be conservative in your expectations of the business. Not everybody cares about wood and all its intricacies the way you might.
Many experienced woodworkers feel that they can't do without a jointer. That's because you can't beat one for fast and accurate edge and surface preparation, and other operations such as chamfering a board. But unlike the trusty hand plane it replaces, a jointer can really bite if you're not careful. Here are some tips that will save you a Band-Aid or two.

More affordable than ever, jointers have become commonplace in home woodworkers' shops. Now, you can select from four-, six-, and eight-inch jointers in a range of prices. No matter the size or the price, though, all hand-fed jointers can cause injury.

Accidents primarily occur when the fingers or hand slip off the workpiece and into the knives of the cutter head. Improper feeding and adjustment also can cause accidents. So before you use a jointer, read the manual that came with it, then practice the following advice gleaned from the WOOD® magazine shop, the National Safety Council, and industry sources.

**Get ready, get set**

As with other power woodworking equipment, using a jointer dictates wearing safety glasses and ear protection. To avoid being suddenly pulled into the cutter head, do not wear gloves; remove all jewelry; tie back long hair; tuck in loose clothing; and roll long sleeves above the elbow. Also heed the following advice:

- Use only extremely sharp knives on a jointer.
- Never make adjustments to the fence, table, or anything else when the machine is running.
- Be sure to tightly secure the fence and table-adjustment locks before jointing stock.
- Before pushing stock against the knives, let them reach full speed.
- Position yourself to the side of the infeed table to avoid any possible kickback of the workpiece. Never stand directly at the end of either table.
- Perform all operations with the guard in place.
- Do not back the workpiece toward the infeed table.

**Security in a safe setup**

You wouldn't change the bit in your router without unplugging it, so give your jointer the same respect. Always unplug the machine before adjusting the knives. And there's more.

- Proper setting means that the opening between the table and the cutter head should be just large enough for the knives to clear. Also set the knives so that they are parallel to the outfeed
SAFETY

table and all at the same height.
  • Lock the adjustable outfeed table securely in position. If vibration should cause it to drop, the knives will seize the stock and possibly your hands, too.
  • Your jointer should be fitted with a cutter guard that self-adjusts out of the way when hit by the stock. Make certain that the return spring has enough tension to return the guard all the way to the fence no matter where the fence is set.
  • Some older jointers, and at least one current model, do not have a guard behind the fence. As shown in the photo right, this exposes the spinning knives when you set the fence closer to you and can lead to accidents. Check with the manufacturer for the availability of an after-market fence if you own such a jointer.

Watch what you cut
No matter how confident you feel with your jointer, never perform any “freehand” operations that do not require the use of the fence to position and guide the work. Keep these points in mind, too:
  • To keep hands away from the knives, use a pushstick and push-block to hold the stock. For shorter lengths of stock (keep in mind, never less than 12" long), always use a pushstick or block that requires two hands. On longer stock, use a pushstick on the end to prevent fingers from slipping off the wood and into the revolving cutterhead.
  • Avoid heavy cuts that may jam the cutterhead: Remember to take off no more than \( \frac{1}{6} \)" on softwoods and even less on hardwood stock.
  • Never joint or bevel workpieces less than \( \frac{3}{4} \)" wide or \( \frac{1}{4} \)" thick. And always use a hold-down or push-block on wood narrower than 3".
  • Don’t plane wood on the jointer that is thinner than \( \frac{1}{8} \), and use hold-downs or a pushblock on wood thinner than 3".
  • To avoid chatter and excessive chipout, always joint with the grain, as shown in the drawing below left.
  • Never run end-grain stock against the knives because it can shatter. Knotty wood also requires extreme care because knots can rip loose from the board and jam the knives. And be sure to check the workpiece for nails and other foreign objects that will damage the cutter head. Due to the hard adhesives, jointing plywood edges will nick and gum up the knives.
  • When surfacing stock on a jointer, keep both hands on top of the workpiece, never on the front or back edge, and use a pushblock. When halfway through the cutting pass, shift pressure on the stock to the part already cut. Pressure on the stock’s back end can cause it to be pulled down into the knives.

Beware of exposed cutters on some older jointers not fitted with a guard behind the fence.

HOW TO FEED A JOINTER

Photographs: John Hetherington
Illustration: Roxanne LeMoine
JOINTERS UNDER

Good bargains can prove elusive in the world of woodworking machinery. Often, trying to save a few dollars means sacrificing quality. If, however, you are considering buying a jointer, we have some good news for you.

We rounded up 17 jointers from 12 manufacturers and measured the critical components for accuracy, tried out the table elevations and adjustments, and jointed a lot of wood. To focus our efforts, we narrowed our selection to 6" and 8" jointers that cost under $1,000. We consider a 6" jointer the minimum size you need for most woodworking projects. And the machines above the $1,000 mark skyrocket in price.

The good news is that every machine proved capable of flattening and straightening stock. We found plenty of differences, though. Most had to do with convenience and personal preferences. Now, let's find out what these differences mean to you.

1. Tables: look for length and adjustability

A jointer has infeed and outfeed tables, collectively called the bed, for workpieces to ride on. The longer the bed, the longer the workpiece you can straighten on it. The 42-46" beds found on most 6" jointers will handle stock up to about 6' long. Benchtop jointers offer much shorter beds, but also several unique features. To find out more about these, see page 47. For stock up to 8' long, you're better off using an 8" jointer with a 65-67" bed.

The lengthwise flatness of all the tables fell within the .010" limit we set as a benchmark for accuracy. Jointing accuracy also depends on having tables that are parallel end to end. All of the machines except the Sears and the benchtop models enable you to adjust both the infeed and outfeed tables, as shown in the illustration on page 46, to obtain two parallel surfaces. With these adjustments, we could fine-tune these jointers to within about .004" of parallel—plenty accurate for any woodworking task.

Sunhill bolts cast-iron table extensions to the infeed and outfeed tables on both of its jointers. These increase the total bed length by 7" and add about 18" to the length of the stock you can joint on them.

2. Motors: extra power comes in handy

With the exception of the benchtop units, which use universal motors, all of the jointers in the test are powered by induction-style motors. Most can be wired to run on either 110- or 220-volt current, except for the 8" Sunhill and 8" Reliant jointers, which only accept 220-volt current.

The extra power of the 1.5- and 2-hp motors on the 8" jointers comes in handy when you've got a lot of face-jointing to do. The 6" jointers also will, however, face-joint well; they just require a slower feed rate and shallower cuts.
$1,000 Eight things to know before you buy

3 Table adjustments: choose the type that suits your style of work

Jointers come with either levers or handwheels to adjust the height of the tables. See the illustrations on page 46. You can raise and lower a heavy cast-iron table quickly with a lever, but levers don’t give you micro-fine control. Your shoulder and arm do the lifting. Handwheels give you fine control, but the torque comes from your wrist—hard work if you’ve got arthritis or an injury that impairs your grip.

Handwheels make the most sense for outfeed table adjustments. You only set the height of the outfeed table when you change the knives, and this adjustment must be accurate. As for the infeed table, some woodworkers change this setting several times a day. A lever can keep this from becoming a tedious chore.

On the infeed table, levers work best if you use a jointer to true-up rough stock. If you’re more likely to use the jointer to precisely dimension stock or clean up saw marks, then go with the more-precise handwheel design.

Among machines with handwheels, AMT and Jet put the wheels on the front of the cabinet (rather than under the tables) for easier access. We found the wheels in this location to be easier and more comfortable to use than the other handwheels.

4 Fences: the best machines give you accurate repeatable stops

Jointer fences come in two basic types, center-mount and side-mount. Only the General, Sears, and Woodtek models use a side-mount fence.

Except for the Delta, the remaining jointers come with one of two types of center-mount fences. The Bridgewood, Jet, and Reliant 6" jointers tilt on a curved bracket as shown below left. The fences on both Enlons, both Grizzlies, both Sunhills, and the 8" Reliant tilt on a hinged steel rod and slide in and out on a pair of cast-iron plates, as shown top right. The only difference we found is that the curved brackets provide a slightly smoother tilting action. Of the 17 machines, only the Delta 37-190 and the General provided stops with enough stiffness to accurately lock the fence into place at 90° and 45° every time. The stops on the remaining machines had enough play in them to occasionally throw the fence off 0.5° or so. We don’t consider this a big drawback. You don’t change this setting often, and the error can be corrected by locking the fence with a square held firmly to it and the outfeed table.

Consider also the direction the fence tilts. Most of the fences tilt out, except for the Delta 37-190, the General, both Reliants, and the Woodtek. Their fences also tilt in, thus trapping the board during bevel or chamfer cuts. This trapped cut gives you an extra margin of safety in that the workpiece can’t slide down off the fence and expose your hands to the cutterhead.

A hinged rod controls the tilt mechanism on the Sunhill jointer.

Side-mounted fences, like the one on this General jointer, control the tilt and sliding mechanism from one handle.

To maintain an accurate stop, the Delta fence uses a spring-loaded pin that locks into a tapered groove in the collar attached to the large rod on the fence.

Continued 45
Guards: these should work smoothly

Except for the General and the Sears, all of the jointers in our test came with substantial cast-aluminum guards. General uses an even beefier cast-iron guard, and Sears uses plastic. To cut rabbets, you can remove the guards on the front edge of the jointers, as shown upper right, except for the Sears, General, and benchtop jointers. The General allows you to rabbet the edges of boards, but not the faces. The Sears and benchtop jointers do not include a rabbeting ledge.

We liked the guard tensioning system on the Enlon jointers the best. As shown lower right, you simply loosen a set screw in the front edge of the guard boss, and turn the knob on top until you have the proper tension.

On the Reliant and Sunhill jointers and the Grizzly 8", you reset the spring tension by turning a small roll pin around the pivot shaft of the guard. Turning the roll pin around enough to tension it causes the pin to bite into your fingers and this might be impossible for someone with an impaired grip. The remaining jointers employ a knurled knob on the underside of the guard boss that you twist to tension the spring. These knurled knobs go easy on the hands, but require some trial and error to set the tension right.

Knives: some install easier than others

Most of the knives were well-sharpened and properly set at the factory. We also found all the cutterheads balanced and detected no significant runout.

To enable you to set the height of the knives, the AMT, Delta, and Sears jointers use jack screws that lift them to the proper height. The General employs an older system that forces you to pry the knives up, or use a magnetic knife-setting jig while you tighten the gib bolts. On the remaining machines, springs push the knives up when you loosen the gib bolts. In comparing the springs and jack screws, we found that the jack screws make it easier to fine-tune the height of the knives.

One innovation that aroused our curiosity was the four-knife cutterhead offered on the 8" Sunhill jointer. We found the edges and faces joined on this machine to be slightly smoother than any of the others. This we attribute to the extra knife. And when given the torture test—face jointing a wide board with a deep cut—the 8" Sunhill required less feed pressure and gave us less chatter than any other jointer. The only drawback to this system is that you'll pay 25 percent more come sharpening time and 25 percent more when you have to replace the knives.

HANDWHEEL ELEVATION MECHANISM
A machine screw attached to a handwheel raises and lowers the table which slides on the gib and dovetailed ways.

LEVER ELEVATION MECHANISM
A simple lever works against a fulcrum mounted on the base of the machine to move the table.

TABLE LEVELING
To adjust the tables parallel with each other turn the gib set screws which causes the table to tip towards or away from the cutterhead.
7 Stands: legs provide balance on rough floors

If the floor of your shop is rough or uneven, you may want to purchase a jointer with four legs such as the Delta 37-190 and Sears joints. (AMT offers a hybrid of two sheet-metal panels open on each end.) The enclosed cabinet stands on the rest of the jointers work fine on a smooth floor, but require shimming to remain steady on an uneven floor.

Enclosed stands do a better job of corralling woodchips and protecting the motor, pulleys, and belts from dust. Delta’s jointer, however, includes a shroud for the motor and pulleys, and a chip chute in front. The narrow opening on the chip chute tends to clog when you’re running a lot of stock through at one time, but the chute also includes an attachment that allows you to hook it up to a dust collector.

8 Manuals and assembly: good instructions take the frustration out of setup

No manual will make a jointer cut better, but if you’re not familiar with knife-setting or table-adjustment operations, look for a jointer with a good manual. The chart on page 49 shows which manuals are thorough, clearly illustrated and easy to understand.

The Delta and the General (and both benchtops) were set perfectly right out of the box. The rest required minor adjustments, mostly to get the tables parallel. The Delta, General, Jet, Sears, and Woodtek jointers come prewired which saves you that step.

In setting up these machines, we encountered only four problems. The stand on the AMT jointer came with misaligned bolt holes, one of the knives on the Grizzly 8” jointer measured .004 above the rest, and the infeed table on the Reliant 8” jointer required substantial tightening of the gib screws to bring it into alignment.

None of these problems took more than an hour to diagnose and correct. We also traced a vibration problem on the 8” Enlon to an out-of-round pulley, which the company replaced.

BUYING MACHINERY BY MAIL

What to know before you phone

Most of the jointers we tested come from mail-order catalogs. These machines offer you good value, but note that some prices do not include shipping. If you live near a mail-order company with a showroom, you may be able to haul a machine home yourself, saving on the freight costs. If not, shipping a 400-pound jointer may cost up to $150, depending on how far you live from the warehouse.

You also should ask mail-order companies about warranties, availability of spare parts, and the return policy. When something breaks or wears out on a tool purchased locally, you can get a replacement part from a full-service dealer immediately or within a few days. If you can’t install the part yourself, a technician will do it for you.

Most mail-order companies also support their equipment with replacement parts. But to get a part fixed or replaced requires that you ship the part back first. The turn-around time may take several days or longer, and you’ll have to install the part yourself. If you aren’t mechanically handy or don’t want to wait for a mail-order part, you may be better off buying from your local dealer.

BENCHTOP JOINTERS

More convenience, but less capacity

If you work in a too-small shop and don’t need to straighten long stock, a benchtop jointer may offer you the best solution. The Delta 37-070 and the Ryobi JP155 differ considerably from the rest of the floor-standing behemoths we tested, but they deliver good results within their limitations.

Powered by universal motors, both jointers spin their two-knife cutterheads up to three times as fast as jointers with induction motors. Both models also offer variable speed the Delta runs from 6,000 to 11,000 rpm, and Ryobi spins at 8,000 to 16,000 rpm. All universal motors create a lot of noise, so ear protection is mandatory.

To set the knives on these jointers, you use jack screws. Clamp bars and through bolts hold the knives to the cutterheads. A convenient cutterhead lock holds the knives at top dead center. All of the knife setting systems, these prove the easiest to work with.

Where benchtop jointers fall short is their capacity. With a bed length of 30” for the Delta and 28” for the Ryobi, neither can straighten edges on boards longer than about 4’. Depth of cut is limited to ¾” on the Delta, ¾” on the Ryobi.

As far as differences between the two benchtop jointers go, we preferred Delta’s taller fence: 4½” versus Ryobi’s 3”-high fence. But we also liked Ryobi’s smooth stainless-steel outfeed table better than the cast-aluminum table from Delta. The Ryobi weighs less: 26.8 pounds compared to 35 pounds for the Delta, and Ryobi’s faster top speed delivers smoother results and less tearout on wood with difficult grain such as birdseye.

Continued
Our Picks

Of the 6" jointers, the General stood out as a clear winner. We found it precise, balanced, smooth, and flawlessly finished. If you are watching your budget, however, the Delta 37-190 offers nearly identical performance at a much lower price and got our vote as the best value in this category. But, with a few adjustments, the rest of these jointers will cut...
perfectly square edges and flat faces as well. If you are interested in these, we suggest you shop for the features you want and the best price.

In the 8th category, the Sunhill’s four-knife cutterhead and table extensions merit the extra money you’ll pay for this machine. In terms of value, the rest of these machines fall within $80 of each other and offer nearly identical performance. We give the edge to Enlon because it comes with a handwheel to adjust the outfeed table, nylon tabs that prevent the fence from dragging on the table surface, and a finger-friendly guard tensioning mechanism.

Of the benchtop joiners, we rated the overall performance as a tie. Your choice will depend on personal preferences. The Ryobi is lighter and easier to carry, but the Delta has a taller fence that improves stability when you edge-joint wide workpieces. The Delta costs $70 less than the Ryobi, giving it the edge in value.

Written by Tom Jackson
Product testing: Dave Henderson, Bob McFarlin
Illustrations: Kim Downing
Photographs: John Hethcington

---

### JUDGING JOINTERS

<table>
<thead>
<tr>
<th>Cutter-Head</th>
<th>Tables</th>
<th>Table Adjustments</th>
<th>Performance (4)</th>
<th>Overall Score (6)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Knives</td>
<td>Blade Setting (S)</td>
<td>Overall Length</td>
<td>Assembly &amp; Setup</td>
<td>Ease of Use</td>
<td>Edge Joining</td>
</tr>
<tr>
<td>3</td>
<td>JS</td>
<td>46</td>
<td>Y</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>3</td>
<td>S</td>
<td>46</td>
<td>Y</td>
<td>E</td>
<td>F</td>
</tr>
<tr>
<td>3</td>
<td>JS</td>
<td>46</td>
<td>Y</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>3</td>
<td>S</td>
<td>47</td>
<td>Y</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>3</td>
<td>MS</td>
<td>42.5</td>
<td>Y</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>3</td>
<td>S</td>
<td>47.5</td>
<td>Y</td>
<td>G</td>
<td>E</td>
</tr>
<tr>
<td>3</td>
<td>S</td>
<td>46</td>
<td>Y</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>3</td>
<td>S</td>
<td>46</td>
<td>Y</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>3</td>
<td>JS</td>
<td>35.5</td>
<td>N</td>
<td>N/A</td>
<td>E</td>
</tr>
<tr>
<td>3</td>
<td>S</td>
<td>53</td>
<td>Y</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>3</td>
<td>S</td>
<td>42</td>
<td>Y</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>3</td>
<td>S</td>
<td>66.5</td>
<td>Y</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>3</td>
<td>S</td>
<td>65.5</td>
<td>Y</td>
<td>G</td>
<td>E</td>
</tr>
<tr>
<td>3</td>
<td>S</td>
<td>66</td>
<td>Y</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>4</td>
<td>S</td>
<td>73.5</td>
<td>Y</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>2</td>
<td>JS</td>
<td>90</td>
<td>N</td>
<td>N/A</td>
<td>E</td>
</tr>
<tr>
<td>2</td>
<td>JS</td>
<td>90</td>
<td>N</td>
<td>N/A</td>
<td>E</td>
</tr>
</tbody>
</table>

---

4. Excellent 5. (FMW) Front-mounted handwheel (LV) Lever
5. Good 6. Based on a scale from 1-10, with 10 being the highest possible score
Fair 7. First year motor - 10 years machine
Poor 8. (C) Canada (J) Japan
9. * Price does not include shipping (T) Taiwan (U) United States
10. Who to call for more information:
   AMT: 800/435-8685
   Bridgewood: 800/236-2100
   Reliant: 800/777-7899
   Delta: 800/438-2486
   Ryobi: 800/225-2579
   Enlon: 800/868-6967
   Seaco: 800/377-7414
   General: 819/472-1161
   Sunhill: 800/226-4321
   Grizzly: 800/541-5537
   Woodtek: 800/645-9262

---

WOOD MAGAZINE  DECEMBER 1995
49
Woodworking jigs don't just happen. Most times they result from a woodworker trying to find an easier or more accurate way to accomplish a workshop task. At least that's been our experience in the WOOD magazine shop. On this and the following five pages, we show you how to make 10 of the most useful jigs from our shop. Here's hoping that you find them equally helpful in your woodworking.

1. Rock-solid outfeed table
If you've had much experience using commercially available roller-stands as outfeed tables, you're already well aware of their shortcomings. Namely, they like to tip over. And, unless you precisely align the roller(s), they tend to track the workpiece off to one side or the other. Add to that the cost and limited uses for roller-stands, and we believe there has to be a better way!

Here's a no-cost solution that works in conjunction with what we consider to be one of the most versatile tools for any workshop: a Black & Decker Workmate. Simply join two pieces of leftover ¾" plywood to form a "T" as shown below. If desired, you can apply paraffin wax or plastic laminate to the top surface, allowing your workpiece to slide more smoothly. Or, build the top surface from a piece of melamine-coated particleboard or kitchen countertop if you have a scrap handy.

**OUTFEED TABLE**

<table>
<thead>
<tr>
<th>3/4 x 3/4 x 22&quot; cleats</th>
</tr>
</thead>
<tbody>
<tr>
<td>#6 x 1/4&quot; F.H. wood screw</td>
</tr>
</tbody>
</table>

---

**We're looking for a few good woodworking jigs**

Do you have a jig or two you've developed during your years as a woodworker? If so, and if you think other WOOD magazine readers would benefit from seeing your idea, send us a snapshot or drawing of your jig and a brief description of what it does. We'll pay you $100 if we publish it in the magazine. What do you say? That extra money might come in handy the next time you spot a woodworking tool or product you'd like to buy.

Send your jig idea to:

My Favorite Jig
WOOD Magazine
1912 Grand Ave.
Des Moines, IA 50309-3379
**Wood Jigs Shop**

2 **Multipurpose thickness blocks**

Once you make a set of hard-maple thickness blocks, you'll wonder how you ever got by without them. Around our shop we use these to set the position of fences on tablesaws, router tables, and biscuit joiners. They also come in handy for adjusting the height of sawblades and router bits.

For example, the photo *left* shows how you can use them to set the depth of cut on your plunge router. Simply adjust the machine so the router bit contacts the surface the router sits on. Lock the router in place, and use the block of your choice to set the distance between the threaded depth-adjuster rod and one of the screw heads on the depth-stop turret.

We use a set of blocks that range from ¼" to 1" thick in ¼" increments. If you have the need, you can make thicker blocks, or produce them in finer increments, too. To make a set like ours, start with a 1×1½×36" piece of hard maple. Cut a 3"-long piece from one end for your 1" block. Then, run the workpiece through your planer until it's ¼" thick. Saw off a 3"-long piece, and continue this process for making a block of each thickness.

With your blocks cut to thickness and length, mark each with its thickness. Drill a ½" hole into the blocks so they slip onto a ¼" dowel mounted to a base. You can stand the base on a work surface for portability, or attach it to a wall for saving space.

---

3 **This jig takes the hassle out of boring into ends**

Sure, it's a snap to drill into the faces or edges of most workpieces. But what about boring into the ends of long rectangular stock or dowels? This simple jig does the trick, with perfect precision and control.

To accommodate long stock with a benchtop drill press, mount the drill press at the end of your bench. Then, rotate its head to clear its work table and the workbench top.

---

*Continued*
Are you ready for on-the-money miters?

Once you build this little beauty, you can rest assured that your miters will always match up. Here's how to put one together.

First, place one miter-slot guide into each slot on your saw table. Align the 1/2" plywood piece on top of the guides so its long edges are perpendicular to the miter slots. With the plywood resting on the tablesaw surface, drill 5/8" shank holes through the plywood and into the guides just far enough to mark their position. Remove the plywood and guides, and drill 3/8" pilot holes through the guides. Reposition these pieces on the tablesaw, and attach the guides with countersunk #8x1"-long brass wood screws. Drive the screws through the guides, lift the assembly off the table. Drive the screws completely and sand off their protruding tips.

Again, place the jig onto the tablesaw surface, turn on the saw, and cut a kerf that goes about halfway across the width of the plywood.

The key to this jig's accuracy is installing the miter fences precisely. The drawings below take you through the first two alignment steps. Use this process to temporarily attach each fence with two #8x1" screws. Test the fences for accuracy by cutting four sample pieces, each about 1" wide and 4" long. Hold them together with a rubber band and check for any gaps at the miters. Adjust the position of the fences as necessary by tapping them with a hammer. Once you're satisfied that the fences are in exactly the right position, permanently attach each of them with three #8x1 1/4" screws driven from the underside of the plywood surface (not shown on the drawing above).

Finally, it's a good idea to attach adhesive-backed, 100-grit sandpaper to the fence faces. This will help hold your workpieces steady during cuts.
Right-angle jig gives you a corner on clamping tasks

Anytime you need to hold two large workpieces at a right angle, say while you're screwing or gluing them together, you need one or more of these plywood triangles. As shown in the photo left, these right-angle jigs have two notches for accepting clamp jaws. The circular cutout comes in handy for temporarily holding the jig in place with a spring clamp while you position bar clamps on the notches. It also gives you a way to hang the jig on a peg when you're through.

Like most of the jigs in this article, the more you use this helper the more jobs you'll find for it. Although we designed the jig for carcase assembly, we also found it handy for holding an on-edge picture frame rigidly to a bench as we sanded the frame's edges.

Evenly spaced holes were never so easy

With this jig clamped to your drill-press table, you can bore an unlimited number of evenly spaced holes. Here's how it works.

First, mark and drill two precisely spaced holes at one end of your workpiece. Place the jig on your drill-press table, and set one of the jig's dowels into the hole closest to the end of the workpiece. Align the fence so the drill bit slips into the other hole, and clamp the jig in place. Now, slide the workpiece along the fence until the dowel slips into the hole that you lined up with the bit. The workpiece should be precisely located for your next hole. Drill the hole, slide the workpiece so the dowel fits into the just-drilled hole, drill another hole, and repeat these steps as necessary.

The jig shown here has dowels for ¼"- and ⅜"-diameter holes. If you're drilling holes of other diameters, simply make more dowels and the slotted piece that holds them. After mounting the wooden balls on the dowels, you will have to sand them slightly so they slip into the holes in the jig and into the holes you're drilling.

Continued
Mount drawer pulls in a jiffy
You can build this jig in a minute or two, and with it you can slice many more minutes off the task of precisely drilling drawer-pull mounting holes.

To use it, first cut a 1/8” or 1/4” scrap piece to 5 1/4”x12”. Then, mark a vertical centerline on the jig. Mark and drill centered holes for the pulls on both sides of the vertical line. For most drawers you will want to locate the holes in the jig so the pulls are centered on the height of the drawer fronts. Then, mark the center of each drawer front on its top edge, align the jig’s vertical centerline with it, and drill the holes as shown above left.

Auxiliary planer bed helps you in two ways
Thickness planers are wonderful tools, but like most machines, they have their limitations. Many of them will not thickness stock thinner than 1/4”, and none of them will plane a bevel. However, outfitted with an auxiliary bed, any planer can perform both of these tasks. We designed our bed to fit a Delta portable planer, but you can change the dimensions, and the shape of the bottom-side cleats, to fit any planer. (The cleats prevent the jig from sliding on the table.) The 3/4” thickness of the auxiliary bed raises the height of the workpiece so that you can plane stock less than 1/4” thick. There’s no danger of damaging the knives because at the worst they will only cut slightly into the plywood surface.

By adding a spacer block under one side of the auxiliary bed, as we did in the photo left and the drawing right, you can raise that side so the planer cuts a bevel. You’ll find this handy for making such things as siding and thresholds. Note in the photo that we clamped down both sides of the jig. And, we added a fence spacer on the low side of the jig to prevent the planer knives from cutting into the bed before it cuts the full depth of the bevel.

Smooth hardwood plywoods such as birch or maple work well for the auxiliary bed. If you use a lesser grade, sand it as smooth as possible and apply paraffin wax to lubricate its surface.
adjoining doors. After drilling holes for one handle, just flip the jig over and drill from its other side for handles located on opposite door sides.

And now, an efficient way to install door handles
This jig works much like the drawer-pull jig, left. But, as you can see in the drawing, it has solid-wood cleats on both sides so that you can locate handles on either the left or right side of

10 Hold-downs work where clamps or your hands won’t
For drilling jobs, it’s essential that you hold the workpiece securely to the table and against a fence before engaging the bit. With smaller workpieces you may not have clamps with the necessary jaw depth, and, as shown in the example above, you don’t want to get your fingers close to knuckle-busting circle cutters. Hold-downs are the answer, and here’s a version that will only set you back the cost of the knobs and all-thread rod. (Many woodworking catalogs carry such knobs.)

We drilled three holes into each side of our drill-press table for accommodating workpieces of various sizes. Each hole is outfitted with a T-nut for accepting the ¼”-all-thread rod.

You’ll find a full-sized pattern of the hold-down on the WOOD PATTERNS™ insert in the center of the magazine.
For ten years, my annual travel agenda has included a visit to a veneer mill. Somehow, I
never got to one. You know, "the best laid plans . . ."
I pledged that it was going to be different this time around and seriously started looking up
veneer mills in the national Hardwood Plywood Manufacturers Association (HPMA) directory. Believe me,
they’re all over the map. But hey, I found one close to home, in Iowa.

I visited the mill last February. What an experience that was. Seeing all that beautifully figured and rich-looking
veneer coming off a log was really memorable. And I’ll never forget their scrap pile—it made me want to take
up marquetry. Anyway, here’s hoping you enjoy my report as much as I did the visit. By the way, that’s me above posing with a cant hook next to some giant madrone burls.

Sheets of walnut veneer, kept in order as they were sliced off the flitch, creep down the conveyor from the dryer. Pressing and banding further flattens them.

"In board form, or as flat-sliced veneer, we call this wood bubinga. But as rotary-cut veneer, it’s dubbed kewazinga in the trade because of its striking figure,” says Paul Johnson. He and a helper slowly fill a crate with carefully placed sheets of veneer.

A forester trained in the field of wood products, Paul co-manages with Mike Larson the production at R. S. Bacon Veneer Company, an industry supplier of architectural and furniture-quality veneer in Grundy Center, Iowa.

"Veneer samples like these go to salesmen at our showrooms in Chicago, New York, and Calgary, Alberta," comments Paul. "From each flitch, or half-log, that we’ve sliced, we put in three samples—one from the outside of the trunk, one further in, and one from the middle. That way the buyer can see if the color and figure are consistent.” But getting those beautiful samples resembles reassembling a tree.

Heartwood from the Heartland
Odd as it may seem to find a manufacturer of high-quality veneer in the cornfield setting of central Iowa, there’s a reason for it. "The company was founded in Chicago in 1898, then moved to Dubuque until 1980, when the family built this facility on their farmland," explains Paul. "Strange? Not actually; we’re still real close to the best walnut in the world.”
Black walnut from northeast Iowa by far represents the greatest amount of veneer produced by R. S. Bacon. All together, though, the company slices about 20 species of domestic hardwoods, and markets about 100 exotics. All the domestic woods come in by truck as logs or burls (especially Oregon madrone). The exotics arrive pre-sliced to their high specifications. "Slicing in the country of origin adds more value to the exported wood," notes Paul. Between the domestics and the exotics, the company continually maintains a veneer inventory of 40 million square feet!

Who buys it? A subcontractor who builds walnut-burl dashboards for Mercedes automobiles. Another who does a similar job for Cadillac, but with zebrawood. Even an occasional order for extra-thick veneer—for guitar parts—goes out to major manufacturers like Gibson. The furniture manufacturers in North Carolina, such as Thomasville, take a big bit. So do commercial cabinetmakers, suppliers of hardwood plywood, and architectural firms and their builders.

Regarding architectural use, Paul has noticed that preferences in wood have been changing. "Executives in billion-dollar corporations no longer want the look of exotic wood in their offices because of the rain-forest thing. Instead, they demand highly figured domestics. But all of the exotic veneers that we sell come from sustainable sources, too."

**How to take a log apart and put it together again**

"An average-sized walnut log eight and a half feet long and about 25" in diameter yields from 2,000 to 2,500 square feet of veneer, depending on how thin we slice it," says the plant manager. At R. S. Bacon, they slice veneer to a minimum thickness of ¼" and a maximum of ⅛".

Paul excuses himself for a minute to fetch something from the office. He returns displaying a long, very flimsy length of yellow birch veneer. It looks like adding machine tape.

"This veneer is from a Wisconsin mill owned by Japanese interests," he says. "It's about ⅛" thick. Why, you can see through it! Our customers wouldn't stand for veneer that thin."

The manufacture of veneer begins at the on-site sawmill, where delivered logs get scaled for volume and examined for defects. If a log will be sliced for veneer, as with almost all of the walnut, sawyers slab it on two sides, then saw it in half lengthwise. Logs marked for rotary slicing, such as quilted maple, the mill leaves intact.

After leaving the sawmill, logs move along in the process to the cooking vats (see photo above left). These stainless steel containers—large enough to accommodate several logs—filled with plain hot water become temporary Continued
Some woods produce more figure when rotary cut, as is being done with this big-leaf maple log turning against the knife. The veneer will feature a desirable quilted figure. Because of the log's uneven shape, it first produces small, irregular sheets.

Paul Johnson and Lin Senger carefully lay numbered samples of figured cherry into a shipping crate. A salesman in a faraway city sells the flitches of veneer they represent for paneling or furniture-grade plywood.

home to the logs prior to slicing. "The cooking softens the wood, so the harder the species the longer or the hotter it cooks," explains Paul. "Walnut cooks a minimum of three days at 156°. Maple takes two days at 165°, and white oak cooks at 175° for two days. Pacific yew takes the longest—three weeks. But we have to be careful with the white woods, such as maple. Too long in the vats and they turn brown."

The sweet-sour aroma of cooking wood permeates the plant. It hangs especially heavy near the vats, where an employee with a pneumatic plane cleans the emerging whole and half logs of their bark. At the vertical slicer, a 13'-long knife remains stationary as the wood moves up and down against it, a sheet of veneer coming off with every pass.

As the wet sheets come down the conveyors, workers stack them in the order in which they came off the log, front to back. In the trade, the completed pile of veneer from each half-log will from then on be called a flitch. Each flitch receives an I.D. number, and each bundle in the flitch carries a corresponding number. This enables the employees to trace the veneer in the vast inventory that R.S. Bacon warehouses.

**It takes care to dry veneer**

After slicing, different wood species require specialized treatment. Walnut, for instance, has a lighter color and a yellowish tint while wet. But, if left to air-dry overnight before heading into the automatic dryer, its natural chocolate color mysteriously returns. Without the air-drying, the color would look artificial. On the other hand, a white wood such as maple must immediately proceed to the dryer or it will discolor.

At the dryer, conveyors pass the veneer sheets beneath steam radiators, which dry them to about 18% moisture content. "There's an LED [light emitting diode] system on the dryer that scans the veneer to measure its square footage," says Paul. "That number is recorded for every flitch."

From the dryer, the veneer moves through the press for flattening, and further drying down to 6% moisture content. Then it will be crated, tightly banded to ensure flatness, and inventoried.

Throughout the entire process—slicing, drying, and pressing—each sheet is kept in order in the flitch, even though workers separate the sheets for each sequence. That's a lot of handwork, and a lot of bookwork. Yet it's necessary to meet the high standards of their customers. And R. S. Bacon takes yet another step in the tracking process. "Not only do we keep the sheets in a flitch numbered as to how they came off the log," says Paul, "we consecutively slice all the logs of the same species that come in from a specific area. That way, there's always continuity of color in our veneer."

Written by Peter J. Stephano
Photographs: King Au/Studio Au

Todd Speicher and a partner load walnut veneer by flitches onto a pallet for shipping to a customer. A pallet may hold up to 20,000 square feet of sliced veneer. Filling one industrial order sometimes requires 40 of those pallets.
Choose from 22 pages of original projects you can make.

Looking for a great selection of projects to help you with your gift-giving needs this holiday season? Here it is—a something-for-everyone roundup of decorations and fun-to-make items that loved ones and friends will treasure forever.
Just as the camels accompanied the Wise Men to Bethlehem that holy night, so also will our stylized set complement your other holiday decorations. In addition to making delightful and inexpensive gifts, they work great as seasonal centerpieces.

1. Using carbon paper or photocopies of the patterns and spray adhesive, transfer the full-sized patterns on the WOOD PATTERNS™ insert in the center of the magazine to posterboard or hardboard.

Project Design: C. L. Grotke
Photograph: Hopkins Associates
Illustrations: Roxanne LeMoine

WISE MEN CUTTING DIAGRAM

1/8 x 12 x 17" Baltic birch plywood

SEE THE WOOD PATTERNS™ INSERT FOR FULL-SIZED PATTERNS
Cut the patterns to shape to form templates. (Since we planned on making several sets, we made templates. If you're making just a set or two, transfer the patterns directly to the 1/8" stock.)

2 Use a sharp pencil to trace around the templates to transfer the patterns to 1/8" stock. (See the Buying Guide for our source of void-free birch plywood.)

3 Scroll saw or bandsaw the pieces to shape (we used a #4 scrollsaw blade, .035 x .014", with 15 teeth per inch; a bandsaw fitted with a 1/8" blade also works well). When cutting the notches in the parts, remember that the notch needs to be the same width as the thickness of the stock you're using. (Since we used 1/8" material for our camels and Wise Men, we show 1/8"-wide notches on our full-sized patterns. Adjust if necessary.)

4 Lightly sand the edges and surfaces with 220-grit sandpaper. Assemble the pieces as shown on the Exploded View drawing (we used a drop of instant glue at each joint to hold the pieces together). Spray on several coats of a quality gloss or semi-gloss white enamel paint. (To avoid runs, especially when in the holiday rush, we found it essential to apply several light coats rather than trying to paint the assembled pieces with a heavy coat or two. If the painted surfaces gets a bit rough, sand lightly with 320-grit paper before applying the last coat.)

**Buying Guide**

**Void-free birch plywood.**

Two pieces of 1/8" plywood (enough for three camels and three Wise Men), $9.95 ppd., four pieces (enough for two sets), $14.95 ppd., or ten pieces (enough for five sets), for $26.95 ppd. Kit no. W841.

Heritage Building Specialties, 205 North Cascade, Fergus Falls, MN 56537. Or call 800/524-4184 to order.
It's hard to beat the elegant good looks of handcrafted mission-style pieces. We've continued that tradition with this handsome 21"-tall tabletop clock. Quartersawn oak, tapered square buttons, and an "aged" copper face make for a timepiece guaranteed to garner compliments (and orders for more). So you can achieve these same results, see the Buying Guide for a source of quartersawn oak, copper, and clock parts.

Start with the face-frame stiles
1 Cut the face-frame stiles (A) to size from 1/4"-thick quartersawn white oak.
2 Clamp the stiles face-to-face with the edges and ends flush. Now, using the dimensions on the Face-Frame Stile drawing for reference, take a square and mark the mortise locations on the inside edge of each stile. Clamping the stiles together allows you to mark both pieces at once and makes for exact alignment later.
3 Clamp the pieces marked edge to marked edge. Locate and mark the button-hole centerpoints on the front face of each stile.
4 Form the mortises on the inside edge of each stile where previously marked. Although you could drill holes and use a chisel to square the holes to form the mortises, we prefer using a mortising attachment on our drill press or a mortising machine.

The face-frame rails, slats, and spacers come next
Note: See the WOOD PATTERNS™ insert in the center of the magazine for the full-sized patterns for the bottom rail (C), top (D), movement shelf (J), clock face (K), and the wood buttons (F, M). Note that the shafts on the square wood buttons needed for the clock face frame and clock face are slightly longer than those buttons used for the display shelf on page 82.
1 Cut the center and top rails (B), and bottom rail (C) to size.
2 Attach a wooden extension to your miter gauge and mount a dado blade to your tablesaw, raising it 3/8" above the saw table. Cut a piece of scrap to verify that the miter-gauge extension is square to the blade. Now, clamp
a stop to the extension for consistent lengths, and cut scrap stock to verify tenon size. See the Large Tenon and Small Tenon details accompanying the Face Frame drawing for dimensions. Now, cut 3/4"-long tenons on each end of each rail (B, C).

3 Remove the dado blade and switch back to your 1/8" blade. Cut a 3/16" groove 3/8" deep along the bottom edge of the center rail (B) and along the top edge of the bottom rail (C). See the Face Frame drawing and accompanying Large Tenon detail for reference.

Continued
4 Cut the slats (D) to size, being careful to resaw the pieces so the fronts are face grain, not edge grain. Cut a ¼" rabbot ¼" deep along each slat end where shown on the Face Frame drawing. Check that the protrusion left on each slat end fits into the grooves cut in the rails.
5 Cut the spacers (E) to size.
6 Glue and clamp the face-frame assembly (A–E), checking for square. (We used pieces of masking tape to hold the spacers in place until the glue dried. Immediately, wipe off the excess glue with a damp cloth.)
7 Drill the ⅜" holes ⅜" deep in each stile where previously marked (we used a fence on our drill press to keep the holes centered exactly 1" from the outside edge). Although the mortise and tenon joints are sufficiently strong enough for the face frame, the shafts on the buttons (F) make the joints doubly strong.
8 Cut the square walnut buttons (F, M) as instructed on page 67. The shank of the buttons must fit in the ⅜" holes in the face frame and clock face. Cut several extra of each length, we broke a few.

**Construct the Carcase**

1 Cut the clock sides (G) to size.
2 Using a square, mark the ½"-square holes on the side pieces. Drill blade-start holes, and cut the holes to shape with a scrollsaw. Or, use a mortising attachment on your drill press to form the holes. The holes allow the clock chimes to sound clearer and with greater volume than without the holes.
3 Mark the locations of the dadoes on the inside face of each clock side. Clamp the sides to the front frame to ensure that the top dado will be located directly behind the center rail (B), adjust if necessary. Cut the dadoes. Now, cut a ⅜" rabbot ¼" deep along the back inside edge of each side piece.
4 Rip and crosscut the bottom shelf (H), top (I), and movement shelf (J) to size.
5 Using Chamfering The Top drawing for reference, cut a chamfer across both ends, and then across the front edge of the top (I). (We used a pushblock behind the piece when cutting the chamfers. Use a sharp blade and keep the piece moving across the blade to prevent burn marks.)
6 Mark the location and cut a pendulum access hole in the movement shelf (J) where dimensioned on the WOOD PATTERNS™ insert. Cut a groove for the clock face in the top surface of the shelf where dimensioned. Make the groove wide enough to fit the plywood clock face with the copper adhered to it; our groove measured ⅜" wide. 7 Clamp (no glue) the carcase assembly (G, H, I, J) in the configuration shown on the Exploded View drawing. Check the fit of the carcase assembly against the face frame. The outside edges of the face frame should be flush with the outside face of the carcase.
8 Remove the movement shelf (J) from the assembly and belt-sand it so it slides easily in and out of its mating dadoes. Now, keeping the ends flush, glue and clamp the side pieces to the face frame. Glue the bottom shelf (H) in place and position (no glue) the movement shelf in place. The shelves hold help the assembly square. Again, remove any excess glue with a damp cloth.
9 To clean-up the square holes, wrap self-adhesive 100-grit sandpaper around a ⅛"x⅜"x⅛" piece of hardwood stock, and sand the square holes as shown in the photo above right.

**Bill of Materials**

| Part | Finished Size | Matl. Qty.
|------|---------------|------------|
| A slit | ⅛" | ⅛" | 21" | QQ | 2
| B center & top rails | ⅛" | ⅛" | ⅛" | ⅛" | QQ | 2
| C bottom rail | ⅛" | ⅛" | ⅛" | ⅛" | QQ | 1
| D slats | ⅛" | ⅛" | ⅛" | ⅛" | QQ | 3
| E spacers | ⅛" | ⅛" | ⅛" | ⅛" | QQ | 8
| F square buttons | ⅛" | ⅛" | ⅛" | W | 8
| G sides | ⅛" | ⅛" | ⅛" | ⅛" | QQ | 2
| H bottom | ⅛" | ⅛" | ⅛" | QQ | 1
| I top | ⅛" | ⅛" | ⅛" | QQ | 1
| J movement shelf | ⅛" | ⅛" | ⅛" | QQ | 1
| K clock face | ⅛" | ⅛" | ⅛" | QQ | 1
| L back | ⅛" | ⅛" | ⅛" | QQ | 1
| M square buttons | ⅛" | ⅛" | ⅛" | W | 4

**Materials Key:**
- QQ—quarterned oak
- W—Walnut, OP—Oak plywood

**Supplies:** ⅛" glass cut to fit, ⅛"x⅛"x⅛" flathead wood screws, clear silicone, stain, clear finish

**Buying Guide**

Movement and lumber kit. Chiming quartz pendulum movement with hands, #200485C, $26.95 ppd. Add $13.20 for a 7¼x7¼" copper blank for the clock face. COPDJAL. Add $44.50 for enough quarterned oak and oak plywood (all pieces cut slightly oversized) for the clock: $79.85 ppd. for the movement, copper, and oak. All prices in U.S. dollars. Schiabab & Sons Woodworking, 720 14th Street, Kalona, IA 52247. Or call 800/346-5668 to order.
CUTTING DIAGRAM

*Plane or resaw to thickness listed in Bill of Materials.

1/4 x 24 x 24" Oak plywood

3/4 x 71/4 x 72" Quartersawn oak

7/8 x 7 1/4" copper clock face

5/16" hole drilled through copper and plywood

Clock movement

Clock hands to 3" for hour hand and 3 1/2" for minute hand.

3/8" plug 5/16" long (sanded flush after assembly)

#8 x 1 1/4" F.H. wood screw

3/8" hole 1/4" deep with a 5/32" shank hole centered inside

Bevel bottom front and side edges of top J.

7/64" pilot hole 3/4" deep

1/2 x 1/2" holes

3/4" dadoes 1/4" deep

9/4"

9/4"

EXPLODED VIEW

CHAMFERING THE TOP

Fence

Bottom face of top I

Saw blade tilted 15° from vertical.

Note: Bottom edge of back L is flush with bottom edge of shelf H.
Add the top, clock face, back, and buttons

1. Centered side-to-side and with the back edges flush, position the top (I) on the carcase assembly, and lightly trace the outline of the carcase top onto the bottom surface of the clock top. Mark and drill 1/8" guide holes centered inside the marked outline where dimensioned on the WOOD PATTERNS™ insert.

2. Reposition and clamp or tape the clock top (I) onto the carcase top, and use the 1/8" guide holes to drill counterbored mounting holes through the oak clock top and into the top end of the side pieces (G). Remove the clamps, sand off the marked outlines, and screw the top in place. Cut 1/8" plugs, and plug the counterbores, matching and aligning the grain of the plugs to the grain of the top. Sand the plugs flush.

3. Cut the clock face backboard (K) and carcase back (L) to size from 1/4" oak plywood. The bottom end of the back (L) should be flush with the bottom end of the bottom shelf (H). Drill countersunk mounting holes through the plywood back and into the back of the carcase.

4. Using a pencil, mark the hole centerpoints on the clock face where shown on the WOOD PATTERNS™ insert. Use brad-point bits to drill the 1/4" and 3/16" holes through the copper face.

5. Refer to the article on working with copper on page 8 to "age" the copper. Left as is, the copper is too shiny and is not a good replication of copper from the time period of this clock.

6. Use double-faced tape, instant glue, or epoxy to adhere the copper face to the plywood clock face (K). If necessary, use your bandsaw to trim the edges of the copper flush with the plywood clock face. Sand or file the edges lightly to debur them. Using the previously drilled holes in the copper face as guides, drill the same-sized holes through the plywood clock face. Be careful when working with the copper not to mar the aged face.

7. Stain the carcase, shelf, and back panel. (We found Minwax Provincial #211, a perfect choice for pieces imitating that time period.) Later, apply a clear finish to the pieces.

8. Measure the opening and have a piece of 1/8" glass cut to fit. Clean the glass thoroughly. Then, slide the glass in place, and run a bead of clear silicone along the top and bottom edges of the glass to hold it in place.

9. Glue the copper/plywood clock face into the groove at a right angle to the movement shelf (J).

10. Use a drop of glue or silicone to secure the buttons in place. Note that the shanks on the buttons in the clock face are shorter than those in the face frame.

11. Fasten the clock movement to the plywood clock face. Add the battery, set the time, add the pendulum, and slide the movement shelf (J) in place. Screw the back (L) in place. To adjust the time when necessary, remove the back panel and slide the clock shelf with attached movement out the back of the clock.
MAKE YOUR OWN
DECORATIVE WOOD BUTTONS

Belt-sand the ends of square stock to start
For buttons that really stand out, choose a wood that contrasts with the project. For instance, on the preceding mantel clock project, we recommend dark walnut or EBON-X. EBON-X is a jet-black, treated-wood product that serves as an ebony substitute; call SuperTech Woods at 616/323-3570 to order. Start the process by ripping 3/4" strips to at least 4" long. Now, as shown in the drawing at right, cut a 67° angle guide and clamp it to your disc-sander table. Sand each of the four corners of both ends until the bevels meet directly in the center. The sanding disc tends to load up quickly.

Cut the dadoes and cut the buttons to length
Attach a wooden extension to your miter gauge, and verify that the extension is square to the blade. Fit your tablesaw with a 1/4" dado blade. Raise the blade 3/4" above the surface of the saw table. Clamp a stop to the wooden extension, and cut a dado across all four surfaces of each strip where shown in the drawing below. After cutting all the dadoes for the first button, use a bandsaw to crosscut the button to length. Check the fit of the button into the 3/8" hole or 1/4" mortise. Adjust the dado blade height if necessary for a snug fit of the plug shank in the hole.

Create round or square holes for the buttons
For round mounting holes use Forstner, brad-point, or counterboring drill bit. For the more authentic square holes (mortises), fit your drill press with a mortising attachment or use a hollow-chisel mortiser. After dry-clamping the project together, drill a pilot hole through the center of the mortise and into the adjoining piece. Then, drive a trim-head screw to strengthen the joint. (Trim-head screws have smaller diameter heads than regular screws. We get ours from McFeely's: 800/443-7937). Finally, use a drop of glue to hold the plugs in place. For knock-down projects, use a dab of silicone to secure the plug in place. Silicone allows you to remove the plug without tearing out the wood around it.

Written by Marlen Kemnet  Project Design: James R. Downing  Photographs: John Heherington  Illustrations: Kim Downing, Lorna Johnson

WOOD MAGAZINE  DECEMBER 1995  Print this article
Woodturning doesn’t get much simpler than this. In a single evening, you can create enough of these attractive cosmetic-mirror holders to satisfy all your friends and relatives. Best of all, it’s a project that will barely dent your pocketbook or your scrap pile.

Here’s how to prepare your stock for turning:

1. With a compass, mark a 3”-diameter circle on a piece of ½” stock. Band saw just outside the marked circle.
2. Trace the outline of your 3”-diameter metal face plate onto a 1”-thick piece of stock. Band saw this auxiliary face plate to shape. Drill pilot holes, and screw it to your metal face plate.

Note: You’ll need ½”-thick stock for this project. Plane or resaw a piece of stock ¾”x3¼”x12” to safely achieve this thickness. Also, for best looks, select highly figured stock. Be sure it’s dry so that the turned project won’t shrink later, possibly cracking the mirror.

3. Center and adhere the mirror-holder blank to the auxiliary face plate. Place the side that will be the back of the mirror holder against the face plate. We used four drops of cyanoacrylate adhesive (instant glue); double-faced carpet tape would work, too.

It’s time to turn:

1. True up the outside edge and face of the blank. (We used a 3/8” shallow-fluted gouge.)
2. Turn a 2”-diameter flat-bottomed recess ¾” deep to house the mirror. When making the final cuts on the recess, come in as straight as possible to ensure a 90° shoulder. See the Step 1 drawing for reference. Check the fit of the mirror into the recess; you need to allow about ¼” edge clearance for possible wood shrinkage. Part the mirror holder from the auxiliary face plate.
3 Form a tenon on the auxiliary faceplate, creating a jam-fit chuck where shown in the Step 2 drawing. (We used a parting tool.) The mirror holder must fit snugly onto the tenon. Start by making your tenon only \( \frac{1}{16} \)" long, and determining the correct diameter. Then, turn the tenon to length.

4 Turn the back of the blank to the profile shown on the Full-sized Section View below left. Or, create your own design.

5 Sand the mirror holder smooth, and apply the finish. (For the finish recipe used by Bonnie Klein, who designed and turned this project, see below.)

6 Separate the mirror holder from the auxiliary faceplate, and epoxy the mirror into the recess.

**Bonnie Klein’s finish recipe**

For her fast-drying finish, Bonnie mixes equal parts of shellac, boiled linseed oil, and solvent alcohol (shellac thinner). With the workpiece on the running lathe, she applies the finish with a cloth pad. Heat generated by friction as the cloth rubs against the turning dries the finish quickly, creating a lustrous shine.

**Buying Guide**

**Mirror blanks.** Five 2"-diameter beveled mirrors, \$13.75 ppd. in U.S. Add \$8.75 for five suedecloth mirror bags (black, grey, or dusty rose). Packard Woodworks, P.O. Box 718, Tryon, NC 28782. Or call 800/683-8876 to order.

Project Design: Bonnie Klein
Photograph: Hopkins Associates
Illustrations: Kim Downing
Reader Russell Lasho of Palm Harbor, Florida, and fellow members of the U.S. Power Squadron launched 360 of these little boats to help keep a toy program for needy children afloat. Russell also sent one to WOOD magazine’s Build-A-Toy contest, where we spotted it. He’s glad to share his design, but does ask a favor: When you build one of these little boats, make an extra to give to a needy child.

Cut out the hull
1 For the hull, joint the rounded corners from one edge of a 12" length of 2x4 stock (1 1/2x3 1/2" actual dimensions). Rip the piece to 3 1/4", then crosscut it to 8".
2 Trace the Full-Sized Hull Top-View pattern, in the WOOD PATTERNS™ insert in the middle of the magazine, onto the stock. Drill the 3/8" hole on each side and the 1/8" hole on the left side, using a drill press. If you can’t drill to the full 2 1/4" depth for the 1/8" hole, don’t worry. You can deepen it after you cut out the hull.
3 Form the mortise for the front wheel, as shown in the Mortise detail. Drill the holes with your drill press, then drill the string hole with a portable drill. Enlarge the hole inside the mortise to accommodate the pull-string knot.
4 Tilt your bandsaw table to 10°. Saw around the outline, keeping the hull on the table’s low side.

Construct the cabin next
1 To make the cabin front, rout a 1/4" rabbet 3/8" deep along each edge of a 3/4x2 1/2x12" board. Crosscut a 1 1/4"-long piece from it. Then, on the end of the stock that will be the bottom, lay out the cabin front’s shape as shown. With the bandsaw table still tilted, saw along the line.
2 Cut the cabin sides and top from 1/4" stock, following the patterns. Bore the 3/8" holes in the sides where shown. Glue the cabin sides into the rabbets on the cabin front. Ensure that the sides are parallel and square to the front piece, then clamp.
3 Drill pilot holes where shown in the cabin front and sides, then attach the assembly to the hull with brads or finishing nails and...
glue. Drill pilot holes for the cabin top, then nail and glue it in place.
4 Cut two ¾"-long pieces of ¾" dowel rod. Glue one into each of the ¾" holes in the hull. Drill a screw hole in each where shown.

**Put on the paint and wheels**
1 Finish-sand the boat, and apply a coat of primer. Paint your craft with gloss acrylic enamels in red, white, and blue (or your own color selections).
2 Install the two rear (or "aft," as we woodworking salts say) wheels with screws. Insert ¼" plastic tubing into each wheel's center hole for a better fit.
3 Feed the end of an 18" string through the hole in the bow. Knot the end inside the mortise, and tie a loop in the other. Now, install the front wheel, using a headless nail for an axle and plastic tubing for a bushing. Fill the axle hole, and touch up the paint before launching the cruiser.

---

**CABIN FRONT**

<table>
<thead>
<tr>
<th>¾&quot; x 2 1/2 x 1 1/4&quot;</th>
<th>¾&quot; x 2 1/2 x 1 1/4&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>¾&quot; x 2 1/2 x 1 1/4&quot;</td>
<td>¾&quot; x 2 1/2 x 1 1/4&quot;</td>
</tr>
</tbody>
</table>

Bandsaw front of cabin at a 10° angle.

---

**FORMING THE FRONT WHEEL MORTISE**

**STEP 1**
Drill ¾" holes 1 1/4" deep at both ends of mortise.

**STEP 2**
Drill 9/16" holes 1 3/4" deep between holes drilled at ends of mortise.

**STEP 3**
Chisel mortise sides square.

---

**MORTISE DETAIL**

---

**EXPLODED VIEW**

Nail back end of Cabin Sides to Hull using #17 x 3/4" brads

CABIN TOP
1/4" x 3 x 3 1/2"

#17 x 3/4" brad
3/16" round-over on top edge

1/16" pre-drilled hole

4d finish nail

---

**REAR AXLE**

3/8" dowel 7/8" long

WHEEL BUSHING
1/4" (O.D.) tubing. Drill to 9/32" (I.D.) after installing in wheel.

1/8" pilot hole 3/4" deep

REAR WHEEL
1 1/2" dia. wooden toy wheel

#6 x 1 1/4" R.H. wood screw

4d finish nail with head cut off

---

**WHEEL WOOD PATTERNS**

INSERT FOR FULL-SIZED PATTERNS

---

18" long pull string with loop tied at end. Insert string through hole, then tie knot in end.
Enjoy the fragrance of potpourri this holiday season with this one-evening shop project. A screened bottom and decorative scroll-sawed top maximize circulation for "scentsational" airs.

Form the box from a board
1. Cut a piece ½" stock to 2" wide by 24" long. (We planed down a ¾"-thick piece of lacewood. See the Buying Guide for our source of this stock and the ¼" plywood.)
2. As shown in Steps 1 and 2 of the three-step drawing, cut a pair of rabbets along the inside surface of the stock. Now, as shown in Step 3, use a ½" round-over bit to rout a partial round-over along the outside top edge of the board.
3. Miter-cut four equal lengths of stock (ours measured 5" long each) from the 24"-long board.
4. Transfer the full-sized radius pattern to the bottom edge of one of the box sides. Cut and sand the radius to shape. Use this as a template to mark the three remaining box sides. Cut and sand them.
5. Dry-clamp the four pieces to check for tight corner joints. Then, glue and clamp the pieces. For an easy no-clamp method to adhere the mitered corners, start by placing all four pieces inside face down on a flat surface. Use a straightedge to align the bottom edges of all four box sides. With the mitered joints flush and tight, adhere a strip of masking tape down the center of the four pieces. Flip the assembly over, and apply glue to the mating ends as shown on the Clamping The Box drawing. Fold the pieces together and attach the tape tail to the open end. Later, remove the tape and sand the box.

Make the top and apply the finish
1. From ¼" Baltic birch plywood, cut a piece 4¼" x 4¼" to fit into the rabbeted top opening in the box.
2. Apply the full-sized pattern to the top of the plywood. To act as a backing board to prevent chip-out, tape a piece of stock to the bottom side of the lid. Using a Forstner bit, drill the ¾" holes through the lid. Then, scrollsaw the openings in the lid to shape. Drill blade start holes and cut the squares to shape.
3. Remove the pattern and lightly sand with 220-grit sandpaper. Apply a clear finish to the box and lid (we used Deft aerosol lacquer).
4. Cut a piece of window screen to 4½" x 4½" and secure the screen into the bottom rabbert with hot-melt adhesive. Fill the box with potpourri and enjoy.

Buying Guide

*Project Design: James R. Downing
Illustrations: Kim Downing
Photograph: Hopkins Associates
**STEP 1**
Cut a 9/16" rabbet 1/8" deep along bottom edge of sides for wire screen.

**STEP 2**
Cut a 1/16" rabbet 1/8" deep along top edge of sides for plywood top.

**SECTION VIEW DETAIL**
- 1/8" rabbet 1/8" deep
- 9/32" rabbet 1/16" deep
- Window screen wire bottom

**EXPLODED VIEW**
- 1/8" round-overs
- 9/32" rabbet 1/16" deep
- Mitered corners
- 4 1/8" x 4 1/8" window screen wire

**SEE THE WOOD PATTERNS**
INSERT FOR FULL-SIZED PATTERNS
Scrollsawers and designers Kim and Rob Russell, winners of the Best Holiday Theme Award in our recent Great Scrollsaw Project Design Contest, collected $750 for their efforts with this festive rendition of the classic Christmas tree. On a mantel or as a table centerpiece, this delightful accent will do wonders for everyone’s holiday spirit.

Note: These holders are for decoration only. Because of the combustibility of wood, we do not recommend that you burn candles in them. Left unattended, the candles could burn to the wooden holders and start a fire.
1 Using carbon paper or photocopies of the patterns and spray adhesive, transfer the full-sized tree patterns on the WOOD PATTERNS™ insert in the center of the magazine to 1/8" stock. See the Buying Guide for our source of void-free birch plywood.

2 Scrollsaw the pieces to shape (we used a #4 scrollsaw blade, 0.033 x 0.014", with 15 teeth per inch). Drill blade start holes, and scrollsaw the openings to shape.

3 Cut the candle-support blocks to size from solid stock. Hold each in a handscrew clamp, and drill a hole to fit the bottom end of your candles.

4 Lightly sand the edges and surfaces with 220-grit sandpaper. Assemble the trees as shown on the Exploded View drawing (we used a drop of instant glue at each spacer block to hold the pieces together). Brush or spray on a light coat of medium green paint. Then, wait about 30 seconds, and wipe off most of the paint to let the grain show through. We found this stained look more appealing than a coat of solid green paint.

**Buying Guide**

Void-free birch plywood. Two pieces of 3/4 x 10 x 12" plywood (enough for one large and one small tree and one piece of 3/4 x 1 x 10" hardwood for the candle-support blocks), kit no. W842, $7.95 ppd. For enough stock for two sets (two large trees and two small trees), $10.95 ppd., or five sets of trees, $18.95 ppd. Heritage Building Specialties, 205 North Cascade, Fergus Falls, MN 56537. Or call 800/524-4184 to order.

**SEE THE WOOD PATTERNS™ INSERT FOR FULL-SIZED PATTERNS**

Project Design: Kim and Rob Sussel
Photographs: John Herberington
Illustrations: Roxanne LeMoine
SCROLLSAW

Here's some sound advice from Santa: Make any music-lover on your gift list sing your praises by giving him or her this noteworthy CD rack. Easy to build, it's bound to rocket right to number one on your Top Ten Projects chart.

Note: To build this CD rack you'll need three 3/4 x 7 x 7" pieces of walnut, two 1/8 x 5 x 5" pieces of maple, and three 20" lengths of 1/2" walnut dowel rod.

Start with the ends
1 Make two photocopies of the End pattern (A). (It's in the WOOD PATTERNS™ insert in the middle of the magazine.) Using rubber cement or spray adhesive, adhere each to a 3/4 x 7 x 7" piece of walnut.
2 Bore the 4 3/8" hole through each end piece where shown. To do so, set your circle cutter's radius to 2 3/4", and chuck it in your drill press. Back the workpiece with scrapwood, and clamp it securely to the drill-press table. With the drill press running at 250 rpm, cut halfway through the stock. Then, for a clean job, flip the workpiece over. Insert the circle cutter's pilot bit into the pilot hole, and finish cutting.
3 Drill the three 1/2" holes through each piece where shown. To ensure that you drill the holes perpendicular to the surface, use the drill press. Again, place scrapwood under the part to minimize drill tear-out.
4 Bandsaw each end to shape, using a 1/8" blade. Stay slightly outside the cutting line, then sand to it. Sand the inside edge of the hole as necessary.
MELODY Slick storage for your CDs

5 Install a piloted ¼" rabbeting bit in your router. Adjust the cutting depth to ¼". Now, rout around the large hole where shown. Be sure to rout the left face of one and the right face of the other to make a matching pair of ends.

Next up: the sliding rest
1 Adhere the Sliding Rest pattern (B) to the remaining ¾×7×7" piece of walnut. Drill the three ¾" holes where shown.
2 Drill a ¼" blade start hole where shown. Feed a scrollsaw blade through the hole (we used a no. 7 blade, .045×.017" with 12 teeth per inch), and cut out the ornamental musical note.
3 Bandsaw the sliding rest. Finish-sand the sliding rest and both ends. Sand slight round-overs on all edges except the rabbets.

Make a little music
1 Stack the two ¼×5×5" pieces of maple together, the grain on both pieces running the same direction. Bind them around the edges with masking tape.
2 Adhere the pattern for parts C to the top of the stack, aligning it with the grain. Drill the blade start holes where shown.
3 Insert the scrollsaw blade through a start hole near the center of the design. (For this finer cutting, we used a no. 4 blade, .035×.015" with 16 teeth per inch.) Cut out the small center areas first, then work your way out to the larger segments at the top and bottom.
4 Cut around the outside pattern line. Saw right along the line so the circles will fit into the rabbeted openings on the ends (A).

All together now
1 Glue one of the round cutouts into the rabbet on each end (A). Place the horizontal lines parallel to the end's bottom edge.
2 Glue a 20" length of ½" walnut dowel into each ½" hole in one end (A). Make the dowel ends flush with the end's outer face. Without gluing, slip the other end onto the dowels to ensure alignment.
3 After the glue dries, apply a clear finish to all parts. Mask off a little less than ¾" at the end of each dowel to leave unfinished wood for gluing. Also, don't put finish inside the ½" holes in the unattached end (A).
4 Allow the finish to dry. Then, slide part B onto the dowels. Glue the remaining end onto the dowel ends.

EXPLODED VIEW

½" dowel 20" long
¾" stock
9/16" hole
4⅝" hole
½" rabbet 1/8" deep
3/16" hole
9/16" hole
½" hole

Project Design: Bill Zuan
Photograph: Hopkins Associates
Illustrations: Roxanne LeMoine
Skiing and trolls have long been staples of Norwegian life and legend. Woodcarver Harley Refsal combines them in this delightful traditional-style folk carving.

**Project Prep**

**Stock**

Basswood or other carving wood 3½ x 4 x 5½" for figure, 2 x 4 x 8" for ski-slope base, skis, and tail. Twigs or ¼" dowel rod for ski poles. (See the Buying Guide for a kit containing a bandsawn blank and other necessary materials.)

**Tools:**

- Bench-type carving knife
- ⅛" no. 9 gouge
- ⅛" no. 3 gouge
- ⅛" no. 9 gouge
- ⅛" V-tool

**Note:** These are suggested tools; you also can carve the troll with gouges and V-tools of other sizes and sweeps.

Nordic sagas recounting tales of trolls go back thousands of years. Legend holds that rock-throwing fights among these mighty giants left craters that became the lakes and valleys of the rugged Norwegian landscape.

By the 1800s, trolls seemed to have shrunk in stature, becoming small enough to live under bridges. Even so, they were still pretty ornery characters; just ask the Billy Goats Gruff.

Today's trolls, tired of being typed as brutes or troublemakers, have become friendly and fun-loving, if somewhat mischievous. WOOD's magazine's carving consultant, Harley Refsal, met this one—named Per—on a recent visit to Norway. Instead of lurking under bridges and scaring kids, Per gets his kicks from Norway's national sport, skiing.

Harley carved this likeness of his newly found skiing buddy. In honor of Per's heritage, Harley employed a traditional Norwegian folk style known as flat-plane carving. Instead of smooth, rounded forms, flat-plane carvings feature bold, rough-hewn surfaces shaped primarily by knife cuts. Here's how you can carve Per's likeness.

Bandsaw the blanks first

Photocopy the full-sized front and side patterns for the troll from the WOOD PATTERNS™ insert in the middle of the magazine. Adhere them to adjoining surfaces of a 3½ x 4 x 5½" carving block.

Bandsaw the side-view outline, and tape the waste pieces back onto the cutout. Then, bandsaw the front-view outline to complete the blank.

On the edge of a 2 x 4 x 8" piece of stock, draw the side view of the ski slope, shown in the WOOD PATTERNS insert. Bandsaw along the line. (Save the cut-off piece; you can use it later to make Per's skis, poles, and tail.) Draw the top-view outline on the ski slope, and cut it out.
Now, start shaping the troll
Sketch lines on the sides of the bandsawn blank to show placement of the arms, hands, scarf, hat, and feet. Refer to Photo 1 and the patterns for guidance.

On the front of the blank, draw lines to delineate the nose and separate the hands. On the back, draw lines about 1" apart on the scarf. Then, draw the feet on the bottom, placing the right one about 3/8" ahead of the left (viewed from the bottom) to give the figure a sense of motion.

Carve away the stock between the hands, using a knife or 1/2" shallow gouge (no. 3 or 5, for example). Cut back about 3/4" to Per’s chest, as shown in Photo 2.

On the back, cut away the sides of the scarf, leaving it about 1" wide for the time being.

Shape the feet next. Carve each to the pencil line on the bottom, and curve the front of the sole upward. The rounded front should look somewhat like a boat, as shown in Photos 2 and 3.

Now, rough-shape the troll’s back, sides, and head. Remove stock from behind his arms to begin shaping the back and sides. Refer to the pattern lines and the photographs to get a feel for the general shape.

As you begin to shape the head, compare the sawn blank (left) and the partially carved one (right) in Photo 5. Then, rough in the jowline and cheeks, referring to Photos 3 and 5.

Draw pencil lines for the scarf wrapped around Per’s neck. Bring it under his chin and along the sides of his head back to the cuff of his hat. The side view photo of the finished carving on the next page shows the scarf.

Carve the troll’s hat to rough shape. Mark the lines to separate his socks from his shoes and knickers. In the photographs of the finished carving, the socks are light blue.

Drill holes for the poles
Before shaping the mittens, drill holes for the ski poles. The poles pierce the mittens on top about 3/8" from the front bandsawn edge and 1/2" from the outside bandsawn edge. Make a pencil mark at that point on each mitten, then draw lines down the front and side of the mitten to mark the hole’s angle (see Photos 4 and 5). Angle the pole outward and backward to place the bottom end beside the ball of the foot.

Drill a ¼" pilot hole through each mitten. Enlarge the hole to ⅛". Then, shape the mitten around the hole, using your own hand and the photos of the finished carving as models.

Next, refine the form
Further shape and define Per’s ski boots and socks, separating them with a sharp V-cut. Don’t try to smooth the contours as you carve to the final shape. Rather, leave a series of cut planes or facets, as

Continued
shown in the finished-carving photos below. This gives the distinctive look of a Norwegian flat-plane folk carving.

Carve Per's legs and body, paying attention to the separation between his socks and skiing knickers. Around his waist, separate the bottom of the sweater from the trousers. Roll the sweater under slightly, as shown in the photos.

Separate his knees with a V-cut, then round them. Carve the chest back from the knees somewhat to make Per look like he's crouched down. Carve a crease at each elbow.

**Go ahead, make him smile**

Before starting to carve Per's face, study the rough shape in Photos 3 and 5 and the facial features in the front- and side-view photos of the finished carving. Then, cut away the stock outside of the nose lines.

Draw the smile lines on the face, where shown on the carving at the right in Photo 5. The smile lines curve down from the sides of the nose around the corners of the mouth, almost like a pair of parentheses. They help define the cheeks.

Carve the lines with the tip of your knife. Below the lines, carve to the level of the surface beneath the nose. Blend this area into the chin. Draw a broad, smiling mouth onto the face, just below the nose. Carve the mouth as a V-cut, broader at the middle than at the corners. Adding a small triangular cut at each corner will make the smile seem even wider.

Shape Per's prominent nose, blending it into the upper lip. Separate it from the cheek on each side with a knife cut. A large V-cut coming almost horizontally across the top of the nose forms the eye area, as shown in the photos below.

Carve the hair at the sides of the head, then model the scarf around Per's throat. Shape the hat, and define the cuff.

**Time for some details**

Carve the fluttering ends of the scarf. Start by cutting a V-groove between them, as in Photo 4. Then, hollow the outside of each flap slightly, shaping the inside to match. Thin the top edge of the scarf ends to about ⅛". This will give the entire scarf a light look. Beware of making the scarf too thin—that would weaken it. Add a few shallow V-cuts for wrinkles, and raise a small oval to represent a knot.

If you want to add the optional tail (and Harley says he's never seen a troll without one), drill a ⅛" pilot hole straight into the middle of your troll's waistline right below the sweater. Enlarge the hole to ¼".

Carve the tail separately from a 1×2×3" piece of stock. Trace the patterns from the WOOD PATTERNS insert onto the stock, and cut out the blank. Round the small end to fit into the drilled hole. Carve the large end to shape, then texture it with a series of V-cuts. Don't install the tail until after you paint both it and the carving, however.

Now, make a pair of skis for Per. Scroll saw them from the stock, then texture the top and edges with a gouge to give them hand-carved appearance. For ski poles, gather up some small twigs. Cut off and whittle two 3½" lengths to fit through the holes in the troll's mittens. You also could use ⅛" dowel rod.

*Continued on page 100*

**Buying Guide**

**Troll kit.** Basswood troll blank (bandsawn front and side), ski-slope base, skis, and material for ski poles and tail, $19.95 each or $37.50 for two p.p.d. in U.S. Harley Reifsal Woodcarving, 619 North Street, Decorah, IA 52101. No telephone orders, please.


Project Design: Harley Reifsal
Photographs: Hopkins Associates; John Hetherington
Illustrations: Roxanne LeMoine; Lorna Johnson
10% to 20% OFF HOLIDAY COMBO SALE

CHOPMASTER FOR SLIDING COMPOUNDS & MITER SAWS

New specs, 5" Reg. Pts. & flats, runs cut less than .002 for perfect, tight, smooth, splitter-free miters. Get yours today! TAKE EXTRA 10% - 20% OFF COMBO SALE!

NEW SIZES AVAILABLE

| Delta Sidewinder 6-1/2 x 4015/8" | $149 | $99 |
| Delta 6-1/2" x 6-1/4 x 8015/8" | $170 | $99 |
| Hitachi 6-1/2 x 4015/8" | $179 | $109 |
| Delta 6-1/2" x 4015/8" & Ryobi 6-1/2 x 8015/8" | $179 | $109 |
| Ryobi-Makita & all 6-1/2 x 8015/8" | $204 | $119 |
| DeWalt/Makita & all 6-1/2 x 8015/8" | $204 | $119 |

For general purposes, use Woodworker II 30T & 40T or Woodworker I. Use small thinners where possible.

WOODWORKER I – For TABLE and RADIAL SAW

This item and all 4 models of Woodworker I radial saws have 100% in cuts on all materials RIP or CROSSCUT 10" x 10". ALL CUTS AND 30° & 45° DIAGONALS 30° ANGLE and finish results in 10" diameter and under, 12" and 14" and 200 ATB 180°. DOUBLE HARD and 40° DIAGONALS for maximum cutting speed. THIN KERF for accurate cuts in small radial saws. "Tightens" JUMP IN for better "TIGHT CONTROL". The radial saw is the most popular tool in your shop. The "2" Kerf allows for a perfect cut in all woods. Made and serviced in U.S.A. for your benefit.

NEW!

14" x 4015/8" x 18/" | $224 | $169 |
12" x 6015/8" x 101/6" | $188 | $139 |
10" x 6015/8" x 2015/8" | $162 | $129 |
9" x 6015/8" x 2015/8" | $156 | $129 |
8" x 6015/8" x 2015/8" | $150 | $109 |

SPECIAL COMBO SALE

EXTRA 10% - 20% OFF

DURALUMIN HI-A/T FOR TABLE & RADIAL SAW

ALL FLAT FACE

Faster feed rate, smoother, better control. Won't splinter or cut up 6 wide. Shipping $4.50.

<table>
<thead>
<tr>
<th>Sizes Available</th>
<th>List</th>
<th>SALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-1/4 x 4015/8&quot;</td>
<td>$149</td>
<td>$129</td>
</tr>
<tr>
<td>8&quot; x 6015/8&quot;</td>
<td>$169</td>
<td>$129</td>
</tr>
<tr>
<td>9&quot; x 6015/8&quot;</td>
<td>$156</td>
<td>$129</td>
</tr>
<tr>
<td>10&quot; x 6015/8&quot;</td>
<td>$150</td>
<td>$109</td>
</tr>
</tbody>
</table>

SPECIAL COMBO SALE

EXTRA 10% - 20% OFF

CARBIDE IS HARDEST OF THE 4-GRADING AND 40% STRONGER, NOT WEAKER! FOR 50% TO 300% LONGER LIFE.

For special price coupons and bonus, mention "WOOD" magazine. We honor AMEX, VISA, MasterCard & Discover, Money Orders, Personal Checks, and CODs. Specify Dept. WD when ordering.

PHONE TOLL FREE 1 (800) 733-7111 (In N.J. 201-473-7306) FAX: 201-471-3333

WE RECOMMEND OUR FACTORY SHARPENING as the best sharpening available. Problems with MICRO-CUTTER EDGES reduce blade life & cutting quality. 3-5 DAYS SHIPPED and ALL MADE OF FLAT FACE "CONCAVE CARBIDE" TiP SAWs. Shipping $4.50. Contact us for UPS rates. Special travel-related discounts may apply. Quality is why we’re different!

BUSINESS OPEN ACCOUNTS AVAILABLE

CA, FL, IL, NJ, NY, PA Residents Add Sales Tax. SATISFACTION GUARANTEED OR FULL CASH REFUND. Fine American-made woodworking & sharpening since 1946. DEALER INQUIRIES WELCOME.

Circle No. 1322
Quartersawn oak, craftsman-style square buttons, and the simple lines of mission style make for a striking shelf bound to please the most discriminating palate.

Cut all the pieces (A–D) to size and shape. See the WOOD PATTERNS™ insert in the center of the magazine for full-sized patterns of parts A and B. Rout the straight portions of the decorative cutouts in the sides (A) and top (B) using a 1/8” straight bit in a table-mounted router fitted with a fence (you could also use a scrollsaw). Then, scrollsaw to shape the ends of the routed cutouts in the side pieces and the center of the cutout in the top piece. Drill the mounting holes and assemble. See the article on page 67 for our process on making your own craftsman-style buttons.

**Bill of Materials**

<table>
<thead>
<tr>
<th>Part</th>
<th>Finished Size</th>
<th>Material Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1/4” x 5 1/2” 20”</td>
<td>2</td>
</tr>
<tr>
<td>B</td>
<td>1/4” x 3” 18”</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>1/4” x 5 1/2” 18”</td>
<td>2</td>
</tr>
<tr>
<td>D</td>
<td>1/4” x 1/2” 18”</td>
<td>2</td>
</tr>
</tbody>
</table>

Material Key: CO-quartersawn oak.

Project Design: James K. Downing
Illustrations: Lorna Johnson Photograph: King Au
Woodworker's Marketplace is a section of advertisers offering products by mail. Please contact the advertisers directly or use the number below each ad to request information through the Woodworker's Resource section.

**OWN A MACHINE SHOP**
Do your own machining and shop work with a Smithy 3-in-1 Lathe • Mill • Drill

**FIX IT YOURSELF!**
- Easy to use!
- Save Money!
- Save Time!
- As low as $895

For FREE Catalog Call: 1-800-345-6342
(Ask for operator Wood)

Circle No. 99

**WOOD MOISTURE METER**
Professionals and hobbyists can choose from 8 different Mini-Ligno moisture meters:
- Versatile
- Affordable
- Sturdy
- Over 100,000 units sold.

Also introducing New Mini-Ligno XL
For brochure contact:
Lignomat USA, Ltd.
PO Box 30145
503/567-9857 800/227-2105
Portland, OR 97230

Circle No. 1250

**NEW! HIGH-SPEED EMBOSSMING MACHINE**
Triple value of ordinary molding!

Woodmaster's new embossing machine can be the start of your own high-profit millwork business... or a welcome addition to your existing operation.

Embossed molding sells for $1 to $6 per linear foot. You can produce this millwork at 26 feet per minute! Choose from hundreds of patterns including picture frames.

Call or write today for free facts:
1-800-821-6651 ext. AC3
Woodmaster Tools, Inc., Dept. AC3
1431 N. Topping Kansas City, MO 64120

Circle No. 445

**CONVERTIBLE SUNSPACE**
Insulated Winter Sunroom Converts to A Summer Screen Room!
Mounts readily on decks, patios, or tues.

Send $2 for Color Catalogue, Prices, SEND FIRST CLASS MAIL.

SUN-PORE DIVISION
VEGETABLE FACTORY, INC.
P.O. Box 1363, Dept. WOO
Stamford, CT 06904-1363

Circle No. 2078

**FREE PLANS for Woodworkers**
FREE Plans for:
- Sliding Glass Door Lock
- Yard Whirlygig
- Trapeze Tumbler
- Two Table Saw Cars
- Dalmatian Decoration

*Send $2.00 for our catalog and we will include a FREE project plan featuring full sized patterns for six different projects ($7.99 value). Our catalog offers over 400 woodworking plans for furniture, country projects, toys, lamps, whirligigs, and many other indoor and outdoor projects. We are the #1 plan source for the woodworking hobbyist.*

I am enclosing $2.00. Please send catalog and plans for six projects.

Name
Address
City State Zip

Meisel Hardware Specialties
P.O. Box 70 B12
Mound, MN 55364-0070

Circle No. 401
Woodworker's Marketplace is a section of advertisers offering products by mail. Please contact the advertisers directly or use the number below each ad to request information through the Woodworker's Resource section.

**BRANDING IRON**
For hard and soft wood
$2900
Plus $3.00 for shipping and handling
CA residents add correct sales tax
SATISFACTION GUARANTEED or your money back
- Shipped in one week
- Solid brass head - raised letters
- 1st Line: HAND CRAFTED BY — as above
- 2nd Line: Your choice — 20 characters/spaces max.
- Electric iron available for $49.00 + $3.00
ORDER TOLL FREE...
1-800-826-7606
NOVA TOOL CO.
P.O. Box 2791 Dept. WH
DuPuis, CA 94558

**WOOD TOY**
- Patterns
- Parts
- Wheels
- Many New Patterns to Choose from.
- Executive toys
SEND $1.00 FOR NEW CATALOG

**BEST CARVING SUPPLIES!**
1000's of quality hand & power carving tools, books, kits, plus more. Fast friendly service, lowest price & satisfaction guaranteed. Join 1000's of happy customers, send $2 for our 76 pg. catalog.
Wood Carvers Supply, Inc.
SERVING CARVERS SINCE 1955
P.O. Box 7500-G,
Englewood, FL 34295-7500

**MAKE IT MOBILE**
WITH HTC MOBILE MACHINE BASES
For a FREE Full-Color Catalog of HTC’s Complete Product Line Call: 1-800-624-2027

**RIP SAW**
The "affordable portable" one man band sawmill. Weighs only 45 lbs. Cuts 20” diameter logs into lumber. Minimum 1/8” to maximum 9” thickness. 14”W x 9” throat capacity. Write or call for free brochure. Videos also available.
Better Built CORPORATION
(508) 853-5656
845 Woburn St., Suite 3, Dept. W12, Wilmington, MA 01887

**CHOICE OF PROS**
NOW AVAILABLE AT 40% LESS!
INTRODUCING THE NEW WAGNER L609 MOISTURE METER...
- Pin-Free
- Narrow Sensor
- Deep Penetrating
- Features Wagner’s Proven EMF Technology
- Accuracy Verified by Independent Studies
Our Lowest Price Was: $225
Now: $129

**Berea Hardwoods**
6867 Eastland Rd., Brookpark, Ohio 44142
216-234-7549 MasterCard/Visa

**MAKE IT MOBILE**
WITH HTC MOBILE MACHINE BASES
For a FREE Full-Color Catalog of HTC’s Complete Product Line Call: 1-800-624-2027

**WOOD TOY**
- Patterns
- Parts
- Wheels
- Many New Patterns to Choose from.
- Executive toys
SEND $1.00 FOR NEW CATALOG

**BEST CARVING SUPPLIES!**
1000's of quality hand & power carving tools, books, kits, plus more. Fast friendly service, lowest price & satisfaction guaranteed. Join 1000's of happy customers, send $2 for our 76 pg. catalog.
Wood Carvers Supply, Inc.
SERVING CARVERS SINCE 1955
P.O. Box 7500-G,
Englewood, FL 34295-7500

**MAKE IT MOBILE**
WITH HTC MOBILE MACHINE BASES
For a FREE Full-Color Catalog of HTC’s Complete Product Line Call: 1-800-624-2027

**RIP SAW**
The "affordable portable" one man band sawmill. Weighs only 45 lbs. Cuts 20” diameter logs into lumber. Minimum 1/8” to maximum 9” thickness. 14”W x 9” throat capacity. Write or call for free brochure. Videos also available.
Better Built CORPORATION
(508) 853-5656
845 Woburn St., Suite 3, Dept. W12, Wilmington, MA 01887

**CHOICE OF PROS**
NOW AVAILABLE AT 40% LESS!
INTRODUCING THE NEW WAGNER L609 MOISTURE METER...
- Pin-Free
- Narrow Sensor
- Deep Penetrating
- Features Wagner’s Proven EMF Technology
- Accuracy Verified by Independent Studies
Our Lowest Price Was: $225
Now: $129

**Berea Hardwoods**
6867 Eastland Rd., Brookpark, Ohio 44142
216-234-7549 MasterCard/Visa

**MAKE IT MOBILE**
WITH HTC MOBILE MACHINE BASES
For a FREE Full-Color Catalog of HTC’s Complete Product Line Call: 1-800-624-2027

**WOOD TOY**
- Patterns
- Parts
- Wheels
- Many New Patterns to Choose from.
- Executive toys
SEND $1.00 FOR NEW CATALOG

**BEST CARVING SUPPLIES!**
1000's of quality hand & power carving tools, books, kits, plus more. Fast friendly service, lowest price & satisfaction guaranteed. Join 1000's of happy customers, send $2 for our 76 pg. catalog.
Wood Carvers Supply, Inc.
SERVING CARVERS SINCE 1955
P.O. Box 7500-G,
Englewood, FL 34295-7500

**MAKE IT MOBILE**
WITH HTC MOBILE MACHINE BASES
For a FREE Full-Color Catalog of HTC’s Complete Product Line Call: 1-800-624-2027

**RIP SAW**
The "affordable portable" one man band sawmill. Weighs only 45 lbs. Cuts 20” diameter logs into lumber. Minimum 1/8” to maximum 9” thickness. 14”W x 9” throat capacity. Write or call for free brochure. Videos also available.
Better Built CORPORATION
(508) 853-5656
845 Woburn St., Suite 3, Dept. W12, Wilmington, MA 01887

**CHOICE OF PROS**
NOW AVAILABLE AT 40% LESS!
INTRODUCING THE NEW WAGNER L609 MOISTURE METER...
- Pin-Free
- Narrow Sensor
- Deep Penetrating
- Features Wagner’s Proven EMF Technology
- Accuracy Verified by Independent Studies
Our Lowest Price Was: $225
Now: $129

**Berea Hardwoods**
6867 Eastland Rd., Brookpark, Ohio 44142
216-234-7549 MasterCard/Visa

**MAKE IT MOBILE**
WITH HTC MOBILE MACHINE BASES
For a FREE Full-Color Catalog of HTC’s Complete Product Line Call: 1-800-624-2027

**WOOD TOY**
- Patterns
- Parts
- Wheels
- Many New Patterns to Choose from.
- Executive toys
SEND $1.00 FOR NEW CATALOG

**BEST CARVING SUPPLIES!**
1000's of quality hand & power carving tools, books, kits, plus more. Fast friendly service, lowest price & satisfaction guaranteed. Join 1000's of happy customers, send $2 for our 76 pg. catalog.
Wood Carvers Supply, Inc.
SERVING CARVERS SINCE 1955
P.O. Box 7500-G,
Englewood, FL 34295-7500

**MAKE IT MOBILE**
WITH HTC MOBILE MACHINE BASES
For a FREE Full-Color Catalog of HTC’s Complete Product Line Call: 1-800-624-2027

**RIP SAW**
The "affordable portable" one man band sawmill. Weighs only 45 lbs. Cuts 20” diameter logs into lumber. Minimum 1/8” to maximum 9” thickness. 14”W x 9” throat capacity. Write or call for free brochure. Videos also available.
Better Built CORPORATION
(508) 853-5656
845 Woburn St., Suite 3, Dept. W12, Wilmington, MA 01887

**CHOICE OF PROS**
NOW AVAILABLE AT 40% LESS!
INTRODUCING THE NEW WAGNER L609 MOISTURE METER...
- Pin-Free
- Narrow Sensor
- Deep Penetrating
- Features Wagner’s Proven EMF Technology
- Accuracy Verified by Independent Studies
Our Lowest Price Was: $225
Now: $129

**Berea Hardwoods**
6867 Eastland Rd., Brookpark, Ohio 44142
216-234-7549 MasterCard/Visa
Woodworker's Marketplace

CORIAN®
THE NEXT GENERATION OF CRAFTSMANSHIP
FOR THE FIRST TIME EVER
You Can Own a 16 Piece CORIAN® Collector Sample Kit PLUS Gain Access to Larger Stock For All Your Workshop Projects
The Sample Kit comes complete with 16 of the most luxurious granite and solid colors available.

16 piece kit $29.95
25.5% to S&H
Add 5.5% Sales tax in Nebraska

ORDER NOW... Get a FREE fabrication guide direct from a certified CORIAN® fabricator!

1-800-721-7501

or mail your order to: Solid Surface Sales, 224 N. Main, Suite 5, Fremont, NE 68025

Circle No. 443

HEIRLOOM TOYS

Baldwin Toy Co., Inc.
P.O. Box 37014 Omaha, NE 68137-0014
Dept. W12

Supplement Your Income From Your Home With A Computer!

Begin part-time and still retain the security of your present position. We offer 20 services you can perform for your community from your home. No experience necessary—easy to learn. We provide training and computer. For FREE explanation cassette and literature call:
1-800-343-8014, ext. 184
Computer Business Services, Inc.

Your Handcrafted Clocks Make Treasured Gifts.

Giving your handcrafted clocks as gifts will make you a winner in the hearts of friends and loved ones. And now, your handcrafted clock could also win you a trip to Germany. See details about our Create-a-Clock contest in the 1995 Fall catalog.

Call for your FREE catalog today.
1-800-555-2548

Circle No. 2335

WINTER LIQUIDATION!!

FINANCING AVAILABLE!

STEEL BLDGS

SAVE UP TO 45%

Model T-110 Dupli-Carver

Model CM614 Sign Carver

Multi-Spindle Carving Machine

For All Your Woodcarving & Sign Carving Needs

Terrco provides a full line of machine carving and sign carving equipment. Beginning models are the T-110 single spindle bench carver and our CM614 single spindle sign carver.

Intermediate models include the K-Star, a two-spindle heavy duty bench model, and the Northstar, a heavy duty floor model available in one to eight spindles.

Our advanced model is our Master Carver series, which is an extremely heavy duty floor model with from eight to forty spindles.

Write or call for more information.

Circle No. 2150

Circle No. 320

Circle No. 512

Circle No. 2030

One Stop Wood Shop

Where the finest cabinet makers select & blend domestic & exotic hardwood in plywood, veneer & lumber.

- 30 species
- Custom Cutting
- Plywood & Veneer made to order
- Competitive Pricing
- We bundle & ship to U.S. & Canada

Call (617) 666-1340 today for catalog and quote.

Boulters Plywood Corp.
24-WD Broadway, Somerville, MA 02145

Circle No. 443
She loves me... and the beautiful doll closet I made for her. Built to hold dress and accessories for Barbie-sized dolls, with drawers, shelf and hanger bar. Precision-cut parts, pre-drilled for exact fit. You assemble and finish. $35.95 (5.95% Va residents add 4.5% sales tax. 12"w x 23"h x 11"d deep (14 lbs). Proudly made in the USA by.

To order call 1-800 MATCH 99 (1-800-628-2499)
P.O. Box 220/02, Chantilly, VA 22022
Visa, MasterCard, check or money order.
Satisfaction guaranteed or your money back.

Circle No. 1065

AMAZING SCROLLSAW FREWORK PATTERNS
Easy to advanced designs

Clocks
Photo frames
Jewelry boxes
Candle holders
Furniture

FREE catalog
1-800-470-9090

Circle No. 475

ONE-MAN SAWMILL Turns Your Timber Into CASH!

30-Day Free Trial!
Call NOW for FREE FACTS!
1-800-942-4406 ext. SW30
TIMBER KING, INC. Dept. SW30
1431 N. TOPPING, KANSAS CITY, MO 64120

Circle No. 2170

Buckboard Bench Kit (Real Springs)

Kit Includes:
Authentically designed steel springs that give a little, steel arms and backrails, complete hardware and full-size plans with detailed instructions. 42"L x 22"W, 18"H to Seat, 30"H to Back
Price: $49.95 (Quantity discounts available)
Pre-cut & drilled oak: $79.95 Additional

The Roudebush Company
P.O. Box 346A, Star City, IN 46965
800-847-4947

Circle No. 1085

Woodworker's Marketplace

HARDWOODS
EXOTIC & DOMESTIC
OVER 100 SPECIES
LUMBER • VENEERS • TURNING STOCK
WOODWORKERS SAMPLER
Discover the perfect wood for your projects
30 GORGEOUS WOODS
Traditional collectors 10" x 3" x 1", sanded smooth, labeled with the common and botanical name. Ideal for display, use to test workability or finish, or just experience and feel these beautiful products of nature.
BOOK OF FINE HARDWOODS included
Provides geographic source, description, uses and availability for over 200 woods. Over 70 woods shown in full color. Charts compare physical properties. 60pp.
A great reference tool!

$59.00 postage paid
Add $5 C&G to US

1-800-423-2450
WOODWORKERS Source
5402 S. 40TH ST. • PHOENIX, AZ 85040 • 602-437-4415
SATISFACTION GUARANTEED

FREE! OUR NEW 1995-96
WOODWORKER’S CATALOG
Over 6000 products to build, repair, restore, refinish anything made of wood!
It’s the catalog woodworkers rely on—120 pages jam-packed with fine woods, veneers, tools, finishing supplies, and much more—all top quality, all reasonably priced, all with our 60-day no-questions-asked guarantee.

CONSTANTINE
Severyn Woodworkers Since 1812
2050 Eastchester Rd., Dpt. 39512, Bronx NY 10461
Call TOLL FREE 1-800-223-8087

Circle No. 20, 820

FREE! WILDWOOD DESIGNS
P.O. Box 676-96
Richland Center
WI 53581

Circle No. 475

SUPERGRIT SANDBAPER
HOOK & LOOP

4½" 8 Hole $10.00/sq
5½" 5 or 8 Hole $12.50/sq
6" 6 Hole $17.50/sq
5½" Solid "E" $15.00/sq
6" Solid "E" $18.00/sq
12" Solid "E" $20.00/sq

BLUE ZIRCONIA
Best in the World
DISCS
BELTS

5" P.S.A. 35c
1" x 42" $1.75
6" P.S.A. 40c
6" x 48" $5.50

RED HILL CORP.
P.O. BOX 229
GETTYSBURG, PA 17325
FREE 28 PAGE CATALOG
& INCREDIBLE CLOSE-OUT SHEETS
800-822-4003

Circle No. 1267

A BIRD HOUSE plan to add more charm to your garden along with your Country Chateau BIRD FEEDER. Designed according to the National Audubon Society's recommendations, with four separate nesting boxes, will attract birds that use an enclosed nest. A handsome addition to any garden. Build as a Christmas gift for family etc. Would be a money maker at Craft Shows.

GOOSE POND MILL
P.O. Box 578, Great Falls, VA 22066-8878

Circle No. 365

Hand-Tooled Carving Look
PROFESSIONAL CARVERS’ CHOICE

AUTO MAKI
Ragged, lightweight aluminum housing, Pressure-activated head controls cut depth, speeds to 10,000 VPM, Makes carving easy! Convertible to rotary use. Heavy-duty 60W motor operates on household current. Includes instruction booklet and 5 steel blades. Specialized blades available. Don't be fooled by cheap imitations detail carvers!

Prices: $178.00 start at (706) 397-8401
(See insert for complete details)

Circle No. 2170
The Best Projects From WOOD® magazine
Compiled Into This Handy Set

Special Offer
2 for $26
All 3 for $32

Best of WOOD Book 1
More than 35 of the most popular projects from WOOD, with photographs, diagrams, and exploded diagrams.
Softcover - 160 pages.
$14.95

Best of WOOD Book 2
Features 40 fantastic projects from WOOD, designed with a mix of styles for all skill levels.
Softcover - 160 pages.
$14.95

Best of WOOD Book 3
More than 430 photos, illustrations, and exploded diagrams for the 35 great projects featured.
Softcover - 160 pages.
$14.95

MAIL TO: WOOD Books, P.O. Box 9255, Dept. WD-39, Des Moines, IA 50306. Each book is $14.95 plus $2 each for shipping and handling. Allow 4-6 weeks for delivery. State and local taxes, if applicable, are included. Please add additional $2 for each book for Canadian or other foreign orders. 100% money-back guarantee if not completely satisfied.

Call 800/572-9350 for VISA or MasterCard orders
Win a ‘96 Dodge Ram loaded with power tools and accessories.

Simply fill out the entry form below, and you could win a 1996 Dodge Ram Pickup loaded with power tools and supplies.

OFFICIAL ENTRY FORM

Win a Dodge Ram Pickup loaded with Power Tools and Supplies.

Name__________________________________________

Address________________________________________

City__________State______ZIP________________________

Phone__________

Please answer the following questions:

1. Do you currently own a truck? YES____ NO____

(W Yes) What is the make and model of the newest truck you own?

Make:________________________ Model:________________________

2. Do you plan to lease/buy a new truck within:

less than 6 months____ 6-12 months____ 1-2 years____

Don’t plan to lease/buy____

3. Would you like to receive more information on Dodge Trucks?

YES____ NO____

Entry Deadline April 1, 1996 Send to: Dodge Truck Contest WOOD magazine GA-204, 1912 Grand Ave., Des Moines IA 50309-3379

The New Dodge
Announcing The Next Generation In Wood Finishing.

Millennium Aerosols
Meet All
San Francisco Bay Area
VOC Regulations.

DEFT

ECO-FORMULA

MILLENNIUM

CLEAR SEMI-GLOSS

POLYURETHANE FINISH

Dries In 1 Hour • Super Hard Floor Finish

Millennium is the first water base polyurethane to incorporate MDL™
(Multi-Dimensional Linking). MDL gives Millennium it's extraordinary toughness.

Deft, Inc. Irvine, California (800) 544-DEFT, Alliance, Ohio (800) 458-DEFT, Toronto, Canada (416) 798-DEFT

Dries In 1 Hour
• VERY LOW VOC
• CRYSTAL CLEAR FINISH
• WATER CLEAN UP
• ECO-FORMULA
• SUPER HARD FLOOR FINISH
Woodworker's Resource

Print this article

You can get useful ideas and product information by mail. Use the coupon in this section to order your choice of literature listed below. Each company mails the catalogs or information directly to you.

POWER TOOLS

ABBEY TOOLS—The much-requested, long-awaited, you'll feel better on-to-this-one-because-who-knows-when-we'll-print-others catalog is here. Packed with 1000's of top brand name power tools and accessories—all at the lowest possible prices. Whether you are a beginning woodworker or an old pro you'll find just the tool you need. Remember—if you can plug it in, we've got it! ABBEY TOOLS. $1.00. Circle No. 2.

SCROLL SAW, CRAFT & WOODWORKING CATALOG—Immediate delivery of products from the excelsior distributors of HIEGNER, the critically acclaimed scroll saws. Complete information on scroll saws and accessories, including blades and retting guides. Also 2YLLIS Scroll Portables, HIEGNER Lathes, LAVRO Veneer Press, and more. Toll-free customer service hotline included! AMI, LTD. Free. Circle No. 3.

TRANSPOWER, CP TOOLS INC.—A fine line of quality transposing maestros, shapers, planers and more. Send for free catalog. CP TOOLS INC. Free. Circle No. 15.

TOOL AND ACCESSORIES—20 page color catalog features Record lathes, Porter-Cable routers, sanders, saws, drill-drivers, pocket hole cutters, grinders, biscuit joiners, Vega lathe duplicators and saw fences, Vaccum-Presses and more. Best quality, fair price. By currier for 35 years. Send for catalog. Toolhead's experience and 60-day money-back guarantee. 2 year subscription. CONSTANTINE'S. $1.00. Circle No. 4.

INCA MACHINERY INFORMATION—Complete information on the fantastic line of Inca woodworking machines. Designed for precision work by the small to medium sized cabinet shop. By thousands of hobbyists and professionals. Tables, saws, planers, sanders, dust collectors, radial arm saws. GARRETT WADE CO. Free. Circle No. 44.

HARBOR FREIGHT TOOLS CATALOG—The finest precision woodworking equipment at the lowest prices...GUARANTEED! Our New Woodworking catalog has been expanded to contain hundreds of additional brand name woodworking tools & supplies. See why millions of woodworking professionals and Do-It-Yourselfers have shopped at Harbor Freight Tools for over 27 years. HARBOR FREIGHT TOOLS. Free. Circle No. 46.

INTERNATIONAL TOOL CORP CATALOG—features the finest tools & accessories at the absolute lowest prices anywhere! Whether you're a home woodworker or an industrial user, you'll find an incredible collection featuring Porter Cable, Bosch, Skil, Freud, Delta, Powermatic, Milwaukee, Makita, Hitachi, and many, many more. We offer same day shipping, the most knowledge able sales staff and free shipping on most orders in the contiguous U.S. INTERNATIONAL TOOL CORP. $2.00. Circle No. 49.

GET TO THE FINISH LINE FASTER—with a Performax drum sander. Don't spend hours with a hand-held sander. Send ultra-wide stock ultra-smooth in just minutes. Models start at $300 to $3495. Select the model that fits your budget and your needs. New Performax drum sanders keep sandpaper tight without re-wrapping. PERFORMAX PRODUCTS. $1.00. Circle No. 78.

RINDUSTRIES, WOODWORKING TOOLS & ACCESSORIES—100% Made in USA. The NEW 1995 catalog is here. Available in the all new 400 page Precision ULTRA Scroll Saws, “4-in-1” and “3-in-1” Universal Woodplaner Systems, and 26“ Variable Speed Drum Sander. SCOTT Drum Sander, the all new PANalimster II Raised Panel Door Machine, Router Tables, Books, Accessories, Patterns, and Much More. When you buy from rindustries, you're saving big money by buying factory-direct from one of America's premier woodworking tool manufacturers. We stand behind every single item in our catalog with our exclusive 30-Day, Money Back Guarantee and 5-Year Warranty. Send today for your FREE catalog. RINDUSTRIES, INC. Free. Circle No. 84.

MINI POWER TOOLS CATALOG—Designed for easy reference, Ryobi's "shirt pocket" Power Tool Catalog includes our complete line of power tools, categorized by type: benchtop, cordless, hand-held and stationary models. It features individual tool photographs with specifications and clear descriptions that offer specific uses and benefits. Accessories are also listed. Send for catalog, RYOB. Free. Circle No. 86.

THE ADVANTAGE—That's what you'll have over other woodworkers when you are using SECO MACHINERY. With choices of straight-line rip saws, wide belt sanders, dust collectors, power feeders, and lots, lots, lots more from manufacturers such as Milwaukee, Makita, Porter Cable, Black & Decker, Dewalt, Freud, Bosch, Delta, and many more. Now introducing our full range of woodworkers' tools on Safe™ division of SEVEN CORNERS ACES HARDWARE. INC. $1.00. Circle No. 92.

WILKE MACHINERY CATALOG—80 pages of quality woodworking equipment from popular brands, accessories, books and videos. Bridgeport woodworkers, bandsaws, lathes, table saws, jointers, wide belt sanders and more. General, Porter-Cable, DeWalt and other famous brands. WILKE MACHINERY CO. $2.00. Circle No. 91.

OWN A MACHINE SHOP—Do your own machining and shop work with a Smithy 3-in-1 Latvia-Mill-Drill. Save time and money with versatile, easy-to-use Smithy machines. 64-page catalog features over 500 machine tools and accessories. SMITHY. Free. Circle No. 96.

HAND TOOLS

PERSONAL BRANDING IRONS—Brochure describes branding irons that enable you to put your name on your work quickly and easily. Made especially for branding beef with a 1, 2, or 3 lines of copy. Chargeable date also available. NOVA TOOL CO. $1.00. Circle No. 160.

STAINS/FINISHES

PERFECT PEN POLISH—New Developed for pens but great for any small lathe turned object. Pen Turning Manual, everything you need to know from the selection of the perfect pen and making of pen making supplies—many styles of mechanisms, unusual pen turning materials such as dyed stabilized butts and spalted woods. Send for catalog of wood turning and pen making supplies. BUT PRODUCTS FOR WOOD. $1.00. Circle No. 280.

WOODWORKERS' PLANS AND SUPPLIES—Wood plans are simplified with the high quality plans, specialty hardware and other supplies offered by Armor Products. Over 100 plans are available for making toys, decorative items, and birdhouses. A complete line of pen making supplies—many styles of mechanisms, unusual pen turning materials such as dyed stabilized butts and spalted woods. Send for catalog of wood turning and pen making supplies. Armor Products. $1.00. Circle No. 375.

HERILOOM WOOD TOY PLANS—You too can build The General train as featured in WOOD, Sept. 1994! Send for our catalog of plans, kits and finished toys. Unique plans for every kind of toy, cars, trucks, trains and much more. Original designs, by professional toy makers, are based on an exclusive puzzle concept. BALDWIN TOY COMPANY. $2.00. Circle No. 320.

FREE SCROLL SAW PATTERN CATALOG—A beautiful full-color catalog showcasing our full line of woodturning patterns and accessories. Shelves, mirrors, clocks, radios, books, baskets, boxes, drills, hand tools, lights, spindles, and much, much more. Too much to list here—you should get one today! BERRY BASKET. $2.22.

SCROLLSAW PATTERNS—In sets of six or more. 1950's cars, 1950's cars, motorcycles, woodlands, ocean, farm, zoo, Christmas, dogs, or beasts. Some interiors, others very detailed or multi-piece. These patterns grab attention. BROKEN ARROW DESIGN. $1.00. Circle No. 324.

THE “CADILLAC OF CATALOGS”—You've never seen anything like this—promising! Our catalog has over 2000 plans and patterns from over 50 companies. The selection seems endless and the quality guaranteed. We are proud to offer so many unusual and unique plans. Many of these plans have been at our customer’s request. We also have a new line of "Nothing but..." catalogs featuring ten different related subjects. The first, and our favorite, to be introduced will be "Nothing but Christmas", followed by "Nothing but" series. (Next listing for details). Catalog: CREATIVCRAFT PLANS. $4.00. Circle No. 330.

CREATIVCRAFT PLANS—Gives you its newest catalog in the “Nothing But...” series. What is the “Nothing But...” series? The first, and our favorite, to be introduced will be "Nothing but Christmas", followed by "Nothing but" series. Catalog: CREATIVCRAFT PLANS. $1.00. Circle No. 331.

FULL-SIZE FURNITURE PLANS CATALOG—Illustrated full-size furniture plans over 200 plans for making furniture of quality found in museums and fine furniture stores. Plans include roll top desk, cradles, dining tables, chairs, buffets, chests, gun cabinets, poker table, children's furniture, rocking horse, spinning wheels, and more. Bill of materials included. Drawing assistant. WOODWORKER FURNITURE DESIGNS, INC. $3.00. Circle No. 345.

NEW EXQUISITE BIRD HOUSE—Now available, as well as our ever popular bird feeder and stand. Two creative designs to add a touch of charm and whimsy to your garden. Build for Christmas gifts or sell for profit all year round. Send for full details. GOOSE POND MILL. $2.00. Circle No. 365.

PROJECT PLANS—Full-size patterns for over 750 easy-to-build woodworking projects. Nation's leading source for scroll saw patterns, cow projects, toy plans, yard ornaments, wood furniture, etc. Over 3000 hard-to-find specialty items. Send for big new 96-page full-color catalog. MEISEL HARDWARE SPECIALTIES. $2.00. Circle No. 405.

PLANS FOR UNIQUE CHRISTMAS GIFTS—90's alternative to doll houses. Great for either boys or girls. Space station with many accessories for customizing, plus-alien and shuttles. Spectacular bath plus animals, insects, and wedding cake. New plans for coffee and end tables simply styled to complement any decor; wall and ceiling light fixtures, table lamps. Geometric patterns with pictures and full descriptions, PARADOX CREATIONS. $1.00. Circle No. 429.

SJOBERGS WORKBENCH CATALOG—Full-color catalog which illustrates the full range of cabinet maker’s workbenches from Europe’s largest manufacturer. Sjobergs workbenches are known internationally and have many unique features including the holdfast facility. There is a wide range of models to suit all requirements for home or industry. SJOBERGS. Free. Circle No. 440.

CORIAN® PROJECT GUIDE—5 separate projects you can create in your own workshop. Comes complete with a step-by-step guide and directions on where to purchase Corian® for these projects and others. SOLID SURFACE SALES, INC. $3.00. Circle No. 445.

TO ORDER THESE BOOKLETS, USE COUPON ON PAGE 56.
WOODCUTTER'S RESOURCE

TO ENSURE PROMPT HANDLING OF YOUR ORDER FOLLOW THESE INSTRUCTIONS:

- Circle your choice:
  - Enclose check or money order for cost of booklets plus $2.00 service charge (no stamps accepted)
  - NO FOREIGN ORDERS ACCEPTED

WOOD SUBSCRIPTION

A 1 year WOOD subscription (9 issues) for $24.97 (U.S. price) - a $19.56 savings off newsstand rate (Circle No. 4000). Allow 6-8 weeks for first issue. Be sure to include payment with total below. NO FOREIGN ORDERS ACCEPTED ON THIS COUPON.

**Circle numbers below corresponding to items in this order. Please include $2.00 for handling charge.

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1828</td>
<td>$2.00</td>
</tr>
<tr>
<td>1829</td>
<td>$2.00</td>
</tr>
<tr>
<td>1830</td>
<td>$2.00</td>
</tr>
<tr>
<td>1831</td>
<td>$2.00</td>
</tr>
<tr>
<td>1832</td>
<td>$2.00</td>
</tr>
<tr>
<td>1833</td>
<td>$2.00</td>
</tr>
<tr>
<td>1834</td>
<td>$2.00</td>
</tr>
<tr>
<td>1835</td>
<td>$2.00</td>
</tr>
<tr>
<td>1836</td>
<td>$2.00</td>
</tr>
<tr>
<td>1837</td>
<td>$2.00</td>
</tr>
<tr>
<td>1838</td>
<td>$2.00</td>
</tr>
<tr>
<td>1839</td>
<td>$2.00</td>
</tr>
<tr>
<td>1840</td>
<td>$2.00</td>
</tr>
<tr>
<td>1841</td>
<td>$2.00</td>
</tr>
<tr>
<td>1842</td>
<td>$2.00</td>
</tr>
<tr>
<td>1843</td>
<td>$2.00</td>
</tr>
<tr>
<td>1844</td>
<td>$2.00</td>
</tr>
<tr>
<td>1845</td>
<td>$2.00</td>
</tr>
<tr>
<td>1846</td>
<td>$2.00</td>
</tr>
<tr>
<td>1847</td>
<td>$2.00</td>
</tr>
<tr>
<td>1848</td>
<td>$2.00</td>
</tr>
<tr>
<td>1849</td>
<td>$2.00</td>
</tr>
<tr>
<td>1850</td>
<td>$2.00</td>
</tr>
<tr>
<td>1851</td>
<td>$2.00</td>
</tr>
<tr>
<td>1852</td>
<td>$2.00</td>
</tr>
<tr>
<td>1853</td>
<td>$2.00</td>
</tr>
<tr>
<td>1854</td>
<td>$2.00</td>
</tr>
<tr>
<td>1855</td>
<td>$2.00</td>
</tr>
<tr>
<td>1856</td>
<td>$2.00</td>
</tr>
<tr>
<td>1857</td>
<td>$2.00</td>
</tr>
<tr>
<td>1858</td>
<td>$2.00</td>
</tr>
<tr>
<td>1859</td>
<td>$2.00</td>
</tr>
<tr>
<td>1860</td>
<td>$2.00</td>
</tr>
<tr>
<td>1861</td>
<td>$2.00</td>
</tr>
<tr>
<td>1862</td>
<td>$2.00</td>
</tr>
<tr>
<td>1863</td>
<td>$2.00</td>
</tr>
<tr>
<td>1864</td>
<td>$2.00</td>
</tr>
<tr>
<td>1865</td>
<td>$2.00</td>
</tr>
<tr>
<td>1866</td>
<td>$2.00</td>
</tr>
<tr>
<td>1867</td>
<td>$2.00</td>
</tr>
<tr>
<td>1868</td>
<td>$2.00</td>
</tr>
<tr>
<td>1869</td>
<td>$2.00</td>
</tr>
<tr>
<td>1870</td>
<td>$2.00</td>
</tr>
<tr>
<td>1871</td>
<td>$2.00</td>
</tr>
<tr>
<td>1872</td>
<td>$2.00</td>
</tr>
<tr>
<td>1873</td>
<td>$2.00</td>
</tr>
<tr>
<td>1874</td>
<td>$2.00</td>
</tr>
<tr>
<td>1875</td>
<td>$2.00</td>
</tr>
<tr>
<td>1876</td>
<td>$2.00</td>
</tr>
<tr>
<td>1877</td>
<td>$2.00</td>
</tr>
<tr>
<td>1878</td>
<td>$2.00</td>
</tr>
<tr>
<td>1879</td>
<td>$2.00</td>
</tr>
<tr>
<td>1880</td>
<td>$2.00</td>
</tr>
<tr>
<td>1881</td>
<td>$2.00</td>
</tr>
<tr>
<td>1882</td>
<td>$2.00</td>
</tr>
<tr>
<td>1883</td>
<td>$2.00</td>
</tr>
<tr>
<td>1884</td>
<td>$2.00</td>
</tr>
<tr>
<td>1885</td>
<td>$2.00</td>
</tr>
<tr>
<td>1886</td>
<td>$2.00</td>
</tr>
<tr>
<td>1887</td>
<td>$2.00</td>
</tr>
<tr>
<td>1888</td>
<td>$2.00</td>
</tr>
<tr>
<td>1889</td>
<td>$2.00</td>
</tr>
<tr>
<td>1890</td>
<td>$2.00</td>
</tr>
<tr>
<td>1891</td>
<td>$2.00</td>
</tr>
<tr>
<td>1892</td>
<td>$2.00</td>
</tr>
<tr>
<td>1893</td>
<td>$2.00</td>
</tr>
<tr>
<td>1894</td>
<td>$2.00</td>
</tr>
<tr>
<td>1895</td>
<td>$2.00</td>
</tr>
<tr>
<td>1896</td>
<td>$2.00</td>
</tr>
<tr>
<td>1897</td>
<td>$2.00</td>
</tr>
<tr>
<td>1898</td>
<td>$2.00</td>
</tr>
<tr>
<td>1899</td>
<td>$2.00</td>
</tr>
<tr>
<td>1900</td>
<td>$2.00</td>
</tr>
</tbody>
</table>

I AM ENCLOSING:
- $ for priced items
- $ for handling
- $ total remittance

Name (please print):
Address:
City:
State:
Zip Code:
Phone (Optional): —

P.O. Box 1177 Riverton, NJ 08077-7931
For centuries, arcs have been a part of woodworking. Whether for function, such as rocking-chair rockers, or beauty, such as arch-top cabinet doors, designers and craftsmen frequently have counted on curves. A woodworker could saw an arc on an inside or outside edge easily enough, but then came the challenge of smoothing the curve. Compass planes, also called circular planes, provided the means.

Joiners and cabinetmakers first adapted wooden-bodied jack planes to the task of planing curves. They simply rounded or hollowed the plane's sole to the needed curvature, as shown above. Of course, this alteration limited the plane to work only on a curve of that particular radius.

To avoid keeping a pile of planes around the shop, some craftsmen experimented with adjustable compass planes. One scheme involved sawing a kerf across the front and back of the body, parallel to the sole of the plane. Then, the ends of the sole could be flexed up and held with screws or flexed down with wedges. The limited range of adjustment available with such planes proved a drawback.

During the latter part of the 19th century, manufacturers developed comprehensive lines of precision steel and iron planes, including adjustable compass planes. A popular style, though not the first to come onto the market, was the Stanley model 113, shown in the foreground below left. Introduced in 1879, the 113 featured a flexible steel sole. Turning the knob at the front adjusted the sole over a wide range of arc radii, from convex to concave. Geared linkage arms moved both ends of the sole up or down simultaneously.

The Keen Kutter K 115, shown on the wood in the photo, was sold by one of Stanley's competitors, the E. C. Simmons Co. The Simmons Co., a hardware retailer, marketed a variety of tools under the Keen Kutter brand name. The K 115, nearly identical to the Stanley 113 plane, was probably manufactured by Sargent.

Stanley manufactured the 113 until 1942. Another design remained on sale until the late 1950s. Presently, Record markets a flexible-sole compass plane similar to that later Stanley model.

Today, a Stanley 113 sells for $50-$100; those built before 1885 go for about twice that. The Keen Kutter K 115 would probably bring $125-$250.♣

Stanley 113 from the collection of James Rask, Riverdale, North Dakota.
Keen Kutter K 115 from the collection of Mike Knudson, Bisnerk, North Dakota.
Photograph: John Letherton
Illustration: Kim Downing
The Tool That Your Workshop Needs...

With 208 pages of full-color, our Free Catalog is the biggest in the business. We also think it's the best.

We have the high quality woodworking supplies and tools that are nearly impossible to find anymore. Everything from traditional old-style hand planes and saws to the very latest in power tools and accessories. We've got Precision Measuring tools, Chisels, Carving tools, Turning tools, Sharpening tools, plus Glues, Stains, Top Coats and much more.

Send us a post card or letter with your name and address to the address below. Or Call Toll-Free 800-221-2942 to receive your Free 1995 Garrett Wade Catalog.

Garrett Wade Co., Inc.
161 6th Avenue, Dept. 1057
New York, NY 10013
800-221-2942

And It's Free, From Garrett Wade

Uncap the Power of Polyurethane Glue

- No Mixing
- Waterproof
- Extraordinary Strength
- Sands & Scraps Easily
- Expands as it Dries
- 30 Minute Open Time
- Exterior/Interior Use
- Fully Guaranteed
- Distributor/Dealer Inquiries Welcome

Tel: (318) 876-2495
Fax: (318) 876-2213

EXCEL
The First Polyurethane Wood Glue in America

The AmBel Corporation, P.O. Box 819, Cattoonport, LA 71327

Here's the one thing Belgians don't waffle on.

The Robland X31 is as welcomed in European workshops as a home run in the World Series. We put together a 12" jointer, 12" planer, 10" table saw, 50" sliding table, and a shaper with a mortiser. No cheating. No compromises. Some 1100 lbs. of cast iron stability, with three separate 3HP motors. It stays put. It stays true. and it stays neatly in a little corner of your shop.

That's why Belgians call the Robland X31 The Intelligent One Man Shop. About the only thing you can't make on it is breakfast.

LAGUNA TOOLS
(800) 234-1976 • (714) 494-7006 • FAX (714) 497-1346 • 2265 Laguna Canyon Road, Laguna Beach, CA 92651

Circle No. 44, 855, 1427
90 Minute Demo Video Available

Circle No. 815
Make a colorful character
Paint the carving with acrylic paints. Apply thin washes of color in several coats. (Harley thins liquid acrylics with 5–10 parts of water to one part of paint.) This way, the paint doesn’t mask the wood grain and carving texture.

Colors shown are: Sweater, cadmium red medium; knickers, permanent green light; socks, 50–50 mix of ultramarine blue and titanium white; scarf and hair, yellow ocher; hat and mittens, titanium white; face, flesh with rosy highlights for cheeks and lips; and skis, shoes, and tail, burnt sienna.

Paint the eyes next, using the liquid acrylic paints unthinned. Start by painting a burnt umber arch and circle as shown in Step 1 in the illustration, above right.

Make each eye about \( \frac{3}{8} \)" high, starting from the ridge across the top of the cheeks. Align the center of the eyeball with the side of the nose. Follow the remaining steps to complete each eye.

After the paint dries, apply a liberal coat of Danish oil, tung oil, or boiled linseed oil to seal and antique the carving. For greater effect, darken the oil with a bit of walnut stain or tinted oil. (Test darkened oil on painted scrapwood, first.) Wipe off the excess, and let the carving dry. Oil the base, skis, and poles, too. (Be sure to dispose of oily rags safely.)

The hat and mittens on the carving shown feature barkrosing for ornamentation. In this traditional Scandinavian technique, fine dust created by sanding tree bark is rubbed into an incised design. (For more on barkrosing, see WOOD® magazine no. 61, June 1993, pp. 54–55.)

For barkrosing the carving, wait until the oil dries. Then, draw your design onto the carving with a sharp pencil. Incise the design lines, then rub in the sanding dust. Seal with another coat of oil.

Send him down the hill
Attach Per’s skis to the bottoms of his boots with countersunk #6x1/4" flathead wood screws. Position him on the sloped base, and drill a pilot hole through the bottom of the base into each foot. Counterbore each hole in the base so that 1" of a #6x1/4" screw protrudes through the sloped top. Glue the tail into the tail hole. Slide the ski poles into the holes through the mittens to complete the skiing troll. Then, screw the carving to the base.
Dusty Tours Santa Claus' Wood Working Shop

YOU KNOW I DON'T LIKE MY BROTHER, WOODY PYLES. WHY DO WE HAVE TO VISIT HIM AT SANTA'S WOOD WORKING SHOP EVERY YEAR? HE'S ALWAYS SO GLUM AND THE SHOP IS A MESS.

NOW, DUSTY. HE'S FAMILY. HE'S YOUR BROTHER. AND IT'S CHRISTMAS. WE'RE GOING TO SEE HIM AND THAT'S FINAL.

WELCOME TO THE WONDERFUL WORLD OF SANTA'S WOOD WORKING SHOP!

WHY ARE YOU SO HAPPY? HAS THE DUST FINALLY CLOGGED YOUR BRAIN?

FOR THE LAST 20 YEARS I WAS IN CHARGE OF CLEANING UP THE WHOLE WOOD WORKING SHOP WITH THE HELP OF 28,325 ELVES. IT TOOK ALL YEAR. IT JUST ABOUT DROVE ME CRAZY. THIS CHRISTMAS I'M VERY HAPPY BECAUSE SANTA BOUGHT ME A CLEANAIR. THE CLEANAIR USES A UNIQUE THREE-STAGE FILTRATION SYSTEM TO CAPTURE 97% OF THE FLOATING DUST PARTICLES OUT OF THE SHOP. NOW, CLEAN UP ONLY TAKES TWO ELVES AND ONE CLEANAIR.

WHAT DID YOU DO WITH THE OTHER 28,323 ELVES?

NOW, SANTA CLAUS HAS ALL 28,323 OF THE WOOD WORKING ELVES ANSWERING THE PHONES TO KEEP UP WITH THE CLEANAIR ORDERS FOR THIS CHRISTMAS.

CLEANAIR System
260 CFM order # 90175
Suggested List Price $339
NOW $269 $20 shipping

CLEANAIR System - Heavy Duty
490 CFM order # 90177
Suggested List Price $399
NOW $309 $20 shipping

CLEANAIR System - Commercial
980 CFM order # 90180
Suggested List Price $699
NOW $499 $25 shipping

FILTER REPLACEMENT KIT • ORDER # 90176 • $29.95

And here are just a few more advantages the CleanAir System has over the competition...
- Needs no outside venting
- Available for any size shop
- Very quiet operation
- Has no effect on existing room temperature
- Runs on standard house current
- Compact size fits almost anywhere
- Heavy gauge steel cabinet w/ mounting holes
- Contains approx. 24 sq. ft. of filter material
- Easy filter replacement
- 30 day money back guarantee
- One year warranty on all parts
- Built in the USA with a 8 year record of satisfaction

NAME______________________________________
ADDRESS_____________________________________
CITY/STATE__________________________ ZIP_____
PHONE__________________________
□ PLEASE SEND MORE INFORMATION
□ I WANT TO ORDER #_____________________
CHECK, M/C, VISA, DISCOVER, AMEX
CARD #__________________________ EXP. DATE_____

Total Shop
WORLD OF WOODWORKING

DEPT. 3 • P.O. BOX 25429 • GREENVILLE, SC 29616
Circle No. 949
Free Blade Offer

The experts agree, PGT's are "The Best" Scroll Saw Blades You Can Buy!
The Smoothest Cutting, Most Accurate, & Longest Lasting Scroll Blades Made.

Available from your Olson Dealer
5" Plain End Blades with Reverse Teeth.
Univ. Sizes 5, 7 & 9.

Send for your FREE BLADE in the size of your choice.
(circle size #5, 7 or 9)

Name ________________________________
Address ______________________________
City ______________________ State ______
Zip __________________________

The Olson Saw Company
16 Stony Hill Road, Dept. WD
Bethel, CT 06801
Fine Quality Saw Blades Since 1918

Circle No. 1967

FREE TOOL CATALOG!

Your Best Work Starts With Us!
With over 5,000 of the finest woodworking tools in the world, Woodcraft can help you work more efficiently and skillfully than ever.
Call for your Free copy today.
1-800-542-9115

WOODCRAFT*
210 Wood County Rd. Park., Dept. 96W112S
PO Box 1586, Parkersburg, WV 26102-1586

Circle No. 955

Subscribers, please note:
WOOD magazine subscribers often express interest in products and services which are supplied by our company, Meredith Corporation, and by other reputable firms.

Accordingly, we sometimes send our subscribers offers for books, other magazines or home-related products, and services of potential interest.

We also make subscriber names and addresses available to other firms that are able to supply appropriate products and services. We screen all such offers and take great care to see that information about these products and services is sent only to subscribers who, according to our records, are most likely to be interested.

While we believe the distribution of this information is of benefit to our subscribers, we firmly respect the wishes of any subscriber who does not want to receive it. Should you wish to restrict this, simply send your request to: WOOD Magazine, P.O. Box 10265, Des Moines, IA 50336-0263.

Please enclose a current address mailing label. Please be specific as to whether you want to stop all offers from any company including Meredith.
We will gladly honor your request.

Performax® - A Planer Plus
Drum and Brush Sanders
for Maximum Performance and Maximum Value

You could get lost comparing the many brands of bench-top planers or you could go beyond to a new way of dimensioning.

The new way is the Performax® way!
Now you can smooth a rough-sawn board to a ready-to-stain finish more efficiently than the combined use of a planer and a hand-held belt sander.

The Performax® way eliminates scraping, planer tear-out, snipe and narrow width limitations that require you to rip and glue.

Plus, a Performax® Drum Sander will dimension and finish sand stock that a planer can't. Craft pieces as short as 2-1/4", veneers as thin as 1/4", cross-grain, end-grain, knotty, burlled, scroll saw work, edge-glued and joined stock are all easily handled.

The genuine Performax® Drum Sander, the only MADE IN USA drum sander with patented features. Models are available with 1, 1 1/2 or 5 HP motors to satisfy a wide variety of thicknessing AND fine finish sanding needs.

Call for a free brochure and the dealer nearest you.

Performax Products, Inc. 1-800-334-4910 (612) 895-9922
12257 Nicollet Ave. So. • WD08 • Burnsville, MN 55337

Circle No. 78

Woodfast Wood Lathes
The Professionals' Choice

Woodfast wood lathes are used by professional woodturners all over America. Its powerful, sturdy design and large capacity make it the lathe of choice for both professional and serious woodturners.

FEATURES:
10" or 20" CAPACITY VARIABLE CROSS FEED SOLID CAST IRON 3/16" PLATE STEEL BASE CAGE-LOCK TOOL POST CAGE-LOCK TAILSTOCK AVAILABLE IN 18" OR 20" BETWEEN CENTERS LIFETIME GUARANTEE

Send $2.00 per information on Woodfast lathes and a copy of our 84 page color Woodturners Catalog. $2.00 refunded with order.

Craft Supplies USA
P.O. Box 50000
Provo, Utah 84605-0030

Circle No. 830
FINISHING TOUCHES

Canadian clockmaker doubly inspired

Bob Clements of Kitchener, Ontario, always wanted to build a clock from scratch. But not until he retired did he have time.

"In 1991, Dad commented that he wanted to build grandfather clocks for my brother and me," wrote Joan Pulsifer, Bob's married daughter. "We both liked the clock on the cover of the April 1988 issue of WOOD magazine. So, he said he'd build one for each of us, but it would take three years."

In the summer of 1993, though, Bob asked his son and daughter to select their stain colors. "We chose them, then didn't think too much more," Joan continued, "until Christmas Day when Dad completely surprised us with the finished clocks!"

Bob reports that he changed the face of the clock at right in the photo, and made some component modifications, but he thinks they are fine as published. Great woodworking job, Bob!

As a Christmas surprise for his son and daughter, Canadian reader Bob Clements built each a tall clock from plans in WOOD magazine.

Timber tome for the birds

One of the nation's largest hardwood producers, the Anderson-Tully Company, offers its help in improving songbird habitat. The Memphis-based firm has produced the Breeding Bird Field Manual, a 155-page color-illustrated guide to the habitats of 75 migratory songbirds found in the Mississippi Valley. Intended to assist forest managers and bird lovers, the guide includes a cassette tape of bird songs.

In a 1992 interview ("Logging Along the Mighty Mississippi," WOOD magazine, February 1992) Anderson-Tully's wildlife biologist Mike Staten explained how environmentally conscious forest management encourages songbirds: "Our forests always have a mixture of treestop levels, hollow trees for nesting, and wildlife food. Mulberry and dogwood contribute to the diversity. We look at birds and other wildlife as enriching our forest stands." Anderson-Tully lands stretch from Illinois to Louisiana. For a copy of the book and tape, send $45 (p&p., U.S.) to: Anderson-Tully Co. Bird Book, P. O. Box 28, Memphis, TN 38101.

On display:

Four centuries of Norwegian folk art

Norwegians have always had a way with wood. That's evident in the major exhibition at New York's Museum of American Folk Art, "Norwegian Folk Art: The Migration of a Tradition."

Jointly organized by the Norwegian Folk Museum, Oslo, and the Museum of American Folk Art, the show chronicles the development of Norwegian folk art and its continuation in the United states through more than 175 outstanding works. Among the many wooden items on display, you'll see Viking drinking vessels, decorated trunks, carved furniture, and pieces from contemporary folk carvers, such as Decorah, Iowa's Harvey Refsal, a carving consultant to WOOD magazine (see photo below). The exhibition runs through January 7, 1996, then moves on to Bismarck, North Dakota, St. Paul, Minnesota, Seattle, Washington, and Oslo, Norway. For a complete exhibition schedule, call 212/977-7170.

Harley Refsal's carving "Bringing in the firewood" depicts the rough-hewn individuals and way of life he remembers from growing up in a Norwegian community in Minnesota.

Who ships wood to the U.S.?

According to statistics published by the Western Wood Products Association, softwood-lumber imports to the United States in 1994 totaled 16.4 billion board feet, up 7.3% over the previous year. (Total softwood consumption was about 195 billion board feet.) Canada led the importers filling the void that timber producers associate with the reduction in logging on national forests in the Pacific Northwest. Canadian sawmills shipped 62.5% of their lumber south. Four countries supplied about 90% of the United States' non-Canadian lumber imports: Brazil, Chile, New Zealand, and Mexico.
WITH A FREE MOBILE BASE, IT'S EASY TO ROLL DELTA QUALITY INTO YOUR SHOP.

FREE Get a free mobile base when you buy this 14" Band Saw with open stand. Cuts stock up to 6 1/4" thick and 14" wide. Contour, straight cut, resaw and roll.

FREE Buy the Contractor Saw with a 30" Unifence and we'll put it on wheels for free. With a free mobile base for both the saw and the Unifence extension, you'll be rolling first class.

FREE 14" Band Saw with enclosed stand comes with a free mobile base, plus a free 18" fence. The ultimate deal on wheels.

FREE Free mobile bases plus free knife-setting jigs make our DJ23 8" and DJ-15 6" Precision Jointers as manageable as they are accurate.

We all love those Delta machines. But sooner or later, something's got to give. There's only so much shop space before we hit our limit.

Now here's an idea that just might move you. For a short time only, we're making it easier than ever to roll one of these beauties into your shop and park it anywhere you want.

Just buy any one of the five machines pictured here, and we'll let you slip a hefty mobile base underneath it for free. A genuine Delta Accessory that makes these valuable machines even better. So you'll be able to rearrange your space on a daily basis, if you want. Or move one machine to work in closer proximity to a companion piece. Effortlessly. (Who knows, you might even have room for two new machines.)

We're rolling out our Deals On Wheels promotion for a limited time only. And only at participating Delta dealers. And if you look closer you'll notice that several of these tools even have an extra goody to make an already great value even greater.

If you're ready to roll Delta Quality into your shop, call for the name of your nearest participating dealer. Delta International Machinery Corp., 800-438-2486. In Canada, 519-836-2840.

Select Tools Deals On Wheels Limited Time

The Power Of The Pros

Delta Woodworking Machinery
A Pantar Company

Delta funds these national PBS programs.
The Yankee Workshop with Norm Abram.
The American Woodshop with Scott Phillips.
First we changed the rules.
Then we stretched them.

Dodge Ram Club Cab lets you do something you thought you'd never do in the back seat of a pickup. Relax. Since there's more hip room than other club cabs, back seat passengers can spread out. The seat cushion is deeper, providing added support for longer trips. And when we say that our pickup is the most comfortable full-size club cab you can buy, we have the material to support it. In the form of a patented fabric, with fibers that act as a shock absorber. It's like having a suspension system just for the back seat.

It's easy to climb in and out, too. Because both sides of the 40/20/40 front bench tip and slide forward. Safety doesn't take a back seat, either. A driver's airbag comes standard. And we've made available four-wheel anti-lock brakes.

You've got plenty of power, courtesy of Dodge Magnum engines—overall the most powerful line of truck engines on the planet. And you've got some powerful assurance down the road, as well. Dodge Ram has better resale value than Ford, Chevy or GMC.²

Sit back and make yourself comfortable. Front or back, you'll find that we've made plenty of room. For still more information, call 1-800-4-A-DODGE.

America's Truck Stop The New Dodge

1 Always wear your seat belt for a fully effective airbag. 2 We calculated resale using avg. trade-in values of '94 full-size models vs. MSRP's, published in Jan.-July '95 N.A.D.A. Official Used Car Guide Monthly Editions. Use of these values does not constitute N.A.D.A.'s endorsement.